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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* JOSEF BRUNNER, MARC WYSOCKI, and IVO METTIER

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Appeal 2017-006946  
Application 12/162,778  
Technology Center 3700

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Before STEFAN STAICOVICI, BRANDON J. WARNER, and  
ALYSSA A. FINAMORE, *Administrative Patent Judges*.

STAICOVICI, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant<sup>1</sup> appeals under 35 U.S.C. § 134(a) from the Examiner's decision in the Non-Final Office Action (dated Jan. 15, 2016, hereinafter "Non-Final Act.") rejecting claims 44, 46, and 48–93.

Appellant's representative presented oral argument on September 19, 2019. We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

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<sup>1</sup> We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Hamilton Medical Ag in Appellant's Appeal Brief (filed Sept. 7, 2016, hereinafter "Appeal Br."). Appeal Br. 2.

## SUMMARY OF DECISION

We AFFIRM.

### INVENTION

Appellant's invention relates "to a method and to a device for acquiring several changing values which are be monitored during the ventilation of the patient, and representing the values on a screen." Spec. 1.<sup>2</sup>

Claims 44 and 73 are independent. Claim 44 is illustrative of the claimed invention and is reproduced below (with reference indicators added in brackets):

44. A method for acquiring several, changing values of a different origin of a mechanically ventilated patient and representing the values on a monitoring screen, wherein a ventilator is coupled to the patient for mechanically ventilating the patient, a respiratory tube is coupled between the patient and the ventilator, and at least one sensor is coupled to the mechanically ventilated patient and a monitoring screen, the method comprising:

[i] acquiring, by the at least one sensor, at least three changing values from the patient when the patient is mechanically ventilated by the ventilator, wherein each of the at least three changing values is of a different origin of the mechanically ventilated patient;

[ii] displaying, on the monitoring screen, the at least three changing values together in a single graphic element, wherein the graphic element includes a pictorial representation of a lung shape on the monitoring screen;

[iii] displaying, on the monitoring screen, a pictorial animation by way of the lung shape increasing and decreasing in size within each breath in the pictorial representation of the lung shape to represent a current volume change of a ventilated lung of the patient when the patient is mechanically ventilated by the ventilator and the respiratory tube; and

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<sup>2</sup> Specification filed July 30, 2008.

[iv] displaying, on the monitoring screen, an ideal or normal lung shape size as a comparison shape superimposed with the increasing and decreasing lung shape.

#### REJECTIONS

- I. The Examiner rejects claims 44, 46, and 48–93 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.
- II. The Examiner rejects claims 73–93 under 35 U.S.C. § 112, second paragraph, as being incomplete for omitting essential elements.
- III. The Examiner rejects claims 73–93 under 35 U.S.C. § 102(b) as being anticipated by Banner.<sup>3</sup>
- IV. The Examiner rejects claims 44, 46, 48–57, and 73–82 under 35 U.S.C. § 103(a) as being unpatentable over Banner, Lanpher,<sup>4</sup> and Levine.<sup>5</sup>
- V. The Examiner rejects claims 58–64, 72, and 83–86 under 35 U.S.C. § 103(a) as being unpatentable over Banner, Lanpher, Levine, and Hellige.<sup>6</sup>
- VI. The Examiner rejects claims 65–71, 77–79, and 87–93 under 35 U.S.C. § 103(a) as being unpatentable over Banner, Lanpher, Levine, and Wachter.<sup>7</sup>

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<sup>3</sup> Banner et al., US 6,390,091 B1, issued May 21, 2002.

<sup>4</sup> Lanpher et al., US 5,333,106, issued July 26, 1994.

<sup>5</sup> Levine, US 2004/0064298 A1, published Apr. 1, 2004.

<sup>6</sup> PPG Hellige BV, NL 8801322 A, published Dec. 18, 1989.

<sup>7</sup> Wachter et al., *Evaluation of a Pulmonary Graphical Display in the Medical Intensive Care Unit*, 38 J. of Biomedical Informatics 239 (2004).

ANALYSIS

*Rejection I*

Section 101 states, “[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.” 35 U.S.C. § 101. However, the 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 Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *See Alice*, 573 U.S. 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.” *Id.* 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.”).

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, 679 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 191

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(1981)); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we 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 (internal quotation marks omitted) (citation 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.* (alteration in the 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.*

The PTO has published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (hereinafter “2019 Guidance”). Under Step 2A of that guidance, we first look to whether the claim recites:

- (1) 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) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

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Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look, in Step 2B, 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.

Appellant does not present arguments for the patentability of claims 46, 48–50, 52, 53, 55–57, 59–64, and 66–93 apart from claim 44. Therefore, in accordance with 37 C.F.R. § 41.37(c)(1)(iv), we select claim 44 as the representative claim to decide the appeal of the rejection of these claims, with claims 46, 48–50, 52, 53, 55–57, 59–64, and 66–93 standing or falling with claim 44.

### *Claim 44*

#### *Step 1 – Statutory Category*

We first determine whether claim 44 recites one of the enumerated statutory classes of subject matter, i.e., process, machine, manufacture, or composition of matter, eligible for patenting under 35 U.S.C. § 101. Independent claim 44 recites a series of steps, and, therefore, is a process. *See* Appeal Br. 30 (Claims App.).

*Step 2A, Prong 1 – Recitation of Judicial Exception*

We next look to whether claim 44 sets forth any judicial exceptions, including certain groupings of abstract ideas, i.e., mathematical concepts, certain methods of organizing human activity, or mental processes.

In determining that claim 44 is directed to a judicial exception to patent eligibility, without significantly more, the Examiner determines that this claim is “directed to displaying data, which is considered an abstract idea.” Non-Final Act. 4.

In response, Appellant asserts that the Examiner has oversimplified the claim when determining that it is directed to an abstract idea. Appeal Br. 12 (citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016)). According to Appellant, “[s]uggesting that the claim[] . . . [is] directed to ‘displaying data’ ignores the claim[] ‘as a whole.’” *Id.*

Absent the use of “at least one sensor,” limitation [i] of claim 44 reads on acquiring (gathering) data, which can be carried out either in the human mind (e.g., in the form of noting an observation) or with the aid of pencil and paper. *See* 2019 Guidance 55 n.14 (“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.” (citations omitted)); *see also Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (“[W]e have treated collecting information, including when limited to particular content (which does not change its character as information), as within the realm of abstract ideas.”). Acts that can be performed in the human mind fall within the abstract idea exception subgrouping of mental processes. *See* 2019 Guidance 52.

As to limitations [ii] through [iv], the Examiner is correct that claim 44 describes “*representation* of acquired values from a mechanically ventilated patient on a monitoring screen.” Ans. 4–5 (emphasis added) (dated Jan. 27, 2017). In particular, these limitations recite three distinct steps of displaying information in a particular format, i.e., an animation superimposed on a static image. The act of displaying an animation superimposed onto a static image can be performed by a human with pencil and paper. Acts that can be performed by a human with pencil and paper fall within the abstract idea exception subgrouping of mental processes. *See* 2019 Guidance 52 n.14. These steps are similar to other processes that courts have determined are mental processes. *See, e.g., CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011) (holding a method for verifying the validity of a credit card transaction over the Internet is an abstract idea capable of being performed in the human mind or by a human using pen and paper); *Elec. Power*, 830 F.3d at 1354 (“[W]e have recognized that merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis.”). “Courts have examined claims that required the use of a computer and still found that the underlying, patent-ineligible invention could be performed via pen and paper or in a person’s mind.” *Versata Dev. Grp. v. SAP Am., Inc.*, 793 F.3d 1306, 1335 (Fed. Cir. 2015).

As such, steps [i] through [iv] discussed above, under their broadest reasonable interpretation, set forth gathering and displaying data about the condition of a patient’s ventilated lungs, and therefore describe processes that people can perform mentally or by hand. Therefore, we agree with the

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Examiner’s conclusion that claim 44 recites a mental process, and accordingly, an abstract idea.

*Step 2A, Prong 2 – Integrated Into a Practical Application*

If a claim recites a judicial exception, then, in *Prong 2*, we determine whether the recited judicial exception is integrated into a practical application of that exception by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application. *See* 2019 Guidance 54–55. This evaluation requires an additional element or a combination of additional elements in the claim to apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the exception. *See id.* at 54.

Appellant argues that claim 44 “meaningfully improve[s] the field of diagnostic assessment for mechanically ventilated patients,” and, “[t]his represents a significant technological solution.” Appeal Br. 14. According to Appellant, claim 44 “provide[s] a technical solution to a technical problem that is specific to the technology of computerized diagnostic assessment of a mechanically ventilated patient.” *Id.* at 15 (citing paragraph 7 of the Declaration filed under 37 CFR § 1.132 by Thomas P. Laubscher, PhD on July 24, 2015 (hereinafter “Laubscher Decl.” or “Laubscher Declaration”)). Appellant explains that claim 44 “improve[s] the *presentation* of complex medical data in a way to make diagnostic assessment both rapid and intuitive.” Reply Br. 6 (filed Mar. 24, 2017) (emphasis added). Appellant further argues that “the Federal Circuit’s [non-

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precedential] decision in *Trading Techs.* is instructive” here because Appellant’s claims “are directed to a displaying, on a monitor screen, various information in a specific, structured manner paired with a prescribed functionality directly related to the graphical user interface’s structure that is addressed to and resolves a specifically identified problem in the prior state of the art.” *Id.* at 7–8 (citing *Trading Techs. Int’l, Inc. v. CQG, Inc.*, 675 F. App’x 1001 (Fed. Cir. 2017) (hereinafter “*Trading Technologies 2017*”)).

We are not persuaded by Appellant’s arguments because we agree with the Examiner that “the improvement noted by Appellant[] is what has been determined as the abstract idea.” Ans. 6. More specifically, claim 44 adds *particularity* as to how information (data) about a patient’s ventilated lung is *displayed* in order “to simplify a diagnostic assessment of a patient undergoing ventilation, or to simplify an assessment of the parameters which are to be assessed [by medical personnel] with the ventilation of a patient,” and, thus, “render[] the status of the patient . . . in a manner which [is] rapid and as intuitive as possible.” Spec. 3.

In contrast to *Trading Technologies 2017*, in which the claimed graphical user interface imparts a specific functionality to a trading system, Appellant’s animation of an increasing and decreasing lung superimposed on a static image of a normal lung constitutes a display of acquired values from a mechanically ventilated patient. This is similar to what the court determined to be ineligible in subsequent precedential decisions in the *Trading Technologies* line of cases, in which the generic use of a computer as a tool without improvement of the computer was determined not to be an integration of an abstract idea into a practical application. *See Trading Techs. Int’l, Inc. v. IBG LLC*, 921 F.3d 1084 (Fed. Cir. 2019) (hereinafter

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“*Trading Technologies 2019*”) (citing *Elec. Power*, 830 F.3d at 1353).<sup>8</sup> As in *Trading Technologies 2019*, where the new arrangement of information to assist traders in processing information more quickly was determined to be abstract, so, too, is the new arrangement of information to assist medical personnel to readily assess the condition of a ventilated patient is likewise abstract. *See also Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335, 1345 (Fed. Cir. 2018) (“[T]he collection, organization, and display of two sets of information on a generic display device is abstract.”).

Furthermore, the process steps set forth in claim 44 that people can perform mentally or by hand are set forth as being performed with generic components, i.e., a sensor and a monitoring screen. Appellant’s Specification mentions these elements, but does not describe them in any specific manner. Thus, the additional elements do not add meaningful limits to the mental process steps recited in claim 44. In short, the additional elements discussed above: (1) do not improve the functioning of a computer or other technology; (2) are not applied with any particular machine; (3) do not affect 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. *See* MPEP 2106.05(a)–(c), (e)–(f). Accordingly, the additional elements of claim 44 do not integrate the judicial exception into a practical application.

In conclusion, claim 44 is directed to a result, a format for displaying that itself is the abstract idea, i.e., displaying a pictorial animation of an expanding and contracting lung superimposed on a normal lung shape, and

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<sup>8</sup> The court in *Trading Technologies 2019* held that method steps directed to receiving market information and specific ways to display that market information recited an abstract idea.

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invokes generic processes (i.e., acquiring specific data) and generic machinery (i.e., at least one sensor, and a monitoring screen) to achieve the desired result. Claim 44 does not recite a specific means or method that improves the relevant technology and does not go beyond merely displaying (organizing) existing information (data) into a new form. For these reasons, claim 44 is directed to an abstract idea, which is a judicial exception to patent-eligible subject matter under 35 U.S.C. § 101.

*Step 2B – Well-Understood, Routine, Conventional Activity*

Having determined that claim 44 recites a judicial exception, and does not integrate that exception into a practical application, under *Step 2B* we consider whether the claim adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field.

Appellant argues that “the claims add specific limitations other than what was well-understood, routine and conventional in the field at the time of the invention.” Appeal Br. 15 (citing Laubscher Decl., para. 8). According to Appellant, such limitations include “displaying at least three changing values together in a single graphic element, wherein the graphical element includes a pictorial representation of a lung shape” increasing and decreasing in size superimposed onto “an ideal or normal lung shape.” *Id.* at 15–16.

We are not persuaded by Appellant’s arguments and evidence because the limitations noted above by Appellant and referred in paragraph 8 of the Laubscher Declaration are what has been determined to be the abstract idea. *See Mayo*, 566 U.S. at 72–73 (requiring “a process that focuses upon the use of a natural law also contain *other* elements or a combination of elements, sometimes referred to as an ‘inventive concept,’ sufficient to ensure that the

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patent in practice amounts to significantly more than a patent upon the natural law itself” (emphasis added)); *BSG Tech. LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1290 (Fed. Cir. 2018) (“It has been clear since *Alice* that a claimed invention’s use of the ineligible concept to which it is directed cannot supply the inventive concept that renders the invention ‘significantly more’ than that ineligible concept.”); *Berkheimer v. HP Inc.*, 890 F.3d 1369, 1374 (Fed. Cir. 2018) (Moore, J., concurring) (“[A]nd *Berkheimer* . . . leave[s] untouched the numerous cases from [the Federal Circuit] which have held claims ineligible because the only alleged ‘inventive concept’ is the abstract idea.”)

Here, other than the abstract idea discussed above, claim 44 recites a ventilator, a respiratory tube, at least one sensor, and a monitoring screen. *See* Appeal Br. 30 (Claims App.). Appellant’s Specification mentions a sensor for monitoring pressure and/or flow of the respiration air of a patient on a ventilator with a respiration tube and a screen for displaying the detected values. Spec. 7–8. However, because these elements are described only by the respective function that each element performs, the recited ventilator, respiratory tube, at least one sensor, and monitoring screen are invoked as conventional tools.

Accordingly, we agree with the Examiner that “the ventilator, breathing tube, and sensors are tangentially related to the steps of data gathering,” and, thus, are recited for the conventional function of acquiring data. Ans. 7. We further agree with the Examiner that “[t]he monitoring screen is . . . the device that applies the abstract idea of displaying different types of data,” and, thus, is recited for the conventional function of displaying data. *Id.* Furthermore, the Examiner is correct that “the screen is a general purpose machine that is performing generic functions of displaying

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data” and because claim 44 “does not include programming . . . limitations directed to displaying the image are considered a generic function via a general purpose machine.” *Id.*

As such, apart from being used to perform the abstract idea itself, these generic components only serve to perform well-understood functions (e.g., gathering and displaying data) without any technological improvement. Hence, we are not persuaded that Appellant provides a non-generic arrangement of known, conventional elements. Rather, we conclude that the disclosed and claimed invention uses generic components as tools to implement the abstract mental process of gathering data from a ventilated patient and presenting the data.

Accordingly, claim 44 fails to add a specific limitation beyond the judicial exception that is not “well-understood, routine, and conventional” in the field, but instead “simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.” *See* 2019 Guidance 56.

Thus, we are not persuaded that claim 44 is directed to a specific application designed to achieve an improved technological result, as opposed to being directed to merely ordinary functionality of the above-recited additional elements to apply an abstract idea, and, thus, fails to indicate the presence of an inventive concept. Accordingly, we conclude that none of the claim limitations, viewed “both individually and as an ordered combination,” amount to significantly more than the judicial exception in order to sufficiently transform the nature of the claims into patent-eligible subject matter. *See Alice*, 573 U.S. at 217 (internal quotations omitted) (quoting *Mayo*, 566 U.S. at 77).

In conclusion, for the foregoing reasons, we sustain the rejection of claim 44 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Claims 46, 48–50, 52, 53, 55–57, 59–64, and 66–93 fall with claim 44.

*Claims 51, 54, 58, and 65*

Appellant does not agree with the Examiner’s position that claim 65 sets forth the abstract idea of “displaying at least three parameters from a list.” Appeal Br. 13 (citing Non-Final Act. 6–7). We are not persuaded by Appellant’s argument because claim 65 further defines the step of “displaying on the monitoring screen,” which, as discussed above regarding claim 44, is an act that can be performed by a human with pencil and paper, and, thus, falls within the abstract idea exception subgrouping of mental processes. In other words, claim 65 adds nothing *beyond* the abstract idea recited in claim 44. Thus, for the reasons discussed above, claim 65 likewise fails to survive *Step 2A*, *Prong 2* and *Step 2B*.

Lastly, we note that Appellant recites the limitations of dependent claims 51, 54, and 58, but does not provide a substantive explanation as to why any of these claims recites something significantly more than the mental process recited in its respective independent claim 44. *See* Appeal Br. 16.

Accordingly, we also sustain the rejection of claims 51, 54, 58, and 65 under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.

*Rejection II*

The Examiner finds that, although independent claim 73 requires “a monitoring screen configured to display data,” the claim fails to recite a

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“processor,” which, according to the Examiner, is a required essential element “for the screen to display the data acquired.” Non-Final Act. 3–4.

Appellant argues that “omission of an essential element” does not call for a rejection under 35 U.S.C. § 112, second paragraph, but rather a rejection under 35 U.S.C. § 112, first paragraph. Appeal Br. 6 (citing MPEP § 2172.01). According to Appellant, a rejection under 35 U.S.C. § 112, second paragraph, is warranted when “a failure to interrelate essential elements” is alleged, which the Examiner has not done. *Id.* Appellant asserts that “[t]he Examiner provides no basis for the assertion that a processor is required,” and, moreover, “[t]he Examiner does not explain why a hardware solution without a processor, such as a Field-Programmable Gate Array (FPGA), would not be acceptable.” *Id.*

Although we appreciate the Examiner’s position that a processor is required to process acquired data, we do not agree that it necessarily constitutes an *essential element* of independent claim 73 for the following reasons.

First, we agree with Appellant that “the [S]pecification nowhere discloses that a processor is an essential element or a critical feature of the invention,” and, moreover, the Examiner does not point to any statement of record that a skilled artisan would reasonably understand to mean that a processor necessarily constitutes an essential element in the claimed device. Appeal Br. 6; *see also* MPEP § 2172.01 (“A claim which omits matter *disclosed to be essential* to the invention as described in the specification or in other *statements* of record may be rejected.” (emphasis added)).

Second, we note that the preamble of claim 73 is drawn to “[a] device with a screen to *represent acquired, changing values . . .* of a mechanically *ventilated patient*” and it includes a ventilator, at least one sensor, and a

monitoring screen. Appeal Br. 35 (Claims App.) (emphasis added). As the claimed device is for acquiring data from a ventilated patient and displaying data on a monitoring screen, we do not agree with the Examiner’s position that the lack of an expressly recited processor constitutes an essential element of the claimed device because the ventilator, at least one sensor, and monitoring screen are adequate to ventilate a patient, acquire data from the ventilated patient, and ultimately display data, respectively.

Accordingly, for the foregoing reasons, we do not sustain the rejection under 35 U.S.C. § 112, second paragraph, of claims 73–93, for omitting essential elements.

### *Rejection III*

The Examiner finds that Banner discloses all of the structural limitations of claims 73–93. Non-Final Act. 9–11. With respect to the nature of the images being displayed, the Examiner notes that, because “[n]either the claims nor the [S]pecification include[s] particular details on the configuration of the screen, such as particular programming,” the disclosure of Banner reads on the claims “for merely reciting the device elements with a screen that can be configured to display the images as claimed.” *Id.* at 10. According to the Examiner, the claimed “monitoring screen [i]s the substrate and the pictorial animation of the graphic elements would be considered . . . printed matter.” *Id.*

Appellant argues that “[a] device with a ventilator, at least one sensor, and a monitoring screen configured to display different things, is not printed matter.” Appeal Br. 17. According to Appellant, similar to “indicia on a measuring cup performing the function of indicating volume within that measuring cup,” the claimed “ventilator, the at least one sensor, and the

monitoring screen . . . are in a functional relationship because the different display elements perform the function of assisting with the diagnosis of a mechanically ventilated patient.” *Id.*

We appreciate Appellant’s position that printed matter may patentably distinguish a claimed invention from the prior art when the critical question of whether there is a new and unobvious functional relationship between the printed matter and the substrate is answered in the affirmative. *In re Ngai*, 367 F.3d 1336, 1338 (Fed. Cir. 2004). However, to show a new and unobvious functional relationship, it has to be shown that the printed matter would not achieve its purpose without the substrate and the substrate without the printed matter would similarly be unable to produce the desired result. *Id.* at 1339.

In this case, we agree with the Examiner that the monitoring screen “serves as a support for the printed matter” because “[t]here is *no processor* [or programming] to create a functional relationship between the substrate and printed matter.” Ans. 8–9 (emphasis added). In other words, the printed matter, i.e., animation of a lung shape superimposed on a static image of an ideal lung, does not exploit, or interrelate with, the underlying structure of the claimed monitoring screen, and, thus, does not depend on the monitoring screen. Furthermore, the functioning of the monitoring screen does not depend on the printed matter being displayed, i.e., animation of a lung shape superimposed on a static image of an ideal lung. Stated differently, the animation of a lung shape superimposed on a static image of an ideal lung relates to the *content* displayed on a monitoring screen, not to the underlying monitoring screen on which it is displayed. Moreover, even though Appellant argues there is a functional relationship because “the different display elements [, i.e., printed matter,] perform the function of assisting

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with the diagnosis of a mechanically ventilated patient” (*see* Appeal Br. 17), such an argument is unpersuasive because that function is simply conveying information and does not establish functional relationship *between the printed matter and the substrate*.

In conclusion, for the foregoing reasons, we sustain the rejection under 35 U.S.C. § 102(b) of claims 73–93 as anticipated by Banner.

#### *Rejection IV*

Appellant does not present arguments for the patentability of claims 46, 48–57, and 73–82 apart from claim 44. *See* Appeal Br. 18–28. Therefore, we select claim 44 as the representative claim to decide the appeal of the rejection of these claims, with claims 46, 48–57, and 73–82 standing or falling with claim 44.

The Examiner finds that Banner discloses most of the limitations of independent claim 44, but fails to disclose visually displaying an animation of a patient’s lung superimposed onto a static image of a normal lung in order to indicate to a medical professional the condition of the patient’s lung. Non-Final Act. 12–14. Nonetheless, the Examiner finds that Lanpher discloses employing pressure, flow, and volume data for “visually displaying an animation of a lung” and Levine discloses “displaying a lung animation wherein a fixed state of the lung is superimposed on the animated lung to show disease.” *Id.* at 12–13 (citing Lanpher, col. 14, ll. 54–68, Fig. 1A; Levine, Abstract, paras. 7–10, 88). Thus, the Examiner first determines that it would have been obvious to a person of ordinary skill in the art “to modify Banner with the visual of the lung animation of Lanpher, because it is the use of a known technique to improve similar devices in the same way by allowing the user to visually see the work being performed by the lungs.”

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*Id.* at 13. Furthermore, the Examiner concludes that it would have been obvious to a skilled artisan “to [further] modify Lanpher and Banner with the overlay of Levine, because it is a visual of the lung for diagnosis and is the use of a known technique to improve similar devices in the same way.” *Id.* at 13–14.

In a first instance, Appellant argues that the Examiner did not adequately respond to the Laubscher Declaration. *See* Appeal Br. 20–23. According to Appellant, the Laubscher Declaration “includes several factual assertions,” and the Examiner’s response is merely an opinion without sufficiently rebutting the presented factual assertions. *See id.* at 21–23 (citing Laubscher Decl., paras. 10, 12).

We do not agree with Appellant that the Examiner did not adequately rebut the Laubscher Declaration. The Examiner is correct that, because “[t]he declaration provided no factual evidence from the references cited, specification, or any other extrinsic evidence,” the Laubscher Declaration constitutes “an opinion on the ultimate legal conclusion at issue.” Ans. 9–10. We further agree with the Examiner that, because the Laubscher Declaration mirrors Appellant’s arguments, the Examiner’s response to such arguments constitutes a sufficient rebuttal of the Laubscher Declaration. Non-Final Act. 2–3. For example, in Appellant’s Response, filed July 29, 2015 (hereinafter “Response”), Appellant makes essentially the same arguments as presented in paragraphs 10 and 12 of the Laubscher Declaration. *Compare* Laubscher Declaration, paras. 10, 12, *with* Response 20–22 (*see also* Appeal Br. 24–28). As the Examiner explains how the limitation of “a single graphic element” is construed and that the reasoning to combine the references, which constitute analogous art, is to “improve on the visual display of parameters of the ventilator of Banner,” the Examiner

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not only responded to Appellant's arguments, but also adequately rebutted paragraphs 10 and 12 of the Laubscher Declaration. *See* Non-Final Act. 32–36; Ans. 12–15.

In a second instance, Appellant argues that “[n]either Banner nor the other cited art would have included displaying, on the monitoring screen, the at least three changing values together in a single graphic element.” Appeal Br. 24 (citing Laubscher Decl., para. 10). According to Appellant, the Examiner's construction of the limitation “displaying, on the monitoring screen, the at least three changing values together in a single graphic element, could not reasonably be read to include ‘everything displayed on a screen at one time.’” *Id.* at 25–26. Appellant contends that the Examiner's construction “renders the term single and the term element superfluous.” *Id.* at 24.

It is well settled that claim language should be read in light of the Specification, as it would be interpreted by a person of ordinary skill in the art. *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010). Here, the Examiner is correct that Appellant has “not provided a special definition for what comprises a single graphic element.” Ans. 10. As such, we turn to Appellant's Specification to determine whether the Examiner's construction of the phrase “a single graphic element” as “everything displayed on a screen at one time” is reasonable. *Id.*

In reviewing Appellant's Specification, we note that it describes “a single graphic element” as “encompass[ing] a pictorial representation of the lung shape.” Spec. 3. The Specification further describes the “graphic element” as also having “a heart shape or a blood vessel shape, as also a lung muscle system in the form of a diaphragm,” and “is to be read as a *whole*.” *Id.* at 5 (emphasis added); *see also id.* at 6 (“The vessel/heart shape

is incorporated into this graphic element.”). Appellant’s Specification further states that the numerical and quantitative display 15 “is *evidently* not a constituent of the graphic elements [13].” *Id.* at 16 (emphasis added); *see also* Spec., Fig. 1. As such, we agree with Appellant’s position that the Examiner’s reliance on Banner “to interpret *all* images of the screen as one single graphic element” (*see* Ans. 11 (emphasis added)) is unreasonable because it is inconsistent with the Specification, which specifically excludes numerical and quantitative display 15 from graphical display 13 of a lung, a vessel, and a diaphragm.

Nonetheless, as noted *supra*, the rejection as articulated by the Examiner modifies Banner’s visual display of ventilator parameters to display a visual lung animation and an overlay of a static lung, as taught by Lanpher and Levine, respectively. Such a display is consistent with the Specification’s description of “a single graphic element” as a “pictorial representation of the lung shape.” *See* Spec. 3. Hence, although we appreciate Appellant’s arguments with respect to Banner’s visual display of ventilator parameters, Appellant does not persuasively argue why the resulting graphical display of Banner, as modified by Lanpher and Levine, in the Examiner’s rejection, does not constitute “a single graphic element,” as called for by independent claim 44.

In a third instance, Appellant argues that, although Lanpher discloses the expansion and contraction of a lung, Lanpher fails to disclose “that this expansion or contraction represents a current volume change of a ventilated lung” because “Lanpher is incapable of representing a current volume change of a ventilated lung.” Appeal Br. 26–27 (citing Laubscher Declaration, para. 11).

We are not persuaded by Appellant’s arguments because “[n]on-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references. [Each reference] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.” *In re Merck & Co. Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). In this case, Banner discloses measuring pressure and flow rate of a ventilated lung, and Lanpher discloses an animation of a lung outline that expands and contracts to illustrate the intake and distribution of air and aerosolized medication based on pressure, flow, and volume data. Banner, col. 9, ll. 12–17; Lanpher, col. 14, l. 54–col. 15, l. 1, col. 15. Lanpher further discloses that the “*current* shape of the lungs and/or distribution of air and aerosol throughout the respiratory tract” is “continuously variable, and . . . calculated in real time.” Lanpher, col. 15, ll. 12–17 (emphasis added). As such, we agree with the Examiner, that the combination of Banner and Lanpher employs Banner’s measurements of a ventilated patient and Lanpher’s mathematical model based on pulmonary physiology to generate an animation of a ventilated lung outline that expands and contracts, and, thus, to illustrate a *current* shape of the lungs in real time. *See* Ans. 12–13.

Finally, in a fourth instance, Appellant argues that “there would not have been motivation to combine the references and, had the references been combined, there would not have been an expectation of success.” Appeal Br. 27 (citing Laubscher Declaration, para. 12). According to Appellant, a skilled artisan would not “look at . . . [Lanpher’s] method for training a patient to use an inhaler or using a dynamic virtual patient to instruct a student, [as taught by Levine,] and would have had no expectation of success if he had looked at such references.” *Id.* at 28.

We are not persuaded by Appellant’s arguments because absolute predictability that the combination of Banner, Lanpher, and Levine would be successful is not required; all that is required is a reasonable expectation of success. *See In re O’Farrell*, 853 F.2d 894, 903–04 (Fed. Cir. 1988). In this case, we agree with the Examiner that a person of ordinary skill in the art looking to improve on Banner’s visual display of ventilator parameters would employ Lanpher’s “display of respiratory data using a lung animation including the programming required to create such a display” and Levine’s “lung animation [superimposed] with a fixed [lung] state.” Ans. 14–15. Hence, the Examiner’s combination represents an improvement to Banner’s visual display of ventilator parameters by employing visual displays in the same manner as taught by Lanpher and Levine to lead to a predictable result, and the modification is well within the skill of one having ordinary skill in this art. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”).

In conclusion, for the foregoing reasons, we sustain the rejection under 35 U.S.C. § 103(a) of claim 44 as unpatentable over Banner, Lanpher, and Levine. Claims 46, 48–57, and 73–82 fall with claim 44.

#### *Rejections V and VI*

Appellant does not present substantive arguments with respect to Rejections V and VI. *See* Appeal Br. 18–28. Therefore, we summarily sustain the rejections under 35 U.S.C. § 103(a) of claims 58–64, 72, and 83–86 as unpatentable over Banner, Lanpher, Levine, and Hellige, and of claims

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65–71, 77–79, and 87–93 as unpatentable over Banner, Lanpher, Levine, and Wachter.

### CONCLUSION

<b>Claims Rejected</b>	<b>35 U.S.C. §</b>	<b>Basis</b>	<b>Affirmed</b>	<b>Reversed</b>
44, 46, 48–93	101	patent-ineligible subject matter	44, 46, 48–93	
73–93	112, second paragraph	incomplete for omitting essential elements		73–93
73–93	102(b)	Banner	73–93	
44, 46, 48–57, 73–82	103(a)	Banner, Lanpher, Levine	44, 46, 48–57, 73–82	
58–64, 72, 83–86	103(a)	Banner, Lanpher, Levine, Hellige	58–64, 72, 83–86	
65–71, 77–79, 87–93	103(a)	Banner, Lanpher, Levine, Wachter	65–71, 77–79, 87–93	
<b>Overall Outcome</b>			44, 46, 48–93	

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