

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No.

23

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

Ex parte ANTHONY M. HUMPHREY,  
BRIDGET A. SKILL,  
and JUDITH L. KINDERLERER

---

Appeal No. 1995-2659  
Application No. 07/896,705<sup>1</sup>

---

Heard: September 13, 1999

---

Before WINTERS, GRON, and LORIN, Administrative Patent Judges.

LORIN, Administrative Patent Judge.

REVERSE AND REMAND TO THE EXAMINER

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 8-22 and 31-33, all the claims pending in the application. On consideration of the record, we

---

<sup>1</sup> Application for patent filed June 10, 1992. According to appellants, this application is a division of Application 07/576,633, filed August 31, 1990, now U.S. Patent 5,185,252 issued February 9, 1993.

Appeal No. 1995-2659  
Application 07/896,705

reverse the rejection and remand the case to the examiner with instructions to consider the issue developed infra.

Claim 32 is illustrative of the subject matter on appeal and reads as follows:

32. An improved process for enzymatic biotransformation of fat to produce methyl ketones wherein the improvement comprises substantially uniformly distributing a fat, water and enzymes for hydrolysis of the fat to a fatty acid and oxidation of the fatty acid throughout a porous bed of solid support material in the substantial absence of a continuous liquid phase, passing oxygen through the bed without fluidizing or stirring the bed, and recovering the oxidation product from the bed.

The references relied upon by the examiner are:

Brouillard	4,029,546	June 14, 1977
Pratt	4,832,964	May 23, 1989
Matsuzaki et al. (Matsuzaki)	5,061,498	Oct. 29, 1991

Claims 8-22 and 31-33 are rejected under 35 U.S.C § 103 as being unpatentable over Pratt in view of Brouillard and further in view of Matsuzaki.

#### Discussion

The claimed invention is directed to a process for biotransformation of fat comprising substantially uniformly distributing a fat, water and enzymes throughout a porous bed of solid support material in substantial absence of a continuous liquid phase, passing oxygen through the bed without fluidizing or stirring the

Appeal No. 1995-2659  
Application 07/896,705

bed, and recovering resulting ketones.

Appeal No. 1995-2659  
Application 07/896,705

The issue for our review is whether the claimed invention is properly rejectable under § 103 as unpatentable over Pratt in view of Brouillard and further in view of Matsuzaki. It is apparent from the arguments, however, that although the ultimate issue is obviousness, the dispositive question is one of claim interpretation, requiring us to determine the meaning and scope of the phrase "the substantial absence of a continuous liquid phase". In this regard,

[i]t is axiomatic that, in proceedings before the PTO, claims in an application are to be given their broadest reasonable interpretation consistent with the specification. *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969), and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Johnson*, 558 F.2d 1008, 1016, 194 USPQ 187, 194 (CCPA 1977).

*In re Sneed*, 710 F.2d 1544, 1548, 218 USPQ 385, 388 (Fed. Cir. 1983).

Examiner's position (Final Rejection, paper no. 5, pp. 2-3) is that Pratt teaches a batch fermentation tank similar to that used in the claimed method, albeit with stirring and without a porous bed, that Brouillard teaches that a porous bed of the type here used is

Appeal No. 1995-2659  
Application 07/896,705

conventional in the art of fermentation, and that Matsuzaki establishes that "flow columns and tank fermentation are functional equivalents". The examiner (Examiner's Answer, paper no. 13, p.5)

concludes by stating that:

A person of ordinary skill in the art at the time the invention was made would have been motivated to substitute the porous bed of Brouillard ('546) for the vat in the process for microbial conversion of fats to methyl ketones of Pratt ('964) for the advantages of the fluidized bed disclosed by Brouillard ('546) and because Matsuzaki et al. ('498) teach the functional equivalence of the vat and porous bed column methods.

Appellants respond (brief, paper no. 12, p. 6) by pointing out that a "significant difference between the prior art and the claims at issue is the claim limitation, 'the substantial absence of a continuous liquid phase'"; to which Examiner (Examiner's Answer, p. 7) asserts:

Appellants' argument hinges upon the phrase "the substantial absence of a continuous liquid phase". In the disclosure at page 7, lines 15-19 one finds the only clear reference to this phrase wherein it is stated that "there must be substantially no continuous aqueous or other liquid phase". No definition or interpretation of this phrase is given. It is not stated what is meant by substantial absence. "Substantial" permits that there is continuous liquid

Appeal No. 1995-2659  
Application 07/896,705

phase. Furthermore, it is inherent in carrying out the process of Pratt in a column that the aeration will result in at least some discontinuous liquid phase because Pratt requires considerable aeration of the fermentation broth. If one passes this much air through a column, there will not be a completely continuous liquid phase. The alleged distinction between the process suggested by the combination of references and this instant process is a matter of degree of continuous phase. Hence, contrary to appellants' assertion the references when combined suggest that an aerated column would inherently be at least somewhat discontinuous.

Appeal No. 1995-2659  
Application 07/896,705

However, according to appellants (reply brief, paper no. 15), Pratt's fermentation is in fact conducted under submerged conditions and the claimed invention cannot be interpreted to cover employing "much" continuous liquid phase of the sort which the examiner considers Pratt is capable of achieving.

The examiner appears to be correct when he suggests that the subject phrase is explicitly recited only at page 7, lines 15-19. However, the examiner is not correct in suggesting that this phrase is not clearly defined and could allow the method to operate á la Pratt. Statements made throughout the disclosure, when read by one of ordinary skill, actually eliminate the possibility that the claimed method reads on Pratt. Appellants draw our attention to page 6, lines 5-12; page 7, lines 22-23; page 16, lines 1-6; and, page 6, lines 13-17, each of which suggest or indicate the necessity for the support material to remain porous during the process. To these we add page 19, lines 9-13:

"It is generally desirable for the bed to be static and unstirred, since stirring the support bed may tend to

Appeal No. 1995-2659  
Application 07/896,705

help form a continuous liquid phase which will reduce porosity and may prevent air permeation through the bed, in addition to causing damage to mycelia."

The only passage that might arguably suggest submerging the support can be found at page 16, lines 7-9, where ratios

are given that would permit substantially more water than support. But even this passage cannot support the examiner's interpretation because the next sentence qualifies. "It is naturally desirable that the load of fatty substrate and aqueous nutrient solution, or water, be as high as practicable **without saturating the support and destroying the porosity.**" [Our emphasis.] Page 16, lines 13.

Regarding the primary reference, the examiner does not rebut appellant's contention (brief p. 5) that Pratt is conducted under submerged conditions, which appears to be the case ("submerged aerobic conditions"; col. 4, lines 58-59). Instead, the examiner (examiner's answer, p. 4 and 7) argues that aeration is vigorous enough to cause the liquid phase to result in "at least some

Appeal No. 1995-2659  
Application 07/896,705

discontinuous liquid phase" (examiner's answer, p. 7) and therefore teaches, inherently, the claimed invention. We disagree, for three reasons.

First, assuming for arguments' sake that the examiner is correct, the claims nevertheless call for a "substantial absence of a continuous liquid phase". Such a condition could not exist if a major portion of the liquid remained in

a continuous phase. Therefore, even if Pratt did create "at least some discontinuous liquid phase", the claims preclude it.

Second, the passage that the examiner (examiner's answer, p. 4) relies upon for suggesting an inherent relationship between aeration and a resulting partially discontinuous liquid phase actually teaches aeration in combination with agitation: "aeration and agitation continued throughout the [process]" (column 4, line 8). Agitation has an equally important impact on the liquid phase. Furthermore, we can find no indication that Pratt

Appeal No. 1995-2659  
Application 07/896,705

employs "vigorous" aeration. Therefore, any conclusion that "at least some discontinuous liquid phase" would be inherently formed due to the aeration is a matter of conjecture, at best.

Third, the claims require "passing oxygen through the bed without fluidizing or stirring the bed". There is no doubt that Pratt carries out agitation (e.g., col. 4, lines 59-60: "fermenting... while agitating"), including during aeration. In so doing, however, Pratt is in fact conducting a process in contradistinction to the no-fluidizing/stirring provision of the claims.

Appeal No. 1995-2659  
Application 07/896,705

The secondary art fail to disclose a substantial absence of a continuous liquid phase. Brouillard, though teaching a fixed bed, submerges the support material by pumping syrup over a bed of particles and maintaining it at a level above the top of the bed (col. 16, lines 42-45). Matsuzaki merely teaches reforming fats in, for example, a column or fluid bed bioreactor (col. 5, lines 50-52).

None of the references teach a porous bed of solid support material in "the substantial absence of a continuous liquid phase". We are provided no reason why one with ordinary skill in the art would modify Pratt to conduct their process in an agitation-free unsubmerged environment. Since "[o]bviousness can not be established by hindsight combination to produce the claimed invention," In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998), a prima facie case of obviousness has not been established and, accordingly, we reverse the rejection.

Appeal No. 1995-2659  
Application 07/896,705

Other Issue

During our review of the record, we observed that parent application 07/576,633, which issued as US Patent No. 5,185,252, contains claims drawn to an invention substantially similar to those here at issue. Two of those patented claims are reproduced below:

An improved process for enzymatic oxidation of a fatty acid in the presence of water and oxygen wherein the improvement comprises substantially uniformly distributing the fatty acid, water and enzyme for the oxidation throughout a porous bed of solid support material in the substantial absence of a continuous liquid phase; passing oxygen through the bed without fluidizing or stirring the bed; and recovering the oxidation product from the bed.

5. A process according to claim 1 wherein some of the fatty acid distributed through the bed is in the form of a fat.

A restriction requirement was made in the parent application. Since review of that requirement is outside our jurisdiction, we remand the application back to the examiner to consider whether the claims in this application are still drawn in line with that

Appeal No. 1995-2659  
Application 07/896,705

requirement. If not, an obviousness-type double-patenting rejection may be appropriate. At minimum, the reasons for finding independent and distinct invention should be clarified on the record.

The basis for the restriction requirement was this:

Inventions Groups I and II are two different processes which overlap in that they both involve oxidation steps while distributed in a solid support matrix. However, invention Group II involves additional process steps prior to the oxidation step and uses different starting materials than Group I. Applicant requested reconsideration of this restriction. However, on its face these two Groups appear to involve different process steps.

See Application 07/576,633 (now US 5,185,252); first Office action; paper no. 5; mailed October 2, 1991, p. 2.

First, we note that the examiner states that the process of the patented claims (Invention I) "overlap" that of the application claims (Invention II). Actually, overlapping inventions suggest they are not distinct and independent of each other.

Second, examiner points out that the application claims include an additional process step than set forth in the patented claims. Assuming this is the case, we

Appeal No. 1995-2659  
Application 07/896,705

fail to see how this alone renders the inventions distinct and independent from each other. It may be that the patented claims are a subcombination of the application claims, but that sort of analysis has not been made. Simply because process claims include a step not otherwise mentioned in

other process claims does not make them independent and distinct. According to that logic, dependent claims would normally be restrictable.

Finally, with respect to the different starting materials, the apparent difference is that the application claims (see representative claim 32, supra) involve fat, which is hydrolyzed to a fatty acid and then oxidized, while the patented claims are directed to the fatty acid only. However, upon closer reading, especially considering patented dependent claim 5, the patent claims appear to be generic in scope. According to patented claim 5, "some of the fatty acid ... is in the form of a fat".

Appeal No. 1995-2659  
Application 07/896,705

Therefore, patented independent claim 1 covers a process where "all the fatty acid is in the form of a fat". It follows therefrom that the application claims, which are also directed to fat, would not encompass a distinct and independent invention from that already patented.

The examiner should review the restriction requirement in light of our comments and take appropriate action.

Appeal No. 1995-2659  
Application 07/896,705

For the reasons stated, we reverse the § 103 rejection, and remand this case to the examiner to consider the other issue raised above.

REVERSED AND REMANDED

SHERMAN D. WINTERS )  
Administrative Patent Judge )  
 )  
 )  
 )  
 ) BOARD OF PATENT  
TEDDY S. GRON ) APPEALS  
Administrative Patent Judge ) AND  
 ) INTERFERENCES  
 )  
 )  
 )  
HUBERT C. LORIN )  
Administrative Patent Judge )

Appeal No. 1995-2659  
Application 07/896,705

HCL/dal

Appeal No. 1995-2659  
Application 07/896,705

WOODCOCK, WASHBURN, KURTZ,  
MACKIEWICZ and NORRIS  
ONE LIBERTY PLACE 46<sup>th</sup> FLR.  
PHILADELPHIA, PA 19103