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D E C I S I O N
of 9 March 2001

Case Number: T 0890/98 - 3.2.3

Application Number: 92309414.8

Publication Number: 0551714

IPC: B24D 18/00, B24D 7/04

Language of the proceedings: EN

Title of invention:
Abrasive articles and their production

Applicant:
Wiand, Ronald Carlysle

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - state of the art"

Decisions cited:
-

Catchword:
-

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Case Number: T 0890/98 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 9 March 2001

Appellant: (Applicant)
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Decision under appeal: **Decision of the Examining Division 2.3.02.097 of the European Patent Office dated 16 March 1998, posted on 9 April 1998 refusing European patent application No. 92 309 414.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
J.-P. Seitz

Summary of Facts and Submissions

I. With decision of 9 April 1998 the examining division refused European patent application No. 92 309 414.8 in the light of

(D1) GB-A-2 043 501 and

(D2) US-A-4 910 924.

II. The independent claims 1 and 6 filed with the letter of 13 November 1995 and underlying the above decision of the examining division read as follows:

"1. An abrasive article comprising a moulded abrading body produced from an injection moulded polymeric material with an abrasive material and a secondary filler material interspersed homogeneously therethrough, the abrading body comprising from 1% to 20% by volume of a diamond hardness abrasive grit; from 5% to 80% by volume of a secondary filler; and from 5% to 90% by volume of a thermoformable polymer selected from thermoplastic polymeric materials having a softening point temperature greater than 100°C and less than 250°C, and thermoset polymers."

"6. A process of manufacture of an abrasive article, comprising the steps of:

(a) providing an injection mould cavity for forming a predetermined shape of the abrasive article;

(b) formulating a fluid mixture, said mixture comprising from 1% to 20% by volume diamond hardness abrasive grit, from 5% to 80% by volume

secondary filler(s) and from 5% to 90% of a thermoformable polymer selected from thermoplastic polymers having a softening point temperature greater than 100°C and less than 250°C and thermoset polymers; and

(c) injection moulding the abrasive article by forcing the fluid mixture into the injection mould cavity."

III. Against the above decision to refuse European patent application No. 92 309 414.8 the applicant - appellant in the following - lodged an appeal on 9 June 1998 paying the fee on 10 June 1998 and filing the statement of grounds of appeal on 19 August 1998.

IV. The appellant requests to set aside the impugned decision and to grant a patent on the basis of claims 1 to 6 filed with the letter of 13 November 1995.

V. The arguments of the appellant in support of his above requests can be summarized as follows:

- (D1) is contradictory in itself and the term "injection mould/moulding" should not have been used since the correct technical term for the process disclosed in (D1) for any skilled person is "compression moulding";

- (D1) does not disclose the material set out in claim 1 whereas (D2) discloses that material, however, in combination with a different process, namely compression moulding;

- this process does not lead to a moulded composition which is homogeneous since the abrasive particles are allowed to settle when filled into the mould cavity in which the moulded composition has to be heated prior to the forming/pressing step;

- there existed a prejudice against the use of injection moulding in combination with abrasive particles to be moulded so that a skilled person would not consider a combination of (D1) and (D2);

- what has to be understood by a skilled person is set out in the declaration of John McLoughlin and in the affidavit of John Blackburn both filed in the course of the proceedings before the EPO;

- under these circumstances (D1) and (D2) whether considered singly or in combination cannot be accepted as an obstacle against grant of a patent.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

2.1 According to appellant's letter of 13 November 1995 claim 1 combines the features of originally filed claims 1, 4, 5, 9, 10 and 11; the board shares these findings with the exception that "a diamond hardness abrasive grit" of new claim 1 can only be found in the description of EP-A1-0 551 714 (corresponding to the originally filed documents), see column 8, lines 19 to

22.

The term "**secondary** filler" is not literally mentioned in the original claims but can be accepted since the diamond hardness abrasive grit has to be seen as the "**primary** filler".

2.2 Present claims 2 to 5 correspond to originally filed claims 6, 7, 8 and 12.

2.3 Claim 6 is a combination of features to be derived from originally filed claims 13, 5, 9 and 11 in combination with column 8, lines 19 to 22. The addition of "**fluid**" before "mixture" is acceptable and implicitly contained in an injection moulding process; if not it would not be possible to feed the material to be moulded into the mould cavity (being **closed** in contrast to a **compression** moulding step!)

2.4 Summarising, the requirements of Article 123(2) EPC are met.

3. *Novelty*

Novelty was not disputed in the impugned decision and is acknowledged by the Board so that no detailed arguments are necessary in this respect.

4. *Inventive step*

Claim 1

4.1 As a general remark it is observed that in the technical field of moulding the term "compression moulding" is used when a two-part mould is opened, a

moulding compound is filled into the mould cavity and heated therein, whereby after softening of the moulding compound the two-part mould is closed under pressure to shape the mass into the desired shape.

4.2 In contrast to "**compression** moulding" "**injection** moulding" is characterised in that a (granular) material is fed into a cylinder where it is heated and softened and thereafter forced through a nozzle into a (relatively cool) mould held closed under pressure to form the desired shape.

4.3 Comparing both processes it is important that the **injection** process needs a **fluid mixture** which is prepared outside the mould cavity whereas in **compression** moulding the material to be formed can be filled into part of a cavity in **any form** (solid, semi-solid...) since it is heated/softened after being filled in.

The reference on page 1, lines 58 to 65 of (D1), clearly appears to relate to a **compression** moulding even if "**injection** moulding" is dealt with in this paragraph.

Page 2, lines 73 to 81, of (D1) appear, however, to be clearer and to relate indeed to **injection** moulding since an (external) heating chamber is typical for this process; what could again be misleading is the feature that the mould is preheated which feature would not be typical for **injection** moulding in which process the mould **is cooled**, see Declaration of John McLoughlin (dated 2 February 1995) and the affidavit of John Blackburn (dated 18 June 1999) filed by the appellant

in support of his interpretation of (D1).

4.5 The above discrepancies are enough to cast considerable doubts on how the person skilled in the art would interpret the disclosure of (D1) which, whilst referring specifically to injection moulding, appears, at least in some references, to describe compression moulding.

This finding is further supported by the fact referred to in both the present application and its priority patent US-A-5 449 388 (and confirmed in the above declaration and affidavit, respectively) that injection moulding of materials containing abrasives was thought to be impractical because of the anticipated high wear rate of the injection moulding apparatus.

4.6 What is clearly not known from (D1) is the composition of the abrading body according to claim 1, namely

(a) 1 to 20% by volume of a diamond hardness abrasive grit;

(b) 5 to 80% by volume of a secondary filler and

(c) 5 to 90% by volume of a thermoformable polymer...

4.7 What is, however, known from (D2) is a moulding material composed of

(a) abrasive particles 20 to 70%

(b) filler material 0 to 50%

(c) polymer material 2 to 60%

so that the claimed moulding material is partly known, namely using the upper limit 20% by volume of claim 1 for the diamond hardness abrasive grit and using the lower limit of the range disclosed for it in (D2).

4.8 The above discussion of (D1) and (D2) results in the findings that **injection** moulding is not unambiguously derivable from (D1) and that in a different technology (**compression** moulding) the composition of claim 1 according to the above remark 4.6 is partly known.

4.9 The Board can see no incentive for the person skilled in the art to consider (D1) and (D2) **in combination** so that the available prior art is not directly helpful to arrive at the subject-matter of claim 1.

4.10 Under these circumstances the board is convinced that the subject-matter of claim 1 is inventive within the meaning of Article 56 EPC.

Claim 6

5. This claim is a process claim which comprises the features of claim 1 and is clearly directed to injection moulding so that the same arguments as with claim 1 in respect of (D1) and (D2) are applicable. Claim 6 also defines therefore novel and inventive subject-matter and is 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 grant the patent with the following documents:

   claims 1 to 6 filed with letter of 13 November 1995;
   pages 1 to 3 and 5 to 16 filed with letter of 3 November 2000;

   drawing sheets 1/3 to 3/3 as originally filed.

The Registrar: The Chairman:

A. Counillon C. T. Wilson