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Datasheet for the decision of 4 December 2014

Case Number: T 2338/11 - 3.3.03

Application Number: 02011786.7

Publication Number: 1347012

IPC: C08L27/16, C08J3/24, C08K5/00

Language of the proceedings: EN

Title of invention:
Curable Fluoroelastomers

Patent Proprietor:
Solvay Specialty Polymers Italy S.p.A.

Opponent:
3M Innovative Properties Company

Relevant legal provisions:
EPC Art. 83, 54, 56

Keyword:
Sufficiency of disclosure - (yes)
Novelty - main request (no) - auxiliary request (yes)
Inventive step - auxiliary request (yes)

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Case Number: T 2338/11 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 4 December 2014

Appellant: (Opponent)	3M Innovative Properties Company 3M Center 2501 Hudson Road St. Paul MN 55144-1000 (US)
Representative:	Kurz, Arnd 3M Deutschland GmbH 3M Office of Intellectual Property Counsel Carl-Schurz-Strasse 1 41453 Neuss (DE)
Respondent: (Patent Proprietor)	Solvay Specialty Polymers Italy S.p.A. Via Turati 12 20121 Milano (IT)
Representative:	Vande Gucht, Anne Solvay S.A. Département de la Propriété Industrielle Rue de Ransbeek, 310 1120 Bruxelles (BE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 24 August 2011 rejecting the opposition filed against European patent No. 1347012 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	B. ter Laan
Members:	D. Marquis
	R. Cramer

Summary of Facts and Submissions

I. The appeal by the opponent lies from the decision of the opposition division posted on 18 August 2011 rejecting the opposition against European patent N° 1 347 012 (application No. 02 011 786.7).

II. The patent was granted with a set of 29 claims of which independent claims 1, 26 and 28 read as follows:

"1. Fluoroelastomers curable by ionic route based on vinylidenfluoride (VDF) comprising:
a) 100 parts by weight of fluoroelastomer based on VDF and having an amount of polar end groups that has to be lower than 3% by moles with respect to the total amount of the end groups present in the polymer;
b) from 0.05 to 5 phr of accelerant;
c) from 0.5 to 15 phr of curing agent;
d) from 1 to 40 phr of one or more inorganic acid acceptors, preferably bivalent metal oxides;
e) from 0 to 2.5 phr, preferably from 0 to 1.5 phr of one or more basic compounds preferably hydroxides of bivalent metals or of weak acid metal salts;
f) from 0 to 80 phr of reinforcing fillers."

"26. Cured fluoroelastomers according to claims 1-25."

"28. Manufactured articles obtainable with the cured fluoroelastomers of claims 26-27."

Claims 2 to 25 were directed to preferred embodiments of claim 1. Claim 27 was directed to a preferred embodiment of claim 26. Claim 29 was directed to a preferred embodiment of claim 28.

III. A notice of opposition against the patent was filed in which the revocation of the patent was requested on the grounds according to Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(b) EPC.

IV. By a decision announced orally on 13 July 2011, the opposition division rejected the opposition. The decision was based *inter alia* on the following documents:

D1: US 5,285,002
D2: US 4,287,320
D3: M. Pianca et al, Journal of Fluorine Chemistry, 95 (1999), 71-84.

In the decision it was held that the main request (claims as granted) was sufficiently disclosed. The issue relating to the overlap between the definitions of the "inorganic acid acceptor" and the "basic compound", was considered to be a matter of clarity (Article 84 EPC) rather than of sufficiency of disclosure.

According to the opposition division, both MgO and $Ca(OH)_2$ fell under the definition of an inorganic acid acceptor according to present claim 1 (component (d)). The sum of their combined amounts as used in examples 10 and 12 of D1 fell within the range now being claimed. D1 also disclosed features (a), (b), (c), (d), (e) and (f) as in claim 1 of the granted patent. However, it was found that D1 failed to disclose explicitly a fluoroelastomer having an amount of polar end groups lower than 3 mol% with respect to the total amount of the end groups present in the polymer (feature (a1) of present claim 1). The IR spectrum of

the fluoroelastomer of Example 1 of D1 did not provide any information about the amount of polar end groups other than carbonyl, such as $-CH_2OH$, which, according to the opposed patent, had to be taken into account. The reference to "very small amounts" of $-CH_2OH$ end groups in column 4, lines 2-4 of D1 was not considered to be an explicit disclosure of the amount of that type of polar end groups. Also, the opposition division found that the amount of polar end groups could not be seen as an amount of impurities present in the fluoroelastomer. Therefore, the subject matter of claim 1 was novel over D1.

Starting from D1 as the closest prior art, the problem was defined as to provide ionically curable fluoroelastomers with low amounts of polar end groups characterized by a high curing rate and, therefore, acceptable for the automatic moulding of manufactured articles. Claim 1 differed from D1 in that the VDF-based fluoroelastomer contained an amount of polar end groups lower than 3 mol% with respect to the total amount of the end groups present in the polymer. The increase in the curing rate of the fluoroelastomers was illustrated by the examples and the comparative examples of the opposed patent. In particular, example 1 and comparative example 5, which differed only in the amount of polar end groups, demonstrated an improvement of the curing time expressed as t'50 and t'90. No effect on the curing time was found in D1 even when the amount of polar end groups in the fluoroelastomer was reduced by using a sulfinate such as $C_8F_{17}SO_2Na$ during its preparation. Therefore, there was no suggestion in D1 to decrease the amount of polar end groups in the fluoroelastomer in order to increase its curing rate.

V. On 24 October 2011, the opponent lodged an appeal against the decision of the opposition division and paid the prescribed appeal fee on the same day. The statement setting out the grounds of the appeal was filed on 13 December 2011. The opponent requested that the patent be revoked.

VI. With a reply dated 25 April 2012, the patent proprietor (respondent) requested the dismissal of the appeal and filed three auxiliary requests the wording of which is not relevant for this decision.

VII. The Board provided a preliminary opinion on 10 October 2014.

VIII. By fax dated 31 October 2014 the appellant submitted

D4: US 5,852,149

IX. Oral proceedings were held on 4 December 2014.

X. The appellant's arguments may be summarised as follows:

Main request

- Sufficiency of disclosure

According to claim 1, the composition could be free of basic compound (component e)) but still had to contain from 1 to 40 phr of inorganic acid acceptor (component d)). Since inorganic acid acceptors were by definition basic compounds, it was not possible to prepare a composition that simultaneously contained an inorganic acid acceptor but not a basic compound. The description did not provide any indication of how that conflict could be solved because there was no indication that

the terms "basic compound" and "inorganic acid acceptor" were used in any other way than according to common practise in chemistry. This lack of clarity was such that it led to a lack of enablement according to Article 83 EPC.

- Admissibility of D4

D4 was late filed because the appellant had not been aware of it at an earlier stage. D4 should be admitted to the proceedings because it was prima facie novelty destroying for the subject matter of claim 1 and was highly relevant for the assessment of inventive step. Example 1 of D4 disclosed a VDF-based curable elastomer polymer. The spectra of that polymer showed the "total absence of polar groups, such as $-CH_2OH$, carbonyls, carboxyls" and therefore the polymer contained less than 3 mole % of polar groups. The curable composition of Table 2 contained 0.45 phr of an "accelerator", 2 phr of bisphenol AF as a curing agent, 3 phr of MgO and 6 phr of $Ca(OH)_2$ which were both inorganic acid acceptors. It further contained 30 phr of carbon black as a reinforcing filler. That composition was therefore novelty destroying for claim 1.

XI. The patent proprietor's arguments may be summarised as follows:

Main request

- Sufficiency of disclosure

The alleged contradiction between the terms "basic compound" and "inorganic acid acceptor" in claim 1 was a matter of lack of clarity instead of lack of sufficiency of disclosure. The definition of those

terms was well known in the art of fluoroelastomer preparation, as could be seen in D2. The claimed subject matter was therefore sufficiently disclosed.

- Admissibility of D4

D4 had been introduced at a very late stage of the proceedings for no good reason. In example 1 of D4 $Ca(OH)_2$ was disclosed, which a person skilled in the art understood to be a basic compound (component e)), not an inorganic acid acceptor (component d)). The amount of $Ca(OH)_2$ disclosed in example 1 of D4 lay outside the claimed range of 0 to 2.5 phr for the basic compound (component e)). D4 was therefore not relevant for novelty. Nor was D4 more relevant than the documents already on file for the discussion of inventive step, because comparative example 3 of the patent in suit, which represented the compositions of examples 1 and 3 of D4, demonstrated the improved properties of the compositions now being claimed. D4 should therefore not be admitted to the proceedings.

XII. The appellant requested that the decision under appeal be set aside and the patent be revoked as its main request, or alternatively that the decision under appeal be set aside and the case be remitted to the department of first instance.

The respondent requested that the appeal be dismissed as its main request or alternatively that the decision under appeal be set aside and the case be remitted to the department of first instance.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. Sufficiency of disclosure

2.1 For assessing sufficiency of disclosure the question to be answered in the present case is whether the person skilled in the art could prepare a fluoroelastomer curable by ionic route based on vinylidenefluoride (VDF) according to claim 1. That fluoroelastomer should comprise as component d) from 1 to 40 phr of one or more inorganic acid acceptors and as component e) from 0 to 2.5 phr of one or more basic compounds.

2.2 As the presence of component d) - one or more inorganic acid acceptors in an amount of between 1 and 40 phr - is an essential feature of the subject matter of claim 1, the meaning of the expression "e) from 0 to 2.5 phr of one or more basic compounds" can only be seen as the presence (if any) of any basic compound that is not an inorganic acid acceptor according to component d), in an amount lower than or equal to 2.5 phr. This reading is consistent with the examples of the patent in suit, in which inorganic acid acceptors are present in an amount comprised between 1 and 40 phr in the absence of a basic compound. Therefore, the Board cannot agree with the appellant's argument that the amount of 0 phr of basic compound contradicts the presence of inorganic acid acceptors in the fluoroelastomer according to claim 1 of the patent in suit.

2.3 Moreover, even if a contradiction existed, it would concern the limits of the claimed subject-matter, which

is a matter of clarity (Article 84 EPC), which is not open for objection in opposition proceedings. The appellant has not given any reason why the skilled person would not be in a position to prepare a fluoroelastomer falling within the ambit of claim 1 due to the definitions of components d) and e). The subject matter of claim 1 fulfils the requirements of Article 83 EPC.

3. Admissibility of D4

3.1 D4 discloses a fluoroelastomer comprising vinylidene fluoride (VDF) and/or tetrafluoroethylene (TFE) and at least another fluorinated monomer ethylenically unsaturated, said fluoroelastomer having polar terminal groups in an amount of less than 3% by moles with respect to the total amount of terminal groups (claim 1). In example 1 a fluoroelastomer composition is disclosed that is ionically cured (column 6, line 13). The monomer mixture consists of 55% by moles of VDF and 45% by moles of hexafluoropropene (column 5, lines 55 to 57). Using the same combination of analytical methods (FT-IR, ^{1}H-NMR and ^{19}F-NMR) as in the patent in suit (paragraph [0063]), it is established that the fluoroelastomer of example 1 of D4 does not contain polar end groups such as -CH_2OH, carbonyls and carboxyls (column 6, lines 1 to 10). D4 therefore discloses the absence of polar end groups in the fluoroelastomer of example 1.

While according to the contested decision the subject matter of claim 1 of the patent in suit was novel over D1 because the amount of polar end groups in the fluoroelastomer was not clearly and unambiguously disclosed, D4 does disclose that feature both in claim 1 as well as in example 1.

The composition of example 1 of D4 (Table 2) further comprises Bisphenol AF as a curing agent, an accelerator, MgO, $Ca(OH)_2$ and carbon black MT as a filler, which fulfil the definition of components c), b), d) and f), respectively, according to claim 1 of the patent in suit.

3.2 In view of the disclosure of D4, it is concluded that it is highly relevant for the assessment of novelty of the claims of the main request, more relevant than D1.

3.3 Furthermore, D4 belongs to the same technical field as the patent in suit, namely cured fluoroelastomer compositions and their use as sealing materials, in particular O-rings (D4, column 6, line 23 of D4; paragraph [0001] of the patent in suit). D4 describes improved curing speed and mechanical properties of fluoroelastomer compositions that do not contain polar end groups (column 2, lines 20 to 25), as illustrated by the compression set and t'90 values measured after curing of the composition of example 1 (column 6, lines 24 to 27 and Table 2). An improvement of the curing speed of the fluoroelastomer compositions as a result of the choice of fluoroelastomers with a low amount of polar end groups is the reason given in the contested decision of the opposition division to acknowledge an inventive step of the main request. D4 therefore also appears to be highly relevant for the assessment of inventive step. The fact that the composition of comparative example 3 of the patent in suit appears to correspond to the composition of examples 1 and 3 of D4 also shows the relevance of D4.

3.4 In view of the above considerations, D4 is admitted to the proceedings.

4. Remittal

4.1 Since D4 was filed at such a late stage in the proceedings that the respondent has not had an opportunity to reflect on the situation and for instance to amend its requests, the Board considers it appropriate to exercise its power under Article 111(1) EPC and to remit the case to the opposition division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance for further prosecution.

The Registrar: The Chairman:

B. ter Heijden B. ter Laan

Decision electronically authenticated