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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JONATHAN MAMOU, MOSHE WASSERBLAT,  
OREN PEREG, MICHAEL ASSAYAG and ORGAD KELLER

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Appeal 2018-006172  
Application 14/976,809<sup>1</sup>  
Technology Center 2600

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Before ALLEN R. MacDONALD, JON M. JURGOVAN, and  
AMBER L. HAGY, *Administrative Patent Judges*.

JURGOVAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant seeks review under 35 U.S.C. § 134(a) from a Final Rejection of claims 1, 5–9, 13–17, and 21–33, constituting all pending claims in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.<sup>2</sup>

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<sup>1</sup> We use the word “Appellant” to refer to “applicant(s)” as defined in 37 C.F.R. § 1.42. According to Appellant, the real party in interest is Intel Corporation. Appeal Br. 2.

<sup>2</sup> Our Decision refers to the Specification (“Spec.”) filed December 21, 2015, the Final Office Action (“Final Act.”) mailed May 19, 2017, the Advisory Action (“Adv. Act.”) mailed August 9, 2017, the Appeal Brief (“Appeal Br.”) filed October 23, 2017, the Examiner’s Answer (“Ans.”) mailed February 8, 2018, and the Reply Brief (“Reply Br.”) filed April 9,

### CLAIMED INVENTION

The claims are directed to automatic speech recognition (ASR) using semantic word affinity. Spec. Title, Abstract. A group of the highest ranked ASR hypotheses for words or utterances are selected from a stored list and re-ranked using semantic coherence scoring, and the highest re-ranked hypothesis is output. *Id.*

Claims 1, 9, and 17 are independent. The remaining claims are dependent from one of these three claims. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A component for semantic word affinity automatic speech recognition (ASR), the component comprising:
  - a storage device to hold a ranked list of ASR hypotheses obtained by the component;
  - a filter to select a set of ASR hypotheses from the list, the set of ASR hypotheses consisting of a predefined number of highest ranked ASR hypotheses from the list;
  - a processor to re-rank the set of ASR hypothesis using semantic coherence scoring between words in the ASR hypotheses, wherein to use semantic coherence scoring includes the processor to apply a semantic model to words in an ASR hypothesis to produce a respective semantic score, wherein the semantic model comprises a set of word vectors, wherein to apply the semantic model includes the processor to compute a distance between word vectors of words in a hypothesis and re-ranking the hypothesis higher when the distance is small; and
  - an interface to output a highest re-ranked ASR hypothesis from the set of ASR hypotheses.

Appeal Br. 13 (Claims App'x).

## REJECTION<sup>3</sup>

(1) Claims 1, 5–9, 13–17, and 21–23 stand rejected under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. Final Act. 4–5.

## ANALYSIS

### *§ 101 Rejection*

Patent eligibility is a question of law that is reviewable *de novo*. *Dealertrack, Inc. v. Huber*, 674 F.3d 1315, 1333 (Fed. Cir. 2012). Accordingly, we review the Examiner’s § 101 determinations concerning patent eligibility under this standard.

Patentable subject matter is defined by 35 U.S.C. § 101, as follows:

[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

In interpreting this statute, the Supreme Court emphasizes that patent protection should not preempt “the basic tools of scientific and technological work.” *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972) (“*Benson*”); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012) (“*Mayo*”); *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (“*Alice*”). The rationale is that patents directed to basic building blocks of technology would not “promote the progress of science” under the U.S. Constitution, Article I, Section 8, Clause 8, but instead would impede it. Accordingly, laws of nature, natural phenomena, and abstract ideas, are not

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<sup>3</sup> The Appellant and Examiner are advised to consider whether the word “conical” in paragraphs 22, 39, 55, 68, 83, 96 of the Specification, should instead be “canonical” as in paragraph 28 of the Specification.

patent-eligible subject matter. *Thales Visionix Inc. v. United States*, 850 F.3d 1343, 1346 (Fed. Cir. 2017) (citing *Alice*, 573 U.S. at 216).

The Supreme Court set forth a two-part test for subject matter eligibility in *Alice* (573 U.S. at 217–18). The first step is to determine whether the claim is directed to a patent-ineligible concept. *Id.* (citing *Mayo*, 566 U.S. at 76–77). If so, then the eligibility analysis proceeds to the second step of the *Alice/Mayo* test in which we “examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (internal quotation marks omitted) (quoting *Mayo*, 566 U.S. at 72, 79). There is no need to proceed to the second step, however, if the first step of the *Alice/Mayo* test yields a determination that the claim is directed to patent-eligible subject matter.

*USPTO Step 1—Categories of Invention in 35 U.S.C. § 101*

The Patent Office has recently revised its guidance for how to apply the *Alice/Mayo* test in the *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50–57 (Jan. 7, 2019) (“Revised Guidance”). Step 1 of the Revised Guidance (which is unchanged from the prior guidance) is to review the claims to determine whether they fall within one of the enumerated categories of invention under § 101. Claims 1, 5–8 and 25–27 recite “components,” which qualify as “machines” or “manufactures” under § 101. Claims 9, 13–16, and 28–30 recite “methods,” which qualify as “processes” under § 101. Claims 17, 21–24 and 31–33 recite “machine readable media,” which qualify as “machines” or “manufactures” under § 101. Thus, the claims satisfy Step 1 of the subject matter eligibility

analysis, and we proceed to USPTO Step 2A, which is the first step in the *Alice/Mayo* test.

In our subsequent § 101 analysis, we group all claims together and select claim 1 as representative of the group, as the Examiner and Appellant have done. *See* Final Act. 4–5; Appeal Br. 7–11; 37 C.F.R.

§ 31.47(c)(1)(iv). Accordingly, all claims stand or fall with claim 1. We will address the claims generally where possible, but when it is helpful to refer to explicit claim language, we will refer to claim 1 only.

*USPTO Step 2A – Alice/Mayo Step 1 (Are the Claims Directed to a Judicial Exception?)*

In Step 2A of the Revised Guidance, we determine if the claims are “directed to” a judicial exception. Step 2A of the Revised Guidance corresponds to the first step of the *Alice/Mayo* test but is in part changed from the *2014 Interim Guidance on Patent Subject Matter Eligibility*, 79 Fed. Reg. 74618–74633 (December 16, 2014), by separating the first step into two prongs. We address these prongs in order below.

*USPTO Step 2A—Prong 1 (Does the Claim Recite a Judicial Exception?)*

In Step 2A, Prong One, of the Revised Guidance we determine whether the claims recite a judicial exception including (a) mathematical concepts; (b) certain methods of organizing human activity; or (c) mental processes. 2019 Revised Guidance, 84 Fed. Reg. at 51–52. The Examiner finds that the “claims [] are directed to the abstract idea of listing and ranking of words, i.e. a collection, analysis, and display of available information, recognized as an abstract idea in *Electric Power Group, LLC v. Alstom S.A.*[], 830 F.3d 1350] (Fed. Cir. 2016).” Final Act. 4–5.

We largely agree with the Examiner’s identification of the abstract idea recited in the claims; specifically, the abstract idea is storing (i.e., the claimed “holding”), processing (i.e., the claimed “selecting,” “ranking” and “re-ranking”), and outputting a hypothesis for a word or utterance. We determine that these steps fall in the grouping of mental processes even though the claims recite various technical elements (“storage device,” “filter,” “processor,” “interface,” etc.). “If a claim, under its broadest reasonable interpretation, covers performance in the mind but for the recitation of generic computer components, then it is still in the mental processes category unless the claim cannot practically be performed in the mind.” *See Revised Guidance*, 84 Fed. Reg. at 52 n.14 (emphasis omitted).

Claim 1 recites (a) “a storage device to hold a ranked list of ASR hypotheses obtained by the component;” (b) “a filter to select . . . the highest ranked ASR hypotheses from the list;” (c) “a processor to re-rank the set of ASR hypothesis using semantic coherence scoring between words in the ASR hypotheses . . .;” and (d) “an interface to output a highest re-ranked ASR hypothesis from the set of ASR hypotheses.” Although the various functions and steps of the claims are recited as performed by technical elements, Appellant does not argue that ranking a list of ASR hypotheses, selecting only the highest ranked, re-ranking by semantic coherence scoring, and outputting the highest re-ranked ASR hypothesis, cannot practically be done in the human mind or with the aid of pencil and paper. “[W]ith the exception of generic computer implemented [functions or] steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper.” *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016). The Examiner finds,

and we agree, the recited elements such as a “storage device,” “filter,” “processor,” “interface,” “device component,” and “semantic model” as claimed are generic elements known in the art. *See* Final Act. 3–4.

Our reviewing courts have found similar claims to recite abstract ideas. In addition to *Electric Power Group* cited by the Examiner, examples of these cases include *Versata Development Group, Inc. v. SAP America, Inc.*, 793 F.3d 1306 (Fed. Cir. 2015) (claims directed to abstract idea of determining price using organizational and product group hierarchies); *OIP Technologies, Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015) (claims directed to abstract idea of offer-based price optimization using test offers with different prices); *Intellectual Ventures I LLC v. Capital One Financial Corp.*, 850 F.3d 1332 (Fed. Cir. 2017) (claims directed to abstract idea of collecting, displaying, and manipulating data); *In re TLI Communications LLC Patent Litigation*, 823 F.3d 607 (Fed. Cir. 2016) (claims directed to abstract idea of classifying and storing digital images in an organized manner). The parallels between these cases and the present claims are evident. For example, *Versata* and *OIP* involve processing by sorting, ranking, and selecting data (i.e., test offers or prices). Moreover, all of these cases involve collecting, storing, processing, and outputting data in an abstract manner. The similarities of these cases to the present one lead us to the conclusion that the claims at issue here likewise recite activities that can be done in the human mind or with the aid of pencil and paper. Accordingly, we conclude the claims recite mental processes, which is a category identified in the Revised Guidance as an abstract idea.

We thus proceed to Step 2A, Prong Two, of the *Alice/Mayo* test to determine whether the abstract idea embodied in the claims is integrated into a practical application.

USPTO Step 2A—Prong 2 (Integration into Practical Application)

Under Step 2A, Prong Two, of the Revised Guidance, we (a) identify whether there are any additional elements recited in the claim beyond the judicial exception, and (b) evaluate those additional elements individually and in combination to determine whether the claim as a whole integrates the exception into a practical application. We discern no additional element (or combination of elements) recited in claims that integrates the judicial exception into a practical application. *See Revised Guidance*, 84 Fed. Reg. at 54–55 (“Prong Two”). For example, Appellant’s claimed additional elements (e.g., “storage device,” “filter,” “processor,” “interface,” “device component” and “semantic model”): (1) do not improve the functioning of a computer or other technology; (2) are not applied with any particular machine (except for a generic computer system); (3) do not effect a transformation of a particular article to a different state; and (4) are not applied in any meaningful way beyond generally linking the use of the judicial exception to a particular technological environment, such that the claim as a whole is more than a drafting effort designed to monopolize the exception. *See id.*; MPEP §§ 2106.05(a)–(c), (e)–(h). Instead, the additional elements are used merely to store, select, rank, re-rank, and output a particular kind of data, with no practical application. *See Final Act*. 5.

Specifically, the result of Appellant’s claims is simply the output of a particular kind of data—the highest re-ranked ASR hypothesis. The Specification appears to regard an ASR hypothesis as a proposal or

candidate for what a word or utterance actually is. *See, e.g.*, Spec. ¶ 14, 17. Appellant’s claims, however, do not recite using such a hypothesis in any practical application, nor does the record support determining that a hypothesis itself represents a particular word or utterance. Simply put, there is no additional element recited in the claims that does something meaningful with the ASR hypothesis that is output, such as to produce printed or displayed text from it. *See* Spec. ¶ 26, Fig. 1. As such, the claims may be viewed as merely storing, processing, and outputting a particular kind of data, without actually using that data in a practical application. “[T]he prohibition against patenting abstract ideas ‘cannot be circumvented by’ . . . adding “insignificant post-solution activity.” *Diamond v. Diehr*, 450 U.S. 175, 191–192 (1981). Mere outputting the result of data processing—the highest re-ranked ASR hypothesis—as claimed, is insignificant extra-solution activity that fails to integrate the judicial exception into a practical application. Likewise, the origin of the ranked list of ASR hypotheses is not recited in the claims, and the storing of the ranked list of ASR hypotheses thus amounts to insignificant data gathering that fails to integrate the judicial exception into a practical application. Thus, the claims, when viewed as a whole, recite no additional elements or combinations thereof that amount to integration of the abstract idea recited in these claims into a practical application.

We next proceed to Step 2B of the subject matter eligibility test, corresponding to step two of *Alice/Mayo*, where we determine whether the claims recite an inventive concept that is significantly more than the abstract idea embodied therein.

USPTO Step 2B—Alice/Mayo Step 2 (Do the Claims Recite an Inventive Concept?)

We now evaluate whether the claims recite an inventive concept that transforms the judicial exception into patentable subject matter. Under Step 2B of the Revised Guidance, an “inventive concept” can be evaluated based on whether an additional element or combination of elements:

- (1) “[a]dds a specific limitation or combination of limitations that are not well-understood, routine, conventional activity in the field, which is indicative that an inventive concept may be present;” or
- (2) “simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception, which is indicative that an inventive concept may not be present.”

*See Revised Guidance*, 84 Fed. Reg. at 56.

*Versata* held that claims reciting arranging, storing, retrieving, sorting, eliminating, and determining were “conventional, routine, and well-known” involving “the normal, basic functions of a computer.” *Versata*, 793 F.3d at 1335. The claims at issue in this case similarly involve storing, selecting (essentially the same as *Versata*’s eliminating or determining), ranking and re-ranking (*Versata*’s arranging or sorting), and outputting data, which are well-known, routine and conventional under *Versata*.

Similarly, *Electric Power Group* held that claims that gather, analyze, and display information using conventional and generic technology were insufficient to constitute an inventive concept. *Electric Power Group*, 830 F.3d at 1356. In the present case, the claimed ranked list of ASR hypotheses is the result of data gathering under *Electric Power Group*, the claimed selecting, ranking, and re-ranking are data analysis under *Electric Power*

*Group*, and the claimed data output is more abstract or generic than the displaying of *Electric Power Group*. As noted, the claimed “storage device,” “filter,” “processor,” “interface,” “device component” and “semantic model” appear to be merely generic elements as they are claimed.

*Appellant’s Arguments*

Appellant argues that “limiting the claims to a technical means that are ‘arguably an advance over conventional computer and network technology,’ removes those claims from the same conclusion reached in *Electric Power*.” Appeal Br. 7. We agree with Appellant to the extent that the claimed holding (i.e., storing), selecting, ranking, re-ranking and outputting are performed by technical elements and that these functions or steps are carried out with a degree of particularity as claimed. These claims, however, fall short of patent eligibility because the result of the data processing—the highest re-ranked ASR hypothesis—is merely output and nothing further is done with it, such as rendering it on a display or sheet of paper as text. In addition, the origination of the ranked list of ASR hypotheses is not recited in the claims, which makes the claims even less patent-eligible.

Appellant argues that the claims provide “a technical solution that improves the capabilities of the computer results in patent eligible subject matter.” Appeal Br. 8. In support of this proposition, Appellant cites a discussion in *Electric Power Group* distinguishing the *Enfish* case. *Id.* (citing *Electric Power Group*, 830 F.3d at 1354 (distinguishing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016))). Appellant argues, as in *Enfish*, the claimed “semantic coherence scoring based on a word vector semantic model is a specific technological improvement over

the art that allows a computer to more accurately process human speech than previous ASR technologies allowed.” Appeal Br. 8. Although this claim feature may be an improvement, it cannot be a technological one that is practically applied when nothing is done with the result of the semantic coherence scoring. Merely outputting a hypothesis is not sufficient to confer patentability.

Appellant argues the claims are patent-eligible under the *McRO* case. Appeal Br. 9–10; Reply Br. 2; *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016). In particular, Appellant argues “the rejection is based on an over reductionist reading of the claims in light of the specification specifically cautioned against by the courts.” Appeal Br. 9–10. Appellant argues “there is no apparent support in the law for the proposition that the way in which outputs are used is required to demonstrate that an improvement to a computer system has occurred.” *Id.* We disagree with these arguments. The case here would be similar if *McRO*’s claim merely output “a final stream of morph weight sets.” *See McRO*, 837 F.3d at 1307–08. But *McRO*’s claim concludes with a step of “applying said final stream of morph weight sets to a sequence of animated characters to produce lip synchronization and facial expression control of said animated characters.” In other words, the output of data processing in *McRO* is “used and applied to create desired results: a sequence of synchronized, animated characters.” *Id.* at 1315. Accordingly, properly understood, *McRO* actually supports the Examiner’s conclusion and demonstrates why Appellant’s claims are patent-ineligible.

In the Advisory Action mailed August 9, 2017, as support for the rejection, the Examiner cited to the case of *Digitech Image Technologies*,

*LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014).

Adv. Act. 3. Appellant argues *Digitech* is inapposite to the facts of this case because “*Digitech* did not include technical means akin to that recited in the present claims.” Appeal Br. 10. Appellant further argues “*Digitech* is unpersuasive because it is superseded by greater guidance from the court and is irrelevant to the claims at issue.” *Id.* at 11.

We agree with Appellant that *Digitech*’s claims lacked technical means to perform the recited functions and steps, but adding merely generic elements to the claims, as done here, does not result in patent-eligible subject matter. Also, the claimed processing in *Digitech* resulted in a data profile that was not used in any practical application. Likewise, Appellant’s claims result in output of the highest re-ranked ASR hypotheses with no practical application. Thus, *Digitech* actually supports our conclusion that the claims in this case are patent-ineligible.

In the Reply Brief, Appellant presents a new argument citing the *Diehr* case. Reply Br. 2–3; *Diamond v. Diehr*, 450 U.S. 175 (1981). New arguments are not permitted in a reply brief absent a showing of good cause, which has not been provided. See 37 C.F.R. § 41.41(b)(2). In any case, even if we could consider Appellant’s untimely argument, we would remain unpersuaded. The processing in *Diehr*’s claims using the Arrhenius equation concluded with opening a mold press to allow extraction of a molded rubber article, or removing the rubber article from an opened mold press. Appellant’s claims recite no such practical application.

Appellant argues “the present claims represent technology that joins a myriad of other components in a successful ASR system, the present claims further improving the ability of these ASR systems to accurately interpret

spoken words into text.” Reply Br. 3. Nothing in these claims, however, requires that they improve the ability of an ASR system to accurately interpret spoken words into text. They merely result in output of a highest re-ranked ASR hypothesis (i.e., data). A hypothesis is merely a proposition or candidate for what a word or utterance might be, and its output as claimed is not used in any practical application, such as by displaying or printing text determined from the hypothesis. Missing from Appellant’s argument is any identification of which elements in claim 1 are *additional elements* beyond the abstract idea. The analysis in the second step of *Alice* does not consider whether the limitations that are part of the recited abstract idea are routine or well-known. As the Federal Circuit has explained, patent law does not protect abstract ideas, “no matter how groundbreaking the advance.” *SAP America, Inc. v. Investpic LLC*, 898 F.3d 1161, 1170 (Fed. Cir. 2018). What is necessary to impart patent eligibility for a claim that recites an abstract idea is a *specific limitation beyond the judicial exception* that is not well-understood, routine, and conventional.

Accordingly, we do not find Appellant’s arguments persuasive to show the Examiner errs in the conclusion that the claims are directed to patent-ineligible subject matter. Thus, we conclude that claims 1, 5–9, 13–17, and 21–23 fail to recite an inventive concept sufficient to transform into patent-eligible subject matter the recited abstract idea. We, therefore, sustain the Examiner’s rejection of claims 1, 5–9, 13–17, and 21–23 under 35 U.S.C. § 101.

DECISION

The Examiner's rejections of claims 1, 5-9, 13-17, and 21-23 under 35 U.S.C. § 101 are affirmed.

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
1, 5-9, 13-17, and 21-23	101		1, 5-9, 13-17, and 21-23	
<b>Overall Outcome</b>			1, 5-9, 13-17, and 21-23	

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED