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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* BRAN FERREN, MURIEL Y. ISHIKAWA,  
EDWARD K.Y. JUNG, NATHAN P. MYHRVOLD,  
CLARENCE T. TEGREENE, and LOWELL L. WOOD JR.

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Appeal 2011-003616  
Application 11/073,361  
Technology Center 3700

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Before DONALD E. ADAMS, JEFFREY N. FREDMAN, and  
JACQUELINE WRIGHT BONILLA, *Administrative Patent Judges*.

FREDMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a hair depilation method. The Examiner rejected the claims as lacking written description, as anticipated, and as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm-in-part.

*Statement of the Case*

*Background*

“The present application relates, in general, to the field of hair treatment devices and methods, and more particularly to depilation devices and methods” (Spec. 1, ll. 25-26).

*The Claims*

Claims 1, 2, 11, 13, 17, 20, 22, 24, 34, 35, 39, 44, 48, 51, 56, 60, 61, 63, 77, 83, 93, 94, 96, and 138-144 are on appeal. Claims 1 and 17 are representative and read as follows:

1. A depilation method comprising:
  - a) detecting or determining proximity of a depilation device to a skin surface;
  - b) responsive to detecting or determining proximity of a depilation device to a skin surface, delivering a beam of highly convergent light from said depilation device to the skin surface, said beam of light having a beam waist positioned substantially at a base of at least one hair shaft; and
  - c) delivering said light for a duration and with an intensity sufficient to cause mechanical failure of the at least one hair shaft at said beam waist.

17. The method of claim 1, wherein said duration and intensity of said light is sufficient to cause absorption from said light of between about 50 and about 200 Joules per gram of hair by said hair shaft at said beam waist.

*The issues*

A. The Examiner rejected claims 17, 20, and 93 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement (Ans. 4).

- B. The Examiner rejected claims 1, 2, 39, 44, 56, 60, 61, 77, 138, 139 and 143 under 35 U.S.C. § 102(e) as anticipated by Yamazaki<sup>1</sup> (Ans. 5-7).
- C. The Examiner rejected claims 48 and 51 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Neev<sup>2</sup> (Ans. 7).
- D. The Examiner rejected claims 22, 24, 94, and 96 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Shalev<sup>3</sup> (Ans. 8-9).
- E. The Examiner rejected claim 34 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Altshuler '950<sup>4</sup> (Ans. 9).
- F. The Examiner rejected claims 35 and 144 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Altshuler '033<sup>5</sup> (Ans. 9-10).
- G. The Examiner rejected claims 11, 83, and 140 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Mead<sup>6</sup> (Ans. 10-11).
- H. The Examiner rejected claim 142 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Kurtz<sup>7</sup> (Ans. 11).
- I. The Examiner rejected claims 13 and 141 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Lefki<sup>8</sup> (Ans. 11-12).
- J. The Examiner rejected claim 63 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Izawa<sup>9</sup> (Ans. 12).

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<sup>1</sup> Yamazaki et al., US 6,790,205 B1, issued Sep. 14, 2004.

<sup>2</sup> Neev, J., US 6,168,590 B1, issued Jan. 2, 2001.

<sup>3</sup> Shalev et al., US 7,170,034 B2, issued Jan. 30, 2007.

<sup>4</sup> Altshuler et al., US 2003/0032950 A1, published Feb. 13, 2003.

<sup>5</sup> Altshuler et al., US 7,135,033 B2, issued Nov. 14, 2006.

<sup>6</sup> Mead, III, et al., US 6,235,015 B1, issued May 22, 2001.

<sup>7</sup> Kurtz et al., US 5,501,680, issued Mar. 26, 1996.

<sup>8</sup> Lefki et al., US 7,108,690 B1, issued Sep. 19, 2006.

<sup>9</sup> Izawa et al., US 5,820,625, issued Oct. 13, 1998.

A. *35 U.S.C. § 112, first paragraph – New matter*

The Examiner finds that the “Applicant has amended these claims from ‘Joules per gram of energy from said light by said hair shaft/skin surface’ to ‘Joules per gram of hair/skin’” (Ans. 4). The Examiner finds that “Applicants’ disclosure specifically states ‘Joules per gram of energy’ and not Joules per gram of skin/hair. This is considered new matter” (*id.*).

The issue with respect to this rejection is: Does the evidence of record support the Examiner’s conclusion that the limitation in claim 17 to “Joules per gram of hair” or the limitation in claim 22 to “Joules per gram of skin” represents new matter?

*Findings of Fact*

The following findings of fact (“FF”) are supported by a preponderance of the evidence of record.

1. The Specification teaches that the “duration and intensity of the light may be sufficient to cause absorption of light by the hair shaft, at the beam waist, of between about 50 and about 200 joules *per gram*” (Spec. 6, ll. 16-18; emphasis added).

2. The Specification teaches that in “other embodiments the duration and intensity of the light may be sufficient to cause absorption of between about 50 and about 100 joules per *gram of energy* from the light by the hair shaft at the beam waist” (Spec. 6, ll. 18-21; emphasis added).

3. The Specification teaches that “the duration and intensity of the light may be sufficient to cause absorption of between about 20 and about 40 joules *per gram of energy* from the light by the skin surface” (Spec. 6, ll. 24-26; emphasis added).

4. The Specification teaches that in “still other embodiments the duration and intensity of the light may be sufficient to cause absorption of between about 10 and about 80 joules *per gram of energy* from the light by the skin surface” (Spec. 6, ll. 26-28; emphasis added).

5. The Specification teaches that the “beam waist diameter may be between about 1 and about 3 hair diameters” (Spec. 7, ll. 5-6).

#### *Principles of Law*

“[I]t is the specification itself that must demonstrate possession. And while the description requirement does not demand any particular form of disclosure, ... or that the specification recite the claimed invention in *haec verba*, a description that merely renders the invention obvious does not satisfy the requirement” *Ariad Pharmaceuticals, Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1352 (Fed. Cir. 2010).

#### *Analysis*

There is no dispute that the Specification does not, *ipsis verbis*, use either the phrase “Joules per gram of hair” as in claims 17 or “Joules per gram of skin” as in claims 22 or 93. Instead, the Specification uses the phrase “joules per gram of energy” multiple times (FF 2-4).

In the context of the Specification, there is no evidence that Appellants possessed the concept of “joules per gram of hair” or “joules per gram of skin” (FF 1-4). The Specification teaches a focus of the beam on about 1 to 3 hair diameters, focusing on single hairs or hair shafts (FF 1, 2, 5). The Specification does not ever discuss treatment of hair or skin in gram quantities, nor does the Specification ever provide any reason to measure the energy used as “joules per gram of hair” or “joules per gram of skin.” There

are no blazemarks or other indications that “joules per gram of hair” or “joules per gram of skin” was the intended language. *See Fujikawa v. Wattanasin*, 93 F.3d 1559, 1571 (Fed. Cir. 1996) (“In finding that Wattanasin’s disclosure failed to sufficiently describe the proposed sub-genus, the Board again recognized that . . . his application contained no blazemarks . . . [which] might be of special interest.”). At best, it might have been obvious to use “joule per gram of hair” or “joules per gram of skin,” but “a description that merely renders the invention obvious does not satisfy the requirement.” *Ariad*, 598 F.3d at 1352.

*Conclusion of Law*

The evidence of record supports the Examiner’s conclusion that the limitation in claim 17 to “Joules per gram of hair” or the limitation in claim 22 to “Joules per gram of skin” represents new matter.

*B. 35 U.S.C. § 102(e) over Yamazaki*

The Examiner finds that:

Yamazaki teaches a depilation method (Col 1, lines 5-7) comprising: a touch-sensitive switch attached to the tapered cap 14 (fig. 3) of the laser beam projector to detect when the tapered cap 14 is put in contact with the skin, thereby making the power supply turn on automatically when the tapered cap 14 is put in contact with the skin, and turn off automatically when the tapered cap 14 is removed from the skin. (Col 3, lines 62-67). This touch sensitive switch is interpreted as a mechanical proximity sensor. Furthermore, Yamazaki discloses a method of converging light to form a beam waist at its focal point. The light then diverges beyond the focal points, thus distributing the light power widely.

(Ans. 5). The Examiner finds that it “is inherent that in order to remove hair, as taught by Yamazaki (Col 2, lines 65-67), the light must be of a

duration and intensity sufficient to cause mechanical failure of the hair shaft” (Ans. 5).

The issue with respect to this rejection is: Does the evidence of record support the Examiner’s conclusion that Yamazaki anticipates the claims?

*Findings of Fact*

The following findings of fact (“FF”) are supported by a preponderance of the evidence of record.

6. The Specification teaches that “[p]roximity or position sensing may be used to detect that the device is within the specified distance range, and permitting the device to be activated manually by the user (e.g. with a switch) when it is within the specified distance range” (Spec. 5, ll. 17-20).

7. The Specification also teaches that “[i]f proximity sense signal 113 indicates that active surface 106 is within the selected distance range of skin surface 108, control signal 115 is generated to control light source 116 to generate light” (Spec, 9. ll. 21-23).

8. The Specification teaches that “a hair 110 located in the beam may be severed at beam waist 120, providing the light fluence is sufficiently high at the beam waist to melt, vaporize, or otherwise cause sufficient mechanical damage or weakening of the hair shaft” (Spec. 17, ll. 22-25).

9. The Specification teaches that “[I]ight fluence levels below the level that causes mechanical damage or severing of the hair shaft may produce bleaching of the hair shaft” (Spec. 7, ll. 1-3).

10. Yamazaki teaches “a laser beam projector for projecting a laser beam to a selected area on the skin for depilation” (Yamazaki, col. 1, ll. 5-7).

11. Yamazaki teaches that the “tapered cap **14** has a laser beam opening ‘b’ formed at its top end, and the laser beam projector is used by applying the tapered cap **14** to a selected spot on the skin with the laser beam opening ‘b’ surrounding with the selected spot” (Yamazaki, col. 2, ll. 53-57).

12. Yamazaki teaches that in “case of removing undesired hair from skin . . . the undesired hair can also be removed directly by means of the laser beam without removing the undesired hair beforehand” (Yamazaki, col. 2, ll. 62-66).

13. Yamazaki teaches “spherical lens **17** collects the light from the laser diode **18** to converge the light, forming a beam waist at its focal point. The spherical lens **17** has a short focal distance, and accordingly the depth of focus is so short that the power of light may be converged into a limited space” (Yamazaki, col. 3, ll. 31-35).

14. Yamazaki teaches that a touch-sensitive switch may be attached to the tapered cap **14** of the laser beam projector to detect when the tapered cap **14** is put in contact with the skin, thereby making the power supply turn on automatically when the tapered cap **14** is put in contact with the skin, and turn off automatically when the tapered cap **14** is removed from the skin.

(Yamazaki, col. 3, ll. 62-67.)

15. Yamazaki teaches that when “the push button switch S is depressed, the laser diode **18** is made to turn on one second long, and off one second long” (Yamazaki, col. 4, ll. 40-42). Yamazaki teaches that the “user can depress the push button switch to project a laser beam to the right spot

exactly while watching the image of the right spot taken by the CCD camera” (Yamazaki, col. 5, ll. 24-26).

16. Yamazaki teaches that “[d]epilation or skin treatment using a laser beam requires that pores of the skin or discolored pigment cells be exposed to the very hot narrow beam of light with accuracy because otherwise, a satisfactory treatment can be hardly attained” (Yamazaki, col. 1, ll. 28-31).

17. The Examiner finds that the “pore is defined as an opening of the skin which contains the hair shaft and root” (Ans. 13).

18. The Examiner finds that it “is inherent that in order to remove hair, as taught by Yamazaki (Col 2, lines 65-67), the light must be of a duration and intensity sufficient to cause mechanical failure of the hair shaft” (*id.* at 5).

### *Principles of Law*

It is well settled that during examination, the PTO must interpret terms in a claim using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

“A single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation.” *Perricone v. Medicis Pharmaceutical Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005).

*Analysis*

*Claim interpretation*

Claim interpretation is at the heart of patent examination because before a claim is properly interpreted, its scope cannot be compared to the prior art. In this case, the dispute is over steps b) and c) of claim 1.

*“responsive to detecting”*

Appellants contend that “[n]owhere has the Examiner shown evidence of ‘responsive to detecting or determining proximity of a depilation device to a skin surface, delivering a beam of highly convergent light from said depilation device to the skin surface’” (App. Br. 29-30). Appellants contend that the “Examiner failed to establish *objectively-verifiable evidence* of how ‘making the power supply turn on’ is *equivalent* to ‘delivering a beam of highly convergent light’” (*id.* at 30).

As discussed above, during prosecution, claim terms are given their broadest reasonable interpretation as they would be understood by persons of ordinary skill in the art in the light of the Specification. Therefore, we first turn to the Specification to determine whether the meanings of the phrase “responsive to detecting or determining proximity of a depilation device to a skin surface, delivering a beam of highly convergent light” at issue can be discerned.

The Specification teaches that “[p]roximity or position sensing may be used to detect that the device is within the specified distance range, and permitting the device to be activated manually by the user (e.g. with a switch) when it is within the specified distance range” (Spec. 5, ll. 17-20; FF 6). The Specification also teaches that “[i]f proximity sense signal 113

indicates that active surface 106 is within the selected distance range of skin surface 108, control signal 115 is generated to control light source 116 to generate light” (Spec, 9. ll. 21-23; FF 7).

In the context of the Specification, the phrase “responsive to detecting or determining proximity of a depilation device to a skin surface, delivering a beam of highly convergent light” is reasonably interpreted as requiring a proximity sensor to determine the range from the skin (FF 6). If the range is in a selected range, the Specification is reasonably interpreted as teaching the use of either manual (FF 6) or automatic (FF 7) activation of a light source.

Yamazaki teaches that a

touch-sensitive switch may be attached to the tapered cap **14** of the laser beam projector to detect when the tapered cap **14** is put in contact with the skin, thereby making the power supply turn on automatically when the tapered cap **14** is put in contact with the skin, and turn off automatically when the tapered cap **14** is removed from the skin.

(Yamazaki, col. 3, ll. 62-67; FF 14.) Yamazaki teaches that when “the push button switch S is depressed, the laser diode **18** is made to turn on one second long, and off one second long” (Yamazaki, col. 4, ll. 40-42; FF 15).

We find that Yamazaki’s touch-sensitive switch, which automatically controls the power supply, reasonably satisfies the manual movement and operation of the applicator by the physician reasonably satisfies the “responsive to detecting or determining proximity of a depilation device to a skin surface” element of the claim. We find that Yamazaki’s teaching of a manual button switch to turn on and off the laser satisfies the “delivering a beam of highly convergent light” element of the claim. Since the physician

is only permitted to activate the light source when Yamazaki's touch sensitive switch turns on the power supply, Yamazaki teaches that the beam delivery is responsive to detection of skin proximity by the proximity sensor (FF 6, 14-15).

*“beam waist positioned substantially at a base of at least one hair shaft”*

Appellants contend that the “the Examiner *still* failed to demonstrate how the alleged disclosure of targeting the hair shaft or the root is *equivalent* to ‘said beam of light having a beam waist positioned substantially at a base of at least one hair shaft’” (App. Br. 31).

We begin by interpreting the scope of the claim element. The claim element requires a “beam waist positioned substantially at a base of at least one hair shaft.” That is, the claim does not require positioning at the exact base of the hair shaft, but rather in an area close to the hair shaft.

The Examiner finds that the “pore is defined as an opening of the skin which contains the hair shaft and root” (Ans. 13; FF 17). Thus, positioning of the beam waist at the pore is reasonably interpreted as “substantially” close to the base of a hair shaft, since the pore is the opening which contains the base of the hair shaft (FF 17).

Yamazaki teaches that “[d]epilation or skin treatment using a laser beam requires that pores of the skin or discolored pigment cells be exposed to the very hot narrow beam of light with accuracy because otherwise, a satisfactory treatment can be hardly attained” (Yamazaki, col. 1, ll. 28-31; FF 16). In the above citation, Yamazaki's language is reasonably interpreted to connect depilation to pores and skin treatment to discolored pigment cells,

based on ordinary English language usage. Yamazaki teaches “spherical lens **17** collects the light from the laser diode **18** to converge the light, forming a beam waist at its focal point. The spherical lens **17** has a short focal distance, and accordingly the depth of focus is so short that the power of light may be converged into a limited space” (Yamazaki, col. 3, ll. 31-35; FF 13).

We therefore find that Yamazaki reasonably teaches that depilation requires that pores of the skin, which are substantially at the base of the hair shaft, must be exposed to the narrow beam of light, particularly the beam waist, in order for satisfactory treatment, thereby teaching to position the beam waist substantially near the location of the base of the hair shaft for depilation (FF 13, 16, 17).

*“mechanical failure of the at least one hair shaft”*

Appellants contend that “the Examiner did nothing more than allege inherency. The Examiner failed to provide any basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics *necessarily flow* from the disclosure of Yamazaki” (App. Br. 33).

We begin by interpreting the scope of the claim element. The claim element requires a “mechanical failure of the at least one hair shaft.” The Specification teaches that “a hair 110 located in the beam may be severed at beam waist 120, providing the light fluence is sufficiently high at the beam waist to melt, vaporize, or otherwise cause sufficient mechanical damage or weakening of the hair shaft” (Spec. 17, ll. 22-25; FF 8). The Specification teaches that “[l]ight fluence levels below the level that causes mechanical

damage or severing of the hair shaft may produce bleaching of the hair shaft” (Spec. 7, ll. 1-3; FF 9).

Thus, the Specification clearly indicates that any light fluence sufficient to remove the hair will cause “mechanical failure,” while light fluence levels insufficient to sever the hair may cause mechanical damage and bleach the hair (FF 8-9).

The Examiner finds that it “is inherent that in order to remove hair, as taught by Yamazaki (Col 2, lines 65-67), the light must be of a duration and intensity sufficient to cause mechanical failure of the hair shaft” (Ans. 5; FF 18). Yamazaki teaches “a laser beam projector for projecting a laser beam to a selected area on the skin for depilation” (Yamazaki, col. 1, ll. 5-7; FF 10). Yamazaki teaches that “the undesired hair can also be removed directly by means of the laser beam without removing the undesired hair beforehand” (Yamazaki, col. 2, ll. 64-66; FF 12).

We find that the Examiner has the better position. Consistent with the teachings of the Specification (FF 8-9), Yamazaki clearly teaches a laser beam with sufficient light fluence at the beam waist to remove hair with the laser beam (FF 10-12) which inherently results in a “mechanical failure” of the hair shaft sufficient to sever or remove the hair. *See In re Best*, 562 F.2d 1252, 1255 (CCPA 1977) (“Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product.... Whether the rejection is based on ‘inherency’ under 35 U.S.C. § 102, on ‘prima facie obviousness’ under 35

U.S.C. § 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products.") Here, Appellants have provided no evidence to suggest that the lens focused laser beam of Yamazaki, when removing hair, does not inherently satisfy the requirement for "mechanical failure of the at least one hair shaft."

*Claims 2 and 139*

Appellants contend that the "Examiner failed to establish how putting a touch-sensitive switch '**in contact** with the skin' (emphasis added) is *equivalent* to 'determining that said depilation device is within a predetermined **distance range** of the skin surface'" (App. Br. 35).

We are not persuaded. Claim 2 simply requires a sensor which determines "a predetermined distance range of the skin surface." Yamazaki teaches a "touch-sensitive switch may be attached to the tapered cap **14** of the laser beam projector to detect when the tapered cap **14** is put in contact with the skin" (Yamazaki, col. 3, ll. 62-65; FF 14). Skin contact is reasonably interpreted as a "predetermined distance range of the skin surface." There is no requirement in claim 2 that the predetermined range must be greater than skin contact, or that the determining step must perform anything other than demonstrate skin contact. "[L]imitations are not to be read into the claims from the specification." *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). Claim 139 is anticipated for the same reasons, since Yamazaki teaches an electromechanical sensor, the touch-sensitive switch (FF 14).

*Claim 39*

Appellants reiterate the arguments discussed above for claim 2 regarding a proximity sensor (App. Br. 40). Appellants first contend that “the Examiner failed to demonstrate where the Examiner-cited portion of Yamazaki discloses ‘a proximity sensor capable of detecting the proximity of said light source to a skin surface’” (*id.*).

We are not persuaded. In determining whether the complete depilation device is touching the skin or not, Yamazaki is necessarily also detecting the proximity of the light source, physically attached to the tapered cap 14, to the skin surface (FF 14).

Appellants contend that “[t]here is no teaching, and the Examiner has pointed to none, in column 5, lines 36-37 of Yamazaki of ‘control circuitry configured to gate said light in response to said proximity sense signal’” (App. Br. 41).

We are not persuaded. Yamazaki teaches “making the power supply turn on automatically when the tapered cap **14** is put in contact with the skin, and turn off automatically when the tapered cap **14** is removed from the skin” (Yamazaki, col. 3, ll. 65-67; FF 14). This automatic switch reasonably satisfies the requirement for “control circuitry” and this circuitry is configured to permit or prevent laser beam radiation depending upon the proximity detection of skin (FF 14).

*Claim 44*

Appellants contend that “the recitation of ‘control circuitry is configured to permit generation of said highly convergent beam such that said narrow spatially limited beam waist is positioned within a distance-

range of about 40  $\mu\text{m}$  and about 300  $\mu\text{m}$  above the skin surface' is a structural recitation, not an intended use" (App. Br. 43).

We agree with Appellants. This requirement imposes a structural requirement on the device so that the beam is focused at certain locations. In addition, the Examiner has not established in Yamazaki that the range in claim 44, or any point in or near this range, is a results optimizable variable or that there is a known desired range for shaving in the prior art. *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977).

*Claim 61*

Appellants reiterate arguments regarding "detecting a distance" and "distance range" which were fully addressed and not found persuasive for the reasons given above (*see* App. Br. 47, 49). Appellants contend that the "Examiner failed to establish how 'a clear image of the right spot' . . . is *equivalent* to 'detecting the presence of at least one hair shaft on the skin surface adjacent to said active surface'" (App. Br. 48).

We are not persuaded. Yamazaki teaches that the "user can depress the push button switch to project a laser beam to the right spot exactly while watching the image of the right spot taken by the CCD camera" (Yamazaki, col. 5, ll. 24-26; FF 15). Yamazaki teaches that "[d]epilation or skin treatment using a laser beam requires that pores of the skin or discolored pigment cells be exposed to the very hot narrow beam of light with accuracy because otherwise, a satisfactory treatment can be hardly attained" (Yamazaki, col. 1, ll. 28-31; FF 16).

We find that Yamazaki's teaching of finding the right spot (FF 15), in the context of hair depilation (FF 16), would have been reasonably

understood by an ordinary artisan as requiring the user to image the hair shaft being depilated in order to obtain the satisfactory treatment of depilation (FF 15-16).

*Claims 77 and 143*

Appellants contend that “the Examiner failed to provide any *objectively-verifiable evidence* of where Yamazaki *actually* discloses ‘wherein said convergent light is delivered as one or more pulses of duration selected based upon one or more parameters of said hair shaft’” (App. Br. 51).

We are not persuaded. Yamazaki clearly teaches the use of a single pulse (FF 15), which satisfies the requirement for “one or more pulses” in claim 143. Given the breadth of the term “parameter,” we also agree with the Examiner that, minimally, the parameter of length of the hair shaft is encompassed by the recited phrase in claim 77 or 143 since a hair which does not extend from the pore would not require nor be reasonably subject to depilation (*see* Ans. 16).

*Conclusion of Law*

The evidence of record supports the Examiner’s conclusion that Yamazaki anticipates claims 1, 2, 39, 61, 77, 139, and 143.

The evidence of record does not support the Examiner’s conclusion that Yamazaki anticipates the claim 44.

*C. 35 U.S.C. § 103(a) over Yamazaki and Neev – claims 48, 51*

Appellants contend that “[b]ecause the focus of the beam in Neev is so large, it would not be suitable for use in Yamazaki. One of ordinary skill in the art would readily recognize that the broad-spanning beam of Neev (0.3

cm to 10 cm diameter) would render the device of Yamazaki *unsatisfactory for its intended purpose*” (App. Br. 53-54). Appellants contend, regarding the relationship between aperture and f-number, that the “Examiner provided no *objectively-verifiable evidence* to establish this unsupported assertion” (*id.* at 54).

We are not persuaded. As the Examiner notes (Ans. 16), Neev teaches that:

The beam diameter (FWHM) in this single-beam/single hair interaction configuration should be in the range from about 5  $\mu\text{m}$  to about 360  $\mu\text{m}$  with a preferred value of from about 5  $\mu\text{m}$  to about 60  $\mu\text{m}$ . A conventional lens or a fiber lens with an f number in the range of from about 0.4 to about 2.5 may be used with a preferred range of from about 1.0 to about 1.7.

(Neev, col. 15, ll. 11-17.) Neev therefore directly rebuts Appellants argument regarding the focus of the beam being too large, since Neev teaches a “single-beam/single hair” interaction configuration.

The Examiner finds that it “is commonly known in the art that the numerical aperture and f-number are dependent on each other such that the numerical aperture equals half of the inverse of the f-number” (Ans. 8). The term f-number is defined<sup>10</sup> as “[t]he ratio of the focal length of a lens or lens system to the effective diameter of its aperture. Also called f-stop.” The Examiner finds that the “numerical apertures taught by Neev would be in the range of 0.2 to 1.25” (Ans. 8). The Examiner has made a factual finding, consistent with the dictionary meaning of the terms, which is not rebutted

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<sup>10</sup> See <http://www.thefreedictionary.com/f+stop>; accessed Jan. 23, 2013.

with evidence by Appellants. *See In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (“[A]ttorney argument [is] not the kind of factual evidence that is required to rebut a prima facie case of obviousness”).

D. 35 U.S.C. § 103(a) over *Yamazaki and Shalev* – claims 22, 24, 94, 96

Appellants contend that “focusing a beam waist at a *distance* of a skin surface is neither descriptive nor suggestive of a *diameter* of a beam waist or a restricted high fluence region. Such a mischaracterization, alone, is evidence that the Examiner did not examine claims 24 and 96 *as recited* and warrants reversal on appeal” (App. Br. 57-58).

We are not persuaded. *Yamazaki* teaches that the “spherical lens **17** collects the light from the laser diode **18** to converge the light, forming a beam waist at its focal point. The spherical lens **17** has a short focal distance, and accordingly the depth of focus is so short that the power of light may be converged into a limited space” (*Yamazaki*, col. 3, ll. 31-35; FF 13). Thus, *Yamazaki* teaches that the beam waist diameter at the focal point is a results optimizable variable. Similarly, *Shalev* teaches to cut “hair **522**’ at two millimeters above skin surface **524**, though it could be positioned to cut hair **518**’ at one millimeter or less or 10 millimeters or more above skin **524**” (*Shalev*, col. 12, ll. 25-28). In teaching that different distances above skin may be cut, *Shalev* teaches that this distance is also a results optimizable variable. The discovery of an optimum value of a results-effective variable in a known process is normally obvious. *In re Antonie*, 559 F.2d 618, 620 (CCPA 1977). Appellants have provided no evidence to rebut these points.

*E. 35 U.S.C. § 103(a) over Yamazaki and Altshuler '950 – claim 34*

The Examiner finds “Yamazaki is discussed above, but is silent with regards to taking into account the speed of movement of the device. Altshuler teaches a motion sensor to account for the varying speed of the handpiece and adjusts the intensity of the treatment according to the measured speed” (Ans. 9). The Examiner finds it obvious to “modify the device disclosed by Yamazaki with the speed sensor taught by Altshuler in order to increase safety of the device” (*id.*).

The Examiner provides sound fact-based reasoning for combining Altshuler '950 with Yamazaki. We adopt the fact finding and analysis of the Examiner as our own. Appellants argue the underlying anticipation rejection over Yamazaki, but Appellants do not identify any material defect in the Examiner’s reasoning for combining Altshuler '950 with Yamazaki. Since Appellants only argue the underlying rejection of Yamazaki which we affirmed above, we affirm this rejection for the reasons stated by the Examiner.

*F. 35 U.S.C. § 103(a) over Yamazaki and Altshuler '033 – claims 35, 144*

Appellants contend that the “Examiner provided *no objectively verifiable evidence* of where either Yamazaki or Altshuler '033, alone or in combination, discloses or suggests ‘delivering said convergent light to said skin surface through a light-conducting medium ... **coated on at least one hair shaft**” (App. Br. 62).

The Examiner finds that “Altshuler teaches a phototreatment device and method for hair removal including delivering a beam to skin surface through a light-conducting medium ... interposed between the device (180,

Fig 1A) and the skin surface (150, Fig 1A), wherein said light-conducting medium is a light activated medium” (Ans. 9).

Altshuler teaches that a “topical substance may be any suitable transportable material to perform any suitable function. For example, a topical substance may enhance the efficacy of a phototreatment (e.g., coupling light from a source into a tissue, or by removing residual hairs)” (Altshuler, col. 10, ll. 19-24).

We agree with the Examiner that claim 35, which simply requires inclusion of “a light-conducting medium interposed between said depilation device and said skin surface,” is rendered obvious by Altshuler’s teaching of a topical substance which may couple light from a source into a tissue in combination with Yamazaki’s depilation method. This claim lacks the requirement argued by Appellants of “coated on at least one hair shaft” found in claim 144.

We agree with Appellants that Altshuler ‘033 and Yamazaki do not render claim 144 obvious, since claim 144 requires that the light conducting medium is “coated on at least one hair shaft.” The Examiner has not established that the medium would have been coated onto a hair shaft rather than simply be coated on skin and function to “increase safety of a phototreatment device (e.g., cooling the tissue, indicating areas that have been treated, indicating rate of movement of the device over the tissue)” (Altshuler, col. 10, ll. 24-26). It is not inherently necessary that the coating is applied to hair shafts since it might be applied to protect the underlying skin and permit hair removal by cooling the skin or indicating already treated areas as taught by Altshuler. *See MEHL/Biophile Int’l. Corp. v.*

*Milgraum*, 192 F.3d 1362, 1365 (Fed. Cir. 1999) (“Inherency ... may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.”)

G. 35 U.S.C. § 103(a) over *Yamazaki and Mead* – claims 11, 83, 140

The Examiner finds “Yamazaki is discussed above, but is silent with regards to a specific angle of convergence. Mead teaches a device for selective hair depilation where the angle of convergence is at least 8.5 degrees” (Ans. 10). The Examiner finds it obvious to “a person having ordinary skill in the art at the time of applicant's invention to use the angle of convergence taught by Mead, in the device taught by Yamazaki in order to provide a wide range of converging light” (*id.*).

The Examiner provides sound fact-based reasoning for combining Mead with Yamazaki. We adopt the fact finding and analysis of the Examiner as our own. Appellants argue the underlying anticipation rejection over Yamazaki, but Appellants do not identify any material defect in the Examiner’s reasoning for combining Mead with Yamazaki. Since Appellants only argue the underlying rejection of Yamazaki which we affirmed above, we affirm this rejection for the reasons stated by the Examiner.

H. 35 U.S.C. § 103(a) over *Yamazaki and Kurtz* – claim 142

Appellants contend that “[n]owhere has the Examiner establish[ed that] an optical sensor would be an art-recognized equivalent to a ***touch-sensitive*** switch” (App. Br. 67).

The Examiner finds that “Kurtz teaches an optical proximity sensor, depicted in Fig 8, wherein radiation 60 (e.g., infrared light) emitted from the emitting element of the proximity sensor means 40 is reflected from surface

58 and is detected by the detecting element of the proximity sensor means” (Ans. 11). The Examiner finds it obvious to “substitute the mechanical proximity sensor taught by Yamazaki with the optical proximity sensor taught by Kurtz as they are art recognized equivalents” (*id.* at 10).

We find that the Examiner has the better position. “If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007). In the instant case, both Yamazaki’s mechanical sensor and Kurtz’s optical sensor are designed to identify the proximity of skin to the laser in order to prevent the laser from causing injury. We agree with the Examiner that since both of these sensors predictably function for the same purpose in the same type of devices, the ordinary artisan would reasonably incorporate an optical sensor in the place of a touch sensor. Such a combination is merely a “predictable use of prior art elements according to their established functions.” *Id.* at 417.

*I. 35 U.S.C. § 103(a) over Yamazaki and Lefki – claims 13, 141*

Appellants contend that the “Examiner provided no ***objectively-verifiable evidence*** of where either Yamazaki or Lefki, alone or in combination, discloses ‘delivering a beam of light having a diameter at the skin surface that is between about 2 and about 10 times the diameter of said beam at said beam waist’ (App. Br. 68).

The Examiner finds that “Lefki teaches a hair depilation device with an adjustment member, by means of which the user can adjust the location of the target position of the laser beam on the hair shaft relative to the surface of the skin, thus adjusting a desired smoothness” (Ans. 11).

Lefki teaches that a “hair-removing device **1**” may be further provided with an adjustment member by means of which the user can adjust the location of the target position **9** relative to the surface of the skin **11**” (Lefki, col. 15, ll. 11-14).

We agree with Appellants that claim 13, which requires that the beam of light has “a diameter at the skin surface that is between about 2 and about 10 times the diameter of said beam at said beam waist,” is not suggested by either Lefki or Yamazaki. While Yamazaki teaches that the “light diverges beyond the focal point, thus distributing the light power widely” (Yamazaki, col. 3, ll. 36-37), there is no teaching in Yamazaki of how wide the diameter would be at the skin surface. It is not necessarily inherent that the range in Yamazaki is between 2 and 10 times the diameter, since Yamazaki may be referring to distributions much greater than 10 times the diameter, a point which cannot be determined from his teaching. *MEHL/Biophile*, 192 F.3d at 1365.

We agree with the Examiner that claim 141, which requires adjusting the position to “one or more positions on said hair shaft and controlling said light source to produce modification of said hair shaft at said one or more positions on said hair shaft” is rendered obvious by Yamazaki and Lefki. As reasonably interpreted, claim 141 encompasses the situation where the high fluence region is focused on one position to modify the one position. Both Lefki and Yamazaki teach focusing on a single position as discussed above.

*J. 35 U.S.C. § 103(a) over Yamazaki and Izawa – claim 63*

The Examiner finds “Yamazaki is discussed above, but is silent with regards to two or more beams that converge on a high fluence overlap

region. Izawa teaches a light depilating apparatus that has two beams of light that converge at a single focal point (A, Fig 2) on the portion of skin to be depilated” (Ans. 12). The Examiner finds it obvious to “provide multiple laser beams that converge on a single focal spot as taught by Izawa in the device taught by Yamazaki to obtain a high fluence overlap region that severs the hair at the focal spot” (*id.*).

The Examiner provides sound fact-based reasoning for combining Izawa with Yamazaki. We adopt the fact finding and analysis of the Examiner as our own. Appellants argue the underlying anticipation rejection over Yamazaki, but Appellants do not identify any material defect in the Examiner’s reasoning for combining Izawa with Yamazaki. Since Appellants only argue the underlying rejection of Yamazaki which we affirmed above, we affirm this rejection for the reasons stated by the Examiner.

## SUMMARY

In summary, we affirm:

- the rejection of claims 17, 20, and 93 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.
- the rejection of claims 1, 2, 39, 61, 77, 139 and 143 under 35 U.S.C. § 102(e) as anticipated by Yamazaki. Pursuant to 37 C.F.R. § 41.37(c)(1)(vii)(2006), we also affirm the rejection

of claims 56, 60, and 138, as these claims were not argued separately.

- the rejection of claims 48 and 51 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Neev.
- the rejection of claims 22, 24, 94, and 96 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Shalev.
- the rejection of claim 34 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Altshuler '950.
- the rejection of claim 35 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Altshuler '033.
- the rejection of claims 11, 83, and 140 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Mead.
- the rejection of claim 142 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Kurtz.
- the rejection of claim 141 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Lefki.
- the rejection of claim 63 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Izawa.

We reverse:

- the rejection of claim 44 under 35 U.S.C. § 102(e) as anticipated by Yamazaki.
- the rejection of claim 144 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Altshuler '033
- the rejection of claim 13 under 35 U.S.C. § 103(a) as obvious over Yamazaki and Lefki.

Appeal 2011-003616  
Application 11/073,361

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).

AFFIRMED-IN-PART

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