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Bezeichnung der Erfindung: Stable cementitious composition
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C04B 40/00

ENTSCHEIDUNG / DECISION

vom / of / du 8 August 1989

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet : Imperial Chemical Industries PLC

Einsprechender / Opponent / Opposant : Rigips GmbH

Stichwort / Headword / Référence : Cementitious compositions/ICI

EPÜ / EPC / CBE Articles 54 and 56

Schlagwort / Keyword / Mot clé : "Novelty (confirmed) - true construction of claim"
"Inventive step (confirmed) - unforeseeable result".

Leitsatz / Headnote / Sommaire

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Case Number : T 380/88 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 8 August 1989

Appellant : (Opponent)
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Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 22 June 1988 rejecting the opposition filed against European patent No. 0 115 137 pursuant to Article 102(2) EPC.

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R.W. Andrews
R. Schulte

Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 115 137 in respect of patent application No. 83 307 494.1, filed on 8 December 1983 and claiming priority of 31 December 1982 from a prior application filed in the United Kingdom, was announced on 22 October 1986 (cf. Bulletin 86/43) on the basis of nine claims. The independent Claims 1 and 9 read as follows:

"1. A homogeneous cementitious composition comprising

(a) at least one hydraulic cement,

(b) water in a proportion of not more than 25% by weight of the hydraulic cement in the composition, and

(c) at least one organic polymeric material which is water-soluble or water-dispersible, which is capable of aiding the processing of the composition, and which is present in a proportion of 2% to 15% by weight of the hydraulic cement in the composition,

characterised in that the temperature of the composition is less than 0°C.

9. A homogeneous cementitious composition comprising

(a) at least one hydraulic cement and at least one particulate aggregate,

(b) water in a proportion of not more than 25% by weight of the hydraulic cement and particulate aggregate in the composition, and

(c) at least one organic polymeric material which is water-soluble or water-dispersible, which is capable of aiding the processing of the composition, and which is present in a proportion of 2% to 15% by weight of the hydraulic cement and particulate aggregate in the composition,

characterised in that the temperature of the composition is less than 0°C."

II. On 16 July 1987 a notice of opposition was filed requesting the revocation of the patent and the grounds of lack of novelty and inventive step. The opposition was supported, inter alia, by the following documents:

(1) EP-A-0 055 035
(2) US-A-3 813 460
(3) DE-A-2 923 082 and
(6) DE-A-2 453 527.

III. By a decision of 22 June 1988 the Opposition Division rejected the opposition. The Opposition Division concluded that the subject-matter of the patent in suit was novel since none of the cited documents disclosed a cementitious composition fulfilling all the requirements of Claims 1 and 9. Although it is known in the art that the setting of cementitious compositions can be delayed by cooling them to below 0°C the Opposition Division agreed that when a conventional cementitious composition is frozen, thawed and then set, the strength of the resulting cement product is much decreased compared with the strength of the cement product which has been produced from the same composition

which has not been subjected to freezing and thawing. In the light of this, the Opposition Division considered that an inventive step resided in the discovery that the cementitious compositions disclosed in document (1) could be cooled below 0°C without any deterioration in the mechanical properties of the cement products obtained after thawing and setting, since there was no indication in the prior art that these known compositions would possess this property.

IV. An appeal was lodged against this decision on 10 August 1988 with payment of the prescribed fee. A statement of grounds of appeal was filed on 27 October 1988.

In his statement and during the oral proceedings held on 8 August 1989, the Appellant argued that the compositions defined in the precharacterising part of the present Claim 1 are known from document (1) and that it was known from documents (2) and (3) that the setting of mortar and cement is delayed by freezing. Since it is the reaction between the water present in the composition and the cement which is prevented or slowed down by freezing, the other ingredients in the composition are of no importance in this respect and the results obtained in the disputed patent were foreseeable.

The Appellant also alleged that no disadvantages are associated with the freezing of cementitious compositions and that the claimed subject-matter lacked novelty in the light of the disclosure of document (3).

V. The Respondent conceded that compositions comprising hydraulic cement and, optionally, particulate aggregate, water and organic polymeric material, are known from document (1) and that it was known from documents (2) and (3) to freeze cementitious compositions in order to delay their setting. However, when a cementitious composition comprising the components as defined in Claims 1 and 9 in the proportions stated in these claims is cooled below 0°C, there is no adverse effect on the strength of the resulting cement product, particularly on its flexural strength. With respect to the decision T 192/82 of 24 March 1984 of this Board, referred to by the Appellant, he argued that there is no question of a "one-way street situation" since the disputed patent relates to the freezing of one particular composition whose freezing provides the additional effect of the avoidance of the disadvantages associated with the freezing of cementitious compositions in general.

VI. The Appellant requested that the decision under appeal be set aside and that the patent be revoked. The Respondent requested that the appeal be dismissed.

VII. At the conclusion of the oral proceedings, the decision was announced that the appeal was dismissed.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.

2. The patent in suit is directed to the use of homogeneous cementitious compositions comprising at least one hydraulic cement and defined amounts of water and at least one water-soluble or water-dispersible organic polymeric material which is capable of aiding the processing of the

compositions and, optionally, at least one particulate aggregate, which have been maintained for a period of time at a temperature of less than 0°C and then allowed to return to ambient temperature for the manufacture of cement products.

2.1 It is generally known and recognised that freezing of a conventional cementitious composition shortly after preparation of the composition, or freezing of the composition after the setting reaction has proceeded for only a short period of time, results in the cement product obtained after subsequent thawing and setting having a flexural strength which is not as great as that of a cement product produced from an identical cementitious composition which has not been subjected to freezing and thawing.

2.2 In the light of this generally accepted common knowledge and the undisputed results of the Comparative Example in the disputed patent (cf. column 7, lines 7 to 37), the Appellant's allegation that freezing and thawing of any cementitious compositions is not disadvantageous cannot be accepted by the Board. Although it is true that document (2) would imply that the resistances of a cement and mortar which have been frozen is equal to that of a cement and mortar which has not been frozen, provided that the freezing is effected before the beginning of the hydration of the binder (cf. column 3, lines 44 to 50), in the absence of any experimental support the Board considers that the skilled person in the light of his experience in this field would still hold the view that the freezing of conventional cementitious compositions leads to a deterioration in the strength of the resultant cement products.

2.3 In the light of the above, the technical problem underlying the patent in suit may be seen in providing a cementitious composition which may be maintained at a temperature of less than 0°C for a period of time for use in the manufacture of a cement product, the flexural strength of which is at least substantially the same as that of a product made from an identical composition which has not been subjected to freezing and thawing.

2.4 According to the patent in suit this technical problem is solved by using a cementitious composition comprising a hydraulic cement and, optionally, a particulate aggregate, water in a proportion of not more than 25% by weight and 2 to 15% by weight a water-soluble or water-dispersible organic polymeric material which is capable of aiding the processing of the composition; the percentages of water and organic polymer being based on the weight of the hydraulic cement and particulate aggregate, if present.

In the view of the results obtained in the Examples of the disputed patent the Board is satisfied that the above-defined technical problem is plausibly solved.

3. Document (3) discloses a mortar comprising a binding agent, a filler, a setting retarder and water which is frozen until use (cf. Claim 2 and page 4, lines 11 to 19). However, in the absence of any indication of the amount of water in the composition or of an organic polymeric material corresponding to the one used in the present compositions, the disclosure of this document does not destroy the novelty of the present subject-matter.

3.1 Document (1) discloses cementitious compositions comprising at least one hydraulic cement, water in a proportion of not more than 25% by weight of the composition, at least one water-soluble or water-dispersible organic polymer or

copolymer in a proportion of 1 to 15% by weight of the hydraulic cement in the composition and, optionally, a particulate aggregate. Suitable combinations of hydraulic cements and organic polymers or copolymers are selected on the basis of a specified capillary rheometer test (cf. Claims 1 and 10). Therefore, a large number of the cementitious compositions as defined in the precharacterising part of the present Claims 1 and 9 are known from document (1). Although this document does not describe such compositions at a temperature of less than 0°C, in the Board's judgement a non-structural parameter, such as the temperature of the composition, cannot serve to establish the novelty of a claim directed to the composition per se over the disclosure of the same composition without any mention of said parameter.

However, having regard to the circumstances of this particular case, the Board considers that the present claims, although apparently directed to the compositions per se, should be properly construed as being directed to the use of the cementitious compositions as defined which have been maintained at temperatures of less than 0°C for a period of time for the manufacture of cement products. This construction of Claim 1 as a use claim is exceptionally possible in the present case because the composition referred to in Claim 1 is already the subject-matter of the present Patentee's and Respondent's own European patent No. 0 055 035 (document (1)), which is referred to in the disputed patent. Hence, the Board concludes that the same product ought not to be reprotected by the disputed patent, but only its use in the stated temperature range. In the oral proceedings, the Respondent expressed his agreement with this conclusion. The subject-matter of the claims construed in such a manner is novel with respect to both document (1) and the other cited documents.

4. It still remains to be examined whether the requirement of inventive step is met by the subject-matter of the patent in suit.

4.1 As previously mentioned, document (1) discloses cementitious compositions falling within the definition in the precharacterising parts of Claims 1 and 9. However, from the teaching of this document and from his common general knowledge and experience in this field a skilled person could not foresee that, if these known compositions were cooled to a temperature below 0°C and thereafter allowed to warm to higher temperatures and set, there would be no adverse effect on the flexural strengths of the resulting cement products.

4.2 Document (2) discloses a process for the manufacture of concrete and mortar comprising mixing cement, lime or a mixture of cement and line with aggregate and water, freezing the resulting pasty mixture at a temperature between 0 and -40°C, storing or transporting the frozen mixture and subsequently thawing the mixture to reconvert it to the pasty state for use (cf. Claim 1). Although this document teaches that the setting of cement and mortar is delayed by freezing, there is no indication in this document which would suggest to the skilled person that the solution to the technical problem lay in using the cementitious compositions referred to in the present Claims 1 and 9.

4.3 Similarly, document (3) discloses that the setting of a mixture of a binder, a filler, a setting retarder and water is delayed by freezing the mixture (cf. Claims 2). However, this document does not provide any teaching which would cause the skilled person to reconsider the generally

accepted view that freezing a cementitious composition shortly after the preparation of the composition results in a reduction in the strength of the cement product obtained after subsequent thawing and setting of the frozen composition as compared with that of a cement product obtained from identical composition which has not been subjected to the freezing and thawing. Therefore, this document is of no assistance to the skilled person in his search for the solution to the above-defined technical problem.

4.4 Document (6) discloses a ready-mixed mortar for binding masonry or bricks, or for providing plaster, in which the mortar contains the quantity of water needed for hydraulic setting, a water retaining agent, a sufficient quantity of a substance to lower the freezing temperature of the water so that it does not freeze at temperatures down to -7°C and a setting retarding agent to provide a workability time of 2 to 14 days (cf. Claim 1).

The presence of the anti-freeze implies that this prior art ready-to-use mortar, the workability of which is prolonged by the presence of a setting retarder agent, can be used at temperatures as low as -7°C. However, the limited disclosure of the document, particularly in respect of the flexural strength of the set mortar, would not overcome the skilled person's reluctance to freeze cementitious compositions created by the generally accepted opinion and experience that the strength of a cement product prepared from a cementitious product which has been frozen and subsequently thawed and set is not as great as that of the cement product produced from an identical composition which has not been subjected to freezing and thawing.

5. Therefore, in the Board's judgement, the proposed solution to the technical problem of providing a cementitious

composition which may be maintained at a temperature of less than 0°C for a period of time for use in the manufacture of cement products, the flexural strength of which is at least substantially the same as that of a product made from an identical composition which has not been subjected to freezing and thawing, is inventive.

Claims 1 and 9 are, therefore, allowable. Claims 2 to 8, which relate to preferred embodiments of Claim 1, derive their patentability from this claim.

6. With respect to the decision T 192/82 of this Board (cf. OJ, EPO, 1984, 415-427) it is considered that, although it was known to delay the setting of cementitious compositions by freezing, in the present case the use of this known means applied to the specific cementitious compositions gave rise to an unexpected effect insofar as the generally expected disadvantages associated with freezing cementitious compositions in general are avoided. Moreover, in view of the large number of cementitious compositions available to the skilled person, there is no question of a so-called "one-way street situation".

Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: **The Chairman:**

F. Klein K. Jahn

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