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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHUI T. LAI

Appeal 2016-005579
Application 11/829,027¹
Technology Center 3700

Before FRANCISCO C. PRATS, JOHN G. NEW, and RYAN H. FLAX,
Administrative Patent Judges.

PRATS, *Administrative Patent Judge.*

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134(a) involves claims to ocular surgery methods in which corneal tissue is ablated by a laser. The Examiner rejected the claims as being directed to non-statutory subject matter, as lacking descriptive support, and for obviousness.

We have jurisdiction under 35 U.S.C. § 6(b). We affirm the non-statutory subject matter rejection, but reverse the written description rejection. We reverse each of the Examiner’s obviousness rejections, except as to claims 20 and 21.

¹ Appellant states that the “real party in interest is inventor Shui T. Lai.”
Br. 1.

STATEMENT OF THE CASE

Claims 1–16, 18–26, and 28 stand rejected and are under appeal. Br. 2;² *see also* Non-Final Act. 5–9.³

As a preliminary matter, the Examiner contends that the version of the claims presented in the Appeal Brief is inaccurate. *See* Ans. 3–4. We agree.

The Notice of Appeal that generated the present appeal was filed on June 28, 2012, and appealed “the last decision of the examiner.” Notice of Appeal 1. The last decision of the Examiner before that Notice of Appeal was the Non-Final Action entered February 28, 2012.

Review of the prosecution history shows that the last entered amendment of the claims before the Non-Final Action of February 28, 2012 was on April 17, 2009. *See* Amendment 3–10 (entered April 17, 2009). Accordingly, when evaluating the merits of the Examiner’s rejections, we consider the claims as presented on April 17, 2009, which are the claims the Examiner rejected in the Non-Final Action of February 28, 2012, the rejection now on appeal.

We note that a post-appeal Petition to Revive this application, filed on April 22, 2013, was accompanied by amendments to the claims and Specification. That Petition was denied, however (*see* Decision on Petition (entered June 4, 2013)), and Appellant does not direct us to any indication in the record showing that the April 22, 2013, amendment was ever entered.

In sum, for the reasons discussed, when evaluating the merits of the Examiner’s rejections, we consider the claims as they appeared on April 17, 2009, and not as they appear in the claims Appendix in the Appeal Brief.

² Appeal Brief entered July 14, 2013.

³ Non-Final Action entered February 28, 2012.

The following rejections are before us for review:

(1) Claims 9, 18, 23, and 28, under 35 U.S.C. § 101, as being directed to non-statutory subject matter (Non Final Act. 5–6);

(2) Claims 1–16, 18–26, and 28, under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement (*Id.* at 6);

(3) Claims 1, 2, 4, 7–9, and 19–21, under 35 U.S.C. § 103(a), for obviousness over Peyman⁴ (*Id.*);

(4) Claims 10, 11, 16, and 18, under 35 U.S.C. § 103(a), for obviousness over Juhasz '438⁵ (*Id.*);

(5) Claims 10, 12, 13, and 18, under 35 U.S.C. § 103(a), for obviousness over Juhasz '653⁶ (*Id.* at 7);

(6) Claims 24, 26, and 28, under 35 U.S.C. § 103(a), for obviousness over Juhasz '166⁷ (*Id.*);

(7) Claims 3, 5, 6, 14, 15, 22, and 23, under 35 U.S.C. § 103(a), for obviousness over Peyman and Juhasz '438 (*Id.* at 7–8); and

(8) Claim 25, under 35 U.S.C. § 103(a), for obviousness over Juhasz '166 and Juhasz '438 (*Id.* at 8–9).

Independent claims 1 and 10 illustrate the appealed subject matter and read as follows (Amendment 3, 5, (entered April 17, 2009; strikethroughs and underlined text omitted)):

Claim 1. A method of correcting wavefront aberrations of an eye, comprising:

⁴ US 6,989,008 B2 (issued Jan. 24, 2006).

⁵ US 5,993,438 (issued Nov. 30, 1999).

⁶ US 6,676,653 B2 (issued Jan. 13, 2004).

⁷ US 6,110,166 (issued Aug. 29, 2000).

(a) determining a corneal ablation tissue volume profile for an eye in three dimensions for correcting wavefront error upon removal of corneal tissue in accordance with said determined profile,

(b) selecting a fill material to be used to fill space within the tissue volume upon said removal of corneal tissue,

(c) determining an expansion factor: $(N_c - 1)/(N_m - N_c)$, wherein N_c and N_m are indices of refraction of cornea tissue and the fill material, respectively;

(d) determining an expanded ablation volume in the cornea, wherein the expanded ablation volume comprises the determined profile with its thickness multiplied by the expansion factor in (c),

(e) ablating cornea tissue according to the determined expanded ablation volume; and

(f) filling a stroma space vacated by ablated cornea tissue of the expanded ablation volume with the fill material.

Claim 10. A processor-implemented method of reducing heating of the cornea during an intrastromal laser surgery, comprising:

(a) determining a corneal tissue volume profile to be ablated;

(b) determining a cutting pattern for the tissue volume comprising a series of cutting surfaces, wherein adjacent surfaces of cut are positioned to be separated by greater than one (1) times the diameter of an ablation spot created by a single shot of laser pulses; and

(c) converting the cut pattern into executable steps in a computerized program for controlling a laser beam to cut the tissue volume; and

(d) directing the laser beam to cut the tissue volume into a plurality of pieces according to the cutting pattern, and

(e) wherein the cutting pattern includes intersecting cutting surfaces and spacings between adjacent surfaces such that residual pieces of corneal tissue remain within the tissue volume after directing the laser beam to cut the tissue according to the cutting pattern, and the method further comprises removing the multiple residual pieces; and

(f) wherein a significant reduction in number of laser pulses used compared with fully ablating the tissue volume serves to reduce heating of the cornea during a laser surgery.

NON-STATUTORY SUBJECT MATTER

In rejecting claims 9, 18, 23, and 28 under 35 U.S.C. § 101, the Examiner concluded that the computer readable media recited in those claims “is not limited to non-transitory embodiments. The claimed invention is not limited to statutory subject matter and is therefore non-statutory. However, a claimed ‘non-transitory computer readable medium ...’ would be statutory subject matter.” Non-Final Act. 5–6.

Appellant does not present argument traversing this rejection. *See* Br., *generally*. We therefore summarily affirm it. *See* MPEP § 1205.02 (“If a ground of rejection stated by the examiner is not addressed in the appellant’s brief, appellant has waived any challenge to that ground of rejection and the Board may summarily sustain it, unless the examiner subsequently withdrew the rejection in the examiner’s answer.”).

We acknowledge the presence of the term “non-transitory” in the versions of claims 8, 9, 18, 23, and 28 appearing in the Claims Appendix to the Appeal Brief. Br. 22, 24, 25, 26. As discussed above, however, the amendment to the claims that would have added this language (filed April 22, 2013) was not entered.

WRITTEN DESCRIPTION

The Examiner’s rejection of claims 1–16, 18–26, and 28, as failing to comply with the written description requirement, is based on Appellant’s amendment to the Specification that replaced the refractive index value of 1.443 with the value 1.309, on page 11 of the Specification. *See* Non-Final

Act. 6 (asserting lack of support for refractive index of 1.309); *see also* Amendment 2 (entered April 17, 2009).

The Examiner reasoned:

The originally filed disclosure is silent on “the exemplary value of 1.309 for the index of refraction of the implant material” since all the claims recite providing a specific ratio of implant material to removed corneal material, based on the refractive index of the implant material relative to that of the corneal material, the previously undisclosed implant material refractive index renders these claims not supported by the originally filed disclosure.

Non-Final Act. 6

The amendment in question relates to Equation (1), which appears on page 9 of the Specification, and also in claims 1 and 14. *See* Spec. 9; *see also* Amendment 3, 6 (entered April 17, 2009). Equation (1) provides for determining an “expansion factor” which equals $(N_c - 1)/(N_m - N_c)$, wherein N_c and N_m are indices of refraction of cornea tissue and fill material to be placed into a volume vacated by ablated corneal tissue, respectively. *See id.* The Specification explains that, when removing a volume of corneal tissue by ablation to correct a vision defect, and replacing the removed tissue with a vision-correcting filler material such as silicon hydrogel, the volume of the removed corneal tissue must be expanded by the expansion factor. Spec. 9–10.

The amendment at issue concerns the following change to an illustrative example in the Specification at page 11: “For example, if the implant material has an index of 1.309 [[1.443]], the expansion factor is 5.6 using Equation (1). The height of the tissue volume along the light ray’s traversing direction is multiplied by the expansion factor of 5.6.”

Amendment 2 (entered April 17, 2009; inserted material underlined, deleted

material bracketed).

As is evident, the amendment to the Specification that forms the basis of this rejection does not change the scope of the claims in any way. That the amendment either corrects or inserts a mathematical error in an example in the Specification (*see* Ans. 5–6) does not demonstrate that any portion of the rejected claims lacks descriptive support in the Specification. While the Examiner urges that Equation (1) encompasses a negative denominator (*see id.* at 7), that is true whether or not the amendment at issue is entered.

In sum, we have carefully considered the Examiner’s position in light of Appellant’s arguments. We are not persuaded, however, that the Examiner has explained adequately why the amendment at issue, which simply changes a value in an illustrative example in the Specification, results in a situation in which a skilled artisan reading the claims in view of Appellant’s Specification would have failed to recognize that Appellant possessed the full scope of the claimed subject matter. *See Ralston Purina Co. v. Far-Mar-Co, Inc.*, 772 F.2d 1570, 1575 (Fed. Cir. 1985) (The test for determining whether a specification is sufficient to support a particular claim “is whether the disclosure of the application relied upon ‘reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.’”) (quoting *In re Kaslow*, 707 F.2d 1366, 1375 (Fed. Cir. 1983)). We, therefore, reverse the Examiner’s written description rejection.

OBVIOUSNESS—PEYMAN

The Examiner’s Prima Facie Case

In rejecting claims 1, 2, 4, 7–9, and 19–21 over Peyman, the Examiner stated as follows:

Peyman teaches a method as claimed except for the explicit discussion of the determination of the “expansion factor”. However, as set forth above, the proper volume of the implant must be produced, in order to correct the patient’s vision, and thus the particular equation employed to arrive at this volume would have been obvious to one having ordinary skill in the art.

Non-Final Act. 6.

The Examiner noted in particular that correction of refractive error in the eye using wavefront technology to determine the size and shape of corneal tissue to be removed was known in the art. *Id.* at 2 (citing Peyman, 4:19–27). Based on this knowledge in the art, the Examiner reasoned:

This process will require the determination of the relative volume of the implant with respect to the volume of the tissue removed. Therefore, regardless of the manner in which Peyman arrives at the relative volume of the implant with respect to the tissue removed, the employment of applicants['] “expansion factor” in order to provide the refractive correction disclosed by Peyman, would have been obvious, since, in the end, the size and shape of the implant must be the same to provide corrected vision, regardless of the precise mathematical manipulations employed to arrive at the size and shape thereof, as would be appreciated by one of ordinary skill in the art.

Id. at 2–3.

Analysis

In *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 415 (2007), the Supreme Court emphasized “an expansive and flexible approach” to the obviousness question, but also reaffirmed the importance of determining “whether there was an apparent reason to combine the known elements *in the fashion claimed* by the patent at issue.” *Id.* at 418 (emphasis added).

Ultimately, therefore, “[i]n determining whether obviousness is established by combining the teachings of the prior art, the test is what the

combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re GPAC Inc.*, 57 F.3d 1573, 1581 (Fed. Cir. 1995) (internal quotations omitted).

In the present case, Appellant persuades us⁸ that the Examiner has not adequately explained why Peyman would have suggested using the refractive index of corneal filler material to determine the volume of corneal tissue to be removed when performing corrective surgery, as required by independent claim 1.

As seen above, claim 1 requires using an expansion factor, based on the refractive index of the filler material to be inserted into the cornea, to determine the amount of tissue to be ablated from the cornea before the vision-correcting filler material is inserted. *See* Amendment 3 (entered April 17, 2009; claim 1 steps (c) through (f)).

We acknowledge that, like Appellant’s claim 1, Peyman discloses ablating corneal tissue to produce an internal “pocket” in the corneal tissue, into which “an ocular implant is introduced through [an] incision and into the internal pocket of the cornea.” Peyman, Abstract; *see also id.* at 4:61–5:65 (ocular implant can be gel, polymer, or lens).

The Examiner does not, however, identify any specific teaching or disclosure in Peyman suggesting any relationship between the refractive index of the implanted material and the amount of corneal tissue that must be removed. Although the Examiner contends that it was well known in the

⁸ We acknowledge, as the Examiner points out (*see, e.g.* Ans. 8, 12, 18), that Appellant erroneously characterizes a number of the Examiner’s obviousness rejections as rejections under § 102(b). *See* Br. 15, 17, 19. We, nonetheless, review each of the rejections in light of the arguments presented.

art that the shape of any corrective vision device depends on its refractive index (Ans. 8–9), none of the portions of Peyman cited by the Examiner suggests that, *in the particular process described in Peyman*, the volume of corneal tissue to be ablated is determined on the basis of the refractive index of the material to be inserted in the cornea, as required by Appellant’s claim 1.

Accordingly, because a preponderance of the evidence does not support the Examiner’s position that Peyman would have taught or suggested a process having all of the features of Appellant’s claim 1, we reverse the Examiner’s rejection of claim 1, and its dependent claims 2, 4, 7–9, and 19, over Peyman.

However, our analysis differs as to claims 20 and 21.

Appellant contends that claim 20 is “allowable for the same reasons as claim 1.” Br. 16. We are not persuaded.

Claim 20 reads as follows:

Claim 20. A method of relaxing a rigid mechanical structure of a Bowman layer comprising making an excision pattern in the Bowman layer including at least one excision, wherein the excision pattern comprises a line or ring cut, or both.

Amendment 7 (entered April 17, 2009; strikethroughs and underlined text omitted). Claim 20, thus, encompasses processes in which an excision in the form of a line or a ring is made in the Bowman layer.

As explained in Juhasz ’166, Bowman’s membrane is the layer of tissue immediately below the outermost layer of the cornea (the epithelium), and immediately above the stroma. Juhasz ’166, 5:16–23; *see also id.* at Fig. 3.

As taught in Peyman, the laser-ablated pocket into which the ocular implant is inserted can extend to the outermost layer of the cornea, and can include the Bowman's layer:

As seen specifically in FIGS. 1–5, a laser **12** is aimed at an internal portion of the cornea, adjacent the external surface of the cornea of the eye and fired. Preferably, the laser is focused to create the pocket **18** in the first one-third of the cornea, and not in the back of the cornea. In other words, the pocket is preferably formed adjacent [outermost corneal] surface **28** or closer to surface **28** than to the interior or anterior chamber **11** of eye **10**. By forming the pocket in the first one-third of the cornea, *the pocket or pockets may extend beyond the Bowman[']s layer and the cornea*, to create a large pocket, which would allow raising of the entire front portion **10** of the cornea, as described above.

Peyman, 5:66–6:10 (emphasis added).

Earlier in its disclosure, Peyman explains the configuration of the pocket further, in relation to insertion of a vision-correcting gel:

The gel can be inserted into a pocket that encompasses the entire front of the cornea, or extend past the cornea and Bowman layer to the sclera. *By extending the pocket past the Bowman layer*, the portion of the cornea above the pocket would become loose. The injection of the gel would allow lifting of the Bowman layer, lifting up the entire front surface of the cornea, allowing the eye to be reshaped as desired. However, the gel can be injected or positioned into any size pocket desired and the pocket does not have to encompass the entire front of the cornea.

Id. at 5:3–12 (emphasis added).

Peyman further discloses that, as seen in Figures 2–5, an incision **38** “is made in the surface **28** of the cornea to access pocket **18** or pockets **18'**, **18''** and **18'''**”. Preferably, the incision **38** is made at the periphery of the pocket; however, it may be made anywhere desired that would allow access

to the pocket **18**.” *Id.* at 6:49–53. Because this access-providing incision 38 passes from the exterior of the eye to the laser-ablated pocket, the incision 38 must pass through the Bowman’s layer, as required by Appellant’s claim 20. Moreover, as seen in Peyman’s Figure 2, incision 38 is in the form of a line, as claim 20 also requires.

In addition, laser-ablated pocket 18, which can include the Bowman’s layer as discussed above, is in the form of a ring, the other excision pattern recited in Appellant’s claim 20. *See* Peyman Fig. 2.

Therefore, given the discussed teachings, Appellant does not persuade us that Peyman fails to teach or suggest the process recited in claim 20. We therefore affirm the Examiner’s rejection of claim 20 over Peyman.

Turning to Appellant’s claim 21, Appellant contends that claim 21 is allowable over Peyman “because Peyman does not teach the advantageous invention set forth there by Applicant. Peyman does not disclose any method of reducing a mechanical rigidity of a Bowman layer of an eye, and as such, clearly does not set forth the advantageous method recited at Applicant’s claim 21.” Br. 16–17. We are not persuaded.

Appellant’s claim 21 reads as follows:

Claim 21. A method of reducing a mechanical rigidity of a Bowman layer of an eye, comprising:

(a) determining a tissue volume profile in a Bowman layer to be removed; and

(b) directing laser pulses to ablate Bowman layer tissue within the tissue volume profile, and

(c) wherein Bowman layer tissue anterior to the ablated tissue volume is less rigid and more conforming to the shape of a stromal bed posterior to the Bowman layer.

Amendment 7–8 (entered April 17, 2009; strikethroughs and underlined text omitted). Claim 21, thus, encompasses processes in which Bowman’s layer tissue in a predetermined profile volume is ablated by laser. We interpret the “wherein” clause of step (c) as a functional result of that ablation step.

As discussed above, Peyman discloses using a laser to ablate a pocket of corneal tissue in the anterior-most portion of the cornea, the pocket extending beyond the Bowman’s layer to more interior portions of the cornea. *See Peyman*, 5:66–6:10; *see also id.* at 5:3–12. In addition to thus teaching and/or suggesting the positive process steps of Appellant’s claim 21, Peyman suggests that its pocket would reduce the rigidity of the Bowman’s layer, as claim 21 also recites. *See id.* at 5:5–7 (“By extending the pocket past the Bowman layer, the portion of the cornea above the pocket would become loose.”).

Thus, given the discussed teachings, Appellant does not persuade us that Peyman fails to teach or suggest the process recited in Appellant’s claim 21. We therefore affirm the Examiner’s rejection of claim 21 over Peyman.

OBVIOUSNESS—JUHASZ ’438

The Examiner’s Prima Facie Case

The Examiner’s rationale for rejecting claims 10, 11, 16, and 18 over Juhasz ’438 reads as follows:

Juhasz et al (’438) teaches a method as claimed except for the explicit discussion of the determination of the “expansion factor”. However, as set forth above, the proper volume of the implant must be produced, in order to correct the patient’s vision, and thus the particular equation employed to arrive at this volume would have been obvious to one having ordinary skill in the art.

Non-Final Act. 7.

Analysis

Appellant persuades us that a preponderance of the evidence does not support the Examiner's conclusion that Juhasz '438 teaches or suggests a process having all of the process steps of claim 10, the only independent claim subject to this rejection.

Contrary to the Examiner's assertion, claim 10 does not recite an expansion factor. Rather, claim 10 recites a method in which corneal tissue is ablated by a laser beam, the ablation being performed in a cutting pattern that results in "spacings between adjacent [cutting] surfaces such that residual pieces of corneal tissue remain within the tissue volume after directing the laser beam to cut the tissue according to the cutting pattern." Amendment 5 (entered April 17, 2009; underlining omitted). Thus, as Appellant contends, claim 10 requires the laser cutting to produce "residual pieces" of non-laser-ablated tissue within the overall volume of tissue to be removed from the cornea. *Id.*

In contrast, Juhasz '438 describes serially ablating entire layers of stromal tissue of the cornea, by sequentially focusing a laser beam at adjacent portions of tissue. *See, e.g.*, Juhasz '438, Abstract ("With this progressive pattern of photodisruption, each spot is placed substantially contiguous with adjacent a volume of previously disrupted tissue. The resultant photodisrupted tissue creates a layer which is substantially centrosymmetrical around the optical axis. A plurality of layers can be removed to create a cavity in the stroma.").

The Examiner identifies the following disclosure in Juhasz '438 as evidence that Juhasz contemplates non-overlapping tissue disruptions which would result in the residual pieces required by claim 10 (Ans. 13–14):

“Importantly, the distance along path **50** between first focal spot central point **42a** and second focal spot central point **42b** is selected so that the adjacent volumes of disrupted tissue in cavitation bubbles **36a**, **36b** will *preferably* overlap.” Juhasz ’438, 6:31–35 (emphasis added).

Although we acknowledge this teaching of a preference for overlapping tissue disruptions, the Examiner does not identify, nor do we discern, any teaching or suggestion in Juhasz ’438 of producing non-photo-ablated residual pieces of corneal tissue, as required by Appellant’s claim 10, even as an unpreferred result. Rather, as aptly summarized in the abstract, quoted above, Juhasz ’438 consistently teaches ablating adjacent portions of tissue, without leaving residual non-photo-ablated pieces of tissue, as required by claim 10.

Thus, because a preponderance of the evidence does not support the Examiner’s conclusion that Juhasz ’438 teaches or suggests a process having all of the process steps of claim 10, we reverse the Examiner’s rejection of that claim, and its dependent claims 11, 16, and 18, over that reference.

OBVIOUSNESS—JUHASZ ’653

The Examiner’s Prima Facie Case

The Examiner’s rationale for rejecting claims 10, 12, 13, and 18 over Juhasz ’653 reads as follows:

Juhasz et al (’653) teaches a method as claimed except for the explicit discussion of the determination of the “expansion factor”. However, as set forth above, the proper volume of the implant must be produced, in order to correct the patient’s vision, and thus the particular equation employed to arrive at this volume would have been obvious to one having ordinary skill in the art.

Non-Final Act. 7.

Analysis

Appellant persuades us that a preponderance of the evidence does not support the Examiner's conclusion that Juhasz '653 teaches or suggests a process having all of the process steps of claim 10, the only independent claim subject to this rejection.

As noted above, claim 10 recites a method in which corneal tissue is ablated by a laser beam, the ablation being performed in a cutting pattern that produces "residual pieces" of non-laser-ablated tissue within the overall volume of tissue to be removed from the cornea. Amendment 5 (entered April 17, 2009; underlining omitted).

Juhasz '653 is directed to a device that is placed on top of the outer surface of the eye during laser surgery, the device including a suction pump that removes gas and debris generated by the laser's photodisruption of the corneal tissue. *See* Juhasz '653, Abstract.

The Examiner contends that the residual tissue debris generated during laser ablation of corneal tissue corresponds to the residual pieces of non-laser-ablated tissue required by Appellant's claim 10. Ans. 16–17 (citing Juhasz '653, 1:20–33).

We acknowledge Juhasz '653's disclosure that laser ablation results in vaporization of tissue, as well as "mechanical effects" such as "tearing, separation, and division of the affected tissue," and also "thermal effects which include charring and scorching of the affected tissue." Juhasz '653, 1:22–26. As noted above, however, we interpret Appellant's claim 10 as requiring laser ablation in a cutting pattern that produces residual pieces of non-laser-ablated tissue within the overall volume of tissue to be removed from the cornea.

We are not persuaded that Juhasz '653's disclosure, that laser ablation results in a variety of types of damaged corneal tissue, sufficiently teaches or suggests performing laser ablation in a cutting pattern that produces residual pieces of non-laser-ablated tissue within the overall volume of tissue to be removed from the cornea, as Appellant's claim 10 requires. We, therefore, reverse the Examiner's rejection of claim 10, and its dependent claims 12, 13, and 18, over Juhasz '653.

OBVIOUSNESS—JUHASZ '166

The Examiner's Prima Facie Case

The Examiner's rationale for rejecting claims 24, 26, and 28 over Juhasz '166 reads as follows:

Juhasz et al ('166) teaches a method as claimed, see Figures 3-8, and attendant text, except for the explicit discussion of the determination of the "expansion factor". However, as set forth above, the proper volume of the implant must be produced, in order to correct the patient's vision, and thus the particular equation employed to arrive at this volume would have been obvious to one having ordinary skill in the art.

Non-Final Act. 7.

Analysis

Appellant persuades us that a preponderance of the evidence does not support the Examiner's conclusion that Juhasz '166 teaches or suggests a process having all of the process steps of claim 24, the only independent claim subject to this rejection.

Contrary to the Examiner's assertion, claim 24 does not recite an expansion factor. Rather, claim 24, similar to claim 10 discussed above, recites a method in which corneal tissue is ablated by a laser beam in a cutting pattern that produces residual pieces of non-laser-ablated tissue in

the cornea. Amendment 8–9 (entered April 17, 2009). Claim 24 also requires the laser ablation pattern to include “at least one grid pattern of contiguous laser spots.” *Id.*

Juhasz ’166 discloses a method in which laser ablation is performed around a non-laser-ablated volume of tissue, termed a “lentoid volume,” allowing removal of the lentoid volume, thereby correcting a vision defect such as myopia. Juhasz ’166, 5:24–41.

Juhasz ’166 discloses that the excised lentoid volume can have different shapes, depending on the needs of the physician. *See id.* at 5:42–46; *see also id.* at Fig. 3A (showing convex lens-shaped lentoid volume); Fig. 3C (showing lentoid volume having rectangular cross-section).

The Examiner contends that excising the lentoid volume shown in Figure 3C of Juhasz ’166 corresponds to excising the grid pattern required by Appellant’s claim 24:

[T]aking the lenticel of Figure 3C of Juhasz et al (’166) as exemplary, the upper surface (anterior surface 38”) is produced by a layer of contiguous laser spots, and the remaining ablation (posterior surface 40” and contiguous flat annular surface 41) constitute the grid pattern, as defined by the last full sentence on page 13, the sentence bridging pages 13 and 14, and the first full sentence on page 14 of the originally filed disclosure (the third to fifth sentences in paragraph [0056] of the Pre-Grant Publication).

Ans. 19.

We are not persuaded that the Examiner has adequately explained why simply excising the flat posterior surface of the lentoid volume shown in Figure 3C of Juhasz ’166 equates to excising a grid pattern, as required by Appellant’s claim 24. The portion of Appellant’s Specification cited by the Examiner states, in relevant part, that “[a] next layer 820 is illustrated in

Figure 8B. Here the laser only ablates the ‘wall’ surrounding the ‘dissected’ tissue like a grid.” Spec. 14. As seen in Appellant’s Figure 8B, the ablated tissue pattern includes a plurality of ablated portions of tissue that intersect at right angles, “like a grid.” *Id.*; *see also* Fig. 8B.

We are not persuaded that the Examiner has explained adequately why excising the entire flat posterior surface of the lentoid volume shown in Figure 3C of Juhasz ’166 equates to excising a pattern of tissue having ablated portions that intersect at right angles, like a grid. Because we are not persuaded, therefore, that the Examiner has adequately explained why Juhasz ’166 teaches or suggests a process having all of the steps and features of Appellant’s claim 24, we reverse the Examiner’s rejection of claim 24, and its dependent claims 26 and 28, over that reference.

OBVIOUSNESS—
PEYMAN AND JUHASZ ’438

In rejecting claims 3, 5, 6, 14, 15, 22, and 23 over Peyman and Juhasz ’438, the Examiner concluded that it would have been obvious to employ the laser pulses and placement taught in Juhasz ’438 in Peyman’s methods. Non-Final Act. 7–8.

Each of claims 3, 5, 6, 22, and 23 depends directly or ultimately from claim 1, discussed above. As discussed above, we are not persuaded that Peyman teaches or suggests a process having all of the steps and features recited in claim 1. Because the Examiner does not identify, nor do we discern, any teaching in Juhasz ’438 that remedies the deficiencies discussed above of Peyman with respect to claim 1, we reverse the Examiner’s rejection of claims 3, 5, 6, 22, and 23 over the combination of Peyman and Juhasz ’438.

Each of claims 14 and 15 depends directly or ultimately from claim 10, also discussed above. As discussed above, we are not persuaded that Juhasz '438 teaches or suggests a process having all of the steps and features recited in claim 10. Because the Examiner does not identify, nor do we discern, any teaching in Peyman that remedies the deficiencies discussed above of Juhasz '438 with respect to claim 10, we reverse the Examiner's rejection of claims 14 and 15 over the combination of Peyman and Juhasz '438.

OBVIOUSNESS—
JUHASZ '166 AND JUHASZ '438

In rejecting claim 25 over Juhasz '166 and Juhasz '438, the Examiner concluded that it would have been obvious to employ the laser pulse placement taught in Juhasz '438 in the methods of Juhasz '166. Non-Final Act. 8–9.

Claim 25 depends from claim 24, discussed above. As discussed above, we are not persuaded that Juhasz '166 teaches or suggests a process having all of the steps and features recited in claim 24. Because the Examiner does not identify, nor do we discern, any teaching in Juhasz '438 that remedies the deficiencies discussed above of Juhasz '166 with respect to claim 24, we reverse the Examiner's rejection of claim 25 over the combination of Juhasz '166 and Juhasz '438.

SUMMARY

For the reasons discussed:

(1) We affirm the Examiner's rejection of claims 9, 18, 23, and 28, under 35 U.S.C. § 101, as being directed to non-statutory subject matter;

(2) We reverse the Examiner's rejection of claims 1–16, 18–26, and 28, under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement;

(3) We reverse the Examiner's rejection of claims 1, 2, 4, 7–9, and 19 for obviousness over Peyman;

(4) We affirm the Examiner's rejection of claims 20 and 21 for obviousness over Peyman;

(5) We reverse the Examiner's rejection of claims 10, 11, 16, and 18 for obviousness over Juhasz '438;

(6) We reverse the Examiner's rejection of claims 10, 12, 13, and 18 for obviousness over Juhasz '653;

(7) We reverse the Examiner's rejection of claims 24, 26, and 28 for obviousness over Juhasz '166;

(8) We reverse the Examiner's rejection of claims 3, 5, 6, 14, 15, 22, and 23 for obviousness over Peyman and Juhasz '438; and

(9) We reverse the Examiner's rejection of claim 25 for obviousness over Juhasz '166 and Juhasz '438.

TIME PERIOD

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

AFFIRMED-IN-PART