

Internal distribution code:

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

D E C I S I O N
of 11 May 2006

Case Number: T 1229/05 - 3.2.07

Application Number: 01962017.8

Publication Number: 1309424

IPC: B24D 11/00

Language of the proceedings: EN

Title of invention:
Abrasive pad for CMP

Applicant:
3M Innovative Properties Company

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - no"

Decisions cited:
-

Catchword:
-



Case Number: T 1229/05 - 3.2.07

D E C I S I O N
of the Technical Board of Appeal 3.2.07
of 11 May 2006

Appellant: 3M Innovative Properties Company
3M Center
P.O. Box 33427
St. Paul, MN 55233-3427 (US)

Representative: von Kreisler, Alek
Patentanwälte
von Kreisler-Selting-Werner
Bahnhofsvorplatz 1 (Deichmannhaus)
D-50667 Köln (DE)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 3 March 2005
refusing European application No. 01962017.8
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: C. Holtz
Members: P. O'Reilly
H. Hahn

Summary of Facts and Submissions

I. European application No. 01 962 017.8 was refused by the Examining Division for lack of inventive step.

The appellant (applicant) filed an appeal against the decision.

II. The appellant requested that the decision under appeal be set aside and a patent be granted on the basis of claims 1 to 6 filed with letter of 17 January 2005 in the proceedings before the Examining Division.

III. In a communication accompanying an invitation to oral proceedings the Board set out its provisional opinion explaining why the Board had not been convinced by the arguments of the appellant that the decision of the Examining Division should be overturned. The appellant subsequently withdrew his request for oral proceedings and made no further submission. The oral proceedings were cancelled.

IV. Independent claim 1 of the valid set of claims reads as follows:

"1. An abrasive pad for CMP, said pad having a substrate and an abrasive layer disposed on the substrate, wherein said abrasive layer has a three-dimensional structure including a plurality of regularly arranged three-dimensional elements having a predetermined shape, and said abrasive layer comprises an abrasive composite containing approximately spherical advanced alumina abrasive grains produced by a CVD method and a binder as construction components."

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

D1: WO-A-97/11484

D2: EP-A-0 644 277

D3: "Development of Advanced Alumina", Kinoh Zairyoh, Material Report, R & D (translation from Japanese).

VI. The arguments of the Examining Division in their decision may be summarised as follows:

D1 is the closest prior art document. The subject-matter of claim 1 is distinguished over the disclosure of D1 by the features that the abrasive grains are approximately spherical and consist of advanced alumina produced by a CVD method. The problem to be solved is to select abrasive grains for the abrasive pad which would perform best in a CMP process. The skilled person would turn to D2 when seeking a solution to the problem. D2 discloses a method of producing α -alumina particles by a CVD method which is suitable for use as an abrasive and particularly suitable for use as a precision abrasive. The skilled person would use these precision abrasive particles in the abrasive pad known from D1.

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

The closest prior art document is D1. Claim 1 is distinguished over the disclosure of D1 by the features that the grains are α -alumina grains which are of

approximately spherical shape and produced by a CVD method. D1 discloses a large number of possible working materials. With respect to the shapes there are also a number of these disclosed and the skilled person would understand these shapes, which include spherical, as being representative of agglomerates of individual grains. D1 teaches away from selecting alumina, even though it is disclosed therein, in view of the fact that the document discloses 147 working examples. D1 also teaches away from selecting a spherical shape since none of the working examples discloses a spherical shape for a grain.

The problem to be solved is to provide an improved abrasive pad for CMP, which results in less defects or scratches on the abraded surfaces, whilst maintaining good friction properties.

The subject-matter of claim 1 involves an inventive step because of the numerous possible materials and shapes disclosed in D1 and the fact that the distinguishing features of claim 1 produce a surprising effect. This is demonstrated by the comparative example described on page 18 of the application.

With regard to D2 there is a list of uses for the grains disclosed therein which is clearly speculative so that the skilled person would have no reason to assume that the material disclosed therein would solve the problem addressed in the application in suit. The Examining Division furthermore misunderstood the meaning of the term precision as used in D2.

Reasons for the Decision

1. *Novelty*

1.1 The Examining Division considered that claim 1 was novel and the Board has no reason to depart from that view.

2. *Inventive step*

2.1 The Board considers D1 to be the closest prior art document and this view was also expressed by the appellant in his appeal grounds.

With respect to D1 it may be noted that this document discloses a number of materials and shapes for the abrasive grains. Among the materials alumina is mentioned and among the shapes spherical is mentioned. Since there is no indication in D1 as to exactly which shape may be used with which material the Board considers that there is no disclosure in the document of a combination of alumina material with a spherical shape. The Board considers that the alumina material disclosed in D1 is the most relevant starting point. Therefore, the Board considers that claim 1 is distinguished over the disclosure of D1 by the features that the alumina is an advanced alumina produced by a CVD method and that the grains have an approximately spherical shape. It may here be noted that according to the description of the application advanced alumina is an α -alumina produced by a CVD (chemical vapour deposition) method (see page 9, lines 7 - 9).

However, from D3 it emerges that these two features are linked since in D3 it is explained that the production of advanced alumina by a CVD method produces an approximately spherical shape (see page 3, 2nd paragraph of the introduction together with page 9, 2nd and 3rd lines from the bottom).

2.2 In the view of Board the problem to be solved is to find suitable alumina abrasive grains for the abrasive pad which would perform well in a CMP (chemical and mechanical polishing) process.

The appellant on the other hand has argued that the correct problem to be solved is to provide an adhesive pad which results in less defects and scratches in the abraded surface whilst maintaining good friction qualities, referring to page 2, lines 14 - 17 of the description of the application.

When assessing the objective problem to be solved it is an essential ingredient that the distinguishing features of the claim actually solve the problem. According to the appellant the selection of spherically shaped α -alumina grains made produced by a CVD method solves this problem (see appeal grounds, page 5, middle paragraph).

In support of its view regarding the objective problem and the presence of an inventive step the appellant referred to a comparative example contained in the application on page 18. The example compares grains produced by one conventional method with grains produced by CVD. According to the constant jurisprudence of the Boards of Appeal, for the purposes

of assessing inventive step a comparison must be made with the nearest prior art, i.e. D1 in the present case (cf. Case Law of the Boards of Appeal 4th edition 2001, I.D.7.7,2). Further, the comparison in the description is only made with one conventional method. The results appear to show an improvement. However, there is nothing to show that the improvement is surprising or even that it is more than the difference which would arise between the uses of two differing conventional methods, so that it is not shown by the comparative example that a problem has been solved.

- 2.3 The solution to the objective problem deduced by the Board is found in D2. D2 discloses that the abrasive grains are made from advanced alumina by a CVD method and the appellant confirmed this in his appeal grounds. With respect to the spherical shape it has already been indicated above that in D3 it is explained that a CVD production method results in an approximately spherical shape. Moreover, in D2 itself it is indicated that the shape of the advanced alumina is "an octa- or higher polyhedral" (page 4, lines 57 - 59) which may be considered to be approximately spherical. D2 refers to the use of the disclosed grains as an abrasive on page 16, line 9 and then emphasises this use in lines 15 to 16.

Given the recommendation in D2 for the use of the disclosed grains as abrasive grains the skilled person would apply its teaching to the disclosure of alumina grains in D1 in order to solve the objective problem and would thus arrive at an abrasive pad in accordance with claim 1 of the application in suit.

With regard to D2 the appellant has argued that the skilled person would not see the teaching of this document as providing a solution to the problem proposed by the appellant. However, as expressed above, the Board considers that it has not been shown that the problem proposed by the appellant is actually solved by the distinguishing features of claim 1.

The appellant has further argued that the use of the grains as an abrasive is only one of many uses mentioned in D2. This argument, however, does not appear to reflect fully the teaching of the document. In the document the use of the grains as an abrasive is the first named use (in line 9 of page 16) and this use is then specifically picked out and defined more narrowly (in lines 15 to 16) as the one for which the grains are particularly suitable. The skilled reader would therefore understand abrasives to be the principal field of application of the teaching of D2.

The appellant has further argued that D1 teaches away from the use of alumina and the spherical shape, cf. pages 3 and 4 of the appeal grounds. The Board cannot understand how D1 can teach away from the use of the specific features which are disclosed therein as useful embodiments of the teaching of the document. The Board therefore does not accept this argument. The appellant pointed out that D1 leaves it open as to whether the spherical shape relates to grains or to agglomerates. This cannot however be construed as a reason not to use a spherical shape. On the contrary, the fact that D1 discloses a spherical shape would mean that the skilled person considering D2 would recognise that the approximately spherical shape disclosed therein is one

which is recommended in D1 and this would give the skilled person an extra incentive to apply the teaching of D2 to D1.

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

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Nachtigall

C. Holtz