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File Number: T 863/91 - 3.3.1

Application No.: 83 100 874.3

Publication No.: 0 087 001

Title of invention: A process for the manufacture of absorbent materials

Classification: C09K 3/32

D E C I S I O N
of 23 March 1993

Applicant: Laporte Industries Limited

Opponent: SÜD-CHEMIE AG

Headword: Absorbent materials/LAPORTE

EPC Articles 54, 56 and 84

Keyword: "Clarity (yes) - term used in the art"
"Novelty (confirmed) - new element"
"Inventive step (confirmed)"



Case Number : T 863/91 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 23 March 1993

Appellant :
(Opponent)

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Representative :

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Respondent :
(Proprietor of the patent)

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Decision under appeal :

Interlocutory decision of the Opposition Division
of the European Patent Office of 19 June 1991,
with written reasons posted on 3 September 1991
concerning maintenance of European patent
No. 0 087 001 in amended form.

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R.W. Andrews
J.-C. Saisset

Summary of Facts and Submissions

- I. European patent No. 0 087 001 in respect of European patent application No. 83 100 874.3, which was filed on 31 January 1983, was granted on 12 March 1986 (cf. Bulletin 86/11).
- II. A notice of opposition, which was filed on 12 December 1986, requested the revocation of the patent on the ground that its subject-matter did not involve an inventive step. The opposition was supported, inter alia, by the following document

(1) US-A-4 187 803

and, after expiry of the time allowed for filing notice of opposition, the Opponent referred to, inter alia, the following document

(5) US-A-3 700 474

and alleged that the claimed subject-matter lacked novelty in the light of the disclosure of this document.

- III. By a decision issued orally on 19 June 1991, with the corresponding interlocutory decision being issued on 3 September 1991, the Opposition Division held that the amended claims satisfied the requirements of Article 84 EPC with respect to clarity. The Opposition Division also decided that the claimed subject-matter was novel having regard to the disclosure of document (5) since this document taught the compacting and crushing of swelling clays to obtain products which were technically different from the present ones.

With respect to inventive step, the Opposition Division found that, in order to use the process of document (5) to prepare compacted clay particles that do not slake in contact with aqueous fluids and that would be useful as a litter, the skilled person would have to disregard the basic teaching of this document. Therefore, the disclosure of this document either alone or combined with any of the other cited documents did not render the claimed invention obvious.

IV. An appeal was lodged against this decision on 31 October 1991 with payment of the prescribed fee. In his Statement of Grounds of Appeal filed on 4 January 1992 and during oral proceedings held on 23 March 1993, the Appellant contended that the expression "non-swelling clay mineral" is not clear, particularly in view of the experimental data submitted with the grounds of appeal which demonstrates that a sample of calcium bentonite swells by more than 100% and the spacing of the cleavage plane increases from 12.1 to 16 to 20 Å. On the basis of this data the Appellant also alleged that calcium bentonite had a water absorbency of 280%. In the Appellant's opinion, the expression "non-swelling" was an unscientific and loose definition, which was too vague to satisfy the requirement of Article 84 EPC as regards clarity.

The Appellant also argued that the claimed subject-matter lacked novelty in the light of the disclosure of document (5) since the starting materials, the process steps and the products directly obtained by this prior art process were identical with those claimed in the present Claim 1. The Respondent contended that the problem underlying document (5) was in fact the same as the one addressed by the disputed patent insofar as they were both involved with increasing the response of clays to wetting.

The Appellant also maintained that the claimed subject-matter did not involve an inventive step in view of the prior art discussed in document (1) combined with the report of a lecture given by Dr.-Ing. H. Rieschel in Essen on 10 February 1970 (document (2)).

IV. The Respondent contended that the expression "non-swelling clay mineral" has a clear meaning to the skilled addressee of the disputed patent since he is aware of the usage of swelling and non-swelling to distinguish the sodium and calcium forms of montmorillonite. The Respondent admitted that calcium montmorillonite swells to some extent but argued that the swelling was negligible in comparison to sodium montmorillonite which increases its volume by 10 to 15 times. In practice, this big difference in swelling is reflected in the art by the use of the terms swelling and non-swelling. Moreover, further guidance is given in the disputed patent by the definition of a swelling clay with reference to a minimum Bingham Yield Value.

The Respondent denied that document (5) destroys the novelty of the subject-matter as now claimed since the disclosure of non-swelling clays in document (5) is non-leading and unenabling in view of the problem addressed and solved therein. Moreover, document (5) does not disclose the use of a non-swelling clay having a water absorbency of at least 60%.

The Respondent also argued that document (5) is concerned with the problem of rendering a clay more readily dispersible in water which is not a property required from litter. Therefore, document (5) would not lead the skilled person to the present invention.

With respect to documents (1) and (2), the Appellant contended that document (2) would not be considered by the

skilled person seeking to put the teaching of document (1) into effect. Moreover, the statement of prior art in this document was too vague and general for it to be combinable with document (2).

- V. The Appellant requested that the decision under appeal be set aside and that the patent be revoked.

The Respondent requested that the patent be maintained on the basis of the claims and description as submitted during oral proceedings. The only independent claim of this set of claims reads as follows:

"A process for preparing an absorbent clay material in particulate form useful as litter comprising compacting particles of non-swelling clay mineral having a water absorbency of at least 60% as measured by the Absorbency % Test as defined herein, the clay mineral containing water in a quantity not exceeding 15% by weight and having a particle size in the 105 to 710 microns size range and the compaction being conducted at a pressure of 5 to 200 KN/cm² or, in the case of a roll press at a pressure of 25 to 500 KN/cm of roll length, and breaking the compacted product to produce particles in the 710 microns to 4 mm size range."

- VI. At the conclusion of the oral proceedings, the Board's decision to maintain the patent in amended form was announced.

Reasons for the Decision

1. The appeal is admissible.

2. There are no objections under Article 123 EPC in the present claims. In particular, Claim 1 represents a combination of granted Claims 1, 2 and 10 in combination with page 2, line 1, lines 30 to 32 and lines 51 to 54, page 3, lines 50 and 51 and 59 to 65 and page 4, lines 18 to 22 of the printed patent specification (cf. also Claims 1, 5, 7, 13, 14, 15 and 16 as originally filed and page 1, lines 1 and 2, page 2, lines 14 to 19 and 28 to 31, page 3, lines 7 to 12 and page 6, lines 14 to 17 and 26 to 36 and page 7, line 28 to page 8, line 1 of the published patent application).

Claims 2 to 7 correspond to Claims 3, 4 and 6 to 9 as granted respectively (cf. also Claims 2, 3 and 7 to 11 as originally filed).

- 2.1 In the Board's judgment, the expression "non-swelling clay material", notwithstanding the use of calcium montmorillonite (Surrey powder) in Examples 2 to 14, is sufficiently clear to the skilled addressee of the disputed patent so that the requirements of Article 84 EPC with respect to clarity can be considered to be met by the present Claim 1.

It is clear from the table on the second page of the article entitled "Minerals of the Montmorillonite Group" by Clarence S. Ross and Sterling B. Hendricks, Professional Paper 205-B, US Geological Survey, 1943-1944 (document (10)) and the experimental data submitted by the Appellant with his grounds of appeal that calcium montmorillonite or calcium bentonite swells to some extent. However, the degree of swelling of the calcium form is comparatively negligible as compared to the sodium form, the volume of which increases from 10 to 15 times (cf. Volclay Technical Leaflet, dated 1962, last ten lines of the column headed "Composition of Volclay"; document

(15) and Materials and Technology, Volume II, 1971, page 51, lines 10 to 16; document (8)).

Moreover, the practical skilled person in this field distinguishes between the sodium and calcium forms of bentonite by the use of terms "swelling" and "non-swelling". Thus, for example, in the Society of Mining Engineers of AIME, Transactions Volume 282, pages 1901 to 1910, (document (13)) reference is made to non-swelling bentonite as being comprised predominantly of the mineral calcium montmorillonite (cf. first six lines of the introduction on page 1901). Additionally in Table 1 on page 1902 the sodium form of montmorillonite is said to be also called sodium bentonite, swelling bentonite, Wyoming bentonite, and western bentonite, whereas the calcium form is referred to as calcium bentonite, sumpentonite, non-swelling bentonite, Texas bentonite and southern bentonite.

This nomenclature also appears in document (8) in which reference is made to swelling and non-swelling types of bentonite (cf. lines 17 to 25). On page 4 of "The Use of "Fulbond" in Foundries", issued by The Fullers' Earth Union Limited in 1961 (document (6)), it is stated that when the exchangeable ions are calcium, the montmorillonite clay is fullers' earth; when they are mostly sodium, the clay is swelling bentonite.

Further guidance to the skilled person is provided in the disputed patent itself since on page 3, lines 32 and 33, a definition of a swelling clay is given in terms of its Bingham Yield Value. A clay having a Bingham Yield Value of at least 20 dynes/cm² as a 2% dispersion in water is classified as a swelling clay.

Therefore, in the Board's judgment, references (6), (8) and (13) indicate that the terms "swelling" and "non-swelling" have a clear meaning to the skilled person.

3. The disputed patent relates to a process for the manufacture of an absorbent clay mineral in a particulate form useful as litter.
- 3.1 Document (1) which, in the Board's view, represents the closest state of the art, discloses a process for the production of pellets from sorptive mineral fines. The resulting pellets may be used in an animal toilet box (cf. Claims 1 and 3). Although this prior art process produces pellets having the desired stability under most environmental conditions, they only had about the same water absorbency capacity as the fines used as starting material (cf. column 2, lines 8 to 12). Furthermore, the final stage of the process for their manufacture involved the removal of the water used to fill the pores of space in the particles (cf. column 2, lines 24 to 27).
- 3.2 Therefore, in the light of the closest prior art, the technical problem underlying the patent in suit is to provide a process for the manufacture of an absorbent clay mineral in a particulate form by which the water absorbency capacity of the starting material is increased. Additionally, the necessity of removing water from the resulting product should be avoided.
- 3.3 According to the disputed patent, this technical problem is essentially solved by compacting particles in the 105 to 710 μ size range of a non-swelling clay mineral having a water absorbency of at least 60% as measured by the disclosed method and containing water in a quantity not exceeding 15% by weight under certain specified pressures.

The compacted product is broken up to produce particles in the 710 μ to 4 mm size range.

In the light of Examples 1 and 2 and 15 and 16 in which the water absorbency capacity increased from 69 and 79% to 92 and 151% respectively the Board is satisfied that the technical problem has been solved.

3.4 The Board cannot agree with the Appellant that the technical problem of increasing the responsiveness of a platey clay to wetting addressed and solved by document (5) is the same as the one underlying the disputed patent. It is clear from its disclosure that increasing the responsiveness of a clay to wetting in the context of this document is to be construed as rendering the clay more readily slaked or dispersed in water; i.e. the treated clay is dispersed in water in less time and with less energy than an untreated clay (cf. column 2, lines 31 to 37). This is determined, on the one hand, by the rate at which the water penetrates the clay particles and, on the other hand, by the rate of swelling of the clay particles which should be at such a rate that the water can penetrate to the core of the clay particles before the surface swells to form a gelatinous sealing layer (cf. column 2, lines 1 to 5). Therefore, increasing the responsiveness of a clay to wetting in the context of document (5) cannot be equated to the increasing quantity of water absorbed; i.e. the technical problem underlying the disputed patent.

4. In accordance with the established jurisprudence of the Boards of Appeal (cf. Decisions T 124/87, "Copolymer/DUPONT", OJ EPO 1989, 491, paragraph 3.2; T 12/81, "Diastereomers", OJ EPO 1985, 209, paragraph 4; and T 666/89, "Washing composition/UNILEVER", Headnote published OJ EPO 6/1992) in order to decide whether the

subject-matter of the present Claim 1 is novel with respect to the disclosure of document (5) it is necessary to consider whether its disclosure is such as to make available to the public a process for the manufacture of an absorbent clay mineral in a particulate form in accordance with this claim in the form of a technical teaching. Therefore, it is necessary to determine the nature and the extent of the information imparted to the skilled person by this document as distinct from its literal disclosure.

4.1 This document discloses a method of increasing the responsiveness of clay to wetting by compacting a ground, finely divided (about minus 100 mesh Tyler; $< 149 \mu$) platey clay having a maximum water content of about 20% by weight, preferably from about 6 to 15% by weight, under a pressure, for example, of about 10,000 to about 200,000 psi (6.895 to 137.9 KN/cm²) and crushing the compacted clay to the desired size (cf. Claim 1 in a combination with column 2, lines 42 to 43 and column 3, lines 53 to 60).

According to column 3, lines 13 to 24 of document (5), the process is applicable to clays having a micaceous sheet structure such as two-layer minerals for example, kaolinite and halloysite and three-layer clays of both the expanding (swelling) lattice and non-expanding (non-swelling) types. Examples of three-layer clays include montmorillonite, vermiculite, hectorite and illite.

It is true that the main thrust of the disclosure of document (5) is directed to the application of the process described therein to swelling clays (cf. for example, the use of western (swelling) bentonite in the examples and the suggested use of the products in foundry moulding compositions and well-drilling muds). However, in

agreement with the above-mentioned jurisprudence, the Board considers that this document discloses the process as outlined above using a non-swelling clay mineral as the starting material. For determining novelty it is not a question of whether the skilled person would not have put the prior art teaching into practice, but what teaching the prior art document actually makes available to him.

- 4.2 However, document (5) is wholly silent with respect to the water absorbency capacity of the non-swelling clay material used as starting material. Therefore, the requirement that the non-swelling clay mineral must have a water absorption of at least 60% as measured by the Absorbency % Test disclosed on page 3, lines 59 to 65 of the printed patent specification adds a new element to the process disclosed in document (5) (cf. Decision T 12/90 of 23 August 1990, reported in [1991] EPOR 312).

Therefore, in the Board's judgment, the claimed subject-matter is novel with respect to the disclosure of document (5).

The Appellant alleged that a water absorbency of 60% was an inherent property of calcium montmorillonite and supported this allegation by referring to the experimental data submitted with the Grounds of Appeal. In the absence of any evidence in this respect the Board does not accept that all samples of calcium montmorillonite have a water absorbency of at least 60% as measured by the described test method. The allegation is not supported by the experimental data since it is by no means certain that the expansion reported is entirely due to water and not some other factors and the test was not carried out under the conditions specified in the disputed patent.

- 4.3 After examination of the other cited documents, the Board has reached the conclusion that the claimed subject-matter is also novel with respect to these. Since novelty was not disputed with respect to these documents, it is not necessary to give detailed reasons for this finding.
5. It is still necessary to decide whether the subject-matter of the present claims involves an inventive step.
- 5.1 Document (1) discloses a process for making pellets from sorptive mineral fines having open pore spaces therein comprising mixing fines with water to substantially fill the open pore spaces with water, pelletising the moistened fines while avoiding forcing the water from the said pore spaces and evaporating the water from said pore spaces (cf. Claim 1). The resulting pellets have substantially the same absorbent capacity and bulk density as the original material (cf. column 2, lines 8 to 12).

The disclosure of this document would be clearly of no assistance to the skilled person seeking to increase the absorbent capacity of the starting clay material according to the present technical problem. In fact, the Appellant did not rely on the disclosure of the invention claimed in document (1) to support his allegation of lack of inventive step, but instead based his arguments on the discussion of the prior art in column 1, lines 52 to 63 of this document. This passage, insofar as it relates to sorptive fines, reads as follows:

"Processes for pelletizing sorptive mineral "fines" which use colloidal clay as binder by agglomeration have also been advanced but for the most have been unsatisfactory because it is difficult to control the pellet size and strength and the resulting pellets are unstable under

certain environmental conditions and lack the qualities of the sorptive minerals."

This document further states that previously it had not been realised that pelletising machines actually compress the particles of sorptive mineral during the forming process thereby destroying the porosity of the particles (cf. column 2, lines 47 to 52).

Since porosity and water absorbency go hand in hand, this disclosure would positively discourage the skilled person from attempting to solve the technical problem under the patent in suit in the proposed manner. Therefore, the teaching of document (1) relied on by the Appellant does not render the claimed subject-matter obvious.

The Appellant sought to combine this disclosure of prior art in document (1) with that of document (2). This document is the written account of a lecture relating to the industrial application of compacting, including its application in the ceramic industry. However, in view of the clear discouragement in document (1) to even consider compacting sorptive clay particles, there is no justifiable reason to combine the disclosure of documents (1) and (2).

- 5.2 As previously mentioned in paragraph 3.4 above, the problem addressed and solved by document (5) is clearly different from the one underlying the disputed patent and, therefore, of no assistance in solving the present technical problem. Nevertheless, even if the skilled person had studied this document, it does not contain any disclosure which would lead the skilled person to expect that the solution to the problem of providing a process for the production of an absorbent clay mineral in particulate form by which the water absorbent capacity of

the starting material is increased lies in the process claimed in the present Claim 1.

- 5.3 Therefore, in the Board's judgment, the proposed solution to the present technical problem is inventive. Thus, Claim 1 and dependent Claims 2 to 7, which relate to preferred embodiments of the process according to Claim 1, are allowable.

Order

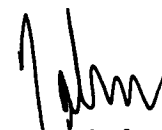
For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the claims and description as submitted during oral proceedings.

The Registrar:


E. Gorgmaier

The Chairman:


K.J.A. Jahn