IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

IPA TECHNOLOGIES INC.,

               Plaintiff,

v.

GOOGLE LLC,

               Defendant.

C.A. No. _____

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff IPA Technologies Inc. ("IPA") as and for its complaint against Google LLC ("Google" or "Defendant") alleges as follows:

PARTIES

1.   IPA is a Delaware corporation with a principal place of business at 600 Anton Blvd., Suite 1350, Costa Mesa, California 92626.

2.   On information and belief, Defendant Google LLC is a Delaware limited liability company with a principal place of business at 1600 Amphitheatre Parkway, Mountain View, California. Google may be served with process through its registered agent, the Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

JURISDICTION AND VENUE

3.   This action arises under the patent laws of the United States, Title 35 of the United States Code. Accordingly, this Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and 1338(a).

4.   This Court has specific and general personal jurisdiction over Defendant pursuant to due process and/or the Delaware Long Arm Statute, due to Defendant having availed itself of the rights and benefits of Delaware by incorporating under Delaware law and due to its substantial business in this forum, including: (i) at least a portion of the infringement alleged herein; and (ii) regularly doing or soliciting business, engaging in other persistent courses of conduct, and/or deriving substantial revenue from goods and services provided to individuals in Delaware and in this Judicial District.

5.   Venue is proper in this District under 28 U.S.C. §§ 1391 (b)-(c) and 1400(b) because Defendant is resident in this District as it is incorporated in Delaware.

BACKGROUND

6.   SRI International, Inc. ("SRI"), the original owner of the patents-in-suit, is an independent, not-for-profit research institute that conducts client-supported research and development for government agencies, commercial businesses, foundations, and other organizations.

7.   SRI employs about 2,100 people worldwide, including scientists, engineers, technologists, policy researchers, and corporate and support staff. SRI works with clients to take the most advanced R&D from the laboratory to the marketplace. SRI collaborates across technical and scientific disciplines to generate real innovation and create value by inventing solutions that solve challenging problems and looks ahead to the needs of the future. For more than 70 years, SRI has led the discovery and design of ground-breaking products, technologies, and industries—from the computer mouse and intelligent personal assistants to robotic surgery, medical ultrasound, cancer treatments, and more. The revenue generated by SRI's R&D projects, commercialization activities,

and marketplace solutions is reinvested in SRI capabilities, facilities, and staff to advance its mission.

8.   Among its many areas of research, SRI has engaged in fundamental research and development related to intelligent personal assistants and speech-based navigation of electronic data sources.

9.   SRI's innovative work on personal digital assistants was a key area of development in one of the world's largest artificial intelligence projects, the Cognitive Assistant that Learns and Organizes ("CALO"). The vision for the SRI-led CALO project, which was funded by the U.S. Defense Advanced Research Projects Agency ("DARPA"), was to create groundbreaking software that could revolutionize how computers support decision-makers.

10.   SRI's work on personal digital assistants and speech-based navigation of electronic data sources, which started before the launch of the CALO project, developed further as part of the project. SRI's engineers were awarded numerous patents on their groundbreaking personal digital assistant and speech-based navigation inventions.

11.   To bring the personal digital assistant and speech-based navigation technology to the marketplace, SRI formed the spin-off company Siri, Inc. in 2007, and granted it a non-exclusive license to the patent portfolio. The technology was demonstrated as an iPhone app at technology conferences and later released as an iPhone 3GS app in February 2010. In April 2010, Apple Inc. acquired Siri, Inc. In 2011, the Siri personal digital assistant was released as an integrated feature of the iPhone 4S.

12.   Intelligent personal assistants and speech-based navigation of electronic data sources have continued to be implemented as effective and user-friendly solutions for interacting with electronic devices.

13.   On May 6, 2016, IPA acquired the SRI patent portfolio at issue here. IPA is a wholly-owned subsidiary of WiLAN, a leading technology innovation and licensing business actively engaged in research, development, and licensing of new technologies.

INVENTOR BACKGROUNDS

14.   Co-inventor Adam Cheyer is today a recognized thought leader in the field of artificial intelligence. After obtaining his computer science degree from Brandeis University and his MS in Computer Science and Artificial intelligence ("AI"), Mr. Cheyer served as a researcher in Artificial Intelligence at SRI International. He authored more than 60 publications and 26 issued patents. He was Chief Architect of CALO, the largest AI project in US history. Previously, he was co-founder and VP Engineering of Siri, a mobile phone virtual personal assistant. As a startup, Siri won the Innovative Web Technologies award at SXSW, and was chosen as a Top Ten Emerging Technology by MIT's Technology Review before Apple purchased Siri in 2010. He is currently co-founder and VP Engineering of Viv Labs, whose goal is to simplify the world by providing an intelligent interface to everything. Viv Labs is now a wholly-owned subsidiary of Samsung.

15.   Co-inventor Dr. Luc Julia is named one of the top 100 most influential French developers in the digital world. After receiving his Ph.D. in Multimodal Human-Computer Interfaces from the Ecole Nationale Superieure de Telecommunications in Paris, France, Dr. Julia worked at SRI, where he studied agent architectures, co-founded

Nuance Communications (a world leader in speech recognition), and served as co-founder and director of the Computer Human Interactive Center (CHIC!). He was also Chief Technologist at Hewlett-Packard Company, and Director of Siri at Apple, Inc. He now serves as VP of Innovation at Samsung Electronics' Strategy and Innovation Center.

16.   Co-inventor Christine Halverson obtained her MS and Ph.D. in Cognitive Science while working at NASA's Ames Research Center building next-generation air traffic control software. She worked for SRI as an Interim Program Director of SRI's CHIC! Most recently she has served at IBM as a researcher at the Thomas J. Watson Research Center for a total of 16 years in the areas of human computer interaction, and the PERCS (Productive Easy-to-Use Reliable Computing System) program, which was part of a DARPA challenge in the High Performance Computing System (HPCS) mandate to develop a peta-scale computer.

17.   Co-inventor Dimitris Voutsas has a Masters in Computer Science and worked as a Research & Development Engineer at SRI's CHIC! For the last twelve years he has served at Microsoft as a Project Manager for Windows and Windows Phone, and currently serves as Senior Program Manager for Microsoft's Bing.

18.   Co-inventor David L. Martin worked as a Senior Computer Scientist at the Artificial Intelligence Center of SRI International for over 16 years, and worked as the Senior Manager for Applications Engineering at Siri Inc. and later as an Engineering Manager at Apple Inc. upon Apple's acquisition of Siri. Since August 2013, he has served as the Senior Research Scientist at Nuance Communications, focusing on artificial intelligence research.

PATENT PROSECUTION AND EXAMINATION

19.   Examiners at the United States Patent and Trademark Office ("USPTO") review patent applications to determine whether a claimed invention should be granted a patent. In general, the most important task of a patent examiner is to review the technical information disclosed in a patent application and to compare it to the state of the art. This involves reading and understanding a patent application, and then searching the prior art to determine what technological contribution the application teaches the public. A patent is a reward for informing the public about specific technical details of a new invention. The work of a patent examiner includes searching prior patents, scientific literature databases, and other resources for prior art. Then, an examiner reviews the claims of the patent application substantively to determine whether each complies with the legal requirements for granting of a patent. A claimed invention must meet patentability requirements including statutory subject matter, novelty, inventive step or non-obviousness, industrial application (or utility) and sufficiency of disclosure, and examiners must apply federal laws (Title 35 of the United States Code), rules, judicial precedents, and guidance from agency administrators.

20.   To have signatory authority (either partial or full), Examiners must pass a test equivalent to the Patent Bar. All examiners must have a college degree in engineering or science. Examiners are assigned to "Art Units," typically groups of 8-15 Examiners in the same area of technology. Thus, by way of required background and work experience, Examiners have special knowledge and skill concerning the technologies examined by them and in their particular Art Unit.

21.   The basic steps of the examination consist of:

• reviewing patent applications to determine if they comply with basic format, rules and legal requirements;

• determining the scope of the invention claimed by the inventor;

• searching for relevant technologies to compare similar prior inventions with the invention claimed in the patent application; and

 • communicating findings as to the patentability of an applicant's invention via a written action to inventors/patent practitioners.

22.   Communication of findings as to patentability are done by way of one or more Office Actions in which the Examiner accepts or rejects proposed claims filed by the applicant(s) and provides reasons for rejections. The applicant(s) are then permitted to file a Response to Office Action, in which claims may be amended to address issues raised by the Examiner, or the applicant states reasons why the Examiner's findings are incorrect. If an applicant disagrees with a Final Rejection by an Examiner, the applicant may file an appeal with the Patent Trial and Appeal Board ("PTAB"). If, after this process, the USTPO determines that the application meets all requirements, a patent is duly allowed, and after an issue fee is paid, the patent is issued.

23.   A patent duly allowed and issued by the USTPO is presumptively valid and becomes the property of the inventor(s) or assignee(s).

24.   A "Continuation Application" is one where, typically after allowance but in any event prior to issuance, the inventor applies for a second, related patent. A Continuation employs substantially the same invention disclosure as the previous, allowed application, but seeks new or different claims.

ASSERTED PATENTS

U.S. Patent No. 6,851,115

25.   IPA is the owner by assignment of U.S. Patent No. 6,851,115 (the "'115 Patent"). The '115 Patent is entitled "Software-based Architecture for Communication and Cooperation Among Distributed Electronic Agents." The '115 Patent issued on February 1, 2005. A true and correct copy of the '115 Patent is attached as **Exhibit A**.

26.   The '115 Patent "is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents." '115 Patent at Col. 1, lines 25–29 (hereinafter 1:25–29).

27.   The claimed inventions in the '115 Patent are directed to new and improved computer functionality and technological processes that address problems rooted in and arising from computer technology.

28.   When initially filed, the applicants submitted their patent application and patent specification with an appendix containing five source files, cumulatively spanning more than 130 pages of source code.

29.   The background section of the '115 Patent specifies the need for an improved and intuitive computer-user interface:

> More than ever before, the increasing complexity of systems, the development of new technologies, and the availability of multimedia material and environments are creating a demand for more accessible and intuitive user interfaces. Autonomous, distributed, multi-component systems providing sophisticated services will no longer lend themselves to the familiar "direct manipulation" model of interaction, in which an individual user masters a fixed selection of commands provided by a single application. Ubiquitous computing, in networked environments, has brought about a situation in which the typical user of many software services is likely to be a non-expert, who may access a given service infrequently or only a few times.

'115 Patent at 2:21-33.

30.   An overview of the inventions of the '115 Patent emphasize the improved

functioning of the underlying computer's software architecture:

> A first embodiment of the present invention discloses a highly flexible, software-based architecture for constructing distributed systems. The architecture supports cooperative task completion by flexible, dynamic configurations of autonomous electronic agents. Communication and cooperation between agents are brokered by one or more facilitators, which are responsible for matching requests, from users and agents, with descriptions of the capabilities of other agents. It is not generally required that a user or agent know the identities, locations, or number of other agents involved in satisfying a request, and relatively minimal effort is involved in incorporating new agents and "wrapping" legacy applications. Extreme flexibility is achieved through an architecture organized around the declaration of capabilities by service-providing agents, the construction of arbitrarily complex goals by users and service-requesting agents, and the role of facilitators in delegating and coordinating the satisfaction of these goals, subject to advice and constraints that may accompany them.

'115 Patent at 4:58-5:8.

31.   The fundamental technological nature of the improvements to computer

functionality from the inventive software architecture and methods improve the flexibility

and expandability of the underlying system as whole is described one way as follows:

> As new agents connect to the facilitator, registering capability specifications and natural language vocabulary, what the user can say and do dynamically changes; in other words, the ICL is dynamically expandable. For example, adding a calendar agent to the system in the previous example and registering its capabilities enables users to ask natural language questions about their "schedule" without any need to revise code for the facilitator, the natural language agents, or any other client agents. In addition, the interpretation and execution of a task is a distributed process, with no single agent defining the set of possible inputs to the system. Further, a single request can produce cooperation and flexible communication among many agents, written in different programming languages and spread across multiple machines.

'115 Patent at 8:41-55.

32.   One of most important technical improvements to the underlying

computer functionality is the invention's ability to process compound or complex goals,

which is a significant improvement over even SRI's own earlier Open Agent Architecture

technology:

> Complex Goal Expressions
>
> A powerful feature provided by preferred embodiments of the present invention is the ability of a client agent (or a user) to submit compound goals of an arbitrarily complex nature to a facilitator. A compound goal is a single goal expression that specifies multiple sub-goals to be performed. In speaking of a "complex goal expression" we mean that a single goal expression that expresses multiple sub-goals can potentially include more than one type of logical connector (e.g., AND, OR, NOT), and/or more than one level of logical nesting (e.g., use of parentheses), or the substantive equivalent. By way of further clarification, we note that when speaking of an "arbitrarily complex goal expression" we mean that goals are expressed in a language or syntax that allows expression of such complex goals when appropriate or when desired, not that every goal itself is necessarily complex.

'115 Patent at 14:43-59; Compare with 4:34-55.

33.   The '115 Patent contains six independent claims and 89 total claims,

covering various methods, systems, and computer programs. Claim 61 is a facilitator

agent claim:

> 61. A facilitator agent arranged to coordinate cooperative task completion within a distributed computing environment having a plurality of autonomous service-providing electronic agents, the facilitator agent comprising:
>
> an agent registry that declares capabilities of service-providing electronic agents currently active within the distributed computing environment; and
> a facilitating engine operable to parse a service requesting order to interpret a compound goal set forth therein, the compound goal including both local and global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), wherein the ICL includes:
>
> a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and
>
> a content layer comprising one or more of goals, triggers and data elements associated with the events; and
>
> the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination

strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms.

34.   The above-disclosed claim limitations from the '115 Patent comprise various elements, including, e.g., a facilitator agent that coordinates task completion within a distributed computing environment with autonomous service-providing electronic agents, where the facilitator agent includes (i) an agent registry that declares capabilities of service-providing electronic agents and (ii) an engine to parse a service requesting order to interpret a compound goal, including both local and global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and a content layer comprising one or more of goals, triggers and data elements associated with the events; and the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms. This claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and functionality of the underlying computer software architecture, such as unprecedented ease to expand the agent-based system with increased functionality without any need to revise code for the facilitator, the natural language agents, or any other client agents, as well as a greater degree of freedom for users to use, and for the claimed system to accept and process an expanded set of more complex and compound requests and inquiries, relative to the prior art.

35.   The above-disclosed and claimed facilitator agent in a distributed computing environment with service-providing electronic agents additionally constitutes an unconventional technical solution (for example, a facilitator agent using a specialized interagent communication language with a unique (i) conversation protocol layer defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and (ii) content layers with goals, triggers, and data elements associated with the events) to address a technological problem rooted in computer technology of coordinating and completing tasks using service-providing electronic agents in a distributed computer environment.

<div align="center">Prosecution and Examination of the '115 Patent</div>

36.   The examination of the '115 Patent required over six years, from the date of the filing of the patent application on January 5, 1999, through the issue date of February 1, 2005.

37.   Three Patent Examiners were involved in examining the application that matured into the '115 Patent, namely, Examiner Lewis A. Bullock, Jr., and Supervisory Examiners St. John Courtenay III and John Follansbee.

38.   Although the publicly available prosecution history of the '115 Patent does not contain a complete summary of various patent examiner searches, it indicates that Examiner Bullock conducted prior art and/or other searches using at least the patent examiner systems Web-based Examiner Search Tool ("WEST") and Examiner Automated Search Tool ("EAST"), and performed searches on at least July 10, 2002; July 20, 2003; November 20, 2003; August 31, 2004; and September 3, 2004. The Patent Examiners formally cited at least 19 separate references during the prosecution of the '115 Patent.

39.   Between the prior art references located by and cited by the Patent

Examiners, and the references submitted by the applicants and considered by the Patent

Examiners during the prosecution of the '115 Patent, at least 12 patent references and 22

non-patent references were formally considered by the Patent Examiners, as indicated on

the front two pages of the issued '115 Patent.

40.   On information and belief, it is the practice of the USPTO not to cite

excessive cumulative art, in other words, in this instance, the art cited by the Patent

Examiners is representative of considerable other art located by the USPTO and not cited.

Further on information and belief, it is the practice of the USPTO to discuss in its Office

Actions those references of which the Patent Examiners are aware that most closely

resemble the claimed inventions.

41.   On September 10, 2004, the USPTO issued a Notice of Allowance as to

all of claims 1-89 presently in the '115 Patent.

42.   The issued claims from the '115 Patent are patentably distinct from the at

least 34 references identified and/or discussed during prosecution. That is, each of the 89

claims, as a whole—which include, e.g., electronic agents in a distributed environment

that use an inter-agent language that includes (i) a layer of conversational protocol

defined by event types and parameter lists associated with one or more of the events,

wherein the parameter lists further refine the one or more events, and (ii) a content layer

comprising one or more of goals, triggers and data elements associated with the events,

and/or constructing a goal satisfaction plan that includes using reasoning that includes

one or more of domain-independent coordination strategies, domain-specific reasoning,

and application-specific reasoning comprising rules and learning algorithms, and/or the

inter-agent language supporting compound goal expressions such that goals within a single request may be coupled by one or more operators comprising a conditional execution operator, and parallel disjunctive operation that indicates disjunct goals are to be performed by different agents —were found to be patentably distinct from at least the 34 formally identified references.

43.   The references cited during the examination of the '115 Patent all represent patentably distinct and in some instances prior art means or methods to navigate electronic data sources. By allowing the claims of the '115 Patent, each of the claims in the '115 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 34 formally identified references.

44.   As each claim as a whole from the '115 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole, constitutes more than the application of well-understood, routine, and conventional activities.

45.   As of February 19, 2018, the '115 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 266 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as IBM, Toshiba, Microsoft, Apple, Hewlett-Packard, Nuance Communications, and even Google itself. Out of the at least 266 patent applications in which the '115 Patent was cited as pertinent prior art during prosecution, the USPTO has issued more than 169 patents.

46.   The 266 forward citations to the '115 Patent—and at least 169 patents that have issued despite identification of the '115 Patent during their prosecution—reveal that

the '115 Patent and its claimed inventions are directed to specific methods, systems, and programs for an improved software-based architecture for distributed electronic agents to communicate and cooperate, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in software-based architectures for distributed electronic agent communication and cooperation.

47.   The '115 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '115 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '115 Patent was well ahead of the state of the art at the time of the invention. For example, every Office Action rejection during the entire prosecution of the application that issued as the '115 patent was entirely or partially based on publications where one or more inventors was an author or co-author of the reference.

U.S. Patent No. 7,069,560

48.   IPA is the owner by assignment of U.S. Patent No. 7,069,560 (the "'560 Patent"). The '560 Patent is entitled "Highly Scalable Software-Based Architecture for Communication and Cooperation Among Distributed Electronic Agents." The '560 Patent issued on June 27, 2006. A true and correct copy of the '560 Patent is attached hereto as **Exhibit B**.

49.   The '560 Patent "is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents." '560 Patent at Col. 1, lines 25–29 (hereinafter 1:25–29).

50.   The claimed inventions in the '560 Patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

51.   The '560 Patent, at 1:5-12, incorporates by reference and identifies as a related application U.S. Patent Application 09/225,198, filed January 5, 1999 (the parent application that issued as the '115 Patent).

52.   The '560 Patent is a continuation of the '115 Patent discussed immediately above. The specifications of the '115 and '560 Patents are therefore substantially identical, and paragraphs 27-32 above regarding the specification of the '115 Patent are incorporated by reference as if fully restated here in this section for the '560 Patent.

53.   The '560 Patent contains seven independent claims and 55 total claims, covering various methods, systems, and computer programs. Claim 52 states:

> 52. A computer implemented process for providing coordinated task completion within a distributed computing environment, the distributed computing environment including a plurality of autonomous electronic agents, the computer implemented method comprising the steps of:
>
> providing at least one agent registry including capabilities of service providing electronic agents;
>
> interpreting a service request in the form of a base goal, the service request being in a interagent communication language (ICL), the ICL including a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events;
>
> determining a plurality of sub goals necessary to accomplish the base goal; selecting from said registry at least one service providing agent capable of completing said sub goals; delegating at least one sub goal as a peer to peer service request directly from a service requesting agent to a service providing agent; and

delegating any remaining sub goals as service request in the interagent communication language to the selected agents capable of completing the remaining sub-goals.

54.   The above-disclosed method claim from the '560 Patent includes various

elements or steps, including, e.g., providing at least one agent registry including

capabilities of service providing electronic agents; interpreting a service request in the

form of a base goal, the service request being in a interagent communication language

(ICL), which in turn includes a layer of conversational protocol defined by event types

and parameter lists associated with one or more of the events, wherein the Parameter lists

further refine the one or more events; determining a plurality of sub goals necessary to

accomplish the base goal; selecting from said registry at least one service providing agent

capable of completing said sub goals; delegating at least one sub goal as a peer to peer

service request directly from a service requesting agent to a service providing agent; and

delegating any remaining sub goals as service request in the interagent communication

language to the selected agents capable of completing the remaining sub-goals. This

claim, as a whole, provides significant benefits and improvements discussed previously

that directly impact the capacity and functionality of the underlying computer software

architecture, —for example an unprecedented ease to expand the agent based system with

increased functionality without any need to revise code for the facilitator, the natural

language agents, or any other client agents, as well as a significantly greater degree of

freedom for users to use, and for the claimed system to accept and process an expanded

set of more complex and compound requests and inquiries, relative to the prior art.

55.   The above-disclosed and claimed process of claim 52 additionally

constitutes an unconventional technical solution (for example, a process using a

specialized interagent communication language with a unique conversation protocol layer

defined by event types and parameter lists associated with one or more of the events,

wherein the parameter lists further refine the one or more events) to address a

technological problem rooted in computer technology of coordinating and completing

tasks using service-providing electronic agents in a distributed computer environment.

<u>Prosecution and Examination of the '560 Patent</u>

56.   The examination of the '560 Patent took more than seven years to

complete, from the March 17, 1999 filing date of the patent application, to the June 27,

2006 issue date.

57.   Two Patent Examiners were involved in examining the application that

matured into the '560 Patent, namely, Examiner Lewis A. Bullock, Jr., and Supervisory

Examiner John Follansbee.

58.   Although the publicly available prosecution history of the '560 Patent

does not contain the complete results of all patent examiner searches, it indicates that

Examiner Bullock conducted prior art and/or other searches using at least the patent

examiner systems Web-based Examiner Search Tool ("WEST") and Examiner

Automated Search Tool ("EAST"), and performed searches on at least December 4,

2002, November 11, 2003, and November 24, 2004. Certain summary results of the

Examiner's search dated November 24, 2004 indicate nine separate searches across seven

databases, yielding a total of 1,785 hits. The Patent Examiners formally cited at least 10

separate references during the prosecution of the '560 Patent.

59.   Between the prior art references located by and cited by the Patent

Examiners, and the references submitted by the applicants and considered by the Patent

Examiners during the prosecution of the '560 Patent, at least 33 patent references and 22

non-patent references were formally considered by the Patent Examiners, as indicated on

the front two pages of the issued '560 Patent.

60.   On information and belief, it is the practice of the USPTO not to cite

excessive cumulative art, in other words, in this instance, the art cited by the Patent

Examiners is representative of considerable other art located by the USPTO and not cited.

Further on information and belief, it is the practice of the USPTO to discuss in its Office

Actions those references of which the Patent Examiners are aware that most closely

resemble the claimed inventions.

61.   On December 6, 2004, the USPTO issued a Notice of Allowance as to all

of claims 1-55 presently in the '560 Patent.

62.   The issued claims from the '560 Patent are patentably distinct from the at

least 55 references identified and/or discussed during prosecution. That is, each of the 55

claims, as a whole—which include, e.g., at least one registry declaring capabilities of

service-providing electronic agents, which use an interagent Communication Language

(ICL) that includes a layer of conversational protocol defined by event types and

parameter lists associated with one or more of the events, wherein the parameter lists

further refine the one or more events, and/or a facilitator agent, and/or a goal and plan

that uses reasoning to determine sub-goal requests based on non-syntactic decomposition

of the goal and uses the reasoning to co-ordinate and schedule efforts by the service-

providing electronic agents to fulfill sub-goal requests in a cooperative completion of the

goal—all were found to be patentably distinct from the at least 55 formally identified

references.

63.   The references cited during the examination of the '560 Patent all

represent patentably distinct and in some instances prior art means or methods to achieve

communication and coordination among distributed electronic agents. By allowing the

claims of the '560 Patent, each of the claims in the '560 Patent, as a whole was shown to

be inventive, novel, and innovative over at least the 55 formally identified references.

64.   As each claim as a whole from the '560 Patent is inventive, novel, and

innovative as compared to several specific patents and other publications, each claim, as

a whole, constitutes more than the application of well-understood, routine, and

conventional activities.

65.   As of February 19, 2018, the '560 Patent has been cited as pertinent prior

art by a USPTO examiner or an applicant during the prosecution of at least 188 issued

patents and published applications—including during the prosecution of patent

applications filed by leading technology companies such as Apple, IBM, Nuance

Communications, Microsoft, and General Electric. Out of the 188 patent applications in

which the '560 Patent was cited as pertinent prior art during prosecution, the USPTO has

issued at least 152 patents.

66.   The at least 188 forward citations to the '560 Patent—and at least 152

patents that have issued despite identification of the '560 Patent during their

prosecution—reveal that the '560 Patent and its claimed inventions are directed to

specific methods, systems, and programs for an improved software-based architecture for

distributed electronic agents to communicate and cooperate, rather than merely disclosing

an aspiration or result of that technology that would preempt the use of, or innovations in

software-based architectures for distributed electronic agent communication and cooperation.

67.   The '560 patent claims priority to January 5, 1999. The technology disclosed and claimed in the '560 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '560 Patent was well ahead of the state of the art at the time of the invention. For example, every Office Action rejection during the entire prosecution of the application that issued as the '560 patent was entirely or partially based on publications where one or more inventors was an author or co-author of the reference.

U.S. Patent No. 7,036,128

68.   IPA is the owner by assignment of U.S. Patent No. 7,036,128 (the "'128 Patent"). The '128 Patent is entitled "Using a Community of Distributed Electronic Agents to Support a Highly Mobile Ambient Computing Environment." The '128 Patent issued on April 25, 2006. A true and correct copy of the '128 Patent is attached hereto as **Exhibit C**.

69.   The '128 Patent "is generally related to distributed computing environments and the completion of tasks within such environments . . . [and in particular] teaches a variety of software-based architectures for communication and cooperation among distributed electronic agents to incorporate elements such as GPS or positioning agents and speech recognition into a highly mobile computing environment." '128 Patent at Col. 1, lines 19–26 (hereinafter 1:19–26).

70.   The claimed inventions in the '128 Patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

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71.   The '128 Patent, at 1:5-12, states it is a continuation-in part of, and

incorporates by reference U.S. Patent Application 09/225,198, filed January 5, 1999 (the

parent application that issued as the '115 Patent). The '128 Patent also claims priority to

and incorporates by reference provisional application nos. 60/124,718; 60/124,719; and

60/124,720.

72.   As a continuation-in-part of the '115 Patent discussed above, the

specifications of the '128 and '115 Patents overlap significantly, and paragraphs 27-32

above regarding the specification of the '115 Patent are incorporated by reference as if

fully restated here in this section for the '128 Patent.

73.   The '128 Patent discloses additional fundamental technological

improvements to the underlying mobile computing environment:

> The present invention provides a highly mobile, ambient computing
> environment for serving a knowledge worker away from their desk. The
> present invention allows a knowledge worker to obtain increased leverage
> from personal, networked, and interactive computing devices while on the
> move in their car, airplane seat, or in a conference room with other local or
> remote participants. '128 Patent at 4:59-65.

74.   The '128 Patent contains four independent claims and 45 total claims,

covering various methods, systems, and/or computer programs. Claim 1 states:

> 1. A collaborative computer-implemented community of distributed electronic
> agents, organized to provide a mobile computing environment, the computer-
> implemented community of distributed electronic agents comprising:
>
> an agent registry wherein one or more capabilities of each of the electronic
> agents are registered in the form of an interagent communication language
> (ICL), wherein the interagent language includes a layer of conversational
> protocol defined by event types and parameter lists associated with one or
> more events, and wherein the parameter lists further refine the one or more
> events;
>
> a facilitator agent arranged to coordinate cooperative task completion among
> the electronic agents by delegating one or more received ICL goals to a

selected one or more of the electronic agents based upon the registered capabilities of the selected agents;

one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least one location agent operable to ascertain a current physical location of a user; and

one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request.

75. The above-disclosed claim limitations from the '128 Patent comprise various elements, including, e.g., an agent registry wherein one or more capabilities of each of the electronic agents are registered in the form of an interagent communication language (ICL), which includes a layer of conversational protocol defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events; a facilitator agent arranged to coordinate cooperative task completion among the electronic agents by delegating one or more received ICL goals to a selected one or more of the electronic agents based upon the registered capabilities of the selected agents; one or more service-providing electronic agents, being in bi-directional communication with the facilitator agent, including at least one location agent operable to ascertain a current physical location of a user; and one or more computer interface agents being in bi-directional communication with the facilitator agent, the mobile computer interface agents being operable to process at least one mobile user input type and to responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request. This claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and functionality of the underlying computer software architecture, for

example an unprecedented ease to expand the agent based system with increased functionality without any need to revise code for the facilitator, the natural language agents, or any other client agents, as well as providing a significantly greater degree of freedom for users in a mobile environment to use, and for the claimed system to accept and process an expanded set of more complex and compound requests and inquiries, relative to the prior art.

76.   The above-disclosed and claimed invention additionally constitutes an unconventional technical solution (for example, using a specialized interagent communication language with a unique conversational protocol layer defined by event types and parameter lists associated with one or more events, and wherein the parameter lists further refine the one or more events) to address a technological problem rooted in computer technology of coordinating and completing tasks using service-providing electronic agents in a mobile computer environment.

<p style="text-align:center;">Prosecution and Examination of the '128 Patent</p>

77.   The examination of the '128 Patent took more than 5 and a half years, from the August 9, 2000 filing date of the patent application to its April 25, 2006 issue date.

78.   The publicly available prosecution history for the '128 Patent indicates that a single patent examiner was involved in examining the application that matured into the '128 Patent, namely, Examiner Lewis A. Bullock, Jr.

79.   Although the publicly available prosecution history of the '128 Patent does not contain the complete results of all patent examiner searches, it indicates that Examiner Bullock conducted prior art and/or other searches using one or more of the

patent examiner systems Examiner Automated Search Tool ("EAST"), and databases of the European Patent Office (EPO), Japanese Patent Office (JPO), DERWENT, among others, on or around at least March 17, 2005; September 9, 2005; and December 12, 2005. Summary results of the Examiner's search dated March 19, 2005 indicate twenty-six separate searches across up to seven databases each, yielding a total of 1,435 hits. Summary results of the Examiner's search dated September 9, 2005 indicate 20 separate searches across up to seven databases each, yielding a total of 3,881 hits. Summary results of the Examiner's search dated December 12, 2005 indicate 56 separate searches across up to seven database each, yielding a total of 2,157 hits.

80.   The Patent Examiner formally cited at least 22 separate references during the prosecution of the '128 Patent.

81.   Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '128 Patent, at least 41 patent references and 25 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '128 Patent.

82.   On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office Actions those references of which the Patent Examiners are aware that most closely resemble the claimed inventions.

83.   On September 14, 2005, the USPTO rejected the predecessor claims

corresponding to present claims 1-21 and claim 45 for detailing a "a collaborative

community of distributed electronic agents that make up a mobile computing

environment," and that these "environments are software environments that are not

tangible embodied and therefore non-statutory [subject-matter under 35 U.S.C. 101]."

This confirms that the USPTO was analyzing and rejecting patent applications for

compliance with statutory subject matter requirements under 35 U.S.C. 101.

84.   On December 29, 2005, the USPTO issued a Notice of Allowance as to all

of claims 1-45 presently in the '128 Patent.

85.   The issued claims from the '128 Patent are patentably distinct from the at

least 66 references identified and/or discussed during prosecution. That is, each of the 45

claims, as a whole—which include, e.g., distributed electronic agents in a mobile

computing environment, wherein the one or more capabilities of the electronic agents are

registered using an interagent communication language (ICL) that includes a layer of

conversational protocol defined by event types and parameter lists associated with one or

more events, and wherein the parameter lists further refine the one or more events and/or

a facilitator agent to coordinate cooperative task completion among the electronic agents,

and/or a location agent to ascertain or provide user location information, and/or mobile

computer interface to forward a user request for resource access to a facilitator agent and

provide the user with such resource access—were found to be patentably distinct from at

least these 66 formally identified references.

86.   The references cited during the examination of the '128 Patent all

represent patentably distinct and in some instances may constitute prior art means or

methods for a mobile computing environment using distributed electronic agents. By allowing the claims of the '128 Patent, each of the claims in the '128 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 66 formally identified references.

87.   As each claim as a whole from the '128 Patent is inventive, novel, and innovative as compared to the specified patents and other publications, each claim, as a whole constitutes more than the application of well-understood, routine, and conventional activities.

88.   As of February 19, 2018, the '128 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 292 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as AT&T, IBM, Microsoft, Apple, and even Google itself. Out of the 292 patent applications in which the '128 Patent was cited as pertinent prior art during prosecution, the USPTO has issued at least 225 patents.

89.   The at least 292 forward citations to the '128 Patent—and the more than 225 patents that have issued despite identification of the '128 Patent during their prosecution—reveal that the '128 Patent and its claimed inventions are directed to specific methods, systems, and programs that improve communication and cooperation among distributed electronic agents in a mobile environment, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in mobile distributed electronic agent architectures.

90.   The '128 Patent claims priority to January 5, 1999. The technology

disclosed and claimed in the '128 Patent was not then well-understood, routine or

conventional. To the contrary, the technology claimed in the '128 Patent was well ahead

of the state of the art at the time of the invention. For example, every Section 102 or 103

Office Action rejection during the entire prosecution of the application that issued as the

'128 Patent was entirely based on publications where one or more inventors was an

author or co-author of the reference.

U.S. Patent No. 6,742,021

91.   IPA is the owner by assignment of U.S. Patent No. 6,742,021 (the "'021

Patent"). The '021 Patent is entitled "Navigating Network-Based Electronic Information

Using Spoken Input With Multimodal Error Feedback." The '021 Patent issued on May

25, 2004 from U.S. Patent application no. 09/524,095, filed March 13, 2000. A true and

correct copy of the '021 Patent is attached hereto as **Exhibit D**.

92.   The '021 Patent is a continuation-in-part of U.S. Patent Application

09/225,198, and at Col. 1 lines 6-13, the '021 Patent claims priority to and incorporates

by reference the 09/225,198 application, as well as provisional application nos.

60/124,718; 60/124,719; and 60/124,720.

93.   The '021 Patent "relates generally to the navigation of electronic data by

means of spoken natural language requests, and to feedback mechanisms and methods for

resolving the errors and ambiguities that may be associated with such request." '021

Patent at Col. 1, lines 22-26 (hereinafter, 1:22-26).

94.   The claimed inventions are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

95.   The "Background of Invention" section of the '021 Patent states that as the universe of electronic data potentially available to users continues to expand, "there is a growing need for information navigation technology that allows relatively naïve users to navigate and access desired data by means of natural language input." '021 Patent at 1:20-26.

96.   For example, with the explosion of electronic content in important markets like home entertainment and mobile computing, the proliferation of high-bandwidth communications infrastructure enables delivery of movies and other interactive multimedia content. However, "for users to take full advantage of this content stream ultimately requires interactive navigation of content databases in a manner that is too complex for user-friendly selection by means of a traditional remote-control clicker." '021 Patent at 1:28-36.

97.   Allowing users to utilize spoken natural language requests to access electronic data provides the benefit of "rapidly searching and accessing desired content" and "is an important objective" both for "successful consumer entertainment products," that offer "a dizzying range of database content choices," and "navigation of (and transaction with) relatively complex data warehouses," when using "the Internet/Web or other networks for general information, multimedia content, or e-commerce transactions." '021 Patent at 1:37-46.

98.   Then existing prior art "navigational systems for browsing electronic databases and data warehouses (search engines, menus, etc.) have been designed without navigation via spoken natural language as a specific goal," and as a result the world was full of electronic data navigation systems that were not designed to be navigated with natural spoken commands, but assumed navigation with "text and mouse-click inputs (or in the case of TV remote controls, even less)." '021 Patent at 1:47-54.

99.   Prior art systems that simply recognized voice commands using an extremely limited vocabulary and grammar were insufficient, in part because such systems did not accept spoken inputs in a user-intuitive manner, and required users to learn highly specialized command languages or formats. '021 Patent at 1:54-64.

100.   For example, prior art systems tended to require users to speak "in terms of arbitrary navigation structures (e.g., hierarchical layers of menus, commands, etc.) that are essentially artifacts reflecting constraints of the pre-existing text/click navigation system." '021 Patent at 1:59-2:3.

101.   Moreover, the use of spoken natural language inputs for navigation of electronic data resources typically presented a variety or errors and ambiguities, such as garbled and unrecognized words, and under-constrained requests, that could not be resolved in a rapid, user-friendly, non-frustrating manner.

102.   In addition, solutions to the prior art's limitations faced the problem that they needed to be compatible with the constraints imposed by multi-user, distributed environments such as the Internet and high-bandwidth content delivery networks, because a solution contemplating one-at-a-time user interaction at a single location would be insufficient.

103.   The disclosed inventions, on the other hand, achieve a fundamental

technological advance over the then-existing state of the art of navigating network-based

electronic information because it enables "users to speak directly in terms of what the

user wants—e.g., 'I'd like to see a Western film directed by Clint Eastwood'[.]" '021

Patent at 1:64-67.

104.   A further disclosed benefit of the inventions that improves the functioning

of computer technology is that they can function as a voice interface on top (or on the

front end) of a pre-existing non-voice navigational system, i.e., "a voice-driven front-end

atop an existing, non-voice data navigation system, whereby users can interact by means

of intuitive natural language input not strictly conforming to the step-by-step browsing

architecture of the existing navigation system, and wherein any errors or ambiguities in

user input are rapidly and conveniently resolved." '021 Patent at 2:13-19; 10:10-38.

105.   One aspect of the inventions disclosed and claimed in the '021 Patent

relates to formulating a navigation query after the system has interpreted the spoken

request. For example, if responding to a user's interpreted request requires navigating a

structured relational database, an embodiment of the invention could construct an

appropriate Structured Query Language (SQL) query to select a relevant portion of that

electronic data source.

106.   The benefits of the inventions include not only increased convenience, but

improvements to computer functionality and technological processes including increased

efficiency and speed—and they achieve these technological benefits by fundamentally

changing the manner in which a user interfaces and interacts with computer technology

itself, as described in the following two examples:

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It will be apparent, in light of the above teachings, that preferred embodiments of the present invention can provide a spoken natural language interface atop an existing, non-voice data navigation system, whereby users can interact by means of intuitive natural language input not strictly conforming to the linear browsing architecture or other artifacts of an existing menu/text/click navigation system. For example, users of an appropriate embodiment of the present invention for a video-on-demand application can directly speak the natural request: "Show me the movie 'Unforgiven'"—instead of walking step-by-step through a typically linear sequence of genre/title/actor/director menus, scrolling and selecting from potentially long lists on each menu, or instead of being forced to use an alphanumeric keyboard that cannot be as comfortable to hold or use as a lightweight remote control. Similarly, users of an appropriate embodiment of the present invention for a web-surfing application in accordance with the process shown in FIG. 5 can directly speak the natural request: "Show me a one-month price chart for Microsoft stock"—instead of potentially having to navigate to an appropriate web site, search for the right ticker symbol, enter/select the symbol, and specify display of the desired one-month price chart, each of those steps potentially involving manual navigation and data entry to one or more different interaction screens.

'021 Patent at 10:10-38.

107.   As the title of the '021 Patent suggests, an important aspect of the inventions that improves computer technology itself is multi-modal error corrections and clarifications of the user's spoken request when errors and ambiguities arise:

Instead of simply rejecting such input and defaulting to traditional input modes or simply asking the user to try again, a preferred embodiment of the present invention seeks to converge rapidly toward instantiation of a valid navigational template by soliciting additional clarification from the user as necessary,…via multimodal input, i.e., by means of menu selection or other input modalities…in addition to spoken input.

'021 Patent at 2:49-58.

108.   The benefits of this multi-modal error correction/clarification are, as stated above, an accelerated instantiation of a valid navigational template, at least in part because the system is attempting new methods or means to obtain additional clarifying or necessary information that was not provided by a prior spoken request, and therefore avoids simply repeating a prior inquiry that was incomplete or otherwise erroneous. A

further specified benefit is that "this clarifying, multi-modal dialogue takes advantage of whatever partial navigation information has been gleaned from the initial interpretation of the user's spoken request." '021 Patent at 2:49-58.

109.   The increased convenience, efficiency, accuracy, and speed improve the capacity of the navigation system as a whole. The improvements to the computer technology underlying the inventive spoken/natural language query for a database with multi-modal clarification versus prior art navigation systems are confirmed per the following example from the '021 Patent:

> Consider again the example in which the user of a video-on-demand application wishes to see "Unforgiven" but can only recall that it was directed by and starred Clint Eastwood. First, it bears noting that using a prior art navigational interface, such as a conventional menu interface, will likely be relatively tedious in this case. The user can proceed through a sequence of menus, such as Genre (select "western"), Title (skip), Actor ("Clint Eastwood"), and Director ("Clint Eastwood"). In each case—especially for the last two items—the user would typically scroll and select from fairly long lists in order to enter his or her desired name, or perhaps use a relatively couch-unfriendly keypad to manually type the actor's name twice.
>
> Using a preferred embodiment of the present invention, the user instead speaks aloud, holding remote control microphone **102**, "I want to see that movie starring and directed by Clint Eastwood. Can't remember the title." At step **402** the voice data is received. At step **404** the voice data is interpreted. At step **405** an appropriate online data source is selected (or perhaps the system is directly connected to a proprietary video-on-demand provider). At step **406** a query is automatically constructed by the query construction logic **330** specifying "Clint Eastwood" in both the actor and director fields. Step **407** detects no obvious problems, and so the query is electronically submitted and the data source is navigated at step **408**, yielding a list of several records satisfying the query (e.g., "Unforgiven", "True Crime", "Absolute Power", etc.). Step **409** detects that additional user input is needed to further refine the query in order to select a particular film for viewing.
>
> At that point, in step **412** query refinement logic **340** might preferably generate a display for client display device **112** showing the (relatively short) list of film titles that satisfy the user's stated constraints. The user can then preferably use a relatively convenient input modality, such as buttons on the remote control, to

select the desired title from the menu. In a further preferred embodiment, the first title on the list is highlighted by default, so that the user can simply press an "OK" button to choose that selection.

'021 Patent at 11:24-62.

110.   The '021 Patent contains 8 independent claims, and a total of 132 claims, covering various methods, systems, and computer programs. Independent claim 1 is a method claim:

1. A method for speech-based navigation of an electronic data source, the electronic data source being located at one or more network servers located remotely from a user, comprising the steps of:

(a) receiving a spoken request for desired information from the user;

(b) rendering an interpretation of the spoken request;

(c) constructing at least part of a navigation query based upon the interpretation;

(d) soliciting additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request said non-spoken modality;

(e) refining the navigation query, based upon the additional input;

(f) using the refined navigation query to select a portion of the electronic data source; and

(g) transmitting the selected portion of the electronic data source from the network server to a client device of the user.

111.   The above-claimed speech-based navigation method relies on, for example, receiving a spoken request, and performs multiple steps to interpret, construct, and refine a query of an electronic data source, and utilizes multi-modal functionality to obtain and use additional non-spoken input from a user without requiring the user to request said non-spoken modality, to transmit a portion of the electronic data source to a device of the user. Such claimed and disclosed navigation methods provide significant

benefits and improvements to the capacity and underlying computer functionality over

their prior art navigation methods—namely, increased speed, convenience, and efficiency

in creating a proper query to search an electronic data source and providing information

requested by a user, as well as a greater degree of freedom for users to use and the

navigation system to accept and process an expanded set of intuitive inputs (e.g., natural

language), rather than being limited solely to specialized command languages or formats

that may require training or specialized knowledge to effectively use.

112.   The above-disclosed and claimed speech-based navigation method

additionally constitutes an unconventional technical solution (for example, multi-modal

feedback to solicit additional user input, to refine and use an electronic data source query

without requiring a user to request a non-spoken modality) to address a technical problem

of electronic data source navigational methods to interpret, construct, query, and refine

spoken requests.

<div align="center">Prosecution and Examination of the '021 Patent</div>

113.   The examination of the '021 Patent required more than four years, from

the date of the filing of the patent application on March 13, 2000, through the issue date

of May 25, 2004.

114.   Four Patent Examiners were involved in examining the application that

matured into the '021 Patent, namely, Assistant Examiner Firmin Backer and Supervisory

Examiners Ayaz Sheikh, David Wiley, and James Trammel.

115.   Although the results of various patent examiner searches are not

summarized, the prosecution history of the '021 Patent indicates that Assistant Examiner

Backer conducted prior art and other searches on several USPTO databases, including the

patent examiner systems Web-based Examiner Search Tool ("WEST") at least on April

6, 2001; November 21, 2001; April 28, 2002; November 20, 2002; and November 21,

2002.

116.   Between the prior art references located by and cited by the Patent

Examiners, and the references submitted by the applicants and considered by the Patent

Examiners during the prosecution of the '021 Patent, at least 25 patent references and 20

non-patent references were formally considered by the Patent Examiners, as indicated on

the front two pages of the issued '021 Patent.

117.   On information and belief, it is the practice of the USPTO not to cite

excessive cumulative art, in other words, in this instance, the art cited by the Patent

Examiners is representative of considerable other art located by the USPTO and not cited.

Further on information and belief, it is the practice of the USPTO to discuss in its Office

Actions those references of which the Patent Examiners are aware that most closely

resemble the claimed inventions.

118.   During prosecution of the application that matured into the '021 Patent,

the U.S. Patent Office issued a Notice of Allowability on December 16, 2002, for claims

56-187 (i.e., issued claims 1-132), and in the "Examiner's Reasons for Allowance,"

stated, *inter alia*:

> **Applicants teach an inventive concept** for navigating network-based
> electronic data sources in response to spoken natural language input
> request.

119.   In order for the claims of the '021 Patent to have issued, they needed to be

patentably distinct from the at least 45 references formally identified and/or discussed

during prosecution. That is, each of the claims, as a whole (e.g., methods, systems, and

programs for speech-based electronic data source navigation that involve receiving a spoken request, interpreting that request, constructing, and refining a query of an electronic data source based on the interpretation and utilizing various aspects of multi-modal functionality to obtain and use additional non-spoken input from a user, to transmit a portion of the electronic data source to a device of the user) were found to be patentably distinct from these 45 formally identified references.

120.   The references cited during the examination of the '021 Patent all represent patentably distinct and in some instances prior art means or methods to navigate electronic data sources. By allowing the claims of the '021 Patent, each of the claims in the '021 Patent, as a whole was shown to be inventive, novel, and innovative.

121.   As each claim as a whole of the '021 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole constitutes more than the application of well-understood, routine, and conventional activities.

122.   As of February 19, 2018, the '021 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 240 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as Apple, IBM, Intel, and Google. Out of the 240 patent applications in which the '021 Patent was cited as pertinent prior art during prosecution, the USPTO issued more than 200 patents.

123.   The at least 240 forward citations to the '021 Patent—and the more than 200 patents that have issued despite identification of the '021 Patent during their prosecution—reveal that the '021 Patent and its claimed inventions are directed to

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specific methods, systems, and programs that improve speech-based navigation of electronic databases, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

124.   The '021 Patent claims priority to January 5, 1999. The technology disclosed and claimed in the '021 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '021 Patent was well ahead of the state of the art at the time of the invention. For example, Google was not even incorporated until September 1998 and had 39 employees in 1999. The first device widely acknowledged to be marketed as a "smartphone" was not announced until 2000 (Ericsson R380), which had a black and white display partially covered by a flip, users could not install their own software on the device, its architecture did not envisage users downloading their own applications, and it did not have WLAN, Bluetooth, or GPS capabilities. The first mobile camera phone did not come to this country until 2002 when Sprint offered the Sanyo SCP-5300. The first mobile device to offer email, texting, and a web browser was not released until 2003 (BlackBerry 6210). The first mobile phone with any text to speech capability was not released until late 2004 (Samsung MM-A700), and it did not have the ability for speaker independent voice recognition because it did not use a network (that was not introduced on mobile phones until November 2008 with Google's voice recognition app for the iPhone). The first YouTube video uploaded April 2005, and the first mobile phone marketed as a phone to watch TV video was not announced until November 2005 (Nokia N92). The first mobile phone with capacitive

touch screen not announced until January 2007 (LG Prada), which was also the same year the iPhone was released.

U.S. Patent No. 6,523,061

125.   IPA is the owner by assignment of U.S. Patent No. 6,523,061 (the "061 Patent"). The '061 Patent is entitled "System, Method, and Article of Manufacture For Agent-Based Navigation in a Speech-Based Data Navigation System." The '061 Patent issued on February 18, 2003. A true and correct copy of the '061 Patent is attached hereto as **Exhibit E**.

126.   The '061 Patent is a continuation of the '021 Patent discussed immediately above. The specifications of the '061 and '021 are therefore substantially identical, and paragraphs 94-109 and 124 above regarding the specification and state of the art at the time of the '021 are incorporated by reference as if fully restated here in this section for the '061 Patent.

127.   The '061 Patent, at 1:6-19, claims priority to and incorporates by reference U.S. Patent Application 09/524,095 (The '021 Patent—even though the '061 issued out of order, prior to the '021 Patent), and U.S. Patent Application 09/225,198 (the grandparent to the '061 Patent, of which the '021 is a continuation-in-part). The '061 Patent also claims priority to and incorporates by reference the 09/225,198 application, as well as provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

128.   The specifications of both the '021 and '061 Patents disclose various software platforms that enable effective and dynamic collaboration of distributed electronic agents.

129.   The claimed inventions in the '061 patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

130.   A brief overview of the software platforms and certain improvements to the computer functionality and technological processes underlying the claimed speech-based navigation of electronic data sources is set forth in the specification:

> [T]he functionality of each client agent is made available to the agent community through registration of the client agent's capabilities with a facilitator. **A software "wrapper" essentially surrounds the underlying application program performing the services offered by each client.** The common infrastructure for constructing agents is preferably supplied by an agent library. The agent library is preferably accessible in the runtime environment of several different programming languages. **The agent library preferably minimizes the effort required to construct a new system and maximizes the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention.** When invoked, a client agent makes a connection to a facilitator, which is known as its parent facilitator. Upon connection, an agent registers with its parent facilitator a specification of the capabilities and services it can provide, using a high level, declarative Interagent Communication Language ("ICL") to express those capabilities. Tasks are presented to the facilitator in the form of ICL goal expressions. When a facilitator determines that the registered capabilities of one of its client agents will help satisfy a current goal or sub-goal thereof, the facilitator delegates that sub-goal to the client agent in the form of an ICL request. The client agent processes the request and returns answers or information to the facilitator. In processing a request, the client agent can use ICL to request services of other agents, or utilize other infrastructure services for collaborative work. The facilitator coordinates and integrates the results received from different client agents on various sub-goals, in order to satisfy the overall goal.

'061 Patent at 13:22-51. (Emphasis added).

131.   As applied to the previous embodiments of the invention, but now through the lens of an agent platform, the specification states, referring to Figure 6, copied below:
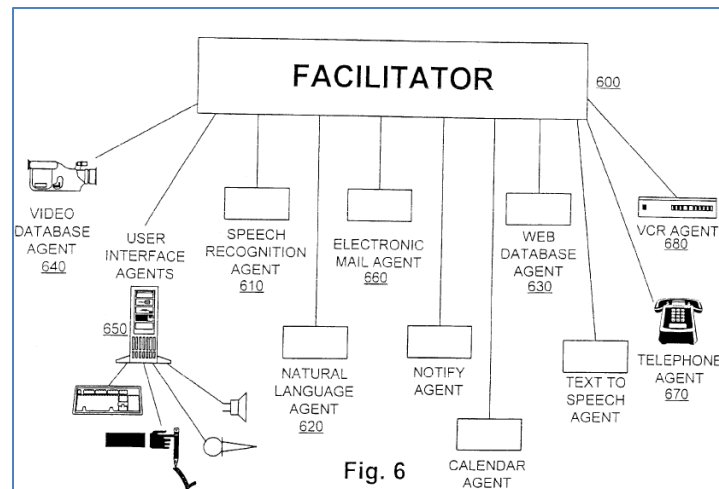
Fig. 6

For example, a representative application is now briefly presented, with reference to FIG. 6. If the statement "show me movies starring John Wayne" is spoken into the voice input device, the voice data for this request will be sent by UI agent 650 to facilitator 600, which in turn will ask natural language (NL) agent 620 and speech recognition agent 610 to interpret the query and return the interpretation in ICL format. The resulting ICL goal expression is then routed by the facilitator to appropriate agents—in this case, video-on-demand database agent 640—to execute the request. Video database agent 640 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, and may also issue ICL requests to facilitator 600 for additional assistance—e.g., display of menus and capture of additional user input in the event that query refinement is needed—and facilitator 600 will delegate such requests to appropriate client agents in the community. When the desired video content is ultimately retrieved by video database agent 640, UI agent 650 is invoked by facilitator 600 to display the movie.

Other spoken user requests, such as a request for the current weather in New York City or for a stock quote, would eventually lead facilitator to invoke web database agent 630 to access the desired information from an appropriate Internet site. Here again, web database agent 630 preferably includes or is coupled to an appropriate embodiment of query construction logic 330 and query refinement logic 340, including a scraping utility.
'061 Patent at 14:25-55.

132.   The '061 Patent contains three independent claims and eighteen total

claims, covering various methods, systems, and computer programs. Claim 1 is a method

claim:

1. A method for utilizing agents for speech-based navigation of an electronic data source, comprising the steps of:

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(a) receiving a spoken request for desired information from a user;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) routing the navigation query to at least one agent, wherein the at least one agent utilizes the navigation query to select a portion of the electronic data source; and

(e) invoking a user interface agent for outputting the selected portion of the electronic data source to the user, wherein a facilitator manages data flow among multiple agents and maintains a registration of each of said agents' capabilities.

133.   The above-disclosed and claimed speech-based navigation method relies on receiving a spoken request, interpreting the spoken request, constructing a navigation query based on the interpretation, routing the query to at least one agent that uses the query to select a portion of an electronic data source, an interface agent outputting the selected data source to a user, and a facilitator managing data flow among agents and maintaining a registration of each agent's capabilities. The claim, as a whole, provides solutions to the previously discussed technological problems, and achieves significant benefits and improvements to computer functionality and technological processes compare to prior art navigation methods—namely, increased speed, convenience, and efficiency in creating a proper query to search an electronic data source and providing information requested by a user, as well as a greater degree of freedom for users to use, and the navigation system to accept and process, an expanded set of intuitive inputs (e.g., natural language), rather than being limited solely to specialized command languages or formats that may require training or specialized knowledge to effectively use.

134.   The above-disclosed and claimed agent and speech-based navigation method of the '061 Patent discloses software architectures that enhance the speech-based

navigation method's capabilities and underlying computer functionality by minimizing "the effort required to construct a new system and maximiz[ing] the ease with which legacy systems can be "wrapped" and made compatible with the agent-based architecture of the present invention," and by the ease with which voice-based functionality can be added to new appliances by adding "service agents [that] can be plugged into the existing platform, immediately enabling the facilitator to respond dynamically to spoken natural language requests." ('061 Patent at 13:24-34; 14:25-55).

135. The above-disclosed and claimed speech-based navigation method of the '061 Patent discloses an unconventional technological solution (for example, an agent-based architecture using a facilitator to manage data flow among multiple agents and maintain a registration of each agents' capabilities) to address technological problems related to electronic data source navigational methods to interpret, construct, and query spoken requests.

<center>Prosecution and Examination of the '061 Patent</center>

136. The examination of the '061 Patent required more than two and one half years, from the date of the filing of the patent application on June 30, 2000, through the issue date of February 18, 2003.

137. Four Patent Examiners were involved in examining the application that matured into the '061 Patent, namely, Assistant Examiners Tammy Lee and Thu Ha Nguyen, and Supervisory Examiners Ayaz Sheikh and David Wiley.

138. Although the results of various patent examiner searches are not summarized, the prosecution history of the '061 Patent indicates that Assistant Examiner Thu Ha Nguyen conducted prior art and other searches using one or both of the patent

examiner systems Web-based Examiner Search Tool ("WEST") and Examiner

Automated Search Tool ("EAST") on at least July 30, 2001; February 6, 2002; May 23,

2002, and September 18, 2002. The Patent Examiners cited at least 13 separate references

during the prosecution of the '061 Patent.

139.   Between the prior art references located by and cited by the Patent

Examiners, and the references submitted by the applicants and considered by the Patent

Examiners during the prosecution of the '061 Patent, at least 30 patent references and 9

non-patent references were formally considered by the Patent Examiners, as indicated on

the front two pages of the issued '061 Patent.

140.   On information and belief, it is the practice of the USPTO not to cite

excessive cumulative art, in other words, in this instance, the art cited by the Patent

Examiners is representative of considerable other art located by the USPTO and not cited.

Further on information and belief, it is the practice of the USPTO to discuss in its Office

Actions those references of which the Patent Examiners are aware that most closely

resemble the claimed inventions.

141.   In order for the claims of the '061 Patent to have issued, they needed to be

patentably distinct from the at least 39 references formally identified and/or discussed

during prosecution. That is, each of the claims, as a whole—e.g., e.g., methods, systems,

and programs for speech-based navigation that comprise receiving a spoken request,

interpreting the spoken request, constructing a navigation query based on the

interpretation, routing the query to at least one agent that uses the query to select a

portion of an electronic data source, and invoking an interface agent to output the

selected data source to a user, wherein a facilitator manages data flow among agents and

maintains a registration of each agent's capabilities—were found to be patentably distinct

from at least these 39 identified references.

142.   The references cited during the examination of the '061 Patent all

represent patentably distinct and in some instances prior art means or methods to navigate

electronic data sources. By allowing the claims of the '061 Patent, each of the claims in

the '061 Patent, as a whole was shown to be inventive, novel, and innovative.

143.   As each claim as a whole from the '061 Patent is inventive, novel, and

innovative as compared to several specific patents and other publications, each claim as a

whole, constitutes more than the application of well-understood, routine, and

conventional activities.

144.   As of February 19, 2018, the '061 Patent has been cited as pertinent prior

art by a USPTO examiner or an applicant during the prosecution of approximately 350

issued U.S. patents and published applications, including during the prosecution of patent

applications filed by leading technology companies such as AT&T, Apple, IBM,

Motorola, Verizon, Sony, Amazon, Microsoft, and even Google itself. Out of the

approximately 350 patent applications in which the '061 Patent was cited as pertinent

prior art during prosecution, the USPTO issued more than 225 patents.

145.   The approximately 350 forward citations to the '061 Patent and more than

225 patents that have issued despite identification of the '061 Patent during their

prosecution reveal that the '061 Patent and its claimed inventions are directed to specific

improved methods, systems, and programs that use agents for speech-based navigation of

electronic databases, rather than merely disclosing an aspiration or result of that

technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

U.S. Patent No. 6,757,718

146.   IPA is the owner by assignment of U.S. Patent No. 6,757,718 (the "718 Patent"). The '718 Patent is entitled "Mobile Navigation of Network-Based Electronic Information Using Spoken Input." The '718 Patent issued on June 29, 2004. A true and correct copy of the '718 Patent is attached hereto as **Exhibit F**.

147.   The '718 Patent is a continuation of the '021 Patent discussed above. The specifications of the '718 and '021 Patents are therefore substantially identical, and paragraphs 94-109 and 124 above regarding the specification and the state of the art of the '021 are incorporated by reference as if fully restated here in this section for the '718 Patent.

148.   The '718 Patent, at 1:5-18, claims priority to and incorporates by reference U.S. Patent Application 09/524,095 (the '021 Patent), and U.S. Patent Application 09/225,198 (the grandparent to the '718 Patent, of which the '021 is a continuation-in-part). The '718 Patent also claims priority to and incorporates by reference provisional application nos. 60/124,718; 60/124,719; and 60/124,720.

149.   The claimed inventions in the '718 Patent are directed to new computer functionality and improvements to technological processes that address problems rooted in and arising from computer technology.

150.   The '718 Patent claims priority to January 5, 1999. The technology disclosed and claimed in the '718 Patent was not then well-understood, routine or conventional. To the contrary, the technology claimed in the '718 Patent was well ahead

of the state of the art at the time of the invention. For example, Google was not even

incorporated until September 1998 and had 39 employees in 1999. The first device

widely acknowledged to be marketed as a "smartphone" was not announced until 2000

(Ericsson R380), which had a black and white display partially covered by a flip, users

could not install their own software on the device, its architecture did not envisage users

downloading their own applications, and it did not have WLAN, Bluetooth, or GPS

capabilities. The first mobile camera phone did not come to this country until 2002 when

Sprint offered the Sanyo SCP-5300. The first mobile device to offer email, texting, and a

web browser was not released until 2003 (BlackBerry 6210). The first mobile phone with

any text to speech capability was not released until late 2004 (Samsung MM-A700), and

it did not have the ability for speaker independent voice recognition because it did not use

a network (that was not introduced on mobile phones until November 2008 with

Google's voice recognition app for the iPhone). The first YouTube video uploaded April

2005, and the first mobile phone marketed as a phone to watch TV video was not

announced until November 2005 (Nokia N92). The first mobile phone with capacitive

touch screen not announced until January 2007 (LG Prada), which was also the same year

the iPhone was released.

151.   The '718 Patent contains three independent claims and 27 total claims,

covering various methods, systems, and computer programs. Claim 1 is a method claim:

> 1. A method for speech-based navigation of an electronic data source
> located at one or more network servers located remotely from a user,
> wherein a data link is established between a mobile information appliance
> of the user and the one or more network servers, comprising the steps of:
>
> (a) receiving a spoken request for desired information from the user
> utilizing mobile information appliance of the user, wherein said
> mobile information appliance comprises a portable remote control device
> or a set-top box for a television;

(b) rendering an interpretation of the spoken request;

(c) constructing a navigation query based upon the interpretation;

(d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

152.   The above-disclosed and claimed speech-based navigation method of the '718 Patent comprises various elements, including establishing a data link between one or more remote network servers and a mobile information appliance of a user, receiving a spoken request from the user utilizing the mobile information appliance, which comprises a partial remote control device or set-top box for a television; rendering an interpretation of the spoken request, constructing a navigation query based on the interpretation, utilizing the query to select a portion of the electronic data source, and transmitting the portion of the data source from the network server to the mobile information appliance of the user. The claim, as a whole, provides significant benefits and improvements discussed previously that directly impact the capacity and underlying navigation computer functionality—namely, increased speed, convenience, and efficiency in creating a proper query to search an electronic data source and providing information requested by a user, as well as a greater degree of freedom for users to use, and for the navigation system to accept and process an expanded set of intuitive inputs (e.g., natural language), rather than being limited solely to specialized command languages or formats that may require training or specialized knowledge to effectively use.

<u>Prosecution and Examination of the '718 Patent</u>

153.   The examination of the '718 Patent required nearly four years, from the date of the filing of the patent application on June 30, 2000, through the issue date of June 29, 2004.

154.   Four Patent Examiners were involved in examining the application that matured into the '061 Patent, namely, Assistant Examiners Firmin Backer and Frantz Jean, and Supervisory Examiners Ayaz Sheikh and David Wiley.

155.   Although the complete results of various patent examiner searches are not summarized, the prosecution history of the '718 Patent indicates that Assistant Examiners Backer and Jean conducted prior art and other searches using one more of the following of the patent examiner systems Web-based Examiner Search Tool ("WEST") databases of the European Patent Office (EPO), Japanese Patent Office (JPO), DERWENT, among others, on at least April 6, 2001; September 29, 2002; September 30, 2002; and March 7, 2003. The Patent Examiners cited at least six separate references during the prosecution of the '718 Patent.

156.   Between the prior art references located by and cited by the Patent Examiners, and the references submitted by the applicants and considered by the Patent Examiners during the prosecution of the '718 Patent, at least 28 patent references and 8 non-patent references were formally considered by the Patent Examiners, as indicated on the front two pages of the issued '718 Patent.

157.   On information and belief, it is the practice of the USPTO not to cite excessive cumulative art, in other words, in this instance, the art cited by the Patent Examiners is representative of considerable other art located by the USPTO and not cited. Further on information and belief, it is the practice of the USPTO to discuss in its Office

Actions those references of which the Patent Examiners are aware that most closely

resemble the claimed inventions.

158.   On March 7, 2003, the USPTO issued a Notice of Allowance, which

included the following statement, *inter alia*:

> The examiner respectfully submits that the specific techniques of providing a
> speech-based navigation where a spoken request for desired information is
> received from a user utilizing a mobile information appliance of the user, wherein
> the mobile information appliance comprises a portable remote control device or a
> set-top box for a television; in conjunction with the other limitations of the
> dependent and independent claims 56-82 were not shown by, would not have
> been obvious over, nor would have been fairly suggested by the prior art made of
> record.

159.   The issued claims from the '718 Patent were patentably distinct from the

at least 36 references identified and/or discussed during prosecution. That is, each of the

27 claims, as a whole—which include, e.g., electronic data navigation and establishing a

data link between one or more remote network servers and a mobile information

appliance of a user, receiving a spoken request from the user utilizing the mobile

information appliance, which comprises a partial remote control device or set-top box for

a television; rendering an interpretation of the spoken request, constructing a navigation

query based on the interpretation, utilizing the query to select a portion of the electronic

data source, and transmitting the portion of the data source from the network server to the

mobile information appliance of the user—were found to be patentably distinct from at

least these 36 formally identified references.

160.   The references cited during the examination of the '718 Patent all

represent patentably distinct and in some instances prior art means or methods to navigate

electronic data sources. By allowing the claims of the '718 Patent, each of the claims in

the '718 Patent, as a whole was shown to be inventive, novel, and innovative over at least the 36 formally identified references.

161.   As each claim as a whole from the '718 Patent is inventive, novel, and innovative as compared to several specific patents and other publications, each claim as a whole constitutes more than the application of well-understood, routine, and conventional activities.

162.   As of February 19, 2018, the '718 Patent has been cited as pertinent prior art by a USPTO examiner or an applicant during the prosecution of at least 350 issued patents and published applications—including during the prosecution of patent applications filed by leading technology companies such as Apple, IBM, Intel, and Google. Out of the 350 patent applications in which the '718 Patent was cited as pertinent prior art during prosecution, the USPTO has issued more than 260 patents.

163.   The at least 350 forward citations to the '718 Patent—and the more than 260 patents that have issued despite identification of the '718 Patent during their prosecution—reveal that the '718 Patent and its claimed inventions are directed to specific methods, systems, and programs that improve speech-based navigation of electronic databases, rather than merely disclosing an aspiration or result of that technology that would preempt the use of, or innovations in, speech-based navigation of electronic databases.

OVERVIEW OF INFRINGING METHODS, SYSTEMS AND PROGRAMS

164.   Defendant makes, markets and uses methods, systems and computer programs called Google Assistant.[1] Google Assistant was publicly available at least as of May 2016.[2]

165.   Google Assistant is a voice-activated, intelligent personal assistant that can answer questions and do things on behalf of a user. It is marketed as an end-user's "own personal Google" that is "always ready to help with over 1 million Actions.
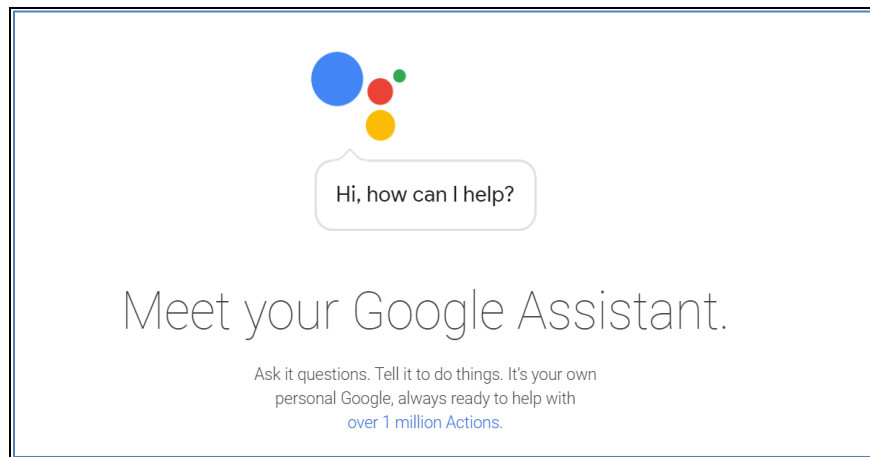
166.   Google Assistant is enabled for many different kinds of devices, including phones, speakers, watches, laptops, televisions, automobiles, and other smart displays.

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[1] https://assistant.google.com/intl/en_us/#?modal_active=none
[2] https://www.pocket-lint.com/apps/news/google/137722-what-is-google-assistant-how-does-it-work-and-which-devices-offer-it
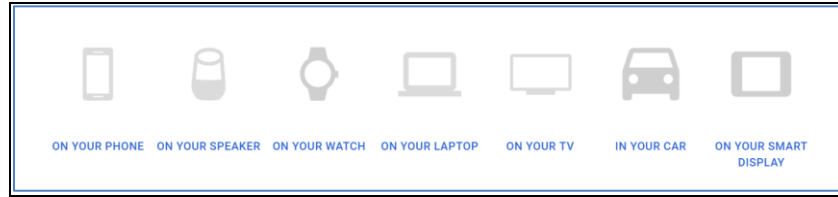
167.   Google Assistant works with a number of different electronic agents,

including but not limited to third-party software applications, lights, TVs, thermostats,

and other "smart" devices (i.e., Philips Hue lights, Wemo electronics control systems, LG

smart appliances), as well as devices marketed and or sold by Defendant such as (without

limitation), Google Pixels (smartphones), Google Home Products[3] (smart speakers),

Google Pixelbook[4] (laptop), Chromecast Ultra, Chromecast, Chromecast Audio, Nest

security systems, Nest Thermostat, and Nest Thermostat E.[5]

Works with your
favorite stuff, too.

Shuffle your favorite playlist, dim your Philips Hue lights
with just your voice, or ask your Assistant on Google
Home to stream Netflix to your TV with Chromecast.
Discover more services and smart devices that work
with your Google Assistant.

---
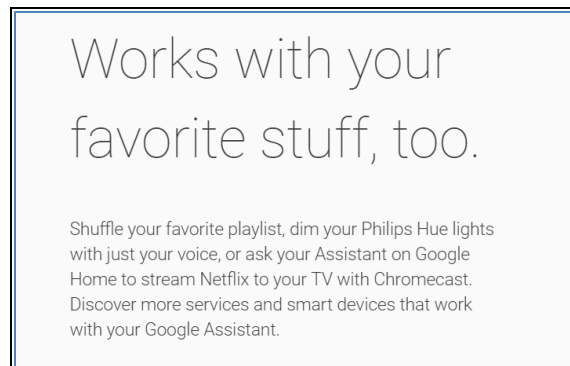
[3] Google Home Products include the Google Home, the Google Home Mini, and the
Google Home Max. *See* https://store.google.com/category/home_entertainment
[4] https://assistant.google.com/platforms/phones/;
https://assistant.google.com/platforms/speakers/;
https://assistant.google.com/platforms/laptops/
[5] *Id.; see also* https://store.google.com/category/home_entertainment.

168.   Google Assistant contains an Assistant app directory to allow users to find capabilities that meet their needs.[6]

169.   Defendant also makes, markets and uses Google Actions, Dialogflow, Cloud Natural Language, and Firebase (collectively, "Google Agent Products") to enable third parties to create additional agent apps for use with Google Assistant.

170.   For example, Dialogflow is described as follows:[7]

---

[6] https://developers.google.com/actions/distribute/directory
[7] https://cloud.google.com/dialogflow-enterprise/

171.   Further, through DialogFlow, Defendant offers numerous pre-built Agents for third parties to use in developing Agents for DialogFlow and Assistant.[8]

172.   As shown by DialogFlow, Google Assistant depends on applications identifying the Invocations that enable Assistant to know when to send a goal or subgoal to the application for completion. There are at least two invocation types, explicit and implicit invocation:

---

[8] *See* https://dialogflow.com/docs/examples/.

173.   Google Assistant then knows to invoke the app based on the user's intent.

Actions on Google includes multiple sets of Actions designed to meet the user's intent:

174.   These invocation phrases and triggering intents are then analyzed and

matched against a user's intent, and the goal or sub-goal is sent to the app for fulfillment:

Action Discovery   ↑

Action discovery is a very powerful tool for getting your app in front of users. If a user wants to accomplish a task and your app has an action that can help the user with their task, the Google Assistant may recommend your app to the user.

This interaction occurs as follows:

1. A user asks the Google Assistant to perform a task.

2. The recommendation algorithm determines that your app has an action that can complete the user's task.

3. The Assistant recommends your app to the user.

This interaction is much more likely when your app uses action invocation phrases that effectively bridge the gap between the user's choice of words and your app's intents. In practice, your app must serve a specific, useful purpose that real users ask the Google Assistant about in order for it to be discovered in this way.

Due to the evolving nature of the recommendation algorithm, Google cannot guarantee that your app will be recommended via action discovery. Keep the following best practices in mind when designing your app to improve the chance of your app being recommended:

175.   Cloud Natural Language is described as follows:[9]

Powerful Text Analysis

Google Cloud Natural Language reveals the structure and meaning of text by offering powerful machine learning models in an easy to use REST API. You can use it to **extract information** about people, places, events and much more, mentioned in text documents, news articles or blog posts. You can use it to **understand sentiment** about your product on social media or **parse intent** from customer conversations happening in a call center or a messaging app. You can **analyze text uploaded in your request** or integrate with your document storage on Google Cloud Storage.

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[9] https://cloud.google.com/natural-language/.

Syntax Analysis

Extract tokens and sentences, identify parts of speech (PoS) and create dependency parse trees for each sentence.

Entity Recognition

Identify entities and label by types such as person, organization, location, events, products and media.

Sentiment Analysis

Understand the overall sentiment expressed in a block of text.

Content Classification

Classify documents in predefined 700+ categories.

Multi-Language

Enables you to easily analyze text in multiple languages including English, Spanish, Japanese, Chinese (Simplified and Traditional), French, German, Italian, Korean and Portuguese.

Integrated REST API

Access via REST API. Text can be uploaded in the request or integrated with Google Cloud Storage.

COUNT I
(Infringement of U.S. Patent No. 6,851,115)

176.   Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

177.   Plaintiff is informed and believes, and on that basis alleges, that Defendant has infringed and are currently infringing one or more claims (*e.g.*, claim 61) of the '115 Patent, in violation of 35 U.S.C. § 271.

178.   Defendant has infringed and is currently infringing literally and/or under

the doctrine of equivalents, by, among other things, making, using, offering for sale,

selling, and/or importing within this judicial district and elsewhere in the United States,

without license or authority, infringing products, including but not limited to Google

Assistant, Google Search, and related products and/or processes falling within the scope

of one or more claims of the '115 Patent, including claim 61:

> 61. A facilitator agent arranged to coordinate cooperative task completion within a distributed computing environment having a plurality of autonomous service-providing electronic agents, the facilitator agent comprising:
>
> an agent registry that declares capabilities of service-providing electronic agents currently active within the distributed computing environment; and
>
> a facilitating engine operable to parse a service requesting order to interpret a compound goal set forth therein, the compound goal including both local and global constraints and control parameters, the service request formed according to an Interagent Communication Language (ICL), wherein the ICL includes:
>
> a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the parameter lists further refine the one or more events; and
>
> a content layer comprising one or more of goals, triggers and data elements associated with the events; and
>
> the facilitating engine further operable to construct a goal satisfaction plan by using reasoning that includes one or more of domain-independent coordination strategies, domain-specific reasoning, and application-specific reasoning comprising rules and learning algorithms.

179.   Defendant's acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Google Assistant, Google Feed/Google Now, Google Search, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 61.[10]

180.   Defendant directly infringes claim 61 by making, using, offering for sale, selling, and/or importing the claimed facilitator agent, and/or by putting the claimed facilitator agent as a whole into service.

181.   For example, Defendant's Google Assistant uses a facilitator agent to coordinate cooperate task completion within a distributed computing environment, as described on the Actions for Google page regarding implicit invocation: [11]

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[10] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 61 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '115 Patent.

[11] https://developers.google.com/actions/discovery/implicit.

1. User: *"Ok Google, I need a chicken soup recipe"*

2. The Assistant queries Actions on Google to find a suitable app for the user's request

3. Assistant: *"Ok, for that, try saying: talk to Personal Chef"*

Implicit invocation occurs when users invoke your app without using its name. This type of invocation occurs when users tell the Google Assistant to do something that's similar to the action invocation phrase for one of your configured intents, or when the user is in a context where your app would be appropriate.

182.   This query to Actions on Google looks to a registry that includes

capabilities of service-providing electronic agents, for example agents built by third

parties as apps. Other examples of a registry for agents is disclosed by the

ActionPackage as part of Actions on Google. The ActionPackage "holds the content for

the draft of an App as well as each deployed version" including the "Manifest" which is

the set of metadata for the Agent, and include things like invocation name and sample

invocation[12]:

183.   A facilitator agent is able to parse a service requesting order to interpret a

_____

[12] https://developers.google.com/actions/reference/rest/Shared.Types/ActionPackage.

compound goal set forth within the request, where the request is formed according to an

ICL. For Example, the Assistant asks Action on Google to invoke the best app to fulfill

the intent given:

How Actions on Google works with the Assistant   ↑

When users request an action to be fulfilled:

1. The Assistant asks Actions on Google to invoke the best app to fulfill the intent.
2. Actions on Google sends a request to the app's fulfillment and receives a response that it hands off to the Assistant.
3. The Assistant renders the response in its UI and displays it to the user. The conversation between the user and the app begins.
4. The Assistant sends subsequent user input directly to the app and the app responds directly to the Assistant. This conversation continues until the app gathers the user input it needs to fulfill the intent.

184.   This process includes a recommendation algorithm that determines which

app has an app that can complete the task required:

This interaction occurs as follows:

1. A user asks the Google Assistant to perform a task.
2. The recommendation algorithm determines that your app has an action that can complete the user's task.
3. The Assistant recommends your app to the user.

185.   For example, on a mobile phone, a user can open up the Google Assistant

app and say or type in "who won the Super Bowl." After the Google Assistant responds,

a user can ask a follow up question:
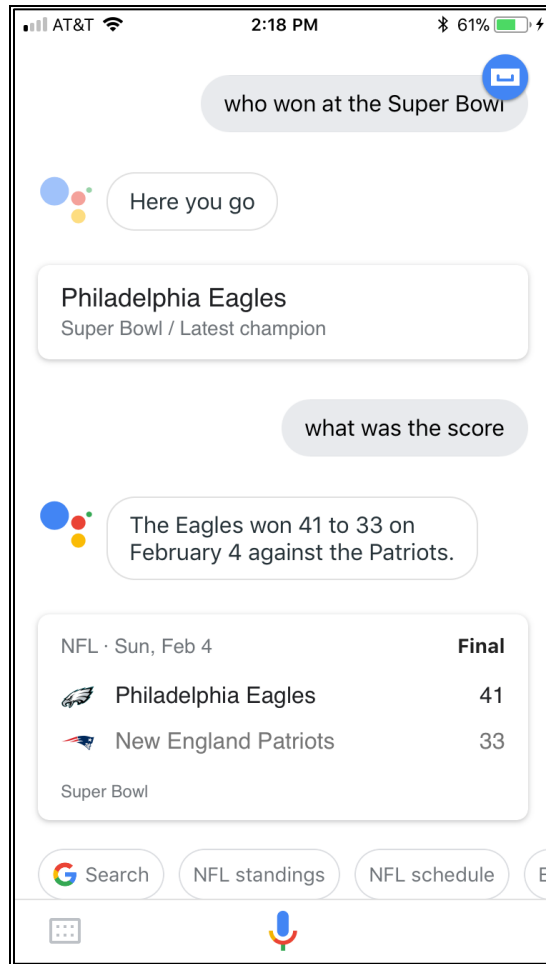
186.   Google Assistant uses an ICL that includes both a conversational protocol layer composed of event types and parameters, as well as a content layer that is comprised of one or more goals, triggers, and data elements associated with the events. A non-limiting example of such communication is disclosed, which at least in some

instances is described in Google's DialogFlow development suite and coding standards

for Agents[13]:
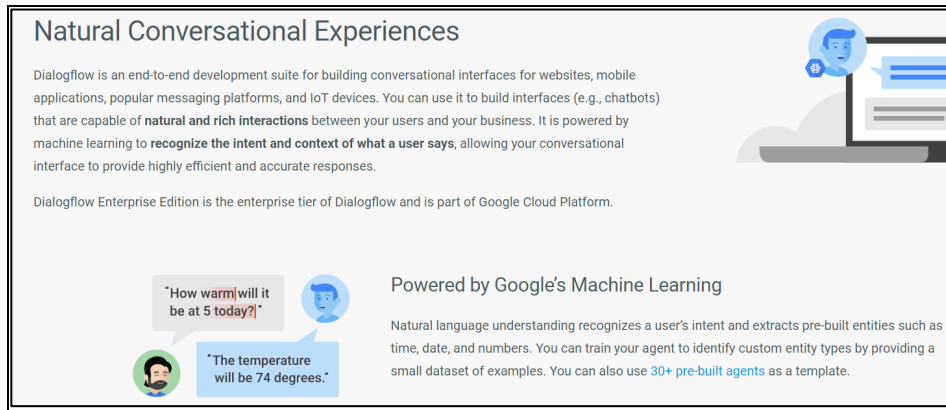
187.   For example, certain phrases, which Google Assistant refers to as Intents,

include event types, and those event types further have a list of parameters that refine

those events:[14]

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[13] *See also* https://developers.google.com/actions/reference/v1/conversation.
[14] https://developers.google.com/actions/discovery/implicit.

You can click on any of the actions listed to view their invocation phrases. If you're using Dialogflow, you'll have the option to **Add more phrases**, which links you directly to your app's intents in Dialogflow.

English ▾ ⓘ

Action invocation phrases ⓘ   ⌃

Invocation phrases are automatically generated for your action based on the "User says" phrases defined in your Dialogflow intent. Saying these phrases by themselves without the name of your app isn't guaranteed to invoke your app if they are not specific enough (e.g. "next") or if Google Assistant already has a direct response to this request (e.g., "what's the time").

How long does it take to get from $origin-stop to $destination-stop on the $route ?

How long does the $route $vehicle-type from $origin-stop to $destination-stop take?

How long does the $route from $origin-stop to $destination-stop take?

$origin-stop

How long does the $agency from $origin-stop to $destination-stop usually take?

What is the average time for the $agency from $origin-stop to $destination-stop on $date ?

What is the travel time from $origin-stop to $destination-stop ?

What is the average time from $origin-stop to $destination-stop ?

How long does the $vehicle-type from $origin-stop to $destination-stop take?

How long is the $agency from $origin-stop to $destination-stop supposed to take?

How long does the $time $vehicle-type from $origin-stop to $destination-stop take

What is the average travel time from $origin-stop to $destination-stop ?

How long does it take to get from $origin-stop to $destination-stop $date $time-period ?

How long does it take to get from $origin-stop to $destination-stop ?

ADD MORE PHRASES ☑

User updates and notifications   None   ⌄

188.   This is also shown in DialogFlow, where parameter names and entities can

be defined:[15]

189.   Other examples of parameter names and entities is shown through the slot

filling process, which includes seeking additional information from the user to resolve the

user's intent:[16]

---

[15] https://dialogflow.com/docs/intents; *see also* https://dialogflow.com/docs/reference/v2-comparison.
[16] *See* https://dialogflow.com/docs/how-tos/slot-filling.

There will be 5 intents in our agent:

1 - Send Message

message

2 - Message correct
Yes

message

Contexts reset

3 - Message correct
Unknown

message

message

4 - Message correct
No

message

new_message

5 - New message

new_message

Contexts reset

Reference:

= Intent flow

= Context flow

= Intent

= Input context

= Output context

190.   As discussed above, the facilitating engine constructs a goal satisfaction

plan that includes reasoning that includes one or more of domain-independent

coordination strategies, domain-specific reasoning, and application-specific reasoning

comprising rules and learning algorithms. For example, Actions on Google determines a

goal satisfaction plan that recommends the app to be used to fulfill the user's request:[17]

191. As part of defining intents for Actions on Google, Training Phrases, for use in machine learning, are presented, so that facilitating engine can use rules and learning algorithms, at least, to construct goal satisfaction programs:[18]

---

[17] https://developers.google.com/actions/discovery/implicit.
[18] https://dialogflow.com/docs/intents#user-says.

An **intent** represents a mapping between what a user says and what action should be taken by your software.

Intent interfaces have the following sections:

- Training Phrases
- Action
- Response
- Contexts

Training Phrases   ↑

Example (") and Template (@) Modes

Each **User says** expression can be in one of two modes: Example Mode (indicated by the " icon) or Template Mode (indicated by the @ icon).

Examples are written in natural language and annotated so that parameter values can be extracted. You can read more on annotation below.

Templates contain direct references to entities instead of annotations, i.e., entity names are prefixed with the @ sign.

To toggle between modes, click on the " or @ icon.

We recommend using examples rather than templates, because it's easier and Machine Learning learns faster this way. And remember: the more examples you add, the smarter your agent becomes.

192.   As another example, the facilitator engine may present results in the form of Google Search or Youtube results. For example, a request of "What does a 747 look like" presents YouTube video results for review:
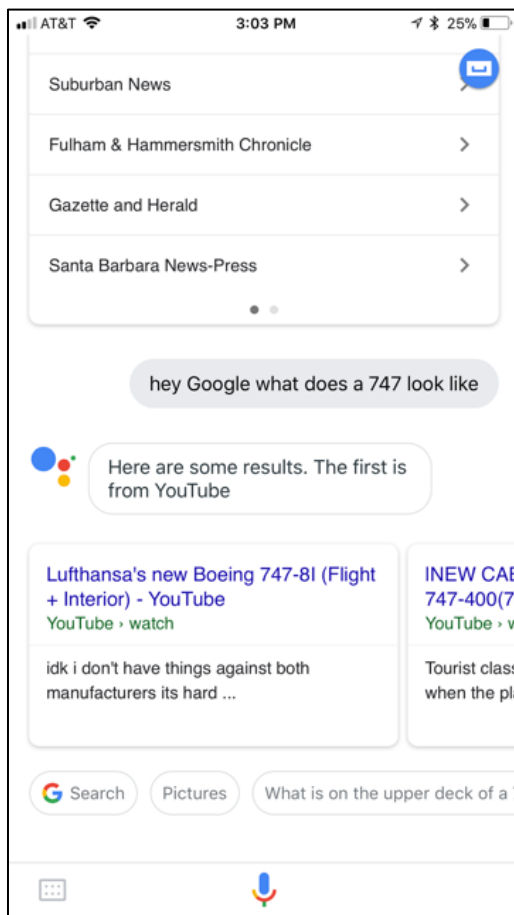
193.   Likewise, asking "What is the best airline" presents a result from Google

Search":
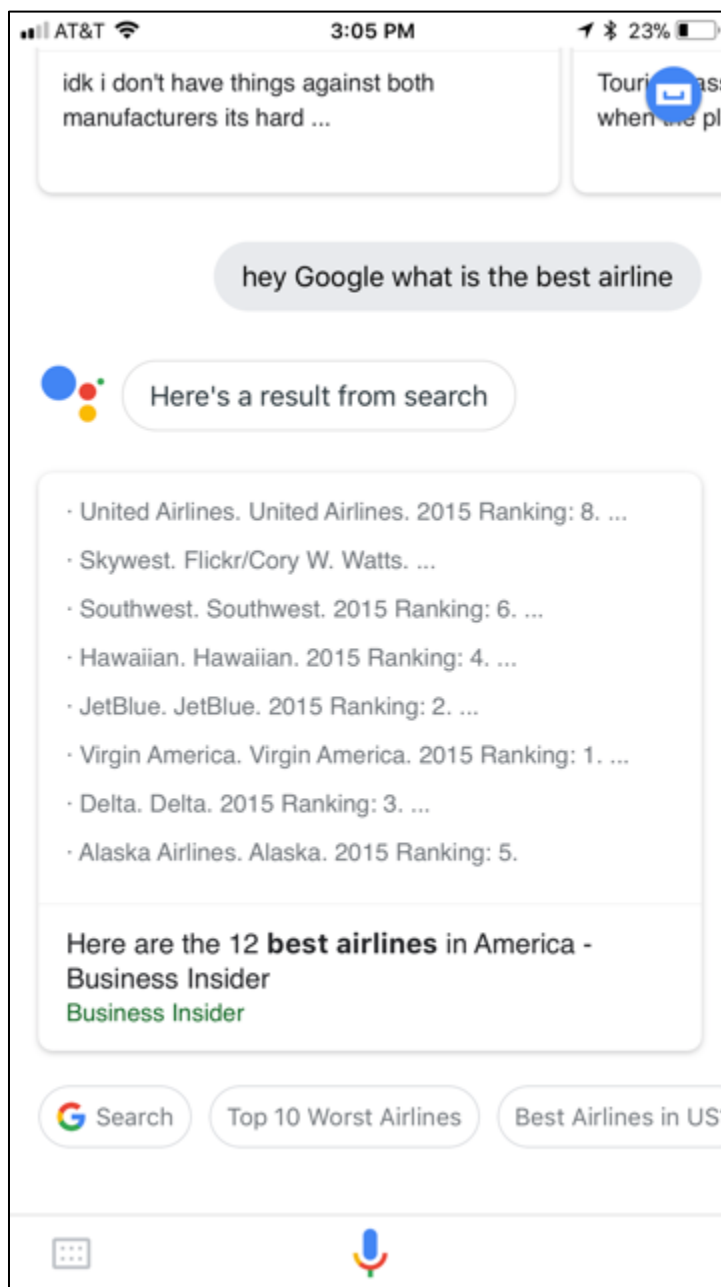
194.   Defendant has also infringed indirectly and continues to infringe indirectly

the '115 Patent by active inducement under 35 U.S.C. § 271(b).

195.   On information and belief, Defendant gained knowledge of the '115

Patent no later than October 21, 2014, the date on which the Examiner of Google's U.S.

Patent App. No. 12/977,003 (issued as U.S. Patent No. 9,031,830) disclosed it to

Defendant in a Notice of References Cited. Defendant gained further knowledge of the

'115 Patent through the prosecution of additional patents and patent applications where

the '115 Patent was cited either by Defendant or the Examiner during prosecution,

including:

Patent or Application No.	File Date	'115 Patent Citation Date	Issue Date	Title
U.S. 9,031,830*	Dec 22, 2010	Oct. 21, 2014	May 12, 2015	Multi-modal input on an electronic device
U.S. 9,251,791	Jun. 9, 2014	Dec. 31, 2014	Feb. 2, 2016	Multi-modal input on an electronic device
U.S. 9,495,127	Dec 22, 2010	Dec. 31, 2014	Nov. 15, 2016	Language model selection for speech-to-text conversion
* Cited by Examiner				

196.   On information and belief, Defendant further confirmed its knowledge of

the '115 Patent and Defendant's infringement thereof no later than the filing date of their

Inter Partes Review Petitions related to the '061 Patent (IPR2018-00384 at Exs. 1007

and 1008) on December 22, 2017; the '021 Patent (IPR 2018-00474 and IPR2018-00475

at Exs. 1007 and 1008) on January 12, 2018; and the '718 Patent (IPR2018-00476 at Exs.

1007 and 1008) on January 12, 2018. On information and belief, Defendant has intended,

and continues to intend, to induce patent infringement by its users and has had knowledge

that the inducing acts would cause infringement or has been willfully blind to the possibility that its inducing acts would cause infringement.

197.   For example, Defendant encouraged end users to use a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents using the method as claimed in claim 61 of the '115 Patent through the very nature of the products.

198.   As a further example, Defendant instructs users on how to use the infringing products for a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents using a method as claimed in claim 61 of the '115 Patent. By using the infringing products to perform a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents, users directly infringe at least claim 61 of the '115 Patent. By continuing to provide instructions to users on how to use the infringing products to perform a computer-implemented method for communication and cooperative task completion among a plurality of distributed electronic agents as claimed in claim 61 of the '115 Patent, and by continuing to encourage such use, Defendant has and continues to specifically intend to induce infringement of the '115 Patent.

199.   Defendant has also infringed indirectly and continue to infringe indirectly the '115 Patent by contributory infringement under 35 U.S.C. § 271(c).

200.   Defendant has and continue to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but

75

not limited to Google Assistant, Google Now, and Google Search, with the knowledge

that the Google Assistant or Google Search will be used by users with, for example, the

Google Assistant app on users' smartphones, or the Google Assistant Search app on

users' smartphones to directly infringe at least claim 61 of the '115 Patent.

201.   Since at least October 21, 2014, Defendant has been and still is willfully

infringing the '115 Patent. On information and belief, at least as early as October 21,

2014, Defendant had actual knowledge of the '115 Patent. Despite having actual

knowledge of the '115 Patent, Defendant has continued to willfully, wantonly, and

deliberately infringe the '115 Patent. Accordingly, Plaintiff seeks enhanced damages

pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the

meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

202.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been

met with respect to the '115 Patent.

203.   As a result of Defendant's infringement of the '115 Patent, Plaintiff has

been injured by Defendant's unauthorized use of Plaintiff's intellectual property.

Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's

infringement, but in no event less than a reasonable royalty for the use made of the

invention by Defendant, together with interest and costs as fixed by the Court, and

Plaintiff will continue to suffer damages in the future unless Defendant's infringing

activities are enjoined by this Court.

204.   Unless a permanent injunction is issued enjoining Defendant and its

agents, servants, employees, representatives, affiliates, and all others acting or in active

concert therewith from infringing the '115 Patent, Plaintiff will be greatly and irreparably

harmed.

COUNT II
(Infringement of U.S. Patent No. 7,069,560)

205.   Plaintiff re-alleges and incorporates by reference the allegations in the

foregoing paragraphs as if fully set forth herein

206.   Plaintiff is informed and believes, and on that basis alleges, that Defendant

has infringed and is currently infringing one or more claims (e.g., claim 52) of the '560

Patent, in violation of 35 U.S.C. § 271.

207.   Defendant has infringed and is currently infringing literally and/or under

the doctrine of equivalents, by, among other things, making, using, offering for sale,

selling, and/or importing within this judicial district and elsewhere in the United States,

without license or authority, infringing products, including but not limited to Google

Assistant, Google Search, and related products and/or processes falling within the scope

of one or more claims of the '560 Patent, including claim 52:

> 52. A computer implemented process for providing coordinated task completion within a distributed computing environment, the distributed computing environment including a plurality of autonomous electronic agents, the computer implemented method comprising the steps of:
>
>> providing at least one agent registry including capabilities of service providing electronic agents;
>>
>> interpreting a service request in the form of a base goal, the service request being in a interagent communication language (ICL), the ICL including a layer of conversational protocol defined by event types and parameter lists associated with one or more of the events, wherein the Parameter lists further refine the one or more events;
>>
>> determining a plurality of sub goals necessary to accomplish the base goal; selecting from said registry at least one service providing agent capable of completing said sub goals;

delegating at least one sub goal as a peer to peer service request directly from a service requesting agent to a service providing agent; and

delegating any remaining sub goals as service request in the interagent communication language to the selected agents capable of completing the remaining sub-goals.

208.   Defendant's acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Google Assistant, Google Search, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 52.[19]

209.   Defendant directly infringes claim 52 by performing each step of the method itself, and for any step it does not itself perform by directing or controlling the performance of such steps by third-parties including app developers and Android device manufacturers when those third-parties develop services for integration into Google Assistant, such that the performance of such steps is attributable to Defendant, including without limitation based on Defendant's instructions, requirements to use Defendant's development platforms, and various Google Cloud Platform Terms and Mobile Application Distribution Agreements. Defendant further directly infringes claim 52 when it tests Google Assistant.

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[19] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 52 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '560 patent

210.   For example, Defendant's Google Assistant uses a process for providing

coordinated task planning and execution within a distributed computing environment.

Google Assistant contemplates the use of (1) an agent registry including capabilities of

service providing electronic agents, (2) interpreting a service request in the form of a base

goal, which is communicated with an ICL that includes a conversational protocol layer

defined by event types and parameter lists associated with the event type (3) determining

sub-goals necessary to accomplish the base goal, and then selecting an agent to complete

the sub goal, and delegating the sub goal as a peer to peer service directly from the

service requesting agent to the service providing agent, and delegating any remaining

subgoals to selected agents capable of completing the remaining subgoals.

211.   As an example, the Google Assistant uses the claimed method when a uses

asks, "How do I get to SFO by public transit?" and Google responds with information

regarding route based on location and schedule.
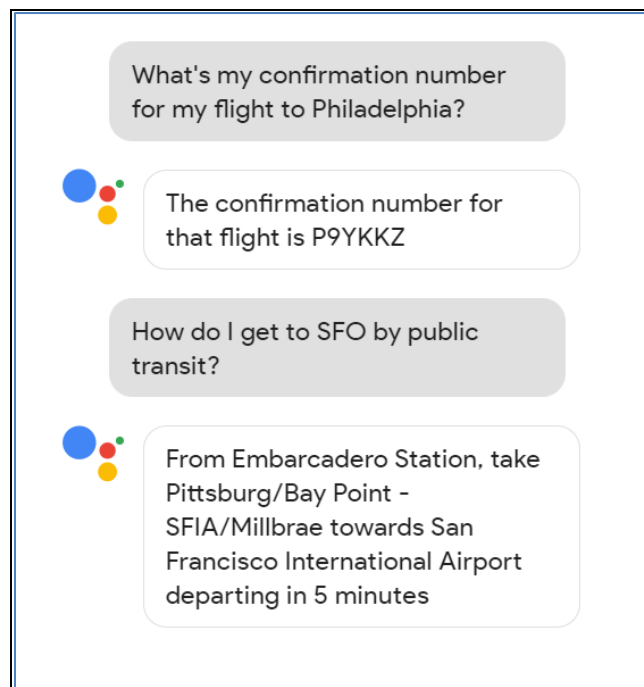
212.   First, Actions on Google represents an agent registry that includes

capabilities of service providing agents, and for selecting from the registry at least one

service providing agent capable of completing a sub goal:

[20] https://developers.google.com/actions/discovery/implicit.
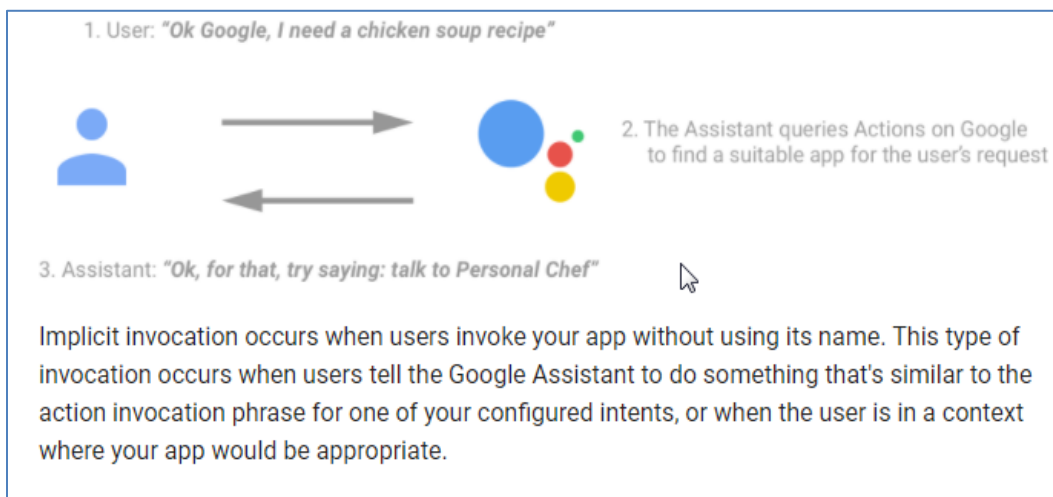
213.   Other examples of a registry for agents is disclosed by the ActionPackage as part of Actions on Google. The ActionPackage "holds the content for the draft of an App as well as each deployed version" including the "Manifest" which is the set of metadata for the Agent, and include things like invocation name and sample invocation[21]:

Manifest

The set of metadata for the Agent. The contents of this message are used in multiple contexts:

https://developers.google.com/actions/reference/rest/Shared.Types/ActionPackage

2/8/2018   ActionPackage | Actions on Google | Google Developers

- Actions on Google directory listing page
- Unique identification of an Agent for explicit invocation (displayName)
- Content for other parts of an ActionPackage (shortDescription is used for display in AccountLinking, displayName is used in Actions to show the Agent name to users).

This message is read-only. You specify the fields in this message via the Actions console and not directly in the action package.

JSON representation

```
{
  "displayName": string,
  "invocationName": string,
  "shortDescription": string,
  "longDescription": string,
  "category": string,
  "smallSquareLogoUrl": string,
  "largeLandscapeLogoUrl": string,
  "companyName": string,
  "contactEmail": string,
  "termsOfServiceUrl": string,
  "privacyUrl": string,
  "sampleInvocation": [
    string
  ],
  "introduction": string,
  "testingInstructions": string,
  "voiceName": string,
  "surfaceRequirements": {
    object(SurfaceRequirements (https://developers.google.com/actions/reference/rest/Shared.Typ
  },
}
```

---

[21] https://developers.google.com/actions/reference/rest/Shared.Types/ActionPackage.

214.   Further, Google Assistant also interprets a service request in the form of a

base goal, which is communicated with an ICL that includes a conversational protocol

layer defined by event types and parameter lists associated with the event type. A non-

limiting exemplary disclosure of such an ICL is described in Google's DialogFlow

development suite and coding standards for agents, and in the Actions on Google

information provided by Google:[22]

215.   For example, certain phrases, which Google refers to as Intents, which

include event types, and those event types further have a list of parameters that refine

those events: [23]

---

[22] *See also* https://developers.google.com/actions/reference/v1/conversation.
[23] https://developers.google.com/actions/discovery/implicit.

You can click on any of the actions listed to view their invocation phrases. If you're using Dialogflow, you'll have the option to **Add more phrases**, which links you directly to your app's intents in Dialogflow.

English ▼ ⓘ

Action invocation phrases ⓘ   ⌃

Invocation phrases are automatically generated for your action based on the "User says" phrases defined in your Dialogflow intent. Saying these phrases by themselves without the name of your app isn't guaranteed to invoke your app if they are not specific enough (e.g. "next") or if Google Assistant already has a direct response to this request (e.g., "what's the time").

How long does it take to get from $origin-stop to $destination-stop on the $route ?

How long does the $route $vehicle-type from $origin-stop to $destination-stop take?

How long does the $route from $origin-stop to $destination-stop take?

$origin-stop

How long does the $agency from $origin-stop to $destination-stop usually take?

What is the average time for the $agency from $origin-stop to $destination-stop on $date ?

What is the travel time from $origin-stop to $destination-stop ?

What is the average time from $origin-stop to $destination-stop ?

How long does the $vehicle-type from $origin-stop to $destination-stop take?

How long is the $agency from $origin-stop to $destination-stop supposed to take?

How long does the $time $vehicle-type from $origin-stop to $destination-stop take

What is the average travel time from $origin-stop to $destination-stop ?

How long does it take to get from $origin-stop to $destination-stop $date $time-period ?

How long does it take to get from $origin-stop to $destination-stop ?

ADD MORE PHRASES ☑

User updates and notifications   None   ⌄

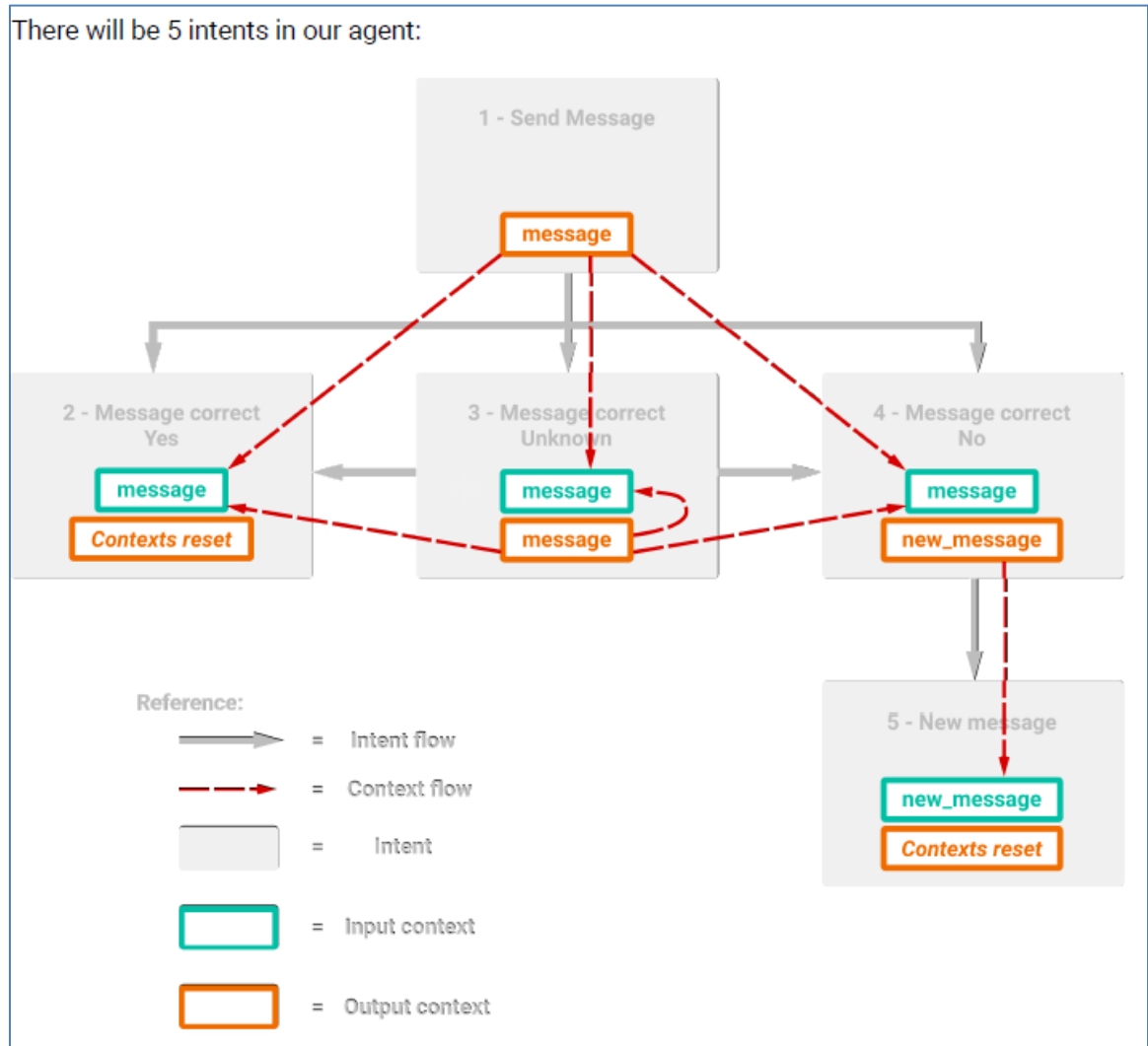This is also shown in DialogFlow, where parameter names and entities can be defined: [24]

216.   Other examples of parameter names and entities is shown through the slot filling process, which includes seeking additional information from the user to resolve the user's intent: [25]

---

[24] https://dialogflow.com/docs/intents; *see also* https://dialogflow.com/docs/reference/v2-comparison.
[25] *See* https://dialogflow.com/docs/how-tos/slot-filling.

217.   Google Assistant also determines sub-goals necessary to accomplish the

base goal, and then selecting an agent to complete the sub goal, and delegating the sub

goal as a peer to peer service directly from the service requesting agent to the service

providing agent. As part of defining intents for Actions on Google, Training Phrases, for

use in machine learning, are presented, so that sub goals can be determined to identify a

sub goal: [26]

> An **intent** represents a mapping between what a user says and what action should be taken by your software.
>
> Intent interfaces have the following sections:
>
> - Training Phrases
> - Action
> - Response
> - Contexts

218. Based on a recommendation algorithm, Actions on Google, through

Google Assistant determines an app that has an action that can complete a task: [27]

> ## Action Discovery
>
> Action discovery is a very powerful tool for getting your app in front of users. If a user wants to accomplish a task and your app has an action that can help the user with their task, the Google Assistant may recommend your app to the user.
>
> This interaction occurs as follows:
>
> 1. A user asks the Google Assistant to perform a task.
> 2. The recommendation algorithm determines that your app has an action that can complete the user's task.
> 3. The Assistant recommends your app to the user.

219. Actions on Google also delegates the sub goal as a peer to peer service

directly from the service requesting agent (here, Google Assistant) to the service

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[26] https://developers.google.com/actions/discovery/implicit.
[27] https://developers.google.com/actions/discovery/implicit.

providing agent (at least one app): [28]


> **How Actions on Google works with the Assistant**   ↑
>
> When users request an action to be fulfilled:
>
> 1. The Assistant asks Actions on Google to invoke the best app to fulfill the intent.
>
> 2. Actions on Google sends a request to the app's fulfillment and receives a response that it hands off to the Assistant.
>
> 3. The Assistant renders the response in its UI and displays it to the user. The conversation between the user and the app begins.
>
> 4. The Assistant sends subsequent user input directly to the app and the app responds directly to the Assistant. This conversation continues until the app gathers the user input it needs to fulfill the intent.

220.   As another example, service providing agents may include Google Search

or YouTube results. For example, a request of "What does a 747 look like" presents

YouTube video results for review:

---

[28] https://developers.google.com/actions/extending-the-assistant.
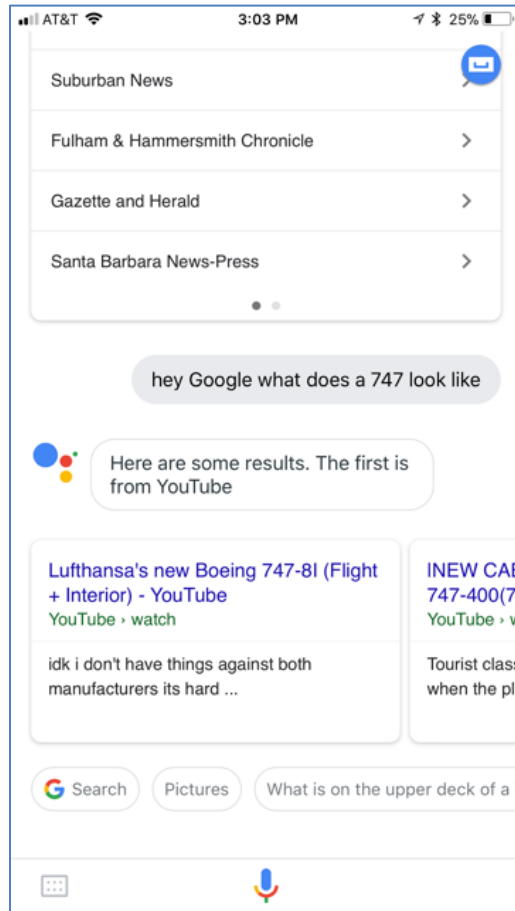
221.   That is, a search was conducted (a sub goal) and interaction with another

agent (YouTube) provided information regarding videos related to the base goal. This

process continues until all sub goals are completed.

222.   Defendant has also infringed indirectly and continues to infringe indirectly

the '560 Patent by active inducement under 35 U.S.C. § 271(b).

223.   On information and belief, Defendant gained knowledge of the '560

Patent no later than the filing of this complaint or shortly thereafter.

224.   On information and belief, Defendant has intended, and continues to

intend, to induce patent infringement by its users and has had knowledge that the

inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

225.   For example, Defendant encourages end users to use a process for providing coordinated task completion within a distributed computing environment that includes a method for (1) an agent registry including capabilities of service providing electronic agents, (2) interpreting a service request in the form of a base goal, which is communicated with an ICL that includes a conversational protocol layer defined by event types and parameter lists associated with the event type (3) determining sub-goals necessary to accomplish the base goal, and then selecting an agent to complete the sub goal, and delegating the sub goal as a peer to peer service directly from the service requesting agent to the service providing agent, and delegating any remaining sub goals to selected agents capable of completing the remaining sub goals.

226.   Defendant has also infringed indirectly and continue to infringe indirectly the '560 Patent by contributory infringement under 35 U.S.C. § 271(c).

227.   Defendant has and continues to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to Google Assistant and Google Search, with the knowledge that the Google Assistant or Google Search will be used by users with, for example, the Google Assistant app or Google Search App on users' smartphones to directly infringe at least claim 52 of the '560 Patent.

228.   Since at least the date of this lawsuit, Defendant has been and still is willfully infringing the '560 Patent. On information and belief, at least as early as the

date of this lawsuit, Defendant had actual knowledge of the '560 Patent. Despite having

actual knowledge of the '560 Patent, Defendant has continued to willfully, wantonly, and

deliberately infringe the '560 Patent. Accordingly, Plaintiff seeks enhanced damages

pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the

meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

229. To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been

met with respect to the '560 Patent.

230. As a result of Defendant's infringement of the '560 Patent, Plaintiff has

been injured by Defendant's unauthorized use of Plaintiff's intellectual property.

Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's

infringement, but in no event less than a reasonable royalty for the use made of the

invention by Defendant, together with interest and costs as fixed by the Court, and

Plaintiff will continue to suffer damages in the future unless Defendant's infringing

activities are enjoined by this Court.

231. Unless a permanent injunction is issued enjoining Defendant and its

agents, servants, employees, representatives, affiliates, and all others acting or in active

concert therewith from infringing the '560 Patent, Plaintiff will be greatly and irreparably

harmed.

COUNT III
(Infringement of U.S. Patent No. 7,036,128)

232. Plaintiff re-alleges and incorporates by reference the allegations in the

foregoing paragraphs as if fully set forth herein.

233.   Plaintiff is informed and believes, and on that basis alleges, that Defendant

has infringed and is currently infringing one or more claims (*e.g.*, claim 1) of the '128

Patent, in violation of 35 U.S.C. § 271.

234.   Defendant has infringed and is currently infringing literally and/or under

the doctrine of equivalents, by, among other things, making, using, offering for sale,

selling, and/or importing within this judicial district and elsewhere in the United States,

without license or authority, infringing products, including but not limited to Google

Assistant, Google Search, and related products and/or processes falling within the scope

of one or more claims of the '128 Patent, including claim 1:

> 1. A collaborative computer-implemented community of distributed electronic
> agents, organized to provide a mobile computing environment, the computer-
> implemented community of distributed electronic agents comprising:
>
>> an agent registry wherein one or more capabilities of each of the electronic
>> agents are registered in the form of an interagent communication language
>> (ICL), wherein the interagent language includes a layer of conversational
>> protocol defined by event types and parameter lists associated with one or
>> more events, and wherein the parameter lists further refine the one or more
>> events;
>>
>> a facilitator agent arranged to coordinate cooperative task completion
>> among the electronic agents by delegating one or more received ICL goals
>> to a selected one or more of the electronic agents based upon the
>> registered capabilities of the selected agents;
>>
>> one or more service-providing electronic agents, being in bi-directional
>> communication with the facilitator agent, including at least one location
>> agent operable to ascertain a current physical location of a user; and
>>
>> one or more computer interface agents being in bi-directional
>> communication with the facilitator agent, the mobile computer interface
>> agents being operable to process at least one mobile user input type and to
>> responsively generate and present to the facilitator agent one or more ICL
>> goals corresponding to the user's desired request.

235.   Defendant's acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Google Assistant, Google Search, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1.[29]

236.   Defendant directly infringes claim 1 by making, using, offering for sale, selling, and/or importing the claimed computer-implemented community of distributed electronic agents, and/or by putting the claimed computer-implemented community of distributed electronic agents as a whole into service

237.   For example, Defendant's Google Assistant uses a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment. Google Assistant includes such a community of distributed electronic agents with (1) an agent registry where capabilities of each electronic agent is registered in the claimed interagent communication language (ICL), (2) a facilitator agent arranged to coordinate cooperative task completion by delegating one or more received ICL goals to one or more electronic agent based on its registered capabilities, (3) at least one service providing agent with bi-directional communication with the facilitator agent and including at least one location agent operable to ascertain a

---

[29] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '128 Patent.

current physical location of a user, and (4) at least one computer interface agents in bi-directional communication with the facilitator agent that can process at least one mobile user input type and responsively generate and present to the facilitator agent one or more ICL goals corresponding to the user's desired request, as described on the Google Assistant page: [30]
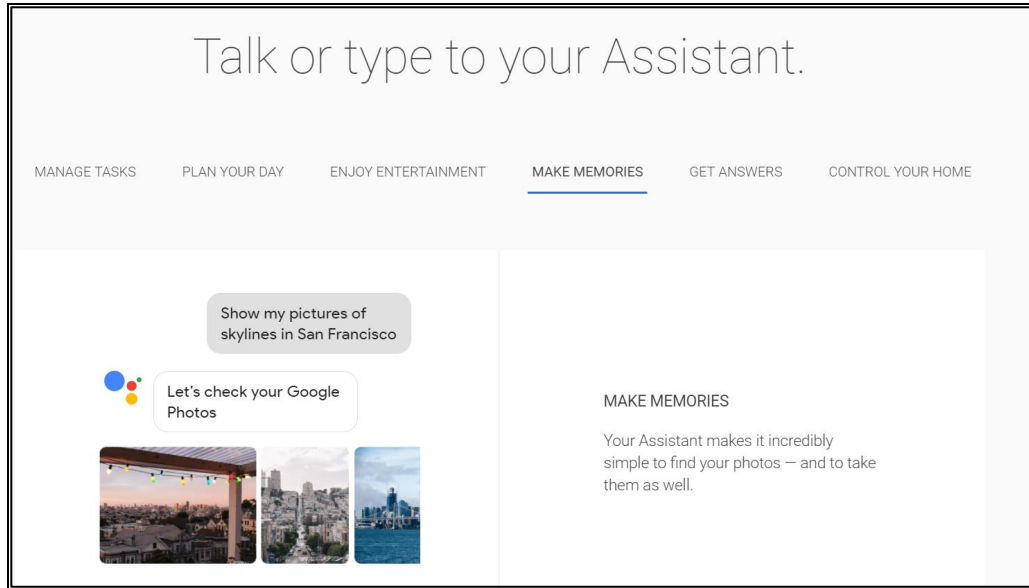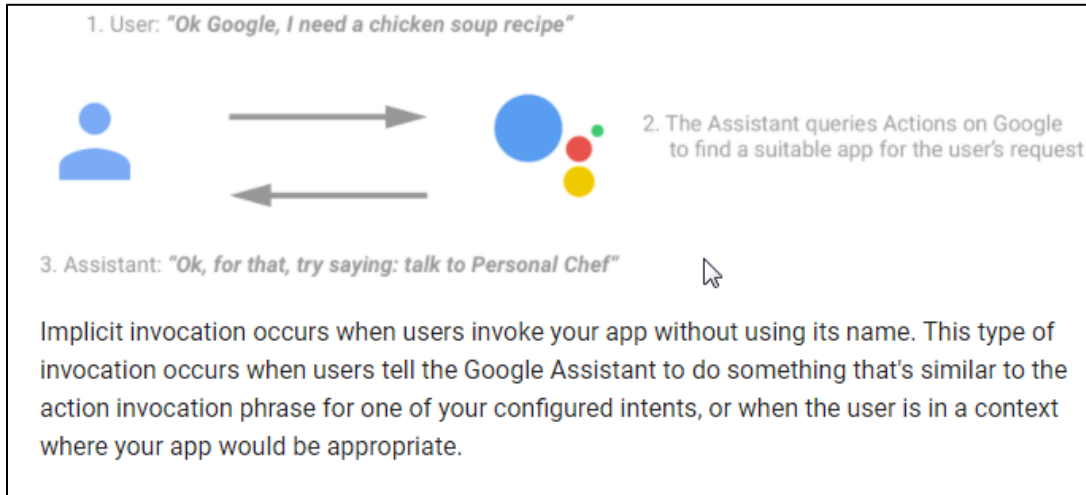

238.   For example, on a mobile phone, a user can open up the Google Assistant and say or type in "I need directions to Renaissance Tower." The Google Assistant then uses an agent to ascertain the current physical location of the user and other agents in bi-directional communication with the facilitator present responsive information corresponding the user's desired request:

---

[30] https://assistant.google.com/platforms/phones/.

93
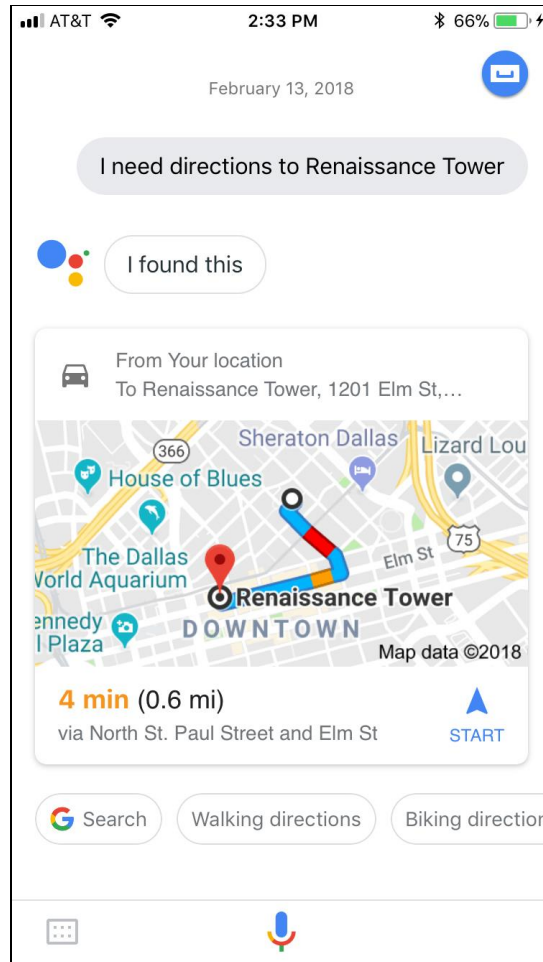
239.   Google Assistant uses Actions by Google and other infrastructure to

access a community of distributed electronic agents operating by using information and

goals recorded in inter-agent communication language (ICL). This includes at least the

use of a facilitator agent including a registry recording agent capability, and arranged to

coordinate cooperative task completion, service providing agents, and computer interface

agents. A non-limiting example of such communication is described by Actions by

Google, and through Google's DialogFlow development suite and coding standards for

Agents:[31]

1. User: *"Ok Google, I need a chicken soup recipe"*

2. The Assistant queries Actions on Google to find a suitable app for the user's request

3. Assistant: *"Ok, for that, try saying: talk to Personal Chef"*

Implicit invocation occurs when users invoke your app without using its name. This type of invocation occurs when users tell the Google Assistant to do something that's similar to the action invocation phrase for one of your configured intents, or when the user is in a context where your app would be appropriate.

How Actions on Google works with the Assistant

When users request an action to be fulfilled:

1. The Assistant asks Actions on Google to invoke the best app to fulfill the intent.
2. Actions on Google sends a request to the app's fulfillment and receives a response that it hands off to the Assistant.
3. The Assistant renders the response in its UI and displays it to the user. The conversation between the user and the app begins.
4. The Assistant sends subsequent user input directly to the app and the app responds directly to the Assistant. This conversation continues until the app gathers the user input it needs to fulfill the intent.

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[31] https://developers.google.com/actions/discovery/implicit.

240.   Other examples of a registry for agents is disclosed by the ActionPackage

as part of Actions on Google. The ActionPackage "holds the content for the draft of an


App as well as each deployed version" including the "Manifest" which is the set of

metadata for the Agent, and include things like invocation name and sample invocation:[32]

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[32] https://developers.google.com/actions/reference/rest/Shared.Types/ActionPackage.

241.   Additionally, a facilitator engine may present results in the form of Google

Search or YouTube results. For example, a request of "What does a 747 look like"

presents YouTube video results for review:

242.   Likewise, asking "What is the best airline" presents a result from Google

Search." Further, as disclosed above, a request for directions to a nearby building uses an

agent to determine the physical location of the user.
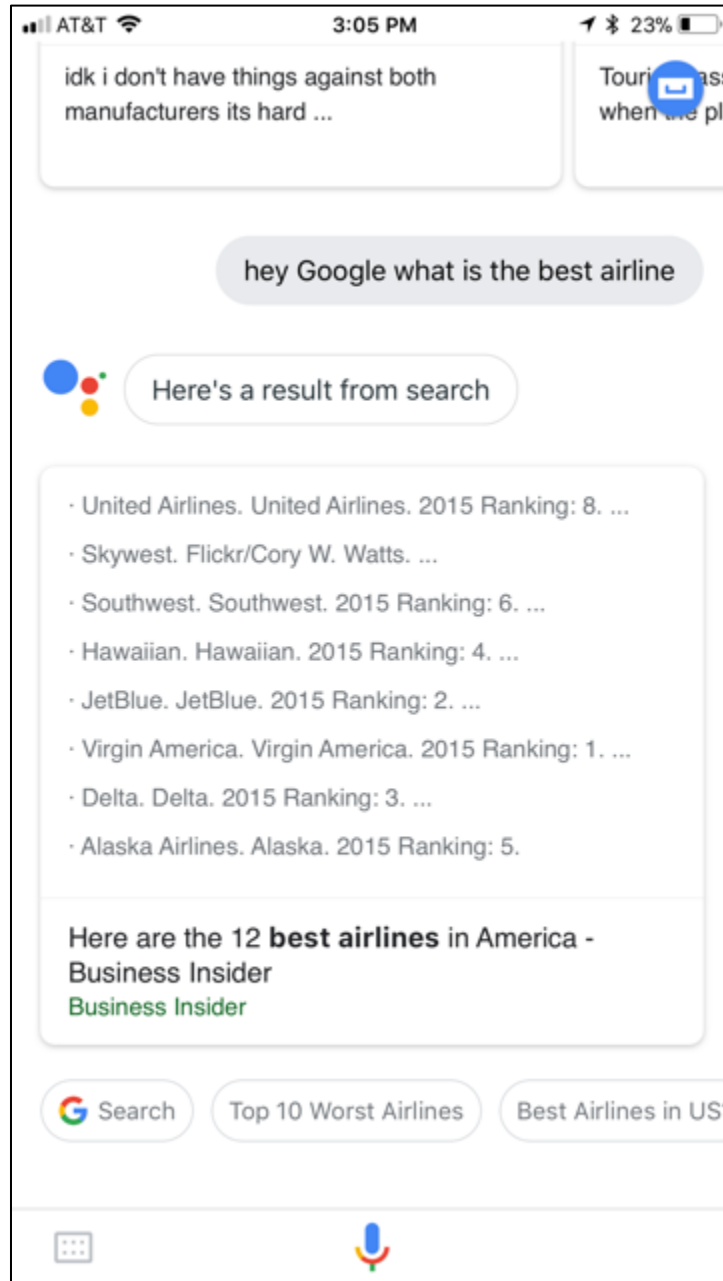
243.   Google Assistant also uses an ICL that includes both a conversational

protocol layer composed of event types and parameters, as well as a content layer that is

comprised of one or more goals, triggers, and data elements associated with the events. A

non-limiting example of such communication is disclosed as part of which at least in some instances is described in Google's DialogFlow development suite and coding standards for Agents:[33]

Natural Conversational Experiences

Dialogflow is an end-to-end development suite for building conversational interfaces for websites, mobile applications, popular messaging platforms, and IoT devices. You can use it to build interfaces (e.g., chatbots) that are capable of **natural and rich interactions** between your users and your business. It is powered by machine learning to **recognize the intent and context of what a user says**, allowing your conversational interface to provide highly efficient and accurate responses.

Dialogflow Enterprise Edition is the enterprise tier of Dialogflow and is part of Google Cloud Platform.

"How warm will it be at 5 today?"

"The temperature will be 74 degrees."

Powered by Google's Machine Learning

Natural language understanding recognizes a user's intent and extracts pre-built entities such as time, date, and numbers. You can train your agent to identify custom entity types by providing a small dataset of examples. You can also use 30+ pre-built agents as a template.

244.   For example, certain phrases, which Google refers to as Intents, which include event types, and those event types further have a list of parameters that refine

---

[33] https://developers.google.com/actions/discovery/implicit.

those events:[34]

---

[34] https://developers.google.com/actions/discovery/implicit.

You can click on any of the actions listed to view their invocation phrases. If you're using Dialogflow, you'll have the option to **Add more phrases**, which links you directly to your app's intents in Dialogflow.

245.   This is also shown in DialogFlow, where parameter names and entities can

be defined:[35]

246.   Other examples of parameter names and entities is shown through the slot

filling process, which includes seeking additional information from the user to resolve the

user's intent: [36]

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[35] https://dialogflow.com/docs/intents; *see also* https://dialogflow.com/docs/reference/v2-comparison.

[36] *See* https://dialogflow.com/docs/how-tos/slot-filling.
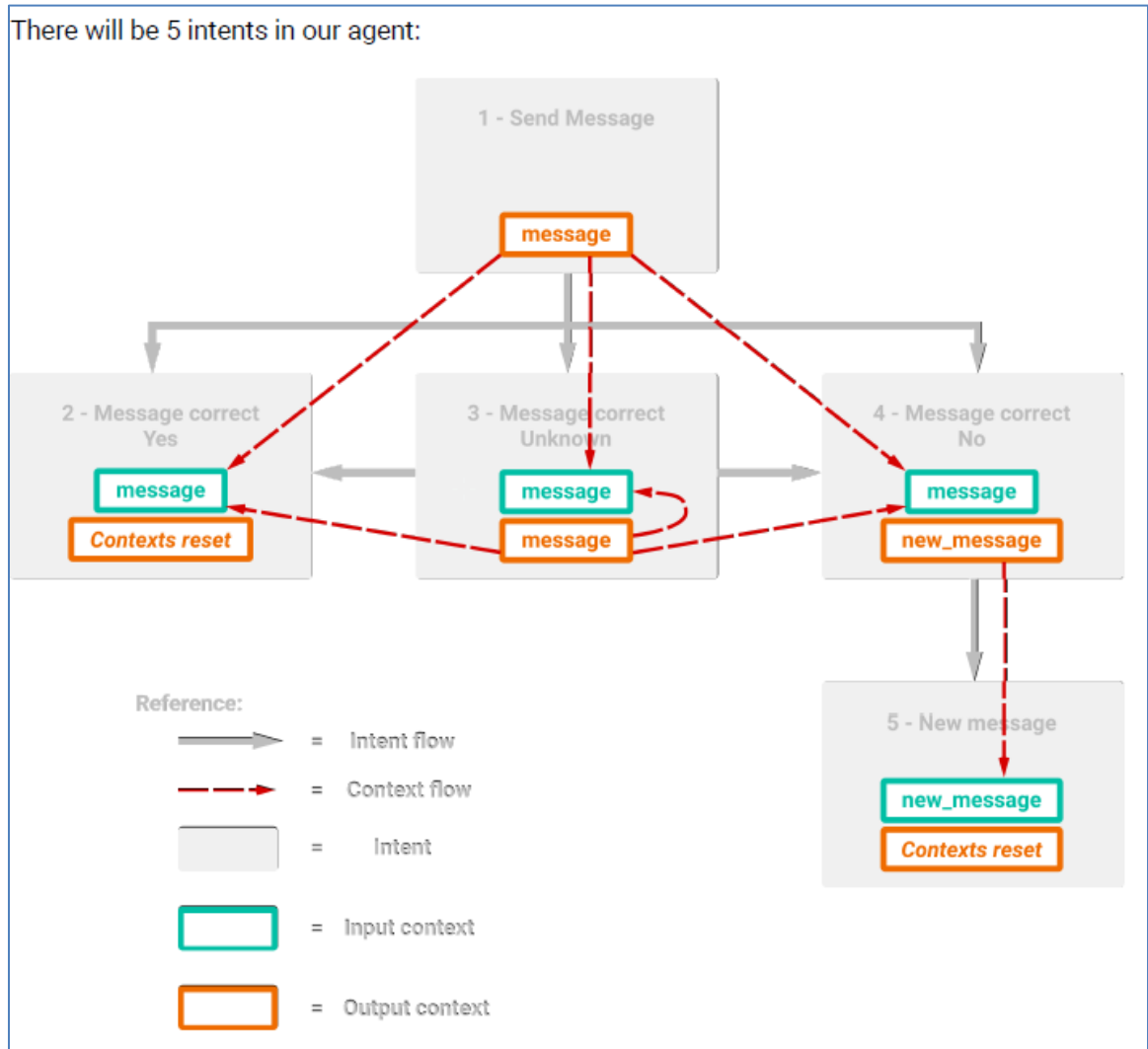
247.   Defendant has also infringed indirectly and continues to infringe indirectly

the '128 Patent by active inducement under 35 U.S.C. § 271(b).

248.   On information and belief, Defendant gained knowledge of the '128

Patent no later than February 29, 2012, the date on which Defendant included it on an

Information Disclosure Statement submitted to the Examiner in connection with U.S.

Patent App. No. 11/695,333 (issued as U.S. Patent No. 8,650,030). Defendant gained

further knowledge of the '128 Patent through the prosecution of additional patents and

patent applications where the '128 Patent was cited either by Defendant or the Examiner

during prosecution, including:

Patent or Application No.	File Date	'128 Patent Citation Date	Issue Date	Title
U.S. 8,650,030	Apr. 2, 2007	Feb 29, 2012	Feb. 11, 2014	Location Based Responses to Telephone Requests
U.S. 8,856,005	Jan. 8, 2014	Jan 8, 2014	Oct. 7, 2014	Location based responses to telephone requests
U.S. 9,600,229	Sept. 5, 2014	Sep 5, 2014	Mar 21, 2017	Location based responses to telephone requests

249.   On information and belief, Defendant has intended, and continues to

intend, to induce patent infringement by its users and has had knowledge that the

inducing acts would cause infringement or has been willfully blind to the possibility that

the inducing acts would cause infringement.

250.   For example, Defendant encourages end users to employ a collaborative

computer-implemented community of distributed electronic agents organized to provide a

mobile computing environment as claimed in claim 1 of the '128 Patent through the very nature of the products. As a further example, Defendant instructs users to use a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment as claimed in claim 1 of the '128 Patent. By continuing to provide instructions to users on how to use the infringing products to employ a collaborative computer-implemented community of distributed electronic agents organized to provide a mobile computing environment as claimed in claim 1 of the '128 Patent, and by continuing to encourage such use, Defendant has and continues to specifically intend to induce infringement of the '128 Patent.

251.   Defendant has also infringed indirectly and continues to infringe indirectly the '128 Patent by contributory infringement under 35 U.S.C. § 271(c).

252.   Defendant has and continues to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to Google Assistant and Google Search, with the knowledge that the Google Assistant or Google Search will be used by users with, for example, the Google Assistant app or Google Search App on users' smartphones to directly infringe at least claim 1 of the '128 Patent.

253.   Since at least the date of the filing of this Complaint, and on information and belief since a date before the filing of this Complaint in light of repeated references to the '128 Patent in Defendant's prosecution of its own patent applications, Defendant has been and still is willfully infringing the '128 Patent. On information and belief, at least as early as February 29, 2012, Defendant had actual knowledge of the '128 Patent.

Despite having actual knowledge of the '128 Patent, Defendant has continued to willfully, wantonly, and deliberately infringe the '128 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

254.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '128 Patent.

255.   As a result of Defendant's infringement of the '128 Patent, Plaintiff has been injured by Defendant's unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

256.   Unless a permanent injunction is issued enjoining Defendant and its agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '128 Patent, Plaintiff will be greatly and irreparably harmed.

COUNT IV
(Infringement of U.S. Patent No. 6,742,021)

257.   Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

258.   Plaintiff is informed and believes, and on that basis alleges, that Defendant

has infringed and is currently infringing one or more claims (*e.g.*, claim 1) of the '021

Patent, in violation of 35 U.S.C. § 271.

259.   Defendant has infringed and is currently infringing literally and/or under

the doctrine of equivalents, by, among other things, making, using, offering for sale,

selling, and/or importing within this judicial district and elsewhere in the United States,

without license or authority, infringing products, including but not limited to Google

Assistant, which also incorporates Search, and related products and/or processes falling

within the scope of one or more claims of the '021 Patent, including claim 1:

> A method for speech-based navigation of an electronic data source, the electronic
> data source being located at one or more network servers located remotely from a
> user, comprising the steps of:
>
> (a) receiving a spoken request for desired information from the user;
>
> (b) rendering an interpretation of the spoken request;
>
> (c) constructing at least part of a navigation query based upon the interpretation;
>
> (d) soliciting additional input from the user, including user interaction in a non-
> spoken modality different than the original request without requiring the user to
> request said non-spoken modality;
>
> (e) refining the navigation query, based upon the additional input;
>
> (f) using the refined navigation query to select a portion of the electronic data
> source; and
>
> (g) transmitting the selected portion of the electronic data source from the
> network server to a client device of the user.

260.   Defendant's acts of making, using, offering for sale, selling, and/or

importing infringing products, including but not limited to Google Assistant, which

incorporates Search, and related products and/or processes satisfy, literally or under the
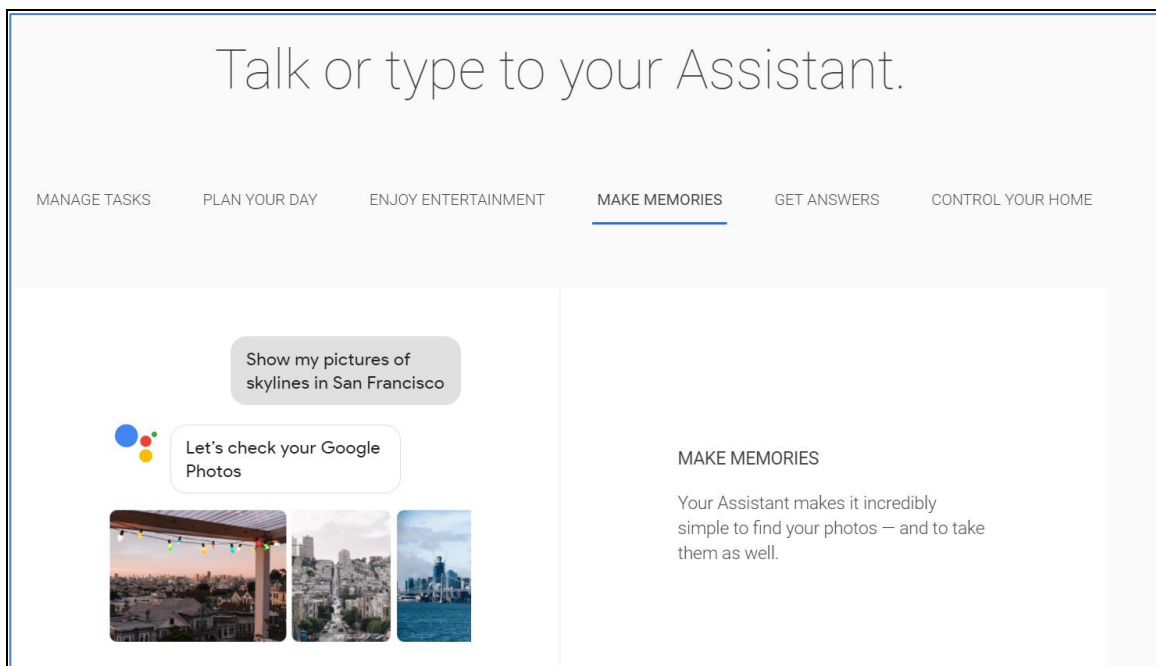
doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1.[37]

261.   Defendant directly infringes claim 1 by performing each step of the method itself, and for any step it does not itself perform by directing or controlling the performance of such steps by third-parties including app developers and Android device manufacturers when those third-parties develop services for integration into Google Assistant, which also incorporates Search, such that the performance of such steps is attributable to Defendant, including without limitation based on Defendant's instructions, requirements to use Defendant's development platforms, and various Google Cloud Platform Terms and Mobile Application Distribution Agreements. Defendant further directly infringes claim 1 when it tests Google Assistant.

262.   For example, Defendant's Google Assistant uses speech-based navigation of an electronic data source. Google Assistant receives a spoken request for desired information from a user (such as a spoken request for sports scores, weather, music, or a particular television show or movie), renders an interpretation of the spoken request, constructs at least part of a navigation query based on the spoken request, solicits additional input from the user, including user interaction in a non-spoken modality different than the original request without requiring the user to request the non-spoken

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[37] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '021 Patent.

modality, refines the query and selects a portion of the electronic data source, and

transmits the selected portion from a network server to Google Assistant, as described

more fully on the Google Assistant page:[38]

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[38] https://assistant.google.com/platforms/phones/.

> **How it works**
>
> The device has the Google Assistant SDK installed on it along with credentials for accessing the Google Assistant Service. The device sends out the spoken request (*Turn on.*) and asks the service to turn on the device's onboard LED. The device also sends its model and device instance identifiers so the service can determine how to best respond in context to the request.
>
> The service uses Automatic Speech Recognition (ASR) to determine what words were spoken by the user, Natural Language Processing (NLP) to analyze and understand the meaning of the request from these words, and device matching to provide context for the request. This context is important because it defines the actions the device supports and how these actions should be fulfilled.

263.   For example, on a mobile phone, a user can activate Google Assistant and say, "what are some restaurants nearby." Google Assistant will analyze the voice command to determine what words were spoken by the user and will render an interpretation of the meaning of the spoken request. Once the request has been interpreted, Google Assistant will construct at least part of a navigation query based on the interpretation.[39]

Defendant has further explained rendering an interpretation of the request as follows:

> "Natural Language Processing (NLP) research at Google focuses on algorithms that apply at scale, across languages, and across domains. Our systems are used in numerous ways across Google, impacting user experience in search, mobile, apps, ads, translate and more.
>
> Our work spans the range of traditional NLP tasks, with general-purpose syntax and semantic algorithms underpinning more specialized systems. We are particularly interested in algorithms that scale well and can be run efficiently in a highly distributed environment.
>
> Our syntactic systems predict part-of-speech tags for each word in a given sentence, as well as morphological features such as gender and number. They

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[39] https://developers.google.com/assistant/sdk/device-actions-overview.

also label relationships between words, such as subject, object, modification, and others. We focus on efficient algorithms that leverage large amounts of unlabeled data, and recently have incorporated neural net technology.

On the semantic side, we identify entities in free text, label them with types (such as person, location, or organization), cluster mentions of those entities within and across documents (coreference resolution), and resolve the entities to the Knowledge Graph.
Recent work has focused on incorporating multiple sources of knowledge and information to aid with analysis of text, as well as applying frame semantics at the noun phrase, sentence, and document level."[40]

264.   Google Assistant responds to the nearby restaurants request with a display

of options.

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[40] https://research.google.com/pubs/NaturalLanguageProcessing.html.
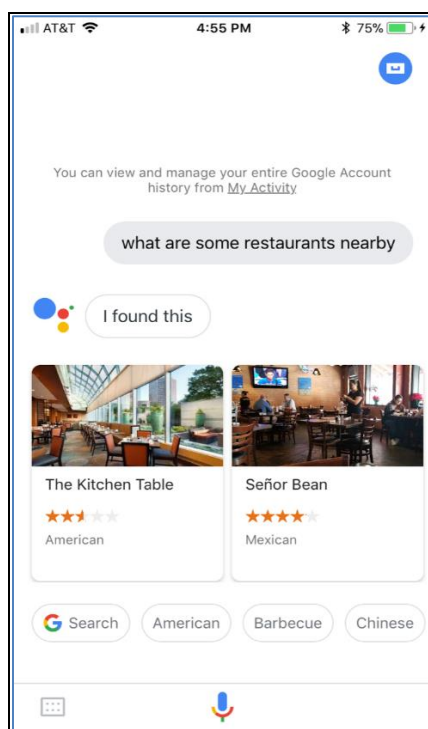
265.   The user can then tap the touch screen to select one of the options. Google

Assistant then displays additional information about the selected option.
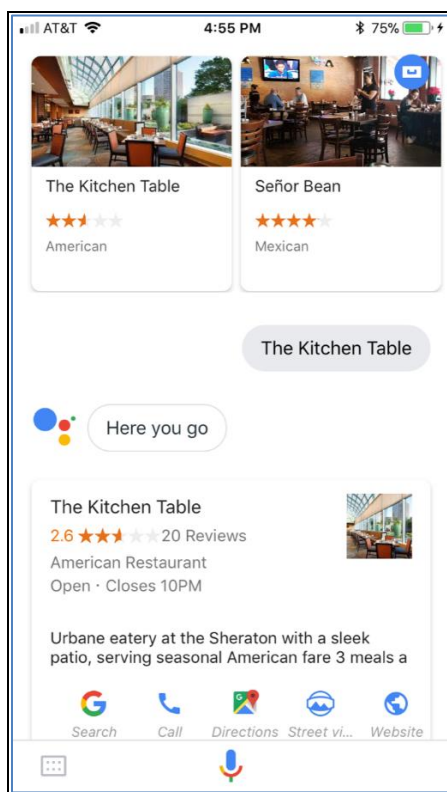
266.   Google Assistant's use of Search is indicated by the Search icon that

appears with the results of a user query from Google Assistant:
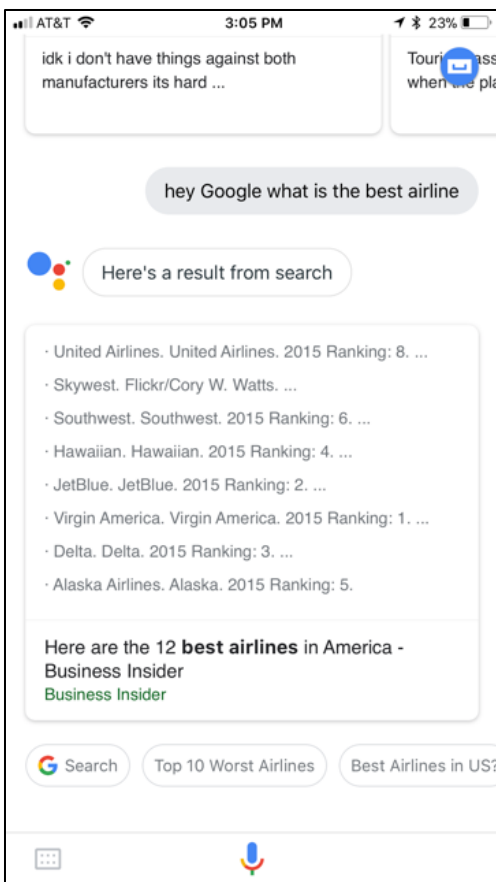
267.   Google Assistant integrates Search to respond to spoken user queries[41]:

Google Everywhere

At its heart, Assistant is an impressive artificial intelligence engine. It's like Google search, but more powerful and aware of context. Google's voice and text search features in the past have always been built into the Google Search app on Android. However, Assistant is designed to be integrated into more places, and it will be explicitly labeled as Assistant instead of just being some amorphous "Google" thing that can go by any number of names depending on the context (eg, Google Now, voice actions, and so on).

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[41] http://www.tested.com/tech/android/585645-how-google-assistant-different-ok-google/.

268.   Defendant has also infringed indirectly and continues to infringe indirectly the '021 Patent by active inducement under 35 U.S.C. § 271(b).

269.   Defendant gained knowledge of the '021 Patent no later than December 7, 2012, the date on which the Examiner of Google's U.S. Patent App. No. 12/795,257 (issued as U.S. Patent No. 8,738,377) disclosed it to Defendant in a Notice of References Cited. Defendant also gained knowledge of the '021 Patent through the prosecution of its own patents and patent applications where the '021 Patent was cited either by Defendant or the Examiner during prosecution, including:

Patent or Application No.	File Date	'021 Patent Citation Date	Issue Date	Title
U.S. 8,738,377*	Jun. 7, 2010	Dec. 7, 2012	May 27, 2014	Predicting and learning carrier phrases for speech input
U.S. 8,856,007*	Oct. 15, 2012	Jan. 24, 2013	Oct. 7, 2014	Use text to speech techniques to improve understanding when announcing search results
U.S. 9,412,360	Apr 15, 2014	Apr. 15, 2014	Aug. 9, 2016	Predicting and learning carrier phrases for speech input
U.S. 9,600,229	Sept. 5, 2014	May 28, 2015	Mar. 21, 2017	Location based responses to telephone requests
* Cited by Examiner				

270.   On information and belief, Defendant further confirmed its knowledge of the '021 Patent and Defendant's infringement thereof at a date before the January 12, 2018 filing date of Defendant's *Inter Partes* Review Petitions related to the '021 Patent (IPR2018-00474 and IPR2018-00475). For example, Defendant knew of the '021 Patent and its infringement prior to the filing of its IPR as a result of litigations previously filed against other parties in the District of Delaware and the Southern District of California involving the '021 Patent and Defendant's use of one or more inventions claimed therein.

271.   On information and belief, Defendant has intended, and continues to intend, to induce patent infringement by its users and has had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

272.   For example, Defendant encourages end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '021 Patent through the very nature of the products. When the Google Assistant is initiated, it provides users with instructions (both audio and text) and examples of how to engage and operate Google Assistant in an infringing manner:
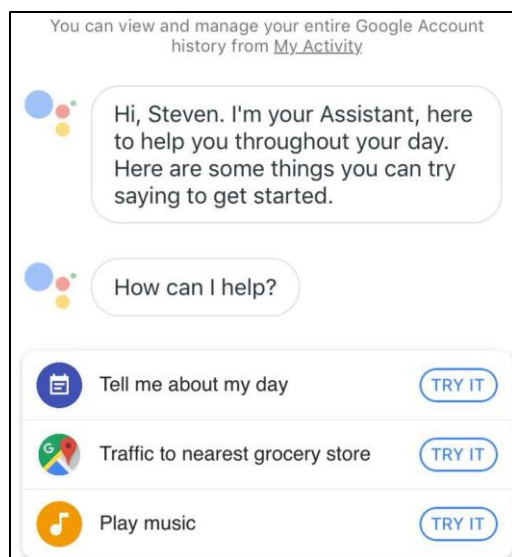
273.   As a further example, Defendant instructs users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '021 Patent (*e.g.*, "[t]alk or type to your Assistant"). By using the infringing products to perform speech-based navigation of an electronic data source, users directly infringe at least claim 1 of the '021 Patent. By providing instructions to users on how to use the infringing products to perform speech-based navigation of an electronic data source using a system as claimed in claim 1 of the '021 Patent, and by continuing to encourage such use, Defendant has and continues to specifically intend to induce infringement of the '021 Patent.

274.   Defendant has also infringed indirectly and continues to infringe indirectly the '021 Patent by contributory infringement under 35 U.S.C. § 271(c).

275.   Defendant has and continues to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but not limited to products marketed with the Google Assistant, with the knowledge that

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Google Assistant will be used by users with, for example, the Google Assistant app on users' smartphones to directly infringe at least claim 1 of the '021 Patent.

276.   Since a date before the January 12, 2018 filing date of Defendant's *Inter Partes* Review Petitions, Defendant has been and still is willfully infringing the '021 Patent. On information and belief, at least as early as December 7, 2012, Defendant had actual knowledge of the '021 Patent. Despite having actual knowledge of the '021 Patent, Defendant has continued to willfully, wantonly, and deliberately infringe the '021 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

277.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '021 Patent.

278.   As a result of Defendant's infringement of the '021 Patent, Plaintiff has been injured by Defendant's unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

279.   Unless a permanent injunction is issued enjoining Defendant and their agents, servants, employees, representatives, affiliates, and all others acting or in active concert therewith from infringing the '021 Patent, Plaintiff will be greatly and irreparably harmed.

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COUNT V
(Infringement of U.S. Patent No. 6,523,061)

280.   Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

281.   Plaintiff is informed and believes, and on that basis alleges, that Defendant has infringed and is currently infringing one or more claims (*e.g.*, claim 1) of the '061 Patent, in violation of 35 U.S.C. § 271.

282.   Defendant has infringed and is currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Google Assistant, which also incorporates Search, and related products and/or processes falling within the scope of one or more claims of the '061 Patent, including claim 1:

> A method for utilizing agents for speech-based navigation of an electronic data source, comprising the steps of:
>
> (a) receiving a spoken request for desired information from a user;
>
> (b) rendering an interpretation of the spoken request;
>
> (c) constructing a navigation query based upon the interpretation;
>
> (d) routing the navigation query to at least one agent, wherein the at least one agent utilizes the navigation query to select a portion of the electronic data source; and
>
> (e) invoking a user interface agent for outputting the selected portion of the electronic data source to the user, wherein a facilitator manages data flow among multiple agents and maintains a registration of each of said agents' capabilities.

283.   Defendant's acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Google Assistant, which

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incorporates Search, and related products and/or processes satisfy, literally or under the

doctrine of equivalents, each and every claim limitation, including but not limited to

limitations of claim 1.[42]

284.   Defendant directly infringes claim 1 by performing each step of the

method itself, and for any step it does not itself perform by directing or controlling the

performance of such steps by third-parties including app developers and Android device

manufacturers when those third-parties develop services for integration into Google

Assistant, such that the performance of such steps is attributable to Defendant, including

without limitation based on Defendant's instructions, requirements to use Defendant's

development platforms, and various Google Cloud Platform Terms and Mobile

Application Distribution Agreements. Defendant further directly infringes claim 1 when

it tests Google Assistant.

285.   For example, Defendant's Google Assistant uses speech-based navigation

of an electronic data source. The Google Assistant receives a spoken request for desired

information from the user (such as a spoken request for sports scores, weather, music, or

a particular television show or movie), renders an interpretation of the spoken request,

constructs a navigation query based on the interpretation, routes the navigation query to

at least one agent that utilizes the navigation query to select a portion of the electronic

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[42] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '061 Patent.

data source, and invokes a user interface agent for outputting the selected portion of the electronic data source wherein a facilitator manages data flow among multiple agents and maintains a registration of each of the agents' capabilities, as described on the Google Assistant page: [43]
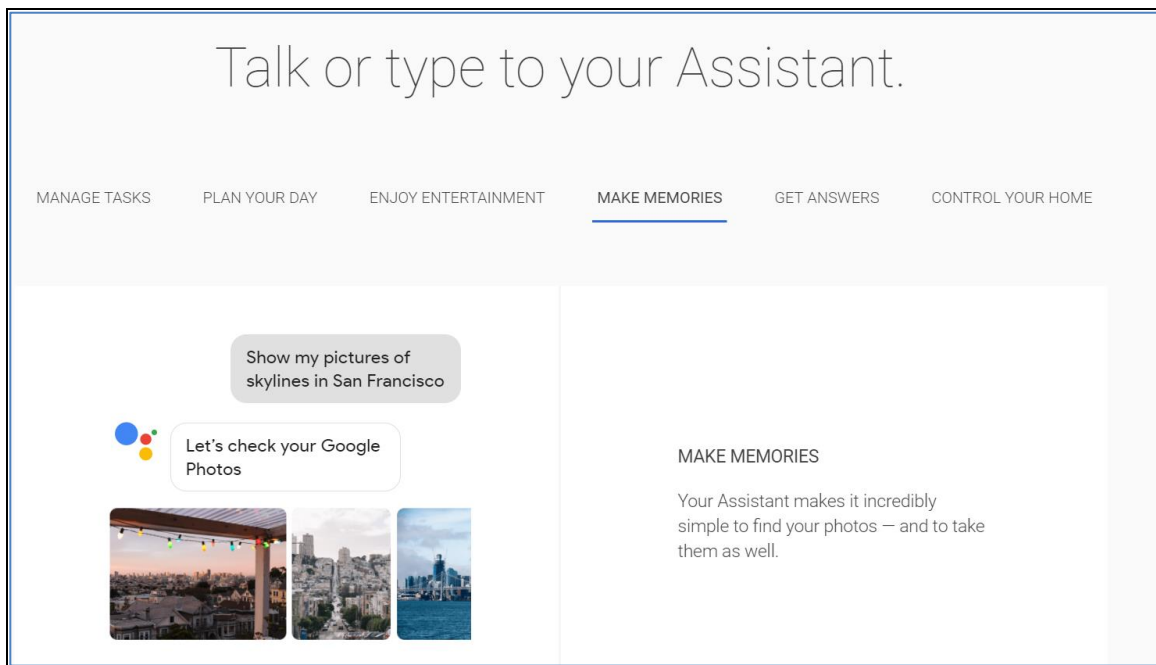
286.   For example, on a mobile phone, a user can open up the Google Assistant app and say "where is Renaissance Tower."

287.   Google Assistant will analyze the voice command to determine what words were spoken by the user and will render an interpretation of the meaning of the spoken request. Once the request has been interpreted, Google Assistant will construct at least part of a navigation query based on the interpretation.

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[43] https://assistant.google.com/platforms/phones/

How it works

The device has the Google Assistant SDK installed on it along with credentials for accessing the Google Assistant Service. The device sends out the spoken request (*Turn on.*) and asks the service to turn on the device's onboard LED. The device also sends its model and device instance identifiers so the service can determine how to best respond in context to the request.

The service uses Automatic Speech Recognition (ASR) to determine what words were spoken by the user, Natural Language Processing (NLP) to analyze and understand the meaning of the request from these words, and device matching to provide context for the request. This context is important because it defines the actions the device supports and how these actions should be fulfilled.

288.   Google Assistant responds as follows, including using Search:
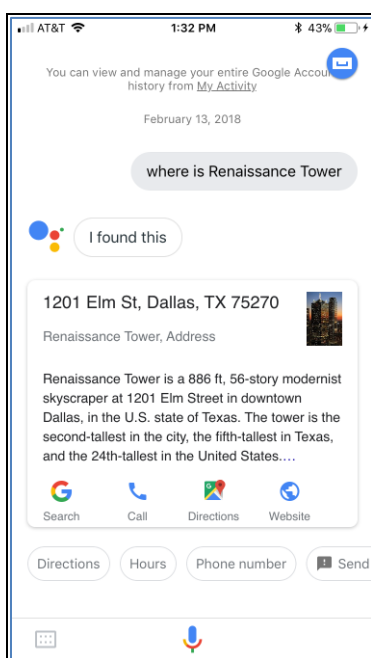
289.   In its response, it displays multiple agents with different capabilities. For example, one agent allows the user to make a phone call to Renaissance Tower:

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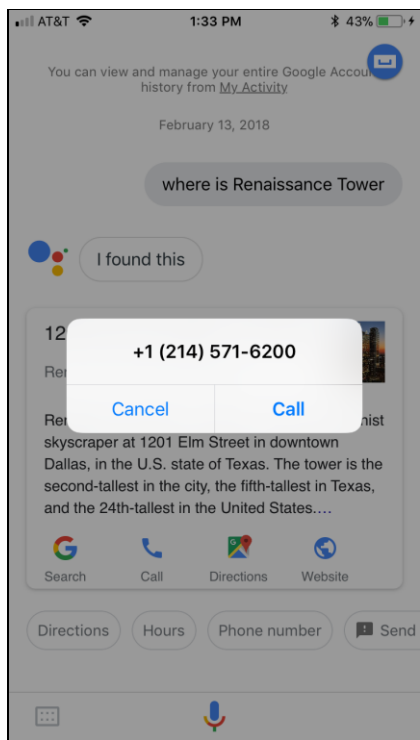
290.   Google Assistant invokes a user interface agent for outputting selected

portions of responsive electronic data to the user:

291.   Google Assistant also utilizes a facilitator that manages dataflow among
multiple agents and maintains a registration of the capabilities of the various agents[44,45]:

> ## Assistant app directory
> ☆ ☆ ☆ ☆ ☆
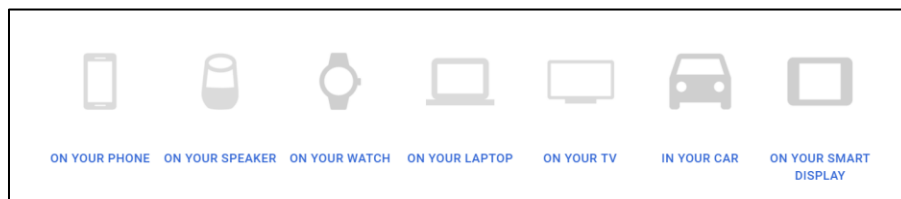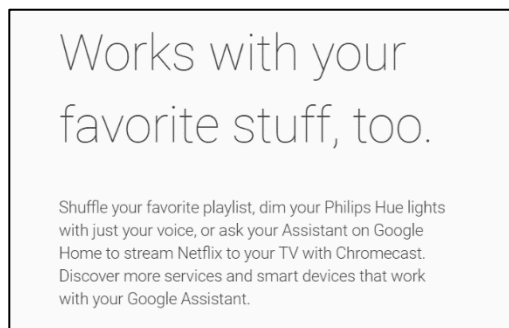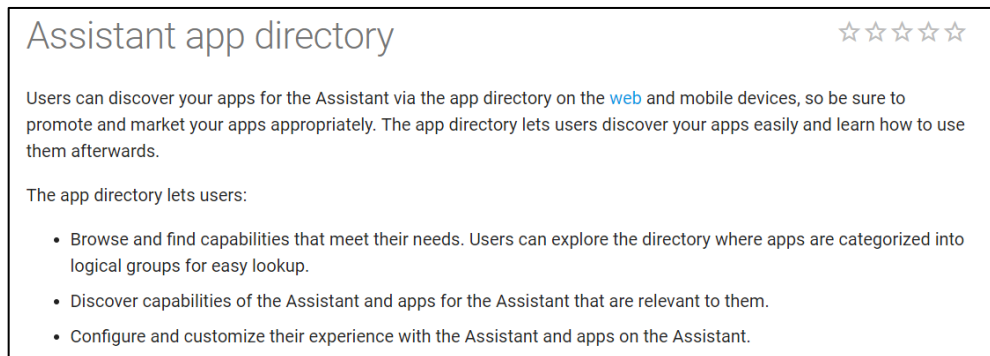>
> Users can discover your apps for the Assistant via the app directory on the web and mobile devices, so be sure to promote and market your apps appropriately. The app directory lets users discover your apps easily and learn how to use them afterwards.
>
> The app directory lets users:
>
> - Browse and find capabilities that meet their needs. Users can explore the directory where apps are categorized into logical groups for easy lookup.
> - Discover capabilities of the Assistant and apps for the Assistant that are relevant to them.
> - Configure and customize their experience with the Assistant and apps on the Assistant.

> # Works with your favorite stuff, too.
>
> Shuffle your favorite playlist, dim your Philips Hue lights with just your voice, or ask your Assistant on Google Home to stream Netflix to your TV with Chromecast. Discover more services and smart devices that work with your Google Assistant.

292.   Defendant has also infringed indirectly and continues to infringe indirectly
the '061 Patent by active inducement under 35 U.S.C. § 271(b).

293.   On information and belief, Defendant gained knowledge of the '061
Patent no later than October 27, 2009, the date on which the Examiner of Google's U.S.

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[44] https://developers.google.com/actions/distribute/directory.

[45] https://assistant.google.com/intl/en_us/#?modal_active=none.

Patent App. No. 11/752,896 (issued as U.S. Patent No. 8,478,515) disclosed it to

Defendant in a Notice of References Cited. Defendant was further aware of the '061

Patent through the prosecution of its own additional patents and patent applications where

the '061 Patent was cited either by Defendant or the Examiner during prosecution,

including:

Patent or Application No.	File Date	'061 Patent Citation Date	Issue Date	Title
U.S. 7,920,968	Aug. 22, 2006	Nov. 9, 2010	Apr. 5, 2011	Generating human-centric directions in mapping systems
U.S. 8,473,293*	Oct. 23, 2012	Mar. 13, 2013	Jun. 25, 2013	Dictionary filtering using market data
U.S. 8,478,515*	May 23, 2007	Oct. 27, 2009	Jul. 2, 2013	Collaborative driving directions
U.S. 8,626,511*	Jan. 22, 2010	July 20, 2012	Jan. 7, 2014	Multi-dimensional disambiguation of voice commands
* Cited by Examiner				

294.   On information and belief, Defendant further confirmed its knowledge of

the '061 Patent and Defendant's infringement thereof on a date before the December 22,

2017 filing date of their *Inter Partes* Review Petition relating to the '061 Patent

(IPR2018-00384). For example, Defendant knew of the '061 Patent and its infringement

prior to the filing of its IPR as a result of litigations previously filed against other parties

in the District of Delaware and the Southern District of California involving the '061

Patent and Defendant's use of one or more inventions claimed therein.

295.   On information and belief, Defendant has intended, and continues to intend, to induce patent infringement by its users and has had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

296.   For example, Defendant encourages end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '061 Patent through the very nature of the products. When the Google Assistant is initiated, it provides users with instructions (both audio and text) and examples of how to engage and operate Google Assistant in an infringing manner. As a further example, Defendant instructs users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '061 Patent (e.g., "[t]alk or type to your Assistant). By using the infringing products to perform speech-based navigation of an electronic data source, users directly infringe at least claim 1 of the '061 Patent. By continuing to provide instructions to users on how to use the infringing products to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '061 Patent, and by continuing to encourage such use, Defendant has and continues to specifically intend to induce infringement of the '061 Patent.

297.   Defendant has also infringed indirectly and continues to infringe indirectly the '061 Patent by contributory infringement under 35 U.S.C. § 271(c).

298.   Defendant has and continues to intentionally commit contributory infringement by selling, offering to sell, or importing the infringing products, which include non-standard software that has no substantial non-infringing use, including but

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not limited to Google Assistant, with the knowledge that the Google Assistant will be used by users with, for example, the Google Assistant app on users' smartphones to directly infringe at least claim 1 of the '061 Patent.

299.   Since at least a date before the December 22, 2017 filing date of their *Inter Partes* Review Petition, Defendant has been and still is willfully infringing the '061 Patent. On information and belief, at least as early as October 27, 2009, Defendant had actual knowledge of the '061 Patent. Despite having actual knowledge of the '061 Patent, Defendant has continued to willfully, wantonly, and deliberately infringe the '061 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

300.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '061 Patent.

301.   As a result of Defendant's infringement of the '061 Patent, Plaintiff has been injured by Defendant's unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

302.   Unless a permanent injunction is issued enjoining Defendant and its agents, servants, employees, representatives, affiliates, and all others acting or in active

concert therewith from infringing the '061 Patent, Plaintiff will be greatly and irreparably harmed.

COUNT VI
(Infringement of U.S. Patent No. 6,757,718)

303.   Plaintiff re-alleges and incorporates by reference the allegations in the foregoing paragraphs as if fully set forth herein.

304.   Plaintiff is informed and believes, and on that basis alleges, that Defendant has infringed and is currently infringing one or more claims (*e.g.*, claim 1) of the '718 Patent, in violation of 35 U.S.C. § 271.

305.   Defendant has infringed and is currently infringing literally and/or under the doctrine of equivalents, by, among other things, making, using, offering for sale, selling, and/or importing within this judicial district and elsewhere in the United States, without license or authority, infringing products, including but not limited to Google Assistant, which incorporates Search, and related products and/or processes falling within the scope of one or more claims of the '718 Patent, including claim 1:

> A method for speech-based navigation of an electronic data source located at one or more network servers located remotely from a user, wherein a data link is established between a mobile information appliance of the user and the one or more network servers, comprising the steps of:
>
> (a) receiving a spoken request for desired information from the user utilizing the mobile information appliance of the user, wherein said mobile information appliance comprises a portable remote control device or a set-top box for a television;
>
> (b) rendering an interpretation of the spoken request;
>
> (c) constructing a navigation query based upon the interpretation;
>
> (d) utilizing the navigation query to select a portion of the electronic data source; and

(e) transmitting the selected portion of the electronic data source from the network server to the mobile information appliance of the user.

306.   Defendant's acts of making, using, offering for sale, selling, and/or importing infringing products, including but not limited to Google Assistant, which incorporates Search, and related products and/or processes satisfy, literally or under the doctrine of equivalents, each and every claim limitation, including but not limited to limitations of claim 1.[46]

307.   Defendant directly infringes claim 1 by performing each step of the method itself, and for any step it does not itself perform by directing or controlling the performance of such steps by third-parties including app developers and Android device manufacturers when those third-parties develop services for integration into Google Assistant, such that the performance of such steps is attributable to Defendant, including without limitation based on Defendant's instructions, requirements to use Defendant's development platforms, and various Google Cloud Platform Terms and Mobile Application Distribution Agreements. Defendant further directly infringes claim 1 when it tests Google Assistant.

308.   For example, Defendant's Google Assistant product uses speech-based navigation of an electronic data source at a network server located remotely from a user

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[46] Plaintiff expressly reserves the right to identify additional asserted claims in its infringement contentions in accordance with the local patent rules. Claim 1 is provided for notice pleading only and is not presented as an "exemplary" claim of all other claims in the '718 Patent.

where a data link is established between the user's mobile device and the network server. The Google Assistant product receives a spoken request for desired information from the user (such as a spoken request for sports scores, weather, music, or a particular television show or movie) utilizing a mobile device that is either a portable remote control device or a set-top box, renders an interpretation of the spoken request, constructs a navigation query, utilizes the navigation query to select a portion of an electronic data source, and transmits the selected portion from a network server to the mobile device, as described on the Google Assistant product page: [47]

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[47] https://assistant.google.com/platforms/speakers/.
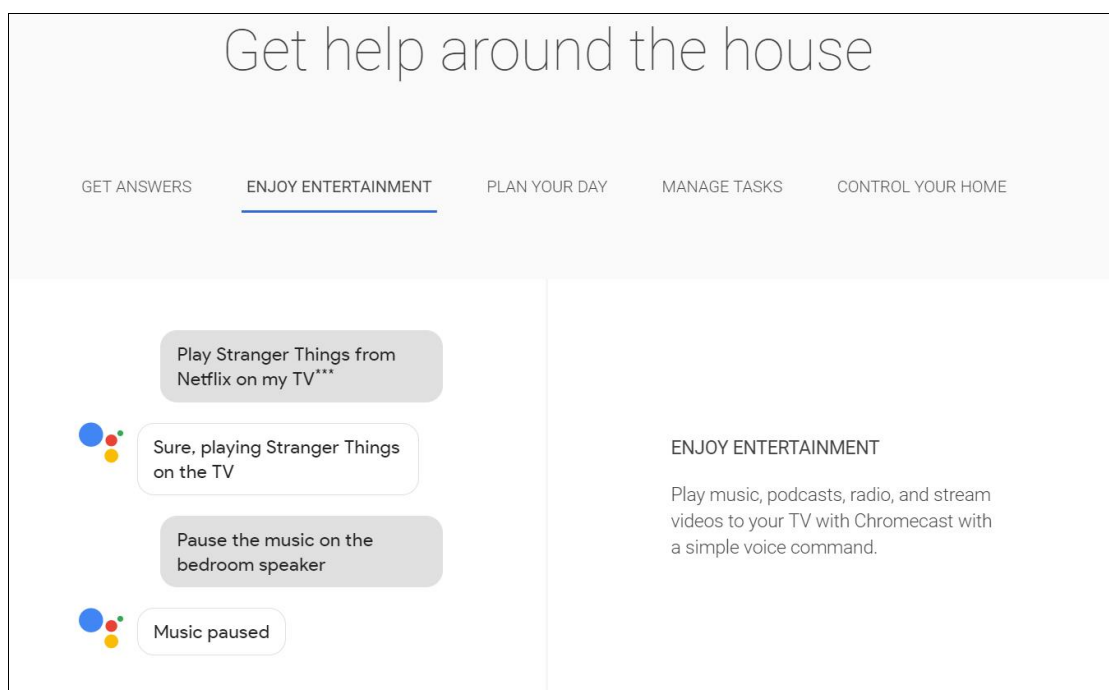
309.   For example, on a mobile phone, a user can activate Google Assistant and say, "Play Stranger Things from Netflix on my TV." Google Assistant will analyze the voice command to determine what words were spoken by the user and render an interpretation of the meaning of those words (the user's intent). Once meaning of the request is determined, Google Assistant will construct a navigation query and use it to select and transmit a portion of an electronic data source from a network server.[48]

310.   Google Home, through the use of Google Assistant, allows control of a TV in manner that infringes, as described on Google's website:[49]

Turn your TV on and off using Google Home

You can turn your TV on and off using your voice and Google Home.

What you need

- Chromecast connected to Google Home. Here's how to link TVs to Google Home ⧉ .
    - **Note:** Android TV and TVs with Chromecast built-in don't support the TV on/off feature.
- TV that supports HDMI-CEC with CEC (Consumer Electronics Control) ⧉ turned on.
    - Common TVs that support CEC include: AOC, Hitachi, Insignia, ITT, LG, Magnavox, Mitsubishi, Onkyo, Panasonic, Pioneer, Philips, Samsung, Sharp, Sony, Sylvania, Toshiba, and Vizio.
    - CEC is often turned off by default. Typically you can turn on CEC in the TVs settings. The location of CEC settings varies depending on the TV.
    - If you're not sure whether your TV supports CEC, or how to turn on CEC, consult the TV manufacturer.
- Plug Chromecast into a wall outlet or other power source so your Chromecast remains on when you turn off the TV off. If you plug Chromecast into the USB port on your TV, it will turn off along with your TV and won't respond to your voice commands.
- If Chromecast is connected to a soundbar or AVR, turn on CEC on that device.

Turn TV on and off using voice commands

To do this...	Say this: "Ok Google" or "Hey Google," then...
Turn on TV	"Turn on/the/my TV," "Turn on/the/my <device name>" "Power on/the/my TV," "Power on/the/my <device name>"
Turn off TV	"Turn off/the/my TV," "Turn off/the/my <device name>"

[48] https://research.google.com/pubs/NaturalLanguageProcessing.html.

[49] https://support.google.com/googlehome/answer/7498991?hl=en.

311.   Defendant has also infringed indirectly and continues to infringe indirectly the '718 Patent by active inducement under 35 U.S.C. § 271(b).

312.   On information and belief, Defendant confirmed its knowledge of the '718 Patent and Defendant's infringement thereof no later than the filing date of their *Inter Partes* Review Petition related to the '718 Patent (IPR2018-00476), January 12, 2018. For example, Defendant knew of the '718 Patent and its infringement prior to the filing of its IPR as a result of litigations previously filed against other parties in the District of Delaware and the Southern District of California involving the '718 Patent and Defendant's use of one or more inventions claimed therein.

313.   On information and belief, Defendant has intended, and continues to intend, to induce patent infringement by its users and has had knowledge that the inducing acts would cause infringement or has been willfully blind to the possibility that the inducing acts would cause infringement.

314.   For example, Defendant encourages end users to perform speech-based navigation of an electronic data source using a method as claimed in claim 1 of the '718 Patent through the very nature of the products. When the Google Assistant is initiated, it provides users with instructions (both audio and text) and examples of how to engage and operate Google Assistant in an infringing manner:
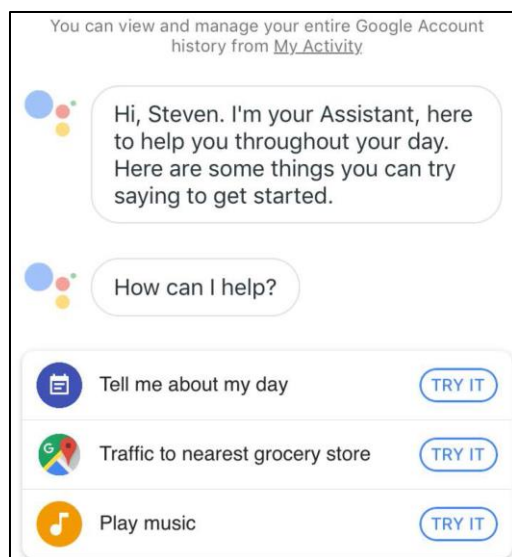
315.   As a further example, Defendant instructs users on how to use the

infringing products to perform speech-based navigation of an electronic data source using

a method as claimed in claim 1 of the '718 Patent (*e.g.*, "…stream videos to your TV

with Chromecast with a simple voice command"). By using the infringing products to

perform speech-based navigation of an electronic data source, users directly infringe at

least claim 1 of the '718 Patent. By continuing to provide instructions to users on how to

use the infringing products to perform speech-based navigation of an electronic data

source using a method as claimed in claim 1 of the '718 Patent, and by continuing to

encourage such use, Defendant has and continues to specifically intend to induce

infringement of the '718 Patent.

316.   Defendant has also infringed indirectly and continues to infringe indirectly

the '718 Patent by contributory infringement under 35 U.S.C. § 271(c).

317.   Defendant has and continues to intentionally commit contributory

infringement by selling, offering to sell, or importing the infringing products, which

include non-standard software that has no substantial non-infringing use, including but

not limited to Google Assistant, with the knowledge that Google Assistant will be used by users with, for example, the Google Chromecast Google Home Products to directly infringe at least claim 1 of the '718 Patent.

318.   On information and belief, since at least a date before the January 12, 2018 filing date for its Petition for *Inter Partes* Review (IPR2018-00476) against the '718 Patent, Defendant had actual knowledge of the '718 Patent and its infringement. Despite having actual knowledge of the '718 Patent, Defendant has continued to willfully, wantonly, and deliberately infringe the '718 Patent. Accordingly, Plaintiff seeks enhanced damages pursuant to 35 U.S.C. § 284 and a finding that this is an exceptional case within the meaning of 35 U.S.C. § 285, entitling Plaintiff to its attorneys' fees and expenses.

319.   To the extent applicable, the requirements of 35 U.S.C. § 287(a) have been met with respect to the '718 Patent.

320.   As a result of Defendant's infringement of the '718 Patent, Plaintiff has been injured by Defendant's unauthorized use of Plaintiff's intellectual property. Plaintiff seeks monetary damages in an amount adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty for the use made of the invention by Defendant, together with interest and costs as fixed by the Court, and Plaintiff will continue to suffer damages in the future unless Defendant's infringing activities are enjoined by this Court.

321.   Unless a permanent injunction is issued enjoining Defendant and its agents, servants, employees, representatives, affiliates, and all others acting or in active

concert therewith from infringing the '718 Patent, Plaintiff will be greatly and irreparably harmed.

PRAYER FOR RELIEF

Plaintiff prays for the following relief:

A.   A judgment that Defendant has infringed one or more claims of the '021, '061, '718, '115, '128, and/or '560 Patents (collectively, "Asserted Patents");

B.   A permanent injunction enjoining Defendant and its officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all others acting in active concert or participation with Defendant, from infringing the Asserted Patents;

C.   An award of damages resulting from Defendant's acts of infringement in accordance with 35 U.S.C. § 284;

D.   A judgment and order finding that this is an exceptional case within the meaning of 35 U.S.C. § 285 and awarding to Plaintiff its reasonable attorneys' fees against Defendant.

E.   A judgment and order requiring Defendant to provide accountings and to pay supplemental damages to Plaintiff, including, without limitation, prejudgment and post-judgment interest; and

F.   Any and all other relief to which Plaintiff may show itself to be entitled.

JURY TRIAL DEMANDED

Plaintiff hereby demands a trial by jury of all issues so triable.

Dated: February 26, 2018

BAYARD, P.A.

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