

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RALPH KAULBACH,
FRIEDRICH KLOOS,
GERNOT LOHR, and
PETER STAMPRECH, Deceased

Appeal No. 2002-0184
Application No. 09/058,537

ON BRIEF

Before GARRIS, LIEBERMAN, and TIMM, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. §134 from the decision of the examiner refusing to allow claims 1 through 8 and 16 through 20 which are all the claims pending in this application other than claims 9 through 14 which stand withdrawn from consideration as directed to a non-elected invention.¹

¹Claim 15 has been cancelled.

THE INVENTION

The invention is directed to a mixture of thermoplastic polymers consisting essentially of tetrafluoroethylene units and specified amounts of perfluoroalkyl vinyl ether moieties. The mixture contains a mixture of a low molecular weight polymer together with a higher molecular weight polymer as determined by the melt flow indexes. A specified ratio of the melt flow index of the low molecular weight polymer to the higher molecular weight polymer is required by the claimed subject matter. Additional limitations are described in the following illustrative claims.

THE CLAIMS

Claims 1, 7 and 17 are illustrative of appellants' invention and are reproduced below.

1. A mixture of thermoplastic PFA fluoropolymers consisting essentially of units of tetrafluoroethylene, from 0.5 to 10 mol % of units of one or more perfluoro alkyl vinyl ethers having from 1 to 4 carbon atoms in the perfluoroalkyl radical and up to about 5 mol % of other fluoromonomers not containing hydrogen, the mixture comprising:

-at least 10 % by weight of the mixture and not more than 90 % by weight of the mixture of at least one component A) with a melt flow index (MFI_A) ≥ 30 g/10 min. and
- not more than 90 % by weight of the mixture and at least 10 % by weight of the mixture of at least one component B) with a melt flow index (MFI_B) ≤ 15 g/10 min.,

the components being selected in such a way that the ratio of MFI_A to MFI_B is in the range from 80 to 2500.

7. A mixture according to claim 17 wherein the ratio of the molecular weight of the high molecular weight component to the low molecular weight component is ≥ 3.5 .

17. A mixture of thermoplastic PFA fluoropolymer having high temperature stability comprising

A) A low molecular weight fluoropolymer consisting essentially of units of tetrafluoroethylene and from 0.5 to 10 mol % of units of one or more perfluoro alkyl vinyl ethers having from 1 to 4 carbon atoms in the perfluoroalkyl radical, and optionally up to 5 mol % of a third monomer not containing hydrogen, the low molecular weight monomer having a melt flow index of ≥ 30 g/10 min., and

B) A high molecular weight fluoropolymer consisting essentially of units of tetrafluoroethylene and from 0.5 to 10 mol % of units of one or more perfluoro alkyl vinyl ethers having from 1 to 4 carbon atoms in the perfluoroalkyl radical, and optionally up to 5 mol % of a third monomer not containing hydrogen, the high molecular weight monomer having a melt flow index of ≤ 15 g/10 min.,

wherein the ratio of the melt flow index of the low molecular weight fluoropolymer to the melt flow index of the high molecular weight fluoropolymer is in the range of from 80 to 2500, and wherein the low molecular weight fluoropolymer is at least 10% by weight of the mixture and not more than 90% by weight of the mixture.

THE REFERENCES OF RECORD

As evidence of anticipation and obviousness, the examiner relies upon the following references:

Nakagawa et al. (Nakagawa)	4,552,925	Nov. 12, 1985
Ishiwari et al. (EP'868)	O 362868 B1	Apr. 11, 1990

Hintzer et al., "Melt Processable Tetrafluoroethylene-Perfluoropropylvinyl Ether Copolymers (PFA)" Modern Fluoropolymers, Scheirs, ed., John Wiley & Sons, New York, pp. 223-237 (1997) (hereinafter Scheirs).

THE REJECTIONS

Claims 1 through 8 and 16 through 20 stand rejected under 35 U. S. C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Claims 7 through 8 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants' regard as the invention.

Claims 1 through 5, 7 through 8, 15 through 17 stand rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over EP'868 in view of Admissions by Appellant².

Claims 1 through 5, 7 through 8, and 15 through 17 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Nakagawa in view of Admissions by Appellant.

²Although the statement of the rejection fails to identify which sections of the specification are relied upon as constituting Admissions by the Appellant, it is apparent that the examiner refers to the description at page 7, lines 1-2. See Answer, page 4.

Claims 1 through 8 and 15 through 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Scheirs in view of Nakagawa, in view of Admissions by Appellant.

Claim 6 and 8 through 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over EP'868 in view of Admissions by Appellant or Nakagawa, in view of Admissions by Appellant and further in view of Scheirs.

OPINION

We have carefully considered all of the arguments advanced by the appellants and the examiner and agree with the appellants that the rejections of the claims under §§ 102(b), 103(a) and 112 are not well founded. Accordingly, we reverse each of the rejections for the reasons discussed herein.

The Rejections under § 112

Any analysis of the claims for compliance with 35 U.S.C. §112 should start with the second paragraph, then proceed with the first paragraph. In re Angstadt, 537 F.2d 498, 501, 190 USPQ 214, 217 (CCPA 1976). "The legal standard for definiteness [under the second paragraph of 35 U.S.C. § 112] is whether a claim reasonably apprises those of ordinary skill in the art of its scope." In re Warmerdam, 33 F.3d 1354, 1361,

31 USPQ2d 1754, 1759 (Fed. Cir. 1994). The inquiry is to determine whether the claim sets out and circumscribes a particular area with a reasonable degree of precision and particularity. The definiteness of the language employed in a claim must be analyzed not in a vacuum, but in light of the teachings of the particular application. In re Moore, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971).

It is the examiner's position that the claimed subject matter is indefinite in that the term, "the ratio of the molecular weight of the high molecular weight component to the low molecular weight component is ≥ 3.5 " is vague and indefinite, as "it is not known what type of molecular weight is being referenced. See claim 7 and Answer, page 3. We disagree with the examiner's position. A ratio of molecular weights is a unit-less number. Regardless whether one uses weight average or number average molecular weight, the ratio of the molecular weights is a pure number. Accordingly, the examiner is in effect objecting to the breadth of the claim in that it encompasses all molecular weight units. However, it is well settled that breadth does not necessarily render a claim indefinite and the examiner has stated no other ground of rejection. Id. In re Gardner, 427 F.2d 786, 788, 166 USPQ 138, 140 (CCPA 1970) ("Breadth is not indefiniteness."); In re Borkowski, 422 F.2d 904, 909, 164 USPQ 642, 645-46 (CCPA 1970).

Based upon the above findings and analysis, the rejection of the examiner under § 112, second paragraph is not sustainable.

With respect to the rejection under the first paragraph of § 112, it is well settled that a specification complies with the 35 U.S.C. § 112, first paragraph, written description requirement if it conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, the inventor was in possession of the invention. See Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991); In re Kaslow, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983); In re Edwards, 568 F.2d 1349, 1351-52, 196 USPQ 465, 467 (CCPA 1978); In re Wertheim, 541 F.2d 257, 262, 191 USPQ 90, 96 (CCPA 1976).

There are two issues raised by the examiner. The first is that there is no basis for the transitional phrase, “consisting essentially of.” Nonetheless, the examiner encourages the appellants to remove the term “essentially” from the phrase, “consisting essentially of.” This would appear in and of itself to be a contradiction. If there is no basis for the first transitional phrase, it would appear that there is no basis for the second. Furthermore, the language of the original claims and the specification in its description of the thermoplastic fluoropolymer utilized the transitional phrase, “essentially comprising.” See original claim 1 and specification, page 3, lines 11-15. We find that the appellants intend to include small amounts of other fluoromonomers. See specification, page 3, lines 11-15. Accordingly, in view of the original language in the specification and the definition thereof, the term, “consisting essentially of” is entirely appropriate to describe the claimed fluoropolymer mixture.

The second issue raised by the examiner concerns the weight ratio of the high and low molecular weight components as stated in the claimed subject matter. It is the examiner's position that, "[a]s the mixture claimed only comprises 'components A) and B)', other components of unspecified amounts are permitted in the mixture as claimed." See Answer, page 3.

Initially, the specification provides that, "the present invention provides shaped articles comprising the mixture." See specification, page 4, lines 13-14. Emphasis ours. Accordingly, it is the clear intent of the appellants to permit the presence of other components. Furthermore as claimed, each of the low molecular weight and high molecular weight components must be present in an amount of at least 10% by weight. As such we conclude that the proportions of each of the low molecular weight and high molecular weight component necessarily must fall within the scope of the disclosure which requires that, "[t]he ratio is generally from 10:90 to 90:10." See specification, page 3, lines 18-20. Accordingly, the rejection of the examiner is not sustainable.

The Rejection over Prior Art

"[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability." See In re Oetiker, 977 F.2d

1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). The claimed subject matter before us contains the limitation that the low molecular weight and the high molecular weight component are chosen in such a manner, “that the ratio of MFI_A to MFI_B is in the range from 80 to 2500.” See claim 1. Claim 17 essentially contains the same limitation. The written phrase states, “wherein the ratio of the melt flow index of the low molecular weight fluoropolymer to the melt flow index of the high molecular weight fluoropolymer is in the range of from 80 to 2500.” It is the examiner’s position that this condition is met by each of the rejections. We disagree.

The Rejection over EP’868 and Admissions of Appellant

EP’868 discloses a resin composition comprising at least two tetrafluoroethylene fluorovinyl ether polymers each of which has a different molecular weight distribution in proportions required by the claimed subject matter. See column 1, lines 10-13, and line 50 to column 2, line 33. We find that the lower molecular weight fluoropolymer has a melt viscosity at 380° C of 5,000 to 200,000 poise and the higher molecular weight fluoropolymer has a melt viscosity at 380° C of 25,000 to 300,000 poise. See column 2, lines 34 to 57. We find that the utilization of higher melt viscosities for the higher molecular weight material confers no additional benefits and the utilization of a material having a melt viscosity of less than 5,000 poise results in mechanical properties which are not good. *Id.*

It is the examiner's position that, "[t]he high molecular weight material would be expected to have an MFI significantly overlapping the $MFI_B \leq 15$ g/10 min of the instant claims and a melt viscosity of 300,000 poise would have an MFI of less than 1.6 g/10 min." See Answer pages 4 and 5. Having carefully reviewed the examiner's argument, we conclude that there is no evidence based upon the argument present in the Answer, that the ratio of a 300,000 poise polymer to a 5,000 poise melt viscosity polymer would have a melt flow index within the range of 80 to 2500 as required by the claimed subject matter. Finally we do not see the relevance of the Admissions by Appellant in that they do not provide for the deficiencies in the disclosure and teachings of EP'868. Accordingly, neither the rejection on the grounds of anticipation nor obviousness is sustainable.

The Rejection over Nakagawa and Admissions of Appellant

Nakagawa is directed to a mixture of tetrafluoroethylene/hexafluoropropylene copolymers, wherein 10 to 70% of a first copolymers has a specific melt viscosity at 380°C of from 100×10^4 to $1,000 \times 10^4$ Poise and the second polymer having the same composition has a specific melt viscosity of 0.1×10^4 to 60×10^4 Poise. See column 2, lines 1-15 and claim 1. Furthermore, each polymer present in the mixture of polymers may contain a limited number of third monomers which include perfluorovinyl ethers among a limited number of monomers in amounts of not more than 5% by weight. See column 4, lines 4-19.

The examiner relies on Examples 1 and 2 which have melt viscosities allegedly resulting in melt viscosity ratios and a melt viscosity index that fall within the scope of the claimed subject matter. See Answer, page 5. We disagree. Neither the copolymers of Example 1 nor 2 fall within the scope of the claimed subject matter. There is no perfluoroalkylvinyl ether present in any of the copolymers prepared in Examples 1 or 2. Furthermore, the hexafluoropropylene content of each of the examples is 12.5%. In contrast the claimed subject matter specifically limits the amount of a third monomer to, "up to 5 mol% of other fluoromonomers not containing hydrogen." Accordingly, the results relied upon by the examiner in Examples 1 and 2 are outside the scope of the claimed subject matter and fail to reflect the required melt flow index of from 80 to 2500 as required by the claimed subject matter. Stated otherwise, there is no reason to believe that the same results would have been obtained were polymers to have been prepared within the scope of the claimed subject matter. We conclude that the examiner has been picking and choosing from unrelated parts of the Nakagawa references. Accordingly, the rejection of the claimed subject matter over Nakagawa is not sustainable.

The Rejection Over Scheirs in view of Nakagawa and Admissions of Appellant

The examiner finds that Scheirs discloses that melt processable tetrafluoroethylene/fluorovinyl ether copolymer, preferably containing 1-5 mole % of the elected species of a perfluorovinyl ether is known (page 223, 1st paragraph). It is also

taught that it is necessary to tailor the MWD in order to improve processing properties such as high extrusion rates by broadening the MWD (page 229, last paragraph and page 234 2nd full paragraph). However, Scheirs is deficient in not teaching methods of broadening the MWD or specific molecular weight, viscosity, or melt flow characteristics of composition with a broadened MWD.

The examiner accordingly relies upon the teachings of Nakagawa as discussed supra to provide the requisite molecular weight distribution and accordingly, apply the teachings of Nakagawa to Scheirs to achieve improved extrudability. See Answer, page 6.

As discussed above however, Nakagawa's examples are directed to polymers other than those required by the claimed subject matter and we have concluded that there is no reason to believe that the requisite melt flow ratio index of 80 to 2500 required by the claimed subject matter would have been achieved had the appellants actually prepared the polymers of the claimed subject matter. Accordingly, the rejection of the claimed subject matter over Scheirs in view of Nakagawa and the Admissions of Appellant are not sustainable for the same reasons applied to the rejection of Nakagawa in view of the Admissions of Appellant.

The Rejection Over EP'868 in view of Admissions by Appellant or Nakagawa, in view of Admissions by Appellant and further in view of Scheirs

Finally, we shall not sustain the above rejection as none of references, each of which has been fully discussed supra teaches, discloses or suggests the requisite melt flow index ratio of 80 to 2500 as required by the claimed subject matter.

DECISION

The rejection of claims 1 through 8 and 16 through 20 under 35 U. S. C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention is reversed.

The rejection of claims 7 through 8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants' regard as the invention is reversed.

The rejection of claims 1 through 5, 7 through 8, 15 through 17 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over EP'868 in view of Admissions by Appellant is reversed.

The rejection of claims 1 through 5, 7 through 8, and 15 through 17 under 35 U.S.C. §103(a) as being unpatentable over Nakagawa in view of Admissions by Appellant is reversed.

The rejection of claims 1 through 8 and 15 through 20 under 35 U.S.C. §103(a) as being unpatentable over Scheirs in view of Nakagawa, in view of Admissions by Appellant is reversed.

The rejection of claims 6 and 8 through 20 under 35 U.S.C. §103(a) as being unpatentable over EP'868 in view of Admissions by Appellant or Nakagawa, in view of Admissions by Appellant and further in view of Scheirs is reversed.

The decision of the examiner is reversed.

REVERSED

BRADLEY R. GARRIS
Administrative Patent Judge

PAUL LIEBERMAN
Administrative Patent Judge

CATHERINE TIMM
Administrative Patent Judge

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