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Datasheet for the decision of 23 January 2020

Case Number: T 1666/16 - 3.3.03

Application Number: 05795766.4

Publication Number: 1803749

IPC: C08F14/22, B29B9/12, B29C45/00, B29K27/12

Language of the proceedings: EN

Title of invention:
POLYVINYLIDENE FLUORIDE RESIN POWDER FOR MELT MOLDING AND PROCESS FOR PRODUCING MOLDING FROM THE RESIN POWDER

Patent Proprietor:
Kureha Corporation

Opponent:
Solvay Specialty Polymers Italy S.p.A.

Relevant legal provisions:
EPC Art. 100(c), 54(2), 56

Keyword:

Grounds for opposition - subject-matter extends beyond content of earlier application (no)
Novelty (yes)
Parametric condition not shown to be fulfilled by prior art - no reversal of the burden of proof
Prior use - ability of the skilled person to analyse and reproduce the product whose sale is invoked not demonstrated
New prior art and accompanying evidence in order to demonstrate lack of novelty submitted with statement of grounds for appeal- not addmited in the absence of appropriate justification
Inventive step (yes) - objection based on unrealistic closest prior art (ex post facto analysis)

Decisions cited:

G 0001/92, G 0002/10, G 0003/14, T 0686/91, T 0740/01, T 0131/03

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Case Number: T 1666/16 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 23 January 2020

Appellant: (Opponent)	Solvay Specialty Polymers Italy S.p.A. Via Lombardia, 20 20021 Bollate (MI) (IT)
Representative:	Benvenuti, Federica Solvay S.A. Département de la Propriété Intellectuelle Rue de Ransbeek, 310 1120 Bruxelles (BE)
Respondent: (Patent Proprietor)	Kureha Corporation 3-3-2, Nihonbashi-Hamacho, Chuo-ku Tokyo 103-8552 (JP)
Representative:	Adam, Holger Kraus & Weisert Patentanwälte PartGmbB Thomas-Wimmer-Ring 15 80539 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 8 June 2016 rejecting the opposition filed against European patent No. 1803749 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	D. Semino
Members:	F. Rousseau
	R. Cramer
	O. Dury
	C. Brandt

Summary of Facts and Submissions

I. The appeal by the opponent (appellant) lies against the decision by the opposition division posted on 8 June 2016 rejecting the opposition against European patent No. 1 803 749.

II. The European patent was granted on the basis of 15 claims, claim 1 reading as follows:

"1. Polyvinylidene fluoride resin powder for melt molding having such powder characteristics (a) to (c) that

(a) the resin powder exhibits, as determined by a dry sieving method in accordance with JIS K 0069, such particle size distribution characteristics that

i) an average particle diameter indicated by a 50% cumulative value (D_{50}) in a particle size cumulative distribution is 80 to 250 µm,
ii) a proportion of resin powder having a particle diameter of at most 45 µm is at most 3.0% by weight,
iii) a proportion of resin powder having a particle diameter of at least 355 µm is at most 5.0% by weight, and
iv) a value [(D_{80} - D_{20})/D_{50}] obtained by dividing a particle diameter breadth (D_{80} - D_{20}) represented by a difference between a 80% cumulative value (D_{80}) and a 20% cumulative value (D_{20}) in the particle size cumulative distribution by the 50% cumulative value (D_{50}) is at most 0.8,

(b) a bulk density is 0.40 to 0.70 g/cm^3 as determined by a measuring method for Bulk Specific Gravity in accordance with JIS K 6721-3.3, and

(c) an angle of repose is at most 35° as determined by a measuring method described in the specification in which a bulk specific gravity measuring device prescribed in JIS K 6721 is used."

Claims 2 and 3 are dependent claims of claim 1.

Claim 4 is directed to process for producing a polyvinylidene fluoride resin moulding by injection moulding, said process comprising *inter alia* the step of feeding, to a melt molding machine, the polyvinylidene fluoride resin powder having the characteristics (a) to (c) defined in claim 1.

Claims 5 to 12 are dependent claims of claim 4.

Claim 13 defines the "Use of polyvinylidene fluoride resin powder for melt molding by press-fit techniques selected from the group consisting of injection molding and extrusion molding while retaining the form of the powdery resin as it is without pelletizing the powder" wherein the polyvinylidene fluoride resin powder for melt molding has the characteristics (a) to (c) defined in claim 1.

Claims 14 and 15 are dependent claims of claim 13 which specify that an injection moulding technique and an extrusion moulding technique are used, respectively.

III. The patent was opposed on the grounds that its subject-matter extended beyond the content of the application as filed, lacked novelty and an inventive step. The

following documents were inter alia cited in support of the opposition:

D1: FR 1 531 139
D2: Y. Zhou et al, "An experimental and numerical study of the angle of repose of coarse spheres", Powder Technology, 125 (2002), pages 45-54
D3: JP 47-44032 and machine-assisted translation thereof in English
D4: Kirk-Othmer Encyclopedia of Chemical Technology - Dohany, J.E., 2000, Fluorine-Containing Polymers, Poly(Vinylidene Fluoride)
D10: D. Mills, Pneumatic Conveying Design Guide (2nd Edition), 2004, pages 606-607.

The opposition was also supported by two alleged public prior uses, i.e. a sale of the product SOLEF®PVDF 1010/1001 by Solvay to SGL ACOTECH GmbH in 2003 and a sale of the product SOLEF®PVDF 1015/1001 by Solvay to PCI Membrane Systems Ltd in October 1993. In addition to documents submitted in order to prove the existence of those alleged sales, which documents are not relevant for the present decision, the following documents relative to the characteristics of the products sold were also cited:

E9: Affidavit by Bernard Goffaux dated 26 January 2012
E10: Affidavit by Fabien Roblot dated 27 January 2012
E11: Affidavit by Mattia Bassi dated 27 January 2012.

E9 to E11 comprised all the same analysis report for a sample of SOLEF® 1010/1001 PVDF and a sample of SOLEF® 1015/1001.

The contested decision was also based on the testimony of Mr Roblot during the oral proceedings.

IV. According to the reasons for the decision claims 13 to 15 of the contested patent did not extend beyond the content of the application as filed. As to novelty, it had not been shown that the polyvinylidene fluoride (PVDF) resin powder disclosed in Example 4 of D1 had an angle of repose as defined by feature (c) of claim 1. The same was valid for D3 which also did not disclose features (a)ii) to (a)iv) of claim 1. While it was uncontested that the products SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 had been sold by Solvay to SGL ACOTEC GmbH in 2003 and to PCI Membrane Systems Ltd in 1993, respectively, it could not be concluded that those products at the date of their sale met the parametric requirements set out in claim 1 of the patent in suit. The objection that the subject-matter of claims 1 to 3 lacked novelty was therefore not convincing. As to inventive step, the experimental data contained in the specification demonstrated that the technical problem of providing "*PVDF resin powders capable of being molded by press-fit technique such as injection molding or extrusion molding, while retaining the form of the powdery resin as it is without pelletizing the powder*" had been successfully solved. Since none of the documents cited in the proceedings mentioned or suggested that PVDF resin particles or powders, similar or comparable to those claimed in claim 1 of the opposed patent, could be used as such in melt moulding applications, an inventive step was acknowledged.

V. The appellant submitted with the statement setting out the grounds of appeal (letter of 17 October 2016) inter alia the following documents:

D11: US 5,145,921

D13: ASTM C1444 - 00 "Standard Test Method for Measuring the Angle of Repose of Free-Flowing Mold Powders"
E14: Affidavit by Julio Abusleme dated 14 October 2016 comprising an experimental report concerning Examples 3 to 5 of D11
E15: Affidavit by Mattia Bassi dated 14 October 2016 comprising an analytical bulletin of a sample of SOLEF® PVDF 1015/1001.

VI. The patent proprietor (respondent) submitted with the reply to the statement of grounds of appeal auxiliary requests 1 to 6 and additional documents D14 to D16a. Neither the wording of these auxiliary requests, nor the identity of documents D14 to D16a is of relevance for the present decision.

VII. Oral proceedings before the Board took place on 23 January 2020.

VIII. The appellant's submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

(a) The subject-matter of claims 13 to 15 of the granted patent extended beyond the content of the application as filed.

(b) The resin powder defined in claim 1 of the granted patent lacked novelty over each of example 4 of D1, examples 1 and 2 of D3, the disclosure resulting from the sale of the product SOLEF®PVDF 1010/1001 by Solvay to SGL ACOTECH GmbH in 2003 and that resulting from a sale of the product SOLEF®PVDF 1015/1001 by Solvay to PCI Membrane Systems Ltd in October 1993.

(c) D11 and E14 whose filing was justified should be admitted into the proceedings. Claim 1 also lacked novelty over D11 taking into account the experimental report E14.

(d) The resin powder of claim 1 of the patent in suit lacked an inventive step in view of D1 taken as the closest prior art.

IX. The respondent's submissions, in so far as they are pertinent, may be derived from the reasons for the decision below. They are essentially as follows:

(a) The subject-matter of claims 13 to 15 was disclosed in the application as filed.

(b) Novelty over each of D1, D3 and the public prior uses invoked by the appellant was given.

(c) D11 and E14 should not be admitted into the proceedings.

(d) An inventive step was to be acknowledged since D1 did not represent a suitable starting point for assessing inventive step.

X. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

XI. The respondent requested that the appeal be dismissed, or alternatively that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the claims of one of auxiliary requests 1 to 6, filed with the reply to the statement of grounds of appeal.

Reasons for the Decision

Article 100(c) EPC

1. The appellant argues that the expression "Use of polyvinylidene fluoride resin powder for melt molding by press-fit techniques selected from the group consisting of injection molding and extrusion molding while retaining the form of the powdery resin as it is without pelletizing the powder" in granted claim 13 can only find a basis in the first paragraph of the application as filed and that no link exists in the application as filed between the general statement provided in said first paragraph and the specific features of the powder defined in the second part of claim 13 as granted. Claim 13 is therefore considered by the appellant to extend beyond the content of the application as filed.

1.1 The first paragraph of the application as filed under the heading "TECHNICAL FIELD" provides a general indication of the subject-matter concerned by the present invention. As outlined by the appellant the information provided in this passage has a general character. Already for this reason the skilled person understands that the statement about polyvinylidene fluoride (PVDF) resin powders which are capable of being molded "by press-fit technique such as injection molding or extrusion molding while retaining the form of the powdery resin as it is without pelletizing the powder" is meant to be valid for any powder in accordance with the present invention disclosed in the application as filed, including those defined in the second part of claim 13 as granted whose disclosure in the application as filed is not disputed. Therefore a

formal basis for claim 13 is present in the application as filed.

1.2 Concerning the meaning to be attributed to "melt molding by press-fit technique such as injection molding or extrusion molding" it was not argued, let alone shown, that this expression has a conventional meaning in the art. It is also undisputed that the expression "press-fit technique" as such conventionally designates a technique to assemble two parts, whereas "injection molding" and "extrusion molding" are expressions which refer to processes of injecting into a mould or extruding through a die a molten material in order to manufacture plastic parts. Accordingly, although the expression "press-fit technique" taking its conventional meaning may also relate to plastic parts, this expression cannot be meant to define a general category of techniques encompassing injection moulding and extrusion moulding techniques. The expression "press-fit technique" is therefore incongruous with the rest of the first paragraph of the application as filed or granted claim 13.

1.3 Furthermore, the skilled person reading the first paragraph of the application as filed in the context of the application as a whole (respectively reading claim 13 or the first paragraph of the granted patent in the context of the whole specification) notices not only that the expression "press-fit technique" is not used in other passages of the application as filed (respectively of the patent), as outlined by the appellant, but also that the sole manufacturing techniques for producing parts addressed in both the application as filed and the patent in suit are injection moulding and extrusion moulding.

1.4 Therefore, the presence of the expression "press-fit technique" used in the first paragraph of the application as filed or in claim 13 of the patent in suit in the context not only of those passages, but of the application as filed or of the patent in suit as a whole, is considered by the skilled person to be an error. It also follows from the above that no significance should be derived from this expression which therefore could not have been meant to change the technical meaning of the passage(s) in which it is contained.

1.5 It results from the above that granted claim 13 does not result in the skilled person being presented with new technical information in comparison with the application as filed, which in accordance with the established Case Law of the Boards of Appeal of the EPO (see G 2/10, OJ EPO 2012, 376, point 4.5.1 of the Reasons and Case Law of the Boards of Appeal, 9th Edition 2019, II.E.1.1) is the relevant question to be decided in assessing whether the subject-matter of claim 13 extends beyond the content of the application as filed. The presence of the expression "press-fit technique" in granted claim 13 is at most an issue of clarity which cannot be objected under Article 84 EPC in view of the ruling of G 3/14 (OJ EPO 2015, A102).

1.6 It follows that claims 14 and 15 which merely restrict the uses of claim 13 to those involving injection moulding and extrusion moulding techniques, respectively, which specific uses are disclosed in the first paragraph of the application as filed, also do not result in the skilled person being presented with new technical information in comparison with the application as filed. Hence, the appellant's argument that the application as filed does not provide a basis

for combining a "press-fit technique" with the additional process measures defined in granted claims 14 and 15 also fails to convince.

1.7 Consequently, the ground for opposition under Article 100(c) EPC does not hold against maintenance of the patent as granted.

Article 100(a) EPC

Novelty over D1

2. Lack of novelty of the subject-matter of claim 1 is objected in view of example 4 of D1. This example discloses by reference to example 3 a PVDF resin powder prepared by suspension polymerisation in an aqueous medium in the presence of acetone, methylcellulose as suspending agent and di-n-propyl peroxydicarbonate as polymerization initiator. The powder obtained, described to have a bulk density of 0.40 g/cm^3, meets therefore requirement (b) of operative claim 1. Moreover, the calculation made by the appellant on the basis of the particle size distribution of the powder obtained in example 4, indicated at the bottom of page 6 of that document, which is determined by a dry sieving method based on six fractions, shows that the resin powder prepared in example 4 of D1 also meets requirement (a) of claim 1 of the patent in suit. The only issue in dispute concerning novelty over example 4 of D1 is whether the powder composition described in that example has an angle of repose of at most 35° as required by feature (c) of claim 1.

3. Independently of the question whether the definition of an angle of repose, as alleged by the appellant, was not conventional in the context of PVDF resins, it was

nevertheless undisputed that the "angle of repose" was at the date of priority of the patent in suit a well known parameter used for the definition of free-flowing powders, in particular for free-flowing mould powders. It is in this respect referred to document D10 (page 607) and to the standard test method D13. The angle of repose of a free-flowing powder is understood by the skilled person to define the inclination of a conical pile formed when a sample of said powder is poured on a plate from a funnel in which it was contained. The angle of repose, i.e. the angle between the surface of the cone formed by the powder and the horizontal, expresses the degree of fluidity of the powder.

The angle of repose is furthermore defined in claim 1 to be determined by "*a measuring method described in the specification in which a bulk specific gravity measuring device prescribed in JIS K 6721 is used*". This reference implicitly designates the method defined in paragraph [0075] of the specification. According to this paragraph, "*The angle of repose of PVDF resin powder was determined by a method in which 100 ml of resin powder fully stirred and mixed is placed in a funnel, into which a damper of a bulk specific gravity measuring device prescribed in JIS K 6721 is inserted, and the damper is quickly pulled up to drop the sample on a sample plate having a diameter of 80 mm from a height of 100 mm, thereby measuring an angle of repose of the resin powder deposited on the sample plate. The measuring temperature was 22°C*".

4. The appellant argues that an angle of repose for the powder obtained in example 4 of D1 of at most 35°, as required by operative claim 1, was the implicit result of what was described in D1, since (i) this powder was described to have excellent flow characteristics, (ii)

the parametric description of this powder in D1 (bulk density, particle size distribution data and spherical morphology of the powder) implied said angle of repose and (iii) the synthesis conditions for their synthesis corresponded to those taught in the patent in suit for the preparation of a powder fulfilling this parametric condition.

Arguments in view of the powder's flow characteristics

4.1 The excellent flow characteristics addressed in D1 are those observed in the context of a coating process in which a preheated metal part is immersed in a fluidized bed of the resin powder or coated by electrostatic spraying of the resin powder, the resin powder being for this purpose fluidized by the passage of air or suspended in an air flow (paragraph bridging pages 2 and 3; first full paragraph of page 3; paragraph bridging the two columns of page 3; page 5, example 1 for the description of the coating method; page 6, paragraph bridging the two columns below the bottom table; page 7, two first full paragraphs of the left-hand column; page 7, three last paragraphs of the right-hand column). The indication in the last full paragraph of page 3 that the flowability and the flow characteristics of the polymer particles are very important is therefore to be read in this specific context. The appellant did not provide any explanation, let alone any evidence in this respect, as to why the flowability of a resin in a flow of air would constitute a good approximation of its free-flowing ability, let alone a quantitative assessment thereof in the specific test conditions used in the patent in suit described in the second paragraph of above point 3. Accordingly, in the Board's opinion the sole indication of some flow characteristics of the resin powder

prepared in example 4 of D1 in a context which differs from that of the measurement required for determining parameter (b) of operative claim 1 is not sufficient to reach any conclusion as to the angle of repose of the resin powder obtained in said example.

Arguments in view of the powder's parametric description

4.2 Concerning the relationship between the angle of repose and other physical properties of said powder, it is common general knowledge as shown in D2 that the angle of repose depends on numerous factors such as density, size and shape of the particles constituting the powder, as well as on their sliding and rolling friction coefficients (page 45, abstract, introduction, first paragraph; page 47, table 2; page 48, first paragraph). According to these passages of D2 the angle of repose decreases with increasing particle size and increases with increasing sliding and rolling friction coefficients and deviation from the spherical shape. It can be also inferred from D2 that these parameters are interrelated (page 49, first paragraph and paragraph bridging the left and right columns on page 52). The respondent also argues that the morphology of the surface of the particles which influences the roughness of the surface of the particles affects the angle of repose. This is a way to express the idea that those sliding and rolling friction coefficients are dependent on the morphology of the surface of the particles which the Board finds to be credible. Both parties also agreed that the angle of repose also depends on the size distribution of the particles, in line with the fact that the angle of repose is affected by the size of the particles.

4.3 The number of variables influencing the angle of repose and their complex relationship addressed in the above point illustrate the difficulty to predict the value taken by this parameter. There is thus no reason to assume that based only on a given bulk density and a well defined particle size distribution an angle of repose can be necessarily predicted, even when assuming a perfect spherical shape of the particles. There is even less basis to assume that this would be the case when the particle size distribution is not fully known, but is determined in an approximative manner as for parameter (b) of operative claim 1 or the powder obtained in example 4 of D1 whose particle size distribution is defined based on the result of a dry sieving method using only 6 fractions and when in addition it is unknown if said particles are perfectly spherical. It must therefore be concluded that the mere fact that parameters (a) and (b) of present claim 1 are fulfilled by a powder, as is the case for example 4 of D1, does not constitute sufficient evidence that said powder also fulfills parametric condition (c) of operative claim 1.

Arguments in view of the powder's synthesis conditions

4.4 As to whether the disclosure of the synthesis conditions used in example 4 of D1 allows any conclusion concerning the angle of repose of the powder obtained, these conditions are, as argued by the appellant, essentially within the framework of the general conditions taught in paragraphs [0034] and [0035] of the patent in suit, namely use as indicated in above point 2 of a suspension polymerization process, of a suspending agent such as methyl cellulose, of an organic percarbonate such as di-n-propyl peroxydicarbonate and of a chain transfer agent

(acetone), with the exception that the patent in suit teaches an increase of the polymerization temperature after formation of the primary particles. Those conditions are indicated in paragraphs [0034] and [0035] of the patent in suit to favour high bulk density and low angles of repose, which does not mean that meeting those broadly defined conditions is sufficient to obtain a bulk density and an angle of repose as defined in granted claim 1.

4.5 Although paragraph [0036] of the specification additionally teaches that the proportion of suspending agent to monomers, the amount of the monomers into the aqueous medium, the diameter of the monomer droplets in the aqueous medium, the temperature and the polymerization time are controlled in order to adjust the particle size distribution, including the average particle diameter, the bulk density and the angle of repose, no information is provided in the patent in suit as to how these conditions should be adjusted in order to fulfill simultaneously parametric conditions (a) to (c).

Moreover, the Board concurs with the respondent's opinion that stirring conditions of the suspension polymerisation constitute an important factor influencing the characteristics of the powder resin. It is in fact common general knowledge that the particle size distribution of the obtained resin is dependent on the initial monomer drop size distribution in water at the start of the polymerisation and on agglomeration/ breaking processes during the polymerization, both being influenced by the agitation conditions in the reactor.

On that basis, it cannot be concluded that preparing a PVDF powder while following the general guidance provided in paragraph [0034] of the patent in suit, even if using a two-step polymerisation as taught in paragraph [0035], i.e. with an increase of the polymerization temperature after formation of the primary particles, is sufficient to obtain an angle of repose within the range defined in claim 1 of the patent in suit. It is rather credible that the various polymerization conditions would need to be adjusted through experimentation in order to obtain a powder exhibiting the angle of repose required by claim 1.

4.6 Moreover, the respondent outlined that the polymerization conditions used in example 4 of D1 significantly differ from those used in the examples of the patent in suit, mention being made not only of the proportion of suspending agent to monomer which is 6 times lower in example 4 of D1, but also of the polymerisation time and temperature profile, the polymerization temperature being in the examples of the patent in suit increased after formation of the primary particles (see above point 4.4), contrary to what is done in D1. The appellant did not indicate, let alone provide evidence or technical explanation, as to why it is credible that these differences in the preparation of the PVDF powders in example 4 of D1 and in Examples 1 and 2 of the patent in suit would have no impact on the factors influencing the angle of repose. In addition, neither example 4 of D1, nor Examples 1 and 2 of the patent in suit specify the agitation conditions used in the preparation of the resin particles, which renders it even more difficult to conclude, even based on the technical information content of Examples 1 and 2 of the patent in suit, that the polymerisation conditions used in example 4 of D1

necessarily lead to a resin powder exhibiting the angle of repose required by present claim 1.

4.7 Consequently, none of the reasons submitted by the appellant as to why the powder disclosed in example 4 of D1 would also necessarily have an angle of repose as defined in granted claim 1 is found convincing.

Burden of proof

4.8 The appellant argued additionally that the angle of repose being an unusual parameter in the context of PVDF resins, it would be legitimate to reverse the burden of proof and to require from the patent proprietor, having chosen to rely on an unusual parameter as the sole distinguishing feature over the powder disclosed in example 4 of D1, to demonstrate that this parameter was not fulfilled by this powder of D1. The appellant relied in support of their case on decisions T 0131/03 and T 0740/01. Both decisions are based on the same rationale, namely that when a strong presumption has been established that a claimed subject-matter defined with an unusual parameter is inherently disclosed in the prior art, the patent proprietor cannot merely claim the benefit of the doubt and has to demonstrate that the parametric definition chosen distinguishes the claimed subject-matter from the prior art (T 0131/03, points 2.3 to 2.7 of the Reasons and T 0740/01, point 2.3 of the Reasons). In the present case, as shown in above points 4.1 to 4.6, the appellant did not succeed in showing that it was reasonable to assume that an angle of repose of at most 35° was inherently disclosed in example 4 of D1. Accordingly, even if the Board were of the opinion that the angle of repose should be considered to amount to an unusual parameter when used in the context of PVDF,

there would be in the present case still no justification to reverse the burden of proof and to require from the respondent that they demonstrate that an angle of repose of at most 35° distinguishes the claimed subject-matter from the disclosure of example 4 of D1.

5. Accordingly, no case has been made that the subject-matter of the granted patent lacks novelty over D1.

Novelty over D3

6. Lack of novelty of the subject-matter of claim 1 was also objected in view of Examples 1 and 2 of D3 which describe the preparation of PVDF resin powders. The particles of those powders are prepared like in D1 by suspension polymerisation in an aqueous medium comprising a small amount of acetone, methylcellulose as suspending agent and di-n-propyl- or diisopropyl peroxydicarbonate as polymerization initiator. Like in the patent in suit, the polymerisation reaction is carried out in two stages, the temperature being increased for the second stage. D3 discloses the average particle diameter and the bulk density of the powder obtained whose values are within the ranges defined in claim 1 as granted. D3 is however silent on the angle of repose of those powders. It also silent on various characteristics which influence the angle of repose of a resin powder, in particular its particle size distribution or even a simplified representation thereof using features (a)ii) to iv) as defined in granted claim 1.

6.1 The appellant merely argued that the processes described in Examples 1 and 2 of D3 comprise the process features which were held by the patent

proprietor during examination of the application to be critical features leading inevitably to the achievement of the properties recited in granted claim 1 (page 17, lines 6-11 of the statement of grounds of appeal). The process features addressed by the appellant correspond to those mentioned in paragraphs [0034] and [0035] of the patent in suit. Accordingly, the appellant's line of arguments supporting the objection that claim 1 lacks novelty over Examples 1 and 2 of D3 is in essence the same as that dealt with in above points 4.4 to 4.7 when assessing novelty over example 4 of D1.

6.2 As indicated in above point 4.4, the mere fact of using synthesis conditions within the broad teaching given in paragraphs [0034] and [0035] of the patent in suit does not guarantee that a resin powder exhibiting an angle of repose as defined in granted claim 1 is obtained. Furthermore, the polymerization conditions used in the examples of the patent in suit differ from those used in Examples 1 and 2 of D3 as was pointed out by the respondent. It was in particular shown by the respondent that the ratio of suspending agent (methylcellulose) to monomer is 6 times lower in the examples of the patent in suit than in the process described in those examples of D3. Again, the appellant did not indicate, let alone submit evidence or technical explanations on the basis of which one could conclude that this noticeable difference, as well as additional apparently less significant differences in the preparation of the PVDF powder, i.e. amounts of water and polymerisation initiator, type of transfer agent, polymerization temperature and time, would have no impact on the factors influencing the angle of repose. In addition, the agitation conditions used for the polymerisation reactions, which are as mentioned above an important factor influencing the particle size

distribution of the final powder resin, are not specified in the examples of the patent in suit. Hence, the technical information provided by Examples 1 and 2 of the patent in suit does not allow the conclusion that the polymerisation conditions used in Examples 1 and 2 of D3 would necessarily lead to a resin powder also exhibiting the angle of repose required by present claim 1.

6.3 Accordingly, the appellant failed to show that Examples 1 and 2 of D3 anticipate the subject-matter of granted claim 1.

Novelty over D11 - Admittance of D11 and E14

7. D11 and E14 are items of evidence submitted by the appellant with their statement setting out the grounds of appeal. Their admission to the proceedings, which was contested by the respondent, is to be decided based on the revised version of the RPBA which came into force on 1 January 2020, taking into account their transitional provisions (Articles 24 and 25 RPBA 2020). According to Article 25(2) RPBA 2020, Article 12(4) to (6) RPBA 2020 do not apply to any statement of grounds, and therefore to any evidence submitted therewith, filed before 1 January 2020. Article 12(4) RPBA 2007 remains thus applicable. Accordingly, the admission to the proceedings of D11 and E14 is subject to the discretionary power of the Board in accordance with Article 12(4) RPBA 2007.

7.1 D11 is prior art under Article 54(2) EPC on the basis of which a new objection of novelty has been submitted. E14 is a declaration concerning the reproduction of Examples 3 to 5 of D11 for the purpose of showing that the resin powders obtained in said examples meet the

parametric conditions defined in operative claim 1. In deciding whether D11 and E14 should be admitted into the proceedings, it needs to be decided whether or not the situation was such that those items of evidence should have been submitted already before the opposition division.

7.2 According to the appellant the filing of D11 and E14 was justified by the fact that the appellant had not been able to convince the opposition division of a lack of novelty, despite all converging evidence and explicit disclosures of D1, which made it necessary to provide an experimental re-working of example 4 of D1. Such a re-working however was not possible in view of the highly hazardous initiator used in that example whose use has been banned since years from the appellant's facilities.

7.3 Having regard to the minutes of the first oral proceedings before the opposition division held on 30 October 2014, which minutes were posted on 5 February 2015, the appellant must have been aware at the latest after having received the minutes of the first oral proceedings that the opposition division was not convinced that example 4 of D1 was novelty destroying. Accordingly, if it was felt necessary to file additional submissions to those submitted on the basis of D1, the appellant would have had ample time to submit D11 and E14 before the second oral proceedings before the opposition division which took place on 26 January 2016.

7.4 Even if to the benefit of the appellant one accepted that a repetition of example 4 of D1 with the radical initiator used in that example was impossible in view of safety requirements put in place since years at the

appellant's sites, or could not be repeated by an external laboratory, this also should have been known to the appellant even before the first oral proceedings before the opposition division. This would have constituted an additional reason for the appellant to make submissions based on D11, which as noted by the respondent is a patent in the name of the appellant, or would not have prevented the appellant from repeating example 4 of D1 taking another conventional radical initiator used for the same type of polymerization, such as the one employed by the patent proprietor in D11.

7.5 In view of the above, the Board concludes that the new novelty objection based on the submission of D11 and E14 does not represent a justified reaction to the contested decision and to the course of events having taken place before the opposition division. If the appellant intended to rely on these documents for a separate novelty objection, they should have filed them during opposition proceedings before the opposition division.

7.6 Accordingly, the Board makes use of its power under Article 12(4) RPBA 2007 and holds D11, E14 and the objection for lack of novelty based on those documents inadmissible.

Admittance of D14 to D16a

8. In view of the above, it is not necessary to decide on the admittance of D14 to D16a whose admittance has been requested by the respondent only in case documents D11 and E14 had been admitted into the proceedings.

Novelty over the alleged public prior uses

9. The appellant also argued lack of novelty of granted claim 1 over the alleged public prior uses based on a sale of the product SOLEF®PVDF 1010/1001 by Solvay to SGL ACOTECH GmbH in 2003 and on a sale of the product SOLEF®PVDF 1015/1001 by Solvay to PCI Membrane Systems Ltd in October 1993. The respondent did not challenge the finding of the opposition division in points 4.3.3 and 4.4.2 of the reasons for the contested decision that these sales took place before the priority date of the patent at issue. The Board has no reason to take a different view. The respondent, however, argues concerning the sale of SOLEF®PVDF 1010/1001 in 2003 that it is highly questionable whether the long storage time of a sample of the product manufactured in 2002, the analysis of said sample only being made in 2012, had no influence on the properties measured, especially on the angle of repose. In respect of the sale of SOLEF®PVDF 1015/1001 in 1993 the respondent also argues that the experimental data provided with E9 and E10 concern products manufactured in 2002 and are not relevant to determine the nature of the product sold in 1993. Moreover, the respondent argues in view of the rationale of opinion G 1/92 of the Enlarged Board of Appeal (OJ EPO 1993, 277) that the products SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 could not have been made available to the public, since it had not been shown that those products could be reproduced without undue burden by the skilled person.

9.1 In opinion G 1/92 the Enlarged Board of Appeal held that the chemical composition of a product forms part of the state of the art when the product as such is available to the public and can be analysed and reproduced by the skilled person, irrespective of

whether or not particular reasons can be identified for analysing the composition. The same principle applies mutatis mutandis to any other product (points 1 and 2 of the Conclusion). It also stated in point 1.4 of the Reasons for the Opinion that "An essential purpose of any technical teaching is to enable the person skilled in the art to manufacture or use a given product by applying such teaching. Where such teaching results from a product put on the market, the person skilled in the art will have to rely on his general technical knowledge to gather all information enabling him to prepare the said product. Where it is possible for the skilled person to discover the composition or the internal structure of the product and to reproduce it without undue burden, then both the product and its composition or internal structure become state of the art".

Composition / internal structure of SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001

9.2 Concerning the nature of the products SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001, the submissions of the appellant were based on the experimental report attached to declarations E9 to E11. These reports indicate for each of the parameters defined in operative claim 1 the corresponding values for SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001, i.e. the values of the bulk density and of the angle of repose, as well as the values determined by a dry sieving method of D_{50}, D_{80} and D_{20}, the proportion of resin powder having a particle diameter of below 45 µm and the proportion of resin powder having a particle diameter of more than 355 µm. In addition, values of D_{50}, $(D_{80} - D_{20})/D_{50}$ and the proportion of resin powder having a particle diameter of below 45 µm and the

proportion of resin powder having a particle diameter of more than 355 µm were also determined by laser diffraction.

As to the experimental report attached to E15, this evidence concerns an unspecified sample of SOLEF®PVDF 1015/1001, i.e. a sample which has not been indicated to be representative of the properties of the powder prepared at the time the alleged public prior uses concerned took place. The purpose of this experimental report is to demonstrate the validity of the methodology used in E9 to E11. In any event, it does not address further characteristics in addition to those already addressed in the experimental report attached to E9 to E11. The Board also notes that Mr Roblot provided with his testimony during the oral proceedings before the opposition division a vague statement concerning the viscosity of the products of type 1010 and a vague indication concerning the average diameter of the powder of product (minuted testimony, page 5/23, last paragraph and page 8/23, penultimate paragraph, respectively).

Furthermore, the angle of repose determined in the experimental report submitted by the appellant is a property dependent on the structure of the powder, but does not constitute per se a structural definition thereof. The Enlarged Board specified in point 3 of the reasons for the opinion G 1/92 (supra) that a commercially available product per se does not implicitly disclose anything beyond its composition or internal structure. Extrinsic characteristics, which are only revealed when the product is exposed to interaction with specifically chosen outside conditions, e.g., reactants or the like, in order to provide a particular effect or result or to discover

potential results or capabilities, therefore point beyond the product per se as they are dependent on deliberate choices being made. This is the case for the angle of repose which therefore cannot be considered to have been known at the date of sale of the products whose public prior use is invoked by the appellant.

9.3 As to the internal structure of the powders sold, whereas determining the chemical nature and composition of a PVDF powder is straightforward, a description of its structure is not a trivial task. Such PVDF powders can be described at several scales. At the largest scale the structure of the powder can be defined by the various particles constituting the powder, which particles differ in size, possibly also in shape and in the morphology of their surface. The experimental report attached to E9 to E11 contains information concerning only the particle size distribution characteristics (a) i) to iii) as defined in operative claim 1, which characteristics do not represent a full description of the particle size distribution of the powder measured. Moreover, at a smaller scale the complex structure of this polymer is defined by that of its various chains, e.g. molecular weight and distribution thereof, chain configuration, orientation. It is in this respect referred to D4 (page 4, second paragraph of section 2.2, lines 1-7) which is an excerpt of an encyclopedia concerning PVDF resins and therefore can be considered to reflect the general knowledge in the art.

9.4 On that basis it is concluded that the information provided by the appellant is not sufficient to characterize the internal structure of the products SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001. In the absence of additional submissions in this respect, the

appellant did not demonstrate that the skilled person would have been able to determine the internal structure of the products whose public prior use is invoked.

Ability to reproduce SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001

10. The appellant did not argue that information about the processes actually used for manufacturing SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 was available to the public, but essentially argued that the skilled person based on the common general knowledge in the art would have been able to produce the powders whose sale occurred. Even if to the benefit of the appellant one could assume that the skilled person would recognize that such products had been produced by suspension polymerisation, the skilled person would still be faced with the difficulty that the complex structure of a specific powder, including the structure of the polymer at the molecular scale, depends on the various conditions used for its synthesis (see above points 4.5 and 9.3). The absence of precise structural information concerning SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 does not allow any conclusion as to whether these two specific types of powder, which in fact can only be accurately defined in a complex way as shown above, could necessarily be reproduced without undue burden, i.e. with reasonable effort. Evidence that the skilled person using common general knowledge and only a reasonable amount of experimentation would be generally able to reproduce PVDF resin powders was also not submitted. The sole information concerning the synthesis of PVDF powders referred to by the appellant was that contained in D1 and D3 which are two patent applications whose specific teaching cannot be

considered to represent the common general knowledge in the art.

11. Accordingly, based on the appellant's submissions, the Board cannot conclude that the skilled person would have been able to determine the internal structure of SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 and to reproduce those without undue burden at the date of their sale. Under those circumstances and in view of the requirements set out in opinion G 1/92 for the internal structure of a product put on the market before the priority/filing date of the patent to be considered to have been made available to the public, it is concluded that the internal structure of SOLEF®PVDF 1010/1001 and SOLEF®PVDF 1015/1001 did not form part of the prior art pursuant to Article 54(2) EPC. Accordingly, the public prior uses invoked by the appellant cannot anticipate the subject-matter of claim 1.

Inventive step

12. According to the case law (Case Law, supra, I.D.3.2) ideally the closest prior art should be a document that mentions the purpose or objective indicated in the patent in suit as a goal worth achieving. The aim thereof is that the assessment process should start from a situation as close as possible in reality to that encountered by the inventor, avoiding *ex post facto* considerations. Therefore a document not mentioning a technical problem that is at least related to that derivable from the patent specification does not normally qualify as the closest state of the art on the basis of which an inventive step is to be assessed, regardless of the number of technical features it may

have in common with the subject-matter of the patent (see Case Law, supra, I.D.3.3, in particular T 686/91).

12.1 According to paragraph [0018] of the patent in suit, an object of the present invention was to provide a polyvinylidene fluoride resin powder capable of being stably fed to an injection moulding machine or an extrusion moulding machine and which leads to mouldings having excellent properties like those obtained using pellets, but are less prone to colouring. In line with the contested decision and the respondent's submissions, D1 which is proposed by the appellant as the closest prior art does not concern injection moulding or extrusion moulding, i.e. it does not relate to the production of parts obtained by injection or extrusion moulding. Contrary to the appellant's assertion in the last paragraph of section 3.3.1 on page 37 of the grounds of appeal the specific passage of D1 cited by the appellant (page 5, right column, fourth paragraph) does not disclose that the resin powder is submitted to extrusion.

12.2 D1 concerns only the powder coating of preheated metal parts resulting in the molten powder to form a film on the surface of the metal parts, which process is performed either by immersing the preheated metal in a fluidized bed of the resin powder or by electrostatic spraying of the resin powder (see above section 4.1). Moreover, it was not shown by the appellant that the flow properties of the PVDF resin powders disclosed in the context of D1, i.e. in the context of a resin powder fluidized by air, would give any useful information on the flow properties of such resin in a quite different context such as the feeding of an extrusion or injection moulding machine.

12.3 Accordingly, D1 does not represent a realistic starting point for the skilled person who aims at solving the problem mentioned in paragraph [0018] of the specification. Based on the technical information provided in paragraphs [0043], [0045] and [0046] of the specification in which it is explained why characteristics (a)(ii), (a)(iii) and (b) are necessary for injection or extrusion moulding and without citing other documents of the prior art providing a similar teaching, the appellant argued that the skilled person would consider that the resin powders disclosed in D1 would be suitable for a successful injection or extrusion moulding and would take this document as starting point for the present invention. This demonstrates that the appellant's choice of D1 as the closest prior art, relying only on similarity of structural features with operative claim 1 and explanations given in the patent in suit as to why some of the features of the resin powder of example 4 of D1 would make this powder as an adequate starting point when seeking to solve the problem underlying the patent in suit, is based on the hindsight knowledge of the invention and therefore lacks the objectivity required for assessing inventive step. Therefore, the appellant's objection based on D1 cannot convince.

12.4 The appellant also indicated during the oral proceedings that the extrusion of PVDF resin powder for producing pellets was already known in the art as indicated in paragraph [0001] of the patent in suit. The appellant, however, did not submit any objection starting from any additional prior art.

12.5 Hence, the appellant's submissions cannot lead to the conclusion that the subject-matter of the present claims lacks an inventive step.

13. Accordingly, none of the grounds for opposition submitted by the appellant prejudices the maintenance of the patent as granted.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

B. ter Heijden D. Semino

Decision electronically authenticated