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| COLGATE-PALMOLIVE COMPANY | | | FOLGMANN, DREW S | |
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PATRIK JOHANSSON, STACEY LAVENDER, SCOTT
DEMAREST, RICHARD ADAMS, THOMAS BOYD, and
MADHUSUDAN PATEL

Appeal 2019-002150
Application 14/925,457
Technology Center 3700

Before JENNIFER D. BAHR, WILLIAM A. CAPP, and
JEREMY M. PLENZLER, *Administrative Patent Judges*.

PLENZLER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner's decision to reject claims 32–35, 37–42, 44, 45, 47–49, and 51–
55. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ 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 Colgate-Palmolive Company. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to a method of whitening teeth. Claim 32, reproduced below, is illustrative of the claimed subject matter:

32. A method of whitening teeth comprising:
- a) applying a tooth whitening agent to the tooth, the tooth whitening agent comprising hydrogen peroxide in a concentration ranging from of 2 wt. % to 10 wt. % based on the total weight of the tooth whitening agent; and
 - b) continuously irradiating a tooth with light generated by a light source for an irradiation time period, the light having a wavelength that ranges from 375 nm to 420 nm and the light source emitting the light at an irradiance density ranging from 0.3 mW/cm² to 8.1 mW/cm².

REFERENCES

The prior art relied upon by the Examiner is:

| Name | Reference | Date |
|-----------------|--------------------|---------------|
| Montgomery '955 | US 8,562,955 B2 | Oct. 22, 2013 |
| Soukos | US 2005/0064371 A1 | Mar. 24, 2005 |
| Montgomery '253 | US 2008/0032253 A1 | Feb. 7, 2008 |

REJECTIONS²

Claims 32–35, 37–42, 44, 52, and 53 are rejected under 35 U.S.C. § 103 as being unpatentable over Montgomery '253 and Montgomery '955.

² The Final Office Action includes rejections under 35 U.S.C. § 112. Final Act. 2–3. Those rejections were overcome by an amendment as acknowledged by the Advisory Action mailed June 7, 2018. Nevertheless, the Examiner's Answer repeats those rejections. Ans. 2–3. In view of the amendment and Advisory Action noted above, however, we understand this portion of the Examiner's Answer to be an error.

Claims 45, 47–49, 51, 54, and 55 are rejected under 35 U.S.C. § 103 as being unpatentable over Montgomery ’253, Montgomery ’955, and Soukos.

OPINION

Appellant argues claims 32–35, 37–42, 44, 52, and 53, as a first group. Appeal Br. 6–11. We select claim 32 as representative of the first group. Claims 33–35, 37–42, 44, 52, and 53 stand or fall with claim 32. *See* 37 C.F.R. § 41.37(c)(1)(iv). Similarly, Appellant argues claims 45, 47–49, 51, 54, and 55 as a second group. Appeal Br. 6–11 (arguing claims 45 and 55 with claim 32 without distinguishing between those claims and additionally providing a separate heading for claims 45 and 55 without additional meaningful argument). We select claim 45 as representative of the second group. Claims 48, 49, 51, 54, and 55 stand or fall with claim 45. Appellant provides a separate heading for claim 47, but does not allege any particular error in the rejection of that claim, and, instead, appears to rely on the alleged deficiencies in the rejection of claim 45. *Id.* at 12.

Independent claims 32 and 45 are each directed to “[a] method of whitening teeth” that includes “applying . . . hydrogen peroxide in a concentration ranging from of 2 wt. % to 10 wt. %” and “irradiating a tooth with light emitted from a light source . . . at an irradiance density ranging from 0.3 mW/cm² to 8.1 mW/cm².”

In each of the rejections, the Examiner finds that Montgomery ’253 teaches a method of whitening teeth by applying an unspecified concentration of hydrogen peroxide and also irradiating a tooth with light emitted from a light source at an irradiance density ranging from 1.0 mW/cm² to 20 mW/cm². Final Act. 4, 6 (citing Montgomery ¶¶ 24, 66).

The Examiner also finds that the light emitted in Montgomery '253 has a wavelength that ranges from 350 nm to 700 nm, and that Montgomery '253 teaches that select wavelengths, such as a range from 400 nm to 505 nm can be used. *Id.* at 4, 6 (citing Montgomery ¶ 65). Because the hydrogen peroxide concentration is unspecified in Montgomery '253, the Examiner looks to Montgomery '955. *Id.* at 4–7. The Examiner finds that Montgomery '955 also teaches a method of whitening teeth using light at a wavelength range between 350 nm and 500 nm, along with hydrogen peroxide at a concentration of 6%. *Id.* at 6–7. The Examiner uses Montgomery '955 to fill in the unspecified hydrogen peroxide concentration in Montgomery '253, as both Montgomery references relate to a method of tooth whitening and have a similar light wavelength range. *Id.*

Appellant's sole dispute with the Examiner's rejections relates to whether it would have been obvious to use a 6% hydrogen peroxide concentration in Montgomery '253. Specifically, Appellant contends that in "Montgomery '253 . . . there is no recognition that a 6% hydrogen peroxide concentration can be used at the relied upon power levels" and that "Montgomery '955 . . . makes explicitly clear that whitening teeth at 6 % hydrogen peroxide requires a minimum power density of 10 mW/cm² (preferably at least 100 mW/cm²). Reply Br. 2–3. As made clear in the Appeal Brief, "Appellant does not dispute that whitening treatments using light and 6 % hydrogen peroxide were known at the time the present application was filed." Appeal Br. 8. Rather, Appellant's contention is that neither Montgomery reference, *individually*, teaches the recited hydrogen peroxide in a concentration *and* the recited irradiance density. *Id.* at 8–9.

That is not persuasive of error, because the Examiner relies on the combined teachings of the Montgomery references.

Contrary to Appellant's representation, Montgomery '955 does not *require* a minimum power density of 10 mW/cm². Rather, Montgomery describes a *preferred embodiment* including a minimum power density of 10 mW/cm². *See* Montgomery '955, 11:45–48. The Examiner's determination, noted above, that one skilled in the art would look to another teeth whitening method (e.g., Montgomery '955) to determine a hydrogen peroxide concentration for teeth whitening for use in a teeth whitening method (e.g., Montgomery '235) that teaches using hydrogen peroxide without specifying concentration, is reasonable. Appellant's contention that "the Examiner's requirement that Appellant provide separate factual evidence demonstrating that Montgomery '253 does 'not contemplate such concentrations' is entirely improper" is misguided. Appeal Br. 9. The Examiner has provided a reasonable basis as to why one skilled in the art would have looked to the 6% hydrogen peroxide concentration for the reasons explained above. It is Appellant's burden to identify error in that determination. *See In re Jung*, 637 F.3d 1356, 1365–66 (Fed. Cir. 2011).

Appellant's contention that "the claimed combination . . . provides an unexpected advantage over the prior art discovered by Appellant" (Appeal Br. 10) is also unpersuasive of Examiner error. Appellant notes that "[r]ebuttal evidence and arguments can be presented in the specification." *Id.* at 9 (citing *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995)). Referencing Tables 1 and 3 from its Specification, Appellant contends that "it has been unexpectedly discovered that a light having the specific wavelength and irradiation density, as well as hydrogen peroxide concentration will reach an

asymptotic whitening value, indicating superior whitening has been achieved,” which “is critical because the unexpected synergy between wavelength, hydrogen peroxide concentration, and low power density not only provides a more effective method of getting teeth to change color, but it does so at power levels that are lower than what is expected by the prior art.”

Appeal Br. 10–11.

As the authority cited by Appellant explains,

[t]he basic principle behind [unexpected results supporting non-obviousness] is straightforward—that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often to the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.

In re Soni, 54 F.3d at 750. “Mere improvement in properties does not always suffice to show unexpected results,” but, rather, “when an applicant demonstrates *substantially* improved results . . . and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to the contrary.” *Id.* at 751. Appellant fails to explain, in its briefs, how the purported evidence of unexpected results in the Specification demonstrates substantially improved results.

For example, Appellant does not explain over what the claimed arrangement is an improvement. Further, our review of Appellant’s Table 1 shows, for example, that the claimed arrangement can also provide degraded performance (i.e., no improvement). Table 1 from Appellant’s Specification is reproduced below.

Table 1

| Treatment # | No Light | (λ) 375 nm | (λ) 405 nm | (λ) 420 nm | (λ) 470 nm | (λ) 505 nm |
|-------------|----------|------------|------------|------------|------------|------------|
| 1 | -2.02 | -4.14 | -5.44 | -2.27 | -3.23 | -1.91 |
| 2 | -2.91 | -5.73 | -6.87 | -3.96 | -4.83 | -2.46 |
| 3 | -3.64 | -7.12 | -8.68 | -5.07 | -6.09 | -3.33 |
| 4 | -4.30 | -7.94 | -9.90 | -6.37 | -6.60 | -3.95 |
| 5 | -4.71 | -9.24 | -10.72 | -6.73 | -7.17 | -4.61 |
| 6 | -5.18 | -9.88 | -11.57 | -7.04 | -8.03 | -5.27 |
| 7 | -5.64 | -10.16 | -11.90 | -7.73 | -8.62 | -5.58 |

Table 1 is a summary of whitening results for “treatment includ[ing] a whitening agent comprising 4.5 wt. % of H₂O₂ and irradiating a tooth surface with light from an LED for a period of 15 minutes, wherein the light at the surface of the LED had a irradiance density of 4 mW/cm².” Spec.

¶ 57. Appellant explains that “a larger negative value indicates superior whitening performance.” Appeal Br. 10.

Claim 32, for example, recites “the light having a wavelength that ranges from 375 nm to 420 nm.” As seen in Table 1, a wavelength outside the recited range (470 nm) has better whitening than a wavelength within the recited range (420 nm). Although claim 45 provides a broader range of “375 nm to 500 nm,” we have essentially no data for wavelengths outside the recited range, other than 505 nm. Moreover, based on the upper limit in the table (505 nm), it seems that the whitening provided by no light would be approximately equal to, or perhaps even better than, that provided by the upper end of the wavelength range (500 nm) recited in claim 45.

Accordingly, we are not persuaded that the arrangement recited in claims 32 and 45 provides substantially improved results.

Appellant’s Table 3, discussed in the Appeal Brief, focuses on a single wavelength (405 nm). Spec. ¶¶ 60–61. To the extent Appellant relies

solely on the specific 405 nm wavelength results, that is not commensurate with the scope of the claims. As explained above, claims 32 and 45 are not limited to only the 405 nm wavelength.³ Moreover, that table also shows significant variation in whitening performance for irradiance values at the 405 nm wavelength. *See id.* ¶ 60.

For at least these reasons, we are not apprised of Examiner error.

CONCLUSION

The Examiner's rejections are affirmed.

DECISION SUMMARY

In summary:

| Claims Rejected | 35 U.S.C. § | Reference(s)/Basis | Affirmed | Reversed |
|--------------------------|--------------------|--|------------------------------------|-----------------|
| 32–35, 37–42, 44, 52, 53 | 103 | Montgomery '253, Montgomery '955 | 32–35, 37–42, 44, 52, and 53 | |
| 45, 47–49, 51, 54, 55 | 103 | Montgomery '253, Montgomery '955, Soukos | 45, 47–49, 51, 54, 55 | |
| Overall Outcome | | | 32–35, 37–42, 44, 45, 47–49, 51–55 | |

³ As explained in the discussion of claim grouping, we do not address claims that are not argued separately.

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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