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EXAMINER
HOFFMANN, JOHN M

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte RICHARD J. PIMPINELLA and GASTON E. TUDURY

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Appeal 2019-005090
Application 12/627,752
Technology Center 1700

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Before JEFFREY T. SMITH, JAMES C. HOUSEL, and
BRIAN D. RANGE, *Administrative Patent Judges.*

RANGE, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the

Examiner's decision to reject claims 11 and 13–17. We have jurisdiction

under 35 U.S.C. § 6(b).

We AFFIRM.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37
C.F.R. § 1.42. Appellant identifies the real party in interest as Panduit Corp.
Appeal Br. 1.

CLAIMED SUBJECT MATTER[2]

Appellant describes the invention as relating to "a multimode optical fiber having an improved index-of-refraction profile." Spec. ¶ 2. Multimode fiber (MMF) may have a large core diameter in comparison to the wavelength of light and can enable light to traverse the core along many discrete optical paths, where each optical path is called a mode. *Id.* ¶ 5. Appellant's invention seeks to modify the refractive index profile of a multimode fiber to reduce adverse effects caused by variations in low level of flow control dopant. *Id.* ¶ 10.

Claim 11 is illustrative, and we reproduce claim 11 below:

> 11. A method of manufacturing a graded multimode optical fiber having at least one dopant, the graded multimode optical fiber comprising:
> cladding with a refractive index n_2; and
> a core; the core having a center and a modified graded refractive index profile extending from the center to a radial distance R;
> wherein an ideal refractive index profile of the core would be comprised of refractive indices $n_0(r)$ defined by a function of a radial distance r from the center to a radial distance R_{ideal}:

$$n_0(r) = n_{1_0} * \sqrt{1 - 2\left(\frac{r}{R_{ideal}}\right)^{\alpha} \Delta_0}, \quad \text{for } r < R_{ideal},$$

> where;
> n_{10} is a refractive index at the center of the core;

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[2] In this Decision, we refer to the Final Office Action dated July 25, 2018 ("Final Act."), the Appeal Brief filed January 24, 2019 ("Appeal Br."), the Examiner's Answer dated April 18, 2019 ("Ans."), and the Reply Brief filed June 18, 2019 ("Reply Br.").

$$R < R_{ideal};$$

a is a parameter defining a shape of the ideal refractive index profile; and

$$\Delta_0 = \frac{n_{1_0}^2 - n_2^2}{2 n_{1_0}^2};$$

the method comprising:

introducing the at least one dopant such that the graded multimode optical fiber includes the at least one dopant; and

targeting controlling the concentration of the at least one dopant during the introduction over the radial distance *r* from the center,

wherein the refractive index of the modified graded refractive index profile at radial distance *r* for $0 < r \le R$ is defined by

$$n_{mod}(r) = n_{1_0} * \sqrt{1 - 2 \left(\frac{r}{R_{ideal}}\right)^{\alpha} \Delta_0},$$

wherein the refractive index of the modified graded refractive index profile at radial distance *r* for $r_i < r \le R$ is defined by

$$n_{mod}(r) = n_{1_0} * \sqrt{1 - 2 \left(\frac{r}{R}\right)^{\beta} \Delta_0}, \quad \text{where } \beta < \alpha,$$

wherein the refractive index of the modified graded refractive index profile at radial distance *r* for $r_i < r < R$ is less than the refractive index of the ideal refractive index profile at the same value of *r*, and

wherein the difference between the refractive index of the ideal refractive index profile and the refractive index of the modified graded refractive index profile increases respectively with *r* from r_i until *R*.

Appeal Br. 10–11 (Claims App.).

REJECTION AND REFERENCES

On appeal, the Examiner maintains the rejection of claims 11 and 13–17 under 35 U.S.C. § 103 as obvious over Fujii et al., US 6,078,715, June 20, 2000 ("Fujii") in view of Applicant's admissions in the Specification ("Admitted Prior Art" or "APA"), Soufiane et al., US 6,807,350 B2, Oct. 19, 2004 ("Soufiane"), and Kilner et al, US 6,772,611 B2, Aug. 10, 2004 ("Kilner").

OPINION

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

Appellant argues all claims as a group. *See* Appeal Br. 8–9. Therefore, consistent with the provisions of 37 C.F.R. § 41.37(c)(1)(iv) (2013), we limit our discussion to claim 11, and all other claims on appeal stand or fall together with claim 11.

The Examiner rejects claim 11 as obvious over Fujii in view of the Admitted Prior Art, Soufiane, and Kilner. Final Act. 7. The Examiner finds that the Fujii method and Appellant's method are the same aside from a

difference in refractive index profile in the resulting fiber. *Id.* at 7 (citing Fujii). Claim 1 recites that "β < α," and the Examiner finds that where the difference between β and α is extremely or infinitesimally small, the difference in refractive index in the fiber would also be extremely or infinitesimally small. *Id.* at 8. The Examiner finds that Kilner recognizes that poor process control is common for fiber production and that Soufiane likewise recognizes deviations in the refractive indices in optical fiber. *Id.* (citing Kilner and Soufiane). The Examiner reasons that the infinitesimally small difference between Appellant's claim (where β and α are nearly equivalent) and the art leads to the conclusion that claim 11 is obvious. *Id.*

Appellant first argues that the Examiner improperly compares products rather than processes. Appeal Br. 8. This argument, however, does not distinguish between claim 11 and the cited art. Moreover, the Examiner's rejection compares methods. Final Act. 7. The Examiner states, for example, that the Fujii's method is the same as Appellant's aside from "the difference in the resulting fiber." *Id.*; *see also* Ans. 7. Appellant has not directed us to evidence that establishes the distinction between the claimed method and Fujii's method. Appellant's argument, thus, does not persuade us of reversible Examiner error.

Appellant also argues that the art only shows "a target profile being the ideal parabolic profile as shown in Figure 2 of the application." Appeal Br. 8–9. Appellant argues that the Examiner fails to provide a reason to modify the art to reach the claimed target profile. *Id.* The Examiner responds by explaining that the rejection does not modify the art; rather, the claimed profile is obvious because the difference between the claimed profile and

Fujii's profile is infinitesimally small. Ans. 8–9. We address the Examiner's position below.

Obviousness is a question of law based on underlying determinations of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Richardson-Vicks, Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997). The underlying factual determinations include: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham*, 383 U.S. at 17–18.

Here, with regard to *Graham* factor one, Appellant does not dispute that the prior art teaches manufacture of fiber having cladding and a core. Final Act. 7. Appellant admits that the prior art teaches targeting an ideal parabolic profile. Appeal Br. 9.

With regard to *Graham* factor two, Appellant states that the difference between claim 11 and the prior art is that Appellant "adjusted their targeted profile to one below the ideal parabolic profile." Reply Br. 4. The Examiner, however, correctly states that claim 11 permits any value of β that is less than α. Final Act. 7–8; Ans. 9–10. Appellant does not dispute this point. The Examiner finds that the difference between targeting an ideal parabolic profile (targeting based on α) and targeting a slightly less than ideal profile (targeting based on β) is an infinitesimally small difference if β is very near α. Final Act. 7–8. Appellant also does not dispute this point or explain why the claimed invention is patently distinct from slight difference. Thus, on this record, we agree that the difference between the claimed subject matter,

at claim 11's point where β is very near α, and the prior art is infinitesimally small.

With regard to *Graham* factor three, claim 11 is broad. The parameter "β < α" permits targeting dopant concentration to reach a very large variation away from the ideal refractive index profile, an infinitesimally small variation away from the ideal profile, or anywhere in between. Appellant does not argue that any aspects of claim 11, other than the targeting, distinguish claim 11 from the prior art.

With regard to *Graham* factor four, Appellant does not argue any objective evidence of nonobviousness. *See, e.g.*, *In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997) (party asserting unexpected results has burden of proving results are unexpected). Appellant argues "better Bit Error Rate (BER)" (Appeal Br. 9) and argues reduction in "the number of above parabolic fibers that result" (Reply Br. 5), but Appellant does not, for example, provide evidence establishing these alleged benefits or cite evidence establishing that these results are unexpected over the art or are commensurate in scope with claim 11.

Weighing all of the evidence before us and considering each of the *Graham* factors, we agree with the Examiner's conclusion that claim 11's subject matter would have been obvious in view of the cited art.

Finally, Appellant argues that the Examiner errs in stating that differences in concentration are obvious. As explained above, however, the difference between targeting dopant concentration based on β rather than α is, as a practical matter, not meaningful when β is very near α. Indeed, we discern no meaningful difference between the manufacturing method of the

cited art as compared to Appellant's method when β is, as claim 1 permits, very near α.

Because Appellant's arguments do not identify Examiner error, we sustain the Examiner's rejection.[3]

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
11, 13–17	103	Fujii, APA, Soufiane, Kilner	11, 13–17	

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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[3] We note that Appellant, unfortunately, alleges "unprofessionalism and absurdity" of the Examiner (Appeal Br. 9) and refers to the Examiner's arguments as "disingenuous games of semantics" (Reply Br. 4). We disagree with Appellant's characterizations, and such comments do not serve to persuade us of the merits of Appellant's substantive arguments. Further, we remind Appellant that "Applicants and their attorneys or agents are required to conduct their business with the United States Patent and Trademark Office with decorum and courtesy." 37 C.F.R. § 1.3.