

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(2) is not binding precedent of the Board.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. 19

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RICHARD K. STUART, JR.
and RANDAL R. FORD

Appeal No. 1997-0581
Application 08/168,549¹

ON BRIEF

Before KIMLIN, PAK, and LIEBERMAN, Administrative Patent
Judges.

PAK, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final
rejection of claims 1 through 13 which are all of the claims

¹ Application for patent filed December 16, 1993.

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pending in the application. Claims 14 through 20 were canceled subsequent to the final Office action dated November 23, 1994.

Appellants state that only claims 11, 12 and 13 do not stand or fall with independent claim 1. See Brief, page 6. Therefore, for purposes of this appeal, we need only consider the propriety of the examiner's rejections of claims 1, 11, 12 and 13 consistent with 37 CFR § 1.192(c)(7) and (c)(8)(1995). Claims 1, 11, 12 and 13 are reproduced below:

1. A process for the production of low molecular weight grafted polyolefins comprising;

(a) mixing, at an elevated temperature of about 160 to 300EC, in an extruder equipped with an outlet pressure control device about 0.1 to 20 weight percent of a free radical initiator, about 0.1 to 30 weight percent of an ethylenically unsaturated polycarboxylic acid, anhydride, or ester thereof, and the remainder of a polyolefin containing at least 93 weight percent C3-C10 olefins, wherein said elevated temperature is higher than the atmospheric boiling point of at least one of the components thereby producing an elevated pressure in said extruder of at least 30 psig, and

(b) extruding the resulting molten grafted polyolefin having a viscosity of less than 3,000 cP at 190EC.

11. The process according to Claim 1 wherein said molten grafted polyolefin has a viscosity less than 2,000 cP at 190EC.

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12. The process according to Claim 1 wherein said pressure is about 75 to 200 psig.

13. The process according to Claim 1 wherein said grafted polyolefin is grafted with maleic anhydride to greater than 5 weight percent to an acid number greater than 28.

As evidence of obviousness, the examiner relies on the following prior art:

Knowles et al. (Knowles)	3,642,722	Feb.
15, 1972 Skidmore	3,742,093	
Jun. 26, 1973 ²		
Stuart, Jr. et al. (Stuart)	4,719,260	Jan. 12,
1988		
Strait et al. (Strait)	4,762,890	Aug. 9,
1988		
Kelusky	5,137,975	Aug. 11,
1992		

The appealed claims stand rejected as follows³:

- (1) Claims 1 through 13 under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 1 through 13 of copending Application 08/168,560;
- (2) Claims 1 through 12 under 35 U.S.C. § 103 as unpatentable over the disclosure of Strait or Kelusky; and

² According to the examiner (Answer, page 3), Skidmore is part of the Kelusky disclosure. It is cited to explain the content of the Kelusky reference. *Id.*

³ The examiner withdrew all of the § 103 rejections based on Toyoshima or Olivier, as well as the § 112 rejection, in the final Office action. See Answer, page 2.

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(3) Claim 13 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of one of Strait and Kelusky and one of Knowles and Stuart.

We have carefully reviewed the claims, specification and applied prior art, including all of the arguments and evidence advanced by both the examiner and appellants in support of their respective positions. This review leads us to conclude that only the examiner's § 103 rejection of claims 1 through 12 over the disclosure of Strait or Kelusky is well founded. Accordingly, we will sustain only this rejection.

We turn first to the examiner's rejection of claims 1 through 13 under the judicially created doctrine of obviousness-type double patenting as unpatentable over claims 1 through 13 of Application 08/168,560. We determine that this obviousness-type double patenting rejection is moot since Application 08/168,560 is no longer pending.

We turn next to the examiner's rejection of claims 1 through 12 under 35 U.S.C. § 103 as unpatentable over the disclosure of Strait or Kelusky. We will sustain this rejection for essentially those findings of fact and

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conclusions set forth at pages 5 through 9 of the Answer. We add the following primarily for emphasis and completeness.

The examiner finds (Answer, pages 5 and 6) that:

Either Strait or Kelusky discloses a process occurring in an extruder (col. 1, line 44 of Strait and Example 1 at col. 6 of Kelusky) whereby a derivative of an ethylenically unsaturated polycarboxylic acid such as maleic anhydride is grafted upon a polyolefin such as a copolymer of ethylene (see col. 2, lines 22-23 and 33 of Strait) or a copolymer of propylene (see col. 3, lines 7-12 and col. 2, line 54 of Kelusky) in the presence of a free-radical initiator (see col. 2, line 33 of Strait and col. 2, line 32 of Kelusky) followed by extrusion of the grafted product (col. 4, line 61 of Strait and col. 5, line 58 of Kelusky). Note should be made of the fact that the initiator can be fed in a solvent as disclosed by Strait at col. 2, lines 56-57. Attention is drawn to col. 4, lines 14 and 44 of Kelusky which discloses the amounts of grafting monomer and peroxide initiator to be 0.01-5 wt% and 0.01-1 wt%, respectively, by weight of polymer. Particular note should be made of col. 2, line 65 over to col. 3, line 7 of Strait and of Examples 1-2 in col. 4 therein and of col. 4, line 64 over to col. 5, line 8 of Kelusky which teach that the grafting process takes place under melt process conditions *viz.* at a temperature \geq the melting point of the (polyolefin) polymer. Since the melting point of polyethylene is 130-145°C and that of polypropylene is 189°C it is evident that the reference process occurs at a temperature which overlaps the presently claimed temperature range.

Appellants state (Reply Brief, page 2) that:

Again, appellants do not dispute the fact that Strait et al. and Kelusky disclose an extrusion grafting process, as explained in detail by the

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Examiner. Additionally, appellants do not dispute that the polymers of Strait et al. and Kelusky have a certain melting point.

Rather, appellants argue that neither Strait nor Kelusky discloses or would have suggested the claimed elevated pressure. See, e.g., Reply Brief, page 2. However, the examiner correctly finds that the plain language of claim 1 indicates that the claimed elevated pressure is dependent on the temperature utilized (the claimed temperature). See Answer, pages 7 and 8 and Supplemental Answer, page 1. Since appellants do not dispute that both Strait and Kelusky teach the claimed temperature, we agree with the examiner that both Strait and Kelusky necessarily employ the pressure recited in claims 1 and 11 in their extrusion grafting process. Appellants have not supplied any scientific reasoning or evidence to contradict this fact finding.

Even if, assuming arguendo, the claimed pressure is not necessarily employed in the extrusion grafting process of either Strait or Kelusky, our conclusion would not be altered. Inasmuch as the applied prior art as a whole (e.g., Strait, column 1, lines 14-16) recognizes a pressure condition as a result effective variable, we find that one of ordinary skill

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in the art would have been led to determine the optimum or workable pressure condition, such as that claimed, with a reasonable expectation of successfully carrying out the extrusion grafting process of either Strait or Kelusky. **See *In re Boesch***, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980)(the "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art"). In reaching this conclusion, we note that contrary to appellants' assertion at page 2 of the Reply Brief, claim 1 does not require that the claimed elevated pressure be extended to the outlet of the extruder. **See *In re Morris***, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997) (in prosecution of patent applications, words in the claims are given the broadest reasonable interpretation in light of the specification).

Appellants also argue that neither Strait nor Kelusky discloses or would have suggested the claimed viscosity. See, e.g., Reply Brief, page 2. However, the examiner finds that the melt flow index described in, for example, Kelusky, when calculated to a viscosity at a temperature of 190°C and a pressure of 2160 gram, corresponds to the claimed viscosity.

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Appellants do not specifically point to any error in the examiner's calculation. Rather, appellants refer to a chart relating to the relationship between melt flow index and viscosity for epolene waxes. For the reasons indicated at page 2 of the Supplemental Answer, we agree with the examiner that appellants have not demonstrated that the specific low molecular weight grafted polyolefins produced in the extrusion grafting process of either Strait or Kelusky do not necessarily have a viscosity less than 3000 cP or 2000 cP at 190°C as required by claims 1 and 11, respectively. In this regard, we note that the comparative examples in the specification supposedly representative of prior art grafting processes produce grafted polyolefins having a viscosity of less than 3000 cP and 2000 cP at 190°C as required by the claims. See all of the comparative examples at pages 10-14 of the specification.

Further, appellants argue that "[u]nexpected results are clearly set forth throughout the Examples, particularly viewing the paired Examples 4-5, 7-8, and 9-10, each without pressure and with pressure." See, e.g., Brief, page 9. However, appellants have not satisfied their burden of

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providing an adequate explanation of the extensive data presented in the examples of the specification. It is not within the Board's province to ferret out appropriate data from the examples in the specification to support a conclusion of unexpected results. **See *In re Borkowski***, 505 F.2d 713, 719, 184 USPQ 29, 33 (CCPA 1974).

In addition, appellants have not demonstrated that the showing in the examples is reasonably commensurate in scope with the degree of protection sought by the appealed claims. ***In re Greenfield***, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978). While the showing is limited to feeding particular reactants at particular rates to different specific temperature zones of a particularly sized co-rotating twin-screw extruder having particular rotating speeds and the particular back pressure (150 psi), the appealed claims are not so limited. Appellants have not shown that the alleged improvements applicable to this limited showing can be reasonably extrapolated to support the claimed subject matter involving materially different process conditions, such as temperature, pressure, feeding and screw rotating conditions, than those exemplified in the showing. Note that appellants

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bear the burden of establishing unexpected results. **See In re Klosak**, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972); **In re Heyna**, 360 F.2d 222, 228, 149 USPQ 692, 697 (CCPA 1966).

Thus, having considered all of the evidence proffered by both the examiner and appellants, we find that the evidence of obviousness, on balance, outweighs the evidence of unobviousness. **In re Rijckaert**, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). Hence, we agree with the examiner that the subject matter defined by claims 1 through 12 would have been obvious to one of ordinary skill in the art in view of the applied prior art. Accordingly, we affirm the examiner's decision rejecting claims 1 through 12 under 35 U.S.C. § 103 over either Strait or Kelusky.

We turn next to the rejection of claim 13 under 35 U.S.C. § 103 as unpatentable over the combined disclosures of one of Strait and Kelusky and one of Knowles and Stuart. Claim 13, unlike claims 1, 11 and 12, requires that the finally grafted copolymer has greater than five weight percent of grafted maleic anhydride and an acid number greater than twenty eight. However, as acknowledged by the examiner, "Strait discloses that upto [sic] 2 wt% of maleic anhydride is grafted (col. 3,

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line 35) and Kelusky's Examples teach 0.25-0.36 wt% of grafted monomer...". See Answer, page 10. Notwithstanding silence regarding the claimed grafted copolymer having greater than five weight percent of grafted maleic anhydride and an acid number greater than twenty eight, the examiner asserts (Answer, page 10) that:

In particular if one of ordinary skill were, for instance, willing to tolerate a greater degree of crosslinking than that taught by Strait (cf. col. 3, lines 39-40) or desired to obtain an end-product most suitable for a particular application then the motivation to control the acid number, i.e. the amount of grafted acid or acid derivative monomer, is disclosed by either Knowles at col. 5, lines 25-37 or Stuart at col. 3, lines 28-48 according to which the acid number of the grafted polymer is generally determined by the end-use requirements of the polymer (such as formation of stable emulsions and utility in inks and coatings) and is controlled by such reaction parameters as efficient mixing of the reaction mixture, temperature and choice of catalyst.

However, the fatal flaw in the examiner's assertion is that none of the applied prior art recognizes methods by which the claimed grafted copolymer can be produced. Although the examiner has attempted to fill in this gap by alleging the need for tolerating a greater degree of crosslinking than that taught by the applied prior art (*Id.*), the examiner has supplied no evidence that one of ordinary skill in the art is

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aware of the types of reaction conditions that can be manipulated to form the claimed grafted copolymer, without adversely affecting the desired properties of the resulting product. Hence, we determine that the applied prior art as a whole would not have suggested the claimed process useful for forming the claimed grafted copolymer. Accordingly, we reverse the examiner's decision rejecting claim 13 under 35 U.S.C. § 103.

In view of the foregoing, the decision of the examiner is affirmed-in-part.

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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)	
)	
)	
	Chung K. Pak)	BOARD OF
PATENT	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
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