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DECISION
of 9 April 1996

Case Number: T 0340/93 - 3.3.2

Application Number: 87310488.9

Publication Number: 0263723

IPC: C04B 16/02

Language of the proceedings: EN

Title of invention:
A process for manufacture of fibre-reinforced shaped articles

Patentee:
Dansk Eternit-Fabrik A/S

Opponent:
01: Eternit AG
02: Eternit-Werke Ludwig Hatschek AG

Headword:
-

Relevant legal provisions:
EPC Art. 54 and 56

Keyword:
"Novelty vis-à-vis prior art document containing an error (yes)
error immediatly recognisable"
"Inventive step (no) obvious to try"

Decisions cited:
-

Catchword:
-

Case Number: T 0340/93 - 3.3.2

DECISION
of the Technical Board of Appeal 3.3.2
of 9 April 1996

Appellant:
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 8 February 1993 revoking European patent No. 0 263 723 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: P. A. M. Lançon
Members: M. M. Eberhard
R. E. Teschemacher

Summary of Facts and Submissions

I. European patent No. 0 0263 723 based on application No. 87 310 488.9 was granted on the basis of 12 claims. Claim 1 reads as follows:

"1. A process for the manufacture of asbestos-free fibre-reinforced shaped articles having a density of at least 1000 kg/m^3 with a matrix of a cured inorganic binder, in which green shaped articles are formed by dewatering an aqueous slurry of fibres and a matrix forming material comprising particles of an inorganic hydraulic binder, a particulate inorganic additive and possibly other additives containing an excess of water in relation to the amount necessary to secure curing of the hydraulic binder, and containing, on a dry weight basis, 3-20%, preferably 5-20%, in particular 7-15%, cellulose fibres, after which the green shaped articles are cured, characterized in that the matrix forming material comprises, on a dry weight basis, 40-90%, preferably 45-85%, of a coarse material with an average particle size of 35-12 µm, preferably 25-18 µm, preferably with a particle size distribution exhibiting only one maximum, comprising the hydraulic binder and possibly a silica- or silicate-containing, preferably pozzolanic active additive, 5-45%, preferably 10-40%, in particular 10-35%, of a fine inorganic, preferably silica- or silicate-containing, in particular pozzolanic active additive with an average particle size of 10-1 µm, preferably 7-3 µm, preferably with a particle size distribution exhibiting only one maximum, 3-25% of an ultra fine preferably pozzolanic active additive with an average particle size within the range 1-0.02 µm, preferably less than 0.5 µm, and 0-30% other additives."

II. Respondents 1 and 2 (Opponents) filed Notices of Opposition requesting the revocation of the patent on the grounds of lack of novelty and lack of inventive step. Of the documents cited by the parties during the opposition procedure the following ones remain of importance for the present appeal:

O1D4	EP-A-0 067 456
O2D1	EP-A-0 127 960
O2D5	GB-A-2 170 141
O2D6	GB-A-2 174 382
O2D7	Proceedings of the CANMET/ACI, 1983
O2D8	EP-A-0 165 388
O2D9	Proceedings of the CANMET/ACI, 1983, pages 235 to 255
O2D12	Communications of the 7th International Congress on the Chemistry of Cement, vol. IV, 1980, pages 85 to 91
O2D13	Ciments, Bétons, Platres, Chaux No. 752, 1/85, pages 46 to 50
O2D14	Forschungsberichte des Landes Nordrhein-Westfalen, 1978, Y. Efes and H.P. Lühr
O2D15	The VI International Congress on the Chemistry of Cement, Moscow 1974, Fly-ash Cements, pages 3 to 51
O2D16	Fly Ash, Silica Fume, Slag and Natural Pozzolans in Concrete, Proceedings Second International Conference Madrid, Spain, 1986, Volume 1
O2D17	Densified cement/ultra-fine particle-based materials, H. H. Bache, 2nd International Conference on Superplasticizers in Concrete, Ottawa 1981

III. The Opposition Division revoked the patent. In its decision it took the view that the process of claim 1 as granted was new over O2D1, O2D5 and O2D6 and differed therefrom by the presence of the fine additive with an average particle size of 10-1 µm but held that this difference did not involve an inventive step.

IV. The Appellant lodged an appeal against this decision. In reply to the Statement of Grounds of Appeal, Respondent 1 cited two further documents, namely O1D9, H. Kühl Zementchemie, Band III, 1952, pages 262 to 263 and O1D10, F. Keil, Zement, 1971, page 374.

Oral proceedings were held on 15 February 1996. At these proceedings, the question was raised whether O2D16 was published before the priority date of the patent in suit. As the Board considered this document relevant for the outcome of the decision on the appeal, it informed the parties at the end of the hearing that a time limit was given to the Respondents to file evidence on the said publication date and that the same time limit would be given to the Appellant to reply to the submissions to be filed by the Respondents. Respondent 2 submitted evidence in particular in the form of a declaration of the publishers on the publication date and of a Certificate of Copyright Registration by the US Library of Congress on 21 and 26 February 1996. The Appellant did not comment upon the Respondent's submissions.

V. The Appellant's arguments put forward during the appeal procedure can be summarised as follows:

As far as the question of novelty was concerned, the Appellant argued that any person skilled in the art would have immediately recognised that the erroneous size distribution indicated on page 10 of O2D1 was clearly inconsistent with the technical disclosure about

Nyad G at page 6, in example 5 and Table V. Therefore, the erroneous information should not be considered as comprised in the technical teaching of O2D1. The range of Blaine specific surface 1000-12000 cm^2/g given at page 2 of O2D1 concerned the prior art and not the fly ash used in the process of O2D1 which had a specific surface of 3500 cm^2/g. A fly ash with this surface area did not inevitably exhibit an average particle size within the claimed range.

Concerning inventive step, the Appellant contested the findings in the decision under appeal that "the finer the fly ash the better the strength properties to be expected" represented a known general fact within cement technology. He argued that the effect of increasing the fineness of the fly ash on the strength of the cured cement casting was an unpredictable result of the combined IDP-, IPA- and IWD-effects (i.e. increased dense packing, increased pozzolanic activity and increased water demand effects). Furthermore, the alleged known thesis was not reflected in the information contained in the numerous citations. In O2D9, this thesis was confirmed for mixtures containing Portland cement 1, but not for mixtures containing Portland cement 2 or 3. O2D15 indeed disclosed at page 37 that the finer fly ash led to an increase of strength, however this result was obtained only for one particular test involving Portland cement and fly ash and therefore did not confirm the contended general thesis. Furthermore, O2D15 concerned a two particle fraction system and not a three particle fraction system as the claimed process. Regarding O2D16, the Appellant argued in writing that this citation confirmed the said thesis for a Portland cement, fly ash, superplasticizer system, but **not** for a system containing in addition **silica dust**. At the oral proceedings, the Appellant acknowledged that the flexural strength of Casting No. 14 of Table 4 containing the finer fly ash was increased about 6% with respect to Casting No. 13.

The Appellant contended that the person skilled in the art would not have considered the technical solutions within the casting/moulding technology relevant for the problem of providing improved flexural strength for fibre reinforced shaped articles produced by the dewatering technique, in particular because the sub-problems encountered in these two different techniques were totally unrelated to each other. But even if he had consulted the casting/moulding technology, he would have found no clear confirmation of the said thesis and no information suggesting that the flexural strength might have been improved for articles based on a binder consisting of Portland cement, fly ash and silica dust by increasing the fineness of the fly ash. On the contrary, he would have found a clear teaching away from this idea in Table 4 of O2D16. He would have further understood that even though increasing fineness of the fly ash component might lead to the formation of a "fine component" exhibiting improved void filling and improved pozzolanic properties, these improvements would have been negligible compared with the immense void filling and pozzolanic potential associated with the silica dust component. In this context the Appellant pointed out that since the specific surface area of silica dust was 100 times greater than that of fly ash in the experiments of O2D16 including silica dust, the specific surface area of the reactive Si-component was virtually constant, even when the specific area of the fly ash component was increased 400%.

VI. The Respondents both contended that the process of claim 1 lacked novelty. Respondent 2 argued that in Table 5B of O2D7 reporting the **Physical Requirements** for use in concrete of PFA with a Blaine specific surface of 1250 to 4000 cm^2/g, an average particle size of 9 µm was indicated. Therefore it had to be assumed that the fly ash of O2D1 with a Blaine specific surface of 3500 cm^2/g also fulfilled this fundamental condition. In Respondent 1's view, a fly ash with an average particle size of 1-10 µm was disclosed in O2D1 since a fly ash having a specific surface area within the range 1000-12000 cm^2/g was mentioned therein. It clearly appeared from Fig.1 of O2D16 that the Blaine value "up to 12000 cm^2/g" mentioned in O2D1 corresponded to a particle size within the range 1-10 µm. Furthermore, in view of the correlation between the Blaine specific surface and the particle size given in O1D10, the Blaine value 3500 cm^2/g of O2D1 could only be correlated with an average particle size between 5 and 6 µm.

Concerning the wollastonite used in O2D1, Respondent 2 contended that not only "Nyad G" existed but also another wollastonite having the particle size given at page 10 of O2D1, i.e. the commercial product "Nyad 10 micron". The skilled person reproducing the teaching of O2D1 would automatically have tried these two commercial products, thereby necessarily arriving at the claimed process. Furthermore, not only O2D1 but also O1D4 and O2D8 disclosed the same information about the particle size of the wollastonite. As O1D4 was published well before the priority date of O2D1, the right way to interpret the teaching of O2D1 in cases of doubt was to refer to O1D4. The latter disclosed at page 5 the use of acicular bodies (D) having a diameter of 0.5 to 10 µm and providing improved internal coherence, for example wollastonite. As the particle size given at page 10 of O2D1 had not been changed, the skilled person carrying out the process of O2D1 would automatically have followed the clear information indicated on the said page. Respondent 2 further argued that either of O2D5 and O2D6 caused claim 1 to lack novelty since the term "Pulverised Fuel Ash" encompassed both ground and unground fly ash.

As regards inventive step, the Respondents contested that the effect of increasing fineness of fly ash on the strength properties was unpredictable. In principle, it could be expected that by using finer fly ash the IDP- and IPA-effects would appear and it was derivable from O2D12, O2D9 and O2D13 that the incorporation of ground fly ash decreased the water demand and increased the concrete strength. It was also known from O2D13, O2D15 and O2D16 that finer fly ash or ground fly ash led to superior strength properties. O2D16, which referred to O2D17 concerning the achievement of a dense packing, taught that density was increased by introducing silica fume and that strength could be improved by increasing the fineness of the fly ash. A comparison of Castings No. 13 and 14 showed that a slight increase of the flexural strength was achieved by using a smaller amount of finer fly ash instead of a greater amount of coarser fly ash, despite the slightly higher water content. The principle "the finer the fly ash the better the strength" was also known from textbooks well before the filing date of the patent in suit (cf. O1D9). Furthermore, it was denied that the skilled person would not have transferred the teaching from the casting/moulding technique to the dewatering technique.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained as granted. The Respondents requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. The two additional documents O1D9 and O1D10 were mentioned for the first time at the appeal stage. They are parts of standard textbooks and were cited to illustrate the common general knowledge in the field of cement before the priority date in connection with questions already discussed during the opposition procedure. In these circumstances the Board has decided to admit them in the appeal procedure.

3. Regarding the date of publication of O2D16, the Board has no reason to doubt the correctness of the evidence submitted by Respondent 2 on 21 and 26 February 1996. Neither were objections raised by the Appellant after notification of this evidence. Therefore the Board is satisfied that this document was published before the priority date of the patent in suit and forms part of the state of the art as defined in Article 54(2) EPC.

4. The question arises whether the process of claim 1 of the patent in suit is new over the disclosure of O2D1, O2D5 or O2D6 taken separately.

4.1 O2D1 discloses a process for the manufacture of asbestos-free shaped articles, which comprises all the features recited in the preamble of claim 1 of the patent in suit. The slurry used in the said process comprises, on a dry weight basis, 45 to 65% lime and/or lime containing material such as a Portland cement having a Blaine specific surface of for example 2600, 3000 or 4400 cm^2/g; 18 to 25% ultra fine silica dust with an average particle diameter less than about 0.5 µm, for example about 0.1 µm; and 0 to 40%

additives. The additives may be, among others, fly ash or filtering agents including acicular Wollastonite crystals (see page 3, lines 4 to 29, page 5, line 26 to page 6, line 16, pages 9 and 10, claims 1, 8, 10 and 12). The sheet of Experiment No. 7 exhibiting a density of 1220 kg/m^3 was manufactured using 15% cellulose fibres (% by weight of total solid material), 5% fly ash having a Blaine specific surface of 3500 cm^2/g, 24% silica dust with an average particle diameter of about 0.1 µm and 56% LSC cement with a Blaine surface of 3000 cm^2/g. Experiment 18 (page 29) was performed using 15% cellulose fibres, 24% silica dust as defined above, 51% E cement with a Blaine specific surface of 2600 cm^2/g and 10% Nyad G. The sheet of Experiment H3 (page 33) was produced from a slurry containing 10% cellulose fibres, 20% silica dust, 60% LSC cement and 10% Nyad G. It follows therefrom that the novelty of the claimed process depends on the question whether or not the fly ash or the acicular wollastonite incorporated in the articles of O2D1 constitutes a fine additive having an average particle size of 10-1 µm as defined in claim 1.

4.2 It is clear from O2D1 that the fly ash introduced in the shaped article has a Blaine surface area of 3500 cm^2/g and not of 1000-12000 cm^2/g as contended by Respondent 1. This range is indeed mentioned at page 2, lines 6 to 14 of O2D1, however it does not concern the specific surface area of the fly ash incorporated in the shaped articles of O2D1 but that of the siliceous material used in the process of US-A-3 501 323. The teaching of this US patent is partly reviewed in said passage but it is not incorporated by reference so that this range does not apply to the fly ash used in the process of O2D1.

O2D1 is silent about the average particle size of the fly ash having a Blaine specific surface of 3500 cm²/g. Respondent 2's argument that this fly ash must be assumed to have an average particle size of 9 µm in view of Table 5B of O2D7 (cf. point VI above) cannot be accepted by the Board. The requirements concerning the pulverised fuel ash (PFA) for use in concrete as reported in this table are those mentioned in standard specifications of various countries. As regards **fineness**, four specifications required a minimum Blaine surface area in the range 1250 to 4000 cm²/g and only one a maximum average particle diameter of 9 µm while seven specifications required a maximum sieve residue on a 45 µm sieve in the range 12.5 to 50%. It is clearly derivable from this table and from O2D15, which also deals with the fly ash standards in the different countries (see page 17 and page 18, first paragraph), that the limits specified for the fineness of PFA in the various specifications differ according to country and that a fly ash with an average particle size of 9 µm as well as coarser fly ashes, for example those having sieve residues of about 50% on a 45 µm sieve, can be used in concrete. In these circumstances, the fact that the fly ash of O2D1 has a Blaine surface area of 3500 cm²/g does not mean that it inevitably exhibits the average particle size of maximum 9 µm required in a single specification.

Respondent 1's arguments that the Blaine specific surface of 3500 cm²/g disclosed in O2D1 corresponded to an average particle size between 5 and 6 µm in view of the correlation between the Blaine specific surface and the average particle size given in O1D10 are not convincing. Firstly, it appears that the correlation indicated in O1D10 does not concern fly ash but cement. Secondly, according to page 7 of the patent in suit the fly ash used in the comparative examples exhibits a

Blaine specific surface of about 3500 cm²/g and has an average particle size of about 14 µm. Furthermore, it is disclosed on the last page of O2D7 (Table 1) that the fly ash with a Blaine specific surface of 4410 cm²/g has an average particle size of 13 µm. Other correlations between the Blaine specific surface area of fly ashes and their average particle size can also be found in O2D14 (cf. pages 47 and 48) and O2D16 (see page 309, Figure 1 from which it derives that the fly ash PFA 1 with a Blaine surface area of 3430 cm²/g has an average particle size well above the upper limit 10µm stated in claim 1). In view of all these data concerning fly ash, it can only be concluded that a fly ash with a Blaine specific surface of 3500 cm²/g does not inevitably exhibit an average particle size within the range 1-10 µm. Therefore, the mention of this Blaine value in O2D1 does not cause the subject matter of claim 1 to lack novelty.

4.3 According to O2D1, page 7, lines 28 to 29, and page 10, the wollastonite used in the examples is the commercial product Nyad G (a product of Interpace Corporation). This product is mentioned accordingly in Table I of page 23, Table V of page 29 and Table VIII of page 33. It is clearly and unambiguously derivable from the leaflet of the Interpace Corporation concerning the wollastonite Nyad products and filed during the examination procedure that Nyad G is an acicular wollastonite having the highest aspect ratio and exhibiting a particle size considerably higher than that indicated at page 10 of O2D1 (see page 2 of the leaflet annexed to the letter of 20 November 1989, Figure 1). Therefore, the skilled person reading the information at page 10 of O2D1 and/or wanting to get Nyad G or a similar product in order to reproduce the examples of O2D1 would immediately recognise that an error has occurred at page 10. As shown by Respondent 2 and not contested by the Appellant, another commercial product, "Nyad 10 micron", fulfils the particle size characteristics indicated at page 10 so that the question might arise whether the designation of the product or the particle size distribution is erroneous. It should be noted that if the designation were erroneous, then O2D1 would also contain errors at pages 23, 29 and 33. In order to find out where the error lies, not only page 10 of O2D1 should be considered but the whole disclosure of this document and the common general knowledge on its effective date. According to page 6, acicular Wollastonite crystals are used as filtering agents in the process of O2D1, and in example 5 illustrating the effect of incorporation of Wollastonite crystals it is indicated that the said incorporation results in considerable reduction in the filtration time. The test results reported in Table V of page 29 show a reduction of the filtration time from 242 to 180 seconds when replacing 10 parts of E cement by Nyad G. In view of this disclosure and taking into account the common general knowledge, the skilled person would immediately recognise that, of the two wollastonite products, only Nyad G could lead to this considerable reduction of the filtration time since, on the one hand, its long rod-like particles could keep the cement particles apart and, on the other hand, a material with a particle size distribution allowing it to be incorporated in the voids between the cement particles would obviously not be appropriate as a filtering agent for reducing the filtration time to such an extent. Therefore, the skilled person would unambiguously recognise that the wollastonite used in O2D1 is Nyad G having the known particle size distribution and not the incorrect one mentioned on page 10. In these special circumstances the obviously erroneous particle size characteristics given at page 10 cannot, in combination with the remaining disclosure in O2D1, be considered as causing claim 1 to lack novelty.

Respondent 2's additional arguments relying on the disclosure of O1D4 or O2D8 to interpret the content of O2D1 must fail when considering the issue of novelty, since there is no indication in O2D1 that parts of the disclosure of O1D4 or O2D8 are incorporated by reference and, therefore, the Respondent's arguments are in fact based on a combination of separate independent patent documents.

4.4 O2D5 or O2D6 both disclose the incorporation of pulverised fuel ash (PFA) in the aqueous slurry but they do not give information as to the fineness of this product. As PFA does not inevitably exhibit the average particle size defined in Claim 1 (see point 4.2 above), the process of claim 1 is also novel with respect to the disclosure of either of these documents. As regards the designation "Pulverised Fuel Ash" (PFA), it can clearly be derived from the definition given in document P1 (i.e. Sintered light weight aggregate, PFA data book, mentioned in the decision under appeal) or from O2D15, page 3, lines 1 to 7, that this term does not mean that the ash was ground (pulverised).

For the reasons given above, the process of claim 1 differs from that of O2D1 by the presence of the fine additive as defined in the said claim and it is thus novel.

5. Turning to the inventive step issue, the Board considers in agreement with all the parties that O2D1 represents the closest prior art. As pointed out in the patent in suit, the shaped articles formed by the process of O2D1

exhibit high strengths relative to their density; however there is a significant difference in the densities as well as in the MOR (modulus of rupture) values of unpressed and pressed products respectively. Superior strength properties (flexural strength) are only obtained when the products are manufactured by processes comprising pressing of the green sheets in an additional compression step, typically at a pressure of 10 MPa. The necessity for such an additional sheet compression step represents a considerable inconvenience. Another disadvantage of this known process is that the MOR value of water saturated cellulose fibre-reinforced sheets is much lower than that of the dry sheets.

Starting from this closest prior art, the technical problem underlying the patent in suit can be seen to lie in providing a process of the above kind in which the said disadvantages are eliminated, i.e. a process which makes it possible to manufacture shaped articles exhibiting excellent flexural strength and density as well as a smaller difference between the MOR value in wet and dry state without subjecting the green, shaped article to additional compression. The patent in suit proposes to solve this problem by the process as defined in claim 1, which differs from that of O2D1 by the presence of a fine inorganic additive with an average particle size of 1-10 µm in the aqueous slurry, for example ground fly ash. In view of the results of the bending tests and of the densities reported in the examples and comparative examples of the patent in suit, the Board finds that the technical problem has been solved by the claimed process.

5.1 O2D1 itself does not contain any information which would have suggested to the skilled person that by using a fine additive with an average particle size of 1-10 µm in addition to the Portland cement and to the ultra fine silica dust, in particular by using a finer fly ash than the one used in O2D1, the flexural strength of the unpressed sheets or their density or the difference between their MOR value in wet and dry state might have been improved. As the skilled person would have recognised immediately that the particle size indicated at page 10 in connection with Nyad G was erroneous (see point 4.3 above), this information could not lead the skilled person towards the claimed solution.

5.2 O2D16 is a study concerning autoclaved cement-based products produced by the casting/moulding technique and comprising four series of experiments. As the dewatering technique used for the manufacture of fibre-reinforced shaped articles in O2D1 and the casting/moulding technique employed in O2D16 both involve the formation of a dense packing, the same hydration reactions and the same pozzolanic reactions and belong to two neighbouring technical fields, the skilled person confronted with the problem of improvement of strength and/or density in the dewatering technique would have consulted the casting/moulding technique even if different sub-problems had to be solved in these two techniques.

The experiment series No. IV of O2D16 was carried out using Portland cement, hemihydrate, a superplasticizer and either a fly ash (2) having a Blaine surface of 3200 cm^2/g or a finer fly ash (3) obtained by grinding fly ash (2) and exhibiting a Blaine specific surface of 11000 cm^2/g (see page 308, Table 5 and page 295). Experiment series No. III was performed using the same starting materials and, in addition, condensed silica fume having a BET specific surface of about 250 000 cm^2/g and an average particle diameter of about 0.1 µm. The ultra fine silica was added in order to further increase density and hence strength properties (see page 307, Table 4, page 295, page 297, 6th paragraph, page 300, 5th paragraph). It is concluded from these series of experiments that density may be increased by introducing a superplasticizer and even more by introducing condensed silica fume, that strength is increased by increasing density and that strength may be increased by increasing the fineness of the fly ash (see page 302, lines 15 to 19). The results reported in Table 5 for the experiment series IV show that increasing the fineness of the fly ash to a Blaine specific surface of 11000 cm^2/g, i.e. to an average particle size lying within the claimed range of 1-10 µm, leads to an increase of density and flexural strength (see in particular Castings 21 and 22, and page 301, second paragraph). For the system containing silica fume in addition to the fly ash and the cement, Castings 13 and 14 of Table 4 can be compared since they contain comparable amounts of starting components (expressed in weight % on a dry basis), have the same water/solid material ratio and were pre-cured and cured under the same conditions. It follows from this comparison that increasing the fineness of the fly ash gives a slight improvement in the flexural strength of about 6%. It should be noted that this improvement is achieved although the content of silica fume is relatively high and more than twice the content of fly ash.

In the light of this teaching the skilled person faced with the problem stated above would have contemplated trying to replace the fly ash used in the process of O2D1 by a finer fly ash having a Blaine surface area of 11000 cm^2/g in order to improve the flexural strength of the unpressed sheets of O2D1. As the skilled person was aware of the fact that the introduction of ultra fine silica dust led to products with improved densities and flexural strengths not only in the case of products manufactured by the casting/moulding technique but also in the case of the dewatering technique although the latter makes no use of superplasticizers (see O2D1 and O2D16), he would have been encouraged, in the light of the teaching of O2D16, to try replacing the fly ash used in the process of O2D1 by the finer one in the expectation that an improvement of the flexural strength (even a slight one) might also be achieved. Doing so, he would have arrived at the claimed process since the fly ash of O2D16 with a Blaine specific surface of 11000 cm^2/g exhibits an average particle size lying within the claimed range 1-10 µm.

5.3 The Appellant's arguments that improvement in void filling and pozzolanic properties resulting from an increase of the fly ash fineness would have been negligible compared with the immense void filling and pozzolanic potential of the silica dust component (see item V above) do not convince the Board that the skilled person would not have tried the finer fly ash of O2D16 in the process of O2D1. Firstly, Table 4 of O2D16 shows an improvement in the flexural strength of about 6% by using the finer fly ash, and this improvement cannot be considered negligible. Secondly, the specific surface area of the silica dust and that of the fly ash were measured by two different methods (the BET method and the Blaine method) which are known to give very different values for the same product (see O2D9, page 245); thus, it cannot be deduced that the former is about 100 greater than the latter. Furthermore, it appears that the contents of ultra fine silica dust and fly ash in the composition are also of importance when considering the effect of an increase of the fly ash fineness on void filling and pozzolanic activity.

5.4 The remaining documents do not contain information which would have deterred the skilled person from replacing the fly ash used in the process of O2D1 by the finer fly ash with a Blaine specific surface area of 11000 cm^2/g of O2D16 in order to improve the flexural strength.

It follows from the above that the process according to claim 1 as granted does not meet the requirement of inventive step set out in Articles 52(1) and 56. For this reason the Appellant's sole request cannot be granted and the dependent claims 2 to 12 fall with claim 1.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:	The Chairman:
P. Martorana	P. A. M. Lançon