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D E C I S I O N
of 29 April 2005

Case Number: T 1131/02 - 3.3.3

Application Number: 95301928.8

Publication Number: 0676442

IPC: C08K 3/00

Language of the proceedings: EN

Title of invention:

Highly filled extruded thermoplastic polyester compositions
having a speckled surface

Applicant:

GENERAL ELECTRIC COMPANY

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (no) - obviousness of means already available
for the purpose"

Decisions cited:

T 0192/82

Catchword:

-



Case Number: T 1131/02 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 29 April 2005

Appellant:

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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 12 April 2002
refusing European application No. 95301928.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: R. Young
Members: P. Kitzmantel
A. Pignatelli

Summary of Facts and Submissions

- I. This appeal, which was filed on 10 June 2002 lies against the decision of the Examining Division dated 12 April 2002, refusing European patent application No. 95 301 928.8 filed on 23 March 1995 in the name of GENERAL ELECTRIC COMPANY, published under No. 0 676 442, and claiming a US priority of 7 April 1994.
- II. The appeal fee was paid together with the Notice of Appeal and the Statement of Grounds of Appeal was filed on 21 August 2002.

The decision under appeal was based on Claims 1 to 18 filed with a submission dated 1 March 2001.

Independent Claims 1 and 2 read as follows:

"1. A highly filled, extruded thermoplastic composition having a speckled surface which comprises:

(a) 1-70 weight percent of at least one polyalkylene terephthalate resin;

(b) from 0-35 weight percent of an aromatic polycarbonate resin wherein the amount of resin (a) is equal to or greater than amount of resin (b);

(c) from 0.01-10 weight percent of a stabilizer;

(d) from 0-15 weight percent of an impact modifier;

(e) from 0-35 weight percent of a polyetherester or polyetherimide ester resin;

(f) from 30-80 weight percent of an inorganic filler selected from the group consisting of barium sulfate, strontium sulfate, zinc oxide and zinc sulfate; and

(g) from 0.1-5 weight percent of a non-dispersing pigment sufficient to provide said extruded

thermoplastic composition with a speckled surface; wherein said non-dispersing pigment has an aspect ratio greater than about 20 that provides a smooth, uniform surface for said extruded thermoplastic composition without any secondary finishing operations, wherein the surface of said extruded thermoplastic composition has an RMS value of less than about 200."

"2. The thermoplastic composition of claim 1 which comprises:

- (a) from 0-70 weight percent of a polybutylene terephthalate resin;
- (b) from 0-70 weight percent of a polyethylene terephthalate resin, with the proviso that the sum of the amounts of the polybutylene terephthalate resin and the polyethylene terephthalate resin must be at least 10 weight percent of the total composition;
- (c) from 0-35 weight percent of an aromatic polycarbonate resin wherein the amount of (a) + (b) is equal to or greater than (c);
- (d) from 0.01-10 weight percent of a stabilizer;
- (e) from 0-15 weight percent of an impact modifier;
- (f) from 0-35 weight percent of a polyetherester or polyetherimide ester resin;
- (g) from 30-80 weight percent of an inorganic filler selected from the group consisting of barium sulfate, strontium sulfate, zinc oxide and zinc sulfate;
- (h) from 0-30 percent of a fibrous glass reinforcing filler; and
- (i) from 0.1-5 weight percent of a non-dispersing pigment sufficient to provide said extruded thermoplastic composition with a speckled surface; wherein said non-dispersing pigment has an aspect ratio of greater than about 20 that provides a smooth uniform

surface for said extruded thermoplastic composition without any secondary finishing operations wherein the surface of said thermoplastic composition has an RMS value of less than about 200."

The further independent Claims 15 to 18 relate, respectively, to a process comprising extruding the material of Claim 2, to an article comprising the composition resulting from the extrusion of the composition of Claim 2, to an article comprising a composition resulting from the extrusion and thermoforming of the composition of Claim 2, and to an article comprising a profile resulting from the profile extrusion of the composition of Claim 2.

Claims 3 to 14 are dependent on Claims 1 and/or 2.

- III. The decision under appeal refused the application for lack of inventive step over document D1 (WO 92/07026). It held that it was obvious for the skilled person to solve the existing technical problem, i.e. the provision of a speckled surface having an RMS value of less than 200, by modifying the compositions according to D1 by the addition of a minor amount of a fibrous filler as suggested by document D2 (EP-A-0 438 339) and by finding out the most suitable of these materials by trial and error experimentation. This conclusion was supported by the fact that the material "ReedSpectrum Brown Speckles" used according to the application-in-suit for the solution of this problem was a commercial product sold for the purpose of creating a speckle effect before the filing date of the application. It was held that "these materials with an aspect ratio of 43, would certainly be seen as suitable material, and

would in effect solve the problem of maintaining a smooth surface."

An obviousness conclusion was also drawn with regard to document D6 (JP-A-02 245 037; Chem.Abs. 114: 63628d; Derwent Abstract AN 90-339149) relating to mica-containing masterbatches suitable for the making of speckled mouldings because this disclosure would "lead a person skilled in the art to use the non-dispersing fillers as defined in the present claim 1 in the compositions of D1".

The decision furthermore stated that a low RMS value was an obvious desideratum.

IV. The Appellant's arguments brought forward in the Statement of Grounds and in its reply letter dated 9 November 2004 to the Rapporteur's communication dated 9 July 2004 can be summarized as follows:

- (a) The problem underlying the application-in-suit was the provision of a highly filled extruded thermoplastic material having a speckled surface appearance and a smooth surface without requiring any secondary finishing operations.
- (b) It was shown by the experimental evidence in the application that this problem was effectively solved by the incorporation of 0.1 to 5 wt.% of a non-dispersing filler having an aspect ratio greater than about 20; this filler material led to a RMS smoothness value below 200 which could not be attained with a non-dispersing filler having an aspect ratio of 1; in the latter case the RMS of

the extruded composition had the undesirably high value of 233.

- (c) D1 which related to highly filled polyester resin compositions did not comprise a non-dispersable pigment and did not mention the appearance of the composition, nor a speckled surface characteristic.
- (d) Neither D2 nor D6 were concerned with the problem underlying the present invention.

D2 related to providing mouldings having the aesthetic, multi-colour appearance of natural stone by incorporating in a thermoplastic matrix at least two different fillers having different dimensions. However D2 was silent on the smoothness of the moulded articles.

D6 related to an additive for resin moulding compositions in order to provide a flecked appearance, the additive being a transition metal containing mica of certain particle diameter. Again D6 was silent on the smoothness of the surface of the moulded articles.

- (e) Thus neither D2 nor D6 gave any indication that the aspect ratio of the non-dispersing filler was critical in obtaining extruded compositions having a smooth surface with an RMS value of less than 200.
- (f) A finding of obviousness required that there was a teaching in the prior art which motivated one skilled in the art to solve the existing technical

problem by combining the disclosure of documents.
None of the citations contained such a teaching.

- V. Oral proceedings were held on 29 April 2005 not attended by the Appellant.
- VI. In the Notice of Appeal the Appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the sets of claims submitted with the letter dated 1 March 2001.

In the letter dated 26 April 2005 announcing its non attendance of the oral proceedings, the Appellant requested that a decision be made on the basis of the written arguments on file.

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Claims 1 and 2 are essentially based on Claims 1 and 17 of the application as filed, respectively; furthermore they both comprise the following additional features:

- "from 0.01-10 weight percent of a stabilizer" (basis: page 15, lines 24 to 26 of the application as filed),
- "from 0.1-5 weight percent of a non-dispersing pigment" (basis: page 18, lines 13 to 16 of the application as filed),

- "wherein said non-dispersing pigment has an aspect ratio greater than about 20" (basis: page 17, lines 25 to 28 of the application as filed),
- "that provides a smooth, uniform surface for said extruded thermoplastic composition without any secondary finishing operations" (basis *inter alia* page 1, lines 15 to 18 of the application as filed), and
- "wherein the surface of said extruded thermoplastic composition has an RMS value of less than about 200" (basis: original Claims 3 and 19).

Claims 15 to 18 correspond to original Claims 20 to 23.

3. *Novelty*

3.1 Document D1

Claim 1 of this document relates to a thermoplastic resin composition, suitable to replace ceramics (Abstract), comprising from about 80 to about 15 parts by weight of a resinous composition comprising a polyester resin and an effective amount of a thermoplastic elastomeric impact modifier, eg copolyetherester and copolyetherimide ester resins, and from about 20 to about 85 parts by weight of a filler selected from zinc oxide, barium sulfate, zirconium oxide, zirconium silicate and strontium sulfate; or a mixture of such fillers.

Up to 50% of the afore-mentioned filler materials may be replaced with another inorganic filler, eg mica (page 25, lines 9 to 18). Fibrous reinforcing fillers

like fibreglass may also be added (page 27, lines 1 to 10).

Reference is made in the specification to the possibility to achieve *inter alia* extrudability, a smooth surface as well as a ceramic-like feel and density (page 2, line 27 to page 3, line 28).

- 3.2 D1 does not disclose an extruded composition, highly filled with barium sulfate, strontium sulfate or zinc oxide (ie inorganic filler materials according to present Claim 1), which additionally comprises mica, ie a material constituted by plate-like crystals coming under the definition "non-dispersing pigment" as used according to present Claim 1.

Nor does D1 disclose any other extruded thermoplastic composition meeting all the features of the present independent claims, ie having *inter alia* a speckled surface characteristic with a RMS smoothness value of less than about 200 achieved by the presence of a "non-dispersing pigment" having an aspect ratio greater than 20.

- 3.3 The claimed subject-matter therefore complies with the requirement of Article 54 EPC.

4. *Problem and solution*

- 4.1 In the technical field of the subject-matter of the present application, ie the field of highly filled thermoplastic compositions having ceramic like properties, there existed an established desire for special-effect appearances including a granite, fleck-

like or speckled look (page 1, first paragraph of the application as filed).

- 4.2 D1 is a document concerned with the development of plastic compositions suitable to replace ceramics which comprise the same essential components as the claimed invention, ie polymers selected from *inter alia* polyalkylene terephthalate resins, polycarbonates, copolyetheresters, copolyetherimides and their blends (page 1, line 25 to page 2, line 26; page 7, line 18 to page 8, line 8; page 9, lines 12 to 13) and inorganic fillers, like barium sulfate, strontium sulfate or zinc oxide, but also including the possible presence of substantial amounts of other fillers including mica (page 24, line 15 to page 25, line 26).

The compositions of D1 should *inter alia* be extrudable and should also provide a smooth surface (page 2, line 33 to page 3, line 15).

In view of this disclosure, D1 represents an appropriate starting point for the person skilled in the art seeking to provide analogous ceramic-like materials which address the special appearance effects desired in the art.

It is noted in this respect that a modification of the surface appearance, although not expressly mentioned in D1, is not alien to the moulded articles disclosed therein, because some of the "other" inorganic fillers used to replace part of the main filler material (barium sulfate, strontium sulfate, zinc oxide, ...) will have an impact on the surface appearance, as is the case for mica, whose shiny platelets will cause a

glittering effect, which according to the present application which uses mica as one of the most preferred "inventive" non-dispersing pigments (page 18, lines 4 to 6 of the application as filed), is described by the term "speckled surface"

4.3 The technical problem underlying the present subject-matter when starting from D1's disclosure is thus the development of an analogously formulated extrudable composition able to provide on extrusion a speckled, smooth surface having an RMS smoothness value less than about 200 without any secondary finishing operations.

4.4 According to the application in suit this problem has been credibly solved by the incorporation of a non-dispersing pigment having an aspect ratio greater than about 20 into the compositions known from D1.

The "inventive" non-dispersing fillers used in the Examples are: carbon fibres ("ReedSpectrum Black Whiskers"), mica ("Kemira mica") and dyed cellulose fibres ("ReedSpectrum Brown Speckles").

The Table on page 20 of the application shows that by using these filler materials RMS values below 200 are achieved without sanding of the extruded article, a post-treatment step that is required to reduce the RMS value to below 200 if "SAFAS Galaxy Granules" are used as the filler material.

5. *Obviousness*

5.1 The issue of obviousness boils down to the question whether the modification of the compositions according

to D1 by the incorporation of morphologically anisotropic (coloured) filler materials having a certain minimum aspect ratio involves an inventive step.

- 5.2 The expert in the field of ceramic-like thermoplastic compositions looking for filler materials able to provide a speckled appearance will as a matter of course in a first step investigate those filler materials which are commercially available for the purpose of providing the desired effect, ie the provision of a speckled appearance. It is apparent from the application itself that the dyed cellulose fibres commercially available under the trade name "ReedSpectrum Brown Speckles" (emphasis by the Board) are especially designed for the purpose of providing a speckled appearance.

Furthermore, the usability of dyed natural fibres, particularly wood (ie cellulose) fibres, for the purpose of providing the surface appearance of natural stone to thermoplastic resin compositions was known from document D2, which uses filler mixtures of white pigment (eg zinc oxide: column 3, last line to column 4, line 6) and coloured wood fibres in order to create a natural stone appearance of thermoplastic resin compositions (column 2, line 45 to column 3, line 20).

- 5.3 In view of this factual situation, the skilled person seeking a solution to the existing technical problem will in an immediately straightforward way modify the compositions of D1 by the incorporation of the aforementioned fibre materials. Extruded compositions modified in that fashion by the incorporation of

"ReedSpectrum Brown Speckles" will exhibit a speckled and at the same time smooth surface appearance.

The same effects will result from the incorporation of the wood fibre based filler materials used in D2 to generate a nature stone effect if appropriate fibre dimensions (aspect ratios) with their well-known consequential alignment in the extrudate flow direction are used, a measure amounting to routine experimentation not involving an inventive effort.

- 5.4 The argument in the Appellant's submission dated 9 November 2004 that the faculty to provide a speckled look and a smooth uniform surface of thermoplastic extrudates was not part of the disclosure of the pigment "ReedSpectrum Brown Speckles", nor of the wood fibres of D2 cannot invalidate the above obviousness conclusion because, firstly the use of these materials for the provision of a speckled appearance was indeed part of their disclosure, and secondly because their providing a smooth, uniform extrudate surface, albeit undisclosed as such, is an inevitable consequence of their obvious suitability for the desired overriding purpose of providing a speckled surface. This situation can *de facto* be equated with the existence of a so-called "one-way-street" situation (T 192/82 OJ EPO 1984, 415) because the choice suggested by the unsuccessful use, according to the application's worked examples, of spherical filler material cannot render a solution non-obvious which the skilled person will consider as most promising, because the skilled person has to be free to employ the best means already available for his purposes.

5.5 Therefore the claimed subject-matter lacks an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

E. Görgmaier

R. Young