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**Datasheet for the decision
of 21 March 2012**

Case Number: T 0239/09 - 3.3.01

Application Number: 02746078.1

Publication Number: 1416024

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C09D 127/18, C08K 5/053,
C09D 133/10

Language of the proceedings: EN

Title of invention:
Aqueous dispersion composition of fluoro-resin for coating

Applicant:
DAIKIN INDUSTRIES, LTD.

Headword:
Coating composition/DAIKIN

Relevant legal provisions:
EPC Art. 56

Keyword:
"Main request: amended claims at appeal allowable"

Decisions cited:
-

Catchword:
-



Case Number: T 0239/09 - 3.3.01

D E C I S I O N
of the Technical Board of Appeal 3.3.01
of 21 March 2012

Appellant:
(Applicant)

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 25 August 2008
refusing European patent application
No. 02746078.1 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: P. Ranguis
Members: L. Seymour
L. Bühler

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division posted on 25 August 2008 refusing the European patent application No. 02 746 078.1 under Article 97(2) EPC.

II. Claim 1 of the application documents forming the basis of the decision under appeal, filed with letter of 5 November 2007, reads as follows:

"1. An aqueous dispersion composition of fluororesin for coating comprising:

(A) fluororesin particles,

(B) a nitrogen-free high boiling point polyol having a boiling point of at least 100°C and containing at least 2 hydroxyl groups,

(C) depolymerizable acrylic resin particles having a decomposition and vaporization temperature within a temperature range of up to the decomposition temperature of said fluororesin particles,

(D) a nonionic surfactant, and

(E) an aqueous medium;

wherein

(a) said high boiling point polyol (B) and said depolymerizable acrylic resin particles (C) are respectively contained in an amount of 5 to 18 parts by

mass and 5 to 25 parts by mass based on 100 parts by mass of fluororesin particles (A),

(b) an oxidant and an amine-type solvent are not contained, and

(c) said nonionic surfactant (D) is a nonionic surfactant represented by formula (I)

R-O-A-H (I)

(wherein R is a linear or a branched alkyl group having 9 to 19 carbon atoms; A is a polyoxyalkylene chain having 4 to 20 oxyethylene units and 0 to 2 oxypropylene units)".

III. The following documents were cited in the decision under appeal:

(1) RU-C-2 039 069, and English translation provided by the appellant with letter of 31 March 2006

(2) printout of internet page last updated October 1999:
<http://website.lineone.net/~mwarhurst/apeintro.html>

(3) EP-A-0 614 941

(4) WO 97/03140

It is noted that the citations of document (1) in the present decision refer to the English translation thereof provided by the appellant.

IV. In its decision, the examining division considered that the claimed subject-matter did not involve an inventive step. Starting from document (1) as closest prior art, the examining division defined the problem to be solved as lying in the provision of alternative fluoro-resin aqueous coating compositions which were free of potentially harmful surfactants. The proposed solution was found to lack an inventive step in view of documents (2) and (3), which suggested the replacement of the ethoxylated alkylphenol surfactant according to document (1) with a polyoxyethylene alkyl ether of present formula (I).

V. With the statement of grounds of appeal filed on 3 December 2008, the appellant (applicant) resubmitted the main request considered in the decision under appeal, together with an auxiliary request and an experimental report, entitled "Experimental Report 2". A conditional request was made for oral proceedings.

Claim 1 of this auxiliary request, which subsequently became the new main request (cf. point VI below), differs from claim 1 reproduced above under point II in the addition of the following feature at the end of the claim:

"and (d) the depolymerizable resin (C) is one in which butyl methacrylate is used as a monomer".

VI. In its response of 17 February 2012 to the communication sent as an annex to the summons for oral proceedings, the appellant stated that the main request filed with letter of 3 December 2008 was withdrawn and that the auxiliary request filed with letter of

3 December 2008 was now elevated to the main request. Additionally, previous "Experimental Report 2" (cf. above point V) was revised to correct some minor errors and resubmitted as "Experimental Report 3".

- VII. With letter of 28 February 2012, three auxiliary requests were filed, and with letter of 1 March 2012 complete replacement description pages for each of the pending requests.
- VIII. Following a further communication by the board, the appellant filed, with letter of 14 March 2012, replacement description pages 13 and 14 for the main request.
- IX. By fax dated 15 March 2012, the board informed the appellant that the oral proceedings due to take place on 21 March 2012 were cancelled.

The appellant (applicant) requested in writing that the decision under appeal be set aside and that a patent be granted on the basis of the main request, consisting of claims 1 to 8 filed as auxiliary request with letter of 3 December 2008 together with description pages 1 to 12 and 15 to 28 filed with letter of 1 March 2012 and pages 13 and 14 filed with letter of 14 March 2012, or alternatively on the basis of one of the auxiliary requests 1 to 3 filed with letter of 28 February 2012 together with the corresponding adapted description pages filed with letter of 1 March 2012.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request (originally filed as auxiliary request with letter of 3 December 2008)*

2.1 *Amendments (Article 123(2) EPC)*

Claim 1 of the main request differs from claim 1 as originally filed in the limitation in the definition of component (D) to a nonionic surfactant represented by formula (I) (feature (c)), and an the additional restriction such that "the depolymerizable resin (C) is one in which butyl methacrylate is used as a monomer" (feature (d)) (cf. above points II and V). As a result of the former amendment, formula (I) has been deleted from dependent claim 3 as originally filed.

The amendments to claim 1 find their basis the application as originally filed, in claim 3 and page 14, lines 1, 2.

The description has been adapted accordingly.

The requirements of Article 123(2) EPC are therefore met.

2.2 *Novelty (Articles 52(1), 54 EPC)*

No novelty objection was raised by the examining division in view of the cited prior art and the board sees no reason to differ.

2.3 *Inventive step (Articles 52(1), 54 EPC)*

2.3.1 The subject-matter of present claim 1 relates to an aqueous dispersion composition of fluororesin (see above point II). According to the description, these compositions can be used for coating metal cooking utensils, and other products which require corrosion resistance. They can be applied directly to the substrate but preferably, in order to improve adhesion, a primer layer is provided and a topcoat layer is formed (see page 19, lines 4 to 6; page 20, lines 15 to 25; claim 8).

2.3.2 The board considers, in agreement with the examining division, that document (1) represents the closest prior art. This document relates to fluoropolymer coatings for use on the surfaces of metals consisting of a primer layer and a finishing layer, whereby the latter contains the following components (see claim 1, amount as wt% given in brackets; order changed so as to ease comparison with present claim 1):

- (A) homo- and/or copolymer of tetrafluoroethylene with a perfluoromonomer (30-55);
- (B) glycerol (1-3) (note: synonymous with "glycerin" as specified in present claim 2);
- (C) carboxymethylcellulose, polyvinyl alcohol or **a copolymer of butyl acrylate, methyl methacrylate and phenylacrylic acid** (1-5);
- (D) surfactant (3-8);

(E) water (balance); and

(F) an inorganic pigment (1-7) (cf. present claim 6).

In example 6 of document (1), the finishing layer contains the acrylate copolymer highlighted above in bold as component (C) and an ethoxylated alkylphenol as surfactant component (D).

The coatings of document (1) are said to have high hardness and wear resistance (page 3, third complete paragraph), and may be coated to a critical thickness without cracking (paragraph bridging pages 3 and 4).

Document (4), suggested as a possible alternative closest prior art by the appellant, is a less suitable starting point, since the specific topcoat formulation disclosed therein (see pages 16, 17, Example 13) contains an oxidant (cerium octoate) and an amine-type solvent (triethanolamine), which are specifically excluded in the present claims. It also does not contain "a nitrogen-free high boiling point polyol" (cf. present component (B)).

2.3.3 With respect to the definition of the problem to be solved in view of document (1), the appellant relied on "Experimental report 3" filed with letter of 17 February 2012, which is a corrected version of "Experimental report 2" filed with the statement of grounds of appeal (cf. point VI above). In this experimental report, the properties of a baked film formed from two compositions were compared, with respect to critical film thickness and colour. In the composition in accordance with present claim 1,

component (C) is a **butyl methacrylate (BMA)**/hydroxyethylmethyl methacrylate copolymer, whereas, in the comparative example, the corresponding additive is a **butyl acrylate (BA)**/methyl methacrylate/acrylic acid copolymer. Thus, the acrylic resins chosen for comparison not only differ in the distinguishing feature as defined in claim 1, namely, the use of BMA as a monomer, rather than BA as in example 6 of document (1), but also in the remaining monomers. Consequently, based on the data provided, it is not possible to reach any conclusions as to whether the reasons for any differences in properties is attributable to the distinguishing feature of the invention as defined in present claim 1.

In the absence of sufficient proof for any improvement over the composition of document (1), the problem to be solved can only be seen in the provision of alternative fluoro-resin coating compositions.

2.3.4 The solution as defined in claim 1 (cf. above points II and V with point 2.3.2) relates to

- (i) the use of BMA as a monomer in the acrylic resin instead of BA (features (C) and (d)) and
- (ii) the use of a surfactant of formula (I) instead of an ethoxylated alkylphenol (features (D) and (c)).

2.3.5 The results of Experiment 1 include in the above-mentioned "Experimental report 3" demonstrate that a coating with very good properties with respect to crack formation and colouring behaviour is obtained using a composition according to claim 1.

In view of these results, the board is satisfied that the problem as defined above under point 2.3.3 is plausibly solved by the claimed compositions.

- 2.3.6 It remains to be investigated whether the proposed solution as set out above under point 2.3.4 is obvious to the skilled person in the light of the prior art.

Document (1) itself only provides a very specific teaching with respect to the suitable components of the coating compositions, in particular with respect to the additive designated as "carboxymethylcellulose, polyvinyl alcohol or a copolymer of butyl acrylate, methyl methacrylate and phenylacrylic acid" (cf. above point 2.3.2, component (C)). Thus, three alternative options are listed of very different structure, without providing any explanation as to their function. Similarly, the only specific class of surfactants suggested are ethoxylated alkylphenols. Document (1) itself does not therefore provide any hint as to which modifications should be undertaken in order to solve the problem posed.

Document (4) does include a general teaching suggesting the use of BMA as an alternative to BA in film formers for fluoro-resin coating compositions (page 5, lines 7 to 27). However, there is very limited information with respect to the concrete coating compositions in which the corresponding acrylic polymers may be suitably used (cf. e.g. page 7, lines 21 to 26). The only teaching in this respect is in the form of the specific topcoat formulation disclosed in Example 13 (pages 16, 17). However, the composition of this embodiment differs

markedly from that of document (1). For example, it contains several additives that are absent in the topcoat compositions of document (1), such as the oxidant cerium octoate. Moreover, triethanolamine is used as solvent, which is structurally very different from the glycerol solvent used in document (1). It is noted in this context that both "an oxidant and an amine-type solvent" are specifically excluded as components in present claim 1 (see feature (b)). Therefore, in view of the significant differences in the types of compositions contemplated in documents (1) and (4), the skilled person would not be able to derive any valuable information from the latter as to whether its teaching would be applicable in the context of the former, and nevertheless lead to coatings having acceptable properties.

Moreover, document (4) does not contain any hint that would have led to the further modification of the surfactant according to document (1) (cf. feature (ii) listed above under point 2.3.4), since the surfactant taught in Example 13 of document (4) is Triton X-100, which is a phenolic surfactant of the same type as that disclosed in document (1).

Consequently, document (4) does not provide an incentive to the skilled person to modify the compositions of document (1) so as to arrive at the claimed solution of the problem posed.

The further prior art documents cited do not come closer to the claimed subject-matter than those addressed above.

Thus, document (2) merely provides general information concerning alkylphenol ethoxylate surfactants and suggests that alcohol ethoxylates are a safer alternative.

Similarly, although document (3) lists polyoxyethylene alkyl ethers as a potential alternative nonionic surfactants to polyoxyethylene phenol ethers (see page 3, lines 34 to 39), it is completely silent on the subject of depolymerizable resins. Indeed, the compositions are disclosed as preferably not containing binders (page 3, line 51).

Therefore, documents (2) and (3) also cannot render the claimed subject-matter obvious.

Hence, the subject-matter of claim 1 of the main request involves an inventive step.

Having regard to the fact that claims 2 to 7 are dependent composition claims, and that claim 8, relating to a coated article, refers back to the preceding composition claims, it is concluded that the subject-matter of the main request meets the requirements of Articles 52(1) and 56 EPC.

3. Since the main request is considered to be allowable, it is not necessary to comment on the lower-ranking auxiliary requests.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a patent on the basis of the following application documents:
 - Description pages 1 to 12 and 15 to 28 filed with the heading "Main Request" with letter of 1 March 2012
 - Description pages 13 and 14 filed with letter of 14 March 2012
 - Claims 1 to 8 filed as auxiliary request with letter of 3 December 2008

The Registrar:

The Chairman:

M. Schalow

P. Ranguis