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**Datasheet for the decision
of 3. December 2008**

Case Number: T 0056/07 - 3.2.07

Application Number: 98906237.7

Publication Number: 1015179

IPC: B24D 3/34

Language of the proceedings: EN

Title of invention:

A structured abrasive article adapted to abrade a mild steel workpiece

Patentee:

MINNESOTA MINING AND MANUFACTURING COMPANY

Opponent:

Saint-Gobain Abrasives, Inc.

Headword:

-

Relevant legal provisions:

EPC Art. 54, 56, 100(c), 123(2)

RPBA Art. 13(3)

Keyword:

"New line of argument involving new ground - admitted (point 1)"

"Document filed at oral proceedings - not admitted (point 2)"

"Experimental results filed shortly before oral proceedings - not admitted (point 3)"

"Novelty (main request) - yes"

"Inventive step (all requests) - no"

Decisions cited:

G 0010/91, G 0007/95

Catchword:

-



Case Number: T 0056/07 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 3. December 2008

Appellant: Saint-Gobain Abrasives, Inc.
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Respondent: MINNESOTA MINING AND MANUFACTURING COMPANY
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Representative: Vossius & Partner
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
7 November 2006 concerning maintenance of
European patent No. 1015179 in amended form.

Composition of the Board:

Chairman: H. Meinders
Members: P. O'Reilly
I. Beckedorf

Summary of Facts and Submissions

- I. Opposition was filed against European patent No. 1 015 179 as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step) and Article 100(c) EPC (added subject-matter).

The opposition division decided to maintain the patent in amended form. It held that there was no addition of subject-matter, that the subject-matter of claim 1 of the main request was not novel, but that the subject-matter of claim 1 of the first auxiliary request was novel and involved an inventive step.

- II. The appellant (opponent) filed an appeal against that decision.

- III. The appellant requested that the decision under appeal be set aside and the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed or, alternatively, in setting aside the decision under appeal that the patent be maintained in amended form on the basis of one of the sets of claims filed as auxiliary requests 1 to 7 with the letter dated 6 August 2007.

- IV. Claim 1 of the main request reads as follows:

"1. An abrasive article comprising precisely shaped abrasive composites adhered to a major surface of a backing wherein the precisely shaped abrasive composites consist essentially of:
about 20-40 parts by wt. binder;

about 20-60 parts by wt. abrasive articles;
about 10-40 parts by wt. water-insoluble metal silicate particles; and about 0.01-2.5 parts by wt. coupling agent selected from silanes, titanates, zircoaluminates, and mixtures thereof."

Claim 1 of the first auxiliary request reads as follows (amendments when compared to claim 1 of the main request are depicted in bold):

"1. An abrasive article comprising precisely shaped abrasive composites adhered to a major surface of a backing wherein the precisely shaped abrasive composites consist essentially of:
about 20-40 parts by wt. binder;
about 20-60 parts by wt. abrasive articles;
about 10-40 parts by wt. water-insoluble metal silicate particles **selected from the group consisting of calcium silicate particles, zinc silicate particles, lead silicate particles, aluminium silicate particles, magnesium silicate particles, iron silicate particles, cadmium silicate particles and mixtures thereof;** and
about 0.01-2.5 parts by wt. coupling agent selected from silanes, titanates, zircoaluminates, and mixtures thereof."

Claim 1 of the second auxiliary request reads as follows (amendments when compared to claim 1 of the first auxiliary request are struck through):

"1. An abrasive article comprising precisely shaped abrasive composites adhered to a major surface of a backing wherein the precisely shaped abrasive composites consist essentially of:

about 20-40 parts by wt. binder;
about 20-60 parts by wt. abrasive articles;
about 10-40 parts by wt. water-insoluble metal silicate particles selected from the group consisting of calcium silicate particles, zinc silicate particles, lead silicate particles, ~~aluminium silicate particles,~~ magnesium silicate particles, iron silicate particles, cadmium silicate particles and mixtures thereof; and about 0.01-2.5 parts by wt. coupling agent selected from silanes, titanates, zirconaluminates, and mixtures thereof."

The independent claim of the third auxiliary request reads as follows (amendments when compared to claim 1 of the second auxiliary request are depicted in bold or struck through):

"1. An abrasive article comprising precisely shaped abrasive composites adhered to a major surface of a backing wherein the precisely shaped abrasive composites consist essentially of:
about 20-40 parts by wt. binder;
about 20-60 parts by wt. abrasive articles;
about 10-40 parts by wt. water-insoluble metal silicate particles ~~selected from the group consisting of calcium silicate particles, zinc silicate particles, lead silicate particles, magnesium silicate particles, iron silicate particles, cadmium silicate particles and mixtures thereof~~ **which are calcium metasilicate particles**; and about 0.01-2.5 parts by wt. coupling agent selected from silanes, titanates, zirconaluminates, and mixtures thereof."

Claim 1 of the fourth auxiliary request reads as follows (amendments when compared to claim 1 of the **main** request are depicted in bold or struck through):

"1. An abrasive article comprising precisely shaped abrasive composites adhered to a major surface of a backing wherein the precisely shaped abrasive composites consist essentially of:

about ~~20-40~~ **30-35** parts by wt. binder;

about ~~20-60~~ **35-50** parts by wt. abrasive articles;

about ~~10-40~~ **15-30** parts by wt. water-insoluble metal

silicate particles; and about ~~0.01-2.5~~ **1-2** parts by wt.

coupling agent selected from silanes, titanates,

zircoaluminates, and mixtures thereof."

Claim 1 of each of the fifth to seventh auxiliary requests includes the amendments made to claim 1 of the fourth auxiliary request as well as those made to the first to third auxiliary requests respectively.

V. The documents cited in the present decision are the following:

D5: US-A-5 435 816

D6: US-A-4 871 376

D9: US-A-4 609 381

D13: US-A-5 454 844

D18: US-A-5 342 419

D19: Wikipedia Extracts

VI. The arguments of the appellant may be summarised as follows:

- (i) The ground of novelty is based on a document (D18) which is already in the proceedings and is acknowledged by the respondent to be the nearest prior art. Although before the oral proceedings the appellant based its argumentation regarding inventive step on a part of this document which was different to that on which this ground is based the ground should still be admitted.

- (ii) The documents (D19) filed by the appellant during the oral proceedings should be admitted into the proceedings. The documents are merely extracts from Wikipedia which show the general knowledge of the skilled person with regard to the properties of clays, which are mentioned as fillers in the patent in suit.

- (iii) The experimental results filed with letter of 22 October 2008 should be admitted into the proceedings. The results are *prima facie* relevant since they show that the claimed subject-matter does not show an improvement over the nearest prior art (D18). The tests involved manually using an abrasive article and according to the knowledge of the representative of the appellant they were all carried out by the same person so that they should have been consistently applied. It is true that there are inconsistencies in the results for which the appellant has no explanation.

- (iv) The deletion of the wording: "whereby the abrasive composites (particles in claim 10) provide an enhanced cut rate for a mild steel workpiece in the absence of a grinding aid" from the

independent claims as originally filed offends against Article 123(2) EPC. The deletion of this wording means that there may be some grinding aid present in the composite whereas according to the claims as originally filed there should be none. There is no basis in the application as originally filed for this deletion.

- (v) The subject-matter of claim 1 of the main request lacks novelty over the disclosure of D18. This document discloses a combination of binder, abrasive particles, clay (which is well known to be water insoluble and is constituted by metal silicates), and a silane coupling agent. The disclosed ranges in column 10, lines 1 to 7 of D18 for the first three components either overlap or enclose the claimed ranges. In the case of the coupling agent, a single value (1%) is disclosed in all the examples which is within the claimed range. In any case the claimed range for the coupling agent is at least a typical range and hence is implicitly disclosed to the skilled person.

- (vi) The subject-matter of claim 1 of the main request lacks an inventive step. The various features of claim 1 of the main request are each well known in the art and they are fulfilling their normal purposes in the patent in suit. There is no evidence that they produce any special effect in their combination. The feature of the range of the amount of coupling agent is already known in the art. As already noted D18 discloses a value of 1% for the coupling agent in each of its examples

which is within the claimed range. D6 discloses in column 10, lines 41 to 44 the use of about 0.1 to 1% by weight of coupling agent and D13 discloses in column 10, lines 43 to 46 the use of about 0.01 to 3% by weight of coupling agent. These are either within the claimed range or enclose it.

(vii) The subject-matter of claim 1 of the first auxiliary request does not involve an inventive step. The metal silicates mentioned in column 8, lines 66 to 67 of D18 as forming clay are included in the list of alternatives given in this claim so that it is not further distinguished for the purposes of inventive step.

(viii) The subject-matter of claim 1 of the second auxiliary request does not involve an inventive step. The skilled person would consider alternatives to the silicates forming the clay and consider calcium metasilicate (which is within the scope of the claim) depending upon the intended use. In any case D2, column 13, line 45 suggests this filler as an alternative to clays, as does the patent in suit.

(ix) The subject-matter of claim 1 of the third auxiliary request does not involve an inventive step. This request limits the metal silicates to calcium metasilicate which is obvious for the reasons already explained with respect claim 1 of the second auxiliary request.

(x) The subject-matter of claim 1 of the fourth auxiliary request does not involve an inventive

step. There is no indication of any special effects achieved by the narrower ranges specified in this claim so that they must be considered to be normal for the skilled person.

- (xi) The subject-matter of claim 1 of each of the fifth to seventh auxiliary requests does not involve an inventive step. These claims merely included the narrower ranges of claim 1 of the fourth auxiliary request together with the extra features of the first to third auxiliary requests respectively. It has been shown that these features are obvious and there is no new result in their combination.

VII. The arguments of the respondent may be summarised as follows:

- (i) The ground of novelty based on D18 should not be allowed into the proceedings. This ground was not argued against the patent in its maintained form during the opposition proceedings. It also was not argued in the grounds of appeal or in any later submission of the appellant. In accordance with G 10/91 (OJ EPO 1993, 420) the proprietor does not agree with its introduction. If the ground is introduced the representative of the respondent requests a break in the proceedings to consider the matter.
- (ii) The documents D19 which the appellant has filed during the oral proceedings should not be admitted since the respondent has had no chance to prepare a response to these.

- (iii) The experimental results filed by the appellant with its letter of 22 October 2008 should not be admitted into the proceedings since they are late filed and the respondent has not had sufficient time to respond properly to the results by carrying out its own experiments. The results are also not *prima facie* relevant. The tests involved manually using an abrasive article which means that there would be variations in the results and they would not be reproducible. It is not even indicated whether the same person carried out the tests on each of the samples.
- (iv) The deletion of the wording: "whereby the abrasive composites (particles in claim 10) provide an enhanced cut rate for a mild steel workpiece in the absence of a grinding aid" from the independent claims as originally filed does not offend against Article 123(2) EPC. The claims specify now what the composites or particles shall "consisting essentially of" which means that there is no effective amount of grinding aid present so that there has been no change in meaning.
- (v) The subject-matter of claim 1 of the main request is novel over the disclosure of D18. The clay discussed in D18 is constituted by hydrated metal silicates and it has not been shown that it is water-insoluble as claimed. The coupling agent is disclosed in an example in combination with an amount of abrasive particles (70%) which is well outside the claimed range so that this disclosure of the amount of coupling agent is not one in

combination with an amount of abrasive particles that is within their claimed range.

- (vi) The subject-matter of claim 1 of the main request involves an inventive step. The appellant is picking from several prior art documents to show that the skilled person **could** arrive at the subject-matter of claim 1. However, the appellant has not shown that skilled person **would** arrive at the subject-matter of claim 1. The composition of D18 is not a suitable starting point for the purpose of the invention, i.e. abrading a mild steel workpiece. D18 is only concerned with abrading plastics workpieces or paint, see the test procedures I, II and III in column 10, line 30 to column 20, line 16.

- (vii) The subject-matter of claim 1 of the first auxiliary request involves an inventive step. There is no indication to the skilled person to choose the particular metal silicates from the list now included in claim 1 of this request.

- (viii) The subject-matter of claim 1 of the second auxiliary request involves an inventive step. The deletion of aluminium silicate from the list means that the subject-matter of the claim is further distinguished over the disclosure of D13 or D18.

- (ix) The subject-matter of claim 1 of the third auxiliary request involves an inventive step. D18 teaches away from using calcium metasilicate since it shows in the comparative tests that it gives a worse result than clay. The fact that it is

mentioned in some lists of fillers does not alter this fact.

- (x) The subject-matter of claim 1 of the fourth auxiliary request involves an inventive step. The ranges specified in this request are narrow and there is no indication that the skilled person **would** work within these ranges. It is not enough to argue that the skilled person **could** work within the specified ranges.

- (xi) The subject-matter of claim 1 of each of the fifth to seventh auxiliary requests involves an inventive step for the same reasons as already explained with respect to the first to third auxiliary requests since they include combinations of the extra features of the claim 1 of each of those requests with the extra features of the fourth auxiliary request.

Reasons for the Decision

- 1. *New line of argument for the first time in the oral proceedings involving a fresh ground in appeal proceedings*

- 1.1 In the oral proceedings before the opposition division the appellant had argued lack of novelty of the subject-matter of the claims of the then main request (maintenance as granted) starting from comparative example G of D18. The appellant succeeded on this argument causing the main request to be refused. For the subject-matter of the claims of the then first auxiliary

request the appellant acknowledged novelty but argued lack of inventive step again starting from comparative example G of D18 as the nearest prior art disclosure. This argument did not succeed and that request was allowed.

In its appeal grounds the appellant repeated this line of argumentation. Also, the respondent in its response to the appeal considered example G of D18 to represent the closest prior art disclosure.

In the oral proceedings before the Board the appellant indicated that it intended to attack novelty based on D18 though not based on the said comparative example G but based on other parts of the document. The respondent objected to this and indicated that it would not agree to the admittance of this new ground into the appeal proceedings pursuant to decision G 10/91 (*supra*).

- 1.2 The Board considers that the appellant has introduced at the oral proceedings a new line of argument based on a document which is already considered to be the nearest prior art. Even if the appellant had based its line of argument on inventive step, so as not to act contrary to its acknowledgement of novelty over this document, it would first have been necessary to establish what is known from this prior art document so as to find the distinguishing feature(s) and apply the problem/solution approach to these features.

In its decision G 7/95 (OJ EPO 1996, 626) the Enlarged Board of Appeal, whilst considering that novelty and inventive step are separate grounds of opposition, nevertheless considered that novelty could be considered

in the context of deciding upon the ground of inventive step based on the nearest prior art document (see order). In the present case the new line of argument first requires a consideration of which features of the claim under attack are known from the part of the document on which the argument is based. This may consequentially lead to an objection of lack of novelty.

1.3 The Board therefore decided to admit the new line of argument as new arguments can be brought as late as the oral proceedings (see G 4/92, OJ EPO 1994, 149). In view of the unexpected turn in the proceedings the Board asked the representative of the respondent if it wished for a break in the oral proceedings to consider the new line of argument. The representative responded positively and considered that half an hour would be sufficient. The oral proceedings were interrupted for this length.

2. *Documents filed during the oral proceedings*

2.1 In support of its new line of argument the appellant filed new documents in the form of excerpts from Wikipedia (D19). The respondent objected to the admittance of these late-filed documents.

2.2 The Board considers that it would be inappropriate to admit these documents into the proceedings since the respondent would have no chance to look for counterevidence without an adjournment of the oral proceedings. Such an adjournment would not be in accordance with Article 13(3) Rules of Procedure of the Boards of Appeal.

2.3 The documents were therefore not admitted into the proceedings.

3. *Experimental results filed shortly before the oral proceedings*

3.1 The appellant with its submission dated 22 October 2008 and filed the same day, i.e. six weeks before the oral proceedings, filed a set of experimental results intended to show that the claimed subject-matter showed no improvement over the nearest prior art.

The respondent objected to the admittance of these experimental results. It particularly noted there had not been sufficient time before the oral proceedings to allow it to carry out its own experiments to verify the results.

3.2 The Board notes that in considering the admittance of evidence account must be taken of its nature, the stage in the proceedings at which it is filed and its relevance. In this respect experimental results present a particular problem since the other party may reasonably expect to have the opportunity to repeat and verify the results and possibly to perform its own counter experiments. Clearly it takes time to do this.

3.3 The Board considers that it would be inappropriate to admit these experimental results into the proceedings, and this irrespective of their possible relevance. The respondent has not had sufficient time to verify the results and to carry out experiments to provide counterevidence and it would need an adjournment of the oral proceedings to do this. Such an adjournment would

not be in accordance with Article 13(3) Rules of Procedure of the Boards of Appeal.

Moreover, the results are not *prima facie* relevant. The tests involved a person performing a repeated manual operation with an abrasive article and then finding the effects that this had on the abraded article. Each test lasted thirty-two minutes and there were several tests per sample with twelve samples. It is clear that consistency under these conditions would be difficult if not impossible to achieve. Even if the statement of the representative of the appellant that it was informed that the same person had carried out all the tests was correct it still does not help since that person may have been inconsistent and the test results may have been different if carried out by a different person. Indeed comparative examples A and B on the one hand and E and F on the other hand show a large inconsistency which the appellant was unable to explain. Experimental results which have such deficiencies cannot be considered to be *prima facie* relevant.

- 3.4 The experimental results were therefore not admitted into the proceedings.

Main request

4. *Article 100(c) EPC*

- 4.1 In the application as originally filed the independent claims 1 and 10 included of a list of four components which were listed under "consisting essentially of" (claim 1) and "comprising" (claim 10). During the examination proceedings the term "comprising" in

claim 10 was replaced by "consisting essentially of" but the appellant has not objected to this amendment *per se*. After the component list there came the following wording: "whereby the abrasive composites ("particles" in claim 10) provide an enhanced cut rate for a mild steel workpiece in the absence of a grinding aid". The appellant argued that the deletion of this wording during the examination proceedings was not in accordance with Article 123(2) EPC since the requirement that there was no grinding aid was not the same as the wording "consisting essentially of". This wording was included in claim 1 as originally filed and was added to claim 10 which, as originally filed, merely indicated "comprising".

The wording "consisting essentially of" could, in the opinion of the appellant, allow the presence of some grinding aid since the respondent had indicated that this expression meant that only compounds **not materially affecting the abrasive compounds** can be present in the composition in addition to the essential components.

- 4.2 The Board first notes that the deleted wording could be considered to be no more than a statement of intended result and that this result was in the form of a comparison with some unspecified prior art as indicated by the term "enhanced". Also, the description of the application as originally filed includes several references to "consisting essentially of" without any limitation regarding the absence of grinding aid, see for example page 6, lines 13, 16 and 23. On page 13, line 28 to page 14, line 8 of the application as originally filed optional additives are listed which include (line 34) sodium carbonate. According to D9,

column 1, lines 28 to 40 sodium carbonate is a grinding aid. Therefore there are indications in the application as originally filed that the absence of a grinding aid was not an essential feature of the invention.

4.3 The Board therefore concludes that the amendments to the independent claims made during the grant proceedings do not offend against Article 123(2) EPC so that the ground under Article 100(c) EPC fails.

5. *Novelty*

5.1 The appellant attacked novelty based on D18. The appellant argued that D18 disclosed the four components of the composite of claim 1 and that their ranges disclosed therein either overlapped or enclosed the claimed ranges or, in the case of the coupling agent, the claimed range was at least implicit for the skilled person. The appellant further argued that the examples of D18 disclosed a value for the amount of coupling agent (1%) that was within the claimed range. In this context it further asserted that it was well known that clays were water-insoluble.

The respondent argued that the silicates mentioned in D18 were not proven to be water-insoluble as required by claim 1 and that the value for the amount of coupling agent was mentioned in the examples wherein the amount of abrasive particles was outside the ranges claimed in claim 1.

5.2 The Board considers that D18 discloses all the features of claim 1 except the feature of the range of the amount of coupling agent.

- 5.2.1 For the binding agent D18 discloses a range of 10 to 50% (see column 10, lines 1 to 10) which encloses the range specified in claim 1, i.e. 20 to 40 parts by weight. In accordance with the case law of the Boards of Appeal (Case Law of the Boards of Appeal, 5th Edition 2006, I.C.4.2.1) a claimed range which is within a disclosed range should fulfil a number of criteria one of which is that the claimed range should be narrow relative to the disclosed range. In the present case the claimed range is not narrow relative to the disclosed range so that it cannot distinguish over the disclosed range.
- 5.2.2 D18 (see column 10, lines 1 to 10) discloses a range of 40 to 80% for the abrasive particles which overlaps the range specified in claim 1 (20-60 parts by weight) by a significant amount.
- 5.2.3 D18 further discloses a range of 5 to 30% for the clay particles (see column 10, lines 1 to 10) which overlaps the range specified in claim 1 (10-40 parts by weight) by a significant amount. The claimed metal silicates are disclosed in D18 since it refers to clays which are generally described as hydrated silicates of aluminium, magnesium or iron (see column 8, lines 66 to 67), i.e. which are metal silicates as listed in dependent claim 5 of the patent. Also it is well known that clays are water-insoluble, e.g. from geology or from D18, column 3, lines 49 to 50, which indicates expansion or not on exposure to water and hence excludes solution.
- 5.2.4 The fact that D18 gives weight percentages for the ranges whereas claim 1 specifies parts by weight does

not alter this finding since parts by weight have a broader scope than weight percentages.

5.2.5 D18 only discloses a value for the amount of coupling agent (1%) in the examples (see tables 1 and 4) wherein the amount of abrasive particles is 70% which is outside the range specified in claim 1. The Board considers that, at least for this reason, this value is not disclosed in combination with the ranges for the other components disclosed elsewhere in the document as indicated above. Also, the Board does not accept that the claimed range for the coupling agent is implicitly disclosed in D18 in combination with the ranges for the other components. The argument of the appellant that the claimed range is a typical range cannot be considered to be an implicit disclosure since the term typical does not mean that this is necessarily the range.

5.3 The only difference between claim 10 and claim 1 is that claim 10 is directed to a precisely shaped composite particle whereas claim 1 is directed to an abrasive article comprising precisely shaped abrasive composites adhered to a backing. The scope of claim 10 is thus broader than that of claim 1 in this aspect but the findings for claim 1 still apply to claim 10.

5.4 Therefore, the subject-matter of claims 1 and 10 of the main request is novel in the sense of Article 54 EPC.

6. *Inventive step*

6.1 As explained with respect to novelty the distinguishing feature of claim 1 is the range of values for the coupling agent.

D18 does not disclose a value within the claimed range in combination with the other features of claim 1. However, D18 does disclose a value of 1% in each of its examples which is within the claimed range. Furthermore, it is known from D6, column 10, lines 41 to 44 to use about 0.1 to 1% by weight of coupling agent and from D13, column 10, lines 43 to 46 to use about 0.01 to 3% by weight of coupling agent in the same contexts as in D18. These ranges are within or encompass the claimed range for the coupling agent (0.01-2.5 parts by weight) respectively.

This leads to the conclusion that the claimed range is no more than that which is normal in the art and hence is obvious for the skilled person.

The argument of the respondent that the composite disclosed in D18 was meant for a different purpose to that of the patent in suit cannot be accepted since claim 1 contains no corresponding limitation.

- 6.2 Therefore, the subject-matter of claim 1 of the main request does not involve an inventive step in the sense of Article 56 EPC.

First auxiliary request

7. *Inventive step*

- 7.1 Claim 1 of the first auxiliary request contains the additional feature that the metal silicates are selected from a group of specific metal silicates and combinations thereof.

The Board notes here that the listing of a specific metal silicate, such as calcium silicate, includes all variations of calcium silicates, as illustrated by dependent claim 5 which is directed to calcium metasilicate.

7.2 D18 indicates that clays are hydrated silicates of aluminium, magnesium or iron, see column 8, lines 66 to 67. Aluminium, magnesium and iron silicates are all among the metal silicates listed in claim 1 of this request. This means that the distinguishing feature of claim 1 of this request is not different to that of claim 1 of the main request, i.e. the range for the amount of coupling agent, so that the same argumentation as set out above in point 6.1 with respect to the main request also applies in this case.

7.3 Therefore, the subject-matter of claim 1 of the first auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

Second auxiliary request

8. *Inventive step*

8.1 Claim 1 of the second auxiliary request differs from claim 1 of the first auxiliary request in that the alternative of aluminium silicate has been deleted from the list of metal silicates in the claim.

In D18 it was indicated that the clays included hydrated silicates of aluminium, magnesium or iron, see column 8, lines 66 to 67. In the final abrasive of D18 these clays

should preferably be present in an amount of 5 to 30% by weight. Aluminium silicate is no longer one of the claimed silicates. The range for the amount of the remaining two claimed silicates in the clays of D18 cannot be calculated since the only range disclosed in D18 is for the combination of the three silicates. Therefore, the claimed range for the silicates becomes a further distinguishing feature of claim 1 of this request over the disclosure of D18.

8.2 The patent contains no indication whatsoever that there is any difference in the effects of aluminium silicate and the other claimed silicates. These silicates must therefore be considered to be equivalents which would be chosen based on the intended use. The substitution of one of the other specified silicates for the disclosed aluminium silicate must therefore be considered to belong to the normal experimentation of the skilled person.

8.3 Therefore, the subject-matter of claim 1 of the second auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

Third auxiliary request

9. *Inventive step*

9.1 Claim 1 of the third auxiliary request differs from claim 1 of the second auxiliary request in that the claim has been limited to calcium metasilicate as the metal silicate.

9.2 The Board notes that D6 (see column 8, lines 44 to 51) lists clay and calcium metasilicate as fillers in a list of fillers and that from this list calcium metasilicate preferred. Also, in D5 (see column 7, lines 41 to 44) there is a list of fillers including a calcium metasilicate.

In the view of the Board therefore the skilled person would replace clay by calcium metasilicate and *vice versa* depending upon the particular intended use. The fact that D18 uses calcium metasilicate as a comparative example does not mean that the skilled person would reject its use. On the contrary, the preferred filler depends upon the intended use. This is illustrated by the fact that in D6 the preferred filler is calcium metasilicate and the intended use is abrading mild steel (steel 1018, see column 11, lines 39 to 41 and 51 to 54 as well as tables I to XIII and X) whereas in D18 the intended use is on plastics workpieces. Abrading mild steel is the intended use of the claimed composition (see claim 7).

9.3 Therefore, the subject-matter of claim 1 of the third auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

Fourth auxiliary request

10. *Inventive step*

10.1 Claim 1 of the fourth auxiliary request differs from claim 1 of the main request only in that the ranges for the components of the composition have been limited.

10.2 Although the ranges claimed in claim 1 of this request are much narrower than those for claim 1 of the main request there is no evidence of any special effect being obtained with the components being within these ranges. The ranges contain values that the skilled person would have used when carrying out the teaching of D18 in the light of D6 or D13, as was argued for the main request (see point 6.1 above).

10.3 Therefore, the subject-matter of claim 1 of the fourth auxiliary request does not involve an inventive step in the sense of Article 56 EPC.

Fifth to seventh auxiliary requests

11. *Inventive step*

11.1 Claim 1 of each of the fifth to seventh auxiliary requests corresponds to claim 1 of the first to third requests respectively though with the further limitations in the ranges for the components of the composition as given in claim 1 of the fourth auxiliary request.

11.2 There is no indication that the limitation in the ranges for the components of the composition has any extra effect when combined with the particular extra features of the first to third auxiliary requests so that the combinations of features contained in claim 1 of each of the fifth to seventh auxiliary requests is considered to belong to the normal experimentation of the skilled person.

11.3 Therefore, the subject-matter of claim 1 of the each of the fifth to seventh auxiliary requests does not involve an inventive step in the sense of Article 56 EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

G. Nachtigall

H. Meinders