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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARINA CRNOJA-COSIC and
JAMES MARTIN TAYLOR

Appeal 2018-006213
Application 12/809,213
Technology Center 1700

Before ROMULO H. DELMENDO, DONNA M. PRAISS, and
SHELDON M. MCGEE, *Administrative Patent Judges*.

PRAISS, *Administrative Patent Judge*.

DECISION ON APPEAL¹

¹ In this decision, we refer to the Specification filed June 18, 2010 (“Spec.”), the Final Office Action mailed Feb. 17, 2017 (“Final Act.”), the Appeal Brief filed Dec. 18, 2017 (“Appeal Br.”), the Examiner’s Answer mailed Mar. 23, 2018 (“Ans.”), and the Reply Brief filed May 23, 2018 (“Reply Br.”).

STATEMENT OF THE CASE

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner's final decision to reject claims 1, 4, 6, 7, 10, 12–15, 18, 22, and 25–28 as obvious under 35 U.S.C. § 103(a). An oral hearing was held on September 19, 2019.³ We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

The subject matter on appeal relates to yarns comprising an intimate blend of nylon staple fiber and high tenacity man-made cellulosic staple fiber and fabrics comprising such yarns. Spec. ¶ 1. According to the Specification, cellulosic fibers, such as cotton, viscose rayon, or Lyocell (a man-made cellulosic fiber), can be made into garments having a high level of comfort because they absorb moisture and have a cool, comfortable touch. *Id.* ¶ 2. Lyocell is described in the Specification as having a higher tenacity (about 37 cN/tex) compared to regular viscose (<25 cN/tex), but lower than nylon-6,6 (about 56 cN/tex). *Id.* ¶¶ 7–8. The Specification further describes an experimental production of nylon/Lyocell fabrics for the US Army weaving a Lyocell weft into a continuous filament nylon warp, noting that Lyocell is produced as a staple fiber and spun into yarns unlike nylon. *Id.* ¶ 9. Independent claim 1 is illustrative (disputed matter italicized):

1. A yarn comprising *an intimate blend of 10 to 30% nylon staple fiber and 70 to 90% high-tenacity man-made cellulosic staple fiber selected from the group consisting of lyocell, modal and mixtures thereof*, wherein the high-tenacity man-made cellulosic staple fibers has a tenacity at break in conditioned state of more than 32 cN/tex, wherein any

² We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies Lenzing Aktiengesellschaft as the real party in interest. Appeal Br. 1.

³ A transcript of the oral hearing will be filed in due course.

difference between the mean linear density of the nylon fiber and the mean linear density of the cellulosic fiber is not more than 50%.

Appeal Br. 17 (Claims Appendix). Claim 28 is the other pending independent claim that, similar to claim 1, is directed to “[a] yarn comprising an intimate blend of 10 to 30% nylon staple fiber and 70 to 90% high-tenacity man-made cellulosic staple fiber,” but further recites “wherein the fabric exhibits a GATS-test water take up value of at least 0.8 g/g after 20 seconds and a Martindale abrasion resistance of at least 60,000 rubs.” *Id.* at 20.

THE REJECTIONS

The Examiner rejects claims 1, 4, 6, 7, 10, 12–15, 18, 22, and 25–28 under 35 U.S.C. § 103(a) as follows:

1. Claims 1, 6, 7, 10, 12–15, 22, 25, 26, and 28 over Santos⁴ in view of Whitehurst;⁵
2. Claim 4 over Santos in view of Whitehurst and Clarke;⁶
3. Claim 18 over Santos in view of Whitehurst and Aycock;⁷
4. Claims 1, 6, 7, 10, 12–15, 22, and 25–28 over Taylor⁸ in view of Santos and Whitehurst;
5. Claim 4 over Taylor in view of Whitehurst, Santos, and Clarke; and
6. Claim 18 over Taylor in view of Whitehurst, Santos, and Aycock.

⁴ US 6,805,957 B1, issued Oct. 19, 2004.

⁵ US 3,657,773, issued Apr. 25, 1972.

⁶ US 4,698,956, issued Oct. 13, 1987.

⁷ US 3,765,837, issued Oct. 16, 1973.

⁸ US 6,949,126 B2, issued Sept. 27, 2005.

OPINION

Appellant argues the rejection of claims 1, 6, 7, 10, 12–15, 22, 25, 26, and 28 as a group and the rejection of claims 1, 6, 7, 10, 12–15, 22, and 25–28 as a group. Appeal Br. 7–16. In accordance with 37 C.F.R. § 41.37(c)(1)(iv), and based upon the lack of arguments directed to the subsidiary rejections, claims 4, 6, 7, 10, 12–15, 18, 22, and 25–28 will stand or fall together with claim 1.

Appellant argues that the Examiner erred in rejecting claim 1 over Santos and Whitehurst because “at best Santos suggests a **fabric** comprising about 30% to about 80% nylon” as opposed to a yarn. Appeal Br. 9. Appellant contends that only Santos’s examples 1 and 2 disclose spun yarns, but those examples consist of 50 +/- 5% nylon with the remainder cotton and/or electrostatic dissipating fibers rather than the claimed “high-tenacity man-made cellulosic [staple] fibers.” *Id.* at 10 (citing Santos 19:64–20:35).

Appellant also contends that Taylor fails to disclose a blend of Lyocell and nylon because “all of the examples [] suggest blends of [L]yocell with fibers other than nylon.” *Id.* (citing Taylor Examples 2–5). Appellant argues that Taylor’s examples suggest incorporating a smaller percentage of Lyocell when creating a yarn with a fiber other than cotton, thereby suggesting less Lyocell should be included. *Id.* (citing Taylor Examples 2–5).

In addition, Appellant asserts that the rejection is rebutted by evidence of unexpected results disclosed in the Specification. *Id.* at 11. Specifically, Appellant asserts that water take-up data for two fabrics with Lyocell/nylon blends within the claimed ranges (Examples 3 and 4) “each perform surprisingly well” compared to a fabric with a Lyocell/nylon blend outside

of the claimed range (Example 5) that is said to have “performed significantly worse.” *Id.* at 12 (citing Spec. ¶¶ 43–44, Fig. 1). Appellant notes that the fabric with 30% nylon performed better than the fabric with 20% nylon, but asserts that fact does not “detract from the unexpected results across the claimed range.” *Id.*

Appellant’s objective evidence of non-obviousness also includes the Specification’s Table 1, which Appellant asserts “surprisingly demonstrates” that “as the nylon content decreases [between examples 1–6] the yarn tenacity increases” and that “fabrics with 10%, 20% and 30% nylon all show sufficient abrasion resistance.” *Id.* at 13. According to Appellant, “[a] skill[ed artisan] would have expected the yarn tenacity and abrasion resistance to decrease proportionately as the amount of nylon decreases because nylon has a higher break tenacity.” *Id.* Appellant asserts that the asserted unexpected results for 10–30% nylon content fabrics is “more than reasonably commensurate in scope with the instant claims.” *Id.* at 14.

We are not persuaded by Appellant’s arguments that the Examiner reversibly erred in rejecting claim 1 under 35 U.S.C. § 103(a) for the reasons stated in the Final Action and the Answer. The Examiner’s finding (Ans. 9) that Santos discloses that Lyocell can be used instead of cotton is not disputed by Appellant and is supported by the record. Santos, 15:43–44. Appellant also does not dispute the Examiner’s finding (Final Act. 9) that Santos’s “spun yarn” in example 1 means that it is a yarn that consists of staple fibers. Rather, Appellant contends in the Reply Brief that “Santos does not require that the fabric be made from [a] yarn comprising an intimate blend of fibers.” Reply Br. 5. In a determination of obviousness, a reference may be relied upon for all that it would have reasonably suggested

to one having ordinary skill in the art. *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“That the [prior art] patent discloses a multitude of effective combinations does not render any particular formulation less obvious.”). Therefore, the preponderance of the evidence supports the Examiner’s finding (Ans. 9; Final Act. 2) that Santos teaches a staple fiber yarn comprising an intimate blend of nylon and Lyocell in addition to fiber blends of about 30% to about 80% nylon and about 20% to about 70% cotton or Lyocell.

Appellant’s argument in the Reply Brief that the claimed tenacity is not an inherent property of Lyocell (Reply Br. 4) is not persuasive of error because it was not presented in the Appeal Brief, and Appellant has not proffered a showing of good cause explaining why the arguments could not have been presented in the Appeal Brief. Although Appellant cites to page 4 of the Examiner’s Answer, the same finding was made in the Final Office Action itself. Final Act. 3. Therefore, we will not consider this new and untimely argument in our assessment of the Examiner’s § 103(a) rejections. 37 C.F.R. §§ 41.37(c)(iv), 41.41(b)(2).

The Examiner’s finding (Ans. 13) that Taylor discloses that cotton and nylon are substitutable equivalents is also supported by the cited record in this appeal. Taylor 4:22–24. Therefore, as the Examiner reasonably finds, Taylor teaches that Lyocell and nylon may be blended in the same amount as the Lyocell and cotton blends in Taylor’s examples, i.e., nylon or cotton in the amount of 20–60%. Ans. 13; Taylor 4:22–24. Taylor also teaches that Lyocell and synthetic fibers dye differently producing contrast desirable in garments (Taylor 6:60–7:9), and therefore, the Examiner’s determination

(Ans. 14) that it would have been obvious to vary the amount of Lyocell and nylon based on the desired garment appearance is supported by the record.

Regarding Appellant's argument that Figure 1 demonstrates unexpected results with respect to the Lyocell/nylon ranges claimed, we are not persuaded of error because Appellant has not established any criticality of the claimed range. *See In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005) (a *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art.); *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003) (internal citation omitted).

In general, an applicant may overcome a *prima facie* case of obviousness by establishing "that the [claimed] range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range." That same standard applies when, as here, the applicant seeks to optimize certain variables by selecting narrow ranges from broader ranges disclosed in the prior art.

As the Examiner notes, the fabrics containing 30% nylon and 20% nylon would have been expected to perform differently since they have different amounts of Lyocell and nylon and they both absorbed less water than Example 1, which contains 0% nylon. Ans. 15–16. Thus Appellant's evidence cannot be said to be "truly an unexpected result!" (Reply Br. 8) when it consists of two points that fall where expected vis-a-vis the example containing 0% nylon. In addition, the record does not support the differences being significant from what would have been expected.

Regarding Appellant's argument that Table 1 demonstrates unexpected results with respect to the property of tenacity for the blended

yarns, Appellant does not adequately rebut the Examiner's observations that (1) the table is limited to blended yarns made of nylon-6,6 fibers and TENCEL fibers while the claims are not so limited, and (2) the tenacity of a blended yarn depends on other variables than just the tenacity of each separate component. Ans. 17–18. The Examiner reasons that because tenacity is the amount of force needed to break a yarn, cohesion between Lyocell and nylon staple fibers would necessarily affect the tenacity results. *Id.* at 18.

Whether an invention has produced unexpected results is a question of fact. *In re Mayne*, 104 F.3d 1339, 1343 (Fed. Cir. 1997). “[T]here is no hard-and-fast rule for determining whether evidence of unexpected results is sufficient to rebut a *prima facie* case of obviousness.” *Kao Corp. v. Unilever U.S., Inc.*, 441 F.3d 963, 970 (Fed. Cir. 2006); *see also In re Dillon*, 919 F.2d 688, 692–93 (Fed. Cir.1990) (“[e]ach situation must be considered on its own facts.”). However, an applicant asserting unexpected results as evidence of nonobviousness has the burden of proving that the results are unexpected. *In re Geisler*, 116 F.3d 1465, 1469–70 (Fed. Cir. 1997). “[I]t is not enough to show that results are obtained which differ from those obtained in the prior art: that difference must be shown to be an unexpected difference.” *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972).

Appellant provides no evidence as to how a skilled artisan would have expected the tenacity of a blended yarn to perform or explain how the specific nylon-6,6 and TENCEL fibers adequately represent the full scope of fibers encompassed by the claim. Appellant maintains that nylon has a higher break tenacity than Lyocell and that one having skill in the art would have expected the tear resistance to decrease with decreased amounts of

nylon (Reply Br. 9). However, Appellant does not adequately explain why Appellant's assertions would have been expected to apply to blended fibers or blended fibers woven into a fabric. According to the Specification's Table 1, a yarn spun with 100% TENCEL staple fibers has a tenacity value of 24.5 cN/tex whereas Lyocell "normally shows a tenacity at break of about 37 cN/tex" as stated elsewhere in the Specification.⁹ Spec. ¶¶ 7, 45. Thus, the tenacity of spun staple fibers differs from the tenacity of the fiber itself. Table 1 does not include a tenacity value for a yarn spun with 100% nylon staple fibers for purposes of comparison to the reported break tenacity value of 56 cN/tex for nylon 6,6. *Id.* ¶ 8.

Appellant makes the same argument with respect to abrasion resistance as well. *Id.* at 10. As the Examiner finds (Ans. 23), differences in the example compositions would have been expected to result in some differences in properties and it is the extent of these differences that has not been shown to be significant in this appeal record.

After considering the positions of both the Examiner and Appellant, including Appellant's objective evidence of non-obviousness, we find the preponderance of the evidence in this appeal record supports the Examiner's rejection of claims 1, 4, 6, 7, 10, 12–15, 18, 22, and 25–28 over the combination of Santos and Whitehurst alone or together with Taylor.

⁹ The Specification refers to Lyocell fiber as a Tencel fiber. Spec. ¶ 54. All of the examples reported in Table 1 have a reported weight ratio of "Tencel/PA 6.6 [nylon 6,6]." *Id.* ¶ 45.

DECISION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1, 6, 7, 10, 12–15, 22, 25, 26, and 28	§ 103 Santos and Whitehurst	1, 6, 7, 10, 12–15, 22, 25, 26, and 28	
4	§ 103 Santos, Whitehurst, and Clarke	4	
18	§ 103 Santos, Whitehurst, and Aycock	18	
1, 6, 7, 10, 12–15, 22, and 25–28	§ 103 Taylor, Santos, and Whitehurst	1, 6, 7, 10, 12–15, 22, and 25–28	
4	§ 103 Taylor, Whitehurst, Santos, and Clarke	4	
18	§ 103 Taylor, Whitehurst, Santos, and Aycock	18	
Overall Outcome		1, 4, 6, 7, 10, 12–15, 18, 22, and 25–28	

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