

Internal distribution code:

- (A) [] Publication in OJ
(B) [] To Chairmen and Members
(C) [X] To Chairmen
(D) [] No distribution

D E C I S I O N
of 10 October 2002

Case Number: T 0441/00 - 3.2.7

Application Number: 88810118.5

Publication Number: 0280657

IPC: B24D 11/00

Language of the proceedings: EN

Title of invention:
Flexible abrasives

Patentee:
Abrasive Technology N.A., Inc.

Opponent:
Minnesota Mining and Manufacturing Company

Headword:
-

Relevant legal provisions:
EPC Art. 56, 84, 123(2)

Keyword:
"Extension beyond the content of the application as filed
(no)"
"Clarity (yes)"
"Alleged prior use (not proven)"
"Inventive step (yes)"

Decisions cited:
T 0472/92

Catchword:
-



Case Number: T 0441/00 - 3.2.7

D E C I S I O N
of the Technical Board of Appeal 3.2.7
of 10 October 2002

Appellant: Minnesota Mining and Manufacturing Company
(Opponent) P.O. Box 33427
St. Paul
Minnesota 55133-3427 (US)

Representative: Bowman, Paul Alan
Lloyd Wise
Commonwealth House
1-19 New Oxford Street
London WC1A 1LW (GB)

Respondent: Abrasive Technology N.A., Inc.
(Proprietor of the patent) 8400 Green Meadows Drive
Westerville
Ohio 53081 (US)

Representative: Devons, David Jon
MARKS & CLERK
57-60 Lincoln's Inn Fields
London WC2A 3LS (GB)

Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 2 March 2000
concerning maintenance of European patent
No. 0 280 657 in amended form.

Composition of the Board:

Chairman: A. Burkhart
Members: K. Poalas
E. Lachacinski

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division maintaining the European patent No. 0 280 657 in amended form.

Opposition was filed against the patent as a whole based on Article 100(a) EPC (lack of novelty and lack of inventive step), Article 100(b) EPC (lack of enabling disclosure) and Article 100(c) EPC (extension beyond the content of the application as filed).

The Opposition Division held that the grounds for opposition mentioned in Article 100(a), (b) and (c) EPC did not prejudice the maintenance of the patent as amended.

- II. Oral Proceedings before the Board of Appeal took place on 10 October 2002.

(i) The appellant requested that the decision under appeal be set aside and the patent revoked.

(ii) The respondent requested that the decision under appeal be set aside and the patent be maintained in amended form on the basis of the following documents:

claims: 1 to 20 as submitted on
10 October 2002,

description: pages 2 and 3 as submitted on
10 October 2002,
pages 4, 5, 6 of the patent as
granted,

Figures: 1 to 3 of the patent as granted.

(iii) Independent claims 1 and 14 of the patent in suit as amended during the oral proceedings on 10 October 2002 read as follows:

"1. A method of forming an abrasive member wherein a metal film (2) is fixedly attached to one surface of a non-conductive flexible sheet (1), a mask (13) of plating resistant material is applied to the exposed surface of the metal film (2), said plating resistant material having a multitude of discrete openings therein (14), and metal (3) is electrodeposited through said discrete openings (14) onto said metal film (2) in the presence of particulate abrasive material (4) so that the particulate abrasive material (4) becomes embedded in the metal deposits (3), characterized in that the voids between the metal deposits are filled with flexible resin (5) to reduce lateral movement of the metal deposits (3)."

"14. An abrasive member comprising flexible sheet (1) with a multitude of discrete metal protuberances (2, 3) fixedly attached to one surface thereof, each of the protuberances (2, 3) comprising a lower thin film (2) of a first metal fixedly attached to the sheet and an upper electrodeposited film of a second metal (3) having a particulate abrasive material (4) embedded therein, characterized in that the voids between the metal protuberances (2, 3) are filled with flexible resin (5) to reduce lateral movement of the protuberances (2, 3)."

(iv) During the oral proceedings the appellant referred to the following prior art documents:

D1: FR 2 565 870 A and

D4: US 4 256 467 A.

The appellant referred further to an alleged prior use based on the following evidence:

(a) Samples 1 and 2: abrasive members being produced after the priority date of the patent in suit and allegedly produced by a method corresponding to document D4,

(b) Invoice: dated 17 April 1986,

(c) Video: titled "RESIN BONDED DIAMOND CLOTH" dated "OCTOBER 1995" and "16/11/95",

(d) Declarations: made by Messrs. Ian Gorsuch, Christopher Woodcock and Mark Ennis, and

D2: Brochure of INTERFACE DEVELOPMENTS LIMITED.

III. The appellant argued essentially as follows:

The information disclosed in Example 3 of the application as filed that instead of a flexible polyurethane resin "other flexible resins" can be used, has to be read only in the context of Example 3. Consequently, a flexible resin other than a flexible

polyurethane resin can only be used under the conditions described in Example 3 of the application as filed.

Therefore, the insertion of the term "flexible" into the amended claims 1 and 14 corresponds to an unallowable generalisation which violates the requirements of Article 123(2) EPC.

The term "flexible resin" is an unclear term itself, since there are many degrees of flexibility ranging from floppy to substantially rigid. It is a comparative term and there is no teaching in the specification as to how one would distinguish between a resin having the required degree of flexibility to make it suitable for use in the alleged invention of the patent in suit and a resin having a degree of flexibility unsuitable for use in the alleged invention of the patent in suit.

Therefore, the insertion of the term "flexible" into the amended claims 1 and 14 renders the subject-matter of the claims unclear and contravenes the requirements of Article 84 EPC.

The invoice dated 17 April 1986 confirms the despatch of abrasive products on that date and the three filed declarations establish beyond any reasonable doubt that abrasive products shown in the brochure D2 were available to the public before the priority date of the patent in suit and that the Samples 1 and 2 correspond to these products.

Therefore, it was proven that abrasive materials were available to the public before the priority date of the patent in suit, which materials comprised a multitude

of discrete metal protuberances attached to a flexible sheet, each of the protuberances comprising electrodeposited metal having a particulate abrasive material embedded therein, and wherein the voids between the metal protuberances were filled with flexible resin.

The method according to claim 1 of the patent in suit differs from the method known from document D1 in that the voids between the metal deposits are filled with flexible resin to reduce lateral movement of the metal deposits.

The use of a sizing layer made of a flexible resin in order to fix and hold in place abrasive particles on a backing sheet is well known in the manufacture of sandpapers and belongs to the general knowledge of a person skilled in the field of abrasive members. For this reason, the person skilled in the art who intends to reduce the lateral movement and chipping off tendency of the abrasive particles in the abrasive member known from document D1 would apply an additional flexible resin in the form of a sizing layer over the abrasive member shown in Figure 5 of document D1 and would thus arrive at the method of claim 1 of the patent in suit without exercising any inventive activity.

Therefore, the method of claim 1 of the patent in suit does not involve an inventive step.

The same argumentation concerning the inventive step applies also to the abrasive member of claim 14.

IV. The respondent argued essentially as follows:

The person skilled in the art reading the application as filed understands that the use of flexible resins other than a polyurethane resin is applicable to any abrasive member made according to the present invention.

Therefore, the incorporation of the term "flexible" for qualifying the resin to be used into the claims 1 and 14 does not violate the requirements of Article 123(2) EPC.

Example 3 of the patent in suit states that the use of a flexible polyurethane resin or of other flexible resins "has the important advantage that during use the tendency of the deposits to be chipped off the backing sheet is minimized". Accordingly, a flexible resin in the context of the patent in suit is a resin which, when set, is flexible and not brittle.

Therefore, the term "flexible resin" used in claims 1 and 14 is clear to the person skilled in the art and meets the requirements of Article 84 EPC.

A sample product produced prior to the priority date of the patent in suit enabling the estimation of whether it does in fact meet the terms of the claims was not submitted by the appellant. The evidence submitted is based purely on hearsay and the submitted statutory declarations merely contain self-serving statements. The high standard of proof required according to the Board of Appeal Decision T 472/92 for cases where practically all the evidence in support of an alleged prior public use lies within the power and knowledge of the opponent was not met by the opponent/appellant in the present case.

Therefore, the alleged public prior use was not proven.

With regard to the inventive step, the problem to be solved is to reduce the tendency of the metal deposits to chip off the substrate due to the high shearing forces applied to them in use (see page 2, lines 36 to 38 of the patent in suit). Neither document D1 nor document D4 teach the steps of first creating voids between the metal deposits and then filling them with flexible resin in order to reduce the lateral movement of the metal deposits. Also, the fact that sandpapers having a size coating of flexible resin belong to the prior art does not incite the person skilled in the art to fill the voids between the specifically structured electrodeposited metal deposits in document D1 with a flexible resin.

Therefore, the subject-matter of claims 1 and 14 is not obvious.

Reasons for the Decision

1. Amendments to the granted claims 1 and 14

In view of claims 1 and 14 as granted claims 1 and 14 have been amended in that the term "at least partially" was deleted and the feature "resin" was amended to "flexible resin".

1.1 Article 123(2) and (3) EPC

The first amendment of the claims 1 and 14 is a limitation having a base in the application as originally filed (see, page 6, line 2; page 8, line 22;

page 9, line 10; page 11, lines 16 and 37). This was also not disputed by the appellant.

The second amendment defines also a limitation based in Example 3 of the originally filed application (see page 9, lines 15/16). Although the term "flexible resin" is expressively mentioned only in Example 3, it is obvious from the whole application that flexibility is a consistent property for the resin in order to be flexible together with the flexible sheet onto which it is applied. In the originally filed claim 3 the use of a resin in general and of a polyurethane resin in particular is claimed. In Example 3 it is stated that instead of a flexible polyurethane resin other flexible resins can be used. It is obvious to the skilled person that the present invention seeking to reduce the high shearing forces applied to the metal deposits during the abrading process can only achieve this target by using flexible and not brittle resins. Therefore, the amended claims 1 and 14 disclosing the term "flexible resin" do not contain subject-matter which extends beyond the content of the application as filed.

For the above-mentioned reasons claims 1 and 14 do not contravene Article 123(2) and (3) EPC.

1.2 Clarity - Article 84 EPC

The clarity of claims 1 and 14 has been attacked with respect to the expression "flexible resin".

The Board cannot agree with the argument of the appellant that the expression "flexible resin" is unclear *per se*, since it is obvious to the skilled person that a flexible resin in the context of the

present invention is a resin, which when set can be deformed during the abrading process without breaking.

The Board is also unable to agree with the argument of the appellant that the expression "flexible resin" cannot define the resins which are suitable for fulfilling the requirements of claims 1 and 14. It is obvious to the skilled person that according to claims 1 and 14 a resin has to be chosen which, when set, remains flexible and deformable without breaking during the abrading process. The expression "flexible resin" defines a feature which the skilled person is able to put into practice through only routine trials without undue burden.

Therefore, claims 1 and 14 do not contravene Article 84 EPC.

2. *Alleged public prior use*

The Board concurs with the finding in T 472/92 (Reasons 3.1) that by a public prior use where practically all the evidence in support of an alleged prior public use lies within the power and knowledge of the opponent, an opponent must prove his case up to the hilt, for little if any evidence is available to the patentee to establish the contradictory proposition that no public prior use had taken place.

Samples 1 and 2 manufactured after the priority date of the patent in suit were filed by the appellant alleging that they represent abrasive products which were available to the public prior to the priority date of the patent in suit. Documents D2 and D4 showing metal deposits having diamonds embedded therein, said metal

deposits being electrodeposited through a mesh, were filed as evidence for the basic structure of the alleged prior use. A video produced after the priority date of the patent in suit showing metal deposits having diamonds embedded therein, said metal deposits being fixedly attached to a fabric and having resin filling the voids between the metal deposits, was also filed by the appellant as evidence.

The only concrete evidence offered with respect to the alleged sale of the abrasive products consists of a photocopy of an invoice of "Interface Development Limited" to "EDUS MASCHINENBAU GmbH & Co.KG.". The information contained in the invoice with respect to what it was sold is, however, restricted to statements, like "BELT 25.2" X 3" WIDTH RED 18 N74" or "AS ABOVE WHITE 18 N20".

This evidence is far too vague and inconsequential to permit the Board to draw the conclusion that the material that was delivered was indeed identical to the Samples 1 and 2, or, for that matter in accordance with the requirements or part of the requirements of the independent claims 1 and 14.

The filed statutory declarations reflect subjective recollections of Messrs. Ian Gorsuch, Christopher Woodcock and Mark Ennis. These declarations referring to events which took place many years ago only contain allegations about manufacturing methods and the sale of products obtained by those manufacturing methods during a period of time shortly before the priority date of the patent in suit.

However, the appellant/opponent has not provided any

direct evidence of prior use which could back up the allegations of the said declarations. The submitted sales literature of document D2 is silent about the critical features of the present invention. The appellant/opponent has completely failed to provide any constructional drawings, archive samples, research records or sold samples dated before the priority date of the patent in suit.

Evaluating the afore-mentioned evidence presented by the appellant/opponent in support of the alleged prior use with due care and necessary scrutiny, the Board comes to the conclusion that the alleged public prior use was not proven beyond any reasonable doubt and, therefore, the Board considers said alleged public prior use as not belonging to the state of the art according to Article 54(2) EPC.

3. *Inventive step*

3.1 Claim 1

3.1.1 Closest prior art

The closest prior art is undisputedly represented by document D1. Using the wording of claim 1 document D1 (see Figures 5 and 6) discloses a method of forming an abrasive member, wherein a metal film 3 is fixedly attached to one surface of a non-conductive flexible sheet 2, a mask 4 of plating resistant material is applied to the exposed surface of the metal film 3, said plating resistant material having a multitude of discrete openings 5 therein, and metal 7 is electrodeposited through said discrete openings 5 onto said metal film 3 in the presence of particulate

abrasive material 6 so that the particulate abrasive material 6 becomes embedded in the metal deposits 7.

3.1.2 Problem underlying the invention

The inventors of the patent in suit have found that in the abrasive member obtained by the method of document D1 there is a tendency for the metal deposits to chip off due to the high shearing forces applied to them. Therefore, the problem to be solved by the present invention is to reduce the tendency of the metal deposits to chip off the substrate due to the high shearing forces applied to them in use (see page 2, lines 36 to 42 of the patent in suit).

3.1.3 Solution

The above-mentioned problem is solved by the method according to claim 1 of the patent in suit in that the voids between the metal deposits are filled with flexible resin to reduce lateral movement of the metal deposits.

3.1.4 This solution is not rendered obvious by the documents under consideration for the following reasons:

Document D1 seeks to provide a better fixation of the diamonds on the backing member. When looking at the drawings (Figures 5 and 6) of document D1 the skilled person would not recognise any tendency of the metal deposits to chip off the substrate due to the high shearing forces applied to them in use, since the intermediate space between the metal deposits is filled with a mask which apparently reduces lateral movement, and thus the risk of chipping off, of the metal

deposits. The person skilled in the art learns from document D1 that in case of removal of the mask, an additional metal layer should be provided over the whole surface of the substrate (see document D1, page 3, line 34 to page 4, line 3).

Therefore, document D1 teaches that if an additional fixation of the diamonds is needed, then an additional metal layer should be applied to the surface, including the voids between the metal deposits.

Consequently, document D1 teaches away from using a resin as fixing aid by coating and filling with it the voids between the metal deposits.

In view of this teaching of document D1 the person skilled in the art would not be induced by the knowledge of resin-coated sandpapers to replace in the method known from document D1 the metal coating suggested by this document by a resin coating.

Moreover, the person skilled in the art being aware of the general knowledge in the field of size-coated sandpapers would not expect to get any suggestions in such sandpapers for solving the problem of avoiding chipping off of the specifically structured metal deposits according to document D1.

It follows from the above that the method of claim 1 of the patent in suit is not obvious to the skilled person in the light of the combination of the teaching of document D1 with the general technical knowledge in the field of the abrasive members, in particular sandpapers.

3.1.5 Therefore, the method of claim 1 of the patent in suit involves an inventive step within the meaning of Article 56 EPC.

3.2 Claim 14

Each of the discrete metal protuberances of the abrasive member defined in the independent claim 14 comprises a lower and an upper metal film, whereby said upper metal film is identical with the metal deposits mentioned in claim 1. Further, the independent claim 14 requires, similarly to claim 1, that the voids between the metal protuberances are filled with flexible resin to reduce lateral movement of the protuberances.

Therefore, for the same reasons given in respect of claim 1, the abrasive member of claim 14 also involves an inventive step.

4. The subject-matter of claims 2 to 13 and 15 to 20, said claims being dependent on claims 1 and 14 respectively, similarly involves an inventive step.

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 in amended form on the basis of the following documents:

claims: 1 to 20 as submitted on 10 October 2002,

description: pages 2 and 3 as submitted on 10 October 2002,
pages 4,5,6 of the patent as granted,

figures: 1 to 3 of the patent as granted.

The Registrar:

The Chairman:

D. Spigarelli

A. Burkhart