UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

DIALECT, LLC,

　　　　Plaintiff,

　　v.

BANK OF AMERICA, N.A.,

　　　　Defendant.

Civil Action No. <u>2:24cv207</u>

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT AND DAMAGES
AND DEMAND FOR JURY TRIAL

Plaintiff Dialect, LLC ("Dialect" or "Plaintiff") files this Complaint for Patent Infringement and Damages against Bank of American, N.A. ("Bank of America" or "Defendant") and alleges as follows:

INTRODUCTION

1.　　The novel inventions disclosed in U.S. Patent Nos. 7,640,160 (the "'160 Patent"); 8,195,468 (the "'468 Patent"); 8,447,607 (the "'607 Patent"); 9,263,039 (the "'039 Patent"); and 9,495,957 (the "'957 Patent") (collectively, the "Asserted Patents") in this case were invented by VoiceBox Technologies ("VoiceBox"). VoiceBox was a key pioneer in the fields of voice recognition technology and natural language understanding ("NLU") technology. These technologies power a wide variety of applications and platforms used in smart phones, tablets, TVs, Internet of Things ("IoT") devices, and vehicle multimedia and navigation systems. VoiceBox spent more than a decade developing and building key early NLU inventions, producing

1

one of the most valuable patent portfolios in the industry, according to the Institute of Electrical and Electronics Engineers ("IEEE") in 2013. The Asserted Patents in this case are the result of this substantial investment and research.

2.   Over the years, the inventions claimed in the Asserted Patents have been licensed to key companies in the industry.

3.   The Asserted Patents, along with other former VoiceBox patents now owned by Dialect, are presently the subject of infringement lawsuits filed by Dialect against Amazon (pending in the Eastern District of Virginia, asserting the '468, '957 and '039 patents, among others) and Google (pending in the Eastern District of Delaware, asserting the '160 and '607 patents, among others). Dialect also previously asserted the '468, '957 and '607 patents in this District against Samsung; the lawsuit dismissed before Samsung filed a responsive pleading.[1]

4.   Other VoiceBox patents sharing common inventors and subject matter with the Asserted Patents were previously asserted against Amazon in the District of Delaware, resulting in a jury verdict upholding patent validity, finding willful infringement, and awarding pre-enhancement damages of $46.7 million for past infringement plus a running royalty for continuing infringement.

THE PARTIES

5.   Plaintiff is the current owner and assignee of the Asserted Patents.

6.   Plaintiff is a Texas limited liability company with its principal place of business located at 133 E. Tyler St., Longview, Texas 75601-7216.

---

[1] *See* Redacted Public Order Dismissing All Claims, ECF No. 18-1, *Dialect, LLC v. Samsung Elec. Co., Ltd., et al.*, Case No. 2:23-cv-00061-JRG (E.D. Tex. Aug. 30, 2023), attached hereto as Exhibit A.

7.   Defendant is a federally chartered national banking association with its principal place of business at Bank of America Corporate Center, 100 N. Tryon Street, Charlotte, North Carolina 28255. Defendant may be served through its registered agent at CT Corporation System, 1999 Bryan Street, Suite 900, Dallas, Texas 75201.

8.   On information and belief, Defendant directly and/or indirectly develops, designs, manufactures, uses, distributes, markets, and offers infringing products and/or services, including Defendant's "*Erica*" virtual financial assistant feature of Defendant's Mobile App available on "select iOS and Android devices"[2] (the "Accused Products") in the United States and within the Eastern District of Texas, and otherwise directs infringing activities to this District in connection with its products and/or services as set forth in this Complaint.

JURISDICTION AND VENUE

9.   This civil action arises under the patent laws of the United States, 35 U.S.C. § 1 *et seq.*, including without limitation 35 U.S.C. §§ 271, 281, 283, 284, and 285. Accordingly, this Court has subject matter jurisdiction under, *inter alia*, 28 U.S.C. §§ 1331 and 1338(a).

10.   This District has general and specific personal jurisdiction over Defendant because Defendant has committed acts, directly or through intermediaries, in this District, giving rise to this action; is present in and transacts and conducts business in this District and the State of Texas; and transacts and conducts business with residents of this District and the State of Texas.

11.   Plaintiff's causes of action arise, at least in part, from Defendant's contacts with and activities in this District and the State of Texas.

---

[2] "The mobile feature, *Erica*, […] requires that you download the latest version of the Mobile Banking app and is only available in the Mobile Banking app for select iOS and Android devices." https://promotions.bankofamerica.com/consumer/ericabyyourside, at fn. 1.

12.   Defendant has infringed the Asserted Patents within this District and the State of Texas by making, using, distributing, marketing, offering, and/or importing in or into this District and elsewhere in the State of Texas, products and/or services that infringe the Asserted Patents, including the Accused Products. Defendant, directly and through intermediaries, makes, uses, offers, imports, distributes, advertises, promotes, and/or otherwise commercializes such infringing products in or into this District and the State of Texas. Defendant regularly conducts and solicits business in, engages in other persistent courses of conduct in, and/or derives substantial revenue from goods and services provided to residents of this District and the State of Texas.

13.   This Court has personal jurisdiction over Defendants pursuant to TEX. CIV. PRAC. & REM. CODE § 17.041 *et seq*.

14.   Personal jurisdiction exists over Defendant because Defendant has minimum contacts with this forum as a result of business regularly conducted within this District and the State of Texas, and, on information and belief, specifically as a result of, at least, committing the tort of patent infringement within this District and the State of Texas.

15.   This Court also has personal jurisdiction over Defendant, in part, because Defendant does continuous and systematic business in this District, including by providing infringing products and services to the residents of this District that Defendant knew would be used within this District, and by soliciting business from the residents of this District.

16.   Defendant is subject to personal jurisdiction in this Court, and venue is appropriate in this Court because, *inter alia*, Defendant and its authorized agents regularly solicit and transact business in this District and have established places of business in this District. For example, Defendant offers its products and services throughout Texas, including this District, by shipping,

4

distributing, offering for sale, selling, and advertising its products and services through its website, accessible within this District, and through its physical business locations within this District.

17.   On information and belief, Defendant maintains physical places of business in this Judicial District, including but not limited to:

- 7105 Corporate Dr., Plano, Texas 75024

- 113 East FM 544, Murphy, TX 75094

- 3301 Golden Rd, Tyler, TX 75701

- 265 Dowlen Rd, Beaumont, TX 77706

- 6101 S. Broadway Ave, Tyler, TX 75703

18.   In addition, the Bank of America Technology Center is located in 7105 Corporate Dr., Plano, Texas 75024, which Bank of America recently spent $86 million to renovate[3]. Upon information and belief, Bank of America has been actively recruiting research and development personnel for its *Erica* product in this District[4].

19.   Accordingly, this Court's jurisdiction over the Defendant comports with the constitutional standards of fair play and substantial justice and arises directly from Defendant's purposeful minimum contacts with the State of Texas.

20.   This Court also has personal jurisdiction over Defendant because Defendant has made its products and services available for, at least, downloading and use within this District.

21.   Venue is proper in this Judicial District pursuant to 28 U.S.C. §§ 1391(b), 1391(c), and 1400(b) because, among other things, Defendant maintains a regular and established place of

---

[3] https://www.dallasnews.com/business/banking/2021/11/04/bank-of-america-is-pumping-86-million-into-renovating-its-plano-campus/

[4] https://plano-tx.geebo.com/jobs-online/view/id/1136570640-erica-ai-solutions-platform-/

business in his district, Defendant has transacted business in the Eastern District of Texas, and Defendant has committed acts of direct and indirect infringement in this Judicial District.

22.   Defendant has not contested proper venue and exercise of personal jurisdiction in this District for patent infringement in actions in the past. *See, e.g.*, Answer, ¶¶ 4-5 *DynaPass IP Holdings, LLC v. Bank of Am. Corp. and Bank of Am., N.A.*, Civil Action No. 2:22-cv-00210 (E.D. Tex. Aug. 12, 2022); Answer, ¶¶ 4-5, *Wapp Tech Ltd. P'ship, et al. v. Bank of Am., N.A.*, Civil Action No. 4:21-cv-00670 (E.D. Tex. Nov. 4, 2021).

BACKGROUND

23.   In 2001, three brothers, Mike, Rich, and Bob Kennewick, founded VoiceBox to bring NLU to a wide array of computer applications. They recognized that the typical computer speech-recognition systems forced human operators to adhere to a limited number of rigid speech prompts, typically through verbal menus of a so-called "Command and Control" system. These rigid prompts limited how systems were used and inhibited the widespread adoption of speech-recognition systems. The brothers believed that VoiceBox could become the first company to improve voice recognition systems to enable people to interact with computer speech systems naturally and effectively.

24.   From its inception, VoiceBox engaged in intense research efforts to develop its NLU technology. As part of these efforts, VoiceBox Technologies achieved a significant milestone when it developed an early prototype called "Cybermind." As demonstrated on Seattle-area television news,[5] Cybermind was a voice-controlled speaker that could provide weather, recipes, sports scores, calendar updates, or play a song.

---

[5] https://www.youtube.com/watch?v=DDcRyPnvWhw

25.   In addition, Cybermind enabled multi-modal user interactions. For example, Cybermind technology was used in desktop applications that could understand and respond to speech user input as well as non-speech user input.
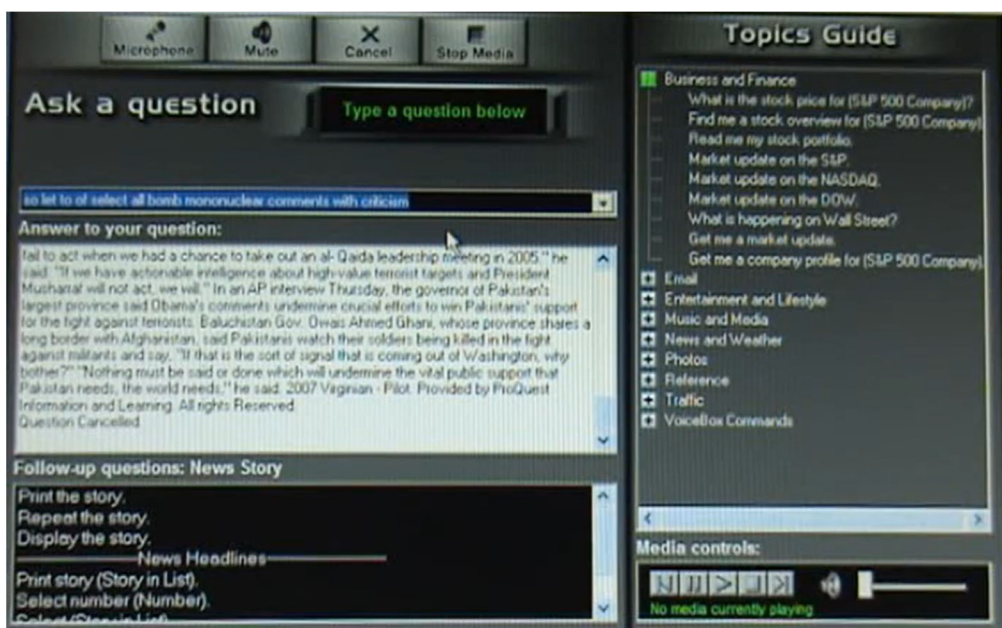
26.   On information and belief, consumer focus groups being introduced to VoiceBox conversational voice technology described it as "cool," "unbelievable," "so fast," "it makes you feel like you're in the future already," and "I feel like I'm in the Jetsons."[6]

---

[6] https://www.youtube.com/watch?v=WCOGNnH-Bws

27.   Throughout its research and development efforts, VoiceBox realized that its technology could be deployed in a wide range of applications from connected home to mobile personal assistants.

28.   VoiceBox's groundbreaking work did not go unrecognized. By January 2012, VoiceBox had become a leader in NLU and conversational voice technology. Leading companies throughout the world, including Samsung, Toyota, Lexus, TomTom, Pioneer, Chrysler, Dodge, and Magellan used VoiceBox's award-winning and patented natural language understanding technology. VoiceBox had software applications that ran on smart speakers, in-car systems, smartphones, smart TVs, computers, tablets, e-readers, and personal navigation devices. As noted above, in November 2023, a Delaware jury determined that Amazon's "*Alexa*" platform, accessible through over 500 million devices throughout the world, including Amazon's *Echo* devices and the *Alexa* application for iOS and Android, also utilized VoiceBox's patented technology.

29.   On information and belief, in 2013 the Institute of Electrical and Electronics Engineers ("IEEE") ranked VoiceBox number 13 in patent power for the computer software industry, ranking between SAP AG and Sony Computer Entertainment Inc.

IEEE Patent Power Rankings

Computer Software

Rank	Company / Organization	Country of Headquarters	2012 U.S. Patents	Pipeline Growth Index	Pipeline Impact	Self-Citations (%)	Adjusted Pipeline Impact	Pipeline Generality	Pipeline Originality	Pipeline Power
1	Microsoft Corp.	United States	2665	1.14	1.07	0.22	1.07	1.19	1.01	3909.67
2	VMware Inc.	United States	106	1.89	3.07	0.16	3.07	3.02	1.06	1966.63
3	Citrix Systems Inc.	United States	112	1.56	2.83	0.27	2.83	2.62	1.12	1441.86
4	Symantec Corp.	United States	379	1.34	1.54	0.16	1.54	1.63	1.01	1297.47
5	Digimarc Corp.	United States	94	0.9	5	0.88	2.08	4.8	1.12	944.96
6	Oracle Corp.	United States	913	0.92	1	0.12	1	1.13	0.98	930.36
7	CommVault Systems Inc.	United States	52	1.3	5	0.88	2.1	5	1.22	866.39
8	Cadence Design Systems Inc.	United States	158	1.15	2.45	0.15	2.45	1.76	0.89	699.87
9	Adobe Systems Inc.	United States	332	1.13	1.14	0.18	1.14	1.24	1	526.88
10	Rovi Corp.	United States	97	1.47	1.85	0.25	1.85	1.91	1.02	514.34
11	TeleCommunication Systems Inc.	United States	57	1.36	2.35	0.42	2.06	2.52	1.12	451.72
12	SAP AG	Germany	601	1.1	0.74	0.23	0.74	0.85	1.02	424.91
13	Voicebox Technologies Inc.	United States	11	1.83	5	0.65	3.26	5	1.29	423.56
14	Sony Computer Entertainment Inc.	Japan	220	1.33	1.1	0.36	1.03	1.26	1.08	409.7
15	Bally Technologies Inc.	United States	98	1.78	1.46	0.38	1.35	1.83	0.9	388.27
16	Smith Micro Software Inc.	United States	18	3	2.8	0.17	2.8	2.41	0.97	353.44
17	McAfee Inc.	United States	84	1.33	2.02	0.39	1.85	1.61	1.04	347.02
18	Nuance Communications Inc.	United States	160	1.15	1.19	0.3	1.19	1.56	1.02	345.99
19	Synopsys Inc.	United States	148	0.95	1.61	0.08	1.61	1.17	1.06	280.46
20	Infosys Ltd.	India	29	1.93	2.52	0.04	2.52	1.75	1.02	253.69

Source: IEEE Spectrum Patent Power 2013

30.   After learning about VoiceBox's technology, Toyota hired VoiceBox to build a sophisticated NLU speech interface for its Lexus automobiles. VoiceBox built the voice and NLU capability for Toyota's award-winning Entune multimedia system[7].

31.   Some of the most well-known technology companies and automotive companies in the world have paid, in the aggregate, hundreds of millions of dollars for access to VoiceBox's patented technology, through licensing of VoiceBox patents, including the Asserted Patents, and through adoption and deployment of VoiceBox's software platform and functionality in their products and services.

---

[7] https://www.prlog.org/11264790-atlantic-toyota-and-huntington-toyota-customers-entune-wins-two-awards-at-ces-in-las-vegas.html;
https://www.businesswire.com/news/home/20120109006490/en/VoiceBox-and-Toyota-Form-Strategic-Relationship-to-Deliver-In-car-Voice-Technology-Innovations#:~:text=LAS%20VEGAS%2D%2D(BUSINESS%20WIRE,car%20voice%20products%20and%20capabilities.

THE ASSERTED PATENTS

32.   The VoiceBox inventions claimed in the Asserted Patents relate to groundbreaking improvements to voice recognition and NLU and have particular application in digital voice assistants such as Bank of America's "*Erica*" virtual financial assistant.

U.S. PATENT NO. 7,640,160

33.   On December 29, 2009, the U.S. Patent Office duly and legally issued the '160 Patent, entitled "Systems And Methods For Responding To Natural Language Speech Utterance". A true and correct copy of the '160 Patent is attached hereto as Exhibit B.

34.   Dialect is the owner and assignee of all right, title, and interest in and to the '160 Patent, including the right to assert all causes of action arising under the '160 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

35.   The '160 Patent describes, among other things, novel and inventive methods for receiving natural language queries and/or commands and executing the queries and/or commands. '160 Patent, Abstract. The methods improve the reliability of determining the context of speech and non-speech communications and presenting the expected results for a particular question or command, for example by obtaining information and presenting results in a natural manner, even in cases where the question asked or the responses received are incomplete, ambiguous, or subjective. *Id.* at Abstract, 1:14-18, 1:51-57.

36.   The novel inventions of the '160 Patent are recited in the claims. For example, claim 12 of the '160 Patent recites:

> 12. A method for interpreting natural language utterances using knowledge-enhanced speech recognition engine, wherein the knowledge-enhanced speech recognition engine is configured to determine an intent and correct false recognitions of the natural language utterances, comprising:
>
> receiving a transcription of a natural language utterance at a computer comprising the knowledge-enhanced speech recognition engine;

10

identifying one or more contexts that completely or partially match one or more text combinations contained in the transcription, wherein identifying the matching contexts includes comparing the text combinations against the grammar expression entries in the context description grammar and against one or more expected contexts stored in a context stack;

scoring each of the identified matching contexts;

selecting the matching context having a highest score to determine a most likely context for the utterance; and

communicating a request to a domain agent configured to process requests in the most likely context for the utterance, the request formulated using at least one grammar expression entry in the context description grammar.

'160 Patent, Cl. 12.

37.   In explaining the reasons for allowability of the claims of the '160 Patent, the United States Patent and Trademark Office described how the closest existing prior art did not disclose or teach the claimed combination of inventive elements, noting that the closest prior art references "do not disclose or suggest comparing text combinations against both grammar expression entries in the context description grammar and against one or more expected contexts stored in a context stack." '160 File History, Notice of Allowability (April 6, 2009) at 2 (attached as Exhibit C).

U.S. PATENT NO. 8,195,468

38.   On June 5, 2012, the U.S. Patent Office duly and legally issued the '468 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions". A true and correct copy of the '468 Patent is attached hereto as Exhibit D.

39.   Dialect is the owner and assignee of all right, title, and interest in and to the '468 Patent, including the right to assert all causes of action arising under the '468 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

40.   As the '468 Patent explains, prior to the inventions disclosed therein, a machine's ability to communicate with humans in a natural manner was a difficult technical problem. The

inventors of the '468 Patent conceived novel software techniques and structures to solve the technical problem.

41.   For example, claim 19 recites a novel method of processing a combination of speech and non-speech inputs that receives multimodal natural language input from a user including a natural language utterance and a non-speech input, identifies the user, creates and merges transcripts of the inputs using a speech recognition engine and a semantic knowledge-based model that includes personalized and general models derived from prior interactions with the identified user and multiple users, and an environmental model derived from the identified user's environment. The method identifies entries in a context stack matching information in the merged transcription, and determines the most likely context from the matched entries. It then identifies a domain agent associated with the most likely context, communicates a request to the domain agent and generates a response to the user from content provided by the domain agent:

> 19. A method for processing multi-modal natural language inputs, comprising:
>
> receiving a multi-modal natural language input at a conversational voice user interface, the multi-modal input including a natural language utterance and a non-speech input provided by a user, wherein a transcription module coupled to the conversational voice user interface transcribes the non-speech input to create a non-speech-based transcription;
>
> identifying the user that provided the multi-modal input;
>
> creating a speech-based transcription of the natural language utterance using a speech recognition engine and a semantic knowledge-based model, wherein the semantic knowledge-based model includes a personalized cognitive model derived from one or more prior interactions between the identified user and the conversational voice user interface, a general cognitive model derived from one or more prior interactions between a plurality of users and the conversational voice user interface, and an environmental model derived from an environment of the identified user and the conversational voice user interface;
>
> merging the speech-based transcription and the non-speech-based transcription to create a merged transcription;
>
> identifying one or more entries in a context stack matching information contained in the merged transcription;

> determining a most likely context for the multi-modal input based on the identified entries;
>
> identifying a domain agent associated with the most likely context for the multi-modal input;
>
> communicating a request to the identified domain agent; and
>
> generating a response to the user from content provided by the identified domain agent as a result of processing the request.

'468 Patent, Cl. 19.

42.   Embodiments of these claimed elements are shown and described in the specification. For example, Figure 8 illustrates one exemplary embodiment:

FIGURE 8
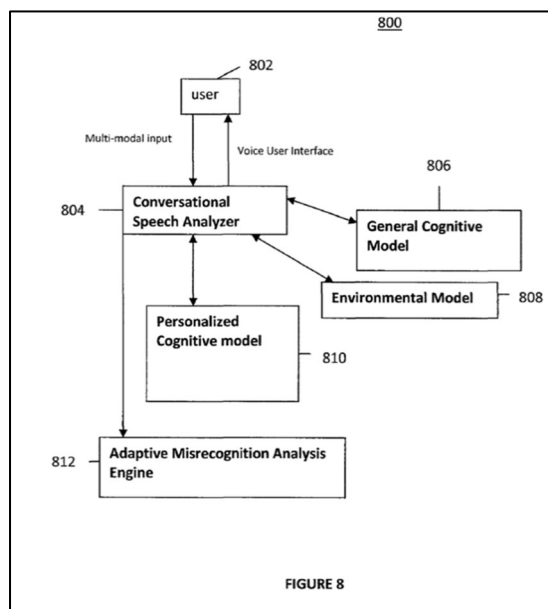
43.   The specification of the '468 Patent describes how these claim elements help the overall system overcome the technical limitations of existing speech recognition systems. *See, e.g.*, '468 Patent, 23:58-24:40.

44.   In explaining the reasons for allowing the claims, the United States Patent and Trademark Office described how the closest existing prior art did not disclose or teach the claimed combination of inventive elements:

> The prior art of record does not teach the combination of limitations in independent claims […], including multi-modal natural language speech and non-speech input

being transcribed and merged, identifying a user with a conversational speech analysis engine which uses a semantic knowledge-based model including a personalized cognitive model derived from one or more prior interactions between the identified user and the mobile device, a general cognitive model derived from one or more prior interactions between a plurality of users and the mobile device, and an environmental model derived from an environment of the identified user and the mobile device, and a knowledge-enhanced speech recognition engine that identifies one or more entries in a context stack matching information contained in the merged transcription and determines a most likely context for the multi-modal natural language input based on the identified entries, and response generation by a domain agent associated with the most likely context identified by the system, where the domain agent receives a request.

'468 File History, Notice of Allowability (October 23, 2011) at 2 (attached as Exhibit E).

U.S. PATENT NO. 8,447,607

45.   On May 21, 2013, the U.S. Patent Office duly and legally issued the '607 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions." A true and correct copy of the '607 Patent is attached hereto as Exhibit F.

46.   Dialect is the owner and assignee of all right, title, and interest in and to the '607 Patent, including the right to assert all causes of action arising under the '607 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

47.   The '607 Patent describes, among other things, a novel mobile system that identifies and uses context, prior information, domain knowledge, and user specific profile data to achieve a natural environment for users to submit natural language requests. '607 Patent, Abstract. The claimed invention creates, stores, and uses extensive personal profile information for each user to improve the reliability of determining the context of a request and presenting the expected results. *Id*. The claimed invention also provides a system that uses "multi-modal communications that enable displaying of non-speech search results on a graphical interface" in conjunction with "speech commands" to execute requests. *Id.* at 21:49-60.

48.   The novel inventions of the '607 Patent are recited in the claims. For example, claim 12 of the '607 Patent recites:

12. A method for processing natural language inputs, comprising:

receiving, by one or more processors, a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input;

generating, by the one or more processors, a non-speech transcription from the non-speech input;

identifying, by the one or more processors, the user who provided the multi-modal natural language input;

generating, by the one or more processors, a speech-based transcription based on a cognitive model associated with the user, wherein the cognitive model includes information on one or more prior interactions between the user and the device;

generating, by the one or more processors, a merged transcription from the speech-based transcription and the non-speech transcription;

identifying, by the one or more processors, an entry in a context stack, from among a plurality of entries that are in the context stack and that are each indicative of context, wherein the identified entry matches information in the merged transcription;

identifying, by the one or more processors, a domain agent associated with the entry in the context stack;

determining, by the one or more processors, a request based on the merged transcription; and

communicating, by the one or more processors, the request to the domain agent, wherein the domain agent is configured to generate a response to the user.

'607 Patent, Cl. 12.

U.S. PATENT NO. 9,263,039

49.   On February 16, 2016, the U.S. Patent Office duly and legally issued the '039 Patent, entitled "Systems And Methods For Responding To Natural Language Speech Utterance." A true and correct copy of the '039 Patent is attached hereto as Exhibit G.

50.   Dialect is the owner and assignee of all right, title, and interest in and to the '039

Patent, including the right to assert all causes of action arising under the '039 Patent and the right

to sue and obtain any remedies for past, present, or future infringement.

51.   The inventors of the '039 Patent conceived novel software techniques and

structures to overcome challenges in natural language processing. For example, claim 13 recites

a novel method of transcribing the speech and non-speech communications to create speech-based

and non-speech-based textual messages, merging the speech-based and non-speech based textual

messages; searching the merged query for text combinations, comparing the text combinations to

context description grammar, generating a relevance score based on that comparison, selecting a

domain agent based on the relevance score, and organizing content based on the results from the

relevance score to generate a response:

> 13. A method of processing speech and non-speech communications,
>   comprising:
>
>   receiving the speech and non-speech communications;
>
>   transcribing the speech and non-speech communications to create a
>   speech-based textual message and a non-speech-based textual message;
>
>   merging the speech-based textual message and the non-speech-based
>   textual message to generate a query;
>
>   searching the query for text combinations;
>
>   comparing the text combinations to entries in a context description
>   grammar;
>
>   accessing a plurality of domain agents that are associated with the context
>   description grammar;
>
>   generating a relevance score based on results from comparing the text
>   combinations to entries in the context description grammar;
>
>   selecting one or more domain agents based on results from the relevance
>   score;
>
>   obtaining content that is gathered by the selected domain agents; and

> generating a response from the content, wherein the content is arranged in
> a selected order based on results from the relevance score.

'039 Patent, Cl. 13.

52.   Embodiments of these claimed elements are shown and described in the specification. For example, Figure 1 shows an overall diagrammatic view of the interactive natural language speech processing system according to one embodiment:
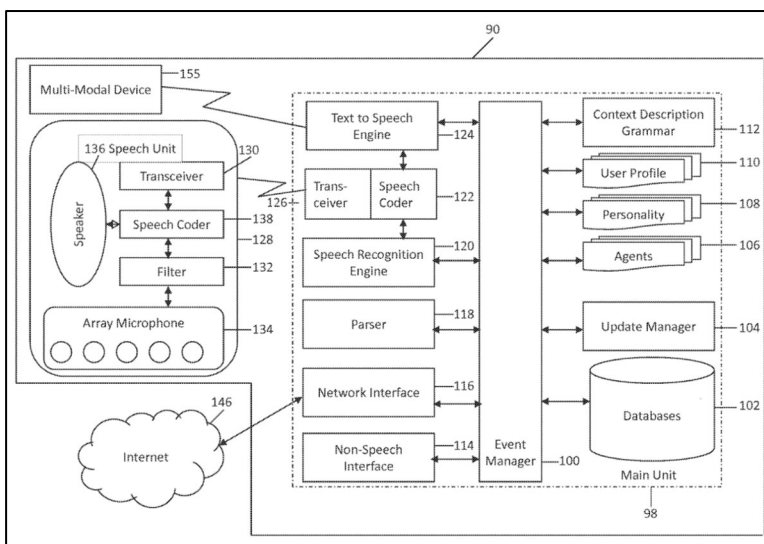
Additionally, Figure 5 shows a process for correctly interpreting a user's utterance according to one embodiment:
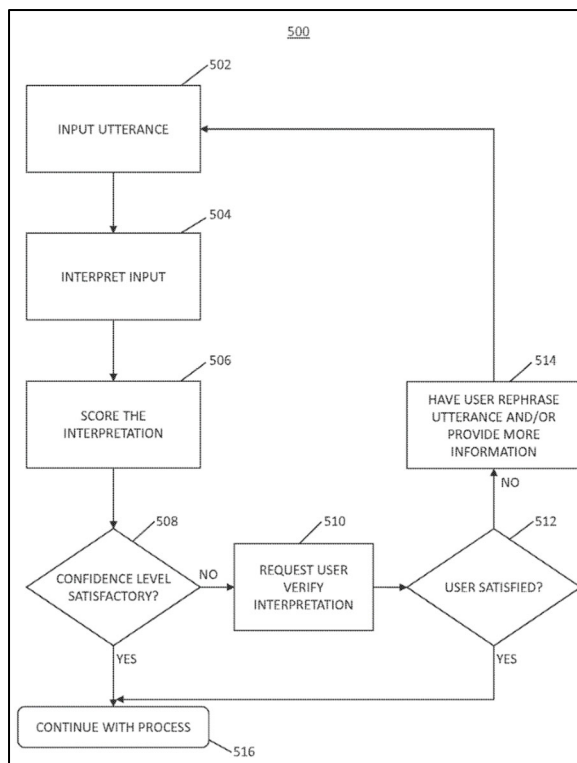
53.   The specification of the '039 Patent describes how these claim elements help the overall system overcome the technical limitations of existing speech recognition systems. *See, e.g., id.* at 13:61-14:37 (describing comparison to context description grammar and relevance scoring); *id.* at 20:20-58 (describing improved word recognition accuracy using data from context description grammar); *id.* at 21:28-36 (describing a scoring system); *id.* at 23:19-29 (describing a scoring system); *id.* at 28:4-31 (describing the process of Figure 5); *id.* at 28:56-29:8 (describing selection of agents).

54.   In explaining the reasons for allowing the claims, the United States Patent and Trademark Office described how the closest existing prior art did not disclose or teach the claimed combination of inventive elements:

> The prior art of record does not disclose or suggest the combination of a comparison module that compares text combinations to entries in a context description grammar, a scoring module that provides relevance scores based on the results from the comparison module, a domain agent selector that selects domain agents based on results from the scoring module, and a response generating module that

generates a response from the content, wherein the content is arranged in a selected order based on results from the scoring module, as required by independent claim 1. Independent claims 13 and 19 recite similar limitations, and are allowed for similar reasons as claim 1.

'039 File History, Notice of Allowability (October 26, 2015) at 2 (attached as Exhibit H).

U.S. PATENT NO. 9,495,957

55.   On November 15, 2016, the U.S. Patent Office duly and legally issued the '957 Patent, entitled "Mobile Systems And Methods Of Supporting Natural Language Human-Machine Interactions." A true and correct copy of the '957 Patent is attached hereto as Exhibit I.

56.   Dialect is the owner and assignee of all right, title, and interest in and to the '957 Patent, including the right to assert all causes of action arising under the '957 Patent and the right to sue and obtain any remedies for past, present, or future infringement.

57.   The inventors of the '957 Patent conceived novel software techniques and structures to solve problems with existing natural language processing systems. For example, claim 7 recites a novel method for processing a natural language utterance that generates a context stack of context information that corresponds to prior utterances, performs speech recognition to determine words in the utterance, identifies context entries in the context stack that correspond to the words by comparing entries from the context stack to the words and generates rank scores for the context entries based on the comparison. Based on the words and the context information, the method determines a command or request associated with the utterance:

> 7.   A computer-implemented method of processing a natural language utterance, the method comprising:
>
> generating a context stack comprising context information that corresponds to a plurality of prior utterances, wherein the context stack includes a plurality of context entries;
>
> receiving, by one or more computer processors, the natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request;

determining one or more words of the natural language utterance by performing speech recognition on the natural language utterance;

identifying, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries, wherein identifying the one or more context entries comprises:

comparing the plurality of context entries to the one or more words;

generating, based on the comparison, one or more rank scores for individual context entries of the plurality of context entries; and

identifying, based on the one or more rank scores, the one or more context entries from among the plurality of context entries; and

determining based on the determined one or more words and the context information, the command or the request associated with the natural language utterance.

'957 Patent, Cl. 7.

58.   Embodiments of these claimed elements are shown and described in the specification. For example, Figure 5 describes an embodiment of the invention:

FIG. 5

20
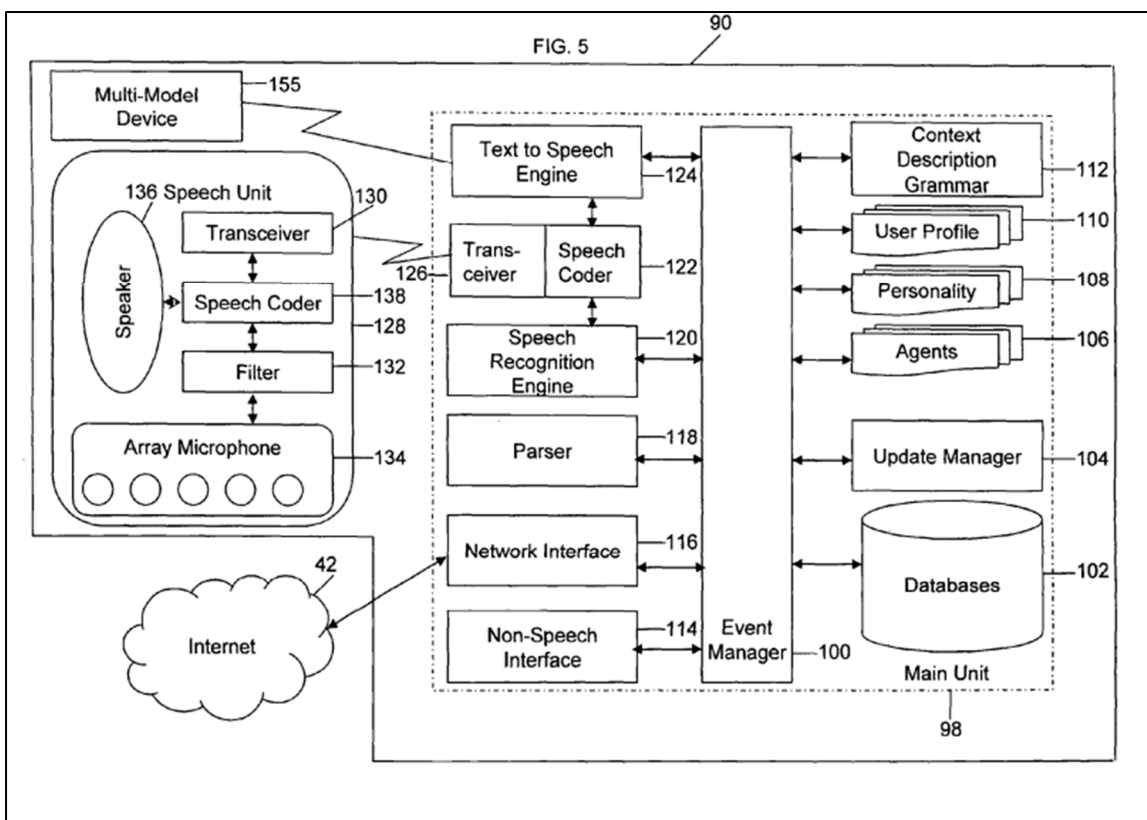
BANK OF AMERICA'S AWARENESS OF VOICEBOX'S TECHNOLOGY

59.   On information and belief, in as early as 2016, VoiceBox and Bank of America engaged in discussions concerning the functionality and applicability VoiceBox's patented conversational voice interaction platform technology for the financial services industry. VoiceBox proposed a collaboration or other relationship through which Bank of America could leverage VoiceBox's existing technology and expertise to build and deploy a virtual financial assistant based on the voice recognition and conversational, natural language understanding (NLU) and natural language processing (NLP) technologies that are the subject of the Asserted Patents invented by VoiceBox.

60.   Bank of America is one of the largest banking institutions in the world. On information and belief, as of February 2024, Bank of America was reportedly the second largest bank in the United States and the second largest bank in the world, with a market capitalization of over $250 billion and total assets in excess of $3.0 *trillion*.

61.   On information and belief, in or about 2016, Bank of America began developing a conversational voice-based "virtual financial assistant" accessible from consumer mobile devices (e.g., devices running Apple's iOS operating system or Google's Android operating system) within Bank of America's mobile banking application. The virtual financial assistant is named *Erica*. By the summer of 2017, Bank of America had reportedly "pooled together a team of more than 100 people dedicated to building [*E]rica*, a voice- and chat-driven product designed to help customers manage their financial lives using predictive analytics and cognitive messaging." *Inside the development of Erica, Bank of America's AI-powered bot,*" Tanaya Macheel, *TearSheet*, July 28, 2017, Exhibit J.

62.   Since the initial deployment of *Erica* in June 2018, Bank of America has regularly touted the growth and success of *Erica*, including that, as of mid-2023:

- *Erica* surpassed 1.5 billion total client interactions, was used by 37 million clients, over 10 million hours of conversations, and that "client engagement with *Erica* is accelerating, and it will easily exceed 2 billion within a few months. Our clients appreciate how simple and intuitive *Erica* is[.]"

- Client engagement with *Erica* was up 35% year-over-year, and hours of interaction were up 31% year-over-year.

- Clients were engaging with *Erica* 56 million times per month, with clients most often using *Erica* to:

  i. Monitor and manage their subscriptions, such as food services and gym memberships – 3.6 million times per month

  ii. Understand spending habits – 2.1 million times per month

  iii. Stay informed of merchant refunds – 863,000 times per month

  iv. Stay on top of upcoming bills – 332,000 times per month

  v. Check their FICO score – 267,000 times per month

See Bank of America Press Release, "BofA's *Erica* Surpasses 1.5 Billion Client Interactions, Totaling More Than 10 Million Hours of Conversations," July 13, 2023, (https://newsroom.bankofamerica.com/content/newsroom/press-releases/2023/07/bofa-s-erica-surpasses-1-5-billion-client-interactions--totaling.html).

63.   On information and belief, one of the primary drivers of *Erica's* success is the "conversational" nature of users' interactions with the virtual assistant, as touted in Bank of America's own employee training reference materials. The financial industry has taken note of the success and the economic value of the *Erica* platform to Defendant's bottom line. For example, in October 2023, Fortune Magazine published an article entitled "*How 'Erica' helped power a*

19% spike in earnings at Bank of America."[8] A February 2019 Note from Juniper Research,

entitled, "*Bank Cost Savings via Chatbots to Reach $7.3 Billion by 2023, as Automated Customer*

Experience Evolves, Representing a Growth in Operational Savings of 3,400% from 2019"

specifically noted the success of the *Erica* platform in relation to its forecasts of bank cost savings

from use of the conversational NLP technology, including the significance of the domain agent

architecture enabled by the Accused Patents:

- "As NLP (Natural Language Processing) evolves and domain expertise is added to AI systems, chatbots are demonstrating a proven record of seamless service delivery..."

- "Chatbot integration in mobile banking apps will be the dominant channel for chatbot-driven customer communications, accounting for 79% of successful interactions in 2023. This dominance is due to several reasons, primarily an increase in user preference for app-based banking, as well as the strong performance of early banking chatbots, such as Bank of America's *Erica*."

https://www.juniperresearch.com/press/bank-cost-savings-via-chatbots-reach-7-3bn-2023/

64.   Bank of America has extensively patented features in the Natural Language

Understanding (NLU) field, which are indicative of infringing activity and the significant

investment by Bank of America in developing NLU functionality, including the accused

functionalities. *See, e.g.*, U.S. Patent No. 11,881,216.

65.   As described in detail below, the consumer-facing functionalities of the *Erica*

platform, as well as Bank of America's own patent filings, reflect and reveal Bank of America's

development and implementation of methods and systems for determining and acting upon the

intents of users' speech and non-speech inputs by using domain agent architectures, context

---

[8]   https://fortune.com/2023/07/19/bank-of-america-erica-financial-assistant-leads-to-earnings-increase/

awareness, user identification, multi-modal input methods, and other elements, steps and methods as described in the Asserted Patents invented by VoiceBox.

66.   In March 2024, Dialect's counsel sent a letter to Bank of America seeking a discussion regarding Dialect's patents. As of the filing date of the Complaint, Dialect has not received a response from Bank of America.

FIRST COUNT
(Infringement of U.S. Patent No. 7,640,160)

67.   Dialect incorporates by reference the allegations set forth in Paragraphs 1-66 of the Complaint as though fully set forth herein.

68.   The claims of the '160 Patent are valid and enforceable.

69.   The claims of the '160 Patent are directed to patentable subject matter. The '160 Patent is directed to innovations that implement and improve a voice recognition system and natural language processing. The inventive claimed steps of the '160 Patent improve on the processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

70.   On information and belief, in violation of 35 U.S.C. § 271(a), Defendant has directly infringed and continues to directly infringe one or more claims of the '160 Patent, including at least claim 12 of the '160 Patent, in the state of Texas, in this District, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products and services that embody one or more of the inventions claimed in the '160 Patent, including the Accused Products.

71.   Each of the Accused Products incorporates and/or implements elements that are identical or equivalent to each claimed element of the patented invention pointed out by at least Claim 12 of the '160 Patent.

72.   Claim 12 of the '160 Patent recites:

12. A method for interpreting natural language utterances using knowledge-enhanced speech recognition engine, wherein the knowledge-enhanced speech recognition engine is configured to determine an intent and correct false recognitions of the natural language utterances, comprising:

receiving a transcription of a natural language utterance at a computer comprising the knowledge-enhanced speech recognition engine;

identifying one or more contexts that completely or partially match one or more text combinations contained in the transcription, wherein identifying the matching contexts includes comparing the text combinations against the grammar expression entries in the context description grammar and against one or more expected contexts stored in a context stack;

scoring each of the identified matching contexts;

selecting the matching context having a highest score to determine a most likely context for the utterance; and

communicating a request to a domain agent configured to process requests in the most likely context for the utterance, the request formulated using at least one grammar expression entry in the context description grammar.

'160 Patent, Cl. 12.

73.   Each of the Accused Products implements a method for interpreting natural language utterances using knowledge-enhanced speech recognition engine, wherein the knowledge-enhanced speech recognition engine is configured to determine an intent and to correct false recognitions of the natural language utterances.

74.   *Erica* implements a method of interpreting natural language utterances. For example, Bank of America touts the ability of *Erica* to answer questions "through spoken conversation and/or visual text" and informs customers that they "can speak or type to *Erica*" and can interact with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests."

How Does Erica Help Clients Manage Their Finances?

Erica helps ensure clients know and understand all that our Mobile Banking app can do for them. Erica is new to the world and she is still learning, but she's pretty smart and eager to help. She can make it easier for clients to stay on top of their finances in three different ways:

Erica Can:	Examples of What Clients Can Type/Say:	Outcome:
1 Answer questions through spoken conversation and/or visual text.	"What is my checking account balance?" "When is my mortgage due?" "What is my credit card limit?"	Erica provides relevant account information on screen (and aloud, if spoken to).

Erica Financial Center Job Aid, Updated 03.26.18, at p. 1.
https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica
_Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

75.   On information and belief, *Erica* interprets natural language utterance using a

knowledge-enhanced speech recognition engine, because it considers prior interactions between

Erica and a plurality of users. For example, Bank of America's own press releases and websites

tout *Erica's* combination of artificial intelligence, predictive analytics, and natural language,

including that "*Erica* is designed to learn from clients' behaviors over time," and that information

is stored and aggregated from "clients" (e.g., "*Erica* learns from the conversations with you and

other Bank of America customers"):

https://www.businesswire.com/news/home/20180518005038/en/Bank-of-Ame...elivers-First-
Widely-Available-AI–Driven-Virtual-Financial-Assistant

> **How does Erica learn and improve (future functionality)?**
>
> Erica learns from the conversations with you and other Bank of America customers and has a dedicated team that's continually working to expand the capabilities offered.

> **Are my conversations with Erica recorded?**
>
> Yes, we keep a record of your conversations with Erica for quality assurance, to maintain an accurate account of your requests, identify opportunities to make Erica's responses more helpful and ensure Erica's performance is optimal. When you speak with Erica by voice, the discussions are recorded and saved for 90 days so they can be analyzed to help refine listening skills.

https://promotions.bankofamerica.com/digitalbanking/mobilebanking/erica

See also:

> When it comes to data collection, conversations with Erica are recorded for reference and quality assurance purposes to help enhance the usefulness of Erica's responses. According to BoA, voice interactions with Erica are saved for 90 days to help refine the AI's listening skills.

https://cointelegraph.com/learn/bank-of-america-erica-ai-powered-chatbot

76.   On information and belief, the speech recognition engine implemented by *Erica* also is knowledge-enhanced in that it takes into account information and knowledge derived from an environment of the identified user and the conversational voice user interface. For example, on information and belief, when a user asks *Erica* "Where's the nearest branch" *Erica's* knowledge-based model can access information concerning the environment of the user, for example the user's current location, responds "Let me pull that up for you." And sends the request to a branch finder

27

"agent" and presents information to the user that relies upon the understanding of "nearby" to leverage said information about the user's current location in processing the request:
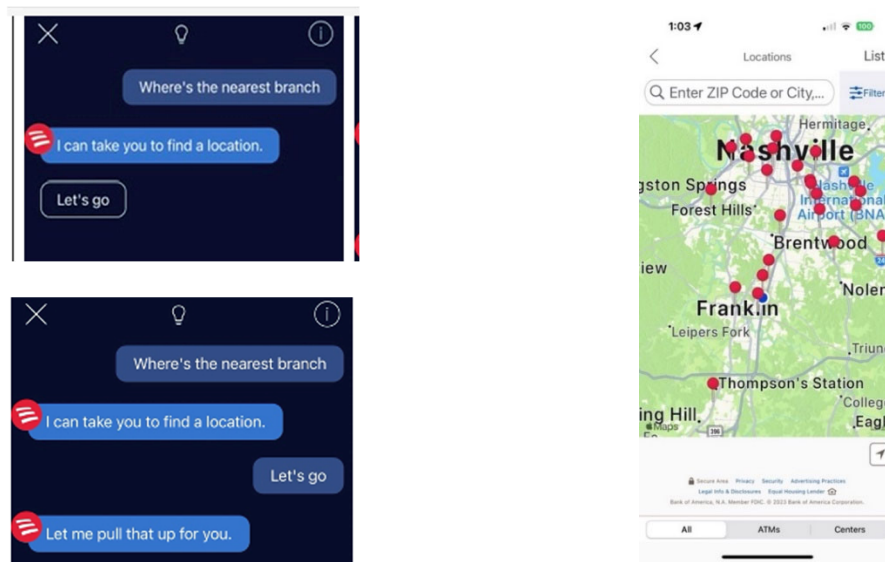
77.   For further example, and on information and belief, *Erica* is also knowledge-enhanced in that it identifies the user and uses knowledge and information relating to the user in interpreting natural language utterances. For example, to use *Erica* a user must be logged into their banking accounts, through which *Erica* can and does access profile and account information specific to that user. On information and belief, *Erica*'s

78.   On information and belief, Erica's knowledge-enhanced speech recognition engine is configured to determine an intent and correct false recognitions of the natural language utterances.

79.   For example, when a user's utterance is misinterpreted, *Erica* is configured to determine an intent and correct false recognitions of a natural language utterance. In the screenshot below, the user's natural language utterance was "transfer money." *Erica* falsely recognized the utterance as "translator money," and on information and belief, the knowledge-enhanced speech

recognition engine as set forth above implemented operations to correct the misrecognition by presenting options including "transfer money":
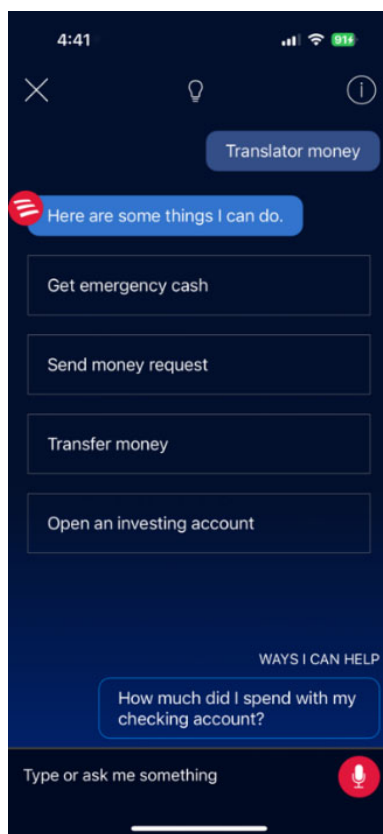
80.   *Erica* transcribes natural language utterances and on information and belief, the transcriptions (whether or not displayed to the user) are received at a computer comprising the knowledge-based speech recognition engine (as set forth above). For example, the screenshot below shows that *Erica* transcribed the user's speech utterances and responded to the transcribed utterances:
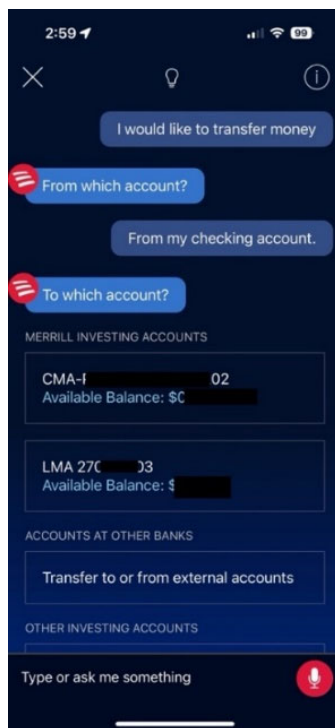
81.   On information and belief, *Erica* identifies one or more contexts that completely or partially match one or more text combinations contained in the transcription, wherein identifying the matching contexts includes comparing the text combinations against the grammar expression entries in the context description grammar and against one or more expected contexts stored in a context stack, including searching for and/or parsing the queries generated from the textual messages derived from the speech inputs for text combinations contained in the transcription.

82.   On information and belief, *Erica* scores each of the identified matching contexts. *Erica* implements processes to generate relevance scores based on the comparisons of the user-request-associated keywords (text combinations) to the entries in a context description grammar, including keyword sets associated with one or more of contexts, associated with domain agents.

83.   Upon information and belief, *Erica* selects the matching context having a highest score to determine a most likely context for the utterance.

84.   On information and belief, *Erica* communicates a request to a domain agent configured to process requests in the most likely context for the utterance, the request formulated using at least one grammar expression entry in the context description grammar. For example, in response to a speech utterance to *Erica* via the microphone interface "Where's the nearest branch," *Erica* responds "Let me pull that up for you." And sends the request to a branch finder "agent" and presents that information to the user:
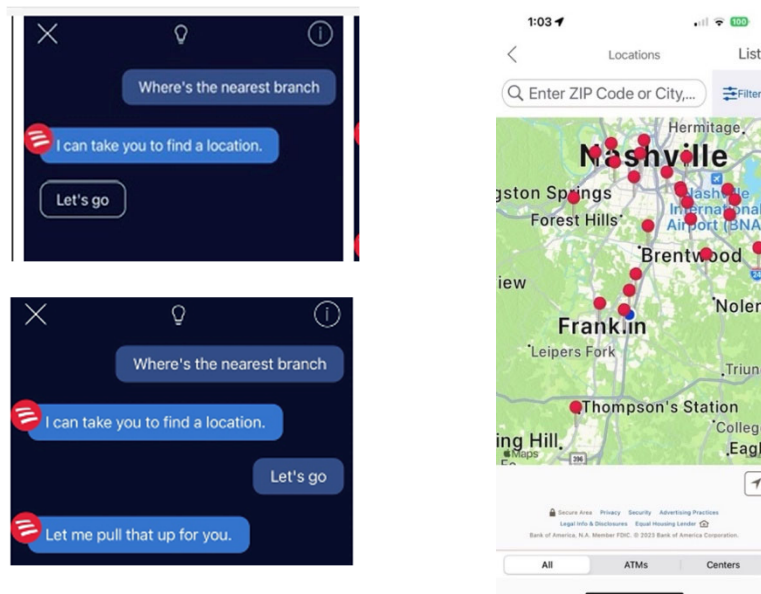
85.   On information and belief, the requests to the domain agents are formulated using at least one grammar expression entry in the context description grammar.

86.   Fact and expert discovery are expected to confirm that the Accused Products infringe the '160 Patent, for which further evidence may lie in whole or in part in source code and technical documents to which Dialect does not presently have access.

87.   Further, on information and belief, Defendant has actively induced and/or contributed to infringement of at least Claim 12 of the '160 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

88.   Users of the Accused Products directly infringe at least Claim 12 of the '160 Patent when they use the Accused Products in the ordinary, customary, and intended way.

89.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the Accused Products to consumers within the United States and instructing and encouraging such customers to use the Accused Products in the ordinary, customary, and intended way, which Defendant knew infringes at least Claim 12 of the '160 Patent, or, alternatively, was willfully blind to the infringement.

90.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the Accused Products in the United States, which Defendant knew infringes at least Claim 12 of the '160 Patent, or, alternatively, was willfully blind to the infringement.

91.   On information and belief, in violation of 35 U.S.C. § 271, Defendant's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 12 of the '160 Patent, constituting a material part of the invention. On information and belief, Defendant knows and has known the same to be especially made or especially adapted for use in an infringement of the '160 Patent, and such

32

components are not a staple article or commodity of commerce suitable for substantial non-infringing use.

92.   Defendant is not licensed or otherwise authorized to practice the claims of the '160 Patent.

93.   Thus, by its acts, Defendant has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '160 Patent, whether literally or under the doctrine of equivalents, including without limitation claim 12.

94.   At a minimum, Defendant has knowledge of the '160 Patent at least as of the filing of this Complaint. Defendant has had, and continues to have, the specific intent to infringe, through its deliberate and intentional infringement or, alternatively, through its willfully blind disregard of the '160 Patent by knowing there was a high probability of infringement but taking deliberate actions to avoid confirming that infringement. The filing of this action has also made Defendant aware of the unjustifiably high risk that its actions constituted and continue to constitute infringement of the '160 Patent. On information and belief, discovery will reveal additional facts and circumstances from which Defendant's knowledge and intent to infringe (or willful indifference), both before and after the filing of this action, may be inferred.

95.   Accordingly, Defendant's infringement of the '160 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

96.   As a result of Defendant's infringement of the '160 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty with interest and costs.

97.   On information and belief, Defendant will continue to infringe the '160 Patent

unless enjoined by this Court. Defendant's infringement of Dialect's rights under the '160 Patent

will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy

at law, unless enjoined by this Court.

SECOND COUNT
(Infringement of U.S Patent No. 8,195,468)

98.   Dialect incorporates by reference the allegations set forth in Paragraphs 1-97 of the

Complaint as though fully set forth herein.

99.   The claims of the '468 Patent are valid and enforceable.

100.   The claims of the '468 Patent are directed to patentable subject matter. The '468

Patent is directed to innovations that implement and improve a voice recognition system and

natural language processing. The inventive claimed steps of the '468 Patent improve on the

processing of a natural language utterance by a user. The claimed inventions provide specific

concrete solutions to the problem of speech recognition in existing systems.

101.   On information and belief, in violation of 35 U.S.C. § 271(a), Defendant has

directly infringed and continues to directly infringe one or more claims of the '468 Patent,

including at least Claim 19 of the '468 Patent, in the state of Texas, in this judicial district, and

elsewhere in the United States by, among other things, making, using, selling, offering for sale,

and/or importing into the United States products and services that embody one or more of the

inventions claimed in the '468 Patent, including the Accused Products.

102.   Each of the Accused Products contains elements that are identical or equivalent to

each claimed element of the patented invention pointed out by at least Claim 19 of the '468 Patent:

   19. A method for processing multi-modal natural language inputs, comprising:

      receiving a multi-modal natural language input at a conversational voice
      user interface, the multi-modal input including a natural language utterance

and a non-speech input provided by a user, wherein a transcription module coupled to the conversational voice user interface transcribes the non-speech input to create a non-speech-based transcription;

identifying the user that provided the multi-modal input;

creating a speech-based transcription of the natural language utterance using a speech recognition engine and a semantic knowledge-based model, wherein the semantic knowledge-based model includes a personalized cognitive model derived from one or more prior interactions between the identified user and the conversational voice user interface, a general cognitive model derived from one or more prior interactions between a plurality of users and the conversational voice user interface, and an environmental model derived from an environment of the identified user and the conversational voice user interface;

merging the speech-based transcription and the non-speech-based transcription to create a merged transcription;

identifying one or more entries in a context stack matching information contained in the merged transcription;

determining a most likely context for the multi-modal input based on the identified entries;

identifying a domain agent associated with the most likely context for the multi-modal input;

communicating a request to the identified domain agent; and

generating a response to the user from content provided by the identified domain agent as a result of processing the request.

'468 Patent, Cl. 19.

103.   *Erica* implements a method of processing multi-modal natural language inputs. For example, Bank of America touts the ability of *Erica* to answer questions "through spoken conversation and/or visual text" and informs customers that they "can speak or type to *Erica*" and can interact with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests."

How Does Erica Help Clients Manage Their Finances?

Erica helps ensure clients know and understand all that our Mobile Banking app can do for them. Erica is new to the world and she is still learning, but she's pretty smart and eager to help. She can make it easier for clients to stay on top of their finances in three different ways:

Erica Can:	Examples of What Clients Can Type/Say:	Outcome:
1 Answer questions through spoken conversation and/or visual text.	"What is my checking account balance?" "When is my mortgage due?" "What is my credit card limit?"	Erica provides relevant account information on screen (and aloud, if spoken to).

Erica Financial Center Job Aid, Updated 03.26.18, at p. 1. https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica _Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

104.   *Erica* also allows users to communicate by selecting (e.g., by tapping on the touchscreen) icons (including those containing natural language statements) displayed on the screen. Each of these input methods (speech, typed text, and text/icon selection) can be used either alone or in combination during a single dialogue with *Erica*, and even in the course of constructing a single utterance for submission to *Erica*. For example, *Erica* can receive a voice speech natural language input ("I would like to transfer money"), then a non-speech, keyboard-entered natural language input ("From my checking account") and then a non-speech, icon-selection natural language input (by tapping one of the provided selection boxes containing the natural language input text).
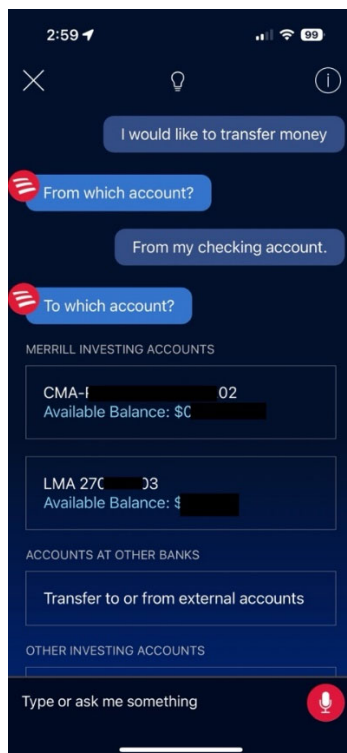
105.   *Erica* receives the multi-modal input including a natural language utterance and a

non-speech input provider by a user, as described above. *Erica* is described by Bank of America

as "conversational" in press releases and employee training documents:

> • ==Expanded Erica's conversational knowledge==, including the ability to engage
> clients with salutations and well wishes, such as "happy birthday".

https://www.businesswire.com/news/home/20180518005038/en/Bank-of-Ame...elivers-First-
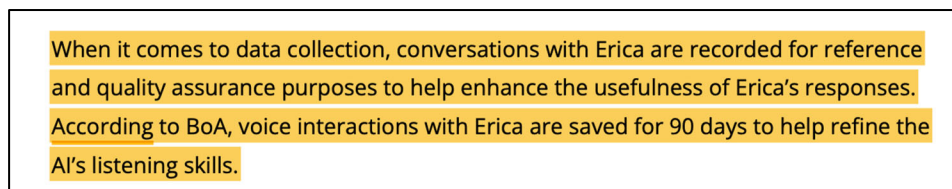Widely-Available-AI–Driven-Virtual-Financial-Assistant

See also:

37

May 28, 2019 at 1:00 PM Eastern

Bank of America today announced that its virtual assistant, Erica, is already helping more
than 7 million clients stay on top of their finances through the company's award-winning
mobile app. Since its nationwide rollout in June 2018, Erica has:

- Completed over 50 million client requests – from everyday banking activities to
  more complex tasks – through the latest in artificial intelligence (AI (A.I.)), predictive
  analytics and natural language processing.

- Been engaged by an average of more than 500,000 new users per month.

- Doubled the various ways in which clients can ask financial questions – from
  200,000 at launch to more than 400,000 today – through the ongoing expansion of
  conversational knowledge.

- Assisted clients across generations, including 15 percent from Gen Z, 49 percent
  millennials, 20 percent Gen X and 16 percent baby boomers/seniors.

https://newsroom.bankofamerica.com/press-releases/consumer-banking/bank-americas-ericar-completes-more-50-million-client-requests

106.   *Erica* provides a voice user interface at which receives multi-modal natural language input:

How Does Erica Help Clients Manage Their Finances?

Erica helps ensure clients know and understand all that our Mobile Banking app can do for
them. Erica is new to the world and she is still learning, but she's pretty smart and eager to
help. She can make it easier for clients to stay on top of their finances in three different ways:

Erica Can:		Examples of What Clients Can Type/Say:	Outcome:
1	Answer questions through spoken conversation and/or visual text.	*"What is my checking account balance?"* *"When is my mortgage due?"* *"What is my credit card limit?"*	*Erica provides relevant account information on screen (and aloud, if spoken to).*

Erica   Financial   Center   Job   Aid,   Updated   03.26.18,   at   p.   1.
https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica_Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

107.   On information and belief, *Erica* uses a transcription module coupled to the conversational voice user interface that transcribes the non-speech input to create a non-speech-based transcription. For example, in the dialogue below, *Erica* transcribed a non-speech input (tapping on box provided by *Erica* with the words "Let's go") into a non-speech-based transcription (displayed/represented to the user in the form of "Let's go" in the user's dialogue stream):
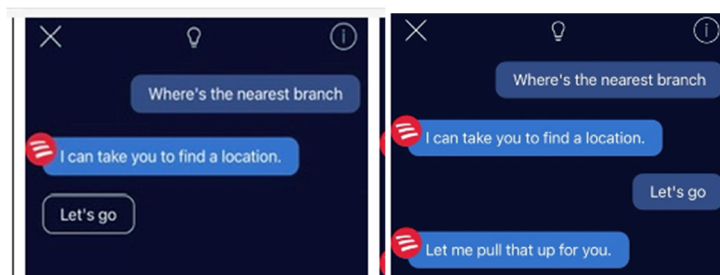
108.   On information and belief, *Erica* identifies the user that provided the multi-modal input, including by identifying the user using the user's account information.

109.   On information and belief, *Erica* creates a speech-based transcription of the natural language utterance using a speech recognition engine and a semantic knowledge-based model.

110.   On information and belief, the semantic knowledge-based model implemented by

Erica also includes a personal cognitive model derived from prior interactions between *Erica* and

the user and a general cognitive model derived from prior interactions between *Erica* and a

plurality of users.   For example, Bank of America's press releases and websites tout *Erica's*

combination of artificial intelligence, predictive analytics, and natural language, including that

"*Erica* is designed to learn from clients' behaviors over time", and that information is stored and

aggregated from "clients" (e.g., "*Erica* learns from the conversations with you and other Bank of

America customers"):

Erica combines the latest technology in artificial intelligence, predictive analytics and natural language to be a virtual financial assistant to clients. Currently, clients can ask Erica to:

Erica is designed to learn from clients' behaviors over time, helping them accomplish simple to complex tasks within the mobile banking app with easy-to-follow prompts. Clients can interact with Erica any way they choose, including texting, talking or tapping options on their screen.

https://www.businesswire.com/news/home/20180518005038/en/Bank-of-Ame...elivers-First-Widely-Available-AI–Driven-Virtual-Financial-Assistant

How does Erica learn and improve (future functionality)?

Erica learns from the conversations with you and other Bank of America customers and has a dedicated team that's continually working to expand the capabilities offered.

> **⋀**   Are my conversations with Erica recorded?
>
> Yes, we keep a record of your conversations with Erica for
> quality assurance, to maintain an accurate account of your
> requests, identify opportunities to make Erica's responses
> more helpful and ensure Erica's performance is optimal.
> When you speak with Erica by voice, the discussions are
> recorded and saved for 90 days so they can be analyzed to
> help refine listening skills.

https://promotions.bankofamerica.com/digitalbanking/mobilebanking/erica

See also:

> When it comes to data collection, conversations with Erica are recorded for reference
> and quality assurance purposes to help enhance the usefulness of Erica's responses.
> According to BoA, voice interactions with Erica are saved for 90 days to help refine the
> AI's listening skills.

https://cointelegraph.com/learn/bank-of-america-erica-ai-powered-chatbot

111.   On information and belief, the semantic knowledge-based model implemented by

Erica also includes an environmental model derived from an environment of the identified user

and the conversational voice user interface. For example, on information and belief, when a user

asks *Erica* "Where's the nearest branch" the user enters non-speech input by tapping on the Let's

Go button provided by *Erica* (which is then transcribed into a textual message), the semantic

knowledge-based model can access information concerning the environment of the user, for

example the user's current location, responds "Let me pull that up for you." and sends the request

to a branch finder "agent" and presents information to the user that relies upon the understanding

of "nearby" to leverage said information about the user's current location in processing the request:
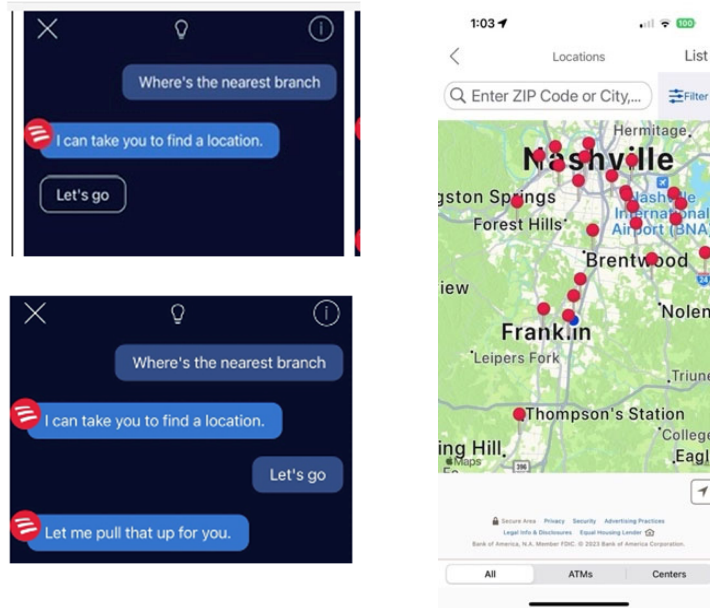
112.   On information and belief, *Erica* merges the speech-based transcription and the non-speech-based transcription to create a merged transcription. For example, in the dialogue below, *Erica* transcribed a non-speech communication (the words "I would like to" which were input via the keyboard interface) and the speech communications (the words "Transfer money" which were input as speech via the microphone interface), creating corresponding textual messages:
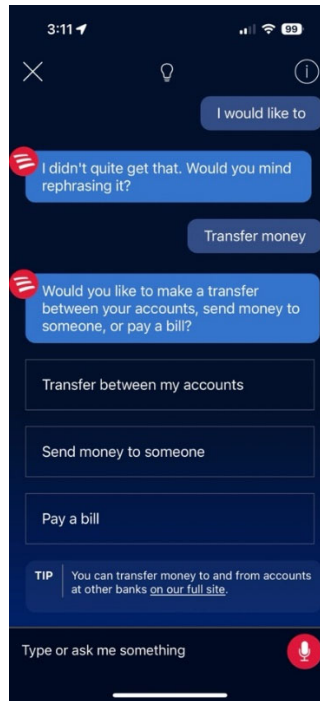
113.   As another example, in the dialogue below, *Erica* transcribed a non-speech communication (tapping on the button "Let's go) and the speech communications ("Where's the nearest branch"), and merged the transcriptions:
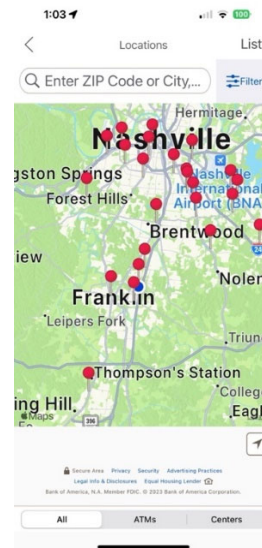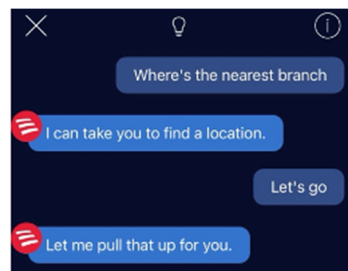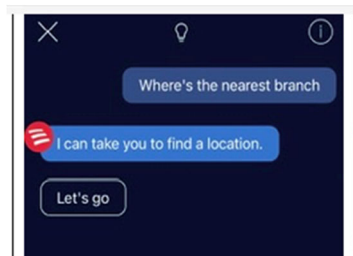
114.   Based on *Erica's* responses and actions in the interaction, one can reasonably infer that the transcriptions from the keyboard input and voice input were merged through Bank of America's software.

115.   On information and belief, *Erica* identifies one or more entries in a context stack, or the equivalent thereof, that match information contained in the merged transcription.

116.   On information and belief, *Erica* searches and/or parses the queries generated from the textual messages derived from the speech and non-speech inputs for text combinations contained in the merged transcription(s).

117.   On information and belief, *Erica* determines a most likely context for the multi-modal input based on the identified "matching" keywords in the lists of keywords in the context stack.

118.   On information and belief, *Erica* identifies a domain agent associated with the most likely context for the multi-modal input.

119.   On information and belief, *Erica* communicates a request to a domain agent. For example, in response to a speech utterance to *Erica* via the microphone interface "Where's the nearest branch" and the non-speech communication of tapping on the Let's Go button provided by *Erica* (which is then transcribed into a textual message), *Erica* responds "Let me pull that up for you." and sends the request to a branch finder "agent" and presents that information to the user:
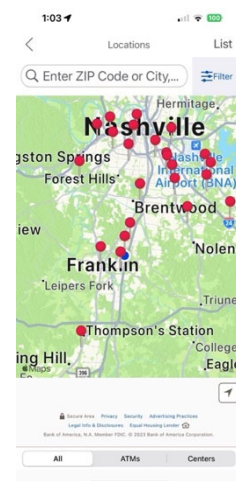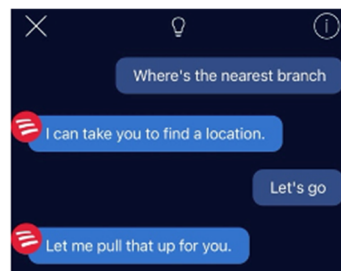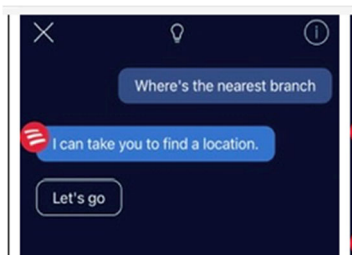
120.   Fact and expert discovery are expected to confirm that the Accused Products infringe the '468 Patent, for which further evidence may lie in whole or in part in source code and technical documents to which Dialect does not presently have access.

121.   Further, on information and belief, Defendant has actively induced and/or contributed to infringement of at least Claim 19 of the '468 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

122.   Users of the Accused Products directly infringe at least Claim 19 of the '468 Patent when they use the Accused Products in the ordinary, customary, and intended way.

123.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the '468 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the Accused Products to consumers within the United States and instructing and encouraging such customers to use the Accused Products in the ordinary, customary, and intended way, which Defendant knew infringes at least Claim 19 of the '468 Patent, or, alternatively, was willfully blind to the infringement.

124.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the Accused Products in the United States, which Defendant knew

infringes at least Claim 19 of the '468 Patent, or, alternatively, was willfully blind to the infringement.

125.   On information and belief, in violation of 35 U.S.C. § 271(c), Defendant's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 19 of the '468 Patent, constituting a material part of the invention.   On information and belief, Defendant knows and has known the same to be especially made or especially adapted for use in an infringement of the '468 Patent, and such components are not a staple article or commodity of commerce suitable for substantial non-infringing use.

126.   Defendant is not licensed or otherwise authorized to practice the claims of the '468 Patent.

127.   Thus, by its acts, Defendant has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '468 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 19.

128.   At a minimum, Defendant has knowledge of the '468 Patent at least as of the filing of this Complaint. Defendant has had, and continues to have, the specific intent to infringe, through its deliberate and intentional infringement or, alternatively, through its willfully blind disregard of the '468 Patent by knowing there was a high probability of infringement but taking deliberate actions to avoid confirming that infringement. The filing of this action has also made Defendant aware of the unjustifiably high risk that its actions constituted and continue to constitute infringement of the '468 Patent. On information and belief, discovery will reveal additional facts

and circumstances from which Defendant's knowledge and intent to infringe (or willful indifference), both before and after the filing of this action, may be inferred.

129.   Accordingly, Defendant's infringement of the '468 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

130.   As a result of Defendant's infringement of the '468 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty with interest and costs.

131.   On information and belief, Defendant will continue to infringe the '468 Patent unless enjoined by this Court. Defendant's infringement of Dialect's rights under the '468 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

THIRD COUNT
(Infringement of U.S Patent No. 8,447,607)

132.   Dialect incorporates by reference the allegations set forth in Paragraphs 1-131 of the Complaint as though fully set forth herein.

133.   The claims of the '607 Patent are valid and enforceable.

134.   The claims of the '607 Patent are directed to patentable subject matter. The '607 Patent is directed to innovations that implement and improve a voice recognition system and natural language processing. The inventive claimed steps of the '607 Patent improve on the processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

135.   On information and belief, in violation of 35 U.S.C. § 271(a), Defendant has directly infringed and continues to directly infringe one or more claims of the '607 Patent,

47

including at least Claim 12 of the '607 Patent, in the state of Texas, in this judicial district, and

elsewhere in the United States by, among other things, making, using, selling, offering for sale,

and/or importing into the United States products and services that embody one or more of the

inventions claimed in the '607 Patent, including the Accused Products.

136.   Each of the Accused Products contains elements that are identical or equivalent to

each claimed element of the patented invention pointed out by at least Claim 12 of the '607 Patent,

which recites:

12. A method for processing natural language inputs, comprising:

receiving, by one or more processors, a multi-modal natural language input from a user, the multi-modal natural language input including a natural language utterance and a non-speech input;

generating, by the one or more processors, a non-speech transcription from the non-speech input;

identifying, by the one or more processors, the user who provided the multi-modal natural language input;

generating, by the one or more processors, a speech-based transcription based on a cognitive model associated with the user, wherein the cognitive model includes information on one or more prior interactions between the user and the device;

generating, by the one or more processors, a merged transcription from the speech-based transcription and the non-speech transcription;

identifying, by the one or more processors, an entry in a context stack, from among a plurality of entries that are in the context stack and that are each indicative of context, wherein the identified entry matches information in the merged transcription;

identifying, by the one or more processors, a domain agent associated with the entry in the context stack;

determining, by the one or more processors, a request based on the merged transcription; and

communicating, by the one or more processors, the request to the domain agent, wherein the domain agent is configured to generate a response to the user.

'607 Patent at Claim 12.

137.   *Erica* implements a method of processing natural language inputs. For example,

Bank of America touts the ability of *Erica* to answer questions "through spoken conversation

and/or visual text" and informs customers that they "can speak or type to *Erica*" and can interact

with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests":

Erica Financial Center Job Aid, Updated 03.26.18, at p. 1.
https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica
_Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

138.   *Erica* receives multi-modal natural language input from a user, including natural

language utterances and non-speech inputs. For example, *Erica* enables users to communicate by

typing text and/or selecting (e.g., by tapping on the touchscreen) icons and text boxes containing

natural language statements displayed on the screen. Each of these input methods (speech, typed

text, and text/icon selection) can be used either alone or in combination during a single dialogue

with *Erica*, and even in the course of constructing a single utterance for submission to *Erica*. For

example, *Erica* can receive a voice speech natural language input ("I would like to transfer

money"), then a non-speech, keyboard-entered natural language input ("From my checking

account") and then a non-speech, icon-selection natural language input (by tapping one of the

provided selection boxes containing the natural language input text):
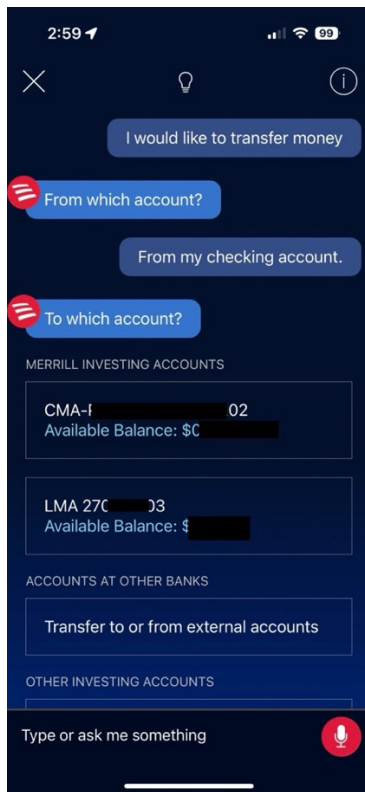
139.   These inputs are received through the *Erica* interface on Bank of America's Mobile

Banking App available on iPhone and Android devices. On information and belief, the inputs are

received by one or more processors, including the touch interface and/or applications processor(s)

on the user's smartphone and/or by processors running on remote servers to which the Bank of

America Mobile Banking Application sends data inputs and information to Bank of America for

processing. *See, e.g.*:

How Do Clients Access Erica?

Erica is exclusive to Mobile Banking at this time (*not* in Online Banking). To enjoy the benefits of Erica, clients need to have the most updated version of the Bank of America Mobile app.

Access Erica by tapping on the **Erica display icon** that appears on the edge of the screen. Clients can move this icon around on their screen by holding it down and dragging it to a different location.

Positioning Erica in our app (behind a login) allows clients to enjoy bank-level security as they interact with her.
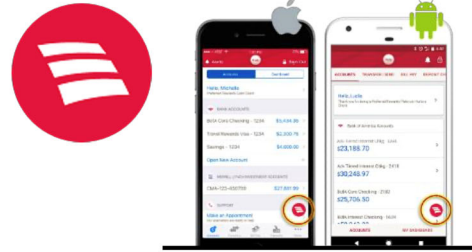
Erica   Financial   Center   Job   Aid,   Updated   03.26.18,   at   p.   2. https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica_Financial_Center_Job_Aid_PDF.pdf

140.   On information and belief, the *Erica* system generates a non-speech transcription from the non-speech input and identifies, by the one or more processors (see above) the user who provided the multi-modal natural language input. For example, in the dialogue below, *Erica* transcribed a non-speech input (tapping on box provided by *Erica* with the words "Let's go") into a non-speech based transcription (displayed/represented to the user in the form of "Let's go" in the user's dialogue stream):
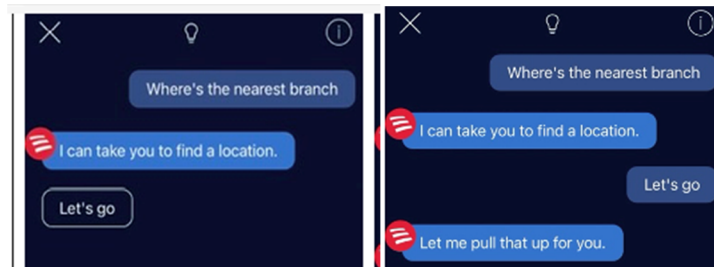
141.   On information and belief, one or more processors executing *Erica* operations also generate a non-speech transcription from non-speech input even when such transcriptions are not directly presented to the user, e.g., when an icon or text box is selected that results in an action by *Erica* (e.g., selection of one of multiple accounts presented in response to a dialogue concerning transferring of money, as shown below). On information and belief, selection of one of the presented accounts results in generation and processing of a non-speech (text-based) transcription

51

upon which the *Erica* server processors act in response to such selection, based on the context that

is determined from the prior utterances in the dialogue (e.g., "I want to transfer money.")
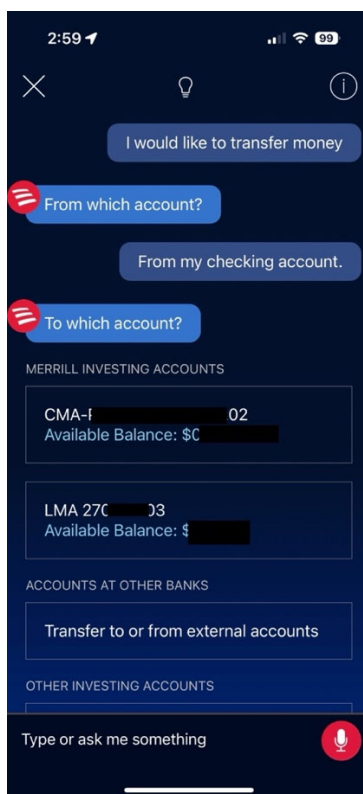
142.   On information and belief, *Erica* identifies the user that provided the multi-modal

input. For example, to use *Erica*, a user must be logged into their banking accounts, through which

Erica can and does access profile and account information specific to that user.

143.   On information and belief, one or more of the processors executing *Erica*

operations generate a speech-based transcription based on a cognitive model associated with the

user, wherein the cognitive model includes information on one or more prior interactions between

the user and the device. For example, Bank of America's press releases and websites tout *Erica's*

combination of artificial intelligence, predictive analytics, and natural language, including that

"*Erica* is designed to learn from clients' behaviors over time", and that information is stored and

aggregated from "clients" (e.g., "*Erica* learns from the conversations with you and other Bank of

America customers"):

> Erica combines the latest technology in artificial intelligence, predictive analytics and natural language to be a virtual financial assistant to clients. Currently, clients can ask Erica to:

> Erica is designed to learn from clients' behaviors over time, helping them accomplish simple to complex tasks within the mobile banking app with easy-to-follow prompts. Clients can interact with Erica any way they choose, including texting, talking or tapping options on their screen.

https://www.businesswire.com/news/home/20180518005038/en/Bank-of-Ame...elivers-First-Widely-Available-AI–Driven-Virtual-Financial-Assistant

> **How does Erica learn and improve (future functionality)?**
>
> Erica learns from the conversations with you and other Bank of America customers and has a dedicated team that's continually working to expand the capabilities offered.

> **Are my conversations with Erica recorded?**
>
> Yes, we keep a record of your conversations with Erica for quality assurance, to maintain an accurate account of your requests, identify opportunities to make Erica's responses more helpful and ensure Erica's performance is optimal. When you speak with Erica by voice, the discussions are recorded and saved for 90 days so they can be analyzed to help refine listening skills.

https://promotions.bankofamerica.com/digitalbanking/mobilebanking/erica

See also:

> When it comes to data collection, conversations with Erica are recorded for reference and quality assurance purposes to help enhance the usefulness of Erica's responses. According to BoA, voice interactions with Erica are saved for 90 days to help refine the AI's listening skills.

https://cointelegraph.com/learn/bank-of-america-erica-ai-powered-chatbot

144.   On information and belief, one or more of the processors executing *Erica* operations generates a merged transcription from the speech-based transcription and the non-speech-based transcription to create a merged transcription that constitutes the combined formulated query.   For example, in the dialogue below, *Erica* transcribed a non-speech communications (the words "I would like to" which were input via the keyboard interface) and the speech communications (the words "Transfer money" which were input as speech via the microphone interface,) creating corresponding textual messages:
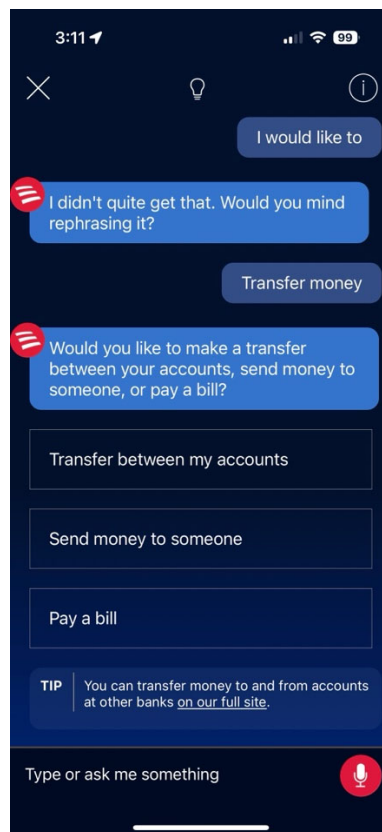
145.   As another example, in the dialogue below, *Erica* transcribed a non-speech communication (tapping on the button "Let's go") and the speech communications ("Where's the nearest branch"), and merged the transcriptions:
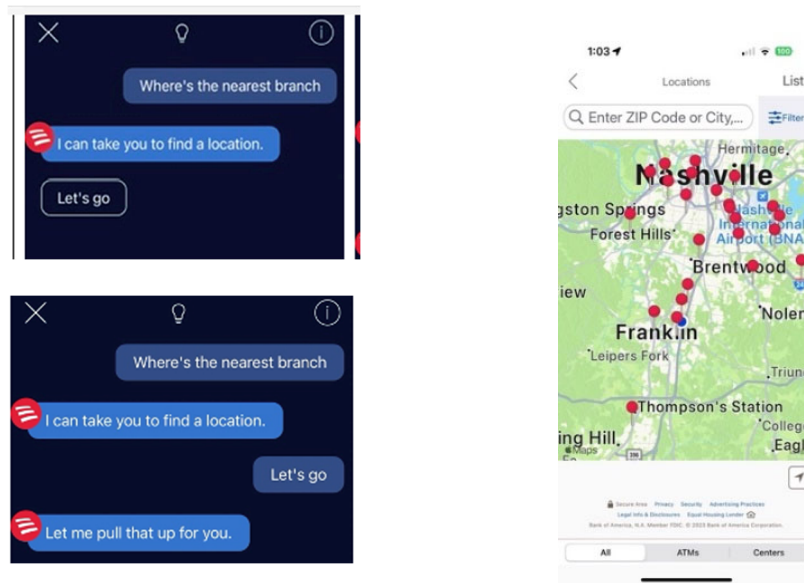
146.   Based on *Erica's* responses and actions in the interaction, one can reasonably infer that the transcriptions from the keyboard input and voce input were merged through Bank of America's software.

147.   On information and belief, *Erica* identifies an entry in a context stack, or the equivalent thereof, from a plurality of entries that are in the context stack and that are each indicative of a context, wherein the identified entry matches information contained in the merged transcription.

148.   On information and belief, one or more of the processors executing *Erica* operations identify domain agent associated with the entry in the context stack.

149.   On information and belief, one or more of the processors executing *Erica* operations determine(s) a request based on the merged transcription. On information and belief,

Erica determines a request based on the merged transcription and communicates that request to a domain agent, wherein the domain agent is configured to generate a response to the user.

150.   For example, in response to a speech utterance to *Erica* via the microphone interface "Where's the nearest branch" and the non-speech communication of tapping on the Let's Go button provided by *Erica* (which is then transcribed into a textual message), *Erica* indicates that it has determined the request for a location and responds "Let me pull that up for you" and sends the request to a branch finder "agent" and presents that information to the user:
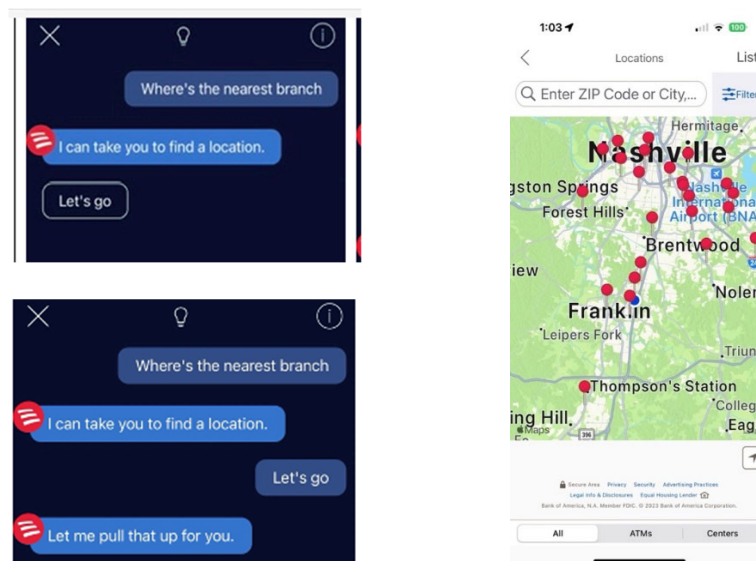
151.   Fact and expert discovery are expected to confirm that the Accused Products infringe the '607 Patent, for which further evidence may lie in whole or in part in source code and technical documents to which Dialect does not presently have access.

152.   Further, on information and belief, Defendant has actively induced and/or contributed to infringement of at least Claim 12 of the '607 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

153.   Users of the Accused Products directly infringe at least Claim 12 of the '607 Patent when they use the Accused Products in the ordinary, customary, and intended way.

154.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the '607 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the Accused Products to consumers within the United States and instructing and encouraging such customers to use the Accused Products in the ordinary, customary, and intended way, which Defendant knew infringes at least Claim 12 of the '607 Patent, or, alternatively, was willfully blind to the infringement.

155.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the Accused Products in the United States, which Defendant knew infringes at least Claim 12 of the '607 Patent, or, alternatively, was willfully blind to the infringement.

156.   On information and belief, in violation of 35 U.S.C. § 271(c), Defendant's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 12 of the '607 Patent, constituting a material part of the invention. On information and belief, Defendant knows and has known the same to be

especially made or especially adapted for use in an infringement of the '607 Patent, and such components are not a staple article or commodity of commerce suitable for substantial non-infringing use.

157.   Defendant is not licensed or otherwise authorized to practice the claims of the '607 Patent.

158.   Thus, by its acts, Defendant has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '607 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 12.

159.   At a minimum, Defendant has knowledge of the '607 Patent at least as of the filing of this Complaint. Defendant has had, and continues to have, the specific intent to infringe, through its deliberate and intentional infringement or, alternatively, through its willfully blind disregard of the '607 Patent by knowing there was a high probability of infringement but taking deliberate actions to avoid confirming that infringement. The filing of this action has also made Defendant aware of the unjustifiably high risk that its actions constituted and continue to constitute infringement of the '607 Patent. On information and belief, discovery will reveal additional facts and circumstances from which Defendant's knowledge and intent to infringe (or willful indifference), both before and after the filing of this action, may be inferred.

160.   Accordingly, Defendant's infringement of the '607 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

161.   As a result of Defendant's infringement of the '607 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty with interest and costs.

162.   On information and belief, Defendant will continue to infringe the '607 Patent unless enjoined by this Court. Defendant's infringement of Dialect's rights under the '607 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

FOURTH COUNT
(Infringement of U.S Patent No. 9,263,039)

163.   Dialect incorporates by reference the allegations set forth in Paragraphs 1-162 of the Complaint as though fully set forth herein.

164.   The claims of the '039 Patent are valid and enforceable.

165.   The claims of the '039 Patent are directed to patentable subject matter. The '039 Patent is directed to innovations that implement and improve a voice recognition system and natural language processing. The inventive claimed steps of the '039 Patent improve on the processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

166.   On information and belief, in violation of 35 U.S.C. § 271(a), Defendant has directly infringed and continues to directly infringe one or more claims of the '039 Patent, including at least Claim 13 of the '039 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products and services that embody one or more of the inventions claimed in the '039 Patent, including the Accused Products.

167.   Each of the Accused Products contains elements that are identical or equivalent to each claimed element of the patented invention pointed out by at least claim 13 of the '039 Patent, which recites:

13. A method of processing speech and non-speech communications, comprising:

receiving the speech and non-speech communications;

transcribing the speech and non-speech communications to create a speech-based textual message and a non-speech-based textual message;

merging the speech-based textual message and the non-speech-based textual message to generate a query;

searching the query for text combinations;

comparing the text combinations to entries in a context description grammar;

accessing a plurality of domain agents that are associated with the context description grammar;

generating a relevance score based on results from comparing the text combinations to entries in the context description grammar;

selecting one or more domain agents based on results from the relevance score;

obtaining content that is gathered by the selected domain agents; and

generating a response from the content, wherein the content is arranged in a selected order based on results from the relevance score.

'039 Patent, Cl. 13.

168. *Erica* implements a method of processing speech and non-speech communications.

For example, Bank of America touts the ability of *Erica* to answer questions "through spoken

conversation and/or visual text" and informs customers that they "can speak or type to *Erica*" and

can interact with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests":

Erica Financial Center Job Aid, Updated 03.26.18, at p. 1. https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica _Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

169.   *Erica* also allows users to communicate by selecting (e.g., by tapping on the touchscreen) icons displayed on the screen. Each of these input methods (speech, typed text, and icon-selection) can be used either alone or in combination during a single dialogue with *Erica*, and even while constructing a single utterance for submission to *Erica*. For example, *Erica* can receive a voice speech communication ("I would like to transfer money"), then a non-speech, keyboard-entered communication ("From my checking account") and then a non-speech, icon-selection communication (by tapping one of the provided selection boxes):
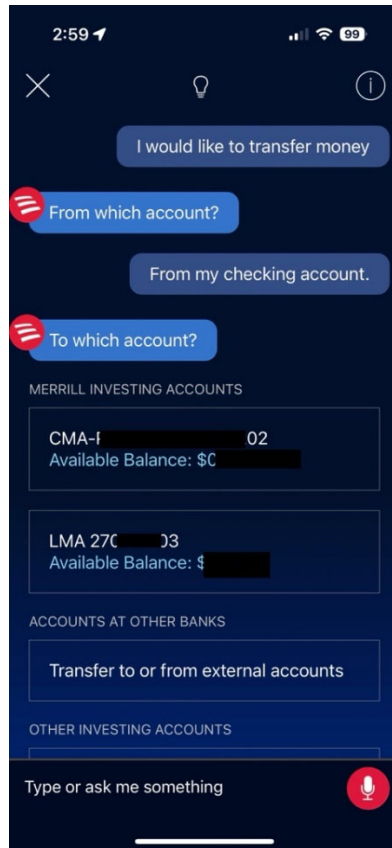
170.   *Erica* receives the speech and non-speech communications from the user as described above. On information and belief, *Erica* transcribes speech and non-speech communications to create a speech-based textual message and a non-speech-based textual message. For example, in the dialogue below, *Erica* transcribed a non-speech communications (the words "I would like to" which were input via the keyboard interface) and the speech communications (the words "Transfer money" which were input as speech via the microphone interface), creating corresponding textual messages:

62
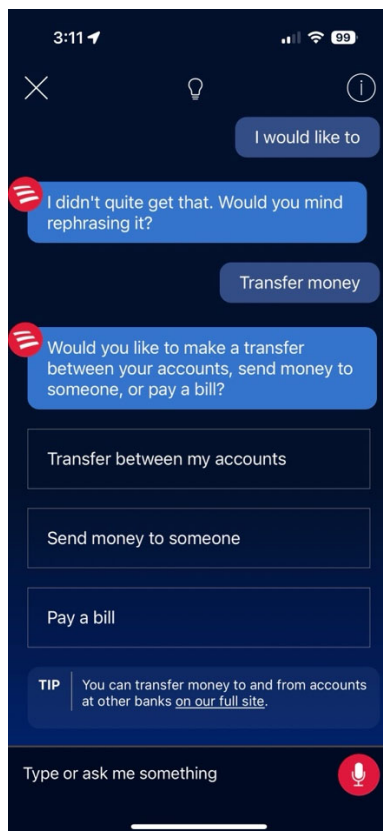
171.   On information and belief, *Erica* merges the speech-based and non-speech-based textual messages to generate a query. For example, in the above-referenced dialogue, one can reasonably infer that the textual messages transcribed from the keyboard input and voce input were merged in order to generate a query through Bank of America's software.

172.   As another example, in the dialogue below, *Erica* transcribed a non-speech communication (tapping on the button "Let's go) and the speech communications ("Where's the nearest branch"), and merged the transcriptions:
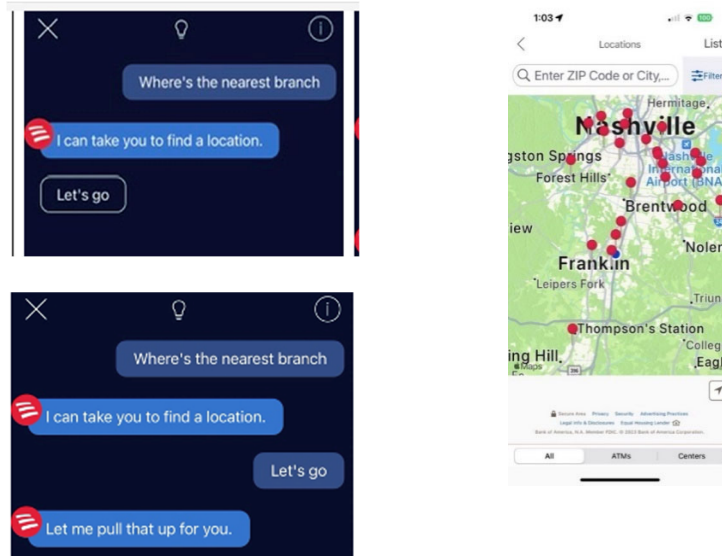
173.   On information and belief, *Erica* searches and/or parses the queries generated from the textual messages derived from the speech and non-speech inputs for text combinations.

174.   On information and belief, *Erica* undertakes a comparison of the text combinations ("associated with the user's request" as indicated below) to entries in a context description grammar, or an equivalent thereof.

175.   On information and belief, *Erica* accesses a plurality of domain agents that are associated the context description grammar, or its equivalent.

176.   On information and belief, in determining which of the domain agents to obtain content from, *Erica* implements processes to generate relevance scores based on the comparisons of text combinations to the entries in a context description grammar (e.g., keyword sets associated with one or more of a plurality of domain agents).

177.   On information and belief, *Erica* selects one or more domain agents based on results from the relevance score.

178.   On information and belief, *Erica* obtains content gathered from the selected domain agents. For example, in response to a speech utterance to *Erica* via the microphone interface

"Where's the nearest branch" and the non-speech communication of tapping on the "Let's Go"
button provided by *Erica* (which is then transcribed into a textual message), *Erica* responds "Let
me pull that up for you." and obtains content from the branch finder "agent" and presents that
information to the user:
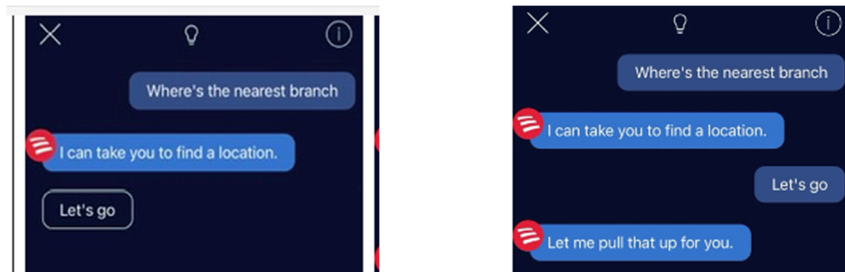
179.   On information and belief, *Erica* generates responses from the content obtained
from the one or more domain agents and arranges them in a selected order based on the results
from the relevance score. For example, "Transfer between my accounts" is arranged above "Send
money to someone" and "Pay a bill":
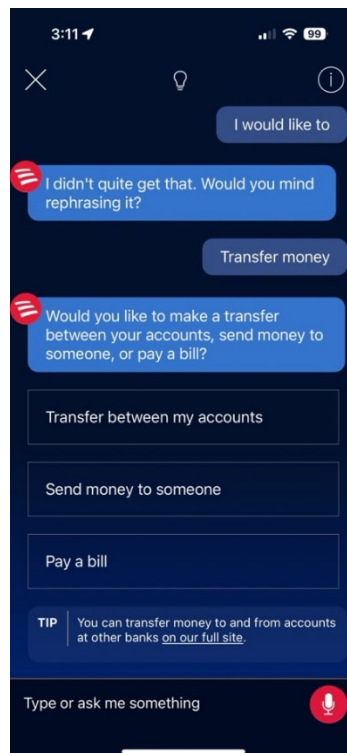
180.   However, when the query includes the word "send" as in "I want to send money," while *Erica* still provides options for "transferring" money across one's own accounts, but arranges the "Send money to someone" option as the first option. One can reasonably infer that this is because the relevance score relating to the "send"-related content is higher than those relating to the "transfer"-related content in this instance:
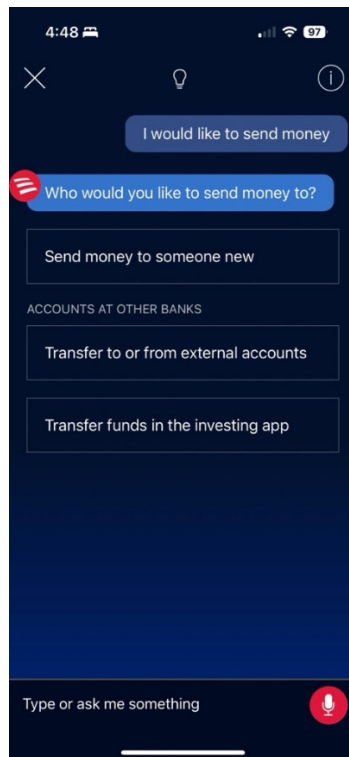
181.   For further example, in response to the a speech utterance to *Erica* via the microphone interface "Where's the nearest branch" and the non-speech communication of tapping on the Let's Go button provided by *Erica* (which is then transcribed into a textual message), *Erica* responds "Let me pull that up for you" and obtains content from the branch finder "agent" and presents that information to the user:
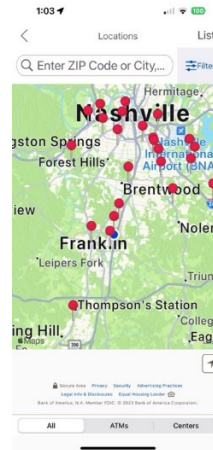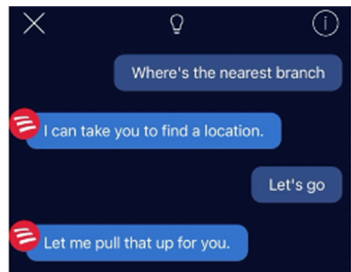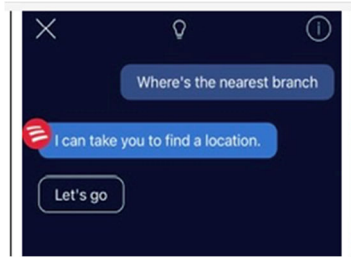
182.   Additionally, in Bank of America's own documentation concerning *Erica's* functionalities, the "Sending and Receiving" domain is separate from the "Transfers" domain, further supporting the inference that in *Erica's* NLU processing system, "Sending and Receiving" money is handled by one particular domain agent in the system and "Transfers" of money is handled by another domain agent as described in Bank of America's documents:

Erica Financial Center Job Aid, Updated 03.26.18, at p. 5.
https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica
_Financial_Center_Job_Aid_PDF.pdf

183.   Fact and expert discovery are expected to confirm that the Accused Products infringe the '039 Patent, for which further evidence may lie in whole or in part in source code and technical documents to which Dialect does not presently have access.

184.   Further, on information and belief, Defendant has actively induced and/or contributed to infringement of at least Claim 13 of the '039 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

185.   Users of the Accused Products directly infringe at least claim 13 of the '039 Patent when they use the Accused Products in the ordinary, customary, and intended way.

186.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the '039 Accused Products within the United States in the ordinary, customary, and intended way by, directly or through intermediaries, supplying the Accused Products to consumers within the United States and instructing and encouraging such customers to use the Accused Products in the ordinary, customary, and intended way, which Defendant knew infringes at least Claim 13 of the '039 Patent, or, alternatively, was willfully blind to the infringement.

187.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the Accused Products in the United States, which Defendant knew infringes at least Claim 13 of the '039 Patent, or, alternatively, was willfully blind to the infringement.

188.   On information and belief, in violation of 35 U.S.C. § 271(c), Defendant's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 13 of the '039 Patent, constituting a material part of the invention. On information and belief, Defendant knows and has known the same to be especially made or especially adapted for use in an infringement of the '039 Patent, and such

components are not a staple article or commodity of commerce suitable for substantial non-infringing use.

189.   Defendant is not licensed or otherwise authorized to practice the claims of the '039 Patent.

190.   Thus, by its acts, Defendant has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '039 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 13.

191.   At a minimum, Defendant has knowledge of the '039 Patent at least as of the filing of this Complaint. Defendant has had, and continues to have, the specific intent to infringe, through its deliberate and intentional infringement or, alternatively, through its willfully blind disregard of the '039 Patent by knowing there was a high probability of infringement but taking deliberate actions to avoid confirming that infringement. The filing of this action has also made Defendant aware of the unjustifiably high risk that its actions constituted and continue to constitute infringement of the '039 Patent. On information and belief, discovery will reveal additional facts and circumstances from which Defendant's knowledge and intent to infringe (or willful indifference), both before and after the filing of this action, may be inferred.

192.   Accordingly, Defendant's infringement of the '039 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

193.   As a result of Defendant's infringement of the '039 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty with interest and costs.

194.   On information and belief, Defendant will continue to infringe the '039 Patent unless enjoined by this Court. Defendant's infringement of Dialect's rights under the '039 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

FIFTH COUNT
(Infringement of U.S Patent No. 9,495,957)

195.   Dialect incorporates by reference the allegations set forth in Paragraphs 1-194 of the Complaint as though fully set forth herein.

196.   The claims of the '957 Patent are valid and enforceable.

197.   The claims of the '957 Patent are directed to patentable subject matter. Particularly, the '957 Patent is directed to innovations that implement and improve a voice recognition system and natural language processing. The inventive claimed steps of the '957 Patent improve on the processing of a natural language utterance by a user. The claimed inventions provide specific concrete solutions to the problem of speech recognition in existing systems.

198.   On information and belief, in violation of 35 U.S.C. § 271(a), Defendant has directly infringed and continues to directly infringe one or more claims of the '957 Patent, including at least Claim 7 of the '957 Patent, in the state of Texas, in this judicial district, and elsewhere in the United States by, among other things, making, using, selling, offering for sale, and/or importing into the United States products and services that embody one or more of the inventions claimed in the '957 Patent, including the Accused Products.

199.   Each of the Accused Products contains elements that are identical or equivalent to each claimed element of the patented invention pointed out by at least Claim 7 of the '957 Patent, which recites:

7.   A computer-implemented method of processing a natural language utterance, the method comprising:

generating a context stack comprising context information that corresponds to a plurality of prior utterances, wherein the context stack includes a plurality of context entries;

receiving, by one or more computer processors, the natural language utterance, wherein the natural language utterance is associated with a command or is associated with a request;

determining one or more words of the natural language utterance by performing speech recognition on the natural language utterance;

identifying, from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries, wherein identifying the one or more context entries comprises:

comparing the plurality of context entries to the one or more words;

generating, based on the comparison, one or more rank scores for individual context entries of the plurality of context entries; and

identifying, based on the one or more rank scores, the one or more context entries from among the plurality of context entries; and

determining based on the determined one or more words and the context information, the command or the request associated with the natural language utterance.

'957 Patent, Cl. 7.

200.   *Erica* implements a computer-implemented method of processing natural language inputs. For example, Bank of America touts the ability of *Erica* to answer questions "through spoken conversation" and informs customers that they "can speak or type to *Erica*" and can interact with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests":
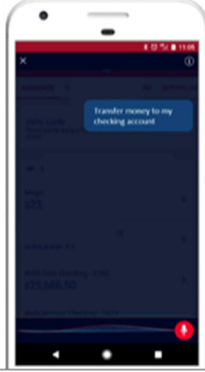

Erica Financial Center Job Aid, Updated 03.26.18, at p. 1. https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica_Financial_Center_Job_Aid_PDF.pdf

Id. at p. 4.

201.   On information and belief, *Erica* generates a context stack comprising context information that corresponds to a plurality of prior utterances.

202.   *Erica* receives a natural language utterance associated with a command or request of the user. For example, Bank of America touts the ability of *Erica* to answer questions "through spoken conversation and/or visual text" and informs customers that they "can speak or type to *Erica*" and can interact with *Erica* by "Speaking to *Erica*" or by "Typing [their] requests":

Erica   Financial   Center   Job   Aid,   Updated   03.26.18,   at   p.   1. https://message.bankofamerica.com/onlinebanking_demo/mobileApp_Simulator/erica_qrg/Erica _Financial_Center_Job_Aid_PDF.pdf

203.   The *Erica* system determines one or more words of the natural language utterance by performing speech recognition on the natural language utterance.

204.   In the dialogue represented by the screenshot below, the user uttered the words "I would like to" and "transfer money" into the microphone of a smartphone running *Erica* on Bank of America's Mobile Banking application, and *Erica* performed speech recognition on the utterances and transcribed the words of the utterances into text:
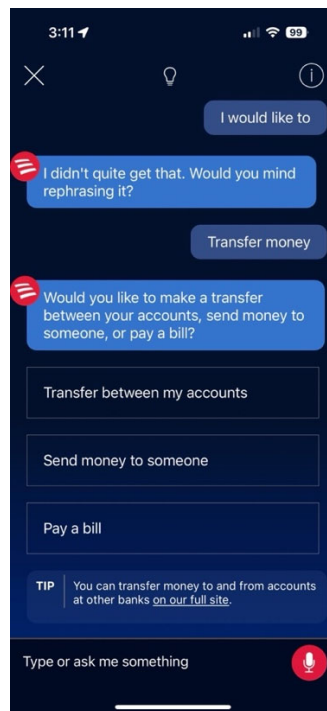
205.   On information and belief, *Erica* identifies from among the plurality of context entries, one or more context entries that correspond to the one or more words, wherein the context information includes the one or more context entries.

206.   On information and belief, *Erica* compares the plurality of context entries to the one or more words.

207.   On information and belief, *Erica* generates rank scores for individual context entries of the plurality of context entries.

208.   On information and belief, *Erica* identifies the one or more context entries from among the plurality of context entries based on the one or more rank scores.

209.   On information and belief, *Erica* determines, based on the words and context information, including identification and selection of the most likely context or domain agent, the command or request associated with the natural language utterance.

210.   For example, in response to the a speech utterance to *Erica* via the microphone interface "Where's the nearest branch" and the non-speech communication of tapping on the Let's Go button provided by *Erica* (which is then transcribed into a textual message), *Erica* responds "Let me pull that up for you." and sends the request to a branch finder "agent" and presents that information to the user:
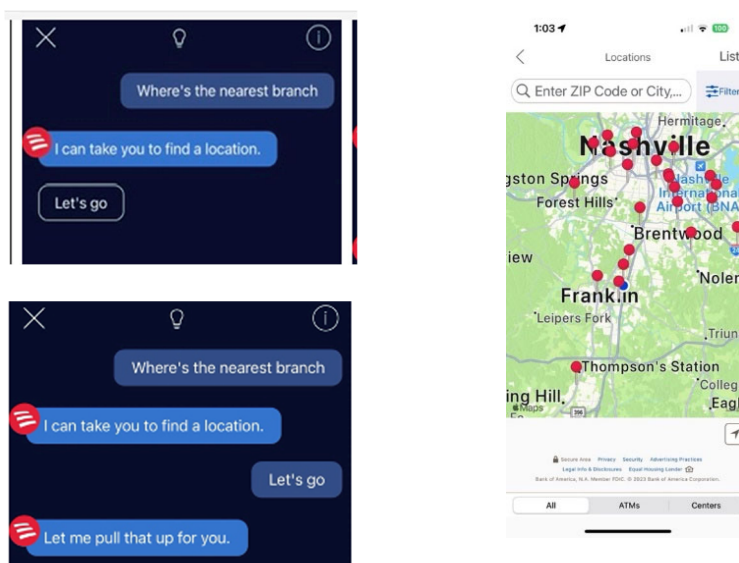
211.   Similarly, in the dialogue represented by the screenshot below, the user uttered the words "Show me the last transaction in the account ending in 9223" into the microphone of a smartphone running *Erica* on Bank of America's Mobile Banking application, and *Erica* performed speech recognition on the utterances and transcribed the words of the utterance and, on information and belief, used the processes described above to determine the context and to determine the request associated with the utterance, as evidenced by providing the information responsive to the request:

75
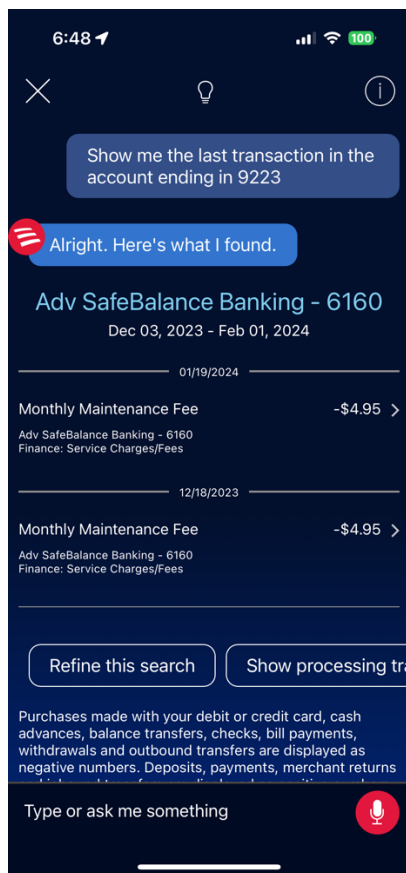
212.   Fact and expert discovery are expected to confirm that the Accused Products infringe the '957 Patent, for which further evidence may lie in whole or in part in source code and technical documents to which Dialect does not presently have access.

213.   Further, on information and belief, Defendant has actively induced and/or contributed to infringement of at least Claim 7 of the '957 Patent in violation of at least 35 U.S.C. § 271(b), (c), and (f).

214.   Users of the Accused Products directly infringe at least Claim 7 of the '957 Patent when they use the Accused Products in the ordinary, customary, and intended way.

215.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) include, without limitation and with specific intent to encourage infringement, knowingly inducing consumers to use the Accused Products within the United States in the ordinary,

customary, and intended way by, directly or through intermediaries, supplying the Accused Products to consumers within the United States and instructing and encouraging such customers to use the Accused Products in the ordinary, customary, and intended way, which Defendant knew infringes at least Claim 7 of the '957 Patent, or, alternatively, was willfully blind to the infringement.

216.   On information and belief, Defendant's inducements in violation of 35 U.S.C. § 271(b) further include, without limitation and with specific intent to encourage the infringement, knowingly inducing customers to commit acts of infringement with respect to the Accused Products within the United States, by, directly or through intermediaries, instructing and encouraging such customers to import, make, use, sell, offer to sell, or otherwise commit acts of infringement with respect to the Accused Products in the United States, which Defendant knew infringes at least Claim 7 of the '957 Patent, or, alternatively, was willfully blind to the infringement.

217.   On information and belief, in violation of 35 U.S.C. § 271(c), Defendant's contributory infringement further includes offering to sell or selling within the United States, or importing into the United States, components of the patented invention of and/or a material or apparatus for use in practicing at least Claim 7 of the '957 Patent, constituting a material part of the invention. On information and belief, Defendant knows and has known the same to be especially made or especially adapted for use in an infringement of the '957 Patent, and such components are not a staple article or commodity of commerce suitable for substantial non-infringing use.

218.   Defendant is not licensed or otherwise authorized to practice the claims of the '957 Patent.

219.   Thus, by its acts, Defendant has injured Dialect and is liable to Dialect for directly and/or indirectly infringing one or more claims of the '957 Patent, whether literally or under the doctrine of equivalents, including without limitation Claim 7.

220.   At a minimum, Defendant has knowledge of the '957 Patent at least as of the filing of this Complaint. Defendant has had, and continues to have, the specific intent to infringe, through its deliberate and intentional infringement or, alternatively, through its willfully blind disregard of the '957 Patent by knowing there was a high probability of infringement but taking deliberate actions to avoid confirming that infringement. The filing of this action has also made Defendant aware of the unjustifiably high risk that its actions constituted and continue to constitute infringement of the '957 Patent. On information and belief, discovery will reveal additional facts and circumstances from which Defendant's knowledge and intent to infringe (or willful indifference), both before and after the filing of this action, may be inferred.

221.   Accordingly, Defendant's infringement of the '957 Patent has been and continues to be deliberate, intentional, and willful, and this is therefore an exceptional case warranting an award of enhanced damages and attorneys' fees and costs pursuant to 35 U.S.C. §§ 284 and 285.

222.   As a result of Defendant's infringement of the '957 Patent, Dialect has suffered monetary damages, and seeks recovery, in an amount to be proven at trial, adequate to compensate for Defendant's infringement, but in no event less than a reasonable royalty with interest and costs.

223.   On information and belief, Defendant will continue to infringe the '957 Patent unless enjoined by this Court. Defendant's infringement of Dialect's rights under the '957 Patent will continue to damage Dialect, causing irreparable harm for which there is no adequate remedy at law, unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff prays for judgment and seeks relief from Defendant as follows:

a.   For judgment that Defendant has infringed and continues to infringe the claims of the '160,'468, '607, '039, and '957 Patents;

b.   For a permanent injunction against Defendant and its respective officers, directors, agents, servants, affiliates, employees, divisions, branches, subsidiaries, parents, and all other acting in active concert therewith from infringement of the '160, '468, '607, '039, and '957 Patents;

c.   For an accounting of all damages sustained by Plaintiff as a result of Defendant's acts of infringement;

d.   For a mandatory future royalty payable by Defendant in relation to each use of an Accused Product that is found to infringe one or more of the Asserted Patents and all future products which are not colorably different from products found to infringe;

e.   For a judgment and order finding that Defendant's infringement is willful and/or egregious and awarding to Plaintiff enhanced damages pursuant to 35 U.S.C. § 284;

f.   For a judgment and order requiring Defendant to pay Plaintiff's damages, costs, expenses, and pre- and post-judgment interest for its infringement of the '160, '468, '607, '039, and '957 Patents as provided under 35 U.S.C. § 284;

g.   For 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; and

h.   For such other and further relief in law and in equity as the Court may deem just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38(b) of the Federal Rules of Civil Procedure, Plaintiff demands a trial by jury in this action for all issues triable by a jury.

Dated: March 22, 2024   Respectfully Submitted,

/s/ Garland Stephens by permission Charles Everingham IV
Garland Stephens (Texas Bar No. 24053910)
garland@bluepeak.law
Justin Constant (Texas Bar No. 24067551)
justin@bluepeak.law
Robert Magee
robert@bluepeak.law
Richard Koehl (Texas Bar No. 24115754)
richard@bluepeak.law
Anna Dwyer
anna@bluepeak.law
Kate Falkenstien
kate@bluepeak.law
Heng Gong
heng@bluepeak.law
BLUE PEAK LAW GROUP LLP
3139 West Holcombe Blvd.
PMB 8160
Houston, TX 77025
Tel: (281) 972-3036

Of Counsel:
Charles Everingham IV
Texas State Bar No. 00787447
ce@wsfirm.com
Claire Abernathy Henry
Texas State Bar No. 24053063
claire@wsfirm.com
Garrett Parish
Texas State Bar No. 24125824
gparish@wsfirm.com
WARD, SMITH & HILL, PLLC
PO Box 1231
Longview, Texas 75606
Telephone: (903) 757-6400
Facsimile: (903) 757-2323

ATTORNEYS FOR PLAINTIFF