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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ANANDAMURUGAN S, MATTHIAS JOBST, and  
JEROME POIRIER

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Appeal 2017-008962  
Application 13/362,585<sup>1</sup>  
Technology Center 2800

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Before KAREN M. HASTINGS, CHRISTOPHER C. KENNEDY, and  
MERRELL C. CASHION, Jr., *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants request our review under 35 U.S.C. § 134 of the  
Examiner's final rejection of claims 1–20. We have jurisdiction under  
35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> General Electric Company is identified as the real party in interest. Appeal  
Br. 3.

## THE INVENTION

Claims 1 and 2, reproduced below, are illustrative of the subject matter on appeal.

1. A system for calibrating comprising:
  - an ultrasonic wedge having a back wall;
  - a probe comprising a phased array transducer, wherein the probe is mounted to a probe interface wall of the ultrasonic wedge; and
  - an ultrasonic inspection station connected to the probe by a probe cable, wherein the ultrasonic inspection station comprises a display, a microprocessor, a memory coupled to the microprocessor, and one or more executable instructions stored in the memory and configured to be executed by the processor, the executable instructions including instructions for:
    - displaying a first ultrasonic signal gate on the display, wherein the first ultrasonic signal gate is based on a theoretical Z distance between a first transducer element of the phased array transducer of the probe and a back wall of the ultrasonic wedge, and a theoretical Z distance between a last transducer element of the phased array transducer of the probe and the back wall of the ultrasonic wedge;
    - locating a second ultrasonic signal gate above a start of the first ultrasonic signal gate;
    - firing an ultrasonic signal from each of the transducer elements;
    - identifying each of the transducer elements that did not trigger the first ultrasonic signal gate as dead transducer elements; and
    - identifying each of the transducer elements that triggered the first ultrasonic signal gate and also triggered the second ultrasonic signal gate as dead transducer elements.

2. A method for calibrating an ultrasonic wedge and a probe having a phased array transducer, the method comprising the steps of:

automatically determining an ultrasonic signal acquisition width based on a first plurality of theoretical parameters of the ultrasonic wedge and the phased array transducer of the probe; and

automatically determining a location of a first ultrasonic signal gate based on a second plurality of theoretical parameters of the ultrasonic wedge and the phased array transducer of the probe.

Appeal Br.<sup>2</sup> 25–26 (Claims Appendix).

Independent claim 1 is directed to a system for calibrating comprising identifying dead transducer elements from a first ultrasonic signal gate based on a first and second “theoretical Z distance.” Independent claims 2 and 13 are similarly directed to methods of calibrating which comprise determining a location of an ultrasonic signal gate based on theoretical parameters.

Appellants argue claims 1, 2, and 13 as a group (Appeal Br. 9–15).

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<sup>2</sup> Citations are to Final Rejection (“Final”), mailed 2/11/2016, to the Corrected Appeal Brief, filed 10/24/2016 (“Appeal Br.”), the Examiner’s Answer (“Ans.”), mailed 3/7/2017 and to the Reply Br. (“Reply Br.”), filed 5/8/2017.

## REJECTIONS AND REFERENCES

The Examiner maintains the following rejections on appeal:

1. Claims 1–20<sup>3</sup> are rejected under 35 U.S.C. § 101.
2. Claims 2, 3, and 6 are rejected under 35 U.S.C. § 102(b) over Buttram, (U.S. Patent Publication No. 2007/0000328 A1, published Jan. 4, 2007) (“Buttram”).
3. Claims 7, 13, and 17–19 are rejected under 35 U.S.C. § 103(a) over Buttram in view of Simard et al., (U.S. Patent Publication 2010/0242613 A1, published Sept. 30, 2010) (“Simard”).

## ANALYSIS

We review the appealed rejections for error based upon the issues identified by the Appellants and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) (cited with approval in *In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections”)). After considering the evidence presented in this Appeal and each of Appellants’ arguments, we are not persuaded that Appellants identify reversible error. Thus, we affirm

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<sup>3</sup> Appellants’ statement that “[c]laims 1–20 stand rejected under 35 U.S.C. § 101, with claims 1, 4–5, 8–12, 14–16, and 20 only rejected on this ground” (Appeal Br. 9) is understood to mean that Appellants and the Examiner were in agreement that all of claims 1–20 were rejected under 101. *See also* Appeal Br. 9 (addressing “the rejection of claims 1–20 under 35 U.S.C. 101”) and Ans. 3 (stating “[c]laims 1–20 stand rejected under 35 U.S.C. 101”).

the Examiner's rejections for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

Rejection 1, Section 101

With respect to this rejection, Appellants argue independent claims 1, 2, and 13 as a group. Appeal Br. 9–15. We therefore limit our discussion to claim 1. Claims 2 and 13 stand or fall with that claim. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

*Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014), identifies a two-step framework for determining whether claimed subject matter is judicially-excepted from patent eligibility under § 101.

According to *Alice* step one, “[w]e must first determine whether the claims at issue are directed to a patent-ineligible concept,” such as an abstract idea. *Alice*, 134 S. Ct. at 2355. In that regard, the Examiner determined that the claims are directed to performing mathematical calculations to identify and calculate parameters, locations, and gates, and therefore concluded that the subject matter of the claims is directed to the judicial exception of abstract ideas. Ans. 3–5; Final 3–5.

Appellants challenge the Examiner's articulation of what the claims are directed to by arguing that the Examiner fails to analyze each claim as a whole, but the challenge is unfounded. *See* Appeal Br. 12–13; Reply Br. 2–3. For example, the fact that the preamble of the claims indicates they are drafted for calibrating is not dispositive. The question is what the claims are “directed to.”

[T]he “directed to” inquiry applies a stage-one filter to claims, considered in light of the specification, based on whether “their

character as a whole is directed to excluded subject matter.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed. Cir. 2015); see *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1375, 2016 WL 1393573, at \*5 (Fed. Cir. 2016) (inquiring into “the focus of the claimed advance over the prior art”).

*Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). In this, there appears to be no dispute as Appellants admit that “the claims are directed to ***a specific application of the mathematical operations***” (Appeal Br. 14). “The ‘abstract idea’ step of the inquiry calls upon us to look at the ‘focus of the claimed advance over the prior art’ to determine if the claim’s ‘character as a whole’ is directed to excluded subject matter.” *Affinity Labs of Texas v. DirecTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016)). “In determining the eligibility of respondents’ claimed process for patent protection under § 101, their claims must be considered as a whole.” *Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

As set out in the Background section of Appellants’ Specification, it was well known to calibrate a probe and ultrasonic wedge combination (¶¶ 5–6). The claims are directed to determining values for a first ultrasonic signal gate and identifying dead transducer elements, wherein both steps are based on calculations using theoretical parameters. The Specification clarifies that the theoretical parameters comprise numerical values, such as a theoretical distance of a transducer element or theoretical offset for the ultrasonic wedge, that are inputted into specific equations as part of the calibration process (Spec. ¶ 25). In addition, the Specification repeatedly discloses that by calculating the equations using the theoretical parameters,

the invention “simplifies the calibration process” by determining the ultrasonic signal acquisition parameters without “the need for an inspection technician” (¶ 26). Accordingly, the claims as a whole, in light of the Specification, are directed to performing mathematical calculations using theoretical parameters to simplify the calibration process of a probe, which is consistent with the Examiner’s position that the claim is directed to mathematical calculations (Final 3–5; Ans. 3–4).

Step two is “a search for an ‘inventive concept’—*i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Alice*, 134 S. Ct. at 2355 (alteration in original) (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 72–73 (2012)). In this regard, the Examiner determined that, generically linking the use of a judicial exception to a particular technological environment or field of use (such as improving ultrasonic inspection technology) is insufficient because there are no additional elements that “that are sufficient to amount to significantly more than the judicial exception because the only additional elements . . . are all generic elements or conventional equipment required by the claimed abstract idea at a high level of generality” (Final 3).

The Specification does not support Appellants’ argument that the additional elements comprise significantly more than the abstract idea of performing mathematical calculations as part of a calibration process. The claims employ conventional devices (ultrasonic wedge, ultrasonic transducers, back wall, probe, ultrasonic inspection station) for their common functions. The Specification discloses that ultrasonic wedges

attached to back walls, probes and ultrasonic transducers are conventional components of an ultrasonic testing/inspection system (¶¶ 3–5). In addition, the Background of the Specification discloses that many of the steps in the claims, such as determining signal width and determining when transducer elements are not operating properly (i.e., dead or alive) are well known steps for performing a calibration procedure (¶ 5 disclosing determining ultrasonic signal acquisition width when testing pipe welds) and conventionally performed by an inspection technician (¶ 6). Simply adding that the conventional steps are “automatically” determined in the claims without further specifying the entity performing the steps or the application of such determinations beyond what is already established as conventional is insufficient to amount to significantly more than the abstract idea. *Cf. Alice*, 134 S. Ct. 2358 (citation omitted). “[T]he mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention. Stating an abstract idea ‘while adding the words ‘apply it’” is not enough for patent eligibility.” *Id.*

The Appellants further argue that the claims comprise significantly more than simple calculations because they “improve the technology of ultrasonic inspections by improving the calibration of the wedge and probe using the results of these allegedly mathematical steps” (Appeal Br. 14) (emphasis omitted). Appellants, however, do not persuasively argue why the additional elements of the claim (beyond calculating) are not routine or conventional. Each of the steps of the claims comprise generating mathematical values (i.e., displaying first signal gate based on theoretical distances, locating a second gate above the first gate and identifying dead

transducer elements). The claims do not disclose any application or further use after generating the mathematical values/gate and identifying the dead transducer elements. Therefore, the claims ***do not disclose using the results of the calculations*** from generating the gate and identifying the dead elements for any improvement or application beyond the calculation of additional math. This supports the Examiner's finding that the determinations/calculations made in the claims "are not further used to feedback data and carry out a calibration." (Ans. 4). Accordingly, Appellants' arguments that the claims comprise significantly more than the abstract idea are not persuasive.

In addition, we agree that *Parker v. Flook*, 437 U.S. 584 (1978), referenced by the Examiner (Final 10; Ans. 3), supports the Examiner's conclusion that a preponderance of the evidence shows that the limitations in Appellants' claims are directed to an abstract idea and are non-statutory. Similar to Appellants' claims, the claims and Specification in *Flook* disclosed monitoring operating conditions such as temperature, pressure and flow rates and generating an alarm when any of the operating conditions exceed a predetermined alarm limit. *Flook*, 437 U.S. at 586. The Court based its determination that the claims were non-statutory in *Flook* upon their conclusion that "[r]espondent's application simply provides a new and presumably better method for calculating alarm limit values," citing "if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory." *In re Richman*, 563 F.2d 1026, 1030 (1977)." *Id.* at 595–596. Therefore, the limitations of Appellants' claims are non-statutory because,

like the claims in *Flook*, the limitations of Appellants' are directed to mathematical calculations using theoretical parameters to determine values of ultrasonic signal gates and identify dead transducer elements.

For the foregoing reasons, Appellants have not shown error in the Examiner's *Alice* step two determination that the claims do not include an element or combination of elements sufficient to ensure that in practice they amount to significantly more than to be upon the ineligible concept itself.

The remaining arguments have been carefully considered but are unpersuasive as to error in the rejection.

The rejection of claims 1–20 under 35 U.S.C. § 101 as being directed to non-statutory subject matter is sustained.

#### Rejection 2, Section 102

A preponderance of the evidence supports the Examiner's finding that the claimed subject matter of representative claim 1 is anticipated within the meaning of § 102 in view of the applied prior art of Buttram. Accordingly, we will sustain all of the Examiner's rejections for essentially those reasons expressed in the Answer, including the Examiner's Response to Argument section, and we add the following primarily for emphasis.

"[T]he PTO must give claims their broadest reasonable construction consistent with the specification. . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation." *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007). "[A]s applicants may amend claims to narrow their scope,

a broad construction during prosecution creates no unfairness to the applicant or patentee.” *Id.*

Appellants argue that independent claim 2 and dependent claims 3 and 6 are not anticipated by Buttram because “the Examiner has failed to explain how Buttram’s general description teaches the specific recitation in claim 2 of ‘automatically determining an ultrasonic signal acquisition width’” (Appeal Br. 17–18; Reply Br. 4–5).

Appellants’ arguments are unpersuasive. There is no dispute between Appellants and the Examiner that the Specification defines the width as comprising the distance or time between the times an acquisition starts and stops (¶ 25). The Examiner properly explains that Buttram teaches width by disclosing calculating a tip depth from the time it takes for sound to start (i.e., time of acquisition) to travel to the crack tip and back (i.e., stop) at a specified arrival time (Buttram ¶ 18). Appellants do not provide any persuasive reasoning or evidence why the claimed width is not encompassed by Buttram’s calculation of the tip depth.

Appellants further argue that Buttram does not teach “determining a location of a first ultrasonic signal gate based on a second plurality of theoretical parameters” as recited in claim 2, because “the Examiner acknowledges that the Application describes the first ultrasonic signal gate as being based on two theoretical Z distances” while “at best Buttram teaches determining a single distance between two elements” (Reply Br. 4) (emphasis omitted). A preponderance of the evidence does not support Appellants’ arguments. Claim 2 does not require two theoretical Z distances. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (it is well

established that limitations not appearing in the claims cannot be relied upon for patentability). The Examiner only discusses the cited portion of the Specification (¶ 10) as an example to illustrate the Examiner's point that the Specification does not provide an explicit definition for the claim phrase "location of a first ultrasonic signal gate" (Ans. 6). Neither the Specification nor the claims actually require the first ultrasonic signal gate to be based on two **different** theoretical Z distances.<sup>4</sup> Claim 2 requires only that the location value be "based on a second plurality of theoretical values." Because the Specification does not provide a specific definition for "location of a first ultrasonic signal gate" and only discloses determining the difference in distances between a transducer element and a wall of the wedge, the Examiner properly interpreted the claim term to encompass the difference between a height of a transducer of a probe and the wall of the wedge (Ans. 6). The Examiner finds that "h" in Figure 9 of Buttram teaches calculating a difference between the height of the transducer (i.e., one value) and a wall of the wedge (a second theoretical value). *Id.* Therefore, a preponderance of the evidence supports the Examiner's position that

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<sup>4</sup> While claim 1 and paragraph 10 of the Specification disclose "one embodiment" in which the first ultrasonic signal gate is based on "a theoretical Z distance between a first transducer element . . . and a back wall" and "a theoretical Z distance between a last transducer element . . . and the back wall," neither claim 1 or the cited portion of the Specification disclose that the first transducer element is distinct from the last transducer element (i.e., there could be only one transducer element which is both the first and last) or that the two theoretical Z distances are actually distinct and different from one another. In addition, only independent claim 1 discloses that the first ultrasonic signal gate is based on the theoretical Z distances and the claim at issue in this rejection is independent claim 2.

Buttram properly anticipates the claim limitation by teaching determining a location, or difference, based upon a plurality of theoretical values.

Accordingly, we affirm the Examiner's anticipation rejection.

### Rejection 3, Section 103

Upon consideration of the evidence relied upon in this appeal and each of Appellants' contentions, we find that the preponderance of the evidence supports the Examiner's conclusion that the subject matter of Appellants' claims is unpatentable over the applied prior art. We sustain the Examiner's § 103 rejections because we are unpersuaded of error in the Examiner's determination of obviousness essentially for the reasons set out by the Examiner in the Answer.

We add the following primarily for emphasis.

It has been established that "the [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *see also In re Fritch*, 972 F.2d 1260, 1264–65 (Fed. Cir. 1992) (a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in the art would have reasonably been expected to draw therefrom).

With respect to rejection 3, Appellants do not offer any new arguments with respect to dependent claim 7 (Appeal Br. 20), therefore claim 7 stands or falls with independent claim 2 which was affirmed in rejection II. Appellants argue claims 13 and 17–19 as a group (Appeal Br.

20–23), therefore those claims stand or fall together. 37 C.F.R. § 41.37(c)(1)(iv) (2013).

Appellants’ arguments regarding claims 13 and 17–19 are unpersuasive. Appellants argue that the claims were improperly rejected because Buttram does not teach determining parameters based on an operating status of the transducer elements. The Examiner, however, correctly points out that the claims only require determining parameters based on time of flight. *In re Self*, 671 F.2d at 1348 (it is well established that limitations not appearing in the claims cannot be relied upon for patentability). In addition, Appellants argue that the secondary reference Simard fails to teach the claim limitations “determining at least one actual parameter” and “determining a location of a first ultrasonic signal gate;” however, the Examiner cited the primary reference (rather than Simard) as disclosing that limitation. In response to Appellants’ arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Consequently, a preponderance of the evidence supports the Examiner’s position that claims 13 and 17–19 were properly rejected over Buttram in view of Simard.

The remaining arguments have been carefully considered but are unpersuasive as to error in the rejection.

Because Appellants have failed to identify harmful error, we sustain the Examiner’s rejection of claims 7, 13, and 17–19 as unpatentable over Buttram in view of Simard.

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Application 13/362,585

DECISION

For the above reasons, the Examiner's rejections of claims 1–20 are affirmed.

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