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Aktenzeichen / Case Number / N^o du recours : T 171/84

Anmeldenummer / Filing No / N^o de la demande : 79 300 136.3

Veröffentlichungs-Nr. / Publication No / N^o de la publication : 3870

Bezeichnung der Erfindung: Aqueous polymer emulsions and water-based paints
Title of invention: and coatings containing such emulsions.
Titre de l'invention :

Klassifikation / Classification / Classement : C 09 D 5 / 02

ENTSCHEIDUNG / DECISION

vom / of / du 24 October 1985

~~Anmelder / Applicant / Demandeur :~~

Patentinhaber / Proprietor of the patent / Air Products and Chemicals Inc.
Titulaire du brevet :

Einsprechender / Opponent / Opposant : Hoechst A.G.

Stichwort / Headword / Référence : "Redox Catalyst/AIR PRODUCTS"

EPÜ / EPC / CBE Art. 83 and Rule 27(1)(f) EPC

"Sufficiency of disclosure" "Reproducibility of example"
"Common general knowledge"

Leitsatz / Headnote / Sommaire

An error in the description (in the present case, an incorrect numerical value in the only example) is immaterial to the sufficiency of the disclosure if the skilled person could recognise and rectify it using his common general knowledge.

Europäisches
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European Patent
Office
Boards of Appeal

Office européen
des brevets
Chambres de recours



Case Number: T 171 / 84

DECISION
of the Technical Board of Appeal^{3.3.1}
of 24 October 1985

Appellant:

(Proprietor of the patent) Air Products & Chemicals Inc.
P.O. Box 538
Allentown
Pennsylvania 18105 U.S.A.

Representative:

Berg, Stapf, Schwabe, Sandmair
P.O. Box 86 02 45
D-8000 München 86

Respondent:

(Opponent)

HOECHST AKTIENGESELLSCHAFT, Frankfurt
Zentrale Patentabteilung
Postfach 80 03 20
D-6230 Frankfurt am Main 80

Representative:

Decision under appeal:

Decision of the Opposition Division of the European Patent Office
dated 16.05.84 revoking European patent No.
003 870 pursuant to Article 102(1) EPC

Composition of the Board:

Chairman: K. Jahn
Member: G. Szabo
Member: F. Benussi

Summary of Facts and Submissions

- I European patent No. 3870 was granted on 14 October 1981 with three claims in response to the European patent application No. 79 300 136.3 filed on 29 January 1979 claiming priority of the earlier application in the U.S. of 31 January 1978. Claim 1 was worded as follows:
- "An aqueous polymer resin emulsion for use in water-based paints and coatings characterised in that it comprises polymer resin formed by the polymerisation of a mixture which incorporates allyl urea and/or methallyl urea".
- II The opponent filed opposition against the European patent on 5 July 1982 requesting that it be revoked on grounds of non-patentability for lack of inventive step and also for insufficient disclosure.
- III The Opposition Division revoked the patent in a decision of 16 May 1984. The reason for the revocation was that the invention had not been disclosed sufficiently clearly and completely for it to be carried out by a person skilled in the art. The opponent submitted evidence suggesting that the only example in this case was irreproducible. Instead of obtaining a 56% yield, as expected, the amount of polymer obtained was only 17%, with about 40% unreacted monomer. In addition the product was unsuitable for the suggested purpose. Although emulsion polymerisation initiated by free radicals in the presence of a redox catalyst system had generally been known, the evidence of the opponent and some general studies (cf. Encyclopedia of Polymer Science and Technology, vol. 1, page 757 (4) and Methoden der Organischen Chemie, vol. XIV/1, pages 1133 and 1134 (5)) suggested that the preparation of copolymers containing allyl or methallyl monomers might not be quite straightforward, in view of reduced reactivity. No evidence to the contrary had been

provided. The extract from Ullmann's Encyclopaedia vol. 14, 1963 (cf. (6), page 115) had not mentioned such monomers and was therefore irrelevant. Since in fact, much more of the reducing catalyst would have been required for success than what had been recommended in the Example, the patentee had not discharged the onus to provide sufficient information in the specification. In the absence of any submission as to the real requirement, the deficiency could not be remedied and the patent was invalid. There was therefore no need to decide the issue of the inventive step.

IV The proprietor of the patent filed an appeal with the payment of the fee on 6 July 1984 and submitted a Statement of Grounds on 26 September 1984. The respondent filed a reply and an oral hearing was held on 24 October 1985. Although duly invited, the respondent elected not to be represented at the oral proceedings.

V The appellant submitted during the proceedings and the oral hearing substantially the following arguments:

- (a) The reaction for polymerisation was similar to that of the cited closest art, BE-A-856 911, Example 5(1). The skilled person would have had no difficulty in recognising what went wrong with the process and should have corrected the same en route. The technique itself was a well-known polymerisation method with free radicals in the presence of a redox catalyst system. Specifications US-A-4 035 329(7), 3 954 687(8), 4 044 197(9) and 4 073 779(10), illustrated the general application of the method to vinyl ester and acrylate polymers in the presence of allyl compounds. Moreover, the general textbook (6) recommended about equivalent amounts for the oxidising and reducing components of the redox system.

- (b) This implied that the amount of the reducing agent should, in weight, be more than that of the oxidising component. The former could be at least 1.2-times the latter. It was 1.6-times in the report submitted to show the reproducibility of the method. The product so prepared was found to provide wet-adhesion in the paint, although no test results to that effect had been submitted in the report.
- (c) The opponent's experiments were not bona fide, since all warning signals were disregarded. The skilled person would have recognised the low figure for the reducing agent and would have taken the appropriate corrective measures at the latest when the experiment was in progress.

VI The respondent (opponent) argued in his submissions substantially as follows:

- (a) According to the evidence submitted, very carefully conducted repeated attempts to reproduce the sole Example in the specification had failed to provide the desired result. A low yield of a solid product of unacceptable quality had been obtained with most of the monomer left in the medium unreacted.
- (b) It took about two years for the patentee to find out how to correct the mistake. There was no general guidance in the introductory part of the specification to explain how the copolymerisation of the allyl component must be achieved. It was not obvious to apply 3 to 5 times the amount of the catalyst prescribed in order to rectify the deficiency. In the absence of

general knowledge, the skilled man was required to make an invention in order to reproduce the process successfully. This should be seen as an unacceptable burden.

VII The appellant requested that the decision under appeal be set aside and that the patent be maintained in an unamended form. As a subsidiary request he requested that an independent expert be called in to clarify the question whether or not the process according to the example could be successfully carried out in order to obtain the desired product. The respondent requests that the appeal be rejected.

Reasons for the Decision

1. The appeal complies with Articles 106 and 108 and Rule 64 EPC and is, therefore, admissible.
2. The case is concerned with the sufficiency of the disclosure under Article 83 EPC, raised appropriately in opposition proceedings with reference to Article 100(b) EPC. The evidence submitted by the respondent (opponent) (cf. Report dated 1 July 1982), suggested that strict adherence to the quantitative prescriptions of the sole Example of the patent specification had not led to the desired result. A substantially lower yield of a solid product was obtained with the unreacted vinyl acetate monomer being present at a 40% concentration, instead of 0.5%, at the end of the reaction. The emulsion did not show the required wet-adhesion properties either.
3. It is generally recognised that the disclosure must be clear and complete so as to be sufficient for the skilled person to carry out the invention (Article 83 EPC). In the present case the skilled person to whom the specification is addressed is the applied chemist in the field of polymers who

has knowledge and experience in polymerisations initiated by free radicals, e.g. with the aid of redox catalysts. The characteristic feature of the invention is the incorporation of allyl or methallyl urea as an additive (cf. Claim 1 and page 2, line 9) in a copolymer of a known type in order to improve its wet-adhesion properties. The amount of such additions was to be fairly small, the Example refers to 0.75% by weight on the total amount of monomers. If, indeed, the resulting copolymer emulsion is significantly improved, as suggested on page 3 and 4 of the specification on the basis of appropriate test results, there would hardly be any justification to increase the proportion of the additive by any significant amount.

4. The Board is therefore satisfied that the product in question is basically a typical copolymer, based for instance on vinyl or acrylic esters, with small amounts of allyl or methallyl urea component therein. Thus the cited reference (4) and (5), which hinted at difficulties with copolymerisation, when the allyl component is a major part of the product are irrelevant since the reaction would have been expected to follow the typical pattern for copolymers of the known types. In view of the fact that the degree of incorporation was not critical at those lower levels as long as some of the additive was taken up by the product, no significant problems were to be expected on that account.
5. The relevant question is, therefore, what kind of redox system was to be applied for the copolymerisation of vinyl acetate and n-butyl acrylate in the Example. The appellant first referred to the closest state of the art (1) as the model for the reaction. This document is, however, neither cited in the patent specification in support of the disclosure (cf. also "Amendment of claims/MOBIL, T 6/64, OJ 8/1985, 238), nor has it become part of common general knowledge, e.g. through appreciation in a standard textbook.

Unless being available to the skilled reader of the patent in question, other specifications cannot normally contribute to the sufficiency of the disclosure and this now also applies to those cited by the appellant in the Statement of Appeal and must be dismissed from consideration.

6. It is, on the other hand, different with Ullmann (6), an authoritative reference book on technology, which recommends redox catalytic systems for such kinds of polymerisations, for instance comprising sulphurous acid derivatives as reducing components and peroxides as oxidising agents in about equivalent proportions for the purpose (cf. page 115). The reference also specifically mentions both agents which are used in the present case. The Opposition Division dismissed this as irrelevant, since the proposal was not specifically concerned with allyl and methallyl monomers. In view of the above, however, exactly the general character of the disclosure should make the information relevant to the case, since the skilled person would not consider a less than 1% addition of allyl monomers, as upsetting the general applicability of standard techniques to any significant extent.
7. The instructions of the Example refer to 1.4 parts of a 70% t-butyl peroxide, i.e. about 1 part of this as an oxidising agent, and 0.4 part of Discolite PEA i.e. sodium formaldehyde sulfoxylate (cf. page 5, line 9), as the reducing component. The appellant stated, and this was uncontested, that the amount of reducing agent would have to exceed that of the oxidising agent in this particular pair (cf. Statement of Grounds page 13). For instance, the two were used in a weight ratio of 1.6 to 1 in the evidence submitted on the appellant's behalf (cf. submissions on 11 January 1985, page 4, top paragraph). It has been stated by the appellant that this complies with the textbook recommendation in (6) that about equivalent quantities were to be used.

8. In view of the above, it could immediately be apparent to the attentive reader of the specification, that contrary to common general knowledge, the prescribed amount of the reducing agent is only a fraction of that of the oxidising one, instead of exceeding the same in quantity. Whilst the actual proportions may in practice vary around the recommended equivalent as an approximate mean value, in no case should he have had reason to consider only 0.4 part of the reducing agent on 1.4 part of oxidising component, as being anywhere near to a normal requirement. This discrepancy between the suggested and usual amount should have enabled him to correct the figure or to know exactly later on what was missing when something went wrong with the reaction.
9. Even if the skilled person had missed noticing the anomalous figure in the Example, and commenced the experiment without attempting to correct the amount of the reducing component, he would have, in all likelihood, observed that the effort to maintain the internal reaction temperature with the addition of Mixture 3 was unsuccessful (cf. page 3, lines 9 and 10 of the specification). In fact this mixture would have been added and consumed whilst the vessels supplying the other two mixtures simultaneously would have been still two-thirds full. In other words, the exothermic reaction must have been dying out visibly.
10. Should the skilled man have again been unable to recognise this to happen, he could have noticed independently from the above that the monomer level in the reaction vessel was dramatically rising above the recommended level of 3 to 5%. Finally, even he failed to monitor the reaction in this respect, a standard procedure in this art, the sudden absence

of any need for cooling, i.e. the drop of internal temperatures in relation to the jacket temperatures should have been an unmistakable sign of the fact that the reaction has actually stopped.

11. The Board is also satisfied that the common general knowledge of the skilled person would have, in any case, pointed to the above-mentioned only possible cause of the inadequate function of the reaction. There has been no suggestion that the other reactants or the stated conditions for the reaction are out of proportion or are unusual. The speed of catalytic reactions are primarily dependent on the presence and availability of catalyst. This is particularly so in cases where the catalyst is not fully regenerating itself. The proportions within the redox system in the Example can only mean a deficiency in the continuous supply of the reducing component, consequently a single addition of this would have rectified the defect without the need of further experimentation.
12. In the circumstances there were no prejudices to prevent the skilled man from applying the common general knowledge about the desired approximate proportions of the catalyst component, nor would he have encountered any difficulty or confusing choices when considering how to steer the reaction back to normality. In addition to this, no undue effort was expected from the skilled man either in way of such search or experimentation, let alone in any necessity to exercise his inventive skill. Apart from the apparent strangeness of one feature in the Example, practice would have provided three red lights forcing the experimenter to take corrective measures. The opponents approach to the problem in a blindfolded manner is not what is expected from persons who

are skilled in the art and are therefore carrying out experiments with a professional skill, which includes the ability of recognising obvious deviations from the normal and of acting accordingly.

13. In view of the above facts, the Board has come to the conclusion that the error in the sole example represents no insufficiency in the present case, in spite of the irreproductibility of the desired product on the basis of the given information.

The Board is, therefore, of the opinion that an error in the description is immaterial to the sufficiency of the disclosure if the skilled person could recognise and rectify it using his common general knowledge.

Since the remedy of such deficiency depends on the particular facts of the case, a warning is, in the opinion of the Board, justified. Applicants are well advised not to be unduly influenced by their excessive experience in the field to which the invention relates, so as to neglect providing all the detailed instructions in the specification which are necessary for carrying out the invention without difficulties and to rely immoderately on the possibility of using common general knowledge to fill gaps and to rectify any deficiency in the disclosure.

14. The issue of the inventive step was deliberately left undecided by the Opposition Division. The Board finds it inappropriate to decide the issue and maes use of its power under Article III(1) EPC to remit the case to the Opposition Division for further prosecution.

Order

It is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division for further prosecution on the basis of the claims as granted.

The Registrar



The Chairman

