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**Datasheet for the decision  
of 7 April 2011**

**Case Number:** T 0403/08 - 3.3.09

**Application Number:** 91905681.2

**Publication Number:** 0594598

**IPC:** B32B 5/16

**Language of the proceedings:** EN

**Title of invention:**

Process for making dry microspheres and microsphere product

**Patentee:**

PIERCE & STEVENS CORP.

**Opponent:**

Akzo Nobel N.V.

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 56

**Relevant legal provisions (EPC 1973):**

-

**Keyword:**

"Inventive step (no)"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0403/08 - 3.3.09

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.09  
of 7 April 2011

**Appellant:** Akzo Nobel N.V.  
(Opponent) Velperweg 76  
NL-6824 BM Arnhem (NL)

**Representative:** Jönsson, Christer  
Akzo Nobel AB  
Legal & IP  
P.O. Box 11500  
S-100 61 Stockholm (SE)

**Respondent:** PIERCE & STEVENS CORP.  
(Patent Proprietor) 710 Ohio Street, P.O. Box 1092  
Buffalo, NY 14240-1092 (US)

**Representative:** Lord, Hilton David  
Marks & Clerk LLP  
90 Long Acre  
London WC2E 9RA (GB)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
2 January 2008 concerning maintenance of  
European patent No. 0594598 in amended form.

**Composition of the Board:**

**Chairman:** W. Sieber  
**Members:** W. Ehrenreich  
K. Garnett

## Summary of Facts and Submissions

- I. Mention of the grant of European patent No. 0 594 598 in respect of European patent application No. 91 905 681.2, filed as International application No. PCT/US91/01177 on 21 February 1991 in the name of Pierce & Stevens Corp., was announced on 5 November 2003 in Bulletin 2003/45.

The patent was granted with 13 claims, claim 1 reading as follows:

"1. A method of making, from a wet cake of unexpanded microspheres, free-flowing dry expanded microspheres with a coating of adherent particulate solid surface barrier coating material thermally bonded to the surface thereof, **characterised in that** drying of the microspheres is conducted as a separate step before expansion, and that the step of drying is conducted in the presence of the barrier coating material, and under conditions of high shear sufficient to eliminate agglomerates in the dried product such that agglomerates constitute less than 1% of the total product."

Independent claim 5 was directed to a further method of making free-flowing dry expanded microspheres.

Independent Claims 9 to 11 related to dry, free-flowing microsphere products, whereby the product of claim 11 was defined in terms of a product-by-process claim.

- II. Notice of opposition against the patent was filed by Akzo Nobel N.V. on 16 July 2004 on the grounds of

Articles 100(a) EPC (lack of novelty and lack of inventive step) and 100(b) EPC.

The opponent *inter alia* cited the following documents:

D1 US-A 4 722 943; and

D2 EP-A 0 348 372.

III. In its decision announced orally on 21 November 2007 and issued in writing on 2 January 2008 the opposition division considered the claims as granted (main request) to be not allowable because, in its view, the subject-matter of independent claim 11 and dependent claim 12 lacked novelty over D1.

The patent was maintained in amended form on the basis of claims 1 to 11 according to auxiliary request 1 filed during the oral proceedings, which corresponded to claims 1 to 10 and 13 as granted, ie granted claims 11 and 12 had been deleted.

In the opposition division's view the process of independent claims 1 and 5 was novel, because neither D1 nor D2 clearly disclosed the use of a high shear or a shear sufficient to eliminate agglomerates during the drying step. The microspheres of independent claims 9 and 10 were considered to be novel, because microsphere particles with a density 0.015 to 0.02 g/cm<sup>3</sup> were disclosed in neither D1 nor in D2.

As to sufficiency of disclosure, the opposition division held that "the Reynolds number [referred to in claims 2 to 4] is not used to characterize the invention since this number is only present in the dependent claims".

IV. Notice of appeal was filed by the opponent (appellant) on 12 February 2008 requesting that the decision under appeal be set aside and that the patent be revoked in its entirety. The prescribed fee was paid on the same day. The statement of grounds of appeal was submitted on 16 April 2008.

The appellant maintained its objection that the method claimed in claims 1 to 8 lacked novelty over D2 and was not based on an inventive step in view of D1 and D2. As regards novelty, it argued in particular that the term "high shear" used in claims 1 and 5 was unclear and could not be taken into account for distinguishing the invention from the prior art. Concerning inventive step, the appellant considered D1 to be the closest prior art. The difference of the claimed method over D1 was seen as being performing the drying and expansion of the microspheres in separated steps. The separation of drying and expansion was, however, taught in D2.

Furthermore, the appellant argued that the product claimed in claims 9 to 11 lacked novelty over D2 (in this context reference was made to experimental report D15 submitted with the statement of grounds of appeal) and was not inventive step over D2 and/or D1. Also, the objection under Article 100(b) EPC was maintained.

V. With its letter dated 12 February 2009 the proprietor (respondent) defended the maintenance of the patent on the basis of the claims as allowed by the opposition division and requested that the appeal be dismissed.

Concerning novelty of the claimed method the respondent argued that D2 did not provide "high shear", but

described a "fluidised bed", which could not be subsumed under the expression "high shear". Because the requirement for "high shear" required in the method of claims 1 and 5 was not provided in either of documents D1 or D2, the claimed method was inventive over a combination of D1 with D2.

Further, the products of claims 9 to 11 were novel and inventive over the cited prior art. As to sufficiency of disclosure the respondent held that claim 1 was sufficient and therefore, the dependent claims must, by definition, also be sufficient.

VI. By the summons dated 14 October 2010 oral proceedings were scheduled for 7 April 2011.

With its letter dated 28 February 2011 the appellant announced that it would not attend the oral proceedings. The request for revocation of the patent was maintained.

In the light of the appellant's decision not to attend the oral proceedings, the respondent gave notice in its letter dated 16 March 2011 that it would also not attend the oral proceedings, but maintained its request for maintenance of the patent as amended during opposition proceedings.

VII. In a communication sent to the parties by fax on 22 March 2011 the board provided its provisional observations on the essential issues of the case. Furthermore, the parties were informed that the date for oral proceedings was not cancelled.

As regards novelty of the process of claims 1 and 5 the board expressed serious doubts as to whether such a process was novel over the disclosure of D1. On the other hand, novelty of the product of independent claims 9 and 10 could not be denied (points I.1 and I.2 of the communication).

The board further noted that neither the claimed process (assuming its novelty were to be acknowledged) nor the product of claims 9 and 10 appeared to involve an inventive step over the disclosure of D1 (points II.1 and II.2 of the communication).

Under point III of the communication the board stated that its considerations were in some respects different from those advanced by the appellant. Each party was thus:

- (a) requested to state whether it still did not wish to attend oral proceedings to discuss the issues in the appeal; and
- (b) given the opportunity to submit comments on the board's observations either in writing or at the oral proceedings.

VIII. In response to the board's communication the appellant confirmed in its letter received 23 March 2011, that it would not attend the oral proceedings. The request for revocation of the patent was maintained.

In a telephone conversation with the registrar of the board on 5 April 2011 the respondent confirmed that it would not attend the oral proceedings. The request to

maintain the patent as amended during opposition proceedings was maintained.

No further written submissions were received from either party.

IX. Oral proceedings took place on 7 April 2011 in the absence of the parties, at the end of which the decision was announced.

### **Reasons for the Decision**

1. The appeal is admissible.
  
2. Claim 1 of the request allowed by the opposition division corresponds to claim 1 as granted and is directed to a method of making, from a wet cake of unexpanded microspheres, free flowing dry expanded microspheres with a coating of adherent particulate solid surface barrier coating material thermally bonded to the surface thereof.  
The method of claim 1 is characterized by the following features:
  - (a) the drying of the microspheres is conducted in a separate step before expansion;
  - (b) the drying step is conducted:
    - (i) in the presence of the barrier coating material;
    - (ii) under conditions of high shear sufficient to eliminate agglomerates in the dried product;
    - (iii) in such a way that agglomerates constitute less than 1% of the total product.



3. The most relevant document with regard to the process of claim 1 is D1, which discloses a method of making, from a wet cake of unexpanded microspheres, free-flowing dry expanded microspheres.

3.1 In a first step, i.e. before expansion, the wet microspheres are dried in the presence of a processing aid which prevents the microspheres from agglomeration in that the processing aid adheres to the surface of the microspheres (D1, column 2, lines 20 to 51 and lines 57 to 63; column 3, lines 34 to 48,; column 4, lines 36 to 41; column 6, lines 32 to 42; column 7, lines 15 to 26). The processing aids are selected from finely divided inorganic or organic particles or fibers (column 6, line 40 to column 7, line 2) and are therefore the same as those used and denoted "surface barrier coating material" in the patent in suit. These measures in D1 correspond to features (a) and (b)(i) of the claimed process.

3.2 According to column 8, lines 23 to 25 of D1, the drying of the microspheres is accomplished with "active mixing" in the presence of the processing aid. This drying operation employs mixing means to distribute the material within the dryer, and to prevent agglomeration of the material (column 8, lines 46 to 48). As regards the shear forces applied, D1 states in column 9, lines 61 to 68:

*"It is the function of the processing aid to prevent the formation of aggregates of the microspheres to the maximum attainable degree. In most drying equipment this particular requirement is facilitated by the use*

*of continuous, often relatively high speed, low shear mixing of the material in the drier. It is worth noting that excessive shear in the mixing operation may result in disrupting the microspheres, and must be avoided".*

In its letter dated 12 February 2009 the respondent argued that, in contrast to D1, the mixing operation in the claimed process is performed under "high shear". The board does not share this view. Claim 1 requires that "*drying is conducted ... under conditions of high shear sufficient to eliminate agglomerates". This measure has to be interpreted in the light of paragraph [0072] of the patent which states:*

*"It will be clear to those of ordinary skill in the art that the term 'high shear' as employed in the present invention is ultimately a functional term, signifying a level at least sufficient to eliminate aggregates in the dried product, and less than the level at which significant disruption of the beads occurs".*

When comparing the above statements of D1 and the patent specification, it is evident that the shear forces applied in the process of D1 and those applied in the process of claim 1 serve the same purpose and are exactly the same.

Step (b)(ii) of claim 1 is therefore also clearly disclosed in D1.

- 3.3 As regards the amount of agglomerates, D1 discloses that the microspheres are "substantially free of undesirable agglomeration" (column 3, lines 44 to 46 ) and to the maximum attainable degree (column 9, lines 61 to 63), respectively. Thus, D1 does not

disclose a specific upper limit for the amount of agglomerates. Consequently, the board can accept that the method of claim 1 is novel over D1 by virtue of feature (b)(iii), in that the rate of agglomeration is less than 1% of the total product.

4. Nevertheless, D1 has to be considered to represent the closest prior art for the assessment of inventive step of the method of claim 1.

The objective technical problem over the closest prior art can only be seen in defining an explicit tolerable upper limit for the amount of agglomerates. However, in the light of the above mentioned disclosure of D1 that the microspheres are substantially free of undesirable agglomeration, nothing inventive can be seen in the definition of the maximum agglomeration rate by a numerical value. Furthermore, the respondent has failed to provide evidence that the specific agglomeration rate of less than 1% required in claim 1 provides any unexpected technical effect. Consequently, the process of claim 1 lacks an inventive step over D1.

5. Since claim 1 is not inventive, the respondent's (sole) request as a whole is not allowable. There is therefore no need to discuss the other claims.

**Order**

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

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar

The Chairman

G. Röhn

W. Sieber