

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JAKOB RADEMACHERS
and GUNTHER TEICHMANN

Appeal No. 1997-4318
Application 08/469,806¹

HEARD: February 21, 2001

Before WARREN, WALTZ and LIEBERMAN, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal and Opinion

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner finally rejecting claims 13 through 29.²

¹ This application is the grandchild of application 07/816,468 ('468 application) in which a prior merits panel of this board entered a decision on July 26, 1994 in Appeal No. 93-3107, as noted by appellants (brief, page 1). The '468 application is the child of application 07/516,801 ('801 application). We find that the '801 application is the grandparent of application 07/888,341 in which the same merits panel entered a decision on July 26, 1994 in Appeal No. 93-2882 with respect to subject matter that is not as closely related to the subject matter of the present appeal as that in Appeal No. 93-3107.

² See the preliminary amendment of September 22, 1994, in parent application 08/310,625 (Paper No. 4).

We have carefully considered the record before us, and based thereon, find that we cannot sustain the rejection of all of the appealed claims under 35 U.S.C. § 103 as being unpatentable over Jungk in view of Weldes et al., GB 948,258 (3M GB '258) and 948,259 (3M GB '259), *Perry's*, Sams et al., Spencer et al., Caswell, Freyhold and Ferrigno (answer, pages 3-5).³

The claims of this application involve a microgranulate inorganic pigment composition as illustrated by claim 26:

26. A dispersible microgranulate inorganic pigment composition for colouring inorganic particulate building materials, consisting essentially of;

- (a) one or more inorganic pigments selected from the group consisting of iron, chromium, manganese and titanium oxides;
 - (b) from about 0.05 to about 1 percent (%) by weight, calculated as oxide and based on the quantity of pigment, of one or more boron, aluminum, silicon, titanium, zinc and tin compounds;
- and

said microgranulates having an average particle size of between about 50 and about 500 μm , and being substantially free of organic liquefiers, and being sufficiently unstable to shearing forces such that when the microgranulates are combined with the inorganic building materials and mixed, the shearing forces of mixing break down the microgranulates and intimately disperse the pigment throughout the building materials to impart a final colour intensity to the building materials, substantially as if the pigment was not microgranulated.

The microgranulate inorganic pigment compositions are used in a process for colouring building materials as illustrated by claim 13:

13. A process for colouring building materials which comprises:

- (a) combining particulate inorganic building materials with microgranulates of pigments, said microgranulates
 - (i) being substantially free of organic liquefiers;
 - (ii) consisting essentially of one or more inorganic pigments selected from the group consisting of iron, chromium, manganese and titanium oxides, and from about 0.05 to about 1 percent (%) by weight, calculated as oxide and based on the quantity of pigment, of one or more boron, aluminum, silicon, titanium, zinc and tin compounds;
 - (iii) having average particle size of between about 50 and about 500 μm ; and

³ The references relied on by the examiner are listed at page 2 of the answer.

- (iv) being sufficiently unstable to shearing forces such that they break down and disperse the pigment in the building materials substantially as if the pigment was not microgranulated; and
- (b) mixing the combination of building materials and microgranulates thereby subjecting the combination to shearing forces which break down the microgranulates and intimately disperse the pigment throughout the building materials to impart a final colour intensity to the building materials.

The review of the examiner's application of prior art to claims 13 and 26⁴ necessarily entails the interpretation thereof with respect to the microgranulate inorganic pigment composition, by giving the claim terms the broadest reasonable interpretation consistent with the written description provided in appellants' specification as it would be interpreted by one of ordinary skill in this art. *See In re Morris*, 127 F.3d 1048, 1054-56, 44 USPQ2d 1023, 1027-29 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). In doing so, the limitations of the specification, or any preferred embodiment or example therein, will not be read into the claims. *See generally, Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998); *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); *In re Van Genus*, 988 F.2d 1181, 1184, 26 USPQ2d 1057, 1059 (Fed. Cir. 1993); *Zletz, supra*; *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978); *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969). In this respect, it is appellants' burden to define the claimed invention encompassed by the appealed claims in the specification. *See Morris*, 127 F.3d at 1055-56, 44 USPQ2d at 1029; *see also PPG Industries Inc. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354-57, 48 USPQ2d 1351, 1353-56 (Fed. Cir. 1998) (Patentees "could have defined the scope of the phrase 'consisting essentially of' for purposes of its patent by making clear in its specification what it regarded as constituting a material change in the basic and novel characteristics of the invention. The question for our decision is whether PPG did so."). The term "substantially" is a term of degree for which the specification must either provide a definition or some standard of measurement for the claim term that it modifies, or that term will be given its ordinary meaning. *See Morris, supra; York Prods.*,

⁴ Appellants do not state in their brief (see page 4) whether the appealed claims do not "stand or fall together." Thus, we decide this appeal based on appealed claims 13 and 26. 37 CFR § 1.192(c)(7) (1995).

Inc. v. Central Tractor Farm & Family Ctr., 99 F.3d 1568, 1572-73, 40 USPQ2d 1619, 1622-23 (Fed. Cir. 1996) (“In this case, the patent discloses no novel use of claim words. Ordinarily, therefore, ‘substantially’ means ‘considerable in . . . extent,’ *American Heritage Dictionary Second College Edition* 1213 (2d ed. 1982), or ‘largely but not wholly that which is specified,’ *Webster’s Ninth New Collegiate Dictionary* 1176 (9th ed. 1983).”); *Seattle Box Co., Inc. v. Industrial Crating & Packing Inc.*, 731 F.2d 818, 826, 221 USPQ 568, 573-74 (Fed. Cir. 1984) (“Definiteness problems arise when words of degree are used. That some claim language may not be precise, however, does not automatically render a claim invalid. When a word of degree is used . . . [it] must [be determined] whether the patent’s specification provides some standard for measuring that degree.”); *In re Mattison*, 509 F.2d 563, 564-65, 184 USPQ 484, 486 (CCPA 1975).

Appellants contend in their brief (e.g., page 3, lines 6-7, page 4, lines 10-12, page 6, line 19, to page 7, line 2, page 9, lines 4-7, and page 11, lines 3-7) and reply brief (page 1, lines 10-13, page 2, lines 7-11, and page 11, line 1) and argued at hearing that the microgranulate inorganic pigment composition as claimed in claims 13 and 26 do not contain “organic liquefiers” and are derived from inorganic compounds. We cannot agree that these claims are so limited because each of these claims specifically provide that the claimed microgranulate inorganic pigment composition is “substantially free of organic liquefiers” and contains “one or more boron, aluminum, silicon, titanium, zinc and tin compounds.”

With respect to the first claim limitation, we find that the specification lists organic compounds known in the art to be “binder(s) for promoting dispersion of the pigment in concrete” and states that such “dispersing agents act as liquefiers in the concrete mixtures” (page 2, lines 23-38). There is no disclosure pertaining to such “liquefiers” in the written description of the invention disclosed in the specification. Thus, in the absence of guidance in the form of a definition or some standard of measurement by which to determine the extent to which the microgranulate inorganic pigment composition is “substantially free of organic liquefiers,” we interpret this limitation in light of the ordinary meaning of the term “substantially” to specify that the microgranulate inorganic pigment composition is considerably but not wholly free of “organic liquefiers.”

We have considered appellants' argument, advanced at hearing, that our interpretation is precluded by the phrase "consisting essentially of" which appears as a transitional phrase in the preamble of claim 26, and in the second of several limitations defining the "microgranulates of pigments" in claim 13 wherein the subject limitation is the first of these limitations. We cannot agree with appellants because, in each instance, the limitation is expressly stated in a manner which clearly permits the presence of "organic liquefiers" and thus the inclusion of such ingredients is not a manner of whether they are excluded by the phrase "consisting essentially of" because they materially affect the basic and novel characteristics of the microgranulates.

We interpret the phrase "boron, aluminum, silicon, titanium, zinc and tin compounds" in light of the plain claim language "calculated as oxide" and the disclosure at page 4, lines 2-10, of the specification, to include any matter of oxide compounds of these elements and any manner of organic compound derived from each of these elements which would give rise to such oxide compounds.

Accordingly, contrary to appellants' arguments, the appealed claims read on microgranulate pigment compositions containing organic compounds and methods of using such compositions.

Turning now to the ground of rejection advanced by the examiner on appeal, we initially find that the record of before us is materially different from the record in Appeal No. 93-3107 (*see above* note 1) and therefore the finding of a *prima facie* case of obviousness in the prior decision does not carry forward (see answer, page 8 first paragraph, and page 15), thus requiring the examiner to make out a separate *prima facie* case on the current record. *See In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976) ("The Board erred in adopting the earlier opinion. The basis for evaluation and for decision had changed. The present board had before it not only the application and the prior art but all of the unrebutted facts established in Rinehart's affidavit. At that stage no question of *prima facie* obviousness remains. The appealed claims must be reconsidered in the light of all of the evidence, and the resultant finding, that the claimed invention would or would not have been obvious, is to be made in such light."). We find that there are a number of differences between the present and prior appealed claims, e.g., the Markush grouping of inorganic pigments and the smaller weight percent range of the "one or more boron, aluminum, silicon, titanium, zinc and tin compounds," and the requirements that the microgranulates are "sufficiently unstable to shearing forces such that they break

down and disperse” in the building material when subjected to shearing forces during mixing, and that there is newly submitted evidence in the two Linde declarations under 37 CFR § 1.132.⁵

Accordingly, the issue in this appeal is whether, on this record, the examiner has established that, *prima facie*, the combined teachings of the applied prior art as a whole would have provided one of ordinary skill in this art with some objective teaching, suggestion or motivation in the applied prior art taken as a whole and/or knowledge generally available to one of ordinary skill in the art would have led that person to the claimed invention as a whole, including each and every limitation of the claims, without recourse to the teachings in appellants’ disclosure. In considering this matter, we were mindful that

[t]he extent to which such suggestion [to select elements of various teachings in order to form the claimed invention] must be explicit in, or may be fairly inferred from, the references, is decided on the facts of each case, in light of the prior art and its relationship to the applicant’s invention.

In re Gorman, 933 F.2d 982, 986-87, 18 USPQ2d 1885, 1888-89 (Fed. Cir. 1991); *see also, e.g., Pro-Mold & Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573, 37 USPQ 1626, 1629-30 (Fed. Cir. 1996) (“In this case, the reason to combine [the references] arose from the very nature of the subject matter involved, the size of the card intended to be enclosed.”); *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991) (“Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant’s disclosure.”); *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) (“The consistent criterion for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this process should be carried out and would have reasonable likelihood of success, viewed in the light of the prior art.”); *In re Sovish*, 769 F.2d 738, 742-43, 226 USPQ 771, 773-74 (Fed. Cir. 1985) (In evaluating the relevance of the various teachings of a reference, skill must be presumed on the part of those of ordinary skill in this art.); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must

⁵ The first Linde declaration (Linde I) was filed in parent application 08/310,625 on October 11, 1994 (Paper No. 2) and the second Linde declaration (Linde II) was filed in the present application on July 10, 1995 (Paper No. 14).

be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *In re Boesch*, 617 F.2d 272, 275-76, 205 USPQ 215, 218-19 (CCPA 1980), and cases cited therein (The “discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art.”).

We have carefully considered the examiner’s application of prior art to the claimed microgranulate inorganic pigment compositions and the processes using the same encompassed by claims 13 and 26, as we have interpreted above, on the record as we find it in light of the examiner’s position that the combined teachings of Jungk and the other applied prior art would have led one of ordinary skill in this art “to have substituted the inorganic sodium silicate binders of the secondary references [for the organic binders] in the production of Jungk’s microgranulates . . . [because the inorganic] binder . . . promotes the dispersion of the pigments in the concrete,” since the substitution of “the inorganic sodium silicate binders of the secondary references” for the organic binders of Jungk amounts to the obvious omission of the organic binders and its function that are not needed for the pigment granules disclosed in that reference (answer, pages 5, second and third paragraphs, and page 6, first paragraph; see also, e.g., page 8, second and third paragraphs, page 10, first paragraph).

Viewed from another perspective, it appears that the examiner’s position (answer, e.g., page 9, last full sentence) is that, *prima facie*, one of ordinary skill in this art would have found in the combined teachings of the applied references the suggestion to combine inorganic pigments known to be useful in colouring concrete with sodium silicate to obtain a microgranulate pigment composition that can be used in a process of colouring concrete, because Jungk discloses the use of binders to promote dispersing the pigment in the concrete and the other references establish that sodium silicate is recognized in a variety of arts as a binder for inorganic materials, including such inorganic pigments, that are formed into granulates for dispersion in a variety of aqueous and non-aqueous media which are used for different purposes, in the reasonable expectation of arriving at the claimed invention wherein the sodium silicate is present in the microgranulate in the amount specified and the microgranulate will break down and disperse the pigment in the particulate building material.

We have considered the specific teachings and the inferences one of ordinary skill in this art would reasonably have been expected to draw from the teachings of each of the applied references, in light of the arguments with respect to such teachings advanced by appellants and the examiner. *See In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968). We find that one of ordinary skill in this art would have found in Jungk the clear teaching that the pigment granules must contain “one or more binders for promoting the dispersing of the pigment in cement” (col. 2, lines 55-57) and would have reasonably inferred from the listing of commercially available binders in the reference (col. 3, lines 33-51; see also Jungk Examples) that the same are all *organic* compounds, including the “other polyhydroxy compounds which are innocuous to the concrete,” which are useful for such purpose. Thus, contrary to the examiner’s allegations (answer, e.g., pages 3-4), we find no specific suggestion in this listing or elsewhere in the reference to use an inorganic compound, including inorganic polyhydroxy compounds, such as provided by the soluble silicates of Weldes et al., as a binder. We further find that Jungk does disclose that the binders listed in the reference, including those identified as “liquefiers” in the present specification (page 2, lines 23-36), can be used in an amount of as low as 0.1 weight percent of the pigment granules and teaches that the granules can contain “optional other additives” (col. 4, lines 2 and 19-21). Therefore, at least some of the pigment granules taught by Jungk would be “substantially free of organic liquefiers,” as we have interpreted this claim limitation of claims 13 and 27 above, and can contain other, albeit unspecified, additional ingredients.

Accordingly, pigment granules taught by Jungk to disperse in cement and have particles sizes (see, e.g., Jungk Examples) falling within the claimed range, differ from the claimed microgranulate inorganic pigments in that there is no teaching, suggestion or motivation in the reference to add “one or more boron, aluminum, silicon, titanium, zinc and tin compounds” in the amount of “from about 0.05 to about 1 percent (%) by weight,” thereby providing microgranulates that are sufficiently unstable to the shearing forces of mixing with the particulate building materials so as to “break down and disperse” therein, as required by claims 13 and 26. Indeed, while the examiner alleges that Jungk would have suggested that any promoter can be present in an amount falling within the claimed range, he does not

explain why one of ordinary skill in this art would have recognized that the range disclosed for the organic binders would apply to undisclosed inorganic binders.

The other applied references would have reasonably taught one of ordinary skill in this art to use different amounts of sodium silicate as binders for, *inter alia*, cements, coating compositions, fertilizers, detergents and clays. The sole reference which discloses the use of sodium silicate with an inorganic pigment is 3M GB '259, wherein the reflective pigment particles, used in "liquid paint-like coating compositions,"⁶ are "clusters or agglomerates in the range of at least 2 microns in diameter up to 70 microns in diameter and consisting of an average size below 2 microns bound together by an inert transparent binder" and the "ordinary paint pigment of commerce" can be titanium dioxide that is "blended with sodium silicate solutions and atomized" in order to bond the particles together "in discrete crush-resistant" manner (e.g., page 1, line 44, to page 2, line 15). The pigment particles can be made weather resistant by treatment with an acid solution, and the resistance can be further increased by "firing at raised temperatures" (page 2, lines 15-21). In the reference Example, "twenty parts by weight of standard titanium dioxide pigment . . . [is] mixed with 25 parts by weight of sodium silicate," wherein the "tiny spherical clusters of the original smaller titanium dioxide particles [are] bonded together with sodium silicate," the particles being further treated with aqueous ammonium chloride, dried and fired at elevated temperatures "to obtain a mass of clusters in the size range of 2 microns up to about 40 microns" (page 2, lines 33-84). It is further disclosed in 3M GB '259 that other pigments may be used, including red iron oxide (page 2, lines 76-84). We find that the pigment particle size range disclosed in this reference overlaps with the claimed particle size range in claims 13 and 26, and that the amount of binder suggested by the reference in the Example to be necessary in order that the particles are resistant to crumbling, that is, crush-resistant when used in the paint-like compositions, is well above the claimed weight percent range in these claims.

In Ferrigno, alkali metal silicates bind anhydrous mineral pigment particles together for calcining (e.g., col. 4, lines 14-30). Thus, this reference teaches that the binder is used in amounts of 1 to 10

⁶ We find that 3M GB '259 (page 1, lines 20-29) cross references 3M GB '258 with respect to the use of "novel reflective pigment particles" in "liquid paint-like coating compositions," the latter reference (page 3, lines 37-79) in turn cross referencing the former.

percent (col. 4, lines 58-60) for the purposes of calcining particles containing anhydrous mineral pigment particles, none of which comprise iron, chromium, manganese or titanium oxides (e.g., col. 2, lines 22-62). Caswell would have disclosed that “colloidal silica” can be a binding agent in similar manner to “film-forming organic binders” and “various industrial gums, rubber latex, resins, starch, asphalt, coal and tar” in forming clay agglomerates, none of which are disclosed in Jungk. Sams teaches that hydrated, soluble alkali metal silicate can be used, *inter alia*, in “brick manufacture,” but there is no disclosure of a pigment. We find that the remaining references add little additional specific teachings to this record with respect to that which is known about alkali metal silicates as a binder for other purposes.

On this record, we cannot agree with the examiner that, *prima facie*, the combined teachings of these diverse references would have reasonably suggested to one of ordinary skill in this art, armed with the knowledge of the use of, *inter alia*, titanium dioxide and red iron oxides as pigments for colouring concrete, that such pigments, substantially free of organic liquefiers, can be combined with a binder, such as sodium silicate, in an amount to obtain microgranulates that break down and disperse in concrete when the particles have a particular average particle size, as specified in claims 13 and 26. *See, e.g., Gorman, supra; Keller, supra.* We find that 3M GB ‘259 constitutes the closest prior art with respect to the claimed microgranulate pigments of claim 26, and also with respect to the microgranulate pigments used in the process of colouring cement in claim 13. We agree with appellants (brief, page 12) that there is a significant difference between the claimed and reference pigment particles in the amount of the silicate employed. We find that the examiner has not provided an explanation why one of ordinary skill in this art would have modified the amount of silicate taught by 3M GB ‘259 in the context of using such a modified pigment particle for the purposes disclosed in this reference, separately or as combined with any other reference (see answer, pages 10-11). Indeed, as we found above, the examiner does not explain why one of ordinary skill in this art would have used any particular amount of sodium silicate as a binder based on the range of amounts of organic liquefiers disclosed by Jungk.

In this respect, we observe that the prior merits panel of this board found in Appeal No. 93-3107 that the pigment particles of 3M GB ‘259 “would obviously meet the needs of the pigment microgranules disclosed by Jungk prepared in essentially the same manner, especially in view of the

solubility of the sodium silicate in the water content of the moist concrete which would ‘certainly’ promote the dispersion of the pigment in the moist concrete during mixing (homogenization),” and that the “crush resistant” pigment particles of this reference would be expected to disperse the pigment in moist concrete due to the recognized “solubility of the sodium silicate in water” (pages 5-6).

Appellants have addressed this position by presenting evidence in Linde I that iron oxide red pigment bonded with the amount of sodium silicate and produced in the four different forms, that is, untreated and successively treated pigment particles, as taught in 3M GB ‘259 provides “virtually no tinting strength (Fig. 2/Encl. 3), in contrast to granules which are formed from iron oxide red with low contents (0.05% - 0.5%) of SiO₂ (Fig. 3/Encl. 4),” wherein Dr. Linde explains that “[i]n the sensitivity test the granulates display a high degree of hardness, which explains the reduction in tinting strength” (page 9; see brief, pages 13-15). Appellants further presented evidence in Linde II that water does not break apart the claimed microgranulate pigments while the microgranulate pigments of Jungk do break apart and disperse in water (¶¶ 7-11; see brief, page 15-16; see answer, pages 11-12).

Thus, the evidence now of record effectively rebuts the findings of the prior merits panel based on the record in Appeal No. 93-3107 and the examiner has not carried the burden of establishing a *prima facie* case of obviousness on the present record. *See Rinehart, supra*.

Accordingly, the decision of the examiner is reversed.

Other Issues

The examiner should consider the following issues in any further prosecution of the appealed claims. As we found above, appealed claims 13 and 26 both contain the limitation “substantially free of organic liquefiers” which we interpreted as specifying that the microgranulate inorganic pigment composition is considerably but not wholly free of “organic liquefiers.” As we further found above, appellants argue that their claimed invention is free of “organic liquefiers” as shown in their specification. This raises two issues.

First, since the claims clearly provide for microgranulate inorganic pigments that can contain some “organic liquefiers” which appellants do not regard to be within their claimed invention, do the appealed claims comply with 35 U.S.C. § 112, second paragraph (“... claiming the subject matter which the applicant regards as his invention.”)? It is well settled that applicants’ mere intent as to the

scope of the claimed invention does not so limit the scope of the claims which are otherwise definite when construed in light of the specification as it would be interpreted by one of ordinary skill in the art. *In re Cormany*, 476 F.2d 998, 1000-02, 177 USPQ 450, 451-53 (CCPA 1973). Any conflict between appellant's intended invention and the actual scope of the claims should be addressed under 35 U.S.C. § 112, second paragraph. *Id.*; *see also Zletz, supra; Prater*, 415 F.2d 1393 at 1404, 162 USPQ at 550.

And, second, since there is no disclosure pertaining to microgranulate inorganic pigments containing "organic liquefiers" in the written description of the invention disclosed in the specification, do the appealed claims comply with 35 U.S.C. § 112, first paragraph, written description requirement? *See generally, In re Wertheim*, 541 F.2d 257, 262, 264, 191 USPQ 90, 96, 98 (CCPA 1976).

Reversed

