UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JANGHO CHOI

Appeal 2007-4504
Application 10/275,256
Technology Center 1700

Decided: November 16, 2007

Before EDWARD C. KIMLIN, THOMAS A. WALTZ, and KAREN M. HASTINGS, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1 and 5-7. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

I. BACKGROUND

The invention relates to a method of manufacturing a synthetic cottonwool. Claim 1 is illustrative:

1. A method of manufacturing a functional synthetic cottonwool, comprising the steps of:

mixing 0.5-20% by weight of a mixed powder consisting of 85% by weight of activated charcoal and 15% by weight of silver-containing inorganic antibacterial carrier, with 80-99.5% by weight of a base resin selected from the group consisting of polyester, nylon, acryl, polypropylene and silicone; and

melt spinning the mixture,

wherein the particle size of the mixed powder is in the range of 0.7 to 2 μm when the thickness of the cottonwool is not more than 3 deniers, the particle size is in the range of 1.5 to 7 μm when the thickness is 7 deniers, and the particle size is in the range of 2 to 10 μm when the thickness is 15 deniers.

The Examiner relies upon the following prior art references in the rejections of the appealed claims:

Jacobson	5,180,585	Jan. 19, 1993
Robinson	5,846,639	Dec. 8, 1998
Shimiz	5,880,044	Mar. 9, 1999
Tatsumi	6,509,294 B1	Jan. 21, 2003
Mi-Soo[1]	KR 2000-0035355	June 26, 2000

Claim 1 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mi-soo.

[1] All references in this decision regarding Mi-soo are to the English translation of record.

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mi-soo in view of Jacobson.

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mi-soo in view of Robinson. Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Mi-soo in view of Robinson and further in view of Jacobson.

Claim 1 and 5 are alternatively rejected under 35 U.S.C. § 103(a) as being unpatentable over Jacobson in view of Tatsumi and Shimiz. To reject claims 6 and 7, the Examiner adds Robinson.

Appellant does not argue either of the independent claims 1 and 6 separately with any reasonable specificity (Br. 11-14, 16-17). Therefore, we select the broadest independent claim 1 to decide the issues on appeal regarding these claims. We will also address the dependent claims that were argued separately.

II. DISCUSSION

The issues on appeal are:

(A) Whether Appellant has established the Examiner erred in rejecting claims 1 and 5-7 under 35 U.S.C. § 103 because:

> (a) there is no motivation to modify the relative proportions of the mixed powder of charcoal/silver containing inorganic antibacterial agent of Mi-soo to the claimed 85/15 weight percentages; and
>
> (b) there is no motivation to modify the proportions of the base resin and charcoal/silver containing inorganic antimicrobial agent mixture of Mi-soo to meet the limitations set forth in dependent claims 5 and 7?

(B) Whether Appellant has established the Examiner erred in alternatively rejecting claims 1 and 5-7 under 35 U.S.C. § 103 because:

> (a) there is no motivation to add charcoal to the powdered silver containing antibacterial agent of Jacobson and arrive at the claimed proportions by weight of 85/15 charcoal/silver containing inorganic antimicrobial agent?

Issue (A)

The § 103(a) rejections based on primary reference Mi-soo

Findings of Fact

A preponderance of the evidence of record supports the following Findings of Facts (FF):

1. Mi-soo describes a method of manufacturing yarn by melt spinning a mixture of a base resin, which may be polyester, nylon, or polypropylene, with a mixed powder of activated charcoal and silver containing inorganic antibacterial agent (Mi-soo 3:¶1, 5:¶6-9; Ans. 4). The resulting yarn may be used for various textiles, clothing, and health implements (Mi-soo 6:¶1).
2. Mi-soo describes that activated charcoal is known for its outstanding absorption ability (Mi-soo 3:¶3). Mi-soo also teaches the advantage of charcoal as a deodorizer (Mi-soo 4:¶1).
3. Mi-soo recognizes that the inorganic silver-ion containing agent has a strong antibacterial effect (Mi-soo 3:¶1).
4. Mi-soo's claim 4 broadly recites using a mixture of charcoal and silver antibacterial agent whereas claim 5 specifies a 80/20 mixture by weight of the two components (Mi-soo 12).

5. Jacobson describes a method of melt spinning a mixture of a base resin and a silver containing inorganic antimicrobial (i.e. antibacterial) agent powder, for various diverse applications, including fibers (col. 12, ll. 19-38 and Ans. 7, 8). The silver inorganic powder may be used in amounts varying from .1 to 60% by weight of the polymer fiber (col. 9, ll. 30-43).
6. Appellant's Specification in Table 1 shows that there is no substantial difference when the mixed powder is used in amounts of 2-9% versus amounts of 15-17% with respect to the base resin (Spec. 7).
7. Appellant's Specification describes that 15-45% by weight of the inorganic antibacterial agent containing 3-7% by weight silver is added to the charcoal powder; thus, mixed powder ratios of charcoal to silver containing inorganic antibacterial agent of 85/15 to 55/45 by weight are described (Spec. 5:5-11).

Principles of Law

"Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1734 (2007). The legal question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18

(1966). *See also KSR*, 127 S. Ct. at 1734 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.").

The discovery of an optimum value of a variable in a known process is usually a matter of obviousness for one of ordinary skill in the art. *Cf. Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1368 (Fed. Cir. 2007). It is normally expected that a change in temperature, or concentration, or both, would be an unpatentable modification over the prior art. *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). This is the kind of situation that requires Appellant to show secondary considerations such as unexpected results or criticality to overcome the prima facie case. *See In re Boesch*, 617 F.2d 272, 276 (CCPA 1980). It is well settled that when patentability is predicated upon a change in a condition of a prior art composition, such as a change in concentration or the like, the burden is on Appellant to establish with objective evidence that the change is critical, i.e. it leads to a new unexpected result. See *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) and *In re Aller*, 220 F. 2d. at 456.

Analysis Regarding Rejections under §103(a) based on Mi-soo

Applying the preceding legal principles to the Factual Findings of the record in this appeal, we determine that Appellant has not shown that the evidence fails to support the Examiner's conclusion of obviousness.

The Appellant does not dispute that Mi-soo teaches or suggests all the limitations of claim 1 except for the claimed 85/15 proportions of charcoal and silver containing inorganic agent (FF 1; Br. 7-9). Appellant's argument

focuses on the propriety of modifying Mi-soo to result in the claimed 85/15 mixture (Br. 7-9).

In the present case, a preponderance of the evidence supports the Examiner's finding that it would have been obvious to form a mixed powder of 85% by weight of charcoal and 15% by weight of silver containing inorganic antibacterial agent. Appellant contends there is no motivation to try concentrations other than the 80/20 mixture of Mi-soo and "settle on" the recited 85/15 mixture (Br. 8, 13). We disagree, essentially for the same reasons well stated by the Examiner (Ans. 4, 12).

Even though the only specific example in Mi-soo teaches an 80/20 mixture, Mi-soo also teaches a broad range via the inclusion of claim 4 which only requires a mixture of the two components (FF 4). As the Examiner aptly pointed out, Mi-soo also recognizes the relative advantages of each component (FF 2, 3), and one of ordinary skill in the art would have recognized the amount of each component was thus a result effective variable in achieving any particular balance of properties (Ans. 4). Optimizing known result effective variables is ordinarily prima facie obvious. *See In re Boesch*, 617 F. 2d at 276. Furthermore, it is well settled that when patentability is predicated upon a change in a condition of a prior art composition, such as a change in concentration or the like, the burden is on Appellant to establish with objective evidence that the change is critical, i.e., it leads to a new unexpected result. See *In re Woodruff*, 919 F.2d at 1578. Appellant presents no convincing evidence of unexpected results on this record. Indeed, Appellant has provided no evidence comparing the claimed 85/15 charcoal/silver inorganic mixture with any other proportions of charcoal/silver inorganic mixtures. To the contrary, Appellant's

Specification describes that blends of up to 55/45 charcoal/silver mixture are in accordance with their invention (FF 7).

Dependent Claims 5 and 7

Appellant contends that there is no motivation to modify the amount of mixed powder used in relation to the base resin polymer of Mi-soo because Jacobson only teaches a silver containing antibacterial agent, not a charcoal/silver containing antibacterial agent mixture. We disagree. Jacobson is relied upon for exemplifying that one of ordinary skill in the art would have varied proportions of the antimicrobial agent with respect to the base resin (FF 5). As set forth above, when patentability is predicated on changing concentrations of components in a composition, the burden is on Appellant to establish with objective evidence that the change is critical. The only evidence proffered by Appellant is the contention that the range of mixed powder to base resin in claims 5 and 7 is the result of "extensive experiments," pointing to Table 1 on page 7 of the Specification (Br. 11). We agree with the Examiner, however, that this data does not support that the claimed ranges in dependent claim 5 and 7 are critical (FF 6, Ans. 15). As a final point, Appellant has proffered no objective evidence of nonobviousness, such as unexpected results, which would serve to rebut the inference of obviousness established by the applied prior art.

Issue (B)

The § 103(a) rejections based on primary reference Jacobson

A preponderance of the evidence of record supports the following <u>additional</u> Findings of Facts (FF):

8. Tatsumi describes a mixed powder of charcoal and an inorganic antibacterial agent (tourmaline) that is useful for a variety of applications as a deodorizer and antibacterial agent; one such application is when dispersed and fixed onto fibers of clothes (e.g., underwear, socks). See Tatsumi Abstract; col. 1, ll. 50-67; col. 3, ll. 17-21; col. 6. ll. 1-7.

9. Tatsumi also describes that the charcoal to antibacterial agent mixture may vary from 83.3 charcoal/16.7 antibacterial agent by weight to 16.7 charcoal/83.3 antibacterial agent; and, even this broad range may be varied according to the application of the obtained composition (Tatsumi, col. 2, ll. 12-17).

10. Jacobson describes that the fibers can be used for numerous applications, including for textiles and clothing, e.g., sportswear, underwear, and socks (col. 3, ll. 30-43 and col. 11, ll. 38-60).

Additional Principles of Law

"[A]nalysis [of whether the subject matter of a claim is obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex, Inc.,* 127 S. Ct. 1727, 1740-41 (2007), *quoting In re Kahn,* 441 F.3d 977, 988 (Fed. Cir. 2006). "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR,* 127 S. Ct. at 1739-40.

Analysis Regarding Rejections under §103 based on Jacobson

Claims 1, and 5-7

Applying the preceding legal principles to the Factual Findings of the record in this appeal, we determine that Appellant has not shown that the evidence fails to support the Examiner's conclusion of obviousness with respect to the rejections using Jacobson as the primary reference.

The Appellant does not dispute that the combination of references applied by the Examiner teaches or suggests all of the limitations of claims 1and 5-7 except for the claimed proportions by weight of 85% charcoal to 15% silver containing antibacterial agent. Appellant's argument with respect to these rejections focuses on the propriety of combining the teachings of Jacobson with Tatsumi (Br. 17-18, argument repeated at Br. 19-21). Specifically, Appellant contends that since Jacobson teaches use of a silver inorganic antibacterial agent alone, there is no motivation to replace it with a charcoal/antibacterial mixture. Appellant contends that the introduction of a totally new component, charcoal, is at the sacrifice of the antibacterial component of Jacobson (Br. 17).

The evidence shows there was a known process of manufacturing yarns by melt spinning a resin base with a silver containing inorganic antibacterial agent as exemplified in Jacobson (FF 5). Jacobson described that useful applications for his fibers include sportswear, socks and underwear (FF 10). The evidence also shows that mixing an inorganic (tourmaline) antibacterial powder with charcoal and using it as an additive for its deodorizing and antibacterial effects by fixing it to fabrics (e.g., underwear and socks) was known as exemplified in Tatsumi (FF 8). Once one of ordinary skill in the art understood that an antibacterial/charcoal

mixture was useful as an additive to fabrics as evidenced by Tatsumi, it would have been obvious to use such a mixture in place of the silver inorganic antibacterial agent alone of Jacobson for the known advantageous effects of a charcoal/antibacterial mixture (FF 8, 9).

Furthermore, one of ordinary skill in the art is also a person of ordinary creativity, not an automaton. *KSR,* 127 S. Ct. at 1742. The argument advanced by Appellants overlooks what the references teach those of ordinary skill in the art: First, that charcoal powder has excellent absorption, sterilizing, deodorizing, and humidity conditioning effects (FF 8). Second, these properties were useful in combination mixed with an inorganic antibacterial agent for applications such as clothing (e.g., underwear, socks) (FF 8). Third, a silver containing antibacterial powder was useful to mix with a base resin and melt spin into fibers, which were used to make clothing such as underwear and socks (FF 5, 10). We also agree with the Examiner's analysis that Jacobson teaches very small amounts of the silver containing agent used therein are useful to impart the desirable antibacterial properties, such that adding charcoal for its desirable properties in amounts as claimed would not negatively impact the desirable properties imparted by the silver containing powder (Ans. 13).

We also determine that adding charcoal to the silver containing inorganic antibacterial agent in Jacobson appears to be no more than combining familiar elements for their known functions to achieve predictable results. *KSR,* 127 S. Ct. at 1739-40. We note that no argument has been made concerning any showing of unexpected results.

For the foregoing reasons and those stated in the Answer, we agree with the Examiner's findings in support of obviousness for claim 1 based on the combined teachings of Jacobson, Tatsumi, and Shimiz.

III. CONCLUSION

Appellant has not shown that the Examiner reversibly erred in any of the rejections of claims 1 and 5-7 as obvious under 35 U.S.C. § 103. In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

IV. DECISION

The Examiner's decision is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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