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**Datasheet for the decision  
of 23 February 2006**

**Case Number:** T 1164/01 - 3.3.07

**Application Number:** 96941491.1

**Publication Number:** 0865314

**IPC:** B01J 20/28

**Language of the proceedings:** EN

**Title of invention:**

Permeable, shaped structures of active particulate bonded with  
PSA polymer macroparticulate

**Applicant:**

MINNESOTA MINING AND MANUFACTURING COMPANY

**Opponent:**

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**Headword:**

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**Relevant legal provisions:**

EPC Art. 54, 56, 123(2)

EPC R. 67

**Keyword:**

"Novelty (yes) - after amendment"

"Inventive step (yes) - after amendment"

"Reimbursement of appeal fee (no)"

**Decisions cited:**

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**Catchword:**

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Case Number: T 1164/01 - 3.3.07

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.07  
of 23 February 2006

**Appellant:** MINNESOTA MINING AND MANUFACTURING COMPANY  
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**Decision under appeal:** Decision of the Examining Division of the  
European Patent Office posted 7 May 2001  
refusing European application No. 96941491.1  
pursuant to Article 97(1) EPC.

**Composition of the Board:**

**Chairman:** S. Perryman  
**Members:** B. ter Laan  
B. Struif

## Summary of Facts and Submissions

- I. European patent application No. 96 941 491.1, filed on 26 November 1996 as International Application PCT/US96/18938 and published on 12 June 1997 under No. WO97/20628, was refused by a decision of the Examining Division of the European Patent Office dated 7 May 2001.
- II. That decision was based on a set of 23 claims filed on 12 May 1999 as the main request and four further sets of claims filed during the oral proceedings on 25 April 2001 as auxiliary requests 1 to 4.

The independent claims of the main request read:

"1. A permeable, composite structure comprising active particulate bonded to each other with pressure-sensitive adhesive polymer microparticulate."

"19. A method of making the structure of claim 1, which method comprises mixing active particulate with pressure-sensitive adhesive polymer microparticulate and shaping and bonding the resulting mixture of the particulates in the form of the structure."

"22. A method of purifying a fluid containing an undesired component, which method comprises passing the fluid through the structure of claims 1-15."

Claim 1 of the first auxiliary request read:

"1. A permeable, composite structure comprising active particulate bonded to each other by spot bonding or point contact with pressure-sensitive adhesive polymer microparticulate."

Claim 1 of the second auxiliary request read:

"1. A permeable, composite structure comprising a mass or agglomeration of active particulate bonded to each other with pressure-sensitive adhesive polymer microparticulate distributed in the mass of active particulate by spot bonding or point contact."

Claim 1 of the third auxiliary request read:

"1. A permeable, composite structure comprising a mass or agglomeration of active particulate bonded to each other with pressure-sensitive adhesive polymer microparticulate by spot bonding or point contact wherein the adhesive polymer microparticulate is distributed among the active particulate in an amount sufficient to adhere together in a flexible, composite structure."

Claim 1 of the fourth auxiliary request read:

"1. A permeable, composite structure comprising a mass or agglomeration of active particulate bonded to each other with pressure-sensitive adhesive polymer microparticulate by spot bonding or point contact, wherein the adhesive polymer microparticulate is distributed among the active particulate in an amount

sufficient to adhere them together in a flexible, composite structure, and wherein the adhesive polymer microparticulate is 1 to 2000 micrometers in size."

III. The Examining Division held that the subject-matter of the main request did not satisfy the requirements of Articles 54 and 56 EPC and that the auxiliary requests did not comply with Article 56 EPC, in view of the following documents:

D1: US-A-4 411 948

D8: EP-A-0 159 696 (corresponding to US-A-4 664 683)

D9: US-A-5 078 132

In particular, it was found that D1 disclosed the bonding to each other of the active particulate with pressure-sensitive adhesive polymer. D1 did not specify that the pressure-sensitive adhesive was in microparticulate form. Since the claimed subject-matter did not define any size or amounts of the pressure-sensitive adhesive "micro"particles, it was however not possible to distinguish between the structure formed with the pressure-sensitive adhesive polymer of D1 and that being claimed, formed with a particulate. Therefore, the main request lacked novelty.

As to inventive step, the closest document was D8, which had been mentioned in the search report as well as in the description. D8 described self-supporting permeable composite structures comprising active particulate bonded to each other with adhesive polymer microparticulate, as did the application in suit. D8 did not disclose the use of a pressure-sensitive adhesive, which, however, was known from D1. No

inventive skill was needed to replace the heat-sensitive adhesive of D8 by the pressure-sensitive adhesive of D1.

Spot bonding or point contact could not serve to distinguish the claimed structure from those of D8 or D9, since the shape or form of the adhesive polymer microparticulate was not mentioned in the claims and could, according to the description, not be clearly defined. The claimed subject-matter was therefore not inventive.

IV. On 4 July 2001 a Notice of Appeal was lodged against that decision, together with payment of the prescribed fee. The Statement of Grounds of Appeal was filed on 17 September 2001. After a communication from the Board dated 12 January 2006, in which several objections under Articles 123(2), 84, 54 and 56 EPC were raised, the Appellant, by letter dated 9 February 2006, filed a new main request as well as five auxiliary requests, replacing the claims then on file.

At the oral proceedings before the Board, held on 23 February 2006, after further objections by the Board, those claims were again replaced by a new set of 19 claims as the sole request. The independent claims of that request read as follows:

"1. A permeable, self-supporting composite structure comprising a mass or agglomeration of active particulate bonded to each other with pressure-sensitive adhesive polymer microparticulate distributed in the mass of active particulate to adhere them together in a flexible composite structure, wherein the

adhesive polymer microparticulate is smaller in size than the active particulate and wherein the adhesive polymer microparticulate is 1 to less than 2000 micrometers in size."

"15. A method of making the structure of claim 1, which method comprises mixing active particulate with an aqueous dispersion of pressure-sensitive adhesive polymer microparticulate and shaping and bonding the resulting mixture of the particulates in the form of the structure."

"18. A method of purifying a fluid containing an undesired component, which method comprises passing the fluid through the structure of claims 1-11."

Dependent claims 2 to 11 refer to preferred embodiments of the structure according to Claim 1; claims 12 to 14 are directed to articles comprising the structure according to any one of the preceding claims.

V. The Appellant's arguments submitted in writing and during the oral proceedings can be summarised as follows:

(i) Regarding Article 123(2) EPC, the application as originally filed provided an adequate basis for the amendments.

(ii) Regarding Article 84 EPC, the present wording of the claims provided a clear definition of the claimed subject-matter.

(iii) Regarding novelty, the claimed subject-matter involved a novel structure prepared by thoroughly mixing active particles with pressure-sensitive adhesive microparticles so as to obtain a uniform distribution. That mixture, put on a cloth and dried, would give a flexible structure in which the adhesive did not completely cover the active particles. That structure differed from D1 in that it contained two kinds of particles as well as in the way those were bonded together. In D8 and D9 the adhesive used was not pressure-sensitive and the structures were rigid, whereas the claimed structures were flexible, i.e. capable of being bent, rolled up or formed when e.g. applied to the face of the user. Furthermore, in D8, no well-defined adhesive particles were present so that the surface of the active particles was covered by the adhesive.

Hence the claimed subject-matter was novel.

(iv) As regards inventive step, the closest document was D9. The problem solved was to obtain a flexible structure. As neither D9 nor D8 referred to flexible structures, they could not render the claimed structure obvious. D1 did not suggest the use of particulate adhesive so that the skilled person could not gather from D1 the suitability of such particles for the purpose of flexibility.

Hence the claimed structure was inventive.

(v) A reimbursement of the appeal fee was requested since the examining division had based its decision on D8, a document that had been cited for the first time



during the oral proceedings and the Appellant had not had sufficient time to prepare arguments and/or experimental data.

- VI. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 19 submitted at the oral proceedings dated 23 February 2006, and the reimbursement of the appeal fee.

### **Reasons for the Decision**

1. The appeal is admissible.

#### *Amendments*

2. Claim 1 is a combination of original claims 1, 2, 3 and 4 as well as being based on passages appearing on page 3, line 29 to page 4, line 4 (self-supporting, mass or agglomeration, distribution) and page 14, lines 4 to 6 (2000 micrometers).

The amendments in the other claims concern merely the adaptation of references to previous claims except for claim 15, where the addition that an aqueous dispersion of the adhesive should be used, is based on original page 7, line 30 to page 8, line 2.

The requirements of Article 123(2) EPC are therefore fulfilled.

3. The Board has no objections regarding clarity (Article 84 EPC).

*Novelty*

4. D1 discloses an air-cleaning filter element which comprises at least two sheets of three-dimensionally mesh-structured elastic-flexible webs of skeletal structure containing 9 to 31 air spaces per 25 linear mm and having 3 mm to 10 mm thickness as superimposed and activated carbon adsorbent of a grain size of 1 to 5 mm in diameter which is bonded to and between the webs with a pressure-sensitive adhesive, the amount of activated carbon adsorbent deposited being 200 to 2500 g. per m<sup>2</sup> of web (claim 1). It may be prepared by (1) applying a synthetic rubber latex to and between at least two of the said sheets of elastic-flexible webs, (2) disposing between the said webs per m<sup>2</sup> of web 200 to 2500 g. of activated carbon adsorbent of a grain size of 1 to 5 mm diameter and (3) pressing the webs together as superimposed (claim 7). There is no mention of the adhesive being in particulate form, nor of mixing it with the active particles before application to the supporting web sheets, so that no distribution of the adhesive particles within the active particles can occur. Therefore, D1 does not disclose the structure now being claimed.
- 4.1 D8 describes a process for immobilizing adsorbent carbon particles and forming a self-supporting structure of high compressive strength therefrom, thereby substantially eliminating the formation of carbon fines while retaining the adsorption characteristics of the carbon particles, comprising the steps of:

- (a) mixing carbon particles, a major portion of which has particle sizes in the range of from about 200 to about 2,000 microns, with a powdered polymeric binding material, preferably a thermoplastic material having a solid-liquid transition stage, in an amount of about 5 to about 20 percent by weight, based on the weight of the total mixture, a major portion of the particles of the polymeric binding material having particle sizes in the range of about 8 to about 30 microns, to form a mixture of the carbon particles partially coated with the polymeric binding material;
- (b) placing the mixture in a container of a desired shape; and
- (c) applying a pressure of up to about 28 bar while the mixture is at an elevated temperature, this temperature being near the solid-liquid transition stage of the thermoplastic material, thereby forming the structure and immobilizing the particles (claim 1).

The polymeric binding material can be thermoplastic or thermosetting, e.g. a polyolefin, such as, in particular, polyethylene, but many other materials are also mentioned (page 8, line 17 to page 9, line 10), the choice of the material depending on the use. The polymeric binder should be capable of being shaped under process conditions (page 8, lines 3 to 7) chosen such that the material is softened to the extent that no well-defined particles exist which have the physical attributes of a solid, yet the material does not flow as does a liquid. At that temperature the polymeric binding particles which existed at a lower temperature as separate particles merge to form a unitary matrix with increased tackiness (page 12, lines 18 to 31).

Hence, the structure according to D8 relates to a matrix of binder material in which the active particles are embedded. No particulate binding material is present after the formation of the structure. In view of the materials preferred as the binder and the necessity to raise the temperature in order to have the binder work, no pressure-sensitive adhesives as defined in the present application - i.e. a material that is capable of forming a firm bond upon contact under light pressure, e.g. finger pressure, at the temperature of use (e.g. room temperature (23°C)) (page 10, lines 13 to 18) - are disclosed. In addition, the structures according to D8 are rigid, as can be gathered from the passage on page 10, lines 18 to 29), where a suggestion is made how to obtain a "somewhat more flexible structure" and reference is made to a tendency to fracture. Therefore, D8 does not disclose the structure now being claimed.

- 4.2 D9 describes respirators comprising at least one porous filtering structure having a panel-like shape, mounted in the respirator across a path for air to be drawn or blown inwardly through the respirator, the filtering structure having two opposed large-area surfaces with dimensions larger than the structure's thickness, being a unified and impact-resistant structure; said filtering structure comprising spaced individual adsorbent granules bonded to one another by uniformly distributed, adherent binder particles disposed between said granules wherein said binder particles were in a liquefied state during bonding of the structure, and at least 85 weight percent of the binder particles have diameters larger than 400 mesh (claim 1).

For the binder particles thermoplastic or thermosetting materials may be used, but not all such materials are satisfactory (column 4, lines 40 to 44) and an important part of D9 concerns tests to establish if a material is a suitable binder or not.

As specific materials, polyurethane, ethylene-vinyl acetate and polyethylene (claim 9) as well as nylon (examples) are mentioned. From the screening tests for suitability of the binder material and from the examples, in which binding is carried out at about 200°C, it can be concluded that the binder material of D9 is not a pressure-sensitive adhesive, so that for that reason already the claimed subject-matter is novel. Furthermore, the structures described in D9 are rigid and not flexible (examples and figures), so that it must be concluded that D9 does not disclose the structures now being claimed.

- 4.3 In view of the above, the claimed subject-matter is novel.

*Inventive step*

5. The application in suit concerns permeable, shaped structures of active particulate bonded with pressure-sensitive adhesive polymer microparticles.
- 5.1 The closest document is normally the document having the same purpose or effect as the application and addressing the same or a similar problem (Case Law of the Boards of Appeal of the European Patent Office, 4th edition, 2001, I.D.3.1 and 2).

- 5.1.1 According to the appellant, D9 was to be seen as the closest document and the problem solved by the claimed subject-matter vis-à-vis D9 was to obtain a flexible structure. D9 describes a similar structure as now claimed in that the active particles are bonded by adhesive particles distributed in the mass of active particles, but the structures of D9 are rigid and also contain no pressure-sensitive adhesive. The structures of D9 are used in respirators, an application also mentioned in the application in suit (page 4, lines 24 to 29).
- 5.1.2 D1 concerns air-cleaning filter elements comprising flexible sheets in which the adhesive is pressure-sensitive. However, the adhesive is not present in the form of particles but as a coating or layer on the covering sheets, and is therefore not distributed in the mass of active particles. Since the flexibility as well as the presence of a pressure-sensitive adhesive are essential features of the present structure, as can be concluded from the fact that they are part of the claim, D1 rather than D9 would appear to be a more appropriate starting point for assessing the presence of an inventive step.
- 5.2 In view of the structures described in D1, the problem to be solved by the application in suit can only be seen in providing an alternative structure, which problem has been effectively solved.
- 5.3 It remains to be decided whether the claimed subject-matter is obvious having regard to the documents on file.

- 5.3.1 The pressure-sensitive adhesive in the structures according to D1 is used in the form of a coating or layer on sheets to which then active particles are applied. There is no hint to use adhesive particles at all, even less that they should be distributed in the mass of active particles. Therefore, D1 by itself does not render the claimed subject-matter obvious.
- 5.3.2 D8 does not teach the use of adhesive particles, so that document would, in combination with D1, not result in the present structure.
- 5.3.3 D9 teaches the use of adhesive particles, but not of pressure-sensitive adhesive particles. On the basis of the rigorous tests (in particular Test 2: Pick Test; column 5, lines 27 to 53), applied in D9 for establishing the suitability of materials as binder of active particles, it is not evident that pressure-sensitive materials would be suitable for that purpose according to the standards of D9. Therefore, the skilled person would find no incentive in D9 to change the pressure-sensitive adhesive layer of D1 into particles and expect a satisfactory result.
- 5.3.4 For the reasons given above, the subject-matter of claim 1 as well as its dependent claims 2 to 11, is inventive.
- 5.3.5 Claims 12 to 14 are directed to applications of the structures according to claims 1 to 11 so that the arguments given above apply *mutatis mutandis*.

5.3.6 Claims 15 to 19 concern a method of making the structure of claim 1 so that the arguments regarding that claim apply *mutatis mutandis*.

5.4 The claimed subject-matter therefore involves an inventive step.

*Reimbursement of the appeal fee*

6. The examining division had raised novelty objections against the main request which had been the sole request until 15 March 2001, the oral proceedings being held on 25 April 2001, during which yet further requests were filed. Therefore, the need for possible arguments as regards inventive step and for documents to be combined became apparent for the first time only about one month before the oral proceedings.

6.1 In such circumstances it is acceptable that a new document is cited against the new claims. However, the applicant should be given sufficient opportunity to study the document, in this case D8, even if, as here, it had been considered sufficiently relevant by the applicant himself to be mentioned in the description of the application as originally filed. According to the minutes, which have not been contested by the appellant, the oral proceedings had in fact been interrupted to that end but it is not clear for how long. However, again according to the minutes, and as written in the decision, the appellant had asked for the continuation of the procedure in writing in order to prepare comparative tests, not because the time to study D8 had been too short.



In its decision, the examining division had explicitly stated that "even if comparative examples would show a technical effect, the present claims would still lack an inventive step." (page 8, second paragraph).

Therefore, continuing the procedure in writing and giving the appellant the opportunity to file additional examples would not have changed the outcome of the decision.

6.2 In the circumstances the Board considers that the Examination Division had a discretion whether or not to continue the proceedings in writing and afford an opportunity to file experimental evidence. The Examination Division considered all the circumstances and exercised its discretion not to continue the proceedings in writing, as it appeared that the further evidence that might be produced would not affect the outcome on the claims before them. The Board considers this a proper exercise of the Examining Division's discretion, and not involving any procedural violation.

6.3 That the Board has allowed the appeal on rather narrower claims than any before the Examining Division, and without any new experimental evidence, is in no way an indication that the latter committed any procedural violation.

6.4 As for reimbursement of the appeal fee under Rule 67 EPC it is necessary that there has been a substantial procedural violation, and this condition is not met, the request for reimbursement of the appeal fee must be refused.

**Order**

**For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The case is remitted to the examining division with the order to grant a patent on the basis of claims 1 to 19 submitted at the oral proceedings dated 23 February 2006 and a description to be adapted.
3. The request for the reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:

G. Rauh

S. Perryman