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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SHULONG LI,
J. TRAVIS GREER, and JAMES D. CLIVER

Appeal 2018-009171
Application 14/022,883
Technology Center 1700

Before GEORGE C. BEST, DONNA M. PRAISS, and
MICHAEL G. McMANUS, *Administrative Patent Judges*.

BEST, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–6, 8–17, and 19–27 of Application 14/022,883. Final Act. (June 20, 2017). We have jurisdiction under 35 U.S.C. § 6(b).

For the reasons set forth below, we *affirm*.

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 Milliken & Company. Appeal Br. 2.

BACKGROUND

The '883 Application describes yarns, textile materials, and garments exhibiting flame resistant properties. Spec. ¶ 1. In particular, the yarn comprises a mixture of regenerated cellulose fiber comprising a flame retardant compound and *para*-aramid fiber. *Id.* ¶ 4. The Specification further describes textile materials and garments made from such yarns. *Id.* ¶¶ 5–9.

Claim 1 is representative of the '883 Application's claims and is reproduced below from the Claims Appendix of the Appeal Brief.

1. A yarn comprising:

(a) about 45% to about 85% by weight of regenerated cellulose fibers, the regenerated cellulose fibers having a dry tenacity of about 27 cN/tex or more, the regenerated cellulose fibers comprising a flame retardant compound within the fiber, wherein the flame retardant compound is a phosphorus-containing flame retardant compound produced by reacting (i) a tetrahydroxymethyl phosphonium salt, a condensate of a tetrahydroxymethyl phosphonium salt, or a mixture thereof and (ii) a cross-linking agent; and

(b) about 5% to about 25% by weight of *para*-aramid fibers.

Appeal Br. 8.

REJECTIONS

On appeal, the Examiner maintains the following rejections:

1. Claims 1–6, 8–17, and 19–27 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Gstettner² and Li.³
Answer 4; Final Act. 2–4.
2. Claims 1–6, 8–17, and 19–27 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Gstettner, Li, and Engineered Fibers Technology.⁴ Answer 4; Final Act. 4–6.

DISCUSSION

Appellant argues for reversal of the rejections of claims 1–6, 8–17, and 19–27 as a group. Appeal Br. 4–6. We select independent claims 1 and 12 as representative of the claims on appeal. 37 C.F.R. § 41.37(c)(1)(iv). Each dependent claim will stand or fall with its parent independent claim. *Id.* Moreover, because Appellant’s arguments do not differentiate between independent claim 1 and independent claim 12, we limit our discussion to independent claim 1 with the understanding that it applies with equal force to independent claim 12.

In rejecting claim 1, the Examiner relied upon Gstettner as describing a yarn having the claimed fiber composition that has been treated with a flame retardant composition. Final Act. 2–3. The Examiner further found that Gstettner does not specifically describe the flame retardant composition

² WO 2012/068600 A1, published May 31, 2012.

³ US 7,713,891 B1, issued May 11, 2010.

⁴ Engineered Fibers Technology, *Tencel Lyocell Short-Cut Fiber* (copyright 2010).

as comprising a compound produced in the manner recited in claim 1. *Id.* at 3.

The Examiner found that Li describes flame resistant fabrics which are treated by a reaction product of tetrahydroxymethyl phosphonium salt or its condensate and a cross-linking agent. *Id.* (citing Li Abstract; 8:15–35; claim 1). The Examiner also found that “Li teaches that this flame retardant improves the flame resistance and tear strength of such fabrics and provides sufficient wrinkle resistance.” *Id.* (citing Li 19:11–20:45).

The Examiner further found that a person of ordinary skill in the art at the time of the invention would have made Gstettner’s fabric and used a tetrahydroxymethyl phosphonium salt-based flame retardant as described by Li to form a conventional flame resistant fabric which has optimal flame retardant effects also providing tear and wrinkle resistance. *Id.*

Appellant argues that the rejections’ proposed combination of Gstettner and Li is improper because “this proposed combination ignores the express teachings of the Gstettner PCT publication.” Appeal Br. 4.

According to Appellant, Gstettner teaches away from the use of Li’s flame retardant compounds. *Id.* at 4–6. Gstettner specifically states that organic phosphorus-containing compounds can be used as flame retardants and cites Proban® and Pyrovatex® as examples.⁵ Gstettner 4. According to Gstettner,

these finishes . . . can be removed by harsh chemical treatments and the level of finish reduces with the number of washing cycles. The finish application has an adverse stiffening effect on the fabric. Fabrics of this type are in use for protection from flame, molten metal splash and electric arc. When exposed to

⁵ For the purpose of this opinion, we accept Appellant’s counsel’s representation that Proban® and Pyrovatex® are commercial products based upon tetrahydroxymethyl phosphonium compounds. *See* Appeal Br. 4.

flame, molten metal or electric arcs, fabrics of this type will not burn, but become highly embrittled and may break open leaving the wearer's skin exposed to the hazard.

Id.

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). However, “[a] known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use.” *Id.* at 553. “[O]bviousness must be determined in light of all the facts, and there is no rule that a single reference that teaches away will mandate a finding of nonobviousness.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). The teachings of a reference that arguably teaches away from a claimed feature must be weighed alongside the teachings of a cited reference that teaches the propriety of employing that feature. *Para-Ordnance Mfg., Inc. v. SGS Importers Int'l, Inc.*, 73 F.3d 1085, 1090 (Fed. Cir. 1995).

In this case, we agree with Appellant that Gstettner teaches away from the use of tetrahydroxymethyl phosphonium-based flame retardants in its fabric.

The question before us, however, is not whether the single reference teaches away from the proposed combination but whether all of the facts weighed together mandate a finding of nonobviousness. *Medichem*, 437 F.3d at 1165. Accordingly, we must consider that Li describes fabrics treated with the condensed tetrahydroxymethyl phosphonium salt as having a soft hand, good tear strength, and good arc protection performance. *See* Li 3:30–35;

19:13–20:35. Li further states that the treated fabric is durable to repeated washing. *Id.* at 18:55–19:10.

The prior art, therefore, describes advantages and disadvantages to the use of tetrahydroxymethyl phosphonium salt-based flame retardants. On balance, and considering all the teaching in the prior art, we determine that Gstettner’s criticism of the properties of some organic phosphorus - containing compounds—such as Proban® and Pyrovatex®—is not sufficient to negate the prima facie case of obviousness. *See Medichem*, 437 F.3d at 1165 (“a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine”).

In view of the foregoing, we affirm the rejection of claims 1–6, 8–17, and 19–27.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–6, 8–17, and 19–27	35 U.S.C. § 103(a) Gstettner and Li	1–6, 8–17, and 19–27	
1–6, 8–17, and 19–27	35 U.S.C. § 103(a) Gstettner, Li, and Engineered Fibers Technology	1–6, 8–17, and 19–27	
Overall Outcome		1–6, 8–17, and 19–27	

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