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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte PHILIP GEORGE PITCHER, RICHARD T. GREENLEE, and
SAMI C. ANTRAZI

Appeal 2017-006509
Application 14/013,320
Technology Center 1700

Before KAREN M. HASTINGS, JAMES C. HOUSEL, and
JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to finally reject claims 1–20. We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

Appellant claims a method of forming a layer. Claim 1 illustrates the subject matter on appeal and is reproduced below:

¹ Appellant is the Applicant, Seagate Technology, LLC, which, according to the Appeal Brief, is the real party in interest. Appeal Brief filed October 31, 2016 (“App. Br.”), 2.

1. A method of forming a layer, the method comprising:
providing a feedstock, the feedstock comprising a first component and a second component;
ionizing at least part of the feedstock thereby forming a plasma,
wherein the plasma comprises constituents selected from:
the first component, derivatives of the first component,
ions of the first component, ions of derivatives of the first component, the second component, derivatives of the second component, ions of the second component, ions of derivatives of the second component, or combinations thereof, and
wherein the individual identities, individual ratios, total quantities, or any combination thereof of the first and second component in the feedstock can modulate the makeup of the plasma;
forming a beam from the plasma; and
forming a layer having an average thickness from sub-monolayer to about 20 Å thick from the beam,
wherein the layer includes at least some portion of at least the first or the second component.

App. Br. 9 (Claims Appendix) (emphasis added).

The Examiner sets forth the following rejections in the Final Office Action entered May 17, 2016 (“Final Act.”), and maintains the rejections in the Examiner’s Answer entered January 11, 2017 (“Ans.”):

- I. Claims 1–5, 10–12, and 16–18 under 35 U.S.C. § 103 as unpatentable over Veerasamy et al. (US 5,858,477, issued January 12, 1999);
- II. Claims 6, 7, 9, 13–15, 19, and 20 under 35 U.S.C. § 103 as unpatentable over Veerasamy in view of Mahoney et al. (US 6,086,962, issued July 11, 2000); and
- III. Claim 8 under 35 U.S.C. § 103 as unpatentable over Veerasamy in view of Rabalais et al. (US 4,822,466, issued April 18, 1989).

DISCUSSION

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we affirm the Examiner's rejections of claims 1–20 under 35 U.S.C. § 103(a) for the reasons set forth in the Final Office Action, Answer, and below.

Rejection I

Appellant argues claims 1–5, 10–12, and 16–18 together on the basis of independent claims 1, 10, and 16, which Appellant argues as a group. App. Br. 5–7. Therefore, we select claim 1 as representative, and decide the appeal as to claims 1–5, 10–12, and 16–18 based on claim 1 alone. 37 C.F.R. § 41.37(c)(1)(iv).

Veerasamy discloses a thin film or protective layer “for use in the production of magnetic recording media, as well as integrated circuits, optics, machine tools, and a wide variety of additional industrial applications.” Col. 1, ll. 17–22; col. 2, ll. 63–67. Veerasamy discloses that “these coatings are smooth and continuous (pinhole-free) at very low thicknesses, and provide a durable protective layer when deposited to a thickness of less than 75 Å, preferably being less than 50 Å thick.” Col. 8, ll. 32–36. Veerasamy discloses that the protective layer is “ultrasmooth and continuous at thicknesses of less than about 75 Å, and will provide durable recording media even at thicknesses of less than about 50 Å.” Col. 4, ll. 37–40. Veerasamy also discloses that the protective layer is “generally in the range between about 30 Å and 70 Å, which will allow the disk to meet recording media industry durability and stiction test requirements.” Col. 8, ll. 48–50.

Veerasamy discloses that forming a layer utilizing deposition rates of

between 2 and 12 Å /sec and deposition times of between about 6 and 30 sec provides a protective layer sufficient for recording media, and the Examiner finds that these disclosures and would have suggested thicknesses within the claimed range, such as about 12 Å (a deposition rate of 2 Å/sec for 6 sec). Ans. 5–6; Veerasamy col. 12, ll. 5–10. The Examiner concludes that the method of claim 1 “would have been obvious to one of ordinary skill in the art before the effective filing date of the claimed invention if the overlapping portion of the thickness range disclosed by Veerasamy was selected because overlapping ranges have been held to be a prima facie case of obviousness.” Final Act. 3 (citing *In re Wertheim*, 541 F.2d 257 (CCPA 1976)).

Appellant argues that one of ordinary skill in the art would have understood that as layers become thinner, they become non-continuous or include pinholes that degrade performance. App. Br. 5. Appellant points out that Veerasamy discloses that the layers described in the reference “are smooth, and continuous (pinhole-free) at very low thicknesses, and provide a durable protective layer. . .” *Id.* Appellant contends that “[t]he ‘range’ referred to by the [Examiner], ‘less than 50 Å thick’ therefore must have a lower limit” even though not explicitly indicated in the particular sentence of Veerasamy where this range is discussed. *Id.* Appellant contends that the “broadest range that Veerasamy can reasonably be considered as disclosing is 30 Å to 50 Å,” and Veerasamy therefore does not disclose or suggest a layer having a thickness from sub-monolayer to about 20 Å², as recited in claim 1. App. Br. 5–7.

However, as discussed above, Veerasamy explicitly discloses that the

² Appellant’s Specification indicates that a “sub-monolayer” thickness is a thickness “less than a monolyer of the material.” ¶ 75.

protective layer described in the reference is ultrasmooth and continuous at thicknesses of less than about 75 Å, and provides a durable protective layer at a thickness of less than 75 Å, preferably less than 50 Å. It is well-settled that even a slight overlap between a prior art range and a claimed range establishes a prima facie case of obviousness of the claimed range. *In re Peterson*, 315 F.3d 1325, 1329–330 (Fed. Cir. 2003) (“In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a prima facie case of obviousness . . .”). Accordingly, Veerasamy’s disclosure of a layer having a thickness of less than 50 Å renders the layer having a thickness of sub-monolayer to about 20 Å recited in claim 1 prima facie obvious.

In addition, as also discussed above, Veerasamy discloses that the layer described in the reference can be used for a wide variety of industrial applications, including production of magnetic recording media, integrated circuits, optics, and machine tools. Although the less than 50 Å layer thickness disclosed in Veerasamy must have a lower limit as Appellant points out, one of ordinary skill in the art would have understood that the lower thickness limit would vary with specific applications, and one of ordinary skill in the art would have determined a thickness that would suit a particular desired purpose. In view of Veerasamy’s disclosure of a layer having a thickness of less than 50 Å that is ultrasmooth, continuous (pinhole-free), and durable, one of ordinary skill in the art reasonably would have understood that although Veerasamy discloses that a protective layer thickness of between about 30 Å and 70 Å allows a disk to meet recording media industry durability and stiction test requirements, a thickness of less than 30 Å, such as about 20 Å as recited in claim 1, would be suitable for

other applications. Contrary to Appellant's arguments, the broadest range disclosed (and suggested) in Veerasamy is therefore not 30 Å to 50 Å.

Appellant further argues that Veerasamy's statement that the protective layer "is generally in the range [of] between about 30 Å and 70 Å, which will allow the disk to meet recording media industry durability and stiction test requirements" would have led one of ordinary skill in the art "to think that anything below 30 Å would not in fact be useful for the recording media industry," which is evidenced by Veerasamy's experimental examples where the thinnest layer made was 40 Å ±10. App. Br. 6. Appellant argues that Veerasamy thus teaches away from a thickness of less than 30 Å. *Id.*

However, we note initially that Veerasamy's disclosures are not limited to the experimental examples referred to by Appellant, and the entirety of Veerasamy's disclosures must be evaluated for what they would have fairly suggested to one of ordinary skill in the art. *In re Fracalossi*, 681 F.2d 792, 794 n.1 (CCPA 1982) (A prior art reference's disclosure is not limited to its examples.); *In re Boe*, 355 F.2d 961, 965 (CCPA 1966) (All of the disclosures in a prior art reference "must be evaluated for what they fairly teach one of ordinary skill in the art.").

The "mere disclosure of alternative designs does not teach away." *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004); *see also Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017) ("A reference that 'merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into' the claimed invention does not teach away." (quoting *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013))). Rather, teaching away requires "clear discouragement" from implementing a technical feature. *In*

re Ethicon, Inc., 844 F.3d 1344, 1351 (Fed. Cir. 2017).

Veerasamy's disclosure that a protective layer thickness of between about 30 Å and 70 Å allows a disk to meet recording media industry durability and stiction test requirements does not criticize or discredit, and would not have otherwise discouraged, one of ordinary skill in the art from forming a layer having a thickness of less than 30 Å for applications other than recording media, in view of Veerasamy's disclosure of the suitability of thickness of less than 50 Å for protective layers used in a wide variety of industrial applications. Accordingly, contrary to Appellant's arguments, Veerasamy does not teach away from a layer thickness of less than 30 Å.

Appellant argues that Veerasamy's disclosure of deposition times of between about 6 and 30 seconds "are noted with respect to the deposition rate range of about 8 to 9 Å per second, not the broader range of between 2 and 12 Å per second," and Appellant contends that this interpretation of Veerasamy's disclosures is "evidenced by the Experimental portion of Veerasamy." Reply Br. 2–3.

The entirety of the disclosure at issue in Veerasamy relied upon by the Examiner for suggesting a layer thickness of 12 Å (discussed above) states:

Carbon deposition rates of between 2 and 12 Å per second can be provided by plasma beam source deposition methods within the above operating ranges, ideally being between about 8 and 9 Å per second to provide the highest quality films. Deposition times of between about 6 and 30 seconds are generally used at these rates to provide a sufficient protective coating for magnetic recording media.

Col. 12, ll. 5–11. The phrase "these rates" in this disclosure reasonably refers to both rates of between 2 and 12 Å and rates of between about 8 and 9 Å per second, and the experimental examples cited by Appellant do not

definitively clarify how one of ordinary skill in the art would have interpreted this phrase by virtue of exemplifying, rather than limiting, Veerasamy's invention. Regardless of how one of ordinary skill in the art would have understood the above disclosure in Veerasamy, as discussed above, Veerasamy's disclosure of a layer having a thickness of less than 50 Å that is ultrasmooth, continuous (pinhole-free), and durable renders the layer having the range of thicknesses recited in claim 1 *prima facie* obvious. Because Appellant does not demonstrate the criticality of the recited range, Appellant's arguments are unpersuasive of reversible error in the Examiner's rejection. App. Br. 5–7; *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) (indicating that in cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.). We accordingly sustain the Examiner's rejection of claims 1–5, 10–12, and 16–18 under 35 U.S.C. § 103.

Rejections II and III

To address these rejections, Appellant relies on the arguments made for Rejection I (discussed above), and argues that the additional reference applied in Rejection II (Mahoney) fails to cure the deficiencies of Veerasamy.³ App. Br. 7. Because we are unpersuaded of reversible error in the Examiner's rejection of claim 1 for the reasons discussed above, Appellant's position as to these rejections is also without merit.

³ Appellant does not address the additional reference applied in Rejection III (Rabalais). App. Br. 7.

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DECISION

We affirm the Examiner's rejections of claims 1–20 under 35 U.S.C. § 103.

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