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D E C I S I O N
of 12 July 2000

Case Number: T 0783/97 - 3.2.3

Application Number: 89114932.0

Publication Number: 0355630

IPC: B24D 3/04, C09K 3/14, C01F 7/02

Language of the proceedings: EN

Title of invention:
Grinding wheel having abrasive grains with vitrified bond

Patentee:
Norton Company

Opponent:
I: Noritake Company Limited
II: Minnesota Mining and Manufacturing Company

Headword:
-

Relevant legal provisions:
EPC Art. 123(2), (3), 100c)

Keyword:
"Amendments - opposition proceedings"

Decisions cited:
T 0108/91, G 0001/93

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0783/97 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 12 July 2000

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office dated 10 April 1997, posted on 14 May 1997, concerning maintenance of European patent No. 0 355 630 in amended form.**

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
M. Aúz Castro

Summary of Facts and Submissions

I. With its decision of 10 April 1997, posted on 14 May 1997, the opposition division upheld European patent Nr. 0 355 630 in amended form.

II. Claim 1 underlying the above decision reads as follows:

"1. A process for the production of a vitreous bonded grinding wheel which comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing wherein the abrasive grain consists essentially of from 10% to 100% by weight of a polycrystalline aluminous abrasive of alpha-alumina particles obtained by gelling an aqueous sol prepared from water, finely pulverized microcrystalline hydrated alumina, and a mineral acid, drying the gel and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder."

III. In its decision the opposition division came to the result that, taking into consideration the amendments made, the patent and the invention to which it relates meet the requirements of Articles 123(2) and (3) EPC. The opposition division held that the feature **"gelling a sol of alpha-alumina particles,"** of claim 1 as

granted could not be found in the originally filed application and, thus, contravened Article 123(2) EPC, that, however, the replacement thereof by the feature **"gelling an aqueous sol prepared from water, finely pulverized microcrystalline hydrated alumina, and a mineral acid,"** had a basis on page 2, lines 9-11 of the originally filed published application.

IV. Against the above decision of the opposition division opponents I and II - appellants I and II in the following - lodged appeals on 14 and 23 July 1997, respectively, paying the appeal fee on the same days and filing the statement of grounds of appeal each on 24 September 1997. The appellants requested to set aside the impugned decision and to revoke the patent, appellant I requesting additionally the reimbursement at the appeal fee.

V. Following the board's Communication pursuant to Article 11(2) RPBA dated 30 November 1999 the patentee - respondent in the following - requested to dismiss the appeal (**main request**), by way of **auxiliary request** with the proviso that the patent be maintained on the basis of one of the five sets of claims filed on 13 June 2000 as "Annex A to E".

VI. Claims 1 of the five **auxiliary requests** read as follows:

First Auxiliary Request

"1. A process for the production of a vitreous bonded grinding wheel which comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing wherein

the abrasive grain consists essentially from 10% to 100% by weight of a polycrystalline aluminous abrasive obtained by gelling a sol of alpha alumina monohydrated particles, drying the gel to form a solid and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive, and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder."

Second Auxiliary Request

"1. A process for the production of a vitreous bonded grinding wheel for wet grinding which process comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing wherein the abrasive grain consists essentially from 10% to 100% by weight of a polycrystalline aluminous abrasive of alpha-alumina particles obtained by gelling an aqueous sol prepared from water, finely pulverized, microcrystalline hydrated alumina, and a mineral acid, drying the gel and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive, and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been

obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder."

Third Auxiliary Request

"1. A process for the production of a vitreous bonded grinding wheel for wet grinding which process comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing wherein the abrasive grain consists essentially from 10% to 100% by weight of a polycrystalline aluminous abrasive obtained by gelling a sol of alpha alumina monohydrated particles, drying the gel to form a solid and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive, and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder."

Fourth Auxiliary Request

"1. A method for wet grinding, comprising the steps of

(a) bringing a workpiece into contact with an abrasive wheel made by a process which comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing

wherein the abrasive grain consists essentially from 10% to 100% by weight of a polycrystalline aluminous abrasive of alpha-alumina particles obtained by gelling an aqueous sol prepared from water, finely pulverized, microcrystalline hydrated alumina, and a mineral acid, drying the gel and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive, and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder;

(b) flooding the workpiece and the abrasive wheel with a water based coolant; and

(c) grinding the workpiece with the abrasive wheel.

Fifth Auxiliary Request

"1. A method for wet grinding, comprising the steps of

(a) bringing a workpiece into contact with an abrasive wheel made by a process which comprises shaping a mixture comprising an abrasive grain and vitreous bond components into the desired shape and firing wherein the abrasive grain consists essentially from 10% to 100% by weight of a polycrystalline

aluminous abrasive obtained by gelling a sol of alpha alumina monohydrated particles, drying the gel to form a solid and sintering the dried gel, and from 0% to 90% by weight of at least one second type of abrasive, and the vitreous bond comprises at least 40% by weight of a vitreous bonding material which is adapted to be fired at a relatively low temperature of about 900°C and the firing of said mixture is carried out at said relatively low temperature, said vitreous bonding material having been obtained by prefiring the vitreous bond components at a temperature of from 1100° to 1800°C for a time sufficient to form a homogenous glass and then crushing the glass to a fine powder;

(b) flooding the workpiece and the abrasive wheel with a water based coolant; and

(c) grinding the workpiece with the abrasive wheel."

VII. With respect to the **main request** the arguments of the parties brought forward in the oral proceedings essentially can be summarized as follows:

a) appellants:

- in granted claim 1 "a sol of **alpha-**alumina particles" is the starting point of the process whereas, in claim 1 of the main request the sol is based only on "hydrated" alumina;
the claim under discussion was therefore broadened within the meaning of Article 123(3) EPC;

- the amendment to granted claim 1 cannot be accepted as the correction of an **obvious error** since a sol of **alpha-**alumina is technically possible and feasible;

- a rectification of claim 1 of the main request under Rule 88 EPC must be excluded since it is not only not an obvious error which is amended, but also since the amendment is not clearly immediately derivable from the A1-document in which **four** possible starting materials are discussed on its page 2, and since the amendment leads to an undisclosed generalization with respect to the starting material of the claimed process;

- summarizing, claim 1 does not meet the requirements of Article 100c) EPC;

- with respect to appellant's I request for reimbursement of the appel fee it is observed that (D25) = Second Declaration of Mr Kenji ITO, should have been allowed into the proceedings since it deals with the issue of a frit in combination with a grinding wheel; Ms Porter from the side of the respondent should not have been allowed to make a statement in combination with (D1) = EP-A-0 171 032; it is argued that the discussion of (D1) was incomplete before the opposition division since it discloses the use of a frit; for the above reasons the opposition division committed a substantial procedural violation; the appeal fee should therefore be reimbursed.

b) respondent:

- since a "sol of **alpha-**alumina particles" according to granted claim 1 is not derivable from EP-B1-0 355 630 and US-A-4 623 364, 4 314 827 and 4 744 802 discussed on page 2 thereof, this feature can be amended according to the decision T 108/91, OJ EPO 1994, 228 since in addition a sol of alpha-alumina for a skilled reader of the patent specification was also not wanted;

- the feature of granted claim 1 under discussion is an obvious mistake which can be amended without violating the requirements of Article 100c) EPC since this feature has to be seen as an inaccurate technical feature; a normal sol-gel-process should have been the starting point of the claimed process for producing a grinding wheel with a vitreous bond; contrary to the arguments of both appellants a sol of **alpha-**alumina is not technically feasible irrespective of the costs of such a material;

- claiming instead of a sol of **alpha-**alumina a sol of **hydrated** alumina, see claim 1 of the main request, cannot be seen as a shift of protection so that claim 1 of the main request should be valid; in addition this claim is not open to a clarity objection since the essential constituents are clearly set out, namely water, micro-crystalline hydrated alumina and a mineral acid;

- (D1) is silent about the use of a frit so that

the discussion of a frit in this context in the oral proceedings before the opposition division was not helpful;

- under these circumstances the proceedings do not suffer from a substantial procedural violation.

VIII. With respect to the **auxiliary requests** the respondent argued that "monohydrated" particles of alpha alumina are narrower than the feature "a sol of alpha-alumina particles" according to granted claim 1; out of three possible hydrates of alumina the monohydrate is seen as a restriction.

The appellants argued that no amendment to claim 1 was possible to avoid the inevitable trap between the requirements of Articles 123(2) and (3) EPC and requested to refuse the auxiliary requests also.

Reasons for the Decision

1. The appeals are admissible.

Main request

2. *Granted claim 1*

2.1 In granted claim 1 a sol of **alpha-**alumina particles is claimed. This feature prima facie is **technically feasible** since it can be prepared from water, **alpha-**alumina particles and a mineral acid.

2.2 The sol of **alpha-**alumina particles is, however, not originally disclosed. Reference is made in the

following to EP-B1-0 355 630 corresponding to the originally filed document in respect of the discussion of the relevant prior art. On its page 2 **four** possibilities are specifically disclosed in this context, see:

- lines 9 to 15: a sol is prepared from ultra fine crystalline alumina of at least 18 GPa hardness and of a crystal size not greater than 0,4 micrometer and water and a mineral acid;
  to the sol an effective amount of submicrometer alpha alumina particles is added which will function as **seeds**;

- lines 17/18: as above, however, **without** the addition of submicrometer alpha alumina;

- lines 19/20: a composition includes zirconia hafnia or mixtures thereof, cobalt, nickel, zinc, magnesium;

- lines 24: alpha ferric oxide or alpha alumina particles act as seeds.

Summarizing, a **sol of alpha alumina particles** according to granted claim 1 is not contained among the above possibilities. No further disclosure in the remaining parts of EP-B1-0 355 630 can serve as a basis for the feature under discussion of granted claim 1.

2.3 As a result of the above findings granted claim 1 is not in accordance with the requirements of Article

123(2) EPC.

3. *Claim 1 of the main request*

3.1 In claim 1 thereof the sol is now differently defined, namely by omitting the alpha-alumina particles from the sol and by replacing this feature with "hydrated alumina".

3.2 Since a sol of alpha-alumina is feasible it cannot be replaced without violating the requirements of Article 123(3) EPC; in addition the replacement cannot be seen as an **obvious mistake** which could be rectified under Rule 88 EPC.

3.3 Even if a rectification under Rule 88 EPC were considered, it is not unambiguously clear to a skilled reader of EP-B1-0 355 630 what the replacement feature has to be since he is aware that the four possibilities cited in above remark 2.2 could replace the non-disclosed feature of a sol comprising **alpha-**alumina particles.

3.4 Under these circumstances the decision T 108/91 is not applicable in the present case since it is not clear which feature should and could replace the non-disclosed feature of granted claim 1 and since the replacing feature "hydrated alumina" leads further to an **undisclosed generalization** with respect to the starting material of the claimed process since essential features mentioned on page 2 of EP-B1-0 355 630, lines 9 to 15, are missing in claim 1 of the **main request**, namely the hardness and size and the effective amount of particles used when preparing the sol.

3.5 A sol of **alpha-**alumina not being disclosed in EP-A1-0 355 630, however, having a technical meaning and constituting a limiting feature to claim 1 as granted this feature cannot be deleted from claim 1, (see decision G 1/93, remarks 16 and 17), irrespective of the issue whether the non-disclosed feature was wanted or not. Respondent's reference to the costs of alpha-alumina is not helpful in this context since the questions to be answered are the technical availability of alpha-alumina particles and the feasibility of the teaching with respect to a sol comprising such particles.

3.6 Whether or not claim 1 of the **main request** is merely a side-shift as argued by the respondent is not to be decided by the board since claim 1 of the **main request** does not meet the requirements of Articles 123(2) and (3) EPC and of Article 100c) EPC so that this claim is not valid. As a consequence the decision under appeal cannot be upheld.

4. *Auxiliary requests*

4.1 The auxiliary requests "A" to "E" comprise five claims 1 which are either restricted to the use of a sol of alpha alumina particles, and do not therefore comply with the requirements of Article 123(2), or are not so restricted and do not comply with the requirements of Article 123(3) EPC.

4.2 The board is in agreement with the conclusions of the appellants that no amendment to these claims 1 is possible to avoid the inevitable trap between Articles 123(2) and (3) EPC. Therefore, the non-validity arguments relating to the **main-request** have to be

applied to the **auxiliary requests** also.

4.3 Bringing in features "instead" of features laid down in granted claim 1 has to be seen as extending the protection conferred and possibly as claiming added subject-matter. The **auxiliary requests** have therefore to be refused.

5. *Reimbursement of the appeal fee*

5.1 Where the board of appeal deems an appeal to be allowable the reimbursement of appeal fees shall be ordered pursuant to Rule 67 EPC, if such reimbursement is equitable by reason of a substantial procedureal violation. Whether to allow or not to allow documents filed after the time-limit for giving notice of opposition into the proceedings depends on the discretion of the deciding body in view of the circumstances of the case, Article 114(2) EPC.

5.2 As can be seen from point 23 of the minutes of the oral proceedings held before the opposition division (D25) **was considered** and only disregarded after having been examined as to its relevance as can be seen from the decision under appeal, second paragraph of point 1 of the "Reasons for the Decision", where it is stated that inter alia (D25) is not relevant for the decision because it is even less relevant than the documents already on file.

5.3 As can also be seen from the above minutes Ms Porter was not the only person to be allowed to argue the merits of the present case since Mr Celikkaya from appellant II was also allowed to participate in the discussion. In fact from the minutes it cannot be

concluded that any person present in the oral proceedings on behalf of one of the parties was denied to present his arguments.

5.4 Under these circumstances the board cannot see an unfair treatment of any one party to the proceedings and thus no substantial procedural violation justifying the reimbursement of the appeal fee. The request of appellant I has therefore to be refused.

Order

For these reasons it is decided that:

1. The impugned decision is set aside.

2. The patent is revoked.

3. The request of appellant I for reimbursement of the appeal fee is refused.

The Registrar: The Chairman:

R. Schumacher C. T. Wilson