

*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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* NAOKI IKEDA, MASAFUMI YOSHIMURA,  
KAZUAKI MIZOGUCHI, HIROSHI KITAGAWA,  
YUJI KAWASHIMA, KIYOSHI SADAMITSU  
and YASUYUKI KAWAHARA

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Appeal No. 1996-1372  
Application No. 08/003,659<sup>1</sup>

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HEARD: June 10, 1999

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Before KIMLIN, GARRIS, and SPIEGEL, *Administrative Patent Judges*.  
SPIEGEL, *Administrative Patent Judge*.

*DECISION ON APPEAL*

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 10 and 12 through 22, which are all of the claims pending in this application. Claims 1, 21 and 22 are illustrative and a copy of these claims are appended to this decision.

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<sup>1</sup> Application for patent filed January 13, 1993.

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The reference relied on by the examiner is:

European Patent		
Shibuya et al. (Shibuya)	263 678	April 4, 1988

A reference relied on by appellants (brief, page 2) is:

Shi et al. (Shi), "Effect of  $\beta$ -nucleator content on the crystallization and melting behaviour of  $\beta$ -crystalline phase polypropylene," 205 *Thermochimica Acta* 235-243 (1992).

Claims 1-10 and 12-22 stand rejected under 35 U.S.C. § 103 as being unpatentable over Shibuya. We AFFIRM-IN-PART.

In reaching our decision in this appeal we have given careful consideration to the appellants' specification and claims and to the respective positions articulated by the appellants and the examiner. We make reference to the examiner's answer (Paper No. 21, mailed August 3, 1995) for the examiner's reasoning in support of the rejections and to the appellants' brief (Paper No. 22, filed August 7, 1995) and declaratory evidence (IKEDA Declaration, Paper No. 11, filed June 22, 1994) for the appellants' arguments thereagainst.

According to appellants, the claims are grouped as follows: (I) composition claims 1-10, (II) method claims 22 and 12-20 and (III) compound claim 21 (brief, page 3). Therefore, we decide this appeal on the basis of claims 1, 22 and 21. 37 C.F.R. § 1.192(c)(5)(1993).

*OPINION*

According to Shibuya, polyolefins (e.g., polypropylene) are inexpensive, have excellent molding properties, toughness, resistance to water, organic solvents and chemicals, and low specific viscosity but have insufficient heat resistance; whereas, polyphenylene ether resins have excellent heat resistance but unsatisfactory molding properties and solvent resistance (page 2, lines 10-19). Therefore, blends of polyolefins and polyethylene ether resins have been proposed which compensate for the respective disadvantages while retaining the respective advantages inherent in each (page 2, lines 20-47). Shibuya discloses a resin blend which “exhibits well-balanced mechanical strength properties, solvent resistance, and molding properties at relatively high levels” (page 2, lines 49-50) obtained “by compounding a hydrogenated block copolymer of an alkenyl aromatic compound and a conjugated diene having properties of specific ranges with a combination of a polyphenylene ether resin and a crystalline polyolefin” (page 2, lines 53-57). Shibuya’s blended resin composition comprises (a) from 20 to 80%, most preferably from 33 to 55%, by weight of a polyolefin, preferably a crystalline polypropylene resin, (b) from 20 to 80%, most preferably 35 to 53%, by weight of a polyphenylene ether resin, (c) from 4 to 50%, most preferably from 10 to 20%, by weight of a hydrogenated alkenyl aromatic compound/conjugated diene block copolymer and, optionally, (d) from 0.05 to 30 parts, most preferably from 2 to 15 parts, by weight of the total amount of the components (a), (b) and (c), a diamide compound of formula



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wherein  $R^{10}$  is a straight or branched chain and saturated or unsaturated acyclic hydrocarbon residue having from 1 to 10 carbon atoms, an alicyclic hydrocarbon residue or an aromatic hydrocarbon residue, or the derivative thereof; and  $R^{11}$  and  $R^{12}$ , which may be the same or different, is a straight or branched chain and saturated or unsaturated acyclic hydrocarbon residue having from 1 to 10 carbon atoms, an alicyclic hydrocarbon residue or an aromatic hydrocarbon residue, or a derivative thereof (page 6, line 48 - page 8, line 2). Diamide compounds of formula (D-1), e.g., adipic acid dianilide and itaconic acid dianilide, are preferred (page 7, lines 44-45). Using less than 20% by weight polyphenylene ether resin (b) or less than 4% by weight of the hydrogenated alkenyl aromatic compound/conjugated diene block copolymer (c) reduces organic solvent resistance and impact strength, respectively, to unsatisfactory levels (page 7, lines 53-63).*I. Composition claims*

Claim 1 recites a crystalline polypropylene resin *consisting essentially of* crystalline propylene resin and a specified diamide  $\beta$ -nucleating agent. According to the examiner, it would have been obvious "to eliminate any of the resinous components of the blend [of Shibuya]... if the concurrent mechanical properties associated therewith were not desired" (answer, page 3).

However, based on the resin described by Shibuya, a person having ordinary skill in the art would not have had any reason or motivation to prepare a resin composition according to Shibuya which does not

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contain polyphenylene ether resin and/or hydrogenated alkenyl aromatic compound/conjugated diene block copolymer. There is no suggestion or disclosure in Shibuya to make a Shibuya resin composition without polyphenylene ether and/or hydrogenated alkenyl aromatic compound/conjugated diene block copolymer.

Further, as noted by appellants, claim 1 contains the language “consisting essentially of.” The claim phrase “consisting essentially of” excludes ingredients that would “materially affect the basic and novel characteristics” of the claimed composition. *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463. In construing the phrase “consisting essentially of” in claims, it is necessary and proper to determine whether the specification reasonably supports a construction that would include additives described in a reference but not required by the claims. We also find it helpful in this appeal to consult the prosecution history.

Reviewing the specification, we find that

[t]he term ‘polypropylene resin’ as used in this specification and claims means not only a polypropylene homopolymer but also a polymer composed predominantly of propylene, particularly a polymer composed of not less than 50% by weight, preferably not less than 80% by weight, of polypropylene. As examples of the latter polymer, there may be mentioned propylene-ethylene random copolymer, propylene-ethylene block copolymer, polymer blends of said polypropylene resin with a small proportion of a thermoplastic resin, such as high-density polyethylene, polybutene-1, poly-4-methylpentene-1 or the like. [Paragraph bridging pages 24-25.]

and

[i]f required, the resin composition of the present invention may contain a variety of additives such as a stabilizer (e.g. epoxy compounds), an antioxidant (e.g. phenol compounds, phosphite compounds), an ultraviolet absorber (benzophenone compounds, benzotriazole compounds), a neutralizer, a nucleatig [sic] agent, an antistatic agent, an antiblocking agent, a lubricant (e.g. aliphatic hydrocarbons, higher fatty acids, and the alkali metal salts or alkaline earth metal salts thereof, fatty acid esters, higher fatty acid amides, rosin derivatives), a colorant, an elastomer, and a mineral (e.g. talc, hydrotalcite), each within a range not interfering with the effect of the invention. [Paragraph bridging pages 25-26.]

Reviewing the prosecution history, we find that appellants have stated that “[i]t is not seen how a reference directed to a polyphenylene ether composition and not mentioning  $\beta$ -form crystalline polypropylene can render obvious *a composition not containing a polyphenol ether ...*” (brief, sentence bridging pages 6-7, emphasis added). We find nothing erroneous in appellants’ remark. Hence, in this particular case, the limitation “consisting essentially of” excludes the possibility of polyphenylene ether being present in the claimed composition.

Finally, absent evidence in the record to indicate that the resin composition disclosed by Shibuya would be expected to have an increased proportion of  $\beta$ -form crystals, we can find no justification for placing the burden on appellants to conduct experiments to determine the  $\beta$ -form crystal properties of the resin disclosed by Shibuya. *In re De Lajarte*, 337 F.2d 870, 873-874, 143 USPQ 256, 258 (CCPA 1964).

Thus, we reverse the examiner’s rejection of claims 1-10 under 35 U.S.C. § 103.

## *II. Method claims*

Claim 22 recites a method which comprises molding a crystalline polypropylene resin composition comprising a crystalline polypropylene resin and at least one specifically defined diamide compound as a  $\beta$ -nucleating agent in an amount sufficient to provide an increased proportion of  $\beta$ -form crystal. According to appellants, “[t]he diamide in EP 0 263 678 [i.e., Shibuya] is added to a very different composition and to accomplish a different result than that specified in claim 22” (brief, page 5).

First, the language of claim 22, i.e., a crystalline polypropylene resin composition *comprising* a crystalline polypropylene resin and at least one specifically defined diamide compound, opens the claim to crystalline polypropylene resins which include other components, e.g., the polyphenylene ether and hydrogenated alkenyl aromatic compound/conjugated diene block copolymer of the resin composition of Shibuya. Secondly, as set forth in *In re Kemps*, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996), citing *In re Dillon*, 919 F.2d 688, 693, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990) (*in banc*), *cert. denied*, 500 U.S. 904 (1991) all that is needed is that the prior art suggest the claimed invention for any reason. See *In re Gershon*, 372 F.2d 535, 539, 152 USPQ 602, 605 (CCPA 1967) (“We think it is sufficient that the prior art clearly suggests doing what appellants have done, although an underlying explanation of exactly why this should be done, other than to obtain the expected superior beneficial results, is not taught or suggested in the cited references.”). Therefore, we agree with the examiner (answer, page 3) that it would have been obvious to the skilled artisan to use the diamide

compound of Shibuya, e.g., D-1, upon molding (page 7, lines 35-36) in the resin blend of Shibuya “[f]or the purpose of further ensuring mechanical properties” (page 6, lines 48-50).

Finally, the amount of diamide compound sufficient to provide an increased proportion of  $\beta$ -form crystal as described in the specification is generally about 0.0001 to 5 parts by weight of polypropylene resin (page 24, lines 2-9) and overlaps with Shibuya’s most preferred use of “from 2 to 15 parts by weight, per 100 parts by weight of the total amount of the components (a), (b), and (c)” (page 8, lines 1-2).

Thus, we affirm the rejection of claims 22 and 12-10 under 35 U.S.C. § 103.

### *III. Diamide compound claim*

Initially, we note that the appendix of claims originally appended to the brief incorrectly indicated that R<sup>18</sup> could be cyclohexyl in claim 21. Appellants submitted a substitute appendix of claims (Paper No. 29, filed June 10, 1999) which correctly recited that R<sup>18</sup> in claim 21 was either naphthylene or biphenylene.<sup>2</sup> According to the examiner, “only certain of the present species of claim 21 have been indicated to be allowable” (answer, page 4), i.e., species wherein R<sup>18</sup> is naphthylene or biphenylene.<sup>3</sup>

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<sup>2</sup> Claims 1 and 22 as submitted in the substitute appendix still contain errors *vis-a-vis* the claims as appended during examination as indicated in the appendix of claims attached to this decision.

<sup>3</sup> In the final Office action mailed September 28, 1994, the examiner stated “applicant’s declaration [i.e., the IKEDA declaration] would indicate unexpected results for species of formula (1) wherein R<sup>1</sup> is naphthylene or biphenylene, claims limited to this particular species and meeting all other criteria of patentability would be allowable” (page 3). Formula (4) of claim 21 is a species of formula (1) wherein the R<sup>19</sup>, R<sup>18</sup>, and R<sup>20</sup> of formula (4) are limited to specific R<sup>2</sup>, R<sup>1</sup> and R<sup>3</sup> substituents.

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Thus, we reverse the rejection of claim 21 under 35 U.S.C. § 103.

*CONCLUSION*

The decision of the examiner to reject claims 1-10 and 12-22 under 35 U.S.C. § 103 as being unpatentable over Shibuya is *reversed* as to claims 1-10 and 21 and *sustained* as to claims 12-20 and 22.

*OTHER MATTERS*

A review of the file shows that there are *two* unconsidered Information Disclosure Statements (IDSs) therein. One was filed on March 23, 1995 (Paper No. 17) and the other was filed on May 15, 2000 (Paper No. 30). Upon return of this application to the examiner, the examiner should review these two IDSs and take appropriate action.

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 )

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BRADLEY R. GARRIS  
Administrative Patent Judge

CAROL A. SPIEGEL  
Administrative Patent Judge

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Appeal No. 1996-1372  
Application No. 08/003,659

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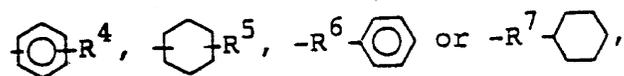
## APPENDIX

1. A crystalline polypropylene resin composition consisting essentially of a crystalline polypropylene resin and a  $\beta$ -nucleating agent, said  $\beta$ -nucleating agent being present in the composition in an amount effective for providing an increased proportion of  $\beta$ -form crystals, and said  $\beta$ -nucleating agent being at least one member selected from the group consisting of:

(1) an amide compound of the formula



wherein  $R^1$  represents a residue formed by elimination of the two carboxyl groups of a  $C_{3-20}$  saturated or unsaturated aliphatic dicarboxylic acid, a  $C_{6-30}$  saturated or unsaturated alicyclic dicarboxylic acid or a  $C_{8-30}$  aromatic dicarboxylic acid;  $R^2$  and  $R^3$  are the same or different and each represents a  $C_{3-12}$  cycloalkyl group, a  $C_{3-12}$  cycloalkenyl group, or a group of the formula



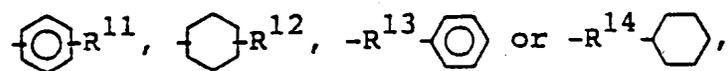
wherein  $R_4$  [sic,  $R^4$ ] represents a hydrogen atoms, a  $C_{1-12}$  straight- or branched-chain alkyl group, a  $C_{2-12}$  straight- or branched-chain alkenyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group;  $R^5$  represents a  $C_{1-12}$  straight- or branched-chain alkenyl [sic, alkyl] group, a  $C_{2-12}$  straight- or branched-chain alkenyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group; and  $R^6$  and  $R^7$  each represents a  $C_{1-4}$  straight- or branched-chain alkylene group; with the proviso that when  $R^4$  is a hydrogen atom, a  $C_{1-12}$  alkyl group or a  $C_{6-10}$  cycloalkyl group,  $R^1$  is a residue formed by the elimination of the two carboxyl groups of a  $C_6$  or  $C_8$  saturated aliphatic dicarboxylic acid,

(2) an amide compound of the formula



wherein  $R^8$  represents a residue formed by elimination of the two amine groups of a  $C_{4-28}$  alicyclic diamine, a  $C_{4-14}$  5- or 6- membered heterocyclic diamine containing 1 or 2 nitrogen or sulfur atoms in its ring or a  $C_{6-28}$  aromatic diamine;

$R^9$  and  $R^{10}$  are the same or different and each represents a  $C_{3-12}$  cycloalkyl group, a  $C_{3-12}$  cycloalkenyl group, or a group of the formula

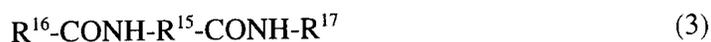


wherein  $R^{11}$  represents a hydrogen atom, a  $C_{1-12}$  straight- or branched-chain alkyl group, a  $C_{2-12}$  straight- or branched-chain alkyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group;  $R^{12}$  represents a  $C_{1-12}$  straight- or branched-chain alkyl group, a  $C_{2-12}$  alkenyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group;  $R^{13}$  and  $R^{14}$  each represents a  $C_{1-4}$  straight- or branched-chain alkylene group; with the proviso that  $R^8$  is not



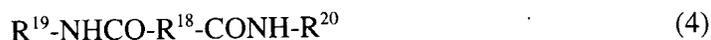
and

(3) an amide compound of the formula



wherein  $R^{15}$  represents a residue formed by elimination of one amino group and one carboxyl group of a  $C_{2-29}$  saturated or unsaturated aliphatic amino acid, a  $C_{7-13}$  saturated or unsaturated alicyclic amino acid or a  $C_{7-15}$  aromatic amino acid; and  $R^{16}$  and  $R^{17}$  are the same or different and  $R^{16}$  has the same meaning as  $R^9$  or  $R^{10}$  in the formula (2) and  $R^{17}$  has the same meaning as  $R^2$  or  $R^3$  in the formula (1).

21. A novel amide compound of the formula

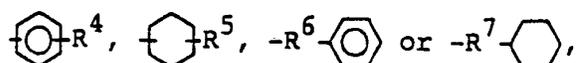


wherein  $R^{18}$  represents  $\langle \text{C}_6 \rangle \text{---} \langle \text{C}_6 \rangle \text{---}$  or  $\langle \text{C}_6 \rangle \text{---} \langle \text{C}_6 \rangle \text{---}$ ; and  $R^{19}$  and  $R^{20}$  are the same or different and each represents a cycloalkyl group of 5 to 12 carbon atoms.

22. A method of increasing the proportion of  $\beta$ -form crystals in a crystalline polypropylene resin molded product which comprises molding a crystalline polypropylene resin composition comprising a crystalline polypropylene resin and at least one  $\beta$ -nucleating agent selected from the group consisting of the amide compounds of the formula:



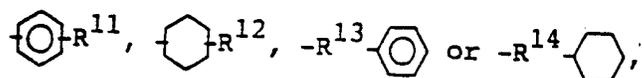
wherein  $R^1$  represents a residue formed by elimination of the two carboxyl groups of a  $C_{3-20}$  saturated or unsaturated aliphatic dicarboxylic acid, a  $C_{6-30}$  saturated or unsaturated alicyclic dicarboxylic acid or a  $C_{8-30}$  aromatic dicarboxylic acid;  $R^2$  and  $R^3$  are the same or different and each represents a  $C_{3-12}$  cycloalkyl group, a  $C_{3-12}$  cycloalkenyl group, or a group of the formula



wherein  $R_4$  [sic,  $R^4$ ] represents a hydrogen atoms, a  $C_{1-12}$  straight- or branched-chain alkyl group, a  $C_{2-12}$  straight- or branched-chain alkenyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group;  $R^5$  represents a  $C_{1-12}$  alkenyl [sic, alkyl] group, a  $C_{2-12}$  straight- or branched-chain alkenyl group, a  $C_{6-10}$  cycloalkyl group or a phenyl group; and  $R^6$  and  $R^7$  each represents a  $C_{1-4}$  straight- or branched- chain alkylene group; with the proviso that when  $R^4$  is a hydrogen atom, a  $C_{1-12}$  alkyl group or a  $C_{6-10}$  cycloalkyl group,  $R^1$  is a residue formed by the elimination of the two carboxyl groups of a  $C_6$  or  $C_8$  saturated aliphatic dicarboxylic acid;



wherein  $R^8$  represents a residue formed by elimination of the two amine groups of a  $C_{4-28}$  alicyclic diamine, a  $C_{4-14}$  5- or 6- membered heterocyclic diamine containing 1 or 2 nitrogen or sulfur atoms in its ring or a  $C_{6-28}$  aromatic diamine;  $R^9$  and  $R^{10}$  are the same or different and each represents a  $C_{3-12}$  cycloalkyl group, a  $C_{3-12}$  cycloalkenyl group, or a group of the formula



wherein  $R^{11}$  represents a hydrogen atom, a  $C_{1-12}$  straight- or branched-chain alkyl group, a  $C_{2-12}$  straight- or branched-chain alkyl [sic, alkenyl] group, a  $C_{6-10}$  cycloalkyl group or a phenyl group;  $R^{12}$  represents a  $C_{1-12}$  straight- or branched-

β-formation of β-form oligomers:  
 amine compound being present in an amount effective for providing an increased  
 the formula (5) and K<sub>13</sub> has the same meaning as K<sub>3</sub> or K<sub>2</sub> in the formula (1); and  
 K<sub>10</sub> and K<sub>13</sub> are the same or different and K<sub>10</sub> has the same meaning as K<sub>9</sub> or K<sub>10</sub> in  
 saturated or unsaturated aliphatic amino acid or a C<sup>3-12</sup> aromatic amino acid; and  
 one carboxyl group of a C<sup>3-50</sup> saturated or unsaturated aliphatic amino acid, a C<sup>3-13</sup>  
 wherein K<sub>12</sub> represents a residue formed by elimination of one amino group and



and



group; with the proviso that K<sub>8</sub> is not  
 group; K<sub>13</sub> and K<sub>14</sub> each represents a C<sup>1-4</sup> aliphatic- or branched-chain alkylene  
 chain alkyl group, a C<sup>5-15</sup> alkyl group, a C<sup>6-10</sup> cycloalkyl group or a phenyl