

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte WILFRIED HEIDE,
STEFAN WICKEL, THOMAS DANIEL,
JOACHIM NILGES, and JURGEN HOFMANN

Appeal 2008-1435
Application 10/765,152
Technology Center 1700

Decided: April 30, 2008

Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 10-12, and 15-35. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

BACKGROUND

The invention relates to a process for the continuous production of crosslinked fine particles of an addition polymer gel. The sole independent claim 10 is illustrative:

10. A process for the continuous production of crosslinked fine particles of an addition polymer gel, comprising

copolymerizing a monomer mixture, comprising

a) one or more water-soluble monoethylenically unsaturated monomers,

b) from 0.001 to 5 mol% based on the monomers (a) of one or more comonomers containing at least two ethylenically unsaturated groups, and

c) from 0 to 20 mol% based on the monomers (a) of one or more water-insoluble monoethylenically unsaturated monomers,

wherein the monomers a), b) and c) are present as a 20 to 80% by weight solution in water based on the total amount of a), b), and c), wherein the copolymerizing is carried out in the presence of initiator at from 0 to 140°C by continuously feeding the aqueous solution of the monomers into a mixing kneader having at least two axially parallel rotating shafts having a plurality of kneading and transporting elements to convey the monomer mixture from an upstream end of the mixing kneader in the axial direction toward a downstream end of the mixing kneader by the continuous conveying action of the transporting elements of the rotating shafts in the presence of one or more addition polymerization inhibitors under an inert gas.

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

(a) the mixing kneader recited in claim 10 is not described in Tsubakimoto;

(b) Tsubakimoto does not disclose an embodiment wherein no heat removal occurs by cooling of the reactor walls (as claimed in dependent claim 24) with sufficient specificity to constitute anticipation;

(c) Tsubakimoto does not disclose the structure of the rotating shafts as set out in dependent claims 27-29;

(d) Tsubakimoto does not disclose the amount of residual monomer that may be present in the polymerized product as claimed in dependent claims 33-35;

(e) Tsubakimoto does not disclose or suggest the percentages of heat loss as claimed in dependent claims 16-23; and

(f) Tsubakimoto does not disclose or suggest the residence time of the monomer mixture in the mixing kneader as claimed in dependent claims 30-32.

OPINION

We agree with the Examiner's findings of facts and legal finding of anticipation with respect to claims 10-12, 15-29 and 33-35 as set out in the Answer. While we do not agree with the Examiner's legal finding of anticipation of claims 30-32, we do agree with the Examiner's alternative conclusion of obviousness with respect to these claims.

Accordingly, we will sustain the Examiner's rejection under § 102 for all the claims on appeal except for claims 30-32. We will also sustain the Examiner's rejection under § 103 of claims 16-23 and 30-32.

The § 102 Rejection Based on Tsubakimoto

Principles of Law Relating to Anticipation

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987).

However, the law of anticipation does not require that the reference ‘teach’ what the subject patent teaches. Assuming that a reference is properly ‘prior art,’ it is only necessary that the claims under attack, as construed, ‘read on’ something disclosed in the reference, i.e., all limitations of the claim are found in the reference, or ‘fully met’ by it. *See Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 772 (Fed. Cir. 1983).

“A patent applicant is free to recite features of an apparatus either structurally or functionally.” *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997). However, “[f]unctional’ terminology may render a claim quite broad ...[;] a claim employing such language covers *any and all* embodiments which perform the recited function.” *In re Swinehart*, 439 F.2d 210, 213 (CCPA 1971). Moreover, as stated in *In re Best*, 562 F.2d 1252, 1254-1255 (CCPA 1977) (quoting *In re Swinehart*, 439 F.2d at 213):

[W]here the Patent Office has reason to believe that a functional limitation asserted to be critical for establishing novelty in the claimed subject matter may, in fact, be an inherent characteristic of the prior art, it possesses the authority to require the applicant to prove that the subject matter shown to be in the prior art does not possess the characteristic relied on.

Furthermore, it has been established that under the principles of inherency, if a structure in the prior art necessarily functions in accordance with the limitations of a process or method claim of an application, the claim is anticipated. *In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986).

Claims 10-12, 15, 25 and 26

Applying the preceding legal principles to the factual findings in the record on appeal, we determine that the Examiner has established a prima facie case of anticipation of claim 10 based on Tsubakimoto.

Appellants do not dispute the Examiner's findings of facts with respect to many of the limitations of the process set out in independent claim 10; Appellants' disagreement with the Examiner's rejection focuses solely on the alleged deficiencies of the axially rotating shafts of the mixing kneader apparatus used in the process of Tsubakimoto as discussed below (App. Br. 4-5; Reply Br. 2-4).

It is axiomatic that during examination proceedings, claims are given their broadest reasonable interpretation consistent with the specification. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Although claims are to be interpreted in light of the specification, limitations from the specification are not to be read into the claims. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Accordingly, we must first construe the disputed claim language "...at least two axially parallel rotating shafts having a plurality of kneading and transporting elements to convey the monomer mixture from an upstream end...toward a downstream end" as found in the pertinent clause of claim 10 on appeal. We construe this clause to set forth the functions of elements of the axially rotating shafts. The Specification contains no explicit definition

of the mixing kneader's "kneading and transporting elements"; to the contrary, according to Appellants' Specification, mixing kneaders "useful in the process of the invention are...described *for example* in CH-A-664 704, EP-A-517 068, ..." and "useful kneading and transporting elements *include for example* close-clearance mixing bars and L- or U-shaped attachments." (Spec. 6:33-36; 6:45 to 7:1; emphasis provided). However, we cannot read limitations from the Specification into the claim. *See, e.g., In re Van Geuns*, 988 F.2d at 1184.

Claim 10 does not recite any specific structure for the kneading and transporting elements. Furthermore, the plain language of the claim does not require that *each* shaft have a plurality of kneading and transporting elements. Thus, the broadest reasonable interpretation includes structure that comprises at least two axially extending shafts, at least one of the shafts having at least one element that would at least inherently function for kneading and the other shaft having at least one element that would at least inherently function for transporting the monomer mixture from an upstream end toward a downstream end of a mixing kneader.

Appellants contend that the kneader of Tsubakimoto cannot reasonably be construed to include "...at least two axially parallel rotating shafts having a plurality of kneading and transporting elements..." since at best patentee describes a single rotating shaft with transporting elements (i.e., discharge screw 29); it does not disclose an apparatus having a plurality of shafts with transporting elements (App. Br. 5; Reply Br. 2-4). Appellants also contend that there is no evidence that the shaft of double-paddle feeder 30 is parallel to any other shaft of the Tsubakimoto mixing kneader. We do not agree for the following reasons.

First, we agree with the Examiner that each mixing shaft 26 has elements that appear will inherently function to both knead and transport, at least to some extent, the monomer mixture as claimed (Ans. 3-4). Appellants do not dispute that each mixing shaft kneads the mixture (*see also* Tsubakimoto's description of Fig. 5 as a "kneader" at e.g., col. 5, ll. 29-31). Claim 10 uses open language, e.g., "comprising", and does not require any minimum amount of kneading or transporting for these elements. It is clear that overall the mixing kneader of Tsubakimoto kneads and transports the monomer mixture from an upstream end towards a downstream end as claimed (*see, e.g.*, Figs. 4, 5; col. 5, ll. 28 to col. 6, ll. 9). Furthermore, we find that one of ordinary skill in the art would immediately envision that the structure of the angled elements on the shafts 26 as depicted in Fig. 5 would reasonably appear to both knead and transport the mixture as claimed.

Second, we determine, as discussed previously, that the plain meaning of the language used in claim 10 does not require that *each* shaft have a plurality of kneading and transporting elements. Therefore, even assuming *arguendo* that the two mixing shafts 26 of Tsubakimoto do not both knead and transport the monomer mixture, we find that "at least two axially parallel rotating shafts having a plurality of kneading and transporting elements" as claimed reads on the combination of at least one of the mixing shafts 26 of the kneader (there is no dispute as to their kneading function, *see, e.g.*, Tsubakimoto, col. 4, ll. 1-4) and the discharge screw 29 (there is no dispute as to its transporting function) of Tsubakimoto.

Third, we determine that Tsubakimoto's fourth axially rotating "double-paddle feeder 30" in combination with the "discharge screw 29",

with the kneading and transporting that inherently results from their use in normal operation, meets the disputed claim language. We find that each of the discharge screw 29 and double-paddle feeder 30 reasonably appears to knead the mixture to at least some extent, in addition to transporting the mixture. We also find that one of ordinary skill in that art would immediately envision that shaft 30, as depicted in Fig. 5 of Tsubakimoto, is parallel to shaft 29, as well as to shafts 26. Thus, shaft 30 in combination with shaft 29 as depicted in Fig. 5 of Tsubakimoto describes "...at least two axially parallel rotating shafts having a plurality of kneading and transporting elements..." with sufficient specificity to constitute an anticipation of claim 10.

Thus, given the structural correspondence of Tsubakimoto's mixing kneader to Appellants' kneader as claimed, we determine that the Examiner was justified in finding that the process described in Tsubakimoto using the kneader described therein anticipates representative claim 10 (Ans. 3). In particular, we determine that based on the evidence before us, the axially extending shafts 26(two), 29 and 30 of the kneader of Tsubakimoto include elements that reasonably appear will at least inherently knead and/or transport the monomer mixture as claimed. Thus, Tsubakimoto inherently performs the functions disclosed in the method claims on appeal when that device (i.e., the kneader) is used in its normal and usual operation. *See In re King*, 801 F.2d at 1326.

For these reasons, we determine that the Examiner has established that the process of the prior art (i.e., Tsubakimoto) reasonably appears to be the same as that claimed. Thus, the burden shifts to Appellants to prove that the claimed process is not the same as the prior art (e.g., establish with

evidence that Tsubakimoto's process, including the axially parallel rotating shafts thereof, does not inherently function as claimed). *See, e.g., In re Best*, 562 F.2d at 1255.

The Appellants have not submitted any evidence to rebut the Examiner's position. Therefore, we affirm the Examiner's § 102 rejection of claims 10-12, 15, 25 and 26 over Tsubakimoto³.

Claim 24

Appellants contend that Tsubakimoto does not disclose an embodiment wherein no heat removal occurs by cooling of the reactor walls (as claimed in dependent claim 24) with sufficient specificity to constitute anticipation (App. Br. 5; Reply Br. 5). We do not agree.

We find that the description of Tsubakimoto's heat transfer jackets 27, 31 as *optional* unambiguously describes to one of ordinary skill in the art that these jackets may be omitted (*see, e.g.,* Fig. 5; col. 5, ll. 37-44). Once these jackets are omitted, there will be no heat "removed via cooling of the reactor walls" as claimed in claim 24.

Thus, we agree with the Examiner that claim 24 is anticipated by Tsubakimoto.

³ Again, Appellants do not separately argue claim 26 in the Appeal Brief nor the Reply Brief, since a statement which merely points out what a claim recites will not be considered an argument for separate patentability of the claim. Claim 26 differs from claim 10 only in calling for "...shafts having a *combination* of kneading and transporting elements..." versus claim 10's "...shafts having a *plurality* of kneading and transporting elements..." (emphasis provided). We do not see (and Appellants do not point out) any patentably significant difference in structure or operation defined by these two phrases, especially in view of our three alternative interpretations of Tsubakimoto.

Claims 27-29

We choose claim 29 to represent this grouping of claims. Claim 29 further limits claim 10 and recites that the "...shafts of the mixing kneader comprise at least one of an L-shaped or U-shaped attachment."

Appellants contend that Tsubakimoto does not disclose the particular structure set out in these claims. We disagree.

We find that the structure as shown in various figures of Tsubakimoto does indeed read on the structure recited in these claims (*see, e.g.*, Figs. 4, 5, 6(a)-(d)). Specifically, we find that Figure 6(a) illustrates a structure for the rotary stirring shafts 26 of Fig. 5 which clearly depicts an L-shaped attachment.

Therefore, we sustain the Examiner's § 102 rejection of claims 27-29.

Claims 33-35

We choose claim 35 to represent this grouping of claims. Claim 35 recites "The process of claim 10, wherein the residual monomer of the addition polymer gel is less than 0.30% by weight." Appellants contend that Tsubakimoto nowhere discloses or suggest such polymerization, since patentee suggests further treatment to obtain better conversion of the monomer to the polymer (Br. 6). We agree with the Examiner that the claims do not preclude such additional treatment. Appellants' argument fails to appreciate the scope of Appellants' claim.

Claim 10 uses open claim language (i.e., "comprising"). The transitional term "comprising" is "inclusive or open-ended and does not exclude additional, unrecited elements or method steps." *Georgia-Pacific Corp. v. United States Gypsum Co.*, 195 F.3d 1322, 1327 (Fed. Cir. 1999). Therefore, Appellants' use of the term "comprising" permits the presence of

additional steps, such as additional processing after discharge from the kneading apparatus to remove residual monomers as taught in Tsubakimoto.

The conclusion of the Examiner that such a residual monomer level as recited in claim 35 is inherent in Tsubakimoto was reasonable since it is clear that *complete* conversion of monomer to polymer is desired (*see, e.g.*, col. 6, ll. 4-6). Appellants have not offered any evidence that Tsubakimoto's process, which we have previously determined reads on the claimed process, does not inherently achieve such residual monomer levels. We note that the PTO is not equipped to run processes and determine any inherent parameters of the product that may result therefrom. Thus, the burden has properly shifted to Appellants to show that the prior art process of Tsubakimoto does not inherently result in "the residual monomer of the addition polymer gel is less than 0.30% by weight". *See, e.g., In re Best*, 562 F.2d at 1255.

Therefore, we sustain the Examiner's § 102 rejection of claims 33-35.

*The § 102, or in the Alternative, § 103, Rejection Based on Tsubakimoto
Claims 16-23 and 30-32*

Claims 16-23

We choose claim 16 to represent this grouping of claims. Claim 16 recites "The process of claim 10, wherein not less than 15% of the heat of reaction is removed by evaporation of water." Appellants contend that the Examiner's assertion that "it is reasonable that the percentages of heat loss would be the same as in the presently claimed process since the continuous process, as well as the mixing kneader, of the prior art process is essentially the same..." is entirely without foundation, especially since Appellants have

shown that the prior art kneader and the kneader of the present claims are not the same (App. Br. 7). We disagree.

As set forth above, we agree that the Examiner has properly established a prima facie case of anticipation for the process as recited in claim 10. The Examiner has also properly established a prima facie case of anticipation that some heat of reaction would inherently be removed via the evaporation of water in Tsubakimoto, which Appellants do not dispute (App. Br. 7). Appellants only dispute that the percentages of the heat loss recited in the claim 16 would be met by Tsubakimoto. However, the PTO is not equipped to run processes and determine any inherent parameters of the process. Thus, the burden has properly shifted to Appellants to show that the prior art process of Tsubakimoto does not inherently remove “not less than 15% of the heat of reaction” via evaporation of water. *See, e.g., In re Best*, 562 F.2d at 1255.

Appellants have not proffered any evidence. Therefore, we sustain the Examiner’s § 102 rejection of these claims.

To the extent the Examiner alternately relies on § 103 to reject these claims, we also sustain that rejection. A lack of novelty is the ultimate or epitome of obviousness. *See In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982). For this reason, and those set out in the Answer, we affirm the Examiner’s legal conclusion of obviousness of claims 16-23.

Claims 30-32

We choose claim 30 to represent this grouping of claims. Claim 30 adds the limitation that the residence time of the monomer mixture in the mixing kneader is “less than 30 minutes”. For the reasons which follow, we agree with the Appellants that the Examiner has not established a prima

facie case of anticipation for claims 30-32, however, we agree with the Examiner that the subject matter of these claims would have been prima facie obvious to one of ordinary skill in the art.

Contrary to Appellants' contention that the minimum reaction time described by Tsubakimoto is 50 minutes (App. Br. 8-9; Reply Br. 7), we find that the minimum residence time described in Tsubakimoto is "35 minutes" (col. 9, ll. 15-24). The description of the timing of both conditions in Tsubakimoto, whose times were added together by Appellants, occur within a set time of the *same* starting point, namely, the addition of the polymerization initiator (*see* col. 9, ll. 16-18 and 22-24). Thus, Appellants' analysis which resulted in the 50 minute reaction time appears to be in error.

Nonetheless, we determine that 35 minutes as described in the overall process of Tsubakimoto does not describe a reaction time of "less than 30 minutes" so as to constitute an anticipation of claim 30. Therefore, we reverse the Examiner's rejection based on § 102 for these claims.

However, we shall sustain the Examiner's rejection of these claims under § 103 for the following reasons.

It has been held that a prima facie case of obviousness exists where claimed ranges and prior art ranges do not overlap but are close enough that one would have expected them to have the same properties. *Titanium Metals Corp. of America v Banner*, 778 F. 2d 775, 783 (Fed. Cir. 1985). We determine that in the instant case, 35 minutes is "close enough" to "less than 30 minutes" (e.g., 29.9 minutes) that one would have expected the reaction product resulting from these reaction times to be the same.

Furthermore, it is by now well settled that where patentability is predicated upon a change in a condition of a prior art composition or

process, such as a change in concentration, temperature, or the like, the burden is on the applicant to establish with objective evidence that the change is critical, i.e., it leads to a new, unexpected result. *See, e.g., In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990); *In re Aller*, 220 F.2d 454, 456 (CCPA 1955). Hence, we determine that it would have been prima facie obvious for one of ordinary skill in the art to optimize the reaction time of the polymerization reaction in the mixing kneader of the reference in order to obtain an appropriate polymer, and the burden is properly upon Appellants to demonstrate with objective evidence that the claimed reaction time achieves a result that would have been truly unexpected by one of ordinary skill in the art. *In re Merck & Co.*, 800 F.2d 1091, 1099 (Fed. Cir. 1986); *In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972).

Appellants have made no such showing in the present case.

Thus, we agree with the Examiner's findings and conclusion in support of obviousness for claims 30-32 based on the teachings of Tsubakimoto.

CONCLUSION

In summary:

The § 102 rejection based on Tsubakimoto of claims 10-12, 15-29, and 33-35 is affirmed for the foregoing reasons and the reasons stated in the Answer.

The § 102 rejection based on Tsubakimoto of claims 30-32 is reversed.

The § 103 rejection based on Tsubakimoto of claims 16-23 and 30-32 is affirmed.

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The Primary 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

tf/lis

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