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**Datasheet for the decision  
of 7 December 2021**

**Case Number:** T 2148/18 - 3.4.03

**Application Number:** 06813114.3

**Publication Number:** 2082619

**IPC:** H05B33/04, C09K11/00,  
B32B27/02, H01L51/52

**Language of the proceedings:** EN

**Title of invention:**

NANOPARTICULATE ENCAPSULATION BARRIER STACK

**Applicant:**

Agency for Science, Technology And Research

**Headword:**

**Relevant legal provisions:**

EPC R. 139  
EPC 1973 Art. 56

**Keyword:**

Correction of error - (yes)  
retraction of a withdrawal of the appeal (allowed)  
Inventive step - (yes) - non-obvious modification

**Decisions cited:**

J 0010/87, J 0019/03

**Catchword:**



**Beschwerdekammern**  
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Case Number: T 2148/18 - 3.4.03

**D E C I S I O N**  
**of Technical Board of Appeal 3.4.03**  
**of 7 December 2021**

**Appellant:** Agency for Science, Technology And Research  
(Applicant) 1 Fusionopolis Way  
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Singapore 138632 (SG)

**Representative:** Viering, Jentschura & Partner mbB  
Patent- und Rechtsanwälte  
Hamborner Straße 53  
40472 Düsseldorf (DE)

**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 23 March 2018  
refusing European patent application No.  
06813114.3 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman** T. Häusser  
**Members:** J. Thomas  
T. Bokor

## **Summary of Facts and Submissions**

- I. The appeal is against the decision of the Examining Division refusing European patent application No. 06 813 114 on the grounds that
- none of the main request or the then first to third auxiliary requests were considered to fulfil the requirements of Article 52(1) EPC in combination with Article 56 EPC 1973,
  - the then fourth auxiliary request was found to be contrary to the requirements of Article 123(2) EPC and
  - the then fifth auxiliary request was found to fulfil the requirements of the EPC by the Examining Division, but the applicant did not give its consent to the text proposed for grant in response to a communication pursuant to Rule 71(3) EPC.
- II. With the statement setting out the grounds of appeal the appellant requested that the decision of the Examining Division be set aside and a patent be granted based on the main request or, as an auxiliary measure, based on any one of first to fifth auxiliary requests submitted with the statement setting out the grounds of appeal.  
Further it requested oral proceedings if the main request could not be granted.
- III. The grounds of appeal contained substantive arguments for each of the main request and the first to third auxiliary requests. For the fourth and fifth auxiliary requests the appellant stated that comments were not deemed necessary, given that these had been found allowable by the Examining Division and a communication under Rule 71(3) EPC had also been issued for the

request being identical to the fourth auxiliary request on appeal.

- IV. Summons to oral proceedings before the Board of appeal and a communication under Article 15(1) RPBA 2020 were sent to the appellant. In the latter, the Board informed the appellant that on the whole the decision of the Examining Division was confirmed. In particular, the Board indicated that the subject-matter defined in claim 1 of the fourth auxiliary request (which was - apart from minor formal amendments - identical to claim 1 of the fifth auxiliary request on which the Examining Division's decision was based) involved an inventive step.
- V. On 29 November 2021, the appellant sent a letter wherein it declared the withdrawal of the appeal.
- VI. On the same day, namely on 29 November 2021, the appellant sent a second letter, declaring that the applicant's intention was to get a European patent granted on the basis of the then fourth auxiliary request on file corresponding to the fifth auxiliary request of the Examining Division's decision which the Examining Division proposed for grant according to Rule 71(3) EPC. The first letter including the unconditional withdrawal of the appeal has been erroneously filed and the appellant requested that this first letter be disregarded.
- VII. The Board sent a further communication to the appellant informing that the Board took notice of the two letters of 29 November 2021 containing a withdrawal of the appeal and a subsequent request to disregard the withdrawal and instead to grant a patent on the basis of the request held allowable by the Examining

Division. The oral proceedings were maintained in order to discuss at least the retraction of the withdrawal.

- VIII. Oral proceedings took place before the Board of Appeal at the end of which the appellant requested the following:

Setting aside the decision under appeal and grant of a patent on the basis of the following:

Description: pages 1-32,

Claims: 1-29,

Drawings: sheets 1/9 to 9/9,

all as in the annex to the communication under Rule 71(3) EPC dated 24 October 2017, clean copy.

- IX. The following document is referred to which was also cited by the Examining Division:

D6: US 2006/0232735 A1

- X. Claim 1 of the now sole request on file (the annex to the communication under Rule 71(3) EPC dated 24 October 2017, clean copy) reads as follows:

*An encapsulation barrier stack (100, 140, 160) capable of encapsulating a moisture and/or oxygen sensitive article, comprising:  
a multilayer film (102, 142, 1621, 1622, 212, 222) to be arranged on a substrate (141, 161, 201), said multilayer film (102, 142, 1621, 1622, 212, 222) having at least one barrier layer (103, 143, 163, 203) having low moisture and/or oxygen permeability, and at least one sealing layer (105, 145, 165, 205) arranged to be in contact with a surface of the at least one barrier layer (103, 143, 163, 203), thereby plugging defects (107, 207) present in the barrier layer (103, 143, 163, 203),*

*wherein*  
*the at least one sealing layer (105, 145, 165, 205) comprises reactive nanoparticles distributed therein, the reactive nanoparticles comprising nanoparticles which are capable of interacting by way of chemical reaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects (107, 207) present in the barrier layer (103, 143, 163, 203); wherein the at least one sealing layer (105, 145, 165, 205) is formed by conformal deposition, wherein the reactive nanoparticles present in the at least one sealing layer (105, 145, 165, 205) plug defects (107, 207) present in the at least one barrier layer (103, 143, 163, 203) by at least partially filling the defects;*  
*characterized in that*  
*the reactive nanoparticles further comprise carbon nanotubes*  
*which are capable of interacting by way of physical interaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects (107, 207), and the amount of carbon nanotubes present is about 0.01% to about 10% of the total weight of the reactive nanoparticles present in the sealing layer (105, 145, 165, 205).*

XI. Claim 26 of the now sole request on file (the annex to the communication under Rule 71(3) EPC dated 24 October 2017, clean copy) reads as follows:

*A method for the manufacture of an encapsulation barrier stack (100, 140, 160) according to any of Claims 1 to 19, comprising:*  
*forming at least one barrier layer (103, 143, 163, 203) and at least one sealing layer (105, 145, 165,*

205) on a surface of a substrate for receiving the barrier stack (100, 140, 160),  
wherein  
forming the at least one sealing layer (105, 145, 165, 205) comprises conformal deposition comprising mixing a polymerisable compound with a nanoparticle dispersion to form a sealing mixture, and polymerising the sealing mixture over the at least one barrier layer (103, 143, 163, 203), preferably under vacuum or in an inert gas environment such that the nanoparticles present in the at least one sealing layer (105, 145, 165, 205) plug defects (107, 207) present in the at least one barrier layer (103, 143, 163, 203) by at least partially filling the defects,  
wherein the at least one sealing layer (105, 145, 165, 205) comprises reactive nanoparticles distributed therein, the reactive nanoparticles comprising nanoparticles which are capable of interacting by way of chemical reaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects (107, 207) present in the barrier layer (103, 143, 163, 203), and  
characterized in that  
the reactive nanoparticles further comprises carbon nanotubes  
which are capable of interacting by way of physical interaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects (107, 207), and the amount of carbon nanotubes present is about 0.01% to about 10% of the total weight of the reactive nanoparticles present in the sealing layer (105, 145, 165, 205).



## **Reasons for the Decision**

1. The appeal is admissible
2. **Correction under Rule 139 EPC**
  - 2.1 Circumstances

The appellant filed on 29 November 2021 a first letter stating that they "*herewith withdraw the appeal*" and on the same day a second letter stating that "*the previous unconditional withdrawal of the appeal has been erroneously filed and [they] request that this earlier letter be disregarded*" (bold face and underlining omitted). In the second letter they also requested the maintenance of the already summoned oral proceedings in case that the appellant's request for disregarding the withdrawal was refused.

In response thereto the oral proceedings were maintained.

In a further letter sent in preparation of the oral proceedings and during the oral proceedings the representative explained that due to a misleading formulation of the instructions by the applicant/appellant and the staff of the representative in the Asian office (see the emails submitted with said letter in preparation to the oral proceedings before the Board), he overlooked in relation to the first letter filed on 29 November 2021 that the withdrawal of the appeal did not reflect the correct intention of the applicant. Once the representative realised his personal error, he immediately sent the second letter filed on 29 November 2021 requesting the Board to disregard the first letter and to decide on the correct

request, namely the grant of a patent based on the request for which the Examining Division had sent a communication under Rule 71(3) EPC, the subject-matter of which had also been considered inventive by the Board in its preliminary opinion.

The representative therefore requested correction of the withdrawal under Rule 139(1) EPC.

2.2 Legal provisions and their application in the present case

2.2.1 According to Rule 139 EPC, "*mistakes in any document filed with the European Patent Office may be corrected on request*". Rule 139, second sentence, EPC provides stricter rules for a correction of an error in application documents (description, claims and drawings). From this it follows *a contrario* that less strict conditions apply for other documents, at least to the extent that an error and the only plausible correction of the error need not be immediately recognisable from the document to be corrected. On the other hand, it is clear that the procedural statements of parties cannot be changed at will. In this respect, specifically for the case of erroneous withdrawal of an appeal, reference is made to the *Case Law of the Boards of Appeal*, 9th Edition, 2019, V.A.6.3.8.

2.2.2 The Board considers the relevant events as follows: The representative credibly stated that he had made the mistake himself. The first letter filed on 29 November 2021 had been incorrectly formulated by the representative as it did not represent the true intention of the applicant. It emerges from the submitted documents that the instructions of the appellant were clear insofar as they wanted to return

to the version for which the Examining Division had already sent a communication under Rule 71(3) EPC (see emails submitted in preparation to the oral proceedings before the Board) being in substance the same as the fourth auxiliary request submitted with the statement setting out the grounds of appeal.

- 2.2.3 When allowing the correction of a mistake in a document filed with the European Patent Office according to Rule 139 EPC, the interests of the party concerned and the public or third parties in general must be weighed up against each other. In case J 0010/87, the competent Board dealt with the correction of a withdrawal of a designation of a Contracting State and established preconditions under which a correction of such an erroneously pronounced procedural declaration might be allowed.

These preconditions were considered the following:

- the public had not been officially notified;
- the erroneous withdrawal was due to an excusable oversight;
- the requested correction would not delay the proceedings substantially;
- the interests of third parties who might have taken note of the withdrawal by inspection of the file were adequately protected.

In the present case, the Board considers these four conditions fulfilled:

- at most, the first letter filed on 29 November 2021 had been available for file inspection for a very short time without the second letter filed on the same day being also available in this manner;

- the error was an excusable oversight by the representative as indicated above under section 2.2.2;
- the requested correction would not delay the procedure since the correction concerned the return to the version proposed for grant by the Examining Division which was also positively evaluated by the Board in its preliminary opinion;
- due to the very short time delay between the two letters received on the same day (29 November 2021), the interests of third parties or the public are considered adequately protected.

Even if it cannot be verified whether a third party has inspected the file history and took note of the erroneous withdrawal without taking note of the letter of correction, the probability of such a file inspection is to be considered minimal due to the very short time lapse between the two letters.

Moreover, the Board finds that the very short time between the withdrawal and its retraction not only protects the interests of third parties or the public, but also makes it plausible that the withdrawal was indeed made in error, and was not due to a change of the applicant's intentions.

2.2.4 The Board also considers that the file history corroborates the submission that the applicant himself did not consider the requests found allowable by the Examining Division to be part of its substantive appeal. The filing of the appeal was only necessary for the main and first to third auxiliary requests and the appellant was only formally adversely affected in respect of the fourth and fifth auxiliary requests. The Examining Division failed to grant a patent based on

these requests not because they were unallowable, but merely because of the lacking agreement by the applicant. The lack of agreement on its part was again a procedural necessity in order to be able to file an appeal for the higher ranking requests.

- 2.2.5 Finally, decision J 0019/03 confirmed the principle that a correctable error under Rule 139 EPC (corresponding to Rule 88 EPC 1973) can also relate to a subjective error, i.e. one that is not recognisable from the document to be corrected, but the proper balance between the interests of third parties or the public and the interest of the party must be maintained (Reasons 4. to 7.).

- 2.3 Based on these considerations, the Board allows the correction of the error under Rule 139(1) EPC, i.e. the retraction of the withdrawal of the appeal.

Such a correction has retroactive effect, with the consequence that the document containing the error has to be regarded as if it was filed in the corrected form (*ab initio* effect, as explained in J 0019/03, Reasons 3.). In the present case, the corrected document is directed at the grant of a patent on the basis of those documents which were held allowable by the Examining Division. During the oral proceedings before the Board the appellant clarified that the documents for the grant of the patent are those that formed the annex to the Examining Division's communication under Rule 71(3) EPC dated 24 October 2017.

### 3. **Inventive step**

- 3.1 The Examining Division was of the opinion that the application documents as indicated in its communication

under Rule 71(3) EPC fulfilled the requirements of the EPC, in particular in relation to inventive step. The Board concludes the same as will be indicated in the following.

### 3.2 Closest prior art

Document D6 presents a suitable closest prior art since it deals with an encapsulating barrier stack comprising nanoparticles. Document D6 discloses (in this paragraph, references in parentheses refer to document D6) an encapsulation barrier stack (title) capable of encapsulating an moisture and/or oxygen sensitive article, comprising:

a multilayer film ([0162]) to be arranged on a substrate ([0162]), said multilayer film ([0162], [0163]) having at least one barrier layer ([0162]; [0164] to [0169]) having low moisture and/or oxygen permeability ([0164]), and at least one sealing layer ([0246]) arranged to be in contact with a surface of the at least one barrier layer ([0170], [0171] and [0246]), wherein the at least one sealing layer comprises reactive nanoparticles distributed therein ([0245], [0246]), the reactive nanoparticles comprising nanoparticles ([0245], last two sentences) which are capable of interacting by way of chemical reaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects ([0246]) present in the barrier layer ([0246]); wherein the at least one sealing layer ([0246]) is formed by conformal deposition ([0246], last sentence), wherein the reactive nanoparticles present in the at least one sealing layer plug defects present in the at least one barrier layer by at least partially filling the defects;

~~characterized in that the reactive nanoparticles further comprise carbon nanotubes which are capable of interacting by way of physical interaction with moisture and/or oxygen to retard the permeation of moisture and/or oxygen through the defects, and the amount of carbon nanotubes present is about 0.01% to about 10% of the total weight of the reactive nanoparticles present in the sealing layer.~~

In the above wording of claim 1, the features relating to the plugging of defects are not explicitly disclosed in document D6. However, all features responsible for obtaining this plugging effect are disclosed in document D6. The "plugging of defects" is considered to be a result of the structural features provided in the encapsulation barrier stack, namely the reactive nanoparticles which are comprised in the sealing layer in contact with a surface of the barrier layer. These particles are capable of interacting by way of a chemical reaction with moisture and/or oxygen. Once these structural features are present (sealing layer on top of the barrier layer comprising reactive nanoparticles, the chemical reaction of nanoparticles with water/vapor and the size of the particles in the layer), the plugging of defects is a necessary consequence of these structural features and their specific physical properties. This is therefore a necessarily occurring effect of the composition and arrangement of those structural features defined in claim 1 which are also present in document D6. Hence, the plugging of defects is considered to occur in the barrier stack disclosed in D6 in the same manner as defined in claim 1.

### 3.3 Distinguishing features

The subject-matter defined in claim 1 differs from the teaching of document D6 by providing carbon nanotubes in a defined amount of total weight in the sealing layer.

#### 3.4 Objective technical problem - technical effect

The problem to be solved is the enhancement of the water absorption properties of the barrier stack and in particular the maintenance of the transparency of the sealing layer and therefore also of the transparency of the entire barrier stack. Carbon nanotubes suck water or oxygen molecules in their tubes through their capillary action, which water would otherwise normally reduce the transparency of the layer. Thus, transparency of the corresponding layer is essentially preserved.

#### 3.5 Obviousness

None of the available prior art gives any hint to use carbon nanotubes in such encapsulating barrier stacks. Also, carbon nanotubes are not a standard material used in the field of encapsulated barrier stacks. Therefore, the use of carbon nanotubes is considered inventive in order to enhance the absorption properties of the barrier stack while maintaining its transparency.

Therefore, the subject-matter of claim 1 involves an inventive step.

Independent claim 26 relates to the corresponding method for the manufacture of an encapsulation barrier stack. Hence, the line of arguments concerning inventive step as presented above applies *mutatis*



*mutandis* also to method claim 26, whose subject-matter consequently also involves an inventive step.

Claims 2 to 25 and 27 to 29 involve an inventive step at least due to their dependence on claims 1 and 26, respectively.

3.6 Accordingly, the subject-matter of claims 1 to 29 of the sole request involves an inventive step (Article 52(1) EPC and Article 56 EPC 1973).

4. Conclusion

For the above reasons the Board is of the opinion that the application and the invention to which it relates, in the version according to the appellant's sole request, meet the requirements of the EPC. Hence, a patent is to be granted on the basis of that version (Articles 97(1) and 111(1) EPC 1973).

## 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 in the following version:

Description: pages 1-32  
Claims: 1-29  
Drawings: sheets 1/9 to 9/9,  
all as in the annex to the communication under  
Rule 71(3) EPC dated 24 October 2017, clean copy.

The Registrar:

The Chairman:



S. Sánchez Chiquero

T. Häusser

Decision electronically authenticated