UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte DAVID WILLIAM KOENIG, FRANKLIN M. C. CHEN, MELANIE A. KEOMANY, and JASON ROBERT BORSKI

Appeal No. 2006-2581
Application No. 10/029,322

ON BRIEF

Before SCHEINER, MILLS, and GRIMES, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

DECISION ON APPEAL

This appeal involves claims to absorbent products (e.g., diapers) that minimize the bacterial ammonia production. The examiner has rejected the claims as obvious in view of the prior art. We have jurisdiction under 35 U.S.C. § 134. We reverse.

Background

"Human urine has a high level of osmotic strength and toxicity toward bacteria. Based on these characteristics, it could be assumed that bacterial growth in urine would be significantly inhibited such that foul odors, such as odors from ammonia, generated by the bacteria through metabolism would not be problematic. However, numerous bacteria have evolved the ability to adapt to high osmolarity and toxicity conditions by

activating osmoregulation protectors such as betaine porters and accumulating organic osmolytes intracellularly." Specification, page 1.

"Glycine betaine is a common osmoregulation protector used by bacteria in the presence of urine. . . . Because glycine betaine is commonly found in urine, the growth of bacteria in urine is common." Id. Growth of bacteria in urine generates ammonia, and "[t]he production of ammonia by bacteria in urine can lead to the release of unwanted and offensive odors." Id., page 2.

The specification discloses that, "[s]urprisingly, the introduction of an osmoregulation protector such as glycine betaine in a sufficient amount into the absorbent product results in a significant decrease in the production of ammonia by the bacteria when the absorbent product contacts voided urine. This decrease in ammonia production can result in a significant decrease in foul odors stemming from voided urine." Page 3.

Discussion

1. Claims

Claims 1-6, 9-17, 20-23, 26-28, 31-35, and 38 are pending and on appeal. Claim 1 is representative and reads as follows:

> 1. An absorbent product for minimizing the amount of ammonia produced by bacteria, said product comprising an osmoregulation protector selected from the group consisting of glycine betaine, proline betaine, trigonelline, carnitine, and arsenobetaine, said osmoregulation protector being present in an amount capable of interacting with bacteria such that the production of ammonia by the bacteria is minimized.

Claim 1 is directed to an absorben product, such as a diaper or wet wipe, that comprises one of five specific osmoregulation protectants "in an amount capable of

interacting with bacteria such that the production of ammonia by the bacteria is minimized."

2. Obviousness

The examiner rejected claims 1-7, 9-11, 14-17, 20-23, 26-28, 31-35, and 38 under 35 U.S.C. § 103 as obvious in view of Mandell[1] and Romano.[2] The examiner characterized Mandell as "disclos[ing] an absorbent product comprising an osmoregulation protector such as a betaine. See page 16, line 12 – page 17, line 33. . . . The betaine acts to prevent the formation of ammonia. See page 3, lines 6-9." Examiner's Answer, page 3. The examiner acknowledged that "Mandell does not specifically disclose glycine betaine." Id.

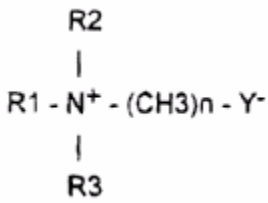
The examiner relied on Romano as "teach[ing] employing glycine betaine in an amount which is effective to interact with bacteria in a wet wipe. See page 7, line 13 – page 8, line 28." Id. The examiner concluded that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to have employed glycine betaine as the particular betaine in the invention of Mandell . . . since Romano teaches that it is a suitable betaine for use in interacting with bacteria in wipes." Id., pages 3-4.

Appellants argue that Romano expresses a preference for betaines other than glycine betaine and, when read as a whole, does not suggest glycine betaine in the disclosed products. Appellants also argue that "Romano, et al. do not merely disclose betaines, but betaine surfactants. As will be recognized by one skilled in the art, surfactants are long-chained. One skilled in the art would thus recognize Romano, et

[1] Mandell et al., WO 00/66187, published Nov. 9, 2000.
[2] Romano et al., WO 97/31092, published Aug. 28, 1997.

al. as disclosing long-chained betaine surfactants, not short-chained glycine betaine." Reply Brief, page 2 (footnote omitted).

We agree with Appellants that the examiner has not adequately explained how the cited references would have led those skilled in the art to combine glycine betaine with the absorbent product disclosed by Mandell. The examiner relies on the following passage from Romano for the suggestion of glycine betaine:

> Suitable betaine/sulphobetaine surfactants to be used in the compositions of the present invention are the betaine/sulphobetaine and betaine-like detergents. . . . Preferred betaine or sulphobetaine surfactants have the formula
>
> 
>
> wherein R1 is an alkyl radical containing from 1 to 24 carbon atoms, preferably from 8 to 18, and more preferably from 12 to 14, wherein R2 and R3 contain from 1 to 3 carbon atoms, and preferably 1 carbon atom, wherein n is an integer of from 1 to 10, preferably from 1 to 6 and more preferably is 1, Y is selected from the group consisting of carboxyl and sulfonyl radicals and wherein the sum of R1, R2 and R3 radicals is from 14 to 24 carbon atoms, or mixtures thereof.
>
> Examples of particularly suitable betaine surfactants include C12-C18 alkyl dimethyl betaine such as the coconut betaine and C10-C16 alkyl dimethyl betaine such as the lauryl betaine.

Page 7, line 30 to page 8, line 20

Romano's formula would correspond to glycine betaine if each of R1, R2, and R3 was an alkyl radical with one carbon (i.e, CH_3), n was 1, and Y was a carboxyl radical. The examiner argues that Romano's formula would have suggested glycine betaine to those skilled in the art because "it is the simplest of all the compounds disclosed by Romano." Examiner's Answer, page 7.

Appellants emphasize Romano's statement that "the sum of R1, R2 and R3 radicals is from 14 to 24 carbon atoms," noting that the R1, R2 and R3 radicals in glycine betaine have a total of 3 carbon atoms. See the Appeal Brief, pages 7-8.

We agree with Appellants that, when the cited references are considered as a whole, they would not have suggested using glycine betaine in Mandell's absorbent product. Both Mandell and Romano suggest using betaine surfactants in their respective products. See Mandell, page 16 ("Examples of amphoteric surfactants that can be included in the present composition include . . . betaines. . . . Examples of specific amphoteric surfactants include . . . cocamidopropyl betaine, lauramidopropyl betaine, coco/oleamidopropyl betaine, coco betaine, [and] oleyl betaine."); Romano, page 7 ("[T]he compositions according to the present invention comprise a betaine or a sulfobetaine surfactant. . . . [S]aid amphoteric surfactants have a twofold action."). In this context, Romano discloses that preferred betaine surfactants correspond to the formula reproduced above "wherein the sum of R1, R2 and R3 radicals is from 14 to 24 carbon atoms."

The examiner has provided no evidence that those skilled in the art would have considered glycine betaine to be a "betaine surfactant." As Appellants have pointed out, those skilled in the art would expect that a betaine surfactant would have at least one long alkyl chain as one of the R groups. Consistent with Appellants' position, all of the betaine surfactants specifically named by Mandell and Romano appear to have an alkyl chain of at least ten carbons.

In addition, those skilled in the art would recognize that compounds act as surfactants because they have both polar and nonpolar regions. Charged groups, such

as the N^+ and COO^- groups in a betaine, create a polar region, and a long-chain alkyl group creates a nonpolar region. Romano's preference that the R1, R2 and R3 groups should have a total of 14 to 24 carbons is consistent with the expectation that a betaine must have at least one long-chain alkyl group to act as a surfactant. Glycine betaine, on the other hand, lacks a long-chain alkyl substituent. Therefore, those skilled in the art would not expect glycine betaine to have any significant nonpolar character, and would not expect it to act as a surfactant.

In summary, the examiner has not adequately explained how the disclosure of absorbent articles comprising betaine surfactants would have suggested the claimed absorbent articles comprising glycine betaine. The rejection of claims 1-7, 9-11, 14-17, 20-23, 26-28, 31-35, and 38 under 35 U.S.C. § 103 is reversed.

The examiner also rejected claims 12 and 13 as obvious in view of Mandell, Romano, and Lorenzi.[3] This rejection relies on the same basic rationale as the rejection based on Mandell and Roman. The examiner cited Lorenzi only to meet the further limitations of claims 12 and 13. Therefore, this rejection suffers from the same flaw as the rejection discussed above, and must be reversed for the same reason.

[3] Lorenzi et al., U.S. Patent 6,217,889, issued April 17, 2001

Summary

The examiner has not adequately explained how the cited references, when considered as a whole, would have suggested the claimed products. We therefore reverse the rejections under 35 U.S.C. § 103.

REVERSED

Toni R. Scheiner Administrative Patent Judge	)
	) BOARD OF PATENT
Demetra J. Mills Administrative Patent Judge	) APPEALS AND
	) INTERFERENCES
Eric Grimes Administrative Patent Judge	)

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