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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RICHARD STEVENSON and SETH GLEIMAN

Appeal 2019-005044
Application 14/582,257
Technology Center 1700

Before: LINDA M. GAUDETTE, MONTÉ T. SQUIRE, and JANE E. INGLESE, *Administrative Patent Judges*.

INGLESE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant requests our review under 35 U.S.C. § 134(a) of the Examiner's decision to finally reject claims 13–32.[1, 2] We have jurisdiction over this appeal under 35 U.S.C. § 6(b).

We REVERSE.

CLAIMED SUBJECT MATTER

Appellant claims a method of making a nonwoven fiber mat (independent claim 13), and a method of making a nonwoven fabric surgical

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[1] We use the word "Appellant" to refer to the "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies Covidien LP as the real party in interest. Appeal Brief, filed April 17, 2019 ("Appeal Br."). Appeal Br. 1.

[2] Final Office Action, dated December 11, 2018 ("Final Act.").

implant (independent claim 26). Appeal Br. 4–6. Independent claims 13 and 26 illustrate the subject matter on appeal, and read as follows:

> 13. A method of making a nonwoven fiber mat, comprising:
>
> providing a material, an extruder and a bimodal spinneret, wherein *the spinneret defines first holes each having a first diameter and second holes each having a second diameter different than the first diameter, the first and second holes disposed along a longitudinal axis of the spinneret*, at a nadir of a cavity of the spinneret, *in a pattern of alternating first and second diameters wherein each of the first holes is disposed axially adjacent to one of the second holes*;
>
> coupling the spinneret to the extruder;
>
> feeding the material into the extruder;
>
> melting the material in the extruder;
>
> passing the melted material into the spinneret;
>
> *extruding an equal number of first and second fibers through the respective first and second holes of the spinneret in the pattern of alternating first and second diameters*; and
>
> collecting the first and second fibers onto a conveyer surface to form a nonwoven fiber mat.
>
> 26. A method of making a nonwoven fabric surgical implant, the method comprising:
>
> passing melted bioabsorbable material into *a spinneret defining first holes each having a first diameter and second holes each having a second diameter different from the first diameter, the first and second holes disposed along a longitudinal axis of the spinneret*, at a nadir of a cavity of the spinneret, *in a pattern of alternating first and second diameters wherein each of the first holes is disposed axially adjacent to one of the second holes*;
>
> *extruding an equal number of first and second fibers through the respective first and second holes of the spinneret in the pattern of alternating first and second diameters*;
>
> depositing the first and second fibers on a conveyor surface; and
>
> cooling the first and second fibers on the conveyor surface to form a nonwoven fabric surgical implant.

Appeal Br. 14, 16 (Claims Appendix) (emphasis added).

REJECTIONS

The Examiner maintains the following rejections in the Examiner's Answer dated May 14, 2019 ("Ans."):

I. Claim 13 under 35 U.S.C. § 103 as unpatentable over Gibbon;[3]

II. Claims 13, 16–22, 25, and 32 under 35 U.S.C. § 103 as unpatentable over Brandner,[4] in view of Hartge;[5]

III. Claims 14 and 15 under 35 U.S.C. § 103 as unpatentable over Brandner in view of Hartge and Hayes;[6]

IV. Claims 23 and 24 under 35 U.S.C. § 103 as unpatentable over Brandner in view of Hartge and McKean;[7] and

V. Claims 26–31 under 35 U.S.C. § 103 as unpatentable over Brandner in view of McKean and Hartge.

FACTUAL FINDINGS AND ANALYSIS

Upon consideration of the evidence relied upon in this appeal and each of Appellant's contentions, we reverse the Examiner's rejections of claims 13–32 under 35 U.S.C. § 103 for reasons set forth in the Appeal and Reply Briefs, and below.

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[3] Gibbon et al., US 5,266,255, issued November 30, 1993, (hereinafter "Gibbon").
[4] Brandner et al., US 2008/00126659 A1, published January 31, 2008 (hereinafter "Brandner").
[5] Hartge, US 2007/0057414 A1, published March 15, 2007.
[6] Hayes, US 2001/0000189 A1, published April 5, 2001.
[7] McKean et al., US 5,542,594, issued August 6, 1996, (hereinafter "McKean").

Rejection I

We first address the Examiner's rejection of claim 13 under 35 U.S.C. § 103 as unpatentable over Gibbon.

The Examiner finds that Gibbon discloses a method of making a nonwoven fiber mat that comprises providing bimodal spinneret 14 defining first holes 30 each having a first diameter and second holes 31 each having a second diameter different than the first diameter. Final Act. 3 (citing Gibbon col. 4, ll. 27–30; Fig. 1). The Examiner finds that Gibbon discloses that first 30 and second 31 holes are disposed along a longitudinal axis of spinneret 14 in a pattern of alternating first and second diameters such that each of first holes 30 is disposed axially adjacent to one of second holes 31. Final Act. 3 (citing Gibbon col. 4, ll. 1–5; col. 5, ll. 34–39; Fig. 2).

On the record before us, however, the Examiner does not provide a sufficient factual basis to establish that the relied-upon disclosures of Gibbon teach or would have suggested a method of making a nonwoven fiber mat that involves providing a spinneret having the features recited in claim 13, for reasons expressed by Appellant and discussed below.

We point out initially that claim 13 recites providing a spinneret defining first holes each having a first diameter and second holes each having a second diameter different than the first diameter. Claim 13 explicitly recites that "the first and second holes [are] disposed along a longitudinal axis of the spinneret. . . in a pattern of alternating first and second diameters wherein each of the first holes is disposed axially adjacent to one of the second holes." And claim 13 further recites "extruding an equal number of first and second fibers through the respective first and second

holes of the spinneret in the pattern of alternating first and second diameters."

We interpret these elements of claim 13 in view of the description provided in Appellant's Specification. *In re Smith Int'l, Inc.*, 871 F.3d 1375, 1382 (Fed. Cir. 2017) ("'[T]he protocol of giving claims their broadest reasonable interpretation . . . does not include giving claims a legally incorrect interpretation' 'divorced from the specification and the record evidence.'") (internal citation omitted); *In re ICON Health and Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007) (During prosecution of patent applications, "the PTO must give claims their broadest reasonable construction consistent with the specification. . . . Therefore, we look to the specification to see if it provides a definition for claim terms, but otherwise apply a broad interpretation.").

The Specification describes Appellant's spinneret as "including a body defining a longitudinal axis, wherein the body includes a first side surface and a second side surface, and a top surface and a bottom surface; and at least two holes disposed along the longitudinal axis of the spinneret, each of the at least two holes having a hole diameter." Spec. ¶ 6; *see also* claim 1 ("A bimodal spinneret, comprising: a body defining a longitudinal axis"). The Specification describes exemplary bimodal spinneret 100 including body portion 101 that defines longitudinal axis 102 extending from proximal end 103 to distal end 104 of body portion 101. Spec. ¶ 34; Fig. 2. The Specification indicates that body portion 101 further defines cavity 107 having nadir 109 formed along longitudinal axis 102 of body portion 101. *Id.* The Specification indicates that through holes 120 having diameter D1 and through holes 130 having diameter D2 are disposed along

longitudinal axis 102 an alternating pattern, such that through holes 120 having first diameter "D1" alternate one after the next with through holes 130 having second diameter "D2." Spec. ¶¶ 32–34; Figs. 2 and 3.

The Specification thus consistently indicates that Appellant's spinneret includes a single longitudinal axis. In view of this description in Appellant's Specification, we interpret "first and second holes disposed along a longitudinal axis of the spinneret" as recited in claim 13 as first and second holes disposed along the same longitudinal axis—or along a single longitudinal axis.

We further interpret claim 13—consistent with the above disclosures in Appellant's Specification—to require the spinneret to define holes of a first diameter that alternate one after the other with holes of a second diameter along a single longitudinal axis of the spinneret, such that every other hole has a first diameter and each of the intervening holes has a second diameter, because such an arrangement is necessary in order for equal numbers of first and second fibers to be extruded through the respective first and second holes of the spinneret in a pattern of alternating first and second diameters, as explicitly recited in claim 13.

Gibbon discloses spinneret 14 including nine rows 20, 21, 22 . . . 28 of orifices. Gibbon col. 5, ll. 34–35; Fig. 2. Gibbon discloses that the diameter of orifices 30 in first row 20 are larger than the diameter of orifices 31 in second row 21, and the diameter of orifices 32, 33, 34, . . 38 in each successive row 22, 23, 24, . . . 28 decrease successively so that the diameter of orifices 38 in last row 28 are the smallest. Gibbon col. 5, ll. 37–43; Fig. 2.

As discussed above, the Examiner finds that Gibbon's first 30 and second 31 holes are disposed along a longitudinal axis of spinneret 14 in a pattern of alternating first and second diameters such that each of first holes 30 is disposed axially adjacent to one of second holes 31. Final Act. 3 (citing Gibbon col. 4, ll. 1–5; col. 5, ll. 34–39; Fig. 2). Appellant argues that Gibbon discloses orifices 30 of the same diameter disposed in first longitudinal row 20, and orifices 31 of a smaller diameter disposed in second longitudinal row 21, which is adjacent to and axially offset from first longitudinal row 20, rather than disclosing holes "disposed along a longitudinal axis . . . in a pattern of alternating first and second diameters," wherein, the pattern includes, 'each of the first holes . . . disposed axially adjacent to one of the second holes,' as recited in claim 13." Appeal Br. 6.

The Examiner responds to Appellant's arguments in the Answer by stating that "Gibbon discloses each of the first holes (30) is disposed axially adjacent to one of the second holes (31) ([*see*] [F]ig.2)." Ans. 12. Claim 13 as we have interpreted it, however, requires holes of a first diameter to alternate one after the other with holes of a second diameter along a single longitudinal axis of a spinneret. Gibbon discloses that first orifices 30 and second orifices 31 are disposed along separate, axially offset rows, and discloses six additional axially offset rows of orifices having successively smaller diameters, rather than disclosing orifices of a first diameter that alternate one after the other with orifices of a second diameter along a single longitudinal axis. Gibbon col. 5, ll. 34–43; Fig. 2.

The Examiner also states in the Answer that:

> Gibbon teaches that although spinnerets show in fig.2 is oval shape, the spinneret can have various shape such as circular,

> annular or any shape (see column 9, lines 22-25), thus it would have been obvious to one having ordinary skill in the art at the time the invention was made would envision that the spinneret can have square shape which has equal dimensional length which will allow the first holes (30) is disposed axially adjacent to one of the second holes (31) in order to have uniform flow arrangement.

Ans. 12.

Even if one of ordinary skill in the art would have modified Gibbon's spinneret to have a square shape as the Examiner proposes, however, such a spinneret would still include rows of orifices having successively smaller diameters. The Examiner's proposed modification of Gibbon, therefore, would not result in orifices of a first diameter alternating one after the other with orifices of a second diameter along a single longitudinal axis of Gibbon's spinneret.

The Examiner does not identify any disclosure in Gibbon that teaches or would have suggested a spinneret having orifices of a first diameter that alternate one after the other with holes of a second diameter along a single longitudinal axis of the spinneret. Nor does the Examiner provide persuasive technical reasoning that explains why one of ordinary skill in the art would have modified Gibbon's spinneret to include such orifices arranged in this manner.

On the record before us, therefore, the Examiner does not provide a sufficient factual basis to establish that Gibbon discloses or would have suggested a method of making a nonwoven fiber mat that comprises providing a bimodal spinneret defining first holes that each have a first diameter and second holes that each have a second diameter different than the first diameter, where the first and second holes are disposed along a

longitudinal axis of the spinneret in a pattern of alternating first and second diameters, such that each of the first holes is disposed axially adjacent to one of the second holes, and extruding an equal number of first and second fibers through the respective first and second holes of the spinneret in the pattern of alternating first and second diameters, as required by claim 13.

We, accordingly, do not sustain the Examiner's rejection of claim 13 under 35 U.S.C. § 103 as unpatentable over Gibbon.

Rejections II–V

We turn now to the Examiner's rejections of claims 13–32 under 35 U.S.C. § 103 as unpatentable over Brandner in view of Hartge and additional prior art references. We need address only independent claims 13 and 26.

Similar to claim 13, independent claim 26 recites a method comprising, in part, passing material into a spinneret defining first holes each having a first diameter and second holes each having a second diameter different than the first diameter, where the first and second holes are disposed along a longitudinal axis of the spinneret in a pattern of alternating first and second diameters, such that each of the first holes is disposed axially adjacent to one of the second holes, and extruding an equal number of first and second fibers through the respective first and second holes of the spinneret in the pattern of alternating first and second diameters. Like claim 13 discussed above, we interpret the plain language of claim 26 to require holes of a first diameter that alternate one after the other with holes of a second diameter along a single longitudinal axis of the spinneret, such that every other hole has a first diameter and each of the intervening holes has a second diameter, because such an arrangement is necessary in order for equal numbers of first and second fibers to be extruded through the

respective first and second holes of the spinneret in a pattern of alternating first and second diameters, consistent with Appellant's Specification.

The Examiner finds that Brandner teaches a method of making a nonwoven fiber mat comprising providing spinneret 206 defining first holes 308 each having a first diameter, and second holes 306 each having a second diameter different than the first diameter, with first 308 and second 306 holes disposed along a longitudinal axis of the spinneret in a pattern of alternating first and second diameters, such that each of the first 308 holes is disposed axially adjacent to one of second 306 holes. Final Act. 4, 8 (citing Brandner, Abst., ¶¶ 46, 47; Figs. 2 and 3).

The Examiner finds that "Brandner does not explicitly teach extruding an equal number of a first and second fibers through respective first and second holes of the spinneret." Final Act. 4. The Examiner finds, however, that Brandner discloses different ratios between the number of first holes 308 and the number of the second holes 306 in Brandner's spinneret. *Id.* (citing Brandner ¶ 47). Based on this disclosure, the Examiner determines that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified a method of making a nonwoven fiber mat as taught by Brandner with extruding an equal number of a first and second fibers through respective first and second holes of the spinneret for the purpose of obtaining a uniform numbers of fibers produced and uniform shape." *Id.*

On the record before us, however, the Examiner does not provide a sufficient factual basis to establish that the relied-upon disclosures of Brandner teach or would have suggested a method of making a nonwoven

fiber mat that involves providing a spinneret having the features recited in claims 13 and 26, for reasons expressed by Appellant and discussed below.

Brandner discloses that its "invention provides . . . a process for forming a monocomponent nonwoven web that comprises flowing fiber-forming material through a die cavity having larger size orifices and at least five times as many smaller size orifices to form filaments . . . attenuat[ing] the filaments into fibers . . . wherein there are at least five times as many microfibers as larger size fibers." Brandner ¶ 7. Brandner discloses that nonwoven webs formed with such a die "have a number of beneficial and unique properties," including improved moldability imparted by the larger size fibers, and increased surface area imparted by the smaller fibers, resulting in improved filter performance. Brandner ¶¶ 7–8.

Brandner discloses die 206 including row 304 of larger orifices 306 and smaller orifices 308 that "define a plurality of flow passages through which liquefied fiber-forming material exits die 206 and forms the filaments." Brandner ¶ 47, Fig. 3. Brandner discloses that in the embodiment shown in Figure 3, "there are 9 smaller orifices 308 for each larger orifice 306," but "[o]ther ratios of the number of smaller orifices per larger orifice may also be used, for example ratios of 5:1 or more, 6:1 or more, 10:1 or more, 12:1 or more, 15:1 or more, 20:1 or more or 30:1 or more." Brandner ¶ 47.

Although Brandner discloses larger orifices 306 and smaller orifices 308 disposed along row 304 (a single longitudinal axis) of die 206, Brandner does not disclose that larger orifices 306 and smaller orifices 308 alternate one after the other along row 304. Rather, Bradner discloses that "there are 9 smaller orifices 308 for each larger orifice 306," in die 206. Brandner

¶ 47. Nor does Brandner disclose extruding an equal number of filaments (fibers) through larger orifices 306 and smaller orifices 308 of die 206. Rather, Brandner repeatedly and consistently discloses that its invention provides a process for forming a nonwoven web that has at least five times as many microfibers as larger size fibers. Brandner ¶¶ 6, 7 (claims 1 and 15).

Although (as discussed above) the Examiner determines that it would have been obvious to modify Brandner's method to involve extruding an equal number of first and second fibers through respective first holes each having a first diameter and second holes each having a second diameter of Brandner's die (spinneret) "for the purpose of obtaining uniform numbers of fibers produced and uniform shape," the Examiner does not provide any objective evidence establishing that so modifying Brandner's method would actually result in production of a uniform number of fibers and a uniform shape.

Nor does the Examiner provide sound technical reasoning that explains why obtaining a uniform number of fibers and uniform shape would have been useful or desirable in a nonwoven mat formed according to Brandner's method, particularly in view of Brandner's disclosure that the nonwoven webs of Brandner's invention formed of at least five times as many microfibers as larger size fibers "have a number of beneficial and unique properties." Brandner ¶¶ 7–8.

Consequently, on the record before us, the Examiner does not provide sound technical reasoning having rational underpinning that explains why one of ordinary skill in the art would have been led to modify Brandner's method to involve providing a bimodal spinneret defining first holes that

each have a first diameter and second holes that each have a second diameter different than the first diameter, where the first and second holes are disposed along a longitudinal axis of the spinneret in a pattern of alternating first and second diameters, such that each of the first holes is disposed axially adjacent to one of the second holes, and extruding an equal number of first and second fibers through the respective first and second holes of the spinneret in the pattern of alternating first and second diameters, as required by claims 13 and 26.

We, accordingly, do not sustain the Examiner's rejections of claims 13–32 under 35 U.S.C. § 103.

DECISION SUMMARY

Claims	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
13	103	Gibbon		13
13, 16–22, 25, 32	103	Brandner, of Hartge		13, 16–22, 25, 32
14, 15	103	Brandner, Hartge, Hayes		14, 15
23, 24	103	Brandner, Hartge, McKean		23, 24
26–31	103	Brandner McKean, Hartge		26–31
Overall Outcome				13–32

REVERSED