

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON.COM, INC.; AMAZON.COM LLC; AMAZON WEB SERVICES, INC.; A2Z DEVELOPMENT CENTER, INC. D/B/A LAB126; RAWLES LLC; AMZN MOBILE LLC; AMZN MOBILE 2 LLC; AMAZON.COM SERVICES, INC. F/K/A AMAZON FULFILLMENT SERVICES, INC.; AND AMAZON SERVICES LLC (formerly AMAZON DIGITAL SERVICES LLC),

Petitioners

- vs. -

VB Assets, LLC,

Patent Owner

Patent No. 7,818,176

Issued: October 19, 2010

Inventors: Tom Freeman, Mike Kennewick

Title: SYSTEM AND METHOD FOR SELECTING AND PRESENTING
ADVERTISEMENTS BASED ON NATURAL LANGUAGE PROCESSING OF
VOICE-BASED INPUT

Inter Partes Review No. ____

PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. §§ 311-319

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July 29, 2020

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
II. COMPLIANCE WITH REQUIREMENTS FOR A PETITION FOR <i>INTER PARTES</i> REVIEW.....	1
A. Grounds for Standing (37 C.F.R. § 42.104(a)).....	1
B. Fees for <i>Inter Partes</i> Review (37 C.F.R. § 42.15(a)).....	2
C. Mandatory Notices (37 C.F.R. § 42.8).....	2
III. THRESHOLD FOR REVIEW (35 U.S.C. § 314(A)).....	3
IV. IDENTIFICATION OF CHALLENGED CLAIMS (37 C.F.R. § 42.204(B)).....	3
A. Relied Upon Patents and Publications.....	3
B. Statutory Grounds.....	3
V. LEVEL OF ORDINARY SKILL IN THE ART.....	4
VI. OVERVIEW OF THE '176 PATENT	4
A. Claim Listing	7
VII. CONSTRUCTION OF THE CHALLENGED CLAIMS (37 C.F.R. § 42.104(B)(3))	7
VIII. THE PRIOR ART DISCLOSED THE FEATURES CLAIMED BY THE '176 PATENT	8
A. U.S. Patent App. Pub. No. 2004/0193420 (“Kennewick”)	9
B. Japanese Patent App. Pub. No. 2002-297626 (“Yonebayashi”)	12
C. U.S. Patent No. 6,173,250 (“Jong”)	14
D. U.S. Patent No. 7,774,333 (“Colledge”)	15

TABLE OF CONTENTS
(Continued)

	Page
IX. THE CHALLENGED CLAIMS ARE INVALID UNDER § 103.....	16
A. Ground 1: Claims 1-3, 6-19, 22-29, 32-45, and 48-52 are rendered obvious by Kennewick in combination with Yonebayashi and Jong.....	16
1. Claim 1	19
[1(pre)] “A method for selecting and presenting advertisements in response to processing natural language utterances, comprising:”	19
[1.a] “receiving a natural language utterance containing at least one request at an input device;”	20
[1.b] “recognizing one or more words or phrases in the natural language utterance at a speech recognition engine coupled to the input device,”	22
[1.c] “wherein recognizing the words or phrases in the natural language utterance includes: mapping a stream of phonemes contained in the natural language utterance to one or more syllables that are phonemically represented in an acoustic grammar; and”	24
[1.d] “generating a preliminary interpretation for the natural language utterance from the one or more syllables, wherein the preliminary interpretation generated from the one or more syllables includes the recognized words or phrases;”	26
[1.e] “interpreting the recognized words or phrases at a conversational language processor coupled to the speech recognition engine, wherein interpreting the recognized words or phrases includes establishing a context for the natural language utterance;”	27

TABLE OF CONTENTS (Continued)

	Page
[1.f] “selecting an advertisement in the context established for the natural language utterance; and;”	30
[1.g] “presenting the selected advertisement via an output device coupled to the conversational language processor.”	33
2. Claim 2: “The method of claim 1, wherein the conversational language processor selects the advertisement based on information related to one or more of the recognized words or phrases, an action associated with the request, a personalized cognitive model derived from an interaction pattern for a specific user, a generalized cognitive model derived from an interaction pattern for a plurality of users, or an environmental model derived from environmental conditions or surroundings associated with the specific user.”	35
3. Claim 3: “The method of claim 2, further comprising:”	39
[3.a] “tracking an interaction pattern with the advertisement presented via the output device; and”	39
[3.b] “updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model based on the interaction pattern tracked for the advertisement.”	40
4. Claim 6: “The method of claim 3, further comprising:”	42
[6.a] “building long-term shared knowledge and short-term shared knowledge in response to updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model;”	42

TABLE OF CONTENTS (Continued)

		Page
	[6.b] “receiving a subsequent natural language utterance at the input device; and”	45
	[6.c] “interpreting the subsequent natural language utterance at the conversational language processor using the long-term shared knowledge and the short-term shared knowledge.”	46
5.	Claim 7: “The method of claim 3, wherein the interaction pattern tracked for the advertisement includes an action performed in response to a subsequent request that identifies the advertisement.”	47
6.	Claim 8: “The method of claim 7, wherein the action includes executing a task or retrieving information based on the subsequent request that identifies the advertisement.	49
7.	Claim 9: “The method of claim 1, wherein the conversational language processor selects the advertisement to resolve the request in response to determining that the natural language utterance includes incomplete or ambiguous information.”	50
8.	Claim 10: “The method of claim 1, wherein the speech recognition engine recognizes the one or more words or phrases in the natural language utterance using a plurality of entries in one or more dictionary and phrase tables that are dynamically updated based on a history of a current dialog and one or more prior dialogs.”	52
9.	Claim 11: “The method of claim 10, wherein the plurality of entries in the one or more dictionary and phrase tables are further dynamically updated based on one or more dynamic fuzzy set possibilities or prior probabilities derived from the history of the current dialog and the prior dialogs.”	53

TABLE OF CONTENTS **(Continued)**

	Page
10. Claim 12: “The method of claim 1, further comprising determining that the conversational language processor incorrectly interpreted the words or phrases in response to an adaptive misrecognition engine detecting a predetermined event, wherein the conversational language processor reinterprets the words or phrases in response to the predetermined event.”	53
11. Claim 13: “The method of claim 12, wherein the predetermined event includes receiving one or more of a subsequent input proximate in time to the natural language utterance, a subsequent input that stops the conversational language processor from processing the request contained in the natural language utterance, a subsequent input that overrides the request in a time shorter than an expected time to process the request, or a subsequent input that repeats the natural language utterance.”	55
12. Claim 14	55
13. Claim 15	56
14. Claim 16	56
15. Claim 17	56
16. Claim 18	56
17. Claim 19	56
18. Claim 22	56
19. Claim 23	57
20. Claim 24	57
21. Claim 25	57

TABLE OF CONTENTS
(Continued)

	Page
22. Claim 26	57
23. Claim 27	57
24. Claim 28	59
25. Claim 29	59
26. Claim 32	60
27. Claim 33	61
28. Claim 34	62
29. Claim 35	62
30. Claim 36	62
31. Claim 37	62
32. Claim 38	62
33. Claim 39	62
34. Claim 40	62
35. Claim 41	63
36. Claim 42	63
37. Claim 43	63
38. Claim 44	63
39. Claim 45	63
40. Claim 48	64
41. Claim 49	64
42. Claim 50	64

TABLE OF CONTENTS
(Continued)

	Page
43. Claim 51	64
44. Claim 52	64
B. Ground 2: Claims 4, 5, 20, 21, 30, 31, 46, and 47 are rendered obvious by Kennewick, Yonebayashi, and Jong in further view of Colledge.	64
1. Claim 4: “The method of claim 3, wherein updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model builds statistical profiles for selecting subsequent advertisements in response to subsequent natural language utterances.”	66
2. Claim 5: “The method of claim 4, wherein the statistical profiles identify affinities between the advertisement presented via the output device and one or more of the recognized words or phrases, the action associated with the request, the personalized cognitive model, the generalized cognitive model, or the environmental model.”	69
3. Claim 20	70
4. Claim 21	70
5. Claim 30	70
6. Claim 31	71
7. Claim 46	71
8. Claim 47	71
X. THE PETITION SHOULD NOT BE DENIED UNDER §§ 314 OR 325	71
XI. CONCLUSION.....	73

TABLE OF AUTHORITIES

	Page(s)
CASES	
<i>Amazon.com, Inc., v. M2M Solutions LLC</i> , IPR2019–01204, Paper No. 14 (PTAB Jan. 23, 2020).....	72
<i>Amgen Inc. v. Alexion Pharm., Inc.</i> , IPR2019-00739, 2019 WL 4132683 (PTAB Aug. 30, 2019).....	72
<i>Becton, Dickinson & Co. v. B. Braun Melsungen AG</i> , IPR2017-01586, Paper No. 8 (PTAB Dec. 15, 2017)	72, 73
<i>Ex parte Kubin</i> , 2007 Pat. App. LEXIS 13 (B.P.A.I. May 31, 2007), aff’d, 561 F.3d 1351 (Fed. Cir. 2009).....	35, 55
<i>General Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha</i> , IPR2016-01357, Paper No. 19 (PTAB Sept. 6, 2017).....	71
<i>In re Harza</i> , 274 F.2d 669 (CCPA 1960)	58
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005) (en banc)	7
STATUTES AND RULES	
35 U.S.C. §§ 102, (b), (e), (f) and (g)	9, 12, 14, 15
35 U.S.C. §§ 103 and (c)(1)	3, 9, 16
35 U.S.C. §§ 314 and (a).....	3, 71, 72
35 U.S.C. §§ 325 and (d)	71, 72, 73
Rule 42.104(b)(4)-(5).....	16

TABLE OF AUTHORITIES
(Continued)

	Page(s)
OTHER AUTHORITIES	
37 C.F.R. § 42.10(b)	3
37 C.F.R. § 42.100(b)	7, 8
37 C.F.R. §§ 42.104(a) and (b)3	1, 7
M.P.E.P. 2144.04	58

EXHIBIT LIST (37 C.F.R. § 42.63(e))

Exhibit	Description
1001	U.S. Patent No. 7,818,176
1002	Declaration of Padhraic Smyth, Ph.D.
1003	U.S. Patent App. Pub. No. 2004/0193420 to Kennewick et al.
1004 – 1006	Reserved
1007	IEEE 100 The Authoritative Dictionary of IEEE Standards Terms, 7th Ed. (Published December 2000), Standards Information Network, IEEE Press, Print ISBN 0-7381-2601-2
1008	Certified Prosecution History of U.S. Patent No. 7,818,176
1009	Asthana, A. & Krzyzanowski, P., “A Small Domain Communications System for Personalized Shopping Assistance,” Proceedings of 1994 International Conference on Personal Wireless Communications (pp. 199-203), IEEE Press (Aug. 1994)
1010	Lucente, M., “Conversational interfaces for e-commerce applications,” Communications of the ACM (Sept. 2000), 43(9), 59-61
1011	Huang et al., “Spoken Language Processing: A Guide to Theory, Algorithm, and System Development,” Prentice Hall (2001)
1012	U.S. Patent No. 6,859,776 to Cohen et al.
1013	Curriculum Vitae of Padhraic Smyth, Ph.D.
1014	Declaration of Rachel J. Watters (for Huang, et al., “Spoken Language Processing: A Guide to Theory, Algorithm and System Development,” Prentice Hall (2001))
1015	Certified English Translation of Japanese Patent App. Pub. No. 2002/297626 to Yonebayashi et al.

Exhibit	Description
1016	Certificate of Translation for Japanese Patent App. Pub. No. 2002/297626 to Yonebayashi et al.
1017	Japanese Patent App. Pub. No. 2002/297626 to Yonebayashi et al.
1018	U.S. Patent No. 6,173,250 to Jong
1019	U.S. Patent No. 7,774,333 to Colledge et al.
1020	U.S. Patent No. 7,634,409 to Kennewick et al.
1021 – 1029	Reserved
1030	Claim listing for U.S. Patent No. 7,818,176

I. INTRODUCTION

In accordance with 35 U.S.C. §§ 311-319 and 37 C.F.R. §§ 42.1-.80, 42.100-.123, Amazon.com, Inc., Amazon.com LLC, Amazon Web Services, Inc., A2Z Development Center, Inc. d/b/a Lab126, Rawles LLC, AMZN Mobile LLC, AMZN Mobile 2 LLC, Amazon.com Services, Inc. f/k/a Amazon Fulfillment Services, Inc., and Amazon.com Services LLC (formerly Amazon Digital Services LLC) (collectively “Petitioners”) respectfully request review of claims 1-52 of U.S. Patent No. 7,818,176 to Freeman et al., titled “System and Method for Selecting and Presenting Advertisements Based On Natural Language Processing of Voice-Based Input” (the “’176 patent”), owned by VB Assets, LLC (“Patent Owner”), and seeks a determination that all claims (1-52) of the ’176 patent be canceled as unpatentable. Ex. 1001. Because it is reasonably likely that Petitioners will prevail on at least one challenged claim, the Patent Trial and Appeal Board should institute review of the ’176 patent.

II. COMPLIANCE WITH REQUIREMENTS FOR A PETITION FOR *INTER PARTES* REVIEW

A. Grounds for Standing (37 C.F.R. § 42.104(a))

Petitioners certify that the ’176 patent is eligible for *inter partes* review and Petitioners are not barred or estopped from requesting the review.

B. Fees for *Inter Partes* Review (37 C.F.R. § 42.15(a))

The Director is authorized to charge the fee specified by 37 C.F.R. § 42.15(a) to Deposit Account No. 19-2555.

C. Mandatory Notices (37 C.F.R. § 42.8)

Petitioners are the real parties-in-interest. No other party had access to, control over, or contributed to funding of the preparation or filing of this Petition.

Patent Owner asserts the '176 patent against Petitioners¹ in a related case: *VB Assets, LLC v. Amazon.com Inc., et al.*, Civil Action No. 1:19-cv-01410-MN (D. Del. July 29, 2019). Petitioners are unaware of any other judicial or administrative matter that would affect, or be affected by, a decision in this proceeding.

Petitioners designate J. David Hadden, Reg. No. 40,629, as lead counsel, Saina Shamilov, Reg. No. 48,266, and Allen Wang, Reg. No. 68,456, all with Fenwick & West LLP, 801 California Street, Mountain View, CA 94041, telephone: (650) 988-8500, fax: (650) 938-5200.

Service of any documents may be made to the postal mailing address above. Petitioners consent to electronic service at VBAssets-IPR@fenwick.com. A Power

¹ Amazon Digital Services LLC, named in the D. Del. case, became Amazon.com Services LLC on January 1, 2020. Neither Rawles LLC nor AMZN Mobile 2 LLC are properly named defendants.

of Attorney is being filed concurrently with the designation of counsel in accordance with 37 C.F.R. § 42.10(b).

III. THRESHOLD FOR REVIEW (35 U.S.C. § 314(A))

It is reasonably likely that Petitioners will prevail on at least one of the challenged claims because the subject matter recited in claims 1-52 of the '176 patent was well known in the prior art, as shown herein. Any motivation to combine the prior art is provided herein as necessary.

IV. IDENTIFICATION OF CHALLENGED CLAIMS (37 C.F.R. § 42.204(B))

A. Relied Upon Patents and Publications

- Ex. 1003: U.S. Patent App. Pub. No. 2004/0193420 to Kennewick et al.
- Ex. 1015: Certified Translation of Japanese Patent App. Pub. No. 2002/297626 to Yonebayashi et al.
- Ex. 1018: U.S. Patent No. 6,173,250 to Jong
- Ex. 1019: U.S. Patent No. 7,774,333 to Colledge et al.

B. Statutory Grounds

Petitioners request *inter partes* review on the grounds below under 35 U.S.C. § 103.

Ground	References	Claims Challenged
1	Kennewick, Yonebayashi, and Jong	1-3, 6-19, 22-29, 32-45, and 48-52

2	Kennewick, Yonebayashi, and Jong in further view of Colledge	4, 5, 20, 21, 30, 31, 46, and 47
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V. LEVEL OF ORDINARY SKILL IN THE ART

A “person of ordinary skill in the art” (“POSITA”) would have at least a Bachelor-level degree in computer science, computer engineering, electrical engineering, or a related field in computing technology, and two years of experience with automatic speech recognition and natural language understanding, or equivalent education, research experience, or knowledge.

VI. OVERVIEW OF THE ’176 PATENT

The ’176 patent, titled “System and Method for Selecting and Presenting Advertisements Based on Natural Language Processing of Voice-Based Input,” was filed on February 6, 2007.

The ’176 patent describes “selecting and presenting an advertisement based on...[a] natural language voice-based input.” *See, e.g.*, Ex. 1001, 1:66-2:3. The ’176 patent identifies a speech recognition system 100 that includes an input device 105, an Automatic Speech Recognizer 110 (“ASR”), a conversational language processor 120, and an output device 180, among others. *Id.*, Fig. 1. A user utterance is received “at [] input device 105...(e.g., a microphone).” *Id.*, 3:28-32. The utterance is then processed by ASR 110. *Id.*, 3:35-36.

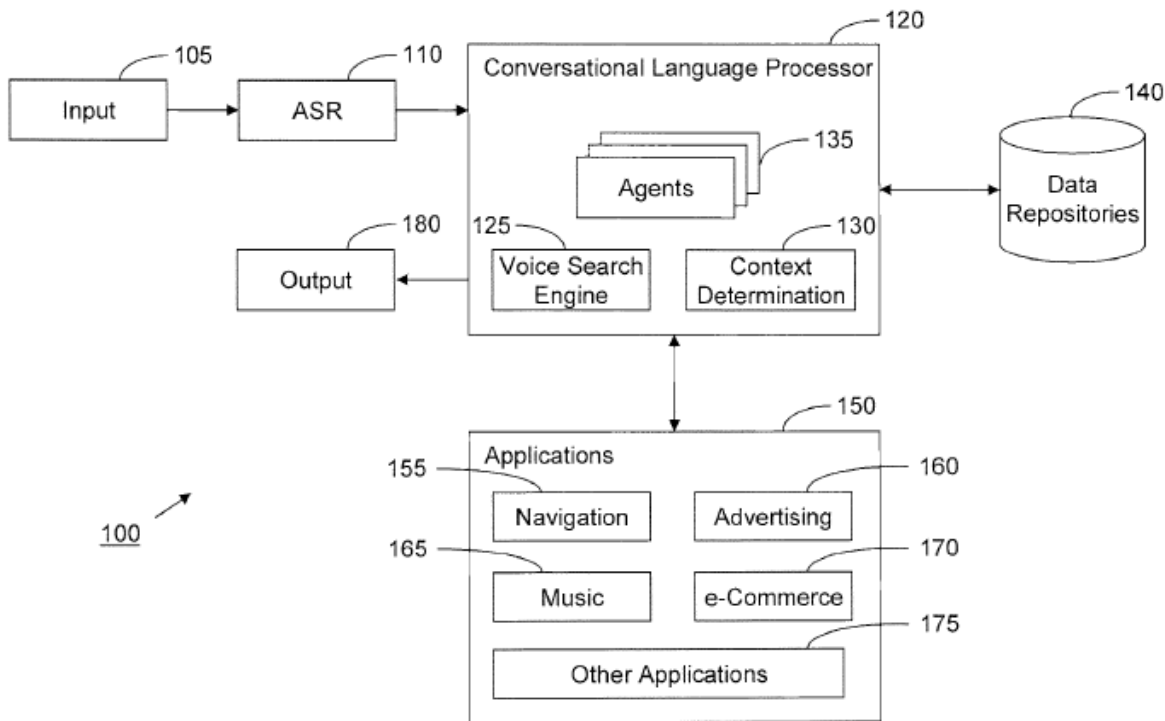


Fig. 1

The ASR can “interpret the utterance using...phonetic dictation to recognize a stream of phonemes.” *Id.*, 3:35-41. The ASR may “recognize words and phrases...using entries in one or more dictionary and phrase tables” and dynamically update “fuzzy set possibilities or prior probabilities for the words in the dictionary and phrase tables” to “maximize the probability of correct recognition at each stage of the dialog.” *Id.*, 3:14-27.

The conversational language processor may use “context determination module 130 to establish a context...by having domain agents 135 competitively generate a context-based interpretation” of the utterance. *Id.*, 4:25-30. Additionally, “an en-

vironmental model may be accessed to determine user location,...[and] other environmental information to invoke context, domain knowledge, [and] preferences...to enhance the interpretation of questions and/or commands.” *Id.*, 4:65-5:3. A “personalized cognitive model,[] [may] provide statistical abstracts of user interaction patterns...[and] predict[] [] user behavior.” *Id.*, 5:5-9. The conversational language processor also has an adaptive misrecognition function to reinterpret current or previous utterances. *Id.*, 4:45-48.

The '176 patent also discloses selecting and presenting an advertisement in response to a user's utterance. *Id.*, 10:30-51; Fig. 3 (steps 305-325, below).

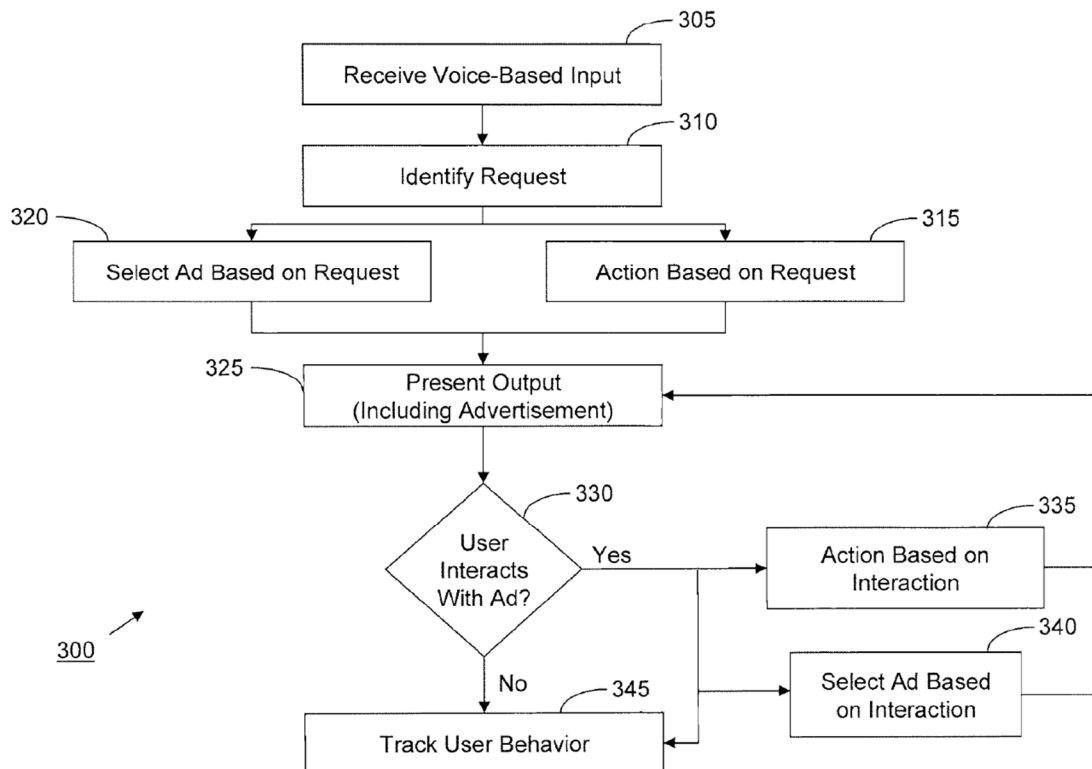


Figure 3 also illustrates tracking user interactions with the presented advertisement. *Id.*, 11:11-12. “For example, operation 345 may track historical data about users,

conversations, topics, contexts” or “other criteria” and “may [] be used to build statistical profiles defining affinities...between advertisements...demographics, or other criteria based on user behavior with the advertisements.” *Id.*, 11:11-23.

The ’176 patent provides an example of selecting and presenting an advertisement when the user asks “How do I get to the Space Needle?” *Id.*, 8:55-56. The system determines the context is “Navigation” and “Seattle” and uses this context to “retrieve an address of the Space Needle and [uses] a navigation application [t] calculate the route.” *Id.*, 8:56-59. The system also uses user profile information indicating that “the user is visiting” to select “an advertisement for popular points-of-interest in Seattle.” *Id.*, 8:59-63.

A. Claim Listing

Exhibit 1030 is a claim listing enumerating each claim element.

VII. CONSTRUCTION OF THE CHALLENGED CLAIMS (37 C.F.R. § 42.104(B)(3))

Claim constructions must comport with “intrinsic” evidence: the words of the claims, the specification, the figures, and the patent prosecution history. *See* 37 C.F.R. § 42.100(b) (same standard for IPR and federal court actions); *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314-17 (Fed. Cir. 2005) (en banc). Terms should be given the meaning “a person of ordinary skills in the art in question at the time of the invention” would ascribe them based on the patent and its file history. *Phillips*, 415 F.3d at 1313. Although Petitioners do not identify any claim term that requires

construction in this Petition, the challenged claims should be interpreted in accordance with § 42.100(b).²

VIII. THE PRIOR ART DISCLOSED THE FEATURES CLAIMED BY THE '176 PATENT

The concepts of selecting and presenting advertisements based on voice-based inputs were well known to POSITAs and described in patents and publications before the February 2007 priority date. Indeed, the '176 patent acknowledges that the ASR and conversational language processor implement speech recognition techniques known in the art. For example, the '176 patent's ASR is incorporated from U.S. Pat. No. 7,634,409 (Ex. 1001, 3:46-51), the conversational language processor's "context-based interpretations" are incorporated from U.S. Pat. No. 7,640,160 and U.S. patent application Ser. No. 11/212,693 (*id.*, 4:34-44), and the adaptive misrecognition techniques are incorporated from U.S. Pat. No. 7,620,549 and U.S. patent application Ser. No. 11/580,926 (*id.*, 4:55-64).

Moreover, the references below discuss speech-based applications and disclose an ASR, conversational language processor, adaptive misrecognition

² For the avoidance of any doubt, nothing in this Petition is a waiver of any arguments, positions, or appellate rights of Petitioners, including, but not limited to, claim construction.

engine, recognizing one or more words or phrases in the natural language utterances, interpreting the recognized words and phrases by establishing a context, and selecting and presenting advertisements based on the context. The references also disclose tracking user interaction with the presented advertisements.

A. U.S. Patent App. Pub. No. 2004/0193420 (“Kennewick”)

Kennewick, titled “Mobile Systems and Methods for Responding to Natural Language Speech Utterances,” published on September 30, 2004 and is prior art to the ’176 patent under § 102(b). Both Kennewick and the patent application that issued as the ’176 patent, which does not claim priority to Kennewick, were filed by VoiceBox Technologies Corporation (“VoiceBox”).³ But this common ownership does not disqualify Kennewick because it is § 102(b) art. *See* § 103(c)(1) (commonly owned “prior art *only under* one or more of subsections (e), (f), and (g) of section 102, shall not preclude patentability under this section”). Additionally, the ’176 patent incorporates by reference the disclosures of corresponding U.S. Patent No. 7,693,720 that issued from Kennewick. Ex. 1001, 3:3-14.

Kennewick discloses a “speech interface” that enables “mobile users to ask natural language speech questions or give natural language commands in a wide range of domains.” Ex. 1003, [0002]. The speech interface “present[s] results in a

³ VoiceBox is a predecessor-in-interest of Patent Owner.

natural manner even in cases where the question asked or the responses received are incomplete, ambiguous or subjective.” *Id.* It also makes “significant use of context, prior information, domain knowledge, and user specific profile data” to interpret a user’s request and provide responses. *Id.*, Abstract.

The speech interface includes a “speech unit 128” with “one or more microphones...134” to receive the utterances of the user. *Id.*, [0121]; Fig. 5 (below). The speech is processed by a speech recognition engine 120 to “recognize words and phrases, using for example, information in the dictionary and phrase tables 112.” *Id.*, [0155]. Parser 118 and agents 106 work together to determine the context of and interpret the recognized words and phrases. *Id.*, [0160], [0161]. In one example, context is based on “[p]ersonal profiles” that may “include information specific to the individual, their interests, their special use of terminology, the history of their interactions with the system, and domains of interest.” *Id.*, [0143].

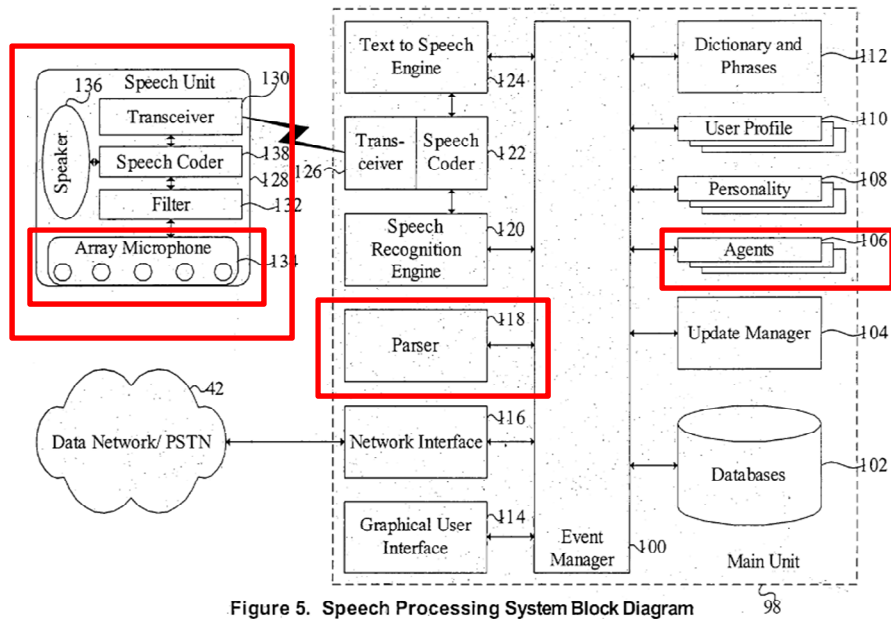


Figure 5. Speech Processing System Block Diagram

Parser 118 may also use a scoring system to determine the most likely context of the user's utterance. The "score can be determined from weighting...factors including, the user profile 110, the domain agent's 156 knowledge and previous context." *Id.*, [0161]. If the score is not high enough, the system determines that a reliable response cannot be generated and "ask[s] a question of the user to verify the question or command is correctly understood." *Id.*

Additionally, Kennewick discloses providing promotional offers to users. *Id.*, [0060], [0066]. These offers may be targeted to each user based on "user profile information, history, location,...etc." *Id.*, [0065]. For example, "the system can provide interactive offers and promotions for goods and services along the route, or in advance of a particular trip." *Id.*

B. Japanese Patent App. Pub. No. 2002-297626 (“Yonebayashi”)

Yonebayashi, titled “Information Presentation Device, Information Presentation Program, and Information Presentation Method,” published on October 11, 2002 and is prior art to the ’176 patent under § 102(b). Ex. 1015 is a certified translation of Yonebayashi, Ex. 1017 is the source Japanese Patent Application Publication, and Ex. 1016 is the certificate of translation.

Similar to Kennewick, Yonebayashi discloses a system that interprets a request “spoken by the user...to present an appropriate advertisement.” Ex. 1015, [0008], [0017]; Fig. 2. A user’s spoken request is captured by a microphone. *Id.*, [0010]. A “voice recognition device 21” “recognizes the voice captured by the microphone and converts the voice to text data.” *Id.*, [0047]. The “text data” is then “convert[ed]...into character string information” representing the recognized words or phrases of the user’s utterance. *Id.* Yonebayashi’s goal is to use this information to select “an advertisement of interest to a user at a desired time” to “enhance[] the effect of advertising.” *Id.*, [0002], [0017].

Figure 5 identifies examples of advertisements that are presented in response to a user’s utterance. When a user states “I’ve been fatigued recently,” the speech recognition system identifies the keyword “fatigue” and determines the context that the user is likely tired. *Id.*, [0050], [0049]. The system uses this context to present an advertisement for the energy drink “Rogain J.” *Id.*, [0051], Figures 5(a)-(b). The

user interacts with the presented advertisement by responding “I don’t need that now.” *Id.*, [0052], Figure 5(a). The system identifies the keywords “don’t need” and based on that context, responds to the user “Oh, I’m sorry[.] I’ll stop the advertisement.” *Id.*

[FIGURE 5]

<Conversation example between user and agent>

(a)

User : I've been fatigued recently.
Agent : "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User : I don't need that now . . .
Agent : Oh, I'm sorry. I'll stop the advertisement.

(b)

User : I've been fatigued recently.
Agent : "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User : I want to see an advertisement for a different manufacturer.
Agent : Then how about Chuho Pharmaceutical's 'Neovita Drink' . . .

In another example, the user requests a different energy drink brand, stating “I want to see an advertisement for a different manufacturer.” *Id.*, [0053], Figure 5(b). The system identifies the keywords “different” and “manufacturer” and based on that context responds “Then how about Chuho Pharmaceutical’s ‘Neovita Drink[?]’” *Id.*, [0053].

This selection of advertisements is based on “if-then format rules.” *Id.*, [0039]. The “if-then format rules” can also be applied to the identification of

“remark history (what topics were mentioned in the past, etc.), progress status of inquiry responses (hierarchical information on inquiry responses, etc.), user information (likes, dislikes, etc.), and various other items.” *Id.*

C. U.S. Patent No. 6,173,250 (“Jong”)

Jong, titled “Apparatus and Method for Speech-Text-Transmit Communication Over Data Networks,” issued on January 9, 2001 and is prior art to the ’176 patent under § 102(b).

Similar to Kennewick, Jong discloses recognizing the words and phrases of a natural language utterance. Ex. 1018, Abstract. “When the speech input signals are received...spectral analysis device 301...extracts feature vectors...[that are] are input to a word-level matching device 302” and are compared “against the word models retrieved by the word model device 303.” *Id.*, 5:41-47. “The word model device 303 identifies the phonemes in the speech input signals and extracts the corresponding syllables from the subword model database 304.” *Id.*, 5:59-61. “The syllables are then checked against the lexicon data stored in the lexicon database 305” so that “the syllables that make up the various words in the speech input signals are grouped into the recognizable words identified using the lexicon database 305.” *Id.*, 5:61-67.

D. U.S. Patent No. 7,774,333 (“Colledge”)

Colledge, titled “System and Method of Associating Queries and Documents with Contextual Advertisements,” published on April 14, 2005 and is prior art to the ’176 patent under § 102(b).

Colledge discloses “a method of providing advertisements to users.” Ex. 1019, 1:48. Advertisements are selected in response to a user query that “may [] be structured in natural language as a sentence or question.” *Id.*, 4:61-62. Colledge also discloses tracking user interaction with “advertisements that have already been displayed...[and] viewing or purchasing habits of the end-user.” Ex. 1019, 12:24-28. When a user is “interested in [an] advertisement” the system “collect[s] other demographic information about the end-user useful in selecting advertisements likely to interest the end-user” *Id.*, 12:16-23. This information is then used to select subsequent advertisements that may match the characteristics of the user. *Id.*, 12:28-30; 12:42-45.

One way of performing this matching is using “a machine learning classifier” such as a “Naïve Bays [sic]” classifier, which “is well known in the art” and offers the benefit that “it does not require an exact match.” *Id.*, 13:6-15. This classifier “produce[s] a list of candidate advertisement [sic] where the characteristics of the advertisement matches those of the request” from the user. *Id.*, 13:16-18.

IX. THE CHALLENGED CLAIMS ARE INVALID UNDER § 103.

Pursuant to Rule 42.104(b)(4)-(5), the following analysis demonstrates where every element of the challenged claims is disclosed by each ground.

A. Ground 1: Claims 1-3, 6-19, 22-29, 32-45, and 48-52 are rendered obvious by Kennewick in combination with Yonebayashi and Jong.

Kennewick, in view of Yonebayashi and Jong renders claims 1-3, 6-19, 22-29, 32-45, and 48-52 obvious.

A POSITA would have found it obvious to combine Kennewick in view of Yonebayashi and Jong. Kennewick and Yonebayashi are in the same field of interactive speech technology, which includes speech recognition as disclosed by Jong.

Kennewick discloses “a mobile interactive natural language speech system” that “receives spoken natural language queries, commands and/or other utterances from a user...processes the input...and responds to the user with a natural language speech response.” Ex. 1003, [0012], [0014]. Kennewick’s “speech interface device” also provides “offers and promotions for goods and services,” such as “location based marketing programs...[for] promotional offers from merchants along a route of travel.” *Id.*, [0066].

Yonebayashi similarly discloses a speech recognition system that performs “voice recognition on voice data” from a user, determines the “topic [] related to []

keywords spoken by the user” and “present[s] an appropriate advertisement.” Ex. 1015, [0008], [0010]; [0017] (“select[ing] [] advertisement that matches the user’s taste and [] is presented at an appropriate tim[e]”). A user can then interact with the presented advertisement with further voice inputs, such as “I don’t need that now,” or “I want to see an advertisement for a different manufacturer.” *Id.*, [0052], [0053]; Fig. 5.

Additionally, both Kennewick and Yonebayashi share the same architecture of an interactive speech system. Both disclose an input device such as a microphone that captures a user’s voice input. Ex. 1003, [0121], [0066]; Ex. 1015, [0047], Fig. 5. Both disclose a microphone that receives the user’s natural language input. Both disclose a speech recognition engine/device that recognizes the words and phrases of the user’s voice input. Ex. 1003, [0123]; Ex. 1015, [0047]. Both disclose determining the context of the recognized words and phrases. Ex. 1003, [0031]-[0033], [0123], [0127]; Ex. 1015, [0007], [0008], [0021]-[0023], [0039]. And both disclose selecting and presenting an advertisement to the user’s device. Ex. 1003, [0123], [0127], [0128]; Ex. 1015, [0010], [0049]-[0053], Fig. 5. Yonebayashi provides further detail on how to select an advertisement based on the user’s interests and dialog history, and how a user can interact with that advertisement. Ex. 1015, [0039]; Fig. 5. A POSITA would be motivated to combine Kennewick and Yonebayashi by, for example, refining the speech system of Kennewick to select

advertisements that are related to the topic of the user’s voice input and enable user interaction with those advertisements, as taught by Yonebayashi.

Jong also discloses a speech recognition system similar to that of Kennewick and Yonebayashi. Jong discloses recognizing the words and phrases of a natural language utterance. Ex. 1018, Abstract. Figure 3 of Jong discloses a speech recognition device 203, which receives a speech signal. A “word-level matching device 302” compares the speech signal “against the word models retrieved by the word model device 303.” *Id.*, 5:41-47. “The word model device 303 identifies the phonemes in the speech input signals and extracts the corresponding syllables from the subword model database 304.” *Id.*, 5:59-61. “The syllables are then checked against the lexicon data stored in the lexicon database 305” so that “the syllables that make up the various words in the speech input signals are grouped into the recognizable words identified using the lexicon database 305.” *Id.*, 5:61-67.

Kennewick, Yonebayashi, and Jong have complimentary disclosures that describe similar architectures for speech recognition. A POSITA would have been motivated to implement the speech recognition engines of Kennewick and Yonebayashi to map phonemes to syllables and recognize words and phrases from those syllables, as taught by the speech recognition device of Jong. This combined system would enhance how words and phrases are recognized from a user’s voice input.

1. Claim 1

[1(pre)] “A method for selecting and presenting advertisements in response to processing natural language utterances, comprising:”

To the extent the preamble is limiting, it is disclosed by the prior art. Kennewick discloses a “speech interface” that enables “mobile users to ask natural language speech questions or give natural language commands.” Ex. 1003, [0002]. These utterances include, for example, “tune in my favorite radio station,” and “what about flight one hundred and twenty too?” *Id.*, [0027], [0163].

Kennewick also discloses selecting and presenting advertisements in response to a user’s utterance. Occupants of a vehicle can “query the system for offers and promotions for goods and services along [a] travel route...[and] [t]he system can provide interactive offers and promotions.” Ex. 1003, [0066]. “Alternatively, the system can provide interactive offers and promotions for goods and services along the route, or in advance of a particular trip.” *Id.* These promotions may be determined by “[l]ocation based marketing programs...from merchants” along the route. *Id.*

Yonebayashi also discloses this limitation. Yonebayashi discloses a speech system that performs “voice recognition on voice data” from a user, determines the “topic [] related to [] keywords spoken by the user,” and “present[s] an appropriate advertisement.” Ex. 1015, [0008], [0010]. Figure 5 identifies examples of advertisements that are presented in response to a user’s utterances. When a user

states “I’ve been fatigued recently,” determines the context of the user’s utterance is that the user is likely fatigued and presents the user with an “energy drink” advertisement. *Id.*, [0049], [0051], Figure 5 (excerpted below).

[FIGURE 5]

<Conversation example between user and agent>

(a)

User : I've been fatigued recently.
Agent : "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User : I don't need that now . . .
Agent : Oh, I'm sorry. I'll stop the advertisement.

(b)

User : I've been fatigued recently.
Agent : "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User : I want to see an advertisement for a different manufacturer.
Agent : Then how about Chuho Pharmaceutical's 'Neovita Drink' . . .

A POSITA would have found it obvious to combine Kennewick and Yonebayashi as both references have complementary disclosures of selecting and presenting an advertisement in response to a user’s natural language utterance. Ex. 1002, ¶90.

[1.a] “receiving a natural language utterance containing at least one request at an input device;”

Kennewick discloses “a mobile interactive natural language speech system” that includes an input device called a “speech unit” to “receive the utterances of the user.” Ex. 1003, [0012], [0121]. “Speech unit 128 can be permanently attached to the vehicle 10 or can be part of a handheld device 36 or a fixed home or office

computer system 44.” *Id.*, [0096]; Figs. 1-5. Figure 5, below, illustrates an example where speech unit 128 is in wireless communication with main unit 98. Ex. 1003, Fig. 5. “The speech unit 128 includes one or more microphones, for example array microphone 134, to receive the utterances of the user.”⁴ Ex. 1003, [0121].

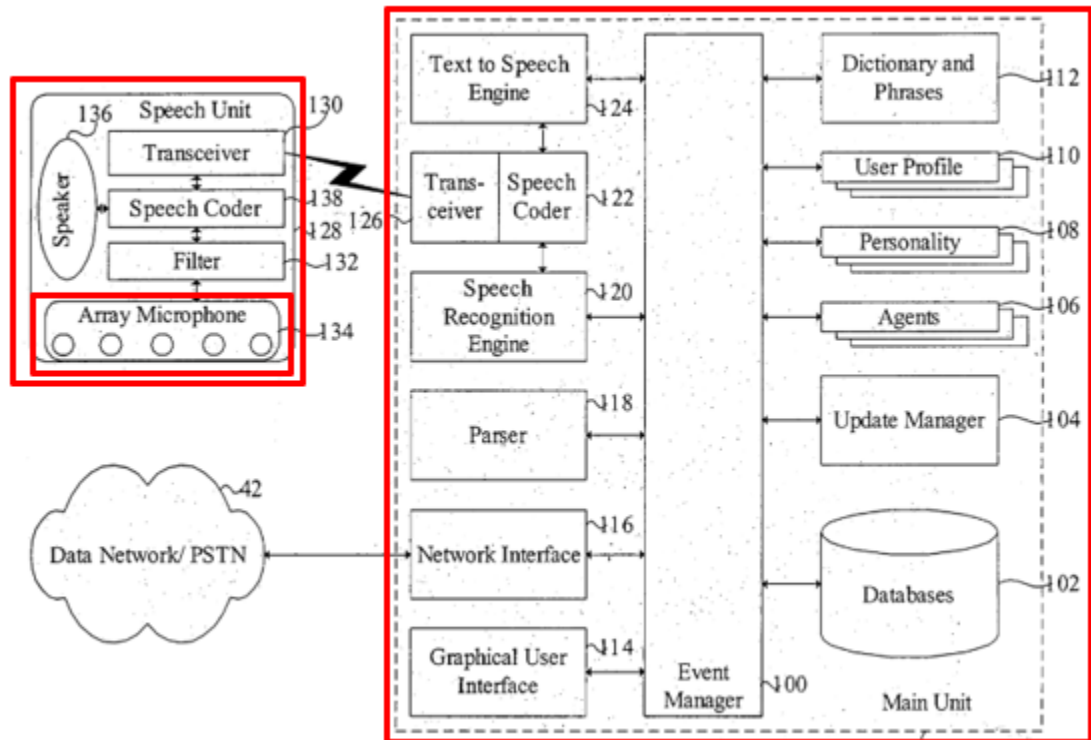


Figure 5. Speech Processing System Block Diagram

98

Kennewick also discloses receiving at least one request. The received utterances “can include both aspects of a command and a query or question.” Ex. 1003, [0017], [0027]. For example, the user may verbally request “tune in my

⁴ Unless otherwise noted, all emphasis is added.

favorite radio station” which causes the system to “determine the name, and/or the channel of the use[r]’s favorite station.” *Id.*, [0027].

[1.b] “recognizing one or more words or phrases in the natural language utterance at a speech recognition engine coupled to the input device,”

Kennewick discloses that “for each user utterance...the system...1) captur[es] the user’s question or query through accurate speech recognition operating in a variety of real-world environments; [and] 2) pars[es] and interpret[s] the question or query” among other steps. Ex. 1003, [0028].

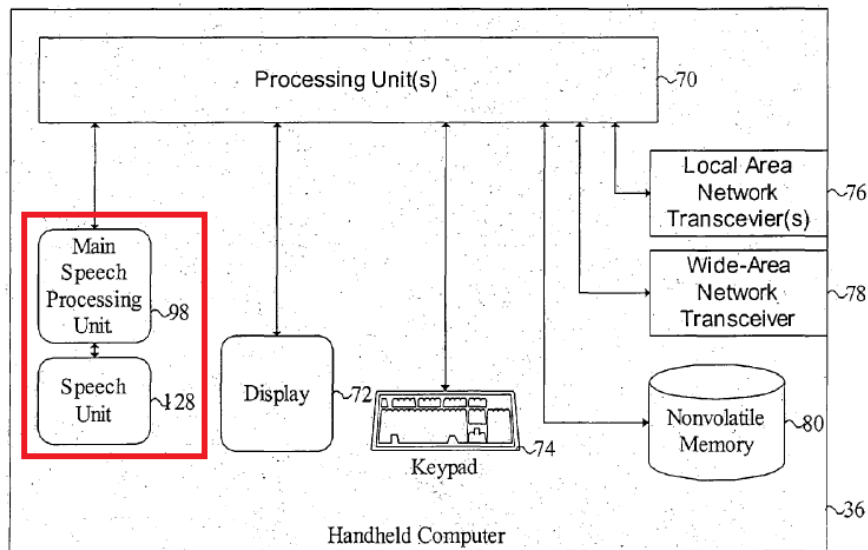
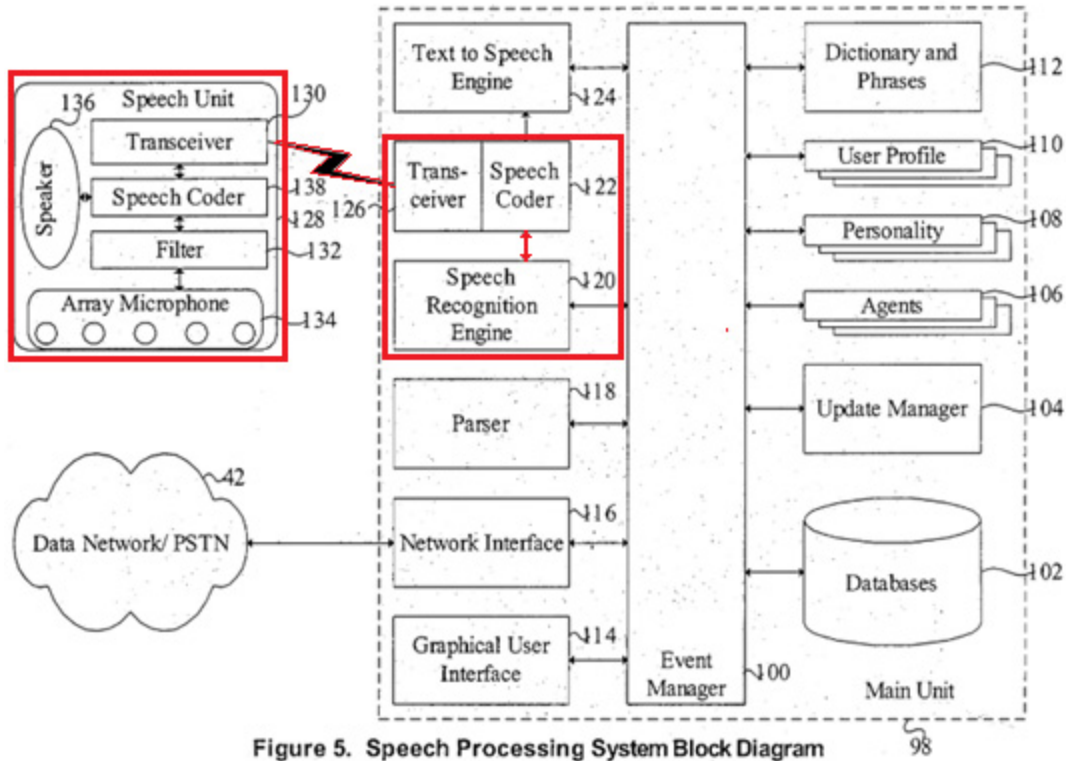
Kennewick discloses that a speech recognition engine recognizes one or more words in the natural language utterance. As discussed in Section IX.A.1[1.a], the user’s utterance is transmitted by the speech unit 128 to the main unit 98. Ex. 1003, [0121]; Fig. 5. The user’s speech is “processed by the speech recognition engine 120 using data in the dictionary and phrases module 112 and received from the agents 106.” *Id.*, [0123]. This process results in “speech recognition engine 120 [] *recogniz[ing] words and phrases.*” *Id.*, [0123], [0155].

Additionally, Kennewick discloses that the speech unit 128—the input device—is coupled to the speech recognition engine 120 of main unit 98. For example, Figure 5 (below) illustrates that the speech recognition engine 120 within main unit 98 is wirelessly coupled to speech unit 128 via the transceiver 126 and speech coder 112. *Id.*, Fig. 5. The coded speech signal is transmitted by transceiver 130 of speech unit 128 and is received by the transceiver 126 of the main unit 98.

Id., [0121]-[0123]. The coded signal is decoded by speech coder 122 of the main unit 98 and the decoded signal is provided as an input to the speech recognition engine 120. *Id.*, [0121]-[0123]. But when “wires, optical fibers, or other connection techniques [] connect the speech unit and the main unit, [this] eliminat[es] the need for a speech coder 138”—*e.g.*, as shown by the wired connection between speech unit 128 and main unit 98 of Figures 3. *Id.*, [0122]; Figs. 3, 4.

A POSITA would have understood that if there is no need for speech coder 138 in the speech unit 128, there is also no need for speech coder 122 within main unit 98. Ex. 1002, ¶96. A POSITA would have also understood that with a wired connection between main unit 98 and speech unit 128 within the same computer, there would be no need for the transceivers 130 and 122, because transceivers are used to transmit and receive *wireless* signals. *Id.*

Thus, in the wired configuration of Figures 3 and 4 there are no transceivers or speech coders, resulting in the speech unit 128—the input device—being coupled to the speech recognition engine 120 of the main unit 98. Ex. 1002, ¶97.



[1.c] “wherein recognizing the words or phrases in the natural language utterance includes: mapping a stream of phonemes contained in the natural

language utterance to one or more syllables that are phonemically represented in an acoustic grammar; and”

As discussed in Section IX.A.1[1.b], Kennewick discloses that the “speech recognition engine 120...recognize[s] words and phrases.” Ex. 1003, [0123].

The recited term “acoustic grammar” does not appear in the specification of the ’176 patent. But the ’176 patent incorporates by reference U.S. Patent No. 7,634,409 (Ex. 1001, 3:46-51), which recognizes “[p]honeme recognition may be based on *any suitable acoustic grammar that maps a speech signal into a phonemic representation.*” Ex. 1020, 2:46-48. Additionally, “[p]ortions of a word may be represented by a syllable” in the grammar. Ex. 1020, 2:48-51 (SUMMARY OF THE INVENTION).

Jong discloses recognizing the words and phrases of a natural language utterance by mapping phonemes to syllables that are phonemically represented in an acoustic grammar. Figure 3 of Jong discloses a speech recognition device 203 that includes a spectral analysis device 301, a word-level matching device 302, and a word model device 303. Ex. 1018, 5:34-40. “When the speech input signals are received by the speech recognition device 203, the spectral analysis device 301...extracts feature vectors...[that are] are input to a word-level matching device 302” and are compared “against the word models retrieved by the word model device 303.” *Id.*, 5:41-47. “The word model device 303 includes a listing of phonemes (speech sounds)” and “retrieves information from the subword model and lexicon

databases 304 and 305.” *Id.*, 5:51-54. “The subword model database 304 contains word syllables that are correlated with the phonemes of the word model device 303” and the “lexicon database 305 stores a dictionary of recognizable words.” *Id.*, 5:55-58. “The word model device 303 identifies the phonemes in the speech input signals and extracts the corresponding syllables from the subword model database 304.” Ex. 1018, 5:59-61.

A POSITA would have understand from Jong’s disclosure of correlating syllables with phonemes that spectral analysis device 301, word-level matching device 302, and the word model device 303 are an acoustic grammar. Ex. 1020, 2:46-51; Ex. 1002, ¶101.

Kennewick and Jong disclose complementary speech recognition systems that recognize the words and phrases of a user’s natural language utterance. Ex. 1003, [0123]; Ex. 1018, 5:61-67. A POSITA would have found it obvious to implement Kennewick’s dictionary and phrases module 112 to include an acoustic grammar that recognizes a stream of phonemes in the user’s speech signal and maps the recognized stream of phonemes to syllables, as taught by Jong. Ex. 1018, 5:41-61; Ex. 1002, ¶103.

[1.d] “generating a preliminary interpretation for the natural language utterance from the one or more syllables, wherein the preliminary

interpretation generated from the one or more syllables includes the recognized words or phrases;

As discussed in Section IX.A.1[1.c], Jong discloses using the recognized phonemes from a speech signal to identify syllables. Ex. 1018, 5:59-61. “The syllables are then checked against the lexicon data stored in the lexicon database 305” so that “the syllables that make up the various words in the speech input signals are grouped into the recognizable words identified using the lexicon database.” *Id.*, 5:61-67. These recognized words are the recited “preliminary interpretation.” Thus, Jong explicitly discloses this limitation.

Kennewick and Jong disclose complementary speech recognition systems that recognize the words and phrases of a user’s natural language utterance. Ex. 1003, [0123]; Ex. 1018, 5:61-67. It would have been obvious to a POSITA to implement Kennewick’s dictionary and phrases module 112 to include a lexicon associating syllables with words as taught by Jong. Ex. 1003, [0123]; Ex. 1018, 5:59-67. This modification would allow the speech recognition engine 120 to generate a preliminary interpretation of the user’s natural language utterance by using the one or more recognized syllables to recognize words or phrases, as taught by Jong. Ex. 1003, [0123]; Ex. 1018, 5:59-67.

[1.e] “interpreting the recognized words or phrases at a conversational language processor coupled to the speech recognition engine, wherein

interpreting the recognized words or phrases includes establishing a context for the natural language utterance;”

Kennewick discloses that parser 118 and agents 106⁵ are the recited conversational language processor that interprets the recognized words or phrases and establishes a context for the natural language utterance. Kennewick discloses that “[o]nce the words and phrases have been recognized by the speech recognition engine 120...[t]he parser may determine *a context for an utterance.*” Ex. 1003, [0160]. For example, a user’s “question with the keyword[] ‘temperature’” may have a different meaning in different contexts. *Id.* In one context, the word “temperature” may “impl[y] a context value of weather for the question,” whereas in another context “temperature” may “imply a context for a measurement.” *Id.* “The parser 118 may use a scoring system to determine the most likely context or domain for a user’s question or command...[by] weighting a number of factors including, the user profile 110, the domain agent’s 156 knowledge and previous context.” *Id.*, [0161]. Information obtained from the user profile to determine context includes “location of vehicle, planned path or route...commonly visited destinations,” among others. *Id.*, [0031].

⁵ Figure 6 illustrates that agents 106 include system agent 150 and domain agents 156, among others. Ex. 1003, Fig. 6; Fig. 5.

Additionally, Kennewick discloses that the conversational language processor—parser 118 and agents 106—is coupled to the speech recognition engine 120. Figure 5 illustrates parser 118 coupled to speech recognition engine 120 via event manager 100. *Id.*, Fig. 5. Thus, Kennewick discloses this limitation.

It would have also been obvious to a POSITA that parser 118 could be directly coupled to speech recognition engine 120. Indeed, Kennewick discloses that the “speech recognition module,” “event manager,” “parser” and “agent module” are “software...modules” that “*can be distributed in any way* between a handheld device, a computer attached to a vehicle, a desktop computer or server *without altering the function, features, scope or intent of the invention.*” *Id.*, [0013]. A POSITA would have found it obvious to redistribute the functionality of certain software modules, including event manager 100, which simply “mediate[s] interactions between other components.” *Id.*, [0119]. For example, the relevant functionality of event manager 100 could be incorporated within speech recognition engine 120 and parser 118 so that these components directly communicate with one another. Ex. 1002, ¶109.

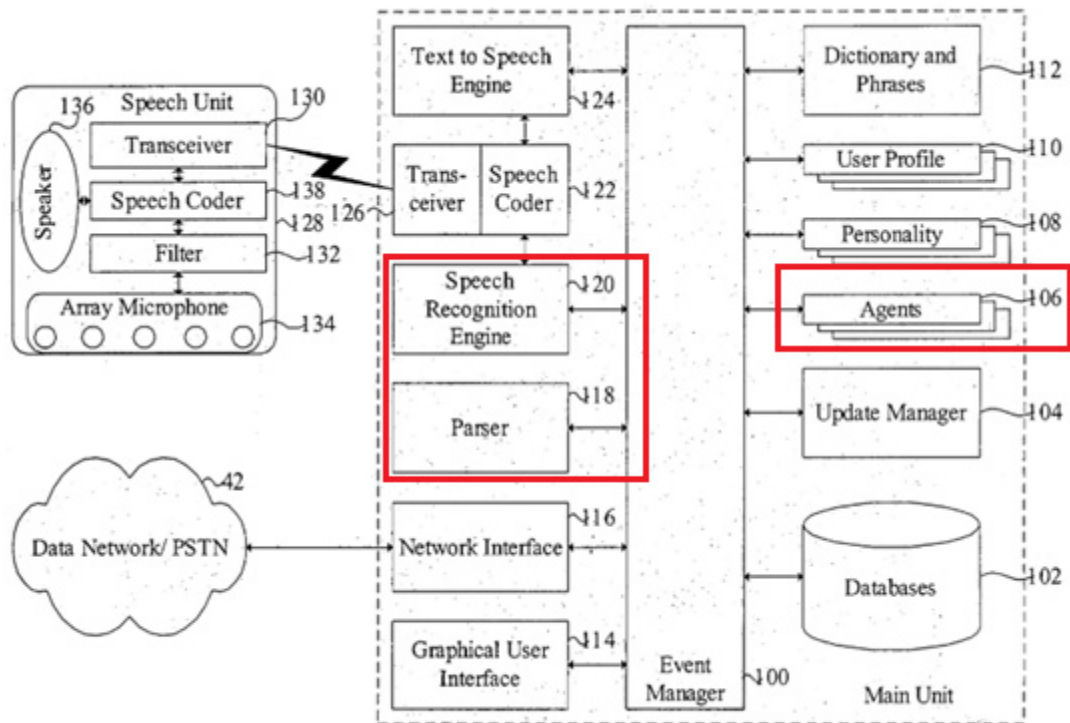


Figure 5. Speech Processing System Block Diagram

[1.f] “selecting an advertisement in the context established for the natural language utterance; and;”

Kennewick discloses that the speech interface may use “[l]ocation based marketing programs wherein occupants of the vehicle receive promotional offers from merchants along a route of travel.” Ex. 1003, [0066]. To do so, users can provide voice inputs in the form of “questions, queries and commands.” *Id.* As discussed in Section IX.A.1[1.e], Kennewick discloses that parser 118 determines “the most likely context or domain for a user’s question or command...[by] weighting a number of factors including, the user profile 110...” which has the “location of [the] vehicle” and the “planned path or route,” among other information. *Id.*, [0161], [0031]. After determining this context, “the system can

provide interactive offers and promotions for goods and services *along the route*, or in advance of a particular trip.” *Id.*, [0066]. Thus, Kennewick discloses this limitation.

Yonebayashi also discloses this limitation. Yonebayashi’s storage unit 6 includes a “case dictionary 62” that defines a “wide range of user remarks...as if-then format rules (cases)” to select an appropriate advertisement. Ex. 1015, [0034], [0039]. This makes it “possible to *select an advertisement* that matches the user’s taste and that is presented at an appropriate timing.” *Id.*, Abstract. In the example of Figure 5, Yonebayashi’s speech system selects and “presents an advertisement for an energy drink” in response to the user’s remark “I’ve been fatigued recently.” *Id.*, [0049]-[0053], Figure 5. The speech system’s identification of the word “fatigue” provides the context that the user is tired and presents a relevant advertisement for an “energy drink.” *Id.* The context is determined based on “case matching condition” defined as “if-then format rules.” *Id.* [0039]. Thus, if the “voice recognition device” identifies the “user remark[] ‘I’m tired,’” or similar words, such as “fatigued,” then the action “present a first candidate energy drink” is determined and an energy drink advertisement is presented to the user. *Id.* The “if-then format rules” are not only limited to the identification of keywords, but can also be applied to determine context based on “remark history (what topics were mentioned in the past, etc.), progress status of inquiry responses (hierarchical

information on inquiry responses, etc.), user information (likes, dislikes, etc.), and various other items.” *Id.*

Both Kennewick and Yonebayashi disclose complementary speech systems that interpret voice-based inputs to provide a user with relevant advertisements. A POSITA would have been motivated to modify Kennewick’s location-based advertisements in view of Yonebayashi so that the combined system could present a wider range of advertisements based on the user’s preferences and the user’s interaction with presented advertisements. Ex. 1015, [0002], [0034]-[0041]. For example, the combined system would implement Yonebayashi’s tracking of user preferences and interactions with the presented advertisement to refine future location-based advertisements that are presented to the user. Ex. 1018, Abstract (presenting “an advertisement with [] appropriate content at an appropriate timing [sic]”). This modified system would also use the contextual information of Kennewick to select targeted advertisements that can be presented to the user “in a natural manner even in cases where the question asked or the responses received are incomplete, ambiguous or subjective.” Ex. 1003, [0002]. It would have also been obvious for Kennewick to present advertisements that may not be based on the location of the user, as taught by Yonebayashi. Ex. 1015, [0051-53]; Fig. 5.

[1.g] “presenting the selected advertisement via an output device coupled to the conversational language processor.”

Kennewick discloses providing “occupants of the vehicle...offers and promotions for goods and services” via “a wireless or wired network equipped handheld device or...a wired or wireless network desktop system.” Ex. 1003, [0065], [0066]. Indeed, “the invention 98, 128 on vehicles 10, in handheld devices 36 and fixed computer 44...provide an interactive natural language speech user interface” that enables the “transmission of speech and video.” *Id.*, [0101], [0112], [0116]; Fig. 1 (illustrating display 18 of vehicle computer 10), Fig. 3 (illustrating display 72 of handheld computer 36), Fig. 4 (illustrating display 86 of fixed computer 44).

Kennewick further discloses that agents 106⁶—which make up the conversational language processor discussed in section IX.A.1[1.e]—are coupled to the display device. For example, for “video, pictures and graphics [that are] best presented in a displayed format[] [t]he domain agents 156...present the information through the graphical user interface 114” which includes a display 18. Ex. 1003, [0182]; [0125]; Fig. 1 (display 18). A POSITA would have understood from this disclosure that Kennewick’s agents 106 are coupled to display 72 of Figure 3 and

⁶ Figure 6 illustrates that agents 106 include system agent 150 and domain agents 156, among others. Ex. 1003, Fig. 6.

display 84 of Figure 4 to present video, picture, and graphic advertisements to a user. Thus, Kennewick discloses this limitation.

Additionally, as described in Section IX.A.1[1.f], Figure 5 of Yonebayashi illustrates an example of the system presenting an advertisement for the energy drink “Rogain J” after understanding that the user is fatigued. Ex. 1015, [0049]-[0053], Figure 5. Yonebayashi further discloses that the advertisement may be presented to a user via “text data or image information on the display means.” *Id.*, [0010]. Thus, Yonebayashi also discloses presenting the selected advertisement via an output device such a display.

As described in Section IX.A.1[1.f], a POSITA would have been motivated to combine the contextual information of Kennewick with Yonebayashi’s use of conditional information, user preferences, and user interaction, to select and present a wider range of targeted advertisements at an appropriate time. Ex. 1003, [0002]; Ex. 1015, Abstract, [0002], [0034]-[0041].

2. **Claim 2: “The method of claim 1, wherein the conversational language processor selects the advertisement based on information related to one or more of the recognized words or phrases, an action associated with the request, a personalized cognitive model derived from an interaction pattern for a specific user, a generalized cognitive model derived from an interaction pattern for a plurality of users, or an environmental model derived from environmental conditions or surroundings associated with the specific user.”**

This limitation recites a list introduced by “one or more,” thus only one of the recited requirements must be disclosed for invalidity. *Ex parte Kubin*, 2007 Pat. App. LEXIS 13, at *10 (B.P.A.I. May 31, 2007), *aff’d*, 561 F.3d 1351, 1361 (Fed. Cir. 2009) (single obvious species renders claimed genus unpatentable).

As discussed in Sections IX.A.1[1.e]-[1.g], Kennewick and Yonebayashi disclose selecting an advertisement based on information related to the recognized words of the user’s natural language utterance. The information used to select the advertisement is the established context for those words. Thus, Kennewick and Yonebayashi disclose this limitation.

Kennewick discloses that the conversational language processor—parser 118 and agents 106—selects the advertisement based on an environmental model derived from the environmental conditions or surroundings associated with the specific

user.⁷ Kennewick discloses that the speech interface may use “[l]ocation based marketing programs wherein occupants of the vehicle receive promotional offers from merchants along a route of travel.” Ex. 1003, [0066]. This location based marketing of merchants along the route of travel are the recited “environmental conditions or surroundings associated with the specific user.” To provide such location-based marketing, Kennewick discloses that users can provide voice inputs in the form of “questions, queries and commands.” *Id.*, [0017], [0027]. As discussed in Section IX.A.1[1.e], the parser 118 determines “the most likely context or domain for a user’s question or command...[by] weighting a number of factors including, the user profile 110...” which has the “*location of [the] vehicle*” and the “*planned path or route*,” among other information. *Id.*, [0161], [0031]. After determining this context, “the system can provide interactive offers and promotions for goods and services *along the route*, or in advance of a particular trip.” *Id.*, [0066].

A POSITA would have also understood that Kennewick’s disclosure of parser 118 weighting factors such as “location of [the] vehicle” and “planned path or route” to determine the “most likely context” represents the recited model. A POSITA would have understood that the recited “model” includes any “approximation,

⁷ Because this limitation recites “or,” only one of the recited methods for selecting the advertisement must be disclosed by the prior art.

representation, or idealization of selected aspects of the structure, behavior, operation, or other characteristics of a real-world process, concept, or system.” Ex. 1007 (IEEE definition of “model”). Parser 118 weighs various location-based factors to approximate the real-world context associated with the user’s utterance. Thus, Kennewick discloses this limitation.

Yonebayashi also discloses selecting an advertisement based on a personalized cognitive model derived from an interaction pattern for a specific user. Yonebayashi discloses tracking and storing user interactions in case dictionary 62 and preference rule dictionary 64, including remark history (what topics were mentioned in the past, etc.)...[and] user information (likes, dislikes, etc.),” among others. Ex. 1015, [0039], [0040] (“user input is stored internally”); [0024] (“store...preference information”). These tracked user interactions are the claimed interaction pattern. User preferences can include “I don’t like XXX,’ ‘I like XXX,’ ‘XXX is nice,’ and ‘XXX is cool[.]’” *Id.*, [0013], [0040]. Yonebayashi uses this interaction pattern to select “appropriate advertisements at appropriate timings [sic].” *Id.*, [0039]. A POSITA would also understand that Yonebayashi’s storage and use of prior user interactions and user preferences represents the recited model. Ex. 1007 (IEEE definition of “model”). This model approximates the user’s preferences to select “an advertisement of interest to a user at a desired time” and “enhance[] the effect of advertising.” Ex. 1015, [0002].

Yonebayashi also discloses a generalized cognitive model derived from the interaction pattern of a plurality of users. *Id.*, [0023] (“if many people talk about sports, sports-related advertisements can be fed”). Ex. 1002, ¶122.

A POSITA would have been motivated to modify parser 118 of Kennewick’s conversational language processor to also select advertisements based on personalized and generalized cognitive models, as taught by Yonebayashi. It would have been obvious to a POSITA for parser 118 to track user interactions and preferences related to Kennewick’s location-based advertisements as an additional form of context for selecting subsequent advertisements. The personalized cognitive model would contain tracked user interactions for each specific user and the generalized cognitive model would contain tracked interactions for a group of users. For example, if a user specified a preference for healthy food, the personalized cognitive model would be used by parser 118 of the combined system to select healthy location-based food advertisements. Thus, the combined system would result in selecting location-based advertisements that are also “of interest to a user at a desired time” and “enhance[] the effect of advertising.” Ex. 1015, [0002]. The combined system could also implement the generalized cognitive model for a group of users in a similar way. Ex. 1002, ¶123.

3. Claim 3: “The method of claim 2, further comprising:”

[3.a] “tracking an interaction pattern with the advertisement presented via the output device; and”

This limitation recites, in part, presenting an advertisement via an output device, which is obvious for the reasons described in Section IX.A.1[1.g].

This limitation also recites tracking an interaction pattern with the presented advertisement. As discussed in Section IX.A.2, Yonebayashi discloses tracking and storing user interactions in case dictionary 62 and preference expression rule dictionary 64, including “remark history (what topics were mentioned in the past, etc.)...[and] user information (likes, dislikes, etc.),” among others. Ex. 1015, [0039], [0040]. These tracked user interactions are the interaction pattern. User preferences can include “I don’t like XXX,’ ‘I like XXX,’ ‘XXX is nice,’ and ‘XXX is cool[.]” *Id.*, [0013], [0040]. Yonebayashi uses this interaction pattern to select “appropriate advertisements at appropriate timings [sic].” *Id.*, [0039]. For example, “if the user remarks ‘I don’t need that now...’ as shown in Figure 5(a)...based on the keyword ‘don’t need’ extracted from this remark, the agent takes the action ‘Oh, I’m sorry, I’ll stop the advertisement.” *Id.*, [0052]. This user interaction in Figure 5 results in the advertisement being excluded from the selection of future advertisements. This user interaction in Figure 5 is also added to the tracked interaction pattern in case dictionary 62. *Id.*, [0040] (“user input is stored internally); [0024] (“store...preference information”).

A POSITA would have found it obvious to modify parser 118 of Kennewick's conversational language processor to track user interactions with presented advertisements, as taught by Yonebayashi. It would have been obvious to a POSITA for parser 118 to track user interactions and preferences related to Kennewick's location-based advertisements as an additional form of context for selecting subsequent advertisements. For example, if a user specified a preference for healthy food, this additional context information would be used by parser 118 of the combined system to select healthy location-based food advertisements. Thus, the combined system would result in selecting location-based advertisements that are "of interest to a user at a desired time" and "enhanc[e] the effect of advertising." Ex. 1015, [0002].

[3.b] "updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model based on the interaction pattern tracked for the advertisement."

As discussed in Section IX.A.2, only one of the recited models must be disclosed for invalidity. Nonetheless, each of the recited models are obvious for the reasons described in Section IX.A.2.

This limitation further discloses "updating one or more of the [models]...based on the interaction pattern tracked for the advertisement." As discussed in Section IX.A.2, Yonebayashi discloses *updating* the personalized cognitive model with user interactions and user preferences to ensure the selection and presentation of an

“appropriate advertisement[] at [an] appropriate tim[e].” Ex. 1015, [0039], [0040]. For example, “if the user remarks ‘I don’t need that now...’ as shown in Figure 5(a)...based on the keyword ‘don’t need’ extracted from this remark, the agent takes the action ‘Oh, I’m sorry, I’ll stop the advertisement.’” *Id.*, [0052]. This user interaction results in updating the personalized cognitive models stored in case dictionary 62 and preference expression rule dictionary 64 to prevent the advertisement from being selected again in the future. *Id.*, [0052], [0039], [0040]. A POSITA would have understood that the generalized cognitive model disclosed by Yonebayashi is updated in the same way.

A POSITA would have found it obvious to modify parser 118 of Kennewick’s conversational language processor to update the recited models based on the interaction pattern tracked for an advertisement, as taught by Yonebayashi. It would have been obvious to a POSITA for parser 118 to update the personalized and generalized cognitive models of the combined system based on user interactions and preferences related to Kennewick’s location-based advertisements. This would have served as an additional form of context for selecting subsequent advertisements. For example, if a user specified a preference for healthy food, this additional context information would be used by parser 118 of the combined system to select healthy location-based food advertisements. Thus, the combined system would result in

selecting location-based advertisements that are also “of interest to a user at a desired time” and “enhanc[e] the effect of advertising.” Ex. 1015, [0002].

4. Claim 6: “The method of claim 3, further comprising:”

[6.a] “building long-term shared knowledge and short-term shared knowledge in response to updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model;”

As discussed in Section IX.A.2, only one of the recited models must be disclosed for invalidity. Nonetheless, as discussed in Section IX.A.3[3.b], the combination of Kennewick and Yonebayashi disclose updating the recited models. This limitation further discloses “building long-term shared knowledge and short-term shared knowledge” in response to updating these models.

Kennewick discloses “building long-term shared knowledge.” Kennewick discloses that its “invention creates, stores and uses extensive *personal profile information for each user*,” which “may be added and *updated automatically as the user uses the system...*” Ex. 1003, [0031]. Kennewick further discloses that the “[u]ser profile data...can be *learned by the system based on user behavior*.” *Id.*, [0143]. Kennewick discloses that certain user profile information—such as “history of questions asked, session histories,” “history of commands and queries,” or “history of [individual] interactions with the system”—are historical in nature. *Id.*, [0031], [0143]. Thus, a POSITA would have understood that those values may be updated and thus, “build[] long-term shared knowledge.”

Kennewick also discloses “building...short-term shared knowledge.” Kennewick discloses that during the “dialog” (*i.e.*, conversation) with the system, the system adds “tags...to each utterance [in the dialog]...to tie that utterance to the correct...dialog” and user. Ex. 1003, [0155-56]. Referring to this information as both “user dialog history” and “history of the dialog” interchangeably, Kennewick discloses “the prior probabilities or fuzzy possibilities” may be derived from and updated by “the history of the dialog” (among other things). *Id.*, [0162] (referring to “*the history of the dialog*” as a “source” and updating these values “based on user responses...as the system learns the desired behavior.”); [0157] (referring to using “*user dialog history*” to “dynamically update[]” these values). The dialog history in Kennewick discloses details about user’s utterances during the conversation (in contrast to the long-term knowledge spanning multiple conversations with the system and stored in the user’s profile as described above). A POSITA would have understood that updating “the history of the dialog” represents “building...short-term knowledge.” Ex. 1002, ¶132.

Yonebayashi also discloses “building long-term shared knowledge” and “short-term shared knowledge.” Yonebayashi discloses presenting the user with an advertisement for the energy drink “Rogain J” in response to a user’s initial utterance “I’ve been fatigued recently.” Ex. 1015, [0049-50]; Fig. 5B. The user responds “I want to see an advertisement for a different manufacturer.” *Id.*, [0053]; Fig. 5(b).

The user's dislike of "Rogain J" is long-term shared knowledge that is stored in the user's preference expression rule dictionary 64 in the user's profile. *Id.*, [0013], [0039], [0040]. Additionally, the history of the current dialog identifying that the context of "different manufacturer" in the user's utterance is referring to a manufacturer other than "Rogain J," is short-term shared knowledge. A POSITA would have understood that this history of the current dialog is stored in a memory module to enable Yonebayashi to determine the context of the user's utterance. Indeed, Yonebayashi properly determines the context of "different manufacturer" in the user's utterance and presents a subsequent advertisement for a different manufacturer: "Then how about Chuho Pharmaceutical's 'Neovita Drink.'" *Id.*, [0053]; Fig. 5(b); Ex. 1002, ¶133.

A POSITA would have also found it obvious to update recited models by building long-term and short-term shared knowledge, as taught by Kennewick and Yonebayashi. For example, a POSITA would have understood that Kennewick may use long-term shared knowledge from prior conversations or short-term shared knowledge from a current conversation identifying a preference for healthy food, to offer the user location-based advertisements for healthy food. Ex. 1002, ¶135. This knowledge would increase the effectiveness of subsequent advertisements based on user preferences and dialog history. Ex. 1015, Abstract, [0002]; Ex. 1003, [0002].

[6.b] “receiving a subsequent natural language utterance at the input device; and”

As discussed in Section IX.A.10 (claim 12), Kennewick discloses receiving subsequent natural language utterances. For example, Kennewick discloses resolving the ambiguity in the user’s utterances by asking “the user to verify the question or command is correctly understood”—“Did I understand that you want such-and-such.” Ex. 1003, [0161]. The user may respond to this verification question by identifying that “such-and-such” is right/wrong or providing additional information. *Id.*

Additionally, as discussed in Section IX.A.1[1.a], Kennewick discloses an input device called the “speech unit” to “receive *the utterances* of the user.” Ex. 1003, [0012], [0121]. “Speech unit 128 can be permanently attached to the vehicle 10 or can be part of a handheld device 36 or a fixed home or office computer system 44.” *Id.*, [0096]; Figs. 1-5. Thus, Kennewick discloses this limitation.

Yonebayashi also discloses this limitation. As discussed in Section IX.A.4[6.a], Yonebayashi discloses presenting the user with an advertisement for the energy drink “Rogain J” in response to a user’s initial utterance “I’ve been fatigued recently.” Ex 1015, [0049-50]; Fig. 5B. The user response “I want to see an advertisement for a different manufacturer” is a subsequent utterance that is received at the input device, such as the microphone. *Id.*, [0047], [0053]; Fig. 5(b).

[6.c] “interpreting the subsequent natural language utterance at the conversational language processor using the long-term shared knowledge and the short-term shared knowledge.”

As discussed in Section IX.A.10 (claim 12), Kennewick discloses the conversational language processor—parser 118 and agents 106—interprets the subsequent natural utterance provided by the user to resolve an ambiguity in the initial natural language utterance. Ex. 1003, [0161].

Kennewick further discloses the parser 118 interprets the subsequent natural language utterance using long-term shared knowledge. Kennewick discloses that the “parser may determine a *context* for an utterance by applying prior probabilities or fuzzy possibilities to...*user profile 110*[.]” Ex. 1003., [0160]. As discussed in Section IX.A.4[6.a], the user profile 110 in Kennewick represents long-term shared knowledge. Kennewick also discloses the parser 118 interprets the subsequent natural language utterance using short-term shared knowledge. Kennewick discloses that the “parser may determine a *context* for an utterance by applying prior probabilities or fuzzy possibilities to...*dfialog history*[.]” Ex. 1003, [0160]. As discussed in Section IX.A.4[6.a], the “dialog history” in Kennewick represents short-term shared knowledge. Kennewick uses both short-term and long-term shared knowledge because “some questions can only be interpreted in the context of previous questions, knowledge of the domain, or the user’s history of interests and preferences.” Ex. 1003, [0007]. Thus, Kennewick discloses this limitation.

Yonebayashi also discloses this limitation. As discussed in Section IX.A.4[6.a], Yonebayashi discloses interpreting the subsequent utterance “I want to see an advertisement for a different manufacturer” using the history of the current dialog. This dialog identifies that the context of “different manufacturer” in the user’s utterance is a manufacturer other than “Rogain J.” Yonebayashi also discloses storing the user’s likes and dislikes, such as the user’s dislike of “Rogain J” in the user’s preference expression rule dictionary 64. Ex. 1015, [0013], [0039], [0040]. This long-term shared knowledge is used to interpret utterances and guide the selection of subsequent advertisements. *Id.*, [0011] (“The user can thereby acquire information such as advertisements *better suited to the user’s preference*”).

5. Claim 7: “The method of claim 3, wherein the interaction pattern tracked for the advertisement includes an action performed in response to a subsequent request that identifies the advertisement.”

The recited “interaction pattern tracked for the advertisement” is obvious for the reasons discussed in Section IX.A.3[3.a]. This limitation further recites “an action performed in response to a subsequent request that identifies the advertisement.” Yonebayashi discloses this limitation.

Yonebayashi discloses an example of presenting the user with an advertisement for the energy drink “Rogain J” in response to a user’s initial utterance “I’ve been fatigued recently.” Ex. 1015, [0049-50]; Fig. 5A. The user provides the subsequent natural language request “I don’t need that now,” in which the word

“that” refers to the previously presented energy drink advertisement. *Id.*, [0051], Fig. 5(a). Yonebayashi discloses that the system identifies the key words “don’t need” and “*takes the action* ‘Oh, I’m sorry. I’ll stop the advertisement’” in response to the user’s subsequent request. *Id.*, [0051]-[0052], Fig. 5A.

[FIGURE 5]

<Conversation example between user and agent>

(a)

User	: I've been fatigued recently.
Agent	: "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User	: I don't need that now...
Agent	: Oh, I'm sorry. I'll stop the advertisement.

In another example, the user responds to the “Rogain J” energy drink advertisement with the subsequent natural language request “I want to see an advertisement for a different manufacturer.” *Id.*, [0053]; Fig. 5(b). Yonebayashi discloses taking the action of responding with the different advertisement “Then how about Chuho Pharmaceutical’s ‘Neovita Drink.’” *Id.*, [0053]; Fig. 5(b).

(b)

User	: I've been fatigued recently.
Agent	: "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User	: I want to see an advertisement for a different manufacturer.
Agent	: Then how about Chuho Pharmaceutical's 'Neovita Drink' ...

A POSITA would have been motivated to modify Kennewick's advertisements by tracking and responding to user interactions with advertisements, to increase the effectiveness of selected and presented targeted advertisements, as taught by Yonebayashi. Ex. 1003, [0002]; Ex. 1015, Abstract, [0002], [0034]-[0041]; Ex. 1002, ¶147.

6. Claim 8: “The method of claim 7, wherein the action includes executing a task or retrieving information based on the subsequent request that identifies the advertisement.

As described in Section IX.A.5 (claim 7), in the example of Figure 5(a) Yonebayashi discloses “*tak[ing] the action ‘Oh, I’m sorry, I’ll stop the advertisement.’*” Ex. 1015, [0049-50]; Fig. 5A. This action includes executing the task to stop the advertisement. *Id.*, [0039] (“*cases are defined to present appropriate advertisements at appropriate timings [sic], such as responding to a request to stop advertisements.*”).

Additionally, in the example of Figure 5(b), Yonebayashi discloses taking the action “Then how about Chuho Pharmaceutical’s ‘Neovita Drink’” when the user responds “I want to see an advertisement for a different manufacturer.” *Id.*, [0053]; Fig. 5(b). This action includes retrieving information for a different energy drink manufacturer. *Id.*, [0053] (“the presentation means 4 looks up the second candidate energy drink from the advertisement information dictionary 61...Chuho Pharmaceutical’s ‘Neovita Drink’”).

A POSITA would have been motivated to modify Kennewick with Yonebayashi for the reasons described in Section IX.A.5.

7. Claim 9: “The method of claim 1, wherein the conversational language processor selects the advertisement to resolve the request in response to determining that the natural language utterance includes incomplete or ambiguous information.”

Kennewick discloses that the conversational language process—parser 118 and agents 106—can determine that the natural language utterance includes incomplete or ambiguous information. As discussed in Section IX.A.1[1.e], “parser 118 may use a scoring system to determine the most likely context or domain for a user’s question or command...[by] weighting a number of factors including, the user profile 110, the domain agent’s 156 knowledge and previous context.” Ex. 1003, [0161]. “If the confidence level of the score is not high enough to ensure a reliable response, the system can ask a question of the user to verify the question or command is correctly understood.” *Id.* For example, Kennewick discloses asking the user “Did I understand that you want such-and-such.” *Id.* If the question or command is not correctly understood, the user may provide “additional information to remove ambiguity, or the system can ask one or more questions to attempt to resolve the ambiguity.” *Id.*

Yonebayashi discloses selecting an advertisement in response to an incomplete or ambiguous request. For example, when the user states “I’ve been fatigued recently” Yonebayashi’s system recognizes the keyword “fatigue” and

presents an advertisement for “Rogain J” an energy drink that is “recommended for hardworking businessmen.” Ex. 1015, [0050], [0051]; Fig. 5A. This advertisement is selected using “if-then format rules” that match keywords, “remark history (what topics were mentioned in the past, etc.), progress status of inquiry responses (hierarchical information on inquiry responses, etc.), user information (likes, dislikes, etc.), and various other items.” *Id.*, [0039]. In the example of Figure 5A the user provides the additional information “I don’t need that now” indicating that the advertisement was a misunderstanding of the user’s initial ambiguous utterance. *Id.* at [0052].

[FIGURE 5]

<Conversation example between user and agent>

(a)

User	: I've been fatigued recently.
Agent	: "Rogain J" by Yonkyo Co., Ltd. is recommended for hardworking businessmen.
User	: I don't need that now . . .
Agent	: Oh, I'm sorry. I'll stop the advertisement.

As discussed in Sections IX.A.1[1.f] and IX.A.1[1.g], a POSITA would have been motivated to include Yonebayashi’s conditional selection of targeted advertisements in Kennewick’s system to present “an advertisement with [] appropriate content at an appropriate timing [sic].” Ex. 1015, Abstract. The modified system would use the contextual information of Kennewick to determine whether a user’s utterance such as “I’ve been fatigued recently” is ambiguous and

would use Yonebayashi’s conditional selection of targeted advertisements to resolve the ambiguity. Ex. 1003, [0161]; Ex. 1015, [0039]. A POSITA would have found it obvious for the combined system to resolve the ambiguity by selecting the “Rogain J” energy drink advertisement as taught by Yonebayashi, instead of asking the user the similar question “Did I understand that you want [an energy drink]” as taught by Kennewick. Ex. 1002, ¶153. Thus, the modified system would achieve the goal of selecting and presenting targeted advertisements “in a natural manner even in cases where the question asked or the responses received are *incomplete, ambiguous or subjective.*” Ex. 1003, [0002].

8. Claim 10: “The method of claim 1, wherein the speech recognition engine recognizes the one or more words or phrases in the natural language utterance using a plurality of entries in one or more dictionary and phrase tables that are dynamically updated based on a history of a current dialog and one or more prior dialogs.”

As discussed in Section IX.A.1[1.d], Kennewick discloses that the “speech recognition engine 120 us[es] data in the dictionary and phrases module 112 and received from the agents 106 [to]...recognize[] words and phrases.” Ex. 1003, [0123], [0155]. “[T]he words in the dictionary and phrase tables may be dynamically updated to maximize the probability of correct recognition at each stage of the dialog.” *Id.*, [0157]. “The probabilities or possibilities can be dynamically updated based on a number of criteria including the application domain, the questions or

commands, contexts, the user profile and preferences, [and] user dialog history...,” among other information. *Id.* Thus, Kennewick discloses this limitation.

9. **Claim 11: “The method of claim 10, wherein the plurality of entries in the one or more dictionary and phrase tables are further dynamically updated based on one or more dynamic fuzzy set possibilities or prior probabilities derived from the history of the current dialog and the prior dialogs.”**

Kennewick discloses this limitation for the reasons discussed in Section IX.A.8 (claim 10). Kennewick further discloses that “fuzzy set possibilities or prior probabilities for the words in the dictionary and phrase tables may be dynamically updated to maximize the probability of correct recognition at each stage of the dialog.” Ex. 1003, [0157]. “The probabilities or possibilities can be dynamically updated based on a number of criteria including the application domain, the questions or commands, contexts, the user profile and preferences, [and] user dialog history...,” among other information. *Id.* Thus, Kennewick discloses this limitation.

10. **Claim 12: “The method of claim 1, further comprising determining that the conversational language processor incorrectly interpreted the words or phrases in response to an adaptive misrecognition engine detecting a predetermined event, wherein the conversational language processor reinterprets the words or phrases in response to the predetermined event.”**

As discussed in Section IX.A.7 (claim 9), Kennewick discloses that the conversational language process—parser 118 and agents 106—uses a scoring system to determine whether the natural language utterance includes incomplete or

ambiguous information. Ex. 1003, [0161]. “[I]f the confidence level of the score is not high enough to ensure a reliable response, the system can ask a question of the user to verify the question or command is correctly understood.” *Id.* For example, Kennewick discloses asking the user “Did I understand that you want such-and-such.” *Id.* Additionally, “the system can ask one or more questions to attempt to resolve the ambiguity.” *Id.* This functionality of parser 118 and agents 106 identifying a confidence score and generating a verification question or command is the adaptive misrecognition engine.⁸ Kennewick also discloses that the user may respond to the verification question or command by “confirm[ing] that the question is correct...[or] rephrase[ing] the original question, perhaps adding additional information to remove ambiguity.” Ex. 1003, [0161]. Thus, the user’s subsequent utterance is the predetermined event.

A POSITA would have also understand from these disclosures that the user’s subsequent utterance is used to resolve the ambiguity by reinterpreting words or phrases of the user’s initial utterance. For example, if the user’s subsequent utterance confirms that the interpretation “such-and-such” is correct by stating “yes”, this utterance results in interpreting the words of the user’s initial utterance

⁸ The ’176 patent identifies that the conversational language processor 120 may support adaptive misrecognition. Ex. 1001, 4:45-46.

as “such-and-such.” If the user’s subsequent utterance provides additional information, the information is used to reinterpret the words of the user’s initial utterance. Thus, Kennewick discloses this limitation.

- 11. Claim 13: “The method of claim 12, wherein the predetermined event includes receiving one or more of a subsequent input proximate in time to the natural language utterance, a subsequent input that stops the conversational language processor from processing the request contained in the natural language utterance, a subsequent input that overrides the request in a time shorter than an expected time to process the request, or a subsequent input that repeats the natural language utterance.”**

Only one of the recited requirements must be disclosed for invalidity. *Ex parte Kubin*, 2007 Pat. App. LEXIS 13, at *10. As discussed in Section IX.A.10 (claim 12), Kennewick discloses resolving the ambiguity in the user’s utterances by asking “the user to verify the question or command is correctly understood”—“Did I understand that you want such-and-such.” Ex. 1003, [0161]. The user may respond to this verification question by identifying that “such-and-such” is right/wrong or providing additional information. *Id.* This subsequent utterance is the recited “predetermined event” that is a “subsequent input proximate in time to the natural language utterance.” Thus, Kennewick discloses this limitation.

12. Claim 14

The preamble 14(pre) and limitations 14.a-14.e are identical to preamble 1(pre), limitations 1.a, 1.b, and 1.e-1.g. The limitation 14.f is identical to claim 12.

Thus, claim 14 is obvious for the reasons in Sections IX.A.1[1.a], IX.A.1[1.b], IX.A.1[1.e]-[1.g], and IX.A.10. Ex. 1002, ¶¶158-164.

13. Claim 15

Claim 15 is identical to claim 13 and is obvious for the reasons in Section IX.A.11.

14. Claim 16

Claim 16 is identical to limitations 1.c and 1.d is obvious for the reasons in Sections IX.A.1[1.c] and IX.A.1[1.d].

15. Claim 17

Claim 17 is identical to claim 9 and is obvious for the reasons in Section IX.A.7.

16. Claim 18

Claim 18 is identical to claim 2 and is obvious for the reasons in Section IX.A.2.

17. Claim 19

Claim 19 is identical to claim 3 and is obvious for the reasons in Section IX.A.3.

18. Claim 22

Claim 22 is identical to claim 6 and is obvious for the reasons in Section IX.A.4.

19. Claim 23

Claim 23 is identical to claim 7 and is obvious for the reasons in Section IX.A.5.

20. Claim 24

Claim 24 is identical to claim 8 and is obvious for the reasons in Section IX.A.6.

21. Claim 25

Claim 25 is identical to claim 10 and is obvious for the reasons in Section IX.A.8.

22. Claim 26

Claim 26 is identical to claim 11 and is obvious for the reasons in Section IX.A.9.

23. Claim 27

Claim 27 recites a system variant of claim 1 that is similar to claim 1 and is disclosed for the in Section IX.A.1. Preamble 27(pre) recites a “system” instead of a “method.” As discussed in Sections IX.A and IX.A.1, each of Kennewick, Yonebayashi, and Jong discloses a “system” and can be combined as a single system. Ex. 1003, [0066], [0096] (identifying the system as “vehicle 10...handheld device 36 or a fixed home or office computer system 44”); Figs. 1-5; Ex. 1015, [0029]; Ex. 1018, 5:35-67; Fig. 3.

The other variations from claim 1 are minor and do not change the scope of the claim. Ex. 1002, ¶¶179-188. Limitation 27.a repeats “an input device” at the beginning of the limitation. Limitation 27.b moves “speech recognition engine coupled to the input device” to the beginning of the limitation and changes “recognizing” to “recognizes.” Limitation 27.c changes the words “recognizing to “recognize” and “mapping” to “map” and repeats the requirement of a “speech recognition engine” already recited in 27.b. As described in Section IX.A.1[1.c], Kennewick and Jong disclose the recited speech recognition engine that recognizes words and phrases. Limitation 27.d changes the word “generating” to “generate.” Limitation 27.e moves “conversational language processor coupled to the speech recognition engine” to the beginning of the limitation, changes “interpreting” to “interpret” and adds the repetitive words “wherein the conversational language processor is configured to.” And limitation 27.f changes “selecting” to “select.” 27.g changes “presenting” to “present.” Repeating certain words does not change the scope of the claim. M.P.E.P. 2144.04 (“mere duplication of parts has no patentable significance unless a new and unexpected result is produced.”) (*citing In re Harza*, 274 F.2d 669 (CCPA 1960))

Limitation 27.e adds the requirement that the conversational language processor selects the advertisement in limitation 27.f and presents the advertisement in limitation 27.g. Ex. 1002, ¶¶184-188. Kennewick and Yonebayashi disclose this

requirement for the reasons discussed in Sections IX.A.1[1.f] and IX.A.1[1.g]. Kennewick discloses that parser 118 and agents 106—the conversational language processor—determine “the most likely context or domain for a user’s question or command...[by] weighting a number of factors including, the user profile 110...” which has the “*location of [the] vehicle*” and the “*planned path or route*,” among other information. Ex. 1003, [0161], [0031]. After determining this context, “the system can provide interactive offers and promotions for goods and services *along the route*, or in advance of a particular trip.” *Id.*, [0066]. Similarly, Yonebayashi discloses selecting and “present[ing] an advertisement for an energy drink” after determining that the context of the user’s remark “I’ve been fatigued recently” is that the user is tired. *Id.*, [0049]-[0053], Figure 5. A POSITA would have been motivated to combine Kennewick and Yonebayashi for the reasons discussed in Sections IX.A.1[1.f] and IX.A.1[1.g].

24. Claim 28

Claim 28 recites a system variant of claim 2 and is obvious for the reasons in Section IX.A.2.

25. Claim 29

Claim 29 recites a system variant of claim 3 and is obvious for the reasons in Section IX.A.3. Limitation 29.a changes the word “tracking to track” and limitation

29.b changes the word “updating” to “update” none of which changes the scope of the claim.

To the extent preamble 29(pre) is limiting, it recites that the “conversational language processor” performs limitations 29.a and 29.b. Ex. 1002, ¶¶190-194.

A POSITA would have found it obvious that Kennewick’s conversational language processor—parser 118 and agents 106—would implement the functionality of tracking user’s interactions with advertisements and updating the recited models based on those interactions. For example, as discussed in Sections IX.A.2 and IX.A.3., the personalized cognitive model of Yonebayashi tracks and updates user preferences related to presented advertisements in preference expression rule dictionary 64. Ex. 1015, [0013], [0039], [0040]. Kennewick’s agents 106 also collect and store user preferences—[d]omain specific agents collect, store and use specific profile information” such as “presentation preferences...terms of interests...location of vehicle...hobbies, sports interests, news interests.” Ex. 1003, [0031]. Thus, it would have been obvious for agents 106 to also implement Yonebayashi’s preference rule expression dictionary 64.

26. Claim 32

Claim 32 recites a system variant of claim 6 and is obvious for the reasons in Section IX.A.4. Limitation 32.a changes the word “building” to “build” and limitation 32.b changes the word “interpreting” to “interpret” neither of which

change the scope of the claim. Limitation 32.b also combines the requirements of limitations 6.b. and 6.c.

To the extent preamble 32(pre) is limiting it recites that the “conversational language processor is configured to” perform limitations 32a-32.b. Ex. 1002, ¶¶195-197.

A POSITA would have understood that Kennewick’s conversational language process—parser 118 and agents 106—is configured to build the long-term and short-term shared knowledge. For example, the “probabilities or possibilities” used by parser 118 for determining context “can be *dynamically updated* based on...the user profile and preferences”—long-term knowledge—and user “dialog history”—short-term knowledge). Ex. 1003, [0157]. These “associated prior probability or fuzzy possibility *updates* [are] *from the system agent 150 or an already active domain agent 156.*” *Id.*, [0160]. Thus, Kennewick discloses limitation 32.a

Additionally, the probability or possibility updates are used by parser 118 to score the context of each natural language utterance, including subsequent utterances. Ex. 1003, [0160], [0161]. Thus, Kennewick discloses limitation 32.b.

27. Claim 33

Claim 33 recites a system variant of claim 7 and is obvious for the reasons in Section IX.A.5.

28. Claim 34

Claim 34 recites a system variant of claim 8 and is obvious for the reasons in Section IX.A.6.

29. Claim 35

Claim 35 recites a system variant of claim 9 and is obvious for the reasons in Section IX.A.7.

30. Claim 36

Claim 36 recites a system variant of claim 10 and is obvious for the reasons in Section IX.A.8.

31. Claim 37

Claim 37 recites a system variant of claim 11 and is obvious for the reasons in Section IX.A.9.

32. Claim 38

Claim 38 recites a system variant of claim 12 and is obvious for the reasons in Section IX.A.10.

33. Claim 39

Claim 39 recites a system variant of claim 13 and is obvious for the reasons in Section IX.A.11.

34. Claim 40

Preamble 40(pre) and limitations 40.a-40.e are identical to preamble 27(pre) and limitations 27.a, 27.b, and 27.e-27.g. Thus, claim 40 is obvious for the reasons

in Section IX.A.23 (claim 27). Additionally, limitation 40.f is substantially similar to the method of claim 12 and is obvious for the reasons in Section IX.A.10. Limitation 27.f moves an “adaptive misrecognition engine” to the beginning of the limitation and changes “determining” to “determines.” These minor variations do not change the scope of the claim. Ex. 1002, ¶¶205-211.

35. Claim 41

Claim 41 recites a system variant of claim 13 and is obvious for the reasons in Section IX.A.11.

36. Claim 42

Claim 42 recites a system variant of claim 1 and is identical to claim 27, and thus, is obvious for the reasons in Sections IX.A.1[1.c], IX.A.1[1.d], IX.A.23[27.c], and IX.A.23[27.d].

37. Claim 43

Claim 43 recites a system variant of claim 9 and is obvious for the reasons in Section IX.A.7.

38. Claim 44

Claim 44 recites a system variant of claim 2 and is obvious for the reasons in Section IX.A.2.

39. Claim 45

Claim 45 is identical to claim 29 and is obvious for the reasons in Section IX.A.25.

40. Claim 48

Claim 48 is identical to claim 32 and is obvious for the reasons in Section IX.A.26.

41. Claim 49

Claim 49 recites a system variant of claim 7 and is obvious for the reasons in Section IX.A.5.

42. Claim 50

Claim 50 recites a system variant of claim 8 and is obvious for the reasons in Section IX.A.6.

43. Claim 51

Claim 51 recites a system variant of claim 10 and is obvious for the reasons in Section IX.A.8.

44. Claim 52

Claim 52 recites a system variant of claim 11 and is obvious for the reasons in Section IX.A.9.

B. Ground 2: Claims 4, 5, 20, 21, 30, 31, 46, and 47 are rendered obvious by Kennewick, Yonebayashi, and Jong in further view of Colledge.

Kennewick, Yonebayashi, and Jong, further in combination with Colledge, renders claims 4, 5, 20, 21, 30, 31, 46, and 47 obvious. As described in Section IX.A., a POSITA would have found it obvious to combine Kennewick, Yonebayashi, and Jong.

A POSITA would have found it obvious to combine Colledge with Kennewick, Yonebayashi, and Jong. Kennewick and Yonebayashi are in same the field of interactive speech technology, which includes speech recognition as disclosed by Jong and natural language understanding as disclosed by Colledge. Ex. 1019, 4:61-62. Additionally, each of Kennewick, Yonebayashi, and Colledge disclose selecting advertisements in response to a user's natural language input. Ex. 1003, [0066]; Ex. 1015, [0002], [0017], [0049]-[0053]; Ex. 1019, 4:61-62.

Both Yonebayashi and Colledge also disclose tracking user interaction with advertisements. Ex. 1019, 12:24-30; Ex. 1015, [0013], [0039], [0040]. Both disclose tracking user preferences and characteristics in response to presented advertisements. Ex. 1019, 12:16-23; Ex. 1015, [0013], [0039], [0040]. And both disclose using this tracked information to select and present subsequent advertisements that are likely to interest the end-user. Ex. 1019, 12:12-23; Ex. 1015, [0002], [0017], [0052], [0053].

Colledge further describes using a machine learning classification algorithm such as Naïve Bayes to select advertisements that closely match the preferences and characteristics of the user. Ex. 1019, 13:6-15.

A POSITA would have found it obvious to modify the combination of Kennewick, Yonebayashi, and Jong to use a machine learning classification algorithm such as a Naïve Bayes classifier to increase the likelihood of selecting an

advertisement that matches the tracked preferences and characteristics of the user, as taught by Colledge. This would increase the likelihood of the combined system selecting “an advertisement of interest to a user at a desired time” and would “enhance[] the effect of advertising.” Ex. 1015, [0002], [0017]; Ex. 1003, [0002].

1. **Claim 4: “The method of claim 3, wherein updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model builds statistical profiles for selecting subsequent advertisements in response to subsequent natural language utterances.”**

As discussed in Section IX.A.2, only one of the recited models must be disclosed for invalidity. The requirement of “updating one or more of the personalized cognitive model, the generalized cognitive model, or the environmental model” is obvious for the reasons discussed in Section IX.A.3[3.b]. This limitation further recites “updating one or more of the [models]...builds statistical profiles for selecting subsequent advertisements in response to subsequent natural language utterances.”

Colledge independently discloses updating a personalized cognitive model based on tracking user interaction with advertisements, as required by parent claim 3. Colledge discloses “track[ing] advertisements that have already been displayed to a user as well as the advertisement viewing or purchasing habits of the end-user.” Ex. 1019, 12:26-30. When a user is “interested in [an] advertisement” Colledge also discloses “collect[ing] other demographic information about the end-user useful in

selecting advertisements likely to interest the end-user...such as: age gender, income, address,...and others.” *Id.*, 12:16-23. These viewing or purchasing habits and collected demographics are “end-user characteristics” that are used to select subsequent advertisements. *Id.*, 12:28-30; 12:42-45. A POSITA would also understand that Colledge’s storage and use of these viewing or purchasing habits and demographics represents the recited model. Ex. 1007 (IEEE definition of “model”). This model approximates the user’s preferences to “select[] an advertisement to display to a [sic] end-user” and Ex. 1019, 12:28-30.

Colledge further discloses updating this personalized cognitive model by building statistical profiles for selecting subsequent advertisements. Colledge discloses that “[one] method to identify advertisement[s] that match[] the characteristics of the end-user...is to use a machine learning classifier” such as a “Naïve Bays [sic]” classifier, which “is well known in the art.” Ex. 1019, 13:6-15. The recited “statistical profiles” are the computed probabilities of a match between the end-user characteristics and the characteristics of the advertisements using the Naïve Bays classifier. *Id.* “A machine learning classification algorithm offers the benefit that it does not require an exact match.” Ex. 1019, 13:11-12. A POSITA would have understood that using a Naïve Bayes classifier to match end-user characteristics to advertisements results in building a “statistical profile” of the end-user characteristics and advertisements. This statistical profile is used to identify

and select advertisements that most closely match the end-user characteristics. Ex. 1019, 13:6-9. A POSITA would have also understood that each time additional end-user characteristics are collected (*id.*, 12:28-30; 12:42-45; 12:12-20), this input to the Naïve Bayes machine learning classification algorithm would change, resulting in an update to the personalized cognitive model and the statistical profiles.

Additionally, Colledge discloses selecting advertisements in response to a user query that “may [] be structured in natural language as a sentence or question.” similar to the natural language utterance of parent claim 1. Ex. 1019, 4:61-62. Thus, Colledge discloses this limitation.

A POSITA would have found it obvious to modify the recited models of Kennewick and Yonebayashi, as discussed in Section IX.A.3[3.b], by building statistical profiles using a machine learning classification algorithm such as a Naïve Bayes classifier to increase the *likelihood* of matching the model to advertisements, as taught by Colledge. This probabilistic matching would be used to present subsequent advertisements in response to subsequent user utterances as taught by Colledge and Yonebayashi. Ex. 1015, [0052], [0053], Fig. 5.

2. **Claim 5: “The method of claim 4, wherein the statistical profiles identify affinities between the advertisement presented via the output device and one or more of the recognized words or phrases, the action associated with the request, the personalized cognitive model, the generalized cognitive model, or the environmental model.”**

As discussed in Section IX.A.2, only one of the recited models must be disclosed for invalidity. As discussed in Section IX.B.1, Colledge disclose using a Naïve Bayes classifier to build statistical profiles for the personalized cognitive model containing end-user characteristics and the advertisements presented via the output device. Ex. 1019, 13:6-15. Colledge discloses that the Naïve Bayes machine learning classification algorithm is used to “identify advertisement [sic] that matches the characteristics of the end-user.” *Id.*, 13:6-10. This “produce[s] a list of candidate advertisement [sic] where the characteristics of the advertisement matches those of the request” from the user. *Id.*, 13:16-18. But “[a] machine learning classification algorithm offers the benefit that *it does not require an exact match.*” *Id.*, 13:11-12. A POSITA would have understood that using a machine learning classification algorithm such as Naïve Bayes identifies the affinities or similarities between the characteristics of the advertisements and the end-user characteristics of the personalized cognitive model. Thus, Colledge discloses this limitation.

A POSITA would have found it obvious to modify the recited models of Kennewick and Yonebayashi, as discussed in Section IX.A.3[3.b], by using a machine learning classification algorithm such as a Naïve Bayes classifier to

increase the likelihood of matching affinities or similarities between the model and advertisements, as taught by Colledge.

3. Claim 20

Claim 20 is identical to claim 4 and is obvious for the reasons in Section IX.B.1.

4. Claim 21

Claim 21 is identical to claim 5 and is obvious for the reasons in Section IX.B.2.

5. Claim 30

Claim 30 recites a system variant of claim 4 and is obvious for the reasons in Section IX.B.1. Claim 30 adds the requirement that this limitation is performed by the conversational language processor. As discussed in Section IX.A.25 (claim 29), it would have been obvious for Kennewick’s conversational language processor—parser 118 and agents 106—to implement Yonebayashi’s preference expression rule dictionary 64 for tracking user interactions with advertisements and updating the recited models based on those interactions. It would have further been obvious for parser 118 and agents 106 to update the models to build statistical profiles. Indeed, Kennewick’s parser 118 already applies “prior probabilities or fuzzy possibilities to...*user profile 110*,” which includes similar user preferences as Yonebayashi’s preference expression rule dictionary 64. Ex. 1003, [0031]; Ex. 1015, [0013], [0039], [0040]. Thus, it would have been obvious for parser 118 to also implement

the Naïve Bayes classifier of College to build statistical profiles of the models to increase the *likelihood* of matching user preferences that are similar to advertisements.

6. Claim 31

Claim 31 recites a system variant of claim 5 and is obvious for the reasons in Section IX.B.2. Claim 31 adds the requirement that this limitation is performed by the conversational language processor, which is obvious for the reasons discussed in Section IX.B.5 (claim 30).

7. Claim 46

Claim 46 is identical to claim 30 and is obvious for the reasons in Section IX.B.5

8. Claim 47

Claim 47 is identical to claim 31, and is obvious for the reasons in Section IX.B.6.

X. THE PETITION SHOULD NOT BE DENIED UNDER §§ 314 OR 325

The Board should not exercise its discretion under §§ 314(a) or 325(d) to deny this Petition based on the district court litigation. As a threshold matter, the Petition seeks to invalidate *all* claims of the '703 patent while the Complaint in the litigation only alleges claim 27. Denying institution under §§ 314(a) or 325(d) would undermine the objective of the AIA at least with respect to claims 1-26 and 28-52 because it would deprive Petitioners of an alternative to district court litigation. *See General*

Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha, IPR2016-01357, Paper No. 19 at 16-17 (PTAB Sept. 6, 2017) (precedential) (stating “an objective of the AIA is to provide an effective and efficient alternative to district court litigation”).

The Board should not exercise its discretion under § 314(a) or § 325(d) to deny institution of this Petition based on the disclosure of Kennewick on an IDS during prosecution of the '703 Patent. The PTAB considers six factors to determine whether it should exercise discretion under § 325(d). *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper No. 8 at 17-18 (PTAB Dec. 15, 2017) (precedential). Factors 3, 5, and 6 relate to the examiner’s evaluation of the reference during prosecution, and do not apply. Kennewick was cited in an IDS identifying over 120 references and was not substantively applied by the examiner. Ex. 1008, pp. 54-58 (IDS filed September 27, 2007). “[T]he Board has consistently declined exercising its discretion under Section 325(d) when the only fact a Patent Owner can point to is that a reference was disclosed to the Examiner during the prosecution.” *Amgen Inc. v. Alexion Pharm., Inc.*, IPR2019-00739, 2019 WL 4132683, at *25-26 (PTAB Aug. 30, 2019); *Amazon.com, Inc., v. M2M Solutions LLC*, IPR2019-01204, Paper No. 14 (PTAB Jan. 23, 2020) (citations omitted) (refusing to exercise discretion under § 325(d) where the examiner did not substantively consider the cited material, which was among “a few hundred” identified across multiple IDSs). Additionally, factors 1, 2 and 4 relate to the similarity between the

reference and the prior art substantively evaluated by the Examiner during prosecution. *Becton*, IPR2017-01586, Paper No. 8 at 17-18. These factors also do not apply because Kennewick is materially different from the prior art that the Examiner evaluated. Accordingly, the *Becton* factors do not favor denial of this petition under § 325(d).

XI. CONCLUSION

For the reasons given above, the challenged claims are unpatentable. Accordingly, Petitioners respectfully request the institution of *inter partes* review on all claims of the '176 patent.

Dated: July 29, 2020

Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE
WITH TYPE-VOLUME LIMITATION**

Pursuant to 37 CFR §42.24 et seq., the undersigned certifies that this Petition complies with the 14,000-word type-volume limitation. This Petition contains 13,873 words, excluding the parts of the Petition exempted from the type-volume limitation.

Dated: July 29, 2020

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CERTIFICATE OF SERVICE (37 C.F.R. §§42.63(e), 42.105(a))

The undersigned hereby certifies that a complete and entire copy of the above-captioned “**PETITION FOR *INTER PARTES* REVIEW UNDER 35 U.S.C. §§ 311-319**” and all supporting exhibits numbered 1001 – 1003, 1007 – 1020, and 1030 were provided via Federal Express, postage prepaid, to the Patent Owner’s correspondence address as stated below:

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