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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 31

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte MASAFUMI KAMIYAMA, YANO HARUHIKO,[1]
MINORU TSUCHIDA and EIJI O'SHIMA

_____

Appeal No. 1996-2015
Application No. 08/181,539[2]

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HEARD: November 1, 1999

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Before KIMLIN, WARREN, and SPIEGEL, *Administrative Patent Judges*.

SPIEGEL, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 20 through 22 and 24 through 33, which are all of the claims pending in this application.

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[1]According to the request for a corrected filing receipt filed April 13, 1992 (Paper No. 3) in parent Application 07/840,181, the second inventor's name is YANO HARUHIKO, Haruhiko is the family name. The request has been annotated to indicate that a corrected filing receipt was processed May 8, 1992. However, the correction has not been physically entered in the file record . This clerical processing oversight should be corrected upon return of the '539 application to the jurisdiction of the examiner.

[2] Application for patent filed December 27, 1993. According to appellants, this application is a continuation of Application 07/840,181, filed February 24, 1992, now abandoned, which is a divisional of Application 07/658,878, filed February 21, 1991.

Claims 28 and 29 are illustrative:

28. An apparatus for suspension polymerization of a monomeric composition of uniformly sized particles having a narrow distribution, said apparatus comprising:

first retaining means for retaining a disperse phase component comprising a monomeric composition;

second retaining means for retaining a continuous phase component comprising a medium;

disperser means for forming a dispersion of said disperse phase component and said continuous phase component, said disperser means comprising a stationary part having a first circular surface and a second annular surface surrounding and concentric with said first surface, a rotating part having a third circular surface confronting said first surface and a fourth annular surface surrounding and concentric with said third surface and confronting said second surface, said first surface and said third surface having substantially the same shape and defining a space therebetween having substantially a uniform thickness, a uniform shear force generating field being disposed in said space, said second surface and said fourth surface having substantially the same shape and defining a gap therebetween in the range of about 1.8 mm or less;

first supplying means for supplying said disperse phase component from said first retaining means to said shear force generating field at a constant rate;

second supplying means for supplying said continuous phase component from said second retaining means to said shear force generating field at a constant rate, said first and second means being independent whereby said disperse phase component and said continuous phase component contact one another for the first time in said shear force generating field, and substantially all of said dispersion must pass through said gap after being dispersed in said shear force generating field;

polymerization means for polymerizing said dispersion; and

means for supplying said dispersion to said polymerization means.

29. An apparatus for suspension polymerization of a monomeric composition of uniformly sized particles having a narrow distribution comprising:

first retaining means for retaining a disperse phase component comprising a monomeric composition;

second retaining means for retaining a continuous phase component comprising a medium;

disperser means for forming a dispersion of said disperse phase component and said continuous phase component, said disperser means comprising a stationary part having an inner surface, a rotating part disposed within said stationary part having an outer surface, said inner surface and said outer surface having substantially the same shape and defining a space therebetween having a substantially uniform thickness in the range of about 0.01 mm to about 5.0 mm, a uniform shear force generating field disposed in said space;

first supplying means for supplying said disperse phase component from said first retaining means to said shear force generating field at a constant rate;

second supplying means for supplying said continuous phase component from said second retaining means to said shear force generating field at a constant rate, said first and second means being independent whereby said disperse phase component and said continuous phase component contact one another for the first time in said shear force generating field;

polymerization means for polymerizing said dispersion; and

means for supplying said dispersion to said polymerization means.

Independent claims 32 and 33 recite the apparati of claims 28 and 29, respectively, except that the stationary part is changed to a second rotating part.

The examiner relies upon the following references as evidence of obviousness:

China	1,690,668	Nov. 6, 1928
Eppenbach (Eppenbach ‘178)	1,728,178	Sept. 17, 1929
Eppenbach (Eppenbach ‘288)	1,738,288	Dec. 3, 1929
Lee et al. (Lee)	3,488,699	Jan. 6, 1970

ISSUES

Claims 20-22 and 24-33 stand rejected under 35 U.S.C. § 103 as being unpatentable over Lee in view of China or Eppenbach '288 in view of Eppenbach '178.[3] We affirm.

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims and to the respective positions articulated by the appellants and the examiner. We make reference to the examiner's answer (Paper No. 26, mailed June 13, 1995) for the examiner's reasoning in support of the rejection and to the appellants' brief (Paper No. 25, filed March 15, 1995) for the appellants' arguments thereagainst.

THE INVENTION

Appellants' claimed invention is directed to an apparatus for producing micron-sized particles having a narrow size distribution range by suspension polymerization of a monomeric composition. The apparatus comprises (a) independent first and second vessels for supplying a disperse phase component containing the monomeric composition and a continuous phase component comprising a medium, respectively, through (b) associated independent passageways directly into a uniform shear force generating field of a disperser where they contact each other for the first time to form a

[3]By an apparently inadvertent error on the examiner's part, claims 27, 30 and 31 have not been listed in the statement of the rejection on page 3 of the answer. It is quite clear, however, that claims 27, 30 and 31 should be included in the rejection since these claims were listed in the statement of this rejection on page 2 of the final Office action mailed September 15, 1994 (Paper No. 21). Moreover, the appellants in their brief have considered claims 27, 30 and 31 to be included in the above noted prior art rejection (e.g., see pages 1 and 9). Under these circumstances, we also consider claims 27, 30 and 31 to be included in this rejection and further consider the examiner's aforementioned error to be harmless.

dispersion, (c) the disperser, (d) a polymerization reactor and (e) associated means for supplying the dispersion to the polymerization reactor. The disperser comprises either a stationary part (stator) and a rotating part (rotor) (claims 28 and 29) or two rotors (claims 32 and 33). The field of shear force generation may be regarded as lying in a space of specified clearance either between the stator and the rotor or between the two rotors. The width of the clearance through which the dispersion is discharged can be adjusted to obtain particles having a desired size and distribution. (See specification, pages 4-11; brief, pages 2-8.)

OPINION

To establish a *prima facie* case of obviousness, there must be some suggestion or motivation to modify the reference or combined reference teachings and a reasonable expectation of success. Furthermore, the prior art must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). This does not mean that the cited prior art references must specifically suggest making the combination. *B.F. Goodrich Co. v. Aircraft Braking Systems Corp.*, 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). Rather, the test for obviousness is what the combined teachings of the prior art references as a whole would have suggested to one of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981).

Here, Lee describes an apparatus for preparing uniform dispersions of a disperse phase component (i.e., immiscible material) in a continuous phase component (i.e., carrier liquid), comprising a first retaining means **12** for the disperse phase component, a second retaining means **14** for the continuous phase component, a disperser means **40** (i.e., mixer unit), a first supplying means **28-34-36-42** for supplying the disperse phase component at a constant rate, a second supplying means **30-34-38-44** for supplying the continuous phase component at a constant rate, and an outlet port **62** (i.e., means for supplying the dispersion to a polymerization means) connected directly to any desired process (i.e., polymerization means) (col. 4, lines 65-68; col. 6, line 22 - col. 7, line 45; Fig. 1). Disperser means **40** is any mixer unit which provides rapid and complete mixing and can be operated on a "demand" basis, preferably a gear pump mixer (col. 6, lines 7-18; col. 7, lines 63-73; col. 11, line 74 - col. 12, line 1). Thus, Lee differs in failing to disclose the specifically claimed disperser means (i.e., mixer).

China describes a mill mixer useful in treating suspensions of disperse and continuous phase liquids with improved efficiency (page 1, lines 1-2, 9-11 and 16-19). The mixer comprises separate input pipes **142** which feed liquids through hollow shafts **125** and **126** directly to a shear force field between the working surfaces **149** and **156** of closely adjacent upper and lower rotors **151** and **146** and an output chamber **129** having an outlet **131** (Fig. 1; page 1, line 76 - page 2, line 120; page 4, lines 41-87). One of the rotors may be stationary or both may rotate in the same or opposite directions

to produce the shear force field (page 2, line 120 - page 3, line 3; page 3, lines 14-22). Rotor variations are illustrated in Figs. 1-8.

Eppenbach ‘288 describes a mill mixer comprising rotating smooth (for emulsifying) or nonsmooth (for grinding) working surfaces **49, 50**, preferably rings or annuli, which are removably positioned on two rotors **15, 16**. The space between the working surfaces is adjustable between about 0.05 to 0.51 mm. Inflow feeds through inlet **44** into region **45** before entering the space between the grinding surfaces. (Page 1, lines 4-7; page 2, lines 95-109; page 3, lines 28-32, 77-82; page 4, lines 16-31, 91-96.) Eppenbach ‘178 describes a similar mill mixer with grinding disks **19, 22** minutely spaced apart and positioned on two rotors **17, 20** with inlet **44** for feeding a *mixture* to be treated. The grinding disks are provided with depressions which serve as shearing means. The mixture to be treated is fed either from a region peripherally exterior to the grinding disks or into the interior of the grinding disks (Page 1, lines 8-28, 76-39; page 2, lines 20-40.)

1. Rejection over Lee in view of China in view of Eppenbach ‘178

According to the examiner, the skilled artisan would have been motivated both to use China’s mixer in Lee’s apparatus because China’s mixer is not only used for the same purpose of providing a suspension but also provides a mixer with increased efficiency and to substitute irregular working surfaces for the smooth working surfaces of China to increase the shear force produced, thereby

improving homogenization, as suggested by Eppenbach ‘178 (answer, pages 6-7).

Appellants argue this is a hindsight reconstruction of the claimed invention (brief, pages 10-11). We wish to note that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the invention was made, and does not include knowledge gleaned only from the applicants’ disclosure, such a reconstruction is proper. *In re McLaughlin*, 443 F.2d 1392, 1395, 170 USPQ 209, 212 (CCPA 1971). We believe that to be the case here.

Lee explicitly states that other mixers may be used providing they fulfill certain requirements, e.g., rapid and complete mixing on demand (col. 6, lines 7-18; col. 7, lines 63-73; col. 11, line 74 - col. 12, line 1). Appellants have not argued, let alone established, that China’s mixer cannot fulfill the requirements of Lee’s mixer. Rather, appellants argue that Lee does not provide a specific working example using China’s mixer. It is axiomatic that the entire disclosure of a reference must be evaluated and that a reference is not limited to the disclosure of specific working examples. Moreover, one of ordinary skill in the art would have reasonably expected the mixer of China to provide more efficient mixing in view of China’s disclosure that the centrifugal force of his mixer aids in the production of high velocity shear force (see e.g., page 3, lines 101-110).

Appellants argue that the combination of China and Lee does not teach or suggest independently supplying the disperse and continuous phases such that they contact each other for the first time in a uniform shear force generating field (brief, pages 15-16). We disagree. China's mixer comprises separate input pipes **142** which independently feed into separate hollow shafts **125** and **126** such that the two feeds contact each other directly for the first time in the space between the working surfaces **149** and **156** of adjacent rotors, i.e., in the shear force generating field. Further, the close adjacency of the working surfaces in China (page 1, lines 12-13; page 2, lines 91-92; Figs. 1-9) reasonably appears to suggest a uniform shear force generating field. As to the claimed gap and space ranges recited in claims 24, 28, 29, 30 and 32, we agree with the examiner (answer, pages 5-6) that the explicit suggestions to use "closely adjacent surfaces" in China (page 1, lines 13-14; page 3, line 104) and a "narrow clearance" or "minute clearance" in Eppenbach '178 (page 1, line 25; page 2, lines 76-77) would have suggested the claimed gap limitations to one of ordinary skill in the art. Appellants have not challenged the examiner's position that the claimed gap and spacing ranges are conventional in the art (answer, page 7). As set forth in *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980), it is normally within the skill in the art to optimize a result effective variable. Here, both China and Eppenbach '178 suggest that the amount of clearance between working surfaces combines with centrifugal forces and/or speed to facilitate homogenization and emulsification. Finally, Figs. 1 and 4 in China reasonably appear to suggest embodiments wherein substantially all of the dispersion formed

in the shear force generating field pass through a gap at the periphery of the rotors prior to exiting the mixer.

In regard to the additional claim limitations argued by appellants on page 16 of the brief: The asperities of claims 20 and 25 (which provide an uneven, rough working surface) and the substantially smooth working surface(s) of claims 21 and 26 are suggested by the disclosure in Eppenbach '178 that while plain or smooth flat surfaces are satisfactory for many applications, use of depressions on a working surface to provide supplemental shearing means provides more effective homogenization and emulsification (page 1, lines 24-28; page 2, lines 26-40) as well as the disclosure of smooth working surfaces in China (page 2, lines 71-75). Independently controlling the flow of materials into the shear force generating field as recited in claims 22 and 27 is suggested by the control valves **42-44** of Lee (col. 6, lines 52-57 and 64-67) and by optional screw valves **158-161** in China (page 2, lines 99-120).

Therefore, we agree with the examiner that all the structural limitations of claims 20-22 and 24-33 would have been *prima facie* obvious in view of the combined disclosures of Lee, China and Eppenbach '178.

Where as here, the initial burden of establishing a *prima facie* case of obviousness is met by the examiner, the burden of coming forward with evidence or argument shifts to appellants.

In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Appellants argue unexpected results, i.e., the claimed apparatus results in a 2.5 fold decrease in the distribution range of particles produced (brief, pages 16-19).

Having reviewed the showing in the specification, we agree with the examiner that appellants have not met their burden of showing unexpected results. First, appellants have not compared the claimed subject matter with the closest prior art, i.e., the gear pump mixer apparatus of Lee, or explained why the evidence in the specification based upon a four-blade impeller proves a comparison of their claimed invention which is closer that than Lee.
In re Baxter Travenol Labs., 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). Second, it is not enough for appellants to show that the results for appellants' claimed invention and the comparative examples are different. Appellants have the burden of showing that the differences are significant and unexpected. *In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973); *In re D'Ancicco*, 439 F.2d 1244, 1248, 169 USPQ 303, 306 (CCPA 1971). For example, a four-blade impeller mixer would not be expected to provide the incremental mixing and, therefore, “perfect” mixing of Lee’s gear pump mixer (col. 7, lines 33-51). Alternatively, the results may not be unexpected in view of the improved efficiency in homogenization based upon use of centrifugal force and roughened working surfaces suggested by China and Eppenbach ‘178, respectively.

For the above reasons, we determine that appellants have not met their burden of showing unexpected results. Reevaluating the patentability based on the total record, we determine that the preponderance of the evidence weighs in favor of obviousness within the meaning of § 103, giving due consideration to appellants' arguments and evidence. Accordingly, the rejection of claims 20-22 and 24-33 under 35 U.S.C. § 103 as being unpatentable over Lee in view of China in view of Eppenbach '178 is affirmed.

2. Rejection of claims 20-22 and 24-33 over Lee in view of Eppenbach '288 in view of Eppenbach '178

According to the examiner, any deficiencies of Lee are met by Eppenbach '288 (answer, page 5). We disagree.

All of the independent claims require first and second supply means whereby the disperse and continuous phase components *contact one another for the first time in the* ***uniform*** *shear force generating field*. The examiner admits that Lee does not disclose or suggest a *uniform* shear force generating field (answer, page 8, first full para.). Secondly, we agree with appellants (brief, para. bridging pages 15-16) that the disperse and continuous phase components of Lee first contact each other *prior* to the shear force generating field (i.e., in the triangular space above the gears) and that neither Eppenbach discloses or suggests premixing the two phases before entering the shear force generating field (i.e., in Eppenbach '288 the inlet **44** feeds into region **45** before entering the space between the grinding surfaces; and, in Eppenbach '178 the *mixture* is fed into the mill). Moreover,

independent claims 28 and 32 require that *substantially all of the dispersion must pass through the gap* defined by the second and fourth surfaces after being dispersed in the uniform shear force generating field. The examiner first states that the claimed second and fourth surfaces, which define the recited "gap" **78**, corresponded to housing **72** and gear **70** in Lee, respectively, and then refers to col. 7, lines 46-50 in Lee for showing that all the mixing constituents pass through a defined mixing gap before exiting the mixer (answer, page 4, para. 1). Thus, it appears that the examiner is now equating mixing zone **76** with the "gap" recited in claims 29 and 32. However, mixing zone **76** is not defined by the second and fourth surfaces, i.e., by housing **72** and gear **70**. Therefore, the examiner's position is not well taken. Lastly, the examiner has not pointed out and we do not find where either Eppenbach '288 or '178 makes up for this deficiency.

Accordingly, we conclude that the examiner has not established a *prima facie* case of obviousness and reverse the rejection of claims 20-22 and 24-33 under 35 U.S.C. § 103 over Lee in view of Eppenbach '288 in view of Eppenbach '178.

CONCLUSION

To summarize, the decision of the examiner (I) to reject claims 20-22 and 24-33 under

35 U.S.C. § 103 over Lee in view of China in view of Eppenbach ‘178 is sustained and (II) to reject claims 20-22 and 24-33 under 35 U.S.C. § 103 over Lee in view of Eppenbach ‘288 in view of Eppenbach ‘178 is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN Administrative Patent Judge	)
CHARLES F. WARREN Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
CAROL A. SPIEGEL Administrative Patent Judge	)

CAS/kis
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