UNITED STATES PATENT AND TRADEMARK OFFICE

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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 PEDRO J. MEDELIUS and ESPEN D. KATERAAS

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Appeal 2018-002393[1]
Application 14/000,797[2]
Technology Center 3600

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Before CAROLYN D. THOMAS, CARL W. WHITEHEAD, JR., and
JAMES B. ARPIN, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's final
rejection of claims 1–3, 7–10, 12, 13, and 20. Final Act. 2. Claims 4–6, 11,
and 14–19 are canceled. *Id.*; App. Br. 2, 4 (Claims App.). We have
jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] In this Decision, we refer to Appellants' Appeal Brief ("App. Br.," filed
October 2, 2017) and Reply Brief ("Reply Br.," filed January 3, 2018); the
Final Office Action ("Final Act.," mailed November 9, 2016); the
Examiner's Answer ("Ans.," mailed November 3, 2017); and the originally-
filed Specification ("Spec.," filed August 21, 2013). Rather than repeat the
Examiner's findings and determinations and Appellants' contentions in their
entirety, we refer to these documents.

[2] Appellants assert Heartmiles, LLC is the real party-in-interest. App. Br. 2.

STATEMENT OF THE CASE

Appellants' claimed wearable article relates to "monitor[ing] physical activity of an individual and determine a particular type of activity in which the individual is engaged. Advertising may be selected and directed to the individual based on this information." Spec. ¶ 2; *see id.* ¶¶ 4, 5. The Specification notes:

> Individuals that participate in certain types of activities often purchase equipment or articles related to that participation. For example, a runner may make regular purchases of athletic shoes and clothing, exercise monitoring equipment, sports drinks and nutrition products, etc. Similar patterns of purchasing behavior may exist for many types of activities, including cycling, swimming, skiing, walking, parachuting, horseback riding, etc. *Targeted advertising to such groups of individuals, based, e.g., on detected participation in a certain type of activity, may increase the effectiveness and efficiency of advertising efforts.*

Id. at 3 (emphasis added).

As noted above, claims 1–3, 7–10, 12, 13, and 20 are pending. Claim 1 is the sole independent claim. App. Br. 1–2 (Claims App.). Claims 2, 3, 7–10, 12, 13, and 20 depend directly or indirectly from claim 1. *Id.* at 2–4.

> Claim 1, reproduced below, is representative.
>
> 1. A wearable article for determining a type of physical activity in which an individual wearing the wearable article has engaged and for initiating direction of an advertisement to the individual tailored to the determined type of physical activity, the wearable article including:
>
> a band for securing the wearable article to an extremity of the individual;
>
> a housing attached to the band;

at least one three-dimensional accelerometer disposed within the housing;

a controller disposed within the housing, wherein the controller includes a pattern recognition algorithm implemented via a neural network configured to determine a type of physical activity, from among a predefined set of physical activity types, through analysis of the output of the three-dimensional accelerometer, the neural network is a trained neural network trained based on acceleration data obtained through performance of each of the predefined set of physical activity types;

a transceiver configured to establish communication with at least one device external to the wearable article;

and at least one battery disposed within the housing and configured to provide power to the controller, three-dimensional accelerometer, and transceiver;

wherein the controller is configured to:

receive the output from the three-dimensional accelerometer, the output including measurements of acceleration over time for the extremity of the individual along three axes;

use the trained neural network to analyze the measurements of acceleration over time for the extremity of the individual along three axes and to determine the type of physical activity in which the individual has engaged, from among the predefined set of physical activity types;

store the determined type of physical activity in a memory; and

use the transceiver to transmit the determined type of physical activity to the at least one device external to the wearable article to initiate delivery of a targeted advertisement tailored to the individual according to the determined type of physical activity.

Id. at 1–2.

REFERENCES AND REJECTIONS

The Examiner relies upon the following references:

Name	Number	Issued/Pub.	Filed
Kondo[3]	US 5,734,625	Mar. 31, 1998	Oct. 20, 1994
Ellis	US 2004/0102931 A1	May 27, 2004	Aug. 20, 2003
Hjelt	US 2005/0171410 A1	Aug. 4, 2005	May 25, 2004
Nurminen	US 2006/0178110 A1	Aug. 10, 2006	Feb. 9, 2005
Fu	US 2010/0305480 A1	Dec. 2, 2010	Jun. 1, 2009
Yuen	US 2012/0083715 A1	Apr. 5, 2012	Jun. 8, 2011
Froloff	US 2012/0089465 A1	Apr. 12, 2012	Oct. 6, 2010

The Examiner rejects the claims on the following grounds:

1. Claims 1–3, 7–10, 12, 13, and 20 under 35 U.S.C. § 101 as directed to patent ineligible subject matter (Final Act. 3–9);
2. Claims 1, 9, 10, 12, and 13 under 35 U.S.C. § 112, first paragraph, as lacking adequate written description (*id.* at 9–21);
3. Claims 1–3, 7, 8, 10, 12, and 13 under 35 U.S.C. § 103(a) as rendered obvious over Ellis, Fu, Froloff, and Hjelt (*id.* at 22–45);
4. Claim 9 under 35 U.S.C. § 103(a) as rendered obvious over Ellis, Fu, Froloff, Hjelt, and Kondo (*id.* at 45–48); and
5. Claim 20 under 35 U.S.C. § 103(a) as rendered obvious over Ellis, Fu, Froloff, Hjelt, and Yuen (*id.* at 49–51).

We review the appealed rejections for error based upon the issues identified by Appellants, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential). Arguments not made are waived. *See* 37 C.F.R.

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[3] All reference citations are to the first named inventor only.

§ 41.37(c)(1)(iv). Unless otherwise indicated, we adopt the Examiner's findings in the Answer as our own and add any additional findings of fact appearing below for emphasis. We address the rejections below.

ANALYSIS

I.   Patent Ineligible Claims

The Examiner rejects the claims 1–3, 7–10, 12, 13, and 20 under 35 U.S.C. § 101 as directed to patent ineligible subject matter. Final Act. 3–9. For the reasons set forth below, we sustain the Examiner's rejections.

A. Section 101

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the U.S. Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g., Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Court's two-part framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk."). According to the Court, concepts determined to be abstract

ideas and, thus, patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)).

In *Diamond v. Diehr*, the claim at issue recited a mathematical formula, but the Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diamond v. Diehr*, 450 U.S. 175, 176 (1981). Having said that, the Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*). Nevertheless, the Court noted that "[i]t is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Id.* at 187.

If the claim is "directed to" an abstract idea, we next "must 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 (quotation marks omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

B. *Office Patent Eligibility Guidance*

In an effort to achieve clarity and consistency in how the Office applies the Court's two part § 101 test, the Office published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019).[4] As an initial matter, we look to see whether the claims, as written, fall within one of the four statutory categories identified in § 101.[5] *Id.* at 53 ("Examiners should determine whether a claim satisfies the criteria for subject matter eligibility by evaluating the claim in accordance with the criteria discussed in MPEP 2106, *i.e.*, whether the claim is to a statutory category (Step 1) and the *Alice/Mayo* test for judicial exceptions (Steps 2A and 2B)").

Under that guidance, we then look to whether the claim recites:

(1) Step 2A – Prong One: any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity, such as a fundamental economic practice, or mental processes); and

(2) Step 2A – Prong Two: additional elements that integrate the judicial exception into a practical application (*see* MPEP[6] § 2106.05(a)–(c), (e)–(h)).[7]

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[4] This guidance supersedes previous guidance memoranda. *See 2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. at 51 ("All USPTO personnel are, as a matter of internal agency management, expected to follow the guidance.").

[5] Here, the pending claims are directed to a "wearable article," i.e., "machines." Final Act. 3; *see* 35 U.S.C. § 101. Thus, the pending claims are directed to a recognized statutory category.

[6] All Manual of Patent Examining Procedure ("MPEP") citations herein are to MPEP, Rev. 08.2017, January 2018.

[7] We acknowledge that some of the considerations at Step 2A, Prong Two, properly may be evaluated under Step 2 of *Alice* (Step 2B of the Office

See 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. at 54–55 ("Revised Step 2A").

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

> (3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or

> (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See id. at 56 ("*Step 2B: If the Claim Is Directed to a Judicial Exception, Evaluate Whether the Claim Provides an Inventive Concept.*").

C. Two-Part Alice/Mayo Analysis

1. Step 2A, Prong One – Claims "Directed To" Abstract Idea

Applying the first part of the *Alice/Mayo* analysis (Step 2A), the Examiner concludes:

> Although the claims recite a "wearable article...including... a band...a housing...at least one three-dimensional accelerometer disposed within the housing....a controller disposed within the housing....a transceiver....and at least one battery disposed within the housing", the claims are *directed to* an abstract idea (*the idea of determining a type of physical activity in which an individual has engaged and initiating delivery of a targeted advertisement tailored according to the determined type of physical activity*).

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guidance). For purposes of maintaining consistent treatment within the Office, we evaluate them under first part of the *Alice/Mayo* analysis (Step 2A of the Office guidance). *See 2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. at 55 n.25, 27–32.

Ans. 4 (emphasis added); *see* Final Act. 3–4. As the Specification explains:

> For example, data collection unit (with microcontroller 40), system 100, and/or system 700 can determine such parameter values as a particular activity type (e.g., running, swimming, cycling, tennis or other racquet sports, bowling, and many other sports or activities that involve general movement patterns providing a "signature" of the activity); time spent engaged in the activity; and/or exertion level while involved in the activity (e.g., both peak and average exertion levels). Based on this information, system 100, 700 may be configured to direct advertising to the individual tailored to the activities of the individual. *For example, advertisements for running equipment (e.g., shoes, clothing, heart rate monitors, run tracking software, etc.) may be provided to the individual if the system determines that the individual's physical activities include running.*

Spec. ¶ 150 (emphasis added). Further, the Examiner finds that "the abstract idea is similar in kind to other concepts focused on advertisements (*see*: *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014)) and marketing/sales force organization (*see*: *In re Maucorps*, 609 F.2d 481 . . . (CCPA 1979)) that were characterized as being abstract methods of organizing human activity."[8] Final Act. 4; *see Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) ("We need not define the outer limits of 'abstract idea,' or at this stage exclude the possibility that any particular inventive means are to be found somewhere in the claims, to

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[8] Our reviewing court recently has stated that it is "not bound by non-precedential decisions at all, much less ones to different patents, different specifications, or different claims. Each panel must evaluate the claims presented to it. Eligibility depends on what is claimed, not all that is disclosed in the specification." *Trading Tech. Int'l, Inc. v. IBG LLC*, No. 2017-2257, 2019 WL 1716242, at *8 (Fed. Cir. Apr. 18, 2019); *see* App. Br. 7–12.

conclude that these claims focus on an abstract idea—and hence require stage-two analysis under § 101."). Appellants disagree.

Initially, Appellants assert, "Claim 1 is directed squarely at an apparatus, not to an abstract concept." App. Br. 4; *see* Reply Br. 1 ("[T]he pending claims are directed to a particular machine and do not seek to tie up any judicial exception."). However,

> as the Supreme Court indicated in *Alice*, whether a device is "a tangible system (in § 101 terms, a 'machine')" is not dispositive. *See* 573 U.S. at 224 . . .; *In re TLI Commc'ns* [*LLC Patent Litig.*, 823 F.3d 607, 611 (Fed. Cir. 2016)] ("[N]ot every claim that recites concrete, tangible components escapes the reach of the abstract-idea inquiry."). Resolving the § 101 inquiry based on such an argument "would make the determination of patent eligibility 'depend simply on the draftsman's art.'" *Alice*, 573 U.S. at 224 . . . (quoting *Flook*, 437 U.S. at 593 . . .).

ChargePoint, Inc. v. SemaConnect, Inc., 920 F.3d 759, 770 (Fed. Cir. 2019).

Appellants further contend that the Examiner should have applied the streamlined § 101 analysis of the claims. App. Br. 5; Reply Br. 2; *see* MPEP § 2106.06. Although the streamlined analysis remains available, it only is appropriate "when the patent eligibility of a claim is self-evident." *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. at 54. In the robotic arm assembly described in streamlined Example 2, "a sensor that obtains movement information about the end effector, and a control system that uses movement information to adjust the velocity of the end effector" are patent eligible. App. Br. 5. Appellants contend that, similarly, pending claim 1 recites a wearable apparatus having a controller that analyzes movement information derived from at least one three-dimensional accelerometer to determine a type of physical activity, using a trained neural network implementing a pattern recognition algorithm. *Id.* The controller

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transmits the determined type of physical activity to the at least one device external to the wearable article to initiate delivery of a targeted advertisement tailored to the individual according to the determined type of physical activity. *Id.* at 5–6. While streamlined Example 2 describes a method of controlling the velocity of an end effector based on arm movement, we conclude that the claim language and the Specification here indicate that the focus of the pending claims is on the abstract idea of determining an individual's physical activity and delivering advertisements tailored to the physical activity, not to control of the wearable article. Thus, the patent eligibility of the pending claims is not *self-evident*, and we agree with the Examiner that streamlined eligibility analysis is not appropriate. Ans. 5.

Independent claim 1 broadly recites the limitations of (1) detecting an individual's physical activity ("a controller . . ., wherein the controller includes a pattern recognition algorithm implemented via a neural network configured to determine a type of physical activity, from among a predefined set of physical activity types, through analysis of the output of the three-dimensional accelerometer, the neural network is a trained neural network trained based on acceleration data obtained through performance of each of the predefined set of physical activity types" and "wherein the controller is configured to: receive the output from the three-dimensional accelerometer, . . . use the trained neural network to analyze the measurements of acceleration . . . and to determine the type of physical activity in which the individual has engaged"); and (2) initiating delivery of advertisement tailored to the individual's physical activity ("use the transceiver to transmit the determined type of physical activity to the at least one device external to

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the wearable article to initiate delivery of a targeted advertisement tailored to the individual according to the determined type of physical activity"). App. Br. 1–2 (Claims App.). These limitations, under their broadest reasonable interpretation, recite the fundamental economic practice of targeting advertising to interested consumers. Ans. 4–5; *see 2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. at 52; *see* Spec. ¶ 3 ("Targeted advertising to such groups of individuals, based, e.g., on detected participation in a certain type of activity, may increase the effectiveness and efficiency of advertising efforts."). Thus, we determine that the Examiner persuasively argues that the pending claims recite "Certain methods of organizing human activity." *See* Final Act. 4; Ans. 6–7; *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. at 52.

2. *Step 2A, Prong Two – Abstract Idea Not Integrated Into Practical Application*

Applying the second part of the *Alice/M*ayo analysis, the Examiner concludes, the additional, recited claim elements

> are part of a generic device, and serve merely to link the abstract idea to a particular technological environment or field of use (e.g., performed at/using a generic "wearable article" such as a generic exercise watch or smartphone). These "additional elements" are part of generic devices (e.g., generic exercise watches, generic smart phones), and the functions they are being used to perform within the context of the claimed invention (i.e., securing the wearable article to an extremity", "establishing communication with at least one device external to the wearable article" "providing power to the controller, three-dimensional accelerometer and transceiver", providing :output including measurements of acceleration over time for the extremity of the individual along three axes", etc.) are the well-understood, routine, and conventional functions/activities these elements are used for.

Ans. 7 (emphasis omitted); *see* Final Act. 5–8. The Examiner finds that this type of wearable article was known in the art. Final Act. 51 (discussing the teachings of Nurminen). Further, the Specification discloses that the additional, recited elements are generic. *See* Spec. ¶¶ 14 (known wrist bands), 26 ("Generally, most sports or types of physical activity produce a signature pattern of movements that can be detected using an accelerometer."), 32 ("[a]ny suitable microcontroller"), 37 (known memories), 43 ("The microcontroller's accuracy in determining the physical activity level or exertion level of a user can be refined according to any desired algorithm."), 86 (known connections to external devices). Neither the claims nor the Specification states that any of the described embodiments necessarily invokes particular hardware or software or, as discussed above, results in improvements in component technology or functions. Thus, the claims rely on generic or known hardware and software techniques, and these do not provide meaningful limitations beyond generally linking the use of the identified abstract idea to a particular technological environment. Final Act. 5–6; *see* MPEP §§ 2106.05(b)(I), 2106.05(h); *see also ChargePoint*, 920 F.3d at 768 ("In short, looking at the problem identified in the patent, as well as the way the patent describes the invention, the specification suggests that the invention of the patent is nothing more than the abstract idea of communication over a network for interacting with a device, applied to the context of electric vehicle charging stations."). Further, the configuration of the controller to "store the determined type of physical activity in a memory" is merely post-solution activity associated with the implementation of the abstract idea. Final Act. 7–8; *see* MPEP § 2106.05(g). The Examiner concludes that "[w]hen

considered as an ordered combination, the computer components of the Independent claims add nothing that is not already present when the steps are considered separately." Final Act. 8.

Appellants further contend that "[a]ccording to the USPTO's guidance on Section 101 examination, 'a streamlined analysis can be used for claims that **clearly** do not seek to tie up any judicial exception.' 2014 Interim Guidance on Patent Subject Matter Eligibility, posted March 6, 2015."[9] App. Br. 5. We recognize that the U.S. Supreme Court has described "the concern that drives this exclusionary principle [i.e., the exclusion of abstract ideas from patent eligible subject matter] as one of pre-emption." *See Alice*, 573 U.S. at 216. As our reviewing court has explained, however, "questions on preemption are inherent in and resolved by the § 101 analysis." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (citing *Alice Corp.*, 573 U.S. at 216). Further, "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Id.* at 1379. We are not persuaded that a potential lack of complete preemption is dispositive here with regard to the identification of an abstract idea or its practical application. *See* MPEP §§ 2106.04(I), 2106.05(b).

In view of Appellants' Specification, the identified prior art (e.g., Nurminen), and consistent with the Examiner's determinations, we conclude the pending claims do not recite:

(i)   an improvement to the functioning of a computer;

(ii)   an improvement to another technology or technical field;

(iii)   an application of the abstract idea with, or by use of, a particular machine;

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[9] *See supra* note 4.

    (iv)   a transformation or reduction of a particular article to a different state or thing; or

    (v)   other meaningful limitations beyond generally linking the use of the abstract idea to a particular technological environment.

See MPEP § 2106.05(a)–(c), (e)–(h). Thus, we conclude that the pending claims do not integrate the judicial exception into a practical application.

Accordingly, we conclude that claims 1–3, 7–10, 12, 13, and 20 are directed to an abstract idea.

3. *Step 2B – Not Significantly More Than the Abstract Idea*

Because we find that the claims are directed to an abstract idea and do not integrate that abstract idea into a practical application, we now consider whether the claims include additional limitations, such that the claims amount to significantly more than the abstract idea. As noted above, applying second part of the *Alice/M*ayo analysis, the Examiner concludes, the claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception. Final Act. 5; Ans. 7–8. In particular, as noted above, the Examiner finds that the additional elements recited in the claims are part of generic devices and perform the well-understood, routine, and conventional functions/activities, for which these elements are known. Ans. 7; *see* Final Act. 51 (citing Nurminen). We agree.

The Specification does not assert that any of the recited components, alone or in combination, are new or novel. On the contrary, the Specification makes clear that the components and techniques recited in the pending claims are well-understood, routine, and conventional. *See* Spec. ¶¶ 14, 26, 32, 37, 43, 86.

Appellants assert the Examiner finding that independent claim 1 is "directed to an abstract idea with 'additional generic computer elements'" "improperly equates the claimed band for securing the wearable article to an extremity of the individual, housing attached to the band, three-dimensional accelerometer disposed within the housing, transceiver, and battery disposed within the housing and configured to provide power to the controller, three-dimensional accelerometer to 'generic computer components.'" App. Br. 7; *but see Alice*, 573 U.S. at 222 ("In holding that the process was patent ineligible, we rejected the argument that 'implement[ing] a principle in some specific fashion' will 'automatically fal[l] within the patentable subject matter of § 101'" (alterations in original) (quoting *Flook*, 437 U.S. at 593).). Nevertheless, we are not persuaded that Appellants show that the recited combinations of these few components are in any way unconventional or non-generic. *See* Reply Br. 5–10.

On this record, we agree with the Examiner that the claims 1–3, 7–10, 12, 13, and 20 are directed to an abstract idea and fail to recite "significantly more" than the identified abstract idea. Therefore, we are not persuaded that the Examiner erred in determining that the pending claims are patent ineligible, and we sustain those rejections. Appellants do not argue the eligibility of the dependent claims separately, and we find that the dependent claims fall with their base claims. *See* Final Act. 8 (addressing the patent eligibility of the dependent claims).

Accordingly, we conclude that claims 1–3, 7–10, 12, 13, and 20 are patent ineligible.

II. Lack of Written Description

The Examiner rejects claims 1, 9, 10, 12, and 13 under 35 U.S.C.
§ 112, first paragraph, as lacking adequate written description. Final Act. 9–
21. The Federal Circuit explained that "[t]he test for the sufficiency of the
written description 'is whether the disclosure of the application relied upon
reasonably conveys to those skilled in the art that the inventor had
possession of the claimed subject matter as of the filing date.'" *Vasudevan
Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 682 (Fed. Cir. 2015).
For the reasons set forth below, we sustain the Examiner's rejection.

Claim 1 recites

> the controller includes a pattern recognition algorithm
> implemented via a neural network configured to determine a type
> of physical activity, from among a predefined set of physical
> activity types, through analysis of the output of the three-
> dimensional accelerometer, the neural network is a trained neural
> network trained based on acceleration data obtained through
> performance of each of the predefined set of physical activity
> types . . . use the trained neural network to analyze the
> measurements of acceleration over time for the extremity of the
> individual along three axes and to determine the type of physical
> activity in which the individual has engaged, from among the
> predefined set of physical activity types.

App. Br. 1–2 (Claims App.). The Examiner finds that this limitation lacks
adequate written description in the Specification for at least four reasons.

First, the Examiner finds that the Specification fails to disclose "a
controller configured to analyze information relating to the movements of
the individual, based on the output of the one or more accelerometers."
Final Act. 11. Nevertheless, as Appellants correctly note, this language does
not appear in claim 1. App. Br. 14. Although the Examiner argues that this
language is *equivalent* to the recitations of claim 1 (Ans. 9), the Examiner

may not ascribe language to the claim and then find that the Specification fails to evidence written description for the ascribed language. We disagree with the Examiner.

Second, the Examiner finds that the Specification fails to describe "how the processor/controller is configured to condition the output or process the signals to remove noise." Ans. 9; *see id.* at 11 ("How does Applicant apply the suggested weighting factors to incoming signals (suggesting weighting based on 'quality' and level of 'noise' merely suggest considerations used when making a weighting determination, not how the determination itself is actually made)?"); Final Act. 12–15. Nevertheless, as Appellants correctly note, the pending claims do not recite that the output of the controller is conditioned or that the signals are processed *to remove noise.* App. Br. 11. Again, the Examiner may not ascribe language to the claim and then find that the Specification fails to evidence written description for the ascribed language, and we again disagree with the Examiner.

Third, claim 1 recites "a band for securing the wearable article *to an extremity of the individual*; a housing attached to the band; [and] *at least one three-dimensional accelerometer* disposed within the housing." App. Br. 1 (Claims App.) (emphases added). Based on this recitation, the Examiner correctly finds that "**the instant claims . . . encompass a single wearable article with <u>only one</u> three-dimensional accelerometer and a controller that is able to classify the user's activity type between 'running, walking, tennis, swimming, and cycling'.**" Ans. 10. However, the Examiner argues that "**[w]hile it is understood that having a plurality of sensors (e.g., one on each wrist and ankle) could give a more accurate**

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representation of body movement, how is the neural network able to classify different types of activity using only one sensor mounted (for example) on a user's waist (which is encompassed by the claims)." *Id.* at 11; *see* Final Act. 15 ("The disclosure fails in this regard for any combination of accelerometers/sensors/biological markers, and acutely in situations where there is only one accelerometer associated with the system (which may be the case per claim 1)."). Although the claim language does encompass "one" accelerometer, as Appellants correctly note, the claims recite that the "at least one three-dimensional accelerometer" is contained in a housing banded to "an extremity" of an individual, not to the individual's waist. Reply Br. 12; *see* RANDOM HOUSE WEBSTER'S COLLEGE DICTIONARY, 466 (2nd Random House ed. 1999) (defining "extremity" as "a limb of the body"). Once again, the Examiner may not ascribe language to the claim and then find that the Specification fails to evidence written description for the ascribed language, and we once again disagree with the Examiner.

> Fourth, the Examiner finds that:
>
> > With regard to the determination of activity type and "activity signature patterns" – while the disclosure generally suggests pattern recognition and activity type classification using a neural network trained with data obtained from performing a plurality for activities *([0026], [0150]-[0151], [0153]*), this level of disclosure amounts to a general approach to programming the computer and a suggestion of possible inputs (e.g. speed, displacement, shock, pulse, temperature, etc.) and desired result (e.g., an accurate activity type classification based on new input). *However, there are several additional algorithms or steps that would be required for a practitioner (and Applicant) to perform to actually program a computer to perform these functions. These additional algorithms or steps would have a significant*

*impact on the actual program (and quality/accuracy of results)
a practitioner would end-up with.* While Applicant is not
required to actually submit the source-code of their
programming, sufficient disclosure of the algorithm/steps
requires a sufficient disclosure of all algorithms/steps that have
a significant impact on Applicant's actual program/model (and
the actual program a practitioner would end-up with if attempting
to recreate Applicant's method/system).

Final Act. 14 (emphasis added); *see* Ans. 11–12. Thus, the Examiner

concludes that the Specification fails to provide an adequate written

description of a "pattern recognition algorithm" or how the neural network is

trained based on the obtained acceleration data. We agree.

Appellants contend that the Specification discloses that:

A 3-axis accelerometer provides a complete representation of the
acceleration in a three-dimensional space.

The indication provided by the accelerometer is
proportional to the acceleration to which it is being exposed. *A
mathematical integration* of the acceleration results in an
indication of velocity. *A second mathematical integration*
provides an indication of displacement. *On the other hand, the
mathematical derivative* of the acceleration provides an
indication of shock.

*The combination of all these measurements can be used to
determine the type of activity being performed by an individual.*
For example, certain activities may be associated with a certain
set of characteristics that may be observed based on analysis of
the outputs of accelerometers 801, 803, 805, 807, and/or
accelerometer 24. For example: walking, jogging, and running
produce a periodic acceleration when measured in the lower
extremities, while exhibiting a shock component every time
contact is made with the ground. The acceleration immediately
following the detection of the shock can be used to estimate the
speed of movement, which when coupled with the time between
successive shocks can be used to estimate the distance traversed.
The numerical integration of the distance traversed between

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> successive shocks can then be used to estimate the total distance traversed by a person. Furthermore, indications from accelerometers placed in the upper extremities can be correlated with those of the lower extremities to further validate the periodic movement of the arms associated with walking, jogging, and running.

Spec. ¶¶ 141–143 (emphases added); *see* App. Br. 16 (quoting portions of these paragraphs). Nevertheless, the Specification only describes components of a pattern recognition algorithm, not a complete algorithm.

> Appellants implicitly acknowledge this deficiency, contending that:

> The types of programming, neural networks, and how to train neural networks based on one or more data sets would have been known to those of skill in the art, and other than general allegations that the specification does not provide the type of detail the Examiner would have liked to see, the Examiner has failed to offer any evidence to suggest otherwise. *The description in the specification is certainly detailed enough to enable a skilled artisan to conclude that the inventor's possessed the claimed invention at the time of filing.*

Reply Br. 12 (emphasis added); *see* App. Br. 20. The adequacy of written description is a question of fact and is not shown by mere argument. *In re Alton*, 76 F.3d 1168, 1175 (Fed. Cir. 1996) ("First, by concluding that the Wall declaration addressed an issue of law instead of an issue of fact, and second, by failing to articulate adequate reasons to rebut the Wall declaration, the examiner and Board failed to consider the totality of the record for the purpose of issuing a final rejection and thus erred as a matter of law."). On this record, we agree with the Examiner that the Specification fails to provide adequate written description of a "pattern recognition algorithm" or how the neural network is trained based on the obtained acceleration data. Absent evidence of what a person of ordinary skill in the art would have known or been able to determine from the Specification, we

are not persuaded that the Specification provides adequate written description to support the claims.

The Examiner did not err in determining that claim 1 lacks adequate written description. Claims 9, 10, 12, and 13 depend from claim 1, and suffer from the same deficiency. Consequently, we sustain the Examiner's lack of written description rejections of claims 1, 9, 10, 12, and 13.

III. Obviousness

The Examiner rejects claims 1–3, 7–10, 12, 13, and 20 under 35 U.S.C. § 103(a) as rendered obvious over Ellis, Fu, Froloff, and Hjelt, alone or in combination with Kondo or Yuen. Final Act. 22–51. A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). For the reasons set forth below, we sustain the Examiner's obviousness rejections.

A. Independent Claim 1

The Examiner determines that independent claim 1 is rendered obvious over the combined teachings of Ellis, Fu, Froloff, and Hjelt. Final Act. 22–45; *see* Ans. 14–18. In particular, the Examiner provides a detailed mapping of the limitations of independent claim 1 that are taught or suggested by each of Ellis, Fu, Froloff, and Hjelt (Final Act. 22–27 (teachings of Ellis), 28–31 (teachings of Fu), 33 (teachings of Froloff), 35–36 (teachings of Hjelt)) and reasons for combining the teachings of each of these references (*id.* at 31–32 (reasons to combine the teachings of Ellis and

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Fu), 34–35 (reasons to combine the teachings of Ellis and Fu with those of

Froloff), 36 (reasons to combine the teachings of Ellis, Fu, and Froloff with

those of Hjelt)) to achieve the wearable article recited in claim 1. *See KSR*,

550 U.S. at 420 ("Under the correct analysis, *any need or problem* known in

the field of endeavor at the time of invention and addressed by the patent

can provide a reason for combining the elements in the manner claimed."

(emphases added)).

    Appellants contend the Examiner fails to demonstrate that combined

teachings of Ellis, Fu, Froloff, and Hjelt render the wearable article of claim

1 obvious for at least three reasons. App. Br. 22–25; Reply Br. 14–15. For

the reasons set forth below, we are not persuaded by Appellants' contentions

that the Examiner erred.

    First, Appellants contend the Examiner relies on improper hindsight in

combining the teachings of Ellis, Fu, Froloff, and Hjelt to render

independent claim 1 obvious. App. Br. 22; *see* Reply Br. 14. In particular,

Appellants contend that these four references relate to different systems and

that only hindsight could have justified *cobbling* their teachings together to

achieve the recited, wearable article of claim 1. App. Br. 22. Appellants

conclude that

> [t]hese references are directed to such varied aspects of different
> types of systems, that even assuming that one skilled in the art
> had perfect knowledge of each of these references, the skilled
> artisan could not have arrived at the presently claimed invention
> without using the pending claims as a roadmap, as the Examiner
> has done.

Reply Br. 14. However, apart from identifying the allegedly different

focuses of the applied references, Appellants do not challenge the reasons

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for combining their teachings proposed by the Examiner. *Id.*; *see* App. Br. 22.

    As the Examiner notes, any obviousness rejection necessarily involves a reconstruction of the recited article based on hindsight. Ans. 14. The Examiner's reconstruction

> takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made [as evidenced by the teachings of the applied references], and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392 . . . (CCPA 1971).

Ans. 14. Here, we are persuaded that the Examiner has expressed persuasive reasons for each proposed combination of the teachings of these references. Final Act. 31–32, 34–35, 36. Appellants do not contend specifically that any of these expressed reasons are incorrect. *See* App. Br. 22; Reply Br. 14. Thus, we find Appellants' contention unpersuasive.

    Second, Appellants contend that "no combination of the cited references teaches or suggests every claim element" and proposes deficiencies in each of the *individual* references that make up the asserted combination. App. Br. 22–25. Initially, Appellants note that the Examiner acknowledges:

> Ellis fails to disclose any determination of a type of physical activity in which an individual has engaged, initiating direction of a targeted advertisement based on the determined activity type, a three-dimensional accelerometer, a controller having the claimed trained neural network and pattern recognition algorithm to detect a type of physical activity based on an output of the

three-dimensional accelerometer, among several other claim elements.

App. Br. 22–23 (citing Final Act. 27). Although the Examiner relies on Fu to supply these missing limitations, Appellants contend that

> Fu, like Ellis, fails to disclose the apparatus wearable on an extremity of an individual and including a controller programmed to determine a physical activity type based on output of a commonly housed accelerometer. . . . Further, while Fu indicates that the central computing device can implement a trained neural network (para. 58), there is no disclosure or any suggestion in Fu (or Ellis) of using any determination of a physical activity type as the basis for initiating a targeted advertisement or transmitting that information to a device external to the wearable apparatus to initiate the transfer.

App. Br. 23–24. Nevertheless, the Examiner relies on

> Ellis [to] teach[] a wearable device with a commonly housed accelerometer and processor [and] Fu [to] teach[] a wearable device with a processor programmed to determine a physical activity type based on output of an accelerometer located on the wearer's body. The combination of references teach a wearable article on an extremity of an individual and including a controller programmed to determine a physical activity type based on output of a *commonly housed* accelerometer.

Ans. 15; *see* Final Act. 22 (citing Ellis ¶¶ 42, 245, 248, 255, Figs. 10, 19, 22A, 26C, 30, 78), 28 (citing Fu ¶¶ 2, 4, 5, 20–24, 25, 32, Fig. 2). Further, the Examiner relies on Froloff, *not Ellis or Fu,* to teach using any determination of a physical activity type as the basis for initiating a targeted advertisement or transmitting that information to a device external to the wearable apparatus to initiate the transfer. *See* Final Act. 33. As noted above, we find that the Examiner provided persuasive reasons for the proposed combination of the teachings of Ellis and Fu. Final Act. 31–32;

see Ans. 15–16. We find Appellants' contentions to the contrary

unpersuasive. *See* App. Br. 23–24; Reply Br. 15.

Appellants also contend that

> like Ellis and Fu, Froloff fails to base any targeted advertisement on the detection of a physical activity type. In Froloff, the physical activity type information must be derived from the type of mobile application being used. It is not automatically obtained through analysis of the output of a three[-]dimensional accelerometer, as claimed.

App. Br. 24. Nevertheless, the Examiner finds that:

> Froloff clearly teaches that advertising can be targeted to a user based on a type of physical activity the user has engaged in. In Froloff, the type of physical activity is specified/selected by the user. As discussed above, the combination of Ellis and Fu teach determining the type of physical activity based on an output of an accelerometer. One of ordinary skill in the art would have been motivated to target advertisements to the user/wearer of the wearable article of Ellis in view of Fu because doing so can identify specific and particular motivated customers and customer needs which may increase the success rate of advertisement presentation which may increase revenue for advertisers and the system and which may increase customer satisfaction by presenting them with potential products to fulfill immediate needs.

Ans. 17 (emphasis omitted); *see* Final Act. 33 (citing Froloff ¶¶ 1, 33, 54,

62, 87, 90, Figs. 6, 7). We agree with the Examiner and find Appellants'

contentions to the contrary unpersuasive. *See* App. Br. 23–24; Reply Br. 15.

Thus, we are not persuaded that the Examiner erred in determining

that the combined teachings of Ellis, Fu, Froloff, and Hjelt render

independent claim 1, and dependent claims 2, 3, 7, 8, 10, 12, and 13, obvious, and we sustain those rejections. *See* Final Act. 36–45; App. Br. 25.

B. *Remaining Dependent Claims*

The Examiner rejects claims 9 and 20 in view of the application of the combined teachings of Ellis, Fu, Froloff, and Hjelt to their base claim and the additional teachings of Kondo or Yuen. Final Act. 45–51. Appellants rely solely on their challenges to the base claim, claim 1, to overcome these rejections. App. Br. 25–26. For the reasons given above, we are not persuaded that the Examiner erred in determining that the combined teachings of Ellis, Fu, Froloff, and Hjelt render claim 1 obvious. Because Appellants have not presented separate patentability arguments or have reiterated substantially the same arguments as those previously discussed for patentability of claim 1 above, claims 9 and 20 fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Accordingly, on this record, we sustain the Examiner's obviousness rejections of claims 1–3, 7–10, 12, 13, and 20.

CONCLUSIONS

1. The Examiner did not err in rejecting claims 1–3, 7–10, 12, 13, and 20 under 35 U.S.C. § 101, as directed to patent-ineligible subject matter.
2. The Examiner did not err in rejecting claims 1, 9, 10, 12, and 13 under 35 U.S.C. § 112, first paragraph, as lacking adequate written description.

3. The Examiner did not err in rejecting claims 1–3, 7–10, 12, 13, and 20 under 35 U.S.C. § 103(a), as rendered obvious over the applied references.

4. Claims 1–3, 7–10, 12, 13, and 20 are not patentable.

DECISION

We affirm the Examiner's rejections of claims 1–3, 7–10, 12, 13, and 20.

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