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**Datasheet for the decision  
of 26 July 2011**

**Case Number:** T 0965/09 - 3.3.09

**Application Number:** 01965656.0

**Publication Number:** 1445294

**IPC:** C09J 7/02

**Language of the proceedings:** EN

**Title of invention:**

Novel easily stuck adhesive sheet and its manufacture method

**Patentee:**

Lintec Corporation

**Opponent:**

3M Innovative Properties Company

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 123(2)

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

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**Keyword:**

"Added subject-matter - no"

"Novelty - yes"

"Inventive step - yes"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0965/09 - 3.3.09

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.09  
of 26 July 2011

**Appellant:** 3M Innovative Properties Company  
(Opponent) 3M Center  
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**Representative:** -

**Respondent:** Lintec Corporation  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
13 March 2009 concerning maintenance of  
European patent No. 1445294 in amended form.

**Composition of the Board:**

**Chairman:** W. Sieber  
**Members:** J. Jardón Álvarez  
K. Garnett

## Summary of Facts and Submissions

I. The grant of European patent No. 1 445 294 in respect of European patent application No. 01965656.0, in the name of LINTEC Corporation, which had been filed on 14 September 2001 as international application PCT/JP2001/008003, was announced on 20 July 2005 (Bulletin 2005/29). The granted patent contained three claims reading as follows:

"1. An easily applicable adhesive sheet having, on the surface of a substrate, an adhesive layer in which a plurality of spherical protrusions are disposed and an air flow channel is formed between each of adjacent protrusions, and the spherical protrusion in the adhesive layer has a diameter of from 50 to 300  $\mu\text{m}$ , a height of 10 to 50  $\mu\text{m}$  and the distance between the adjacent protrusions of 0 to 100  $\mu\text{m}$ ."

"2. The easily applicable adhesive sheet according to claim 1, wherein the thickness of the adhesive layer (distance from the surface of the substrate to the top of the spherical protrusion) is from 15 to 100  $\mu\text{m}$ ."

"3. A method for producing an easily applicable adhesive sheet as described in claim 1 or 2, comprising:

forming an adhesive layer on a releasably treated layer of a release liner in which the releasably treated layer having a shape-transfer face on the surface is provided; and  
superposing the substrate on the adhesive layer."

II. A notice of opposition was filed by 3M Innovative Properties Company on 20 April 2006 requesting the revocation of the patent in its entirety on the grounds that the claimed subject-matter was not novel and did not involve an inventive step (Article 100(a) EPC).

The opposition was supported by the following documents:

D1: WO 95/11945 A1;

D2: WO 98/29516 A1;

D3: WO 98/29231 A1;

D4: JP 3-243677 A, and its English translation; and

D5: JP 2503717 Y2, and its English translation.

III. By its interlocutory decision announced orally on 10 December 2008 and issued in writing on 13 March 2009, the opposition division decided that the claims of the proprietor's main request met the requirements of the EPC. The claims allowed by the opposition division were filed with letter dated 1 December 2006. Claim 1 read as follows:

"1. An easily applicable adhesive sheet having, on the surface of a substrate, an adhesive layer, in which a plurality of spherical protrusions with the same diameters and the same heights, respectively, are disposed, with equal distances between the adjacent protrusions arranged symmetrically in six directions and an air flow channel formed between each of adjacent

protrusions, and the spherical protrusions in the adhesive layer having a diameter of from 50 to 300  $\mu\text{m}$ , a height of 10 to 50  $\mu\text{m}$  and a distance between the adjacent protrusions of 0 to 100  $\mu\text{m}$ , and the height is smaller than half of the diameter."

Claims 2 and 3 corresponded to granted claims 2 and 3.

The opposition division considered that the text of the application as filed and the figures supported the amendments introduced into claim 1. In particular, the original disclosure only described protrusions with the same diameters and the same heights, separated by the same distance.

The claimed subject-matter was novel over each of D1 to D4, essentially because multiple selections were necessary in each document in order to arrive at the claimed adhesive sheets.

Finally, the opposition division acknowledged an inventive step because, starting from D5 as closest prior art document, there was no hint in the cited prior art to choose a distance of 0 to 100  $\mu\text{m}$  between the protrusions in order to obtain an improvement in adhesion, air removability and deformation of the substrate surface of the adhesive sheets.

- IV. On 30 April 2009 the opponent (appellant) lodged an appeal against the decision of the opposition division and requested revocation of the patent in its entirety. The appeal fee was paid on the same day.

In the statement of grounds of appeal filed on 22 July 2009, the appellant argued that the amendments made during the opposition proceedings did not fulfil the requirements of Articles 123(2) and 84 EPC. Furthermore, the claimed subject-matter lacked novelty and inventive step.

The appellant also filed a further document in support of its arguments:

D6: US 3,301,741 A.

- V. With its reply dated 3 February 2010 the patent proprietor (respondent) disputed all the arguments submitted by the appellant and requested that the appeal be dismissed.
- VI. On 31 March 2011 the board dispatched a summons to attend oral proceedings. In a communication dated 12 May 2011 the board outlined the points to be discussed during the oral proceedings, which were held on 26 July 2011.
- VII. The arguments presented by the appellant in its written submissions and at the oral proceedings, insofar as they are relevant for the present decision, may be summarised as follows:
- The person skilled in the art could not derive from the application as originally filed that the protrusions provided on the adhesive sheet all had the same diameters and the same heights, and were disposed at equal distances from the adjacent protrusions arranged symmetrically in six

directions. The arrangement now claimed would embrace arrangements, for instance an arrangement based on figure 1(a) of the patent but without the "centre protrusion", a honeycomb lattice or the presence of isolated groups of protrusions, still fulfilling the requirements of the claims and not disclosed in the application as originally filed. Moreover the amendments lacked clarity and were therefore also not allowable under Article 84 EPC.

- In its statement of grounds of appeal the appellant argued that the subject-matter of claim 1 lacked novelty having regard to the disclosures of the documents D1 to D4 and D6, whereas during the oral proceedings it concentrated mainly on D1. In its opinion D1 disclosed specifically all the features of the claimed adhesive sheets. No selection was necessary and even if it were to be argued that a selection took place this selection would not fulfil the novelty criteria for selection inventions.
  
- Concerning inventive step, the disclosure of D5 represented the closest prior art. It would have been obvious for the skilled person to reduce the distance between the adjacent protrusions to the values claimed in order to avoid the formation of air bubbles. A hint to this solution was given in documents D1-D4 and D6, all of them dealing with repositionability and air removal. Furthermore, there was nothing in the prior art that would have discouraged the skilled person from placing the

protrusions closer and thus improving repositionability.

VIII. The arguments of the respondent may be summarized as follows:

- The amendments made to claim 1 were fully supported by the originally filed application. The arrangement now claimed was based in the disclosure of figure 1(a), disclosing an arrangement which was continued over the whole surface of the adhesive layer. The features that the spherical protrusions should have the same diameter and the same height were at least implicitly disclosed in the application. When the values were defined presenting a range, the skilled person would understand that they applied to each single protrusion. If this were not the case the required point-to-point contact would not be achieved.
  
- The claimed subject-matter was novel because the specific arrangement of protrusions was not disclosed in any of the prior art documents. In particular, none of the specifically disclosed arrangements of the prior art showed hexagonal symmetry, as required by claim 1. Furthermore, the size and distance between protrusions were different from the values claimed.
  
- The claimed subject-matter also involved an inventive step. Only the adhesive sheets having the specific features of claim 1 showed the very good adhesion, air removability, deformation on



substrate surface and swelling after heating demonstrated by the examples and comparative examples in the patent specification. None of the documents gave a hint to modify the teaching of D5 so as to reduce the distance between protrusions in order to achieve these improvements.

IX. The appellant (opponent) requested that the decision under appeal be set aside and that the European patent No. 1 445 294 be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed.

### **Reasons for the Decision**

1. The appeal is admissible.

2. *Amendments (Articles 123 and 84 EPC)*

2.1 Claim 1 is directed to an adhesive sheet having an adhesive layer on the surface of a substrate, the adhesive layer having disposed in it a plurality of spherical protrusions in such a way that an air flow channel is formed between each of the adjacent protrusions, the protrusions being characterized by the following features:

(a) they have the same diameters and the same heights, respectively;

- (b) they are disposed with equal distances between the adjacent protrusions (b1) and arranged symmetrically in six directions (b2);
- (c) they have a diameter of from 50 to 300  $\mu\text{m}$ ,
- (d) they have a height of 10 to 50  $\mu\text{m}$ ;
- (e) the distance between adjacent protrusions is of 0 to 100  $\mu\text{m}$ ; and
- (f) the height of each protrusion is smaller than half of its diameter.

2.2 Amended claim 1 is based on claim 1 as originally filed, with the addition of features (a), (b1), (b2) and (f). It was undisputed that feature (f) is supported by the disclosure on page 6, line 8 of the English translation of the application as originally filed (entry into the European phase on 6 March 2004), hereinafter referred as 'the application as filed'.

Concerning feature (a), there is no explicit basis in the application as filed which states that the protrusions have the same diameter and the same height. However, this amendment is supported by the working examples of the application as filed where in table 1 the diameter of the spherical protrusions is respectively indicated to be 100  $\mu\text{m}$  (examples 1, 2, 5 and 6), 50  $\mu\text{m}$  (example 3) and 150  $\mu\text{m}$  (example 4). The indication of only one value for the diameter of the protrusions can in the board's view only mean that all protrusions of a particular example have this diameter, i.e. the same diameter. This view is corroborated by

figures 1(a) and 1(b) showing protrusions all having the same diameter A. Figures 1(a) and 1(b) are explanatory views for the shape and the state of arrangement of a plurality of spherical protrusions disposed on an adhesive sheet according to the invention (paragraph [0010] of the patent specification).

The same is true for the height of the protrusions, which is indicated in table 1 as being 20  $\mu\text{m}$  (examples 1 to 4 and 6) and 15  $\mu\text{m}$  (example 5). In figures 1(a) and 1(b) the protrusions all have the same height B.

Thus, amendment (a) is clearly and unambiguously derivable from the application as originally filed.

2.2.1 This conclusion is not altered by the appellant's argument that the last paragraph on page 3 and the second paragraph on page 6 of the application as filed do not provide a specific disclosure that each of the protrusions provided on one sheet has the same diameter and the same height as all the others.

2.2.2 In fact, it is usually understood that the use of such a range of values indicates that for different embodiments the feature in question has one specific value within the range. The interpretation of the appellant that for a given embodiment several values within the range could be used, although theoretically possible, does not find any support in the application as originally filed. On the contrary, the application as filed indicates on page 9, lines 5 to 9 that "when the adhesive layer is lightly put to the adherent

point-to-point contact are established by the spherical protrusions to the adherent...". Such point-to-point contact is only possible when the protrusions have all the same height.

2.2.3 Concerning the further arguments of the appellant that the method of preparation would result in protrusions having different sizes and that the values in the examples could be seen as "mean values", it is noted that there is no indication in the application supporting this argument. Nor has the appellant provided any evidence in this context. It is the understanding of the board that each example has been carried out so as to produce protrusions with a single value (within ordinary manufacturing limits) and that these values can be obtained. Possible slight deviations from these values when putting the process into practice cannot cast doubt on the principle shown in the examples, namely that for any given layer all protrusions have the same diameter and the same height.

2.3 Concerning the requirement that the distance between the protrusions,  $C$ , is always the same (cf. feature (b1)), the above reasoning equally applies to this amendment, namely that this amendment is also supported by the working examples and figures 1(a) and 1(b).

2.4 Finally, the amendment that "adjacent protrusions (are) arranged symmetrically in six directions" (cf. feature (b2)) is supported by figure 1(a), which is, as set out above, an explanatory view for the state of an arrangement of a plurality of spherical protrusions disposed in an adhesive sheet according to the invention. As already indicated in the appealed

decision (see point II.19) the symmetrical arrangement in six directions can only be seen as one in which the protrusions are arranged on the surface of the adhesive sheet such that, given a first protrusion, six other protrusions are placed around the first one at an angle of  $60^\circ$  relative its neighbour and each is separated from its neighbour and from the centre protrusion by the same distance.

2.4.1 In the board's judgement the only possible meaning of feature (b) is that both requirements, namely "equal distances between the adjacent protrusions" (b1) and "the adjacent protrusions arranged symmetrically in six directions" (b2) apply to every protrusion. In other words, feature (b) means that each protrusion is surrounded by six nearest protrusions at the same identical distance, forming a hexagonal lattice, which is continued over the whole surface of the adhesive layer.

2.4.2 It follows from the above that other arrangements suggested by the appellant as also falling within the scope of the amended claim, such as a honeycomb lattice or one with isolated groups of protrusions, are not covered by the wording of claim 1. These structures do not fulfil the requirement of equal distances between adjacent protrusions arranged symmetrically in six directions.

2.5 For these reasons the board concludes that the amendments do not introduce subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC).

2.6 The amendments made to claim 1 undisputedly limit its scope over granted claim 1. The claim is now limited to protrusions having the same height and the same diameter, wherein the height is smaller than half of the diameter, and being arranged in a specific structure. Consequently, amended claim 1 also fulfils the requirements of Article 123(3) EPC. This conclusion was not disputed by the appellant.

2.7 Finally, the opponent also argued that the language of feature (b) of claim 1 lacked clarity. The board has already explained above under points 2.4.1 and 2.4.2 its view of the only possible meaning for this feature and that there is no room for other interpretations.

Claim 1 also fulfils the requirements of Article 84 EPC.

### 3. *Novelty*

3.1 The novelty of claim 1 has been contested by the appellant in view of the disclosures of documents D1 to D4 and D6.

#### 3.2 Document D1

3.2.1 Document D1 discloses pressure-sensitive adhesive coated articles having microstructured surfaces and methods for its preparation. The performance properties of the adhesives is said to be tailored by varying the microstructure and the rheological properties of the adhesive (abstract).

The microstructured surfaces used in D1 are described on pages 19 to 22 of D1. They include both positive and negative configurations and are described as having:

- a height of 2.5 to 375  $\mu\text{m}$ , preferably of 25 to 250  $\mu\text{m}$  and most preferably of 25 to 125  $\mu\text{m}$  (page 19, lines 8-21);
- a shape which includes hemispheres, prisms, pyramids, ellipses and grooves (page 19, lines 24-27);
- a diameter which may vary from 0.25 to 3750  $\mu\text{m}$ , as calculated by the appellant from the lateral aspect ratio, LAR, disclosed in D1 (page 20, lines 6-18); and
- a distance between the adjacent protrusions which may vary from 0 to 7125  $\mu\text{m}$  as calculated by the appellant from the spacing aspect ratio, SAR, disclosed in D1 (page 20, lines 19-30).

3.2.2 The appellant argued that no selection was required within the teaching of D1 in order to arrive at the claimed subject-matter. Rather the skilled person simply had to take the most preferred ranges from D1 in order to arrive at the combination of ranges recited in claim 1. The skilled person would be directed to these preferred values by example 7 of D1 which disclosed an adhesive sheet with all the dimensions within the ranges of present claim 1.

3.2.3 The board cannot accept this line of argument for the following reasons:

First of all, it is noted that in example 7 of D1 the protrusions do not all have the same diameter as

required by feature (a) of claim 1. They are formed using glass microspheres ranging between about 50 and 80  $\mu\text{m}$ . Moreover they are arranged in an irregular form and not symmetrically in six directions as required by feature (b) (cf. example 3 referred to in example 7 for the structure of the polyethylene liner and figure 6). Thus, the disclosure of example 7 does not anticipate the subject-matter of claim 1 of the patent in suit.

Concerning the general teaching of D1, the claimed subject-matter is a selection of several parameters from the general teaching of D1, that is to say, a multiple selection (see Case Law of the Boards of Appeal of the EPO, 6<sup>th</sup> edition 2010, Chapter I.C.4.2.3). In such a situation the question of novelty cannot be answered by contemplating the ranges of the various parameters separately. This would be an artificial and unjustified approach, since it is the combination of these ranges that forms the subject-matter of claim 1.

In the present case, the particular combination of parameters, which results in a quite narrow subject-matter, is neither explicitly nor implicitly disclosed in D1. A person skilled in the art, when applying the teaching of D1, would therefore not have had any reason to concentrate on the combination of the sub-ranges as defined in claim 1.

### 3.3 Documents D2 to D4 and D6

3.3.1 Documents D2 to D4 and D6 disclose likewise adhesive sheets showing some of the features of claim 1 of the patent as pointed out by the appellant. However, none



- of these documents discloses an adhesive sheet having all the features of the adhesive sheet of claim 1.
- 3.3.2 Thus, in documents D2 (figures 1 and 3) and D3 (figure 3) the protrusions are not arranged in a hexagonal lattice (feature (b)) but in a rhombic lattice with the rows alternating shifted one half spacing (symmetrically staggered rows). Whilst in the arrangement of claim 1 three adjacent protrusions form an equilateral triangle, in the arrangement of D2 and D3 three protrusions form an isosceles triangle.
- 3.3.3 In document D4 no specific arrangement is disclosed and therefore the disclosure of D4 also does not anticipate the subject-matter of claim 1.
- 3.3.4 In document D6 there is no disclosure of feature (f) of claim 1. In the only embodiment in D6, which indicates the dimensions of the protrusions, the height is larger than half of the diameter (column 3, lines 18-21).
- 3.3.5 Moreover, insofar as documents D2 to D4, or D6, disclose some of the dimensions of the claimed spherical protrusions of claim 1, the skilled person can arrive at the values covered by the claim only by a multiple selection within the teaching of these documents. Such a multiple selection is a further distinguishing feature of the claimed subject-matter as explained in detail above for document D1 (see point 3.2.3).
- 3.3.6 For these reasons, none of documents D2 to D4 or D6 anticipates the subject-matter of claim 1.

4. *Inventive step*

- 4.1 The present invention relates to an easily applicable adhesive sheet and a method for producing the same. A similar adhesive sheet is already known from document D5. The decision under appeal and both parties accept that this document represents the closest state of the art and the board sees no reason to depart from this finding.
- 4.2 Document D5, which is acknowledged in paragraph [0005] of the patent specification, discloses pressure-sensitive adhesive sheets comprising an adhesive layer having multiple protrusions with a height in a range of 3 to 50  $\mu\text{m}$  ([0007]). These adhesive sheets are repositionable and do not cause "blisters" upon application because the large gaps between the protrusions allow the air to be transported to the outside ([0008], [0058] and [0059]). The protrusions in D5 are arranged in a scattered ([0007]) or in a staggered manner ([0041]). In the examples, protrusions with a diameter of 300  $\mu\text{m}$  and a height of 20  $\mu\text{m}$  are placed at a distance of 1000  $\mu\text{m}$  ([0044], [0047], [0051] and [0054]).
- 4.3 Having regard to this prior art the technical problem underlying the present invention is said to be in the provision of adhesive sheets having improved properties with regard to their application (paragraph [0006] of the patent specification). In particular, it is stated in paragraph [0007] that the invention aims to provide adhesive sheets that can be applied easily and neatly with good adhesion, can easily expel air at the time of application to an adherent, can be positioned upon re-

applying and do not worsen the appearance of the adhesive sheet after application.

4.4 As a solution to this problem the patent in suit proposes the adhesive sheet of claim 1 which is characterised by the distance between the protrusions (in the range of from 0 to 100  $\mu\text{m}$ , i.e. feature (e)) in combination with further parameters.

4.5 The examples and comparative examples in the specification show that this problem has been credibly solved by the claimed adhesive sheets. The adhesive sheets of examples 1 to 6 having the combination of features of the claim show improved properties over closely related sheets having values outside the claimed ranges. Thus, in the adhesive sheet of comparative example 4, which has a distance between the protrusions of 150  $\mu\text{m}$  (i.e. above the limit of 100  $\mu\text{m}$  in claim 1), the air cannot be removed effectively and dents are formed in the surface of the adhesive sheet. In a similar way, poorer results are obtained when the diameter or the height is outside the claimed values (comparative examples 2 and 3 and paragraph [0016]).

Furthermore, it is stated in paragraph [0017] of the patent in suit that when the distance between the protrusions exceeds 100  $\mu\text{m}$ , air bubbles are formed and air cannot be removed effectively after applying the adhesive sheet to the adherent, and dents are formed in the surface of the substrate after applying the adhesive sheet to the adherent such as to worsen the appearance.

This finding was not challenged by the appellant.

4.6 It remains to be decided whether, in view of the available prior art documents, it would have been obvious for the skilled person to solve the technical problem identified above by the means claimed, namely by using protrusions having a distance between adjacent protrusions between 0 and 100  $\mu\text{m}$  together with the other features of the claim, namely the hexagonal arrangement of the protrusions and specific values for the diameter and height.

4.6.1 There is no hint to this solution in document D5 itself as the only value disclosed therein for the distance between the protrusions is the above mentioned value of 1000  $\mu\text{m}$ .

4.6.2 There is also no pointer to the claimed combination of features in the other documents in the proceedings.

In particular in relation to document D1, on which the appellant mainly relied, the fact that the ranges of parameters now claimed are encompassed totally or in part by the ranges disclosed in D1 does not mean that it would have been obvious for the skilled person to combine them purposively with the aim of solving the existing technical problem. This combination is, in the board's judgement, not simply the result of an optimisation within the ordinary competence of the skilled person since in D1 the problem of air removal is neither addressed nor is it foreshadowed that the particular set of parameter ranges defining the present adhesive sheets would provide the desired solution.

The board can also not accept the argument of the appellant that the skilled person would be directed to the claimed selection of parameters by the fact that document D1 deals with the problem of repositionability of the adhesive sheets. It is correct that D1 deals with repositionability and that it embraces in part the features now claimed. However, the teaching of D1 also embraces values for the parameters which fall outside the ranges required in claim 1 and yield, as demonstrated in the comparative examples of the patent in suit, bad results. A pointer to the selected ranges in order to improve the properties of the adhesive sheets cannot be found in D1.

- 4.6.3 The same considerations apply *mutatis mutandis* for the other documents cited by the appellant.

Thus, D2 and D3 disclose that the percentage area of the protrusions influences the repositionability but actually they recommend as preferred value a low percentage area of protrusion (see D2, page, 10, lines 23-27; D3, page 9, lines 1-5). Thus D2 and D3 actually teach away of the subject-matter of claim 1 of the patent.

In D4 reference is made to the density of the protrusions in the adhesive sheet, which can vary from 100 to 1000000 pieces/cm<sup>2</sup> (page 5, line 10). However, D4 does not indicate how this parameter correlates with (improved) air removal.

Finally D6 indicates that the dimensions of the protrusions may be widely varied (see column 3,

lines 53-54) but gives no hint to the specific values now claimed.

4.6.4 Also the appellant's argument that there is nothing in the prior art that would stop the skilled person of providing an adhesive sheet as now claimed cannot bring into question the inventiveness of the claimed subject-matter. The question to be answered is not whether something would have stopped the skilled person from providing an adhesive sheet, but rather whether there are indications in the prior art which would lead the skilled person to the claimed features in order to solve the technical problem underlying the patent. The mere assumption that the person skilled would do so without providing any incentive thereto appears to be based on hindsight.

4.7 It follows from the above that the subject-matter of claim 1 and by the same token the subject-matter of dependent claim 2, and claim 3, which relates to a method for producing the adhesive sheets of claims 1 or 2, involves an inventive step within the meaning of Article 56 EPC.

**Order**

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

The appeal is dismissed.

The Registrar

The Chairman

G. Röhn

W. Sieber