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PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: **Robley Carpenter II, Jacob Poore & Benjamin Thielker**
Assignee: **VALYANT AI, INC.**
Filed: **February 12, 2019** Group No.: **2657**
Application No. **16/274,170** Examiner: **Jakieda R. Jackson**
For: **ARTIFICIALLY INTELLIGENT ORDER PROCESSING SYSTEM**

Mail Stop Amendment
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO THE NON-FINAL OFFICE ACTION
MAILED JULY 26, 2019

Sir:

Please enter the following amendments in the above referenced U.S. National
Phase patent application.

Amendments to the Specification can be found on page 2.

Amendments to the Claims are reflected in the listing of claims beginning on page 5.

Remarks begin on page 12.

Amendments to the Specification

Please amend paragraph [00031] of the specification as follows:

Turning to the figures, FIG. 1 is an illustration of a scenario at a drive-through restaurant 12 utilizing an order processing system where an on-site employee takes orders, receives payment and delivers food to customers. Such a system can be employed as a back-up where human intervention is required when the order-processing system according to aspects of the invention experiences a fault and needs to pass control of the artificially intelligent order processing system to an on-site employee.

Please amend paragraph [00033] of the specification as follows:

FIG. 2 is a diagram depicting the components and the flow of data in an order processing system **10** according to aspects of an embodiment of the invention. In the artificially intelligent order processing system according to FIG. 2 the artificially intelligent order processing system is in training mode and the on-site employee **81** is responsible for taking orders, taking payment, and delivering food to a customer **25**. However, in an embodiment, the artificially intelligent order processing system is configured the audio feed from order station microphone **21** to train the artificially intelligent order processing system **10** for future implementation and substitution of the on-site employee **81** in the order function. Accordingly, an on-site computer **31** is added to the artificially intelligent order processing system in an embodiment as depicted in FIG. 1. The on-site computer **31** is placed in the audio stream after the base station **80** to enable the artificially intelligent order processing system **10** to “listen” to audio communications occurring between a customer and an employee in that specific business (e.g. McDonalds TM, Chik-Fil-A TM or Bank of America) or business segment (e.g.

drive-through restaurant, drive-up bank, pick-up window at a drug store, or payment gate for a parking lot), thus facilitating the training of a deep neural network (DNN) system (e.g. DNN **45**).

Please amend paragraph [00038] of the specification as follows:

The audio, text, and metadata from the audio clips are then transmitted from the transcription unit **44** to a Deep Neural Network **45** (DNN), where they are used to develop a Speech-to-Text System **41**. Such transmission is intended to provide the ability to approximately detect frustration levels, age, gender and demographics of future customers. The DNN receives the audio, text and metadata and runs specific training programs on each of these items. The artificially intelligent order processing system in an embodiment is configured to utilize the audio to build a pattern recognition program constituting a speech-to-text module. Thus, when the artificially intelligent order processing system or speech-to-text module element encounters an audio clip in a live environment, the artificially intelligent order processing system or speech-to-text module element can quickly relate the audio clip to other audio clips encountered during training, and then cross-reference the accompanying text with those audio clips. In this manner, the speech-to-text converter infers the text from the audio based on comparison of the new live audio with the past training audio.

Please amend paragraph [00042] of the specification as follows:

An embodiment of the artificially intelligent order processing system is configured such that the transcribed text from the audio clips are then transmitted from the Speech-to-Text System **41** to a Natural Language Processor **51**, also employing a

Deep Neural Network **45**, where meaning is pulled from, or assigned to, the speech following its recognition by the Speech-to-Text System **41**. In the initial training stage the audio, text, and metadata from the clips are transmitted from the Natural Language Processor **51** to a storage device **55** for future access. In an embodiment, storing data facilitates tasks including re-testing the artificially intelligent order processing system, such as in instances where the artificially intelligent order processing system encounters difficulty in the identification of certain, words, phrases or tones.

Amendments to the Claims:

This listing of claims replaces all previous versions and listings of claims in the application.

Listing of Claims

1. (Currently amended) A method ~~of training a natural language ordering system~~ comprising the steps of:

providing an audio stream of customer ordering transactions;

slicing the audio stream into short clips;

transcribing the short clips into text using a transcription unit;

adding metadata tags to the transcribed text using the transcription unit;

training a speech-to-text system by populating the artificially intelligent order

processing system with the transcribed text having the metadata tags;

recognizing an identity of a customer with a business processor;

correlating the identity of the customer with at least one past order with the

business processor; and

querying the customer with an order addition based on the at least one past order

as directed by the business processor.

2. (Original) The method according to claim 1 wherein the transcription unit is a crowd source platform.

3. (Original) The method according to claim 1 wherein the metadata tags provide data regarding tone or inflection that would be lost in a traditional speech-to-text conversion.

4. (Original) The method according to claim 1 wherein the speech-to-text system employs a deep neural network.

5. (Original) The method according to claim 1 further comprising the steps of: identifying a word or phrase in the text using the speech-to-text processor; and providing meaning for the identified word or phrase using a natural language processor.

6. (Currently amended) The method according to claim 5 further comprising the step of generating an order with the [[a]] business processor using the identified word or phrase from the natural language processor.

7. (Original) The method according to claim 5 wherein the natural language processor is configured to trigger an alert when a warning condition is encountered.

8. (Original) The method according to claim 7 wherein the warning condition is a word or phrase indicative of customer dissatisfaction or confusion.

9. (Original) The method according to claim 1 wherein the audio stream used for text transcription is a stream from a customer accessible microphone to a base station.

10. (Original) The method according to claim 9 wherein further comprising the step of decreasing the strength of the audio stream prior to transmission to the transcription unit.

11. (Currently amended) A method of ~~speech recognition-based order processing~~

comprising the steps of:

providing an audio stream of an order of a customer positioned on a site order;

providing an order processor having a speech recognition module trained using

artificial intelligence programs;

converting a word or words in the audio stream to text using the speech

recognition module;

processing the text communication with the speech recognition module to identify

a word or words in the text of the converted audio stream according to a

previous spoken word training;

providing a natural language processor having order assembly capabilities and

exception detection capabilities, wherein the natural language processor

receives recognized text from the order processor and creates or modifies

an order based upon the recognized text;

generating an order with the natural language processor;

alerting an auditor of detected exceptions in the order, the auditor located off-site
and connected to the order processor via a data connection; and
deactivating the order processor with the auditor in response to the detected
exceptions in the order; and
prompting an on-site employee to engage the customer and complete the order
~~transmitting the order to a business processor, wherein the business processor~~
~~communicates with a point-of-sale system to collect payment and provide~~
~~notifications to release the ordered product or service.~~

12. (Original) The method according to claim 11 wherein the order is processed in real time.

13. (Currently amended) The method according to claim 17 ~~11~~ wherein the a
business processor receives order information from the natural language processor (NLP)
NLP and performs the steps of:

associating the order items with one or more additional menu items or options
associated with the order items; and
querying the customer about the one or more additional menu items or options
associated with the order items, wherein the NLP updates the order based
upon the customer response to the query.

14. (Original) The method according to claim 13 further comprising the steps of:

providing a text-to-speech processor to convert queries from the business processor into audio to be communicated to a customer; and processing the text with the text-to-speech processor to create an audio communication of the query generated by the business processor.

15. (Currently amended) The method according to claim 11 ~~12~~ wherein the alert to the auditor prompts the auditor to switch the order processor from an autonomous mode to an auditor-assist mode prior to deactivating the order processor ~~take control of the order processing system.~~

16. (Currently amended) The method according to claim 17 ~~15~~ further comprising the steps of reviewing an order by ~~an~~ the auditor by comparing the order generated by the natural language processor to the communication in the audio stream and updating the order based upon auditor review.

17. (Currently amended) A method ~~of speech recognition-based order processing~~ comprising the steps of:

providing an audio stream of an order of a customer ~~order~~ to a speech-to text processor, the customer positioned on a site;

providing an order processor incorporating a speech recognition module trained using artificial intelligence programs;

converting a word or words in the audio stream to text using the speech recognition module;

processing the text communication with the speech recognition module to identify
a word or words in the text of the converted audio stream according to a
previous spoken word training;

providing a natural language processor having order assembly capabilities and
exception detection capabilities, wherein the natural language processor
receives recognized text from the order processor and creates or modifies
the order based upon the recognized text;

generating an order with the natural language processor;

providing an audio stream of a customer order to an auditor, the auditor located
off-site and connected to the order processor via a data connection;

providing the generated order to the auditor;

performing a comparison of the audio stream of a customer order with the
generated order by the auditor;

switching the order processor from an autonomous mode to an auditor-assist
mode in response to the comparison of the audio stream with the generated
order;

updating the order processor based upon errors detected in the order by the
auditor; ~~and~~

deactivating the order processor with the auditor; and

transmitting the generated order to an on-site employee to communicate with the
customer, a business processor, wherein the business processor
communicates with a point-of-sale system to collect payment from the

customer, and to provide notifications to release the ordered product or service to the customer.

Claims 18 (Cancelled).

19. (Original) The method according to claim 17 further comprising the steps of:
providing a text-to-speech processor to convert queries from the business processor into audio to be communicated to a customer; and
processing the text with the text-to-speech processor to create an audio communication of the query generated by the business processor.

20. (Currently amended) The method according to claim 17 further comprising the step of alerting the auditor by the natural language processor (NLP) of any exceptions detected by the artificially intelligent order processing system, wherein the auditor can override the artificially intelligent order processing system based upon the detected exception.

21. (New) The method according to claim 17 wherein the auditor deactivates the order processor in response to a detected change in customer traffic.

22. (New) The method according to claim 17 wherein the auditor deactivates the order processor in response to a detected change in staffing at the site.

Remarks

Claims 1-20 were rejected in the non-final Office Action mailed July 26, 2019. Claims 18 and 19 have been cancelled and claims 21 and 22 have been newly presented while claims 1, 6, 11, 13, 15-17, and 20 have been amended. The subject matter of the amended and newly presented claims is supported at least by FIGS. 3-5 and para. [00023-00025] & [00051] of the specification. No new matter has been presented. Entrance of the amendments is respectfully requested.

Rejection of Claims Under 35 U.S.C. §102(a)(1)

Claims 1 and 9 have been rejected as allegedly being anticipated by Negreiro (US 7,110,963). These rejections are respectfully traversed.

Independent claim 1 has been amended to recite a business processor recognizing an identity of a customer, correlating the identity of the customer with at least one past order, and querying the customer with an order addition based on the at least one past order. An ordinary artisan would fail to find any disclosure in Negreiro, or any other art of record, of the claimed customer recognition and querying of an order addition.

In Negreiro, the ordinary artisan would find speech recognition of keywords that are used to conduct business. See FIG. 3-11; col. 3, ln. 19 to col. 7, ln. 39. The ordinary artisan would recognize that Negreiro is silent with regard to identifying a customer or querying the customer with order additions based on the detected customer identity. Instead, Negreiro would be understood as utilizing the capabilities of the service staff (27/29/31) to conduct customer interactions without any disclosure or suggestion of providing the staff with an order suggestion, as claimed. See col. 7, ln. 40 to col. 8, ln. 27.

The silence of Negreiro with respect to the claimed customer identification and order addition query based on that identification does not provide sufficient support for the ordinary artisan to render the present claims anticipated. See *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628 (Fed. Cir. 1987); *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990); MPEP §2131. Accordingly, reconsideration and allowance of claims 1 and 9 is respectfully requested.

Rejection of Claims Under 35 U.S.C. §103

Claims 2-8 and 10-20 have been rejected for allegedly being unpatentable over Negreiro in view of Breilig (US 9,646,286), Sankaranarayanan (US 8,879,242), Erbey (US 2012/0317038), Kim (US 2018/ 0277107), Tsao (US 9,239,987), Szabo (US 7,184,438), Borsutsky (US 10,013,980), and Heater (US 2018/0165691). These rejections are respectfully traversed.

As discussed above, Negreiro is silent with respect to the identification of a customer and querying of an order addition based on that identification. The ordinary artisan would further find Negreiro silent with respect to the switching of an order processor between autonomous and auditor-assisted modes as well as deactivating an order processor to pass customer order control to an on-site employee, as claimed in independent claims 11 and 17. Such silence would not provide any reasonable motivation for the ordinary artisan to alter and/or combine Negreiro with any other cited reference to arrive at the present claims.

Review of Breilig, Sankaranarayanan, Tsao, Szabo, and Kim by the ordinary artisan would also reveal that each reference is silent with respect to the claimed deactivation of an order processor by an auditor to pass order control to an on-site

employee. The silence of the respective references would not logically provide any teaching of the present claims or motivation to alter and/or combine the references to arrive at the present claims.

In Erbey, the ordinary artisan would find customer interaction being exclusively autonomous via scripts generated by a scripting system (104). See FIG. 3; para. [0091-0101]. The sophistication of the processing in Erbey would be appreciated by the ordinary artisan as providing autonomous computing response to a variety of customer actions to complete one or more tasks. See *Id.* The autonomous configuration of the system in Erbey, along with the silence of the reference with respect to deactivating a customer order processing to pass customer control to an on-site employee, would cause the ordinary artisan to conclude that Erbey fails to teach the subject matter of the present claims or provide any reasonable motivation to arrive at the present claims.

The ordinary artisan would similarly characterize Borsutsky as being directed exclusively to the autonomous handling of customers with computing processing. The ordinary artisan would point at least to FIGS. 1-21 and col. 6, ln. 10 to col. 16, ln. 27 of Borsutsky as teaching how a computing system can service a customer without the use of an on-site, in-person employee, which contradicts the claimed deactivation of an order processor to pass customer control to an on-site employee. Thus, the ordinary artisan would characterize Borsutsky as teaching away from the present claims, which would not provide any reasonable motivation to use the teachings of Borsutsky to arrive at the present claims. See *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994); MPEP §2143.03(VI).

In Heater, the ordinary artisan would understand that an agent (131) can intervene in an automated customer query answering process. See FIG. 1; para. [0035-0047]. While

Heater teaches an agent supervising a customer query and perhaps talking to the customer (106) via a telephone, the ordinary artisan would identify that Heater exclusively positions the agent remotely from the customer. See *Id.* The ordinary artisan would appreciate that the on-site, in-person employee of the present claims allows for more effective “up-selling” and customer satisfaction than a phone call with a person, particularly in situations where an error or delay has prompted deactivation of an automated order processor. See para. [00050-00052] of the specification. Therefore, the ordinary artisan would conclude that Heater fails to teach the claimed deactivation of an automated order processor by a remote auditor to pass customer control to an on-site employee.

In sum, Negreiro, Brelig, Sankaranarayanan, Tsao, Szabo, and Kim would each be characterized as silent with respect to the claimed processor deactivation and customer control passing to an on-site employee while Borsutsky would be characterized as teaching away from the present claims and Erbey and Heater would each be characterized as failing to teach the on-site employee taking a customer’s order in the place of an automated system. The failure of each cited reference to teach the subject matter of the present claims or provide motivation to alter and/or combine the references to arrive at the present claims cannot sufficiently support a prima facie case of obviousness in view of *KSR and MPEP* §2143. See *KSR v. Teleflex Inc.*, 82 USPQ 2d 1385 (2007); *In re McLaughlin*, 443 F.2d 1392 (CCPA 1971). Accordingly, reconsideration and allowance of claims 2-8 and 10-20 is respectfully requested.

Conclusion

This Response is intended to be a complete response to the non-final Office Action mailed July 26, 2019. The Applicant respectfully requests reconsideration and allowance of all of the claims pending in the application. For the record, silence on the part of the Applicant with regard to any statements made by the Examiner in the present rejection will not be taken as acquiescence to such statements.

Should any questions arise concerning this application, the Examiner is invited to contact the below signed attorney.

Respectfully submitted,

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