

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 16

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte SUN, YI HUANG, ANDREA LEONE-BAY, JOSEPH M. SCHMITT
and PAUL S. WATERMAN

MAILED

SEP 05 1996

PAT & TM OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Appeal No. 95-0888
Application 08/018,858¹

ON BRIEF

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

WEIFFENBACH, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the examiner's final rejection of claims 1-45. We affirm-in-part.

¹ Application for patent filed February 12, 1993.

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The invention is directed to a method of treating a water-in-oil microemulsion containing an aqueous solution of a quaternized amino methylated acrylamide polymer and to the acrylamide polymer formed thereby comprising the steps of treating the microemulsion by adding (i) an acid in an amount sufficient to provide a pH of 3.6 to 4.8, (ii) a formaldehyde scavenger, and (iii) water so that the resulting microemulsion comprises 10-45 weight percent quaternized amino methylated acrylamide polymer. The mixture is then heated between 40° and 80° C for 3 to 20 hours. The invention further encompasses a process for flocculating suspended solids by adding the aforesaid treated acrylamide polymer microemulsion to said suspended solids: Claim 1 is illustrative of the claims on appeal:

1. A method of treating a water-in-oil microemulsion containing, as the dispersed phase, an aqueous solution of a quaternized amino methylated acrylamide polymer which comprises:

(a) adding to said microemulsion:

(i) acid in an amount sufficient to provide a pH of from about 3.6 to about 4.8 in the microemulsion;

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(ii) from about 0.01 to about 30 mole percent of a formaldehyde scavenger, based on the total moles of quaternized amino methylated acrylamide polymer in the microemulsion; and

(iii) water in an amount such that the dispersed aqueous phase of the resulting microemulsion comprises from about 10 to about 45 weight percent of quaternized amino methylated polymer; and

(b) heating the microemulsion obtained in step (a) to a temperature of from about 40 to about 80°C for from about 3 to about 20 hours.

The examiner relies on the following references:

Fujimura et al. (Fujimura)	3,790,529	Feb. 5, 1974
Witschonke et al. (Witschonke)	3,988,277	Oct. 26, 1976
Phillips et al. (Phillips)	4,010,131	Mar. 1, 1977
Tai	4,073,763	Feb. 14, 1978

Claims 1-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Phillips.²

² With regard to this rejection, the examiner stated in the examiner's answer that

[t]he Examiner notes that he has erred in not rejecting the presently presented method claims over the Phillips reference. The Examiner prays that the Board will consider the Phillips reference, as applied against claims 31-45, in the context of anticipation.

If the examiner is of the opinion that claims 31-45 are anticipated by Phillips, the proper procedure would have been for the examiner to make a new ground of rejection in accordance with 37 CFR § 1.196(b) and Section 1208 of

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Claims 16-30 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tai.³

Claims 31-45 stand rejected under 35 U.S.C. § 103 as being unpatentable over Phillips and Tai, each in view of Fujimura.

Claims 13, 28 and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Phillips in view of Witschonke.

Appellant states that the dependent claims "are to be considered separately especially since the so treated microemulsions, when inverted into water to form aqueous polymer solutions and used to flocculate suspended solids, perform in an unexpectedly superior manner ..."⁴ Each of the dependent claims are directed to limiting the polymer to specific polymers or to specific compounds to prepare the polymer or limiting the acid to

the *Manual of Patent Examining Procedure*.

³ With regard to this rejection, the examiner stated in the examiner's answer that "[t]he Examiner believes it was erroneous not to reject claims 31-45 over Tai." If the examiner is of the opinion that claims 31-45 are anticipated by Tai, the proper procedure would have been for the examiner to make a new ground of rejection in accordance with 37 CFR § 1.196(b) and Section 1208 of the *Manual of Patent Examining Procedure*.

⁴ Page 3 of the appeal brief.

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specific organic or inorganic acids. Appellants' argument regarding unexpected results does not specifically address why the specific limitations in the rejected dependent claims are not described in the prior art relied on in the rejection, and how such limitations render the claimed subject matter unobvious over the prior art.⁵ Accordingly, the rejection of claims 1-30 will stand or fall together with independent claims 1 and 16, the rejection of claims 16-30 will stand or fall together with independent claim 16, the rejection of claims 31-45 will stand or fall together with independent claim 31, and the rejection of

⁵ At the time this appeal was filed, 37 CFR § 1.192(c)(5) and (c)(6)(vi) read as follows:

(5) *Grouping of claims.* For each ground of rejection which appellant contests and which applies to more than one claim, it will be presumed that the rejected claims stand or fall together unless a statement is included that the rejected claims do not stand or fall together, and in the appropriate parts or parts of the argument under subparagraph (c)(6) of this section appellant presents reasons as to why appellant considers the rejected claims to be separately patentable.

(6) *Argument...*(iv) For each rejection under 35 U.S.C. § 103, the argument shall specify ... , if appropriate, the specific limitations in the rejected claims which are not described in the prior art relied on in the rejection, and shall explain how such limitations render the claimed subject matter unobvious over the prior art ... A general argument that all the limitations are not described in a single reference does not satisfy the requirements of this paragraph.

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claims 13, 28 and 43 will stand or fall together with dependent claim 13.

Opinion

We have carefully reviewed the application record which led to this appeal and the respective positions advanced by appellants and the examiner for patentability of the appealed claims. We will affirm the examiner's rejections as to claims 13 and 16-45, and reverse the rejection of claims 1-12, 14 and 15.

Rejection Of Claims 1-30 As Anticipated By Phillips

We will not sustain the examiner's rejection of claims 1-15 under 35 U.S.C. § 102 as being anticipated by Phillips. The factual determination of anticipation requires the disclosure in a single reference of every element of the claimed invention. *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *In re Bond*, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677, 7 USPQ2d 1315, 1317 (Fed. Cir. 1988); *In re Marshall*,

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578 F.2d 301, 304, 198 USPQ 344, 346 (CCPA 1978); *In re Arkley*, 455 F.2d 586, 587, 172 USPQ 524, 526 (CCPA 1972). It is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference. *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick*, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984).

Phillips teaches a method of forming a water-in-oil emulsion containing between 10 and 50 weight percent of an aqueous solution of a quaternized amino methylated acrylamide polymer⁶ wherein (i) an acid such as sulfurous acid is added to the aqueous solution to bring the pH to between 0 and 6 and (ii) the emulsion is heated to a temperature of 60° C for 4 hours.⁷ The acid also functions as a formaldehyde scavenger. The pH disclosed by Phillips is within the appellants' claimed range. The disclosure in the prior art of any value within the claimed range is an anticipation of that range. *In re Wertheim*, 541 F.2d

⁶ Column 2, line 63 to column 4, line 41 and column 5, line 25 to column 6, line 31 of Phillips.

⁷ Column 6, lines 6-31 of Phillips.

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257, 267, 191 USPQ 90, 100 (CCPA 1976); *Ex parte Lee*, 31 USPQ2d 1105, 1106 (Bd. Pat. App. & Int. 1993). Phillips, however, does not suggest or teach the steps of adding a specified amount of scavenger to the solution or adding water to bring the microdispersion to between about 10 and about 45 weight percent of quaternized amino methylated acrylamide polymer. The examiner has not provided any explanation and evidence as to why these steps are not required elements of the claimed method or are inherent steps in the claimed method. For these reasons, we will not sustain the examiner's rejection of claims 1-15 as being anticipated by Phillips.

As for claims 16-30, we note that these claims are drafted in product-by-process form. In a product-by-process claim, it is the patentability of the product that is controlling, and not the process steps. Thus, where the product in a product-by-process claim appears to be identical with or is only slightly different from a prior art product, the claim is unpatentable even though the prior art product was made by a different process. The burden is on appellants to establish by objective evidence that

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the claimed product is patentably distinct from that of the prior art. *In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 964-965 (Fed. Cir. 1985); *In re Marosi*, 710 F.2d 799, 803, 218 USPQ 289, 292-293 (Fed. Cir. 1983); *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972); *Ex parte Jungfer*, 18 USPQ2d 1796, 1799 (Bd. Pat. App. & Int. 1991).

We will sustain the examiner's rejection of claims 16-30 as being anticipated by Phillips. Appellants have not established on the record of this application that claimed water-in-oil emulsion is different from that disclosed by Phillips. Appellants argue that Phillips is directed to forming a macroemulsion rather than a microemulsion. The principal thrust of appellants' argument is that microemulsions are formed when the average droplet size in the emulsion is over 4000 Å and that droplet size in Phillips is about 1 micron, or 10,000 Å. We are not persuaded by this argument because Phillips discloses that the particle size of the polymer is between 2 millimicrons and

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about 5 microns which is a range between 20 Å to about 50,000 Å.⁸ Since Phillips' particle sizes are within the claimed range and within the range stated by appellants as forming a microemulsion, in the absence of further evidence of record, the Phillips emulsion is considered to be a microemulsion.

We are also not persuaded by appellants' argument that their narrow pH range renders their composition patentably different from Phillips. The showings relied upon by appellants do establish a relationship between the pH and the S.V. (nat), but these results do not make a comparison with the closest prior art to establish that the pH and S.V. (nat) of the prior art exhibit a different relationship. We agree with the examiner that any showing of criticality of the pH range will not overcome an anticipation unless the applicant presents evidence to show that a different composition is formed by the Phillips process.⁹

⁸ Column 2, line 65 to column 3, line 3 of Phillips.

⁹ Appellants make reference to Patent No. 4,956,399 which they assert was issued over Phillips and therefore establishes that "the U.S.P.T.O., by issuing the '399 patent over Phillips et al. has already determined that microemulsions are materially and patentably distinct from macroemulsions, especially with regard to quarternized aminomethylated polymers" (page 8 of

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For the aforementioned reasons, we will sustain the examiner's rejection of claims 16-30 as being anticipated by Phillips.

Rejection of Claims 16-30 as Anticipated by Tai

Claims 16-30 are presented as product by process claims. As noted above, in such cases, the burden is on the applicants to establish with objective evidence that the claimed product is patentably distinct from the prior art product. Appellants have failed to meet their burden on this record.

Tai discloses a water-in-oil emulsion comprising an aqueous phase containing 10-50% by weight quaternized amino methylated acrylamide polymer.¹⁰ The pH of the emulsion ranges from 1 to 7. It has long been held that the disclosure in the prior art of any value within a claimed range is an anticipation of the claimed range. *In re Wertheim, supra, Ex parte Lee, supra.* For

the brief). In the absence of further evidence, we find appellants' conclusion to be speculative.

¹⁰ Tai: column 2, lines 20-46.

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the same reasons given above, we conclude that the emulsion formed by Tai is a microemulsion.¹¹ The emulsion contains a formaldehyde scavenger such as sodium metabisulfite or phosphorous acid to react with unreacted formaldehyde left after the formation of the quaternized amino methylated acrylamide polymer. On the record of this application, appellants have not established that a different composition is formed by the Tai process. Accordingly, we will sustain the rejection of claims 16-30 as being anticipated by Tai.

Rejection Of Claims 31-45 As Being Unpatentable
Over Phillips, Tai and Fujimura.

The examiner rejected claims 31-45 as being unpatentable under 35 U.S.C. § 103 as being unpatentable over Phillips and Tai, each in view of Fujimura. Appealed claims 31-45 are directed to a process for flocculating suspended solids by adding the acrylamide emulsion to said suspended solids. Both Phillips

¹¹ The average particle size of the polymer is disclosed in Tai to be within the same range as Phillips, i.e. between 2 millimicrons up to 5 microns. See column 2, lines 26-30 of Tai.

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and Tai teach using their compositions as flocculating agent.¹² For reasons already stated, we find that both Phillips and Tai teach a microemulsion of a quaternized amino methylated acrylamide polymer which has a pH encompassing appellants' claimed pH range. Both references teach using a formaldehyde scavenger and heating the emulsion to a temperature of at least 60° C for at about 3 hours.¹³ It would appear from Phillips and Tai that the particular scavenger employed and the amount needed would have been within the skill of the skilled artisan since the amount needed is dictated by the desire to keep a particular pH and to render the formaldehyde non-reactive and to eliminate cross-linking.¹⁴ Both Phillips and Tai disclose that the polymer concentration of the emulsion is between 10 and 50% by weight of the emulsion.¹⁵ The examiner cites the Fujimura reference to

¹² Example 13 of Phillips and column 6, lines 24-28 of Tai.

¹³ Phillips: column 6, lines 6-31. Tai: column 5, line 15 to column 6, line 9 and Example 1.

¹⁴ Id.

¹⁵ Phillips: column 3, lines 16-20. Tai: column 2, lines 42-46.

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show that it would have been obvious in the art "to add the suspended solids to the polymers of Phillips and Tai wherein the polymers would be in the form of aqueous solutions."¹⁶ In view of the teachings of the references, we conclude that the polymer emulsion disclosed by either Phillips or Tai is substantially the same as that claimed by appellant and that it would have been within the skill of the art to add the emulsion to a solution of suspended solids as a flocculating agent.

The principal thrust of appellants' argument for patentability is that the pH range, the percent of polymer in the emulsion, and the need for a heating step to achieve proper pH are critical limitations set forth in the claims on appeal. Appellants refer to data in their specification to show that these limitations are necessary and that unexpected superior results are obtained using appellants treated polymer. In particular, appellants contend that when their claimed process is not followed, the resultant polymer emulsions fail to possess a

¹⁶ Paragraph bridging pages 9 and 10 of the examiner's answer.

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high enough SV or SV(nat). According to appellants' specification, SV stands for standard viscosity. Although appellants define the term "SV(nat)" in the appeal brief as "a measure of the polymer flocculating efficiency,"¹⁷ the term is not defined in their specification. The alleged criticality of the claimed limitations being asserted is based on SV and SV(nat) values. We have considered appellants' arguments, but we are not persuaded that these limitations establish unexpected superior results.

First, we note that the SV or SV(nat) values are not set forth in the claims. Second, appellants have not established what the relative differences in the SV or SV(nat) values mean. For example, it is not known whether the degree of difference between 1.27 and 1.2 is significant. Compare Example 3, 23C and 24C in Tables 1 and 4, respectively, in the specification. Also, the data shows that the SV or SV(nat) values for a pH greater than 4.8 can fall within the SV or SV(nat) values for pH's within

¹⁷ Page 5 of the appeal brief.

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the claimed range of 3.6 to 4.8. Compare Examples 13C, 20C and 32C in Tables 3, 4 and 6, respectively, to Examples 1, 3, 7, and 9 in Tables 1 and 2, respectively, in the specification. Third, the SV or SV(nat) value and resultant pH of the emulsion varies substantially depending on the particular acid employed. Compare Examples 3 and 9 in Tables 1 and 2, respectively, to Examples 14, 23C and 29 in Tables 3, 4 and 5, respectively, in the specification. The data presented is insufficient to draw any reasonable conclusion regarding a desired SV or SV(nat) range of values relative to pH which will provide the results desired by appellants within the claimed pH range. As for the data set forth in Table 15 regarding the critical amount of polymer solids in the emulsion, although appellants rely on the data in line 20 for Example 138 as showing an SV of 1.19, the data on line 23 for Example 138 shows another SV of 2.59. Appellants' specification does not explain what these values mean relative to each other. We do not find this data sufficient to establish any criticality regarding the amount of polymer in the emulsion. Again, it is not clear from the data what constitutes an acceptable SV or

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SV(nat) value or range of values. Appellants rely on Tables 10, 12 and 13 to show criticality of the heating temperature and heating time on the SV or SV(nat) value. The heating step does not appear to affect pH. Compare Examples 80 and 81 to 82C and 83 in Table 10. Again, it is not clear from the data what constitutes an acceptable SV or SV(nat) value or range of values. Compare Example 82C in Table 10 to Examples 3 and 9 of Tables 1 and 2, respectively. Appellants point out that

In Table 12, Appellants explained [to the examiner during prosecution], when proper amounts of acid and formaldehyde scavenger (urea) are used and the heating conditions are properly employed, the stability of the microemulsion, vis-a-vis fresh untreated emulsion, is maintained for up to about 11.75 months, see Examples 109-116 [in Table 13], for example.

Appellants have not provided any explanation of either Table 12 or Table 13 in their specification which would support the above statement regarding the significance of the results shown in Tables 12 and 13.

For all of the foregoing reasons, we conclude that the data presented by appellants does not patentably distinguish their claimed treated polymer from that exemplified by the prior art.

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Accordingly, we will sustain the examiner's rejection for obviousness over the combination of Phillips, Tai and Fujiama.

Rejection Of Claims 13, 28 and 43 As Being Unpatentable
Over Phillips and Witschonke

Claims 13, 28 and 43 stand rejected under 35 U.S.C. § 103 as being unpatentable over Phillips in view of Witschonke.¹⁸ We will sustain this rejection. For reasons already given, the polymer disclosed by Phillips is seen to be a water-in-oil microemulsion which is patentably indistinct from the claimed treated polymer. Phillips teaches a method of forming the water-in-oil emulsion wherein (i) an acid such as sulfurous acid is added to the aqueous solution to bring the pH to between 0 and 6 and (ii) the emulsion is heated to a temperature of 60° C for 4 hours.¹⁹ The sulfurous acid also functions as a formaldehyde scavenger. The pH disclosed by Phillips is within the

¹⁸ It is not clear from this record why the examiner also did not reject independent claims 1, 16 and 31 in view of 37 CFR 1.75(c) which states that "Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference to the dependent claim."

¹⁹ Column 6, lines 6-31 of Phillips.

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appellants' claimed range. Since Phillips desires that the emulsion contain between 10 and 50 weight percent of an aqueous solution of a quaternized amino methylated acrylamide polymer, it would be within the skill of the art to add or remove water until the desired weight percent is obtained. The Witschonke patent teaches that guanidine and urea are formaldehyde scavengers.²⁰ Witschonke further teaches that the amount of scavenger to be added is within the skill of the art.²¹ Based on the foregoing, we conclude that the prior art presents a *prima facie* case of obviousness.

Appellants argue that Phillips does not teach or suggest the criticality of the limitations in their claims. For reasons already given, we do not find that appellants have established criticality for these limitations. Accordingly, we will affirm the examiner's rejection.

²⁰ Witschonke: column 3, lines 31 to column 4, line 7. Also, it is noted that Tai discloses at column 5, line 40 to column 6, line 9 that compounds such as sodium bisulfate, sodium metabisulfite, and phosphorous acid are also useful as formaldehyde scavengers.

²¹ Witschonke: column 3, line 64 to column 4, line 7.

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Conclusion

For the foregoing reasons, we affirm the examiner's rejections of claims 13 and 16-45 for obviousness and the rejection of claims 16-30 as being anticipated by Phillips or Tai, and we reverse the examiner's rejection of claims 1-16 as being anticipated by Phillips. Accordingly, the decision of the examiner is affirmed-in-part.

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

AFFIRMED-IN-PART


EDWARD C. KIMLIN)
Administrative Patent Judge)


CAMERON WEIFFENBACH)
Administrative Patent Judge)

BOARD OF PATENT
APPEALS AND
INTERFERENCES


CHARLES F. WARREN)
Administrative Patent Judge)

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