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D E C I S I O N
of 5 February 1999

Case Number: T 0277/96 - 3.2.5

Application Number: 90108486.3

Publication Number: 0396150

IPC: B24D 11/00

Language of the proceedings: EN

Title of invention:

Coated abrasive material and method of making same

Applicant:

Norton Company

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 56

Keyword:

"Inventive step (yes)"

Decisions cited:

-

Catchword:

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Chambres de recours

Case Number: T 0277/96 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 5 February 1999

Appellant: Norton Company
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 4 October 1995
refusing European patent application
No. 90 108 486.3 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. Burkhart
Members: H. P. Ostertag
M. Vogel

Summary of Facts and Submissions

- I. The appellant (applicant) lodged an appeal against the decision of the examining division refusing the application No. 90 108 486.3.

The examining division held that the subject-matter of the application did not involve an inventive step having regard to the prior art documents

D3: DE-C-173 314 and

D4: EP-A-0 227 394.

- II. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of the following documents:

Claims: 1 to 28, filed on 12 November 1997;

Description: pages 1 to 3, 5 to 9, 12, 13, 21, 22, 24 to 31, 33, 36, 37, 41 to 49, as originally filed,
pages 4, 10, 11, 14 to 20 and 23, filed on 12 November 1997, and
pages 32, 34, 35, 38 to 40, filed on 29 January 1999;

Drawings: Figures 1 to 8, as originally filed.

- III. Claim 1 reads as follows:

"1. A coated abrasive material (10) suitable for use in lapping operations comprising:

- a. a flexible and dimensionally stable backing member (12),

- b. an abrasive material (14) comprising a dispersion (18) of abrasive grains (20) in a cured binder (22); said abrasive material being adhered to one surface (16) of the backing member (12) and being configured in a plurality of discrete raised three-dimensional formations (28) interspersed with areas (32) devoid of abrasive grain and binder such that the abrasive material forms a discontinuous surface opposite the backing member (12), wherein each formation has widths which diminish in the direction away from said backing member (12)."

Claim 18 reads as follows:

"18. A process for the manufacture of a coated abrasive material suitable for use in lapping operations comprising:

- a. providing an abrasive material comprising a dispersion of abrasive grain in a curable binder, said dispersion having non-Newtonian properties,
- b. depositing said dispersion on one side of a dimensionally stable backing member in a pattern of three-dimensional coated abrasive formations interspersed with areas devoid of abrasive grain and binder, wherein each formation has widths which diminish in the direction away from said backing member (12), and
- c. curing said binder to freeze said dispersion in said three-dimensional pattern."

IV. The appellant argued essentially as follows:

Neither D3 nor D4 disclosed or suggested the feature of the present invention "areas devoid of abrasive grain and binder" which feature was important for an excellent performance in ophthalmic fining applications. Moreover, D3 and D4 did not disclose the process feature "use of a dispersion of abrasive grain in a curable binder having non-Newtonian flow characteristics", which feature provides that the dispersion transferred to the surface of the backing member could be distributed thereon in a particular design with areas devoid of abrasive dispersion.

Therefore, even a combined teaching of D3 and D4 could not make obvious the subject-matter of claims 1 and 18.

Reasons for the Decision

1. *Original disclosure (Article 123(2) EPC)*

Claim 1 is based on the following disclosure of the originally filed application documents:

Claims 1 and 2; page 24, lines 28 to 31; page 39, lines 27 to 31; page 40, lines 11 to 14.

Dependent claims 2 to 17 are based on the respective originally filed claims 3, 6 to 10, 12 to 21.

Claim 18 is based on the following disclosure of the originally filed application documents:

Claims 1 and 25; page 24, lines 28 to 31; page 39, lines 27 to 31; page 40, lines 11 to 14.

Dependent claims 19 to 26 are based on the respective originally filed dependent claims 26 to 33.

Use claims 27 and 28 are based on the originally filed claims 34 and 35.

The description has been adapted to the amended claims.

The amended claims and description, therefore, do not contravene Article 123(2) EPC.

2. *Novelty*

Document D4, which represents the closest prior art, discloses a coated abrasive material suitable for use in lapping operations, comprising a flexible and dimensionally stable backing member and an abrasive material comprising a dispersion of abrasive grains in a cured binder, said abrasive material being adhered to one surface of the backing member and being configured in a plurality of discrete raised three-dimensional formations.

The coated abrasive material according to claim 1 differs from the material according to D4 in that

- (a) the three-dimensional formations are interspersed with areas devoid of abrasive grain and binder such that the abrasive material forms a discontinuous surface opposite the backing member, and
- (b) each formation has widths which diminish in the direction away from said backing member.

Therefore, the coated abrasive material according to claim 1 is novel.

The same applies to the process according to claim 18, which contains also the afore-mentioned features (a) and (b).

3. Inventive step

3.1 Problem and solution

The problem underlying the invention consists in providing a coated abrasive material having a high surface fine-finishing performance and a high cut rate.

This problem is solved, in accordance with claim 1, in that the abrasive coating is distributed on the backing member in a particular design, which is characterised by the features

(a) the three-dimensional formations are interspersed with areas devoid of abrasive grain and binder such that the abrasive material forms a discontinuous surface opposite the backing member, and

(b) each formation has widths which diminish in the direction away from that backing member.

3.2 The said solution is not rendered obvious by the teachings of D4 and D3.

In the abrasive material according to D4 the abrasive coating is distributed in a uniform pattern of ridges and valleys on the backing member, which can serve as channels for the flow of lubricants and for removal of abraded material (see D4, page 9, lines 1 to 6).

The wording "the rotogravure coater can impart a uniform patten of ridges and valleys to the binder composition" in lines 2 to 4 of page 9 of D4 indicates that the "binder composition" - which forms the abrasive layer coating on the backing member is applied as a continuous layer consisting of ridges and valleys.

Therefore, D4 does not disclose or suggest that the abrasive material should form a discontinuous surface on the backing member designed in accordance with the aforementioned features (a) and (b) of claim 1.

Document D3 discloses a grinding disc comprising a backing member, a layer of binder entirely covering the surface of the backing member, and an abrasive grain scattered onto the binder layer (see D3, page 2, lines 21 to 25).

The grinding disc according to D3 does not comprise the features "a dispersion of abrasive grains in a cured binder" and "areas devoid of abrasive grain and binder".

Therefore, even the combined teaching of D3 and D4 does not lead the person skilled in the art to the subject-matter of claim 1.

3.3 Consequently, the coated abrasive material according to claim 1 involves an inventive step in the sense of Article 56 EPC.

The same applies to the process according to claim 18 which, in substance, contains the same features as claim 1.

4. Therefore, the subject-matter of claims 1 and 18 constitutes a patentable invention in the sense of Article 52(1) EPC.

This is also true for the subject-matter of dependent claims 2 to 17 and 19 to 26, as well as for the use indicated in claims 27 and 28, which relate to specific embodiments of the subject-matter of claims 1 and 18, respectively.

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 grant a patent in the following version:

Claims: 1 to 28, filed on 12 November 1997;

Description: pages 1 to 3, 5 to 9, 12, 13, 21, 22, 24 to 31, 33, 36, 37, 41 to 49, as originally filed, pages 4, 10, 11, 14 to 20 and 23, filed on 12 November 1997, and pages 32, 34, 35, 38 to 40, filed on 29 January 1999;

Drawings: Figures 1 to 8, as originally filed.

The Registrar:



A. Townend

The Chairman:



A. Burkhart



