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European Patent
Office

Boards of Appeal

Office européen
des brevets

Chambres de recours

Case Number : T 168/84



D E C I S I O N of 20 October 1987 correcting
errors in the decision of the Technical Board of Appeal 3.4.1
of 17 September 1987

Appellant : Minnesota Mining & Manufacturing Company
3M Center, P.O. Box 33427
US - St. Paul, MN55133

Representative : P. Madgwick c/o Ladas & Parry
Isartorplatz 5
D - 8000 München 2

Decision under appeal : Decision of Examining Division 042
of the European Patent Office
dated 15 December 1983 refusing
European patent application
No. 80 901 821.1 pursuant to Article
97(1) EPC

Composition of the Board :

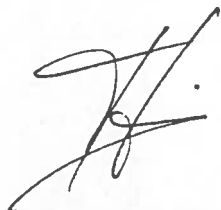
Chairman : E. Turrini
Member : J. Van Voorthuizen
Member : P. Ford

In application of Rule 89 EPC the Decision given on 17 September 1987 is hereby ordered to be corrected as follows:

On page 10 after 2.2. replace

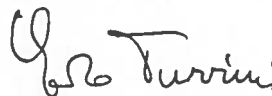
"Claims: 1 to 5, as filed on 1 July 1987." by "Claims: 1 to 6, as filed on 1 July 1987."

The Registrar:



F. Klein

The Chairman:



E. Turrini

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non



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Aktenzeichen / Case Number / N° du recours : T 168/84

Anmeldenummer / Filing No / N° de la demande : 80 901 821.1

Veröffentlichungs-Nr. / Publication No / N° de la publication : WO 81/00770

Bezeichnung der Erfindung: Sheeting useful as a projection screen

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : G03B21/60

ENTSCHEIDUNG / DECISION

vom / of / du 17 September 1987

Anmelder / Applicant / Demandeur : Minnesota Mining & Manufacturing Company

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

Article 56 EPC

EPÜ / EPC / CBE

Kennwort / Keyword / Mot clé :

"Inventive step (Yes);
independent embodiments in one prior art
document"

Leitsatz / Headnote / Sommaire

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Summary of Facts and Submissions

- I. International patent application PCT/US80/00974, filed on 30 July 1980 (International publication number WO 81/00770), was refused by decision of the Examining Division 042 of the European Patent Office dated 15 December 1983. The invention relates to a sheeting useful as a projection screen.
- II. The decision under appeal was based on Claim 1 as presented during the oral proceedings of 15 December 1983 and on Claims 2 to 8 as originally filed.
- III. The reason given for the refusal was that in view of the prior art document US-A-4 089 587 (D1) the subject-matter of Claim 1 did not involve an inventive step within the meaning of Article 56 EPC and the claim was thus not allowable under Article 52(1) EPC.
- IV. On 24 April 1984, an appeal was lodged against the decision and the appeal fee paid. The appellant subsequently submitted on 22 June 1984 the Statement of Grounds, together with a new Claim 1.
- V. The appellant requested that the impugned decision be cancelled. He argued that the sheeting, useful as a projection screen, as defined in Claim 1, cannot be deduced from document D1 in view of the fact that the images on a screen utilising sheeting of the invention can be satisfactorily watched by widely spread audiences, while the screens of D1 allow a very narrow viewing angle. This is due to structural differences between the sheeting of Claim 1 and that proposed in D1, i.e. the differences in shape and distribution of the recesses and projections on the front and back surfaces of the sheeting.

VI. Following a communication on behalf of the Board of Appeal dated 6 October 1986, the appellant filed, on 14 April 1987, a letter requesting that the decision of the Examining Division be set aside and a European patent granted on the basis of a new set of Claims 1 to 6 filed with this letter. Claim 1 was slightly modified in order to make it consistent with the description and refiled on 1 July 1987.

VII. Current Claim 1 reads as follows:

"Sheeting useful as a projection screen comprising a film (14) configured on its front surface (15) and back surface (16) with random patterns of generally parallel elongate microscopic recesses (17') or projections (17'') and coated on its back surface with a specularly reflective layer (18); characterised in that

(a) the film is transparent; and

(b) the recesses (17') or projections (17'') on the back surface (16) are a replicate of the surface formed by stretching a foamed polymeric sheet, the ratio of the number of peaks per unit length in the transverse direction to the number of peaks in the longitudinal direction being of the order of 25:1 or less; and

(c) the recesses or projections on the front surface are elongate lenticular recesses or projections."

Claims 2 to 5 are dependent on Claim 1.

Current Claim 6 reads as follows:

"A projection screen comprising sheeting of any preceding claim adhered to a rigid substrate."

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. There is no objection to the current set of claims or description as far as Article 123(2) EPC is concerned, since both are adequately supported by the original disclosure. In particular, the feature (b) of Claim 1 obviously implies that the recesses and projections are concave or convex in both their longitudinal and transverse directions, due to the fact that a stretched foam has such a feature.
3. Novelty
 - 3.1 Document D1 describes two independent embodiments concerning a sheeting useful as a projection screen.

In the first embodiment (Figures 2 and 3 and corresponding description) the sheeting comprises a transparent film (18) configured on its front or on its front and back surfaces with recesses or projections. These may be assumed to be microscopic, as would appear to be required to avoid grain in the projected image. It is also assumed that the recesses or projections are random, due to the fact that the surface may be produced by brushing (column 4, lines 54 and 59). Only one of the two surfaces has generally parallel elongate recesses or projections as shown in both alternatives of Figure 3A and 3B respectively. In the alternative of Figure 3A, the elongate recesses or projections are on the front surface and they can be lenticular (column 4, lines 47 and 48). In the alternative of Figure 3B the elongate recesses

or projections are on the back surface, while the other surface is matt. In both alternatives the sheeting is coated on its back surface with a specularly reflective layer (20).

D1 does not even hint at a combination of the two alternatives of Figures 3A and 3B respectively, so that they have to be considered separately.

Contrary to the subject-matter of Claim 1, D1 does not mention in the first embodiment, that both front and back surfaces present generally parallel elongate microscopic recesses or projections, nor the feature (b) of Claim 1.

In the second embodiment (Figures 4 to 7 and corresponding description), contrary to the subject-matter of Claim 1, there is no transparent film, features (b) and (c) of Claim 1 are only partially present and the specularly reflective layer is located on the front surface of the film so that the film has merely the function of a supporting surface for the reflective layer.

The reflective layer is sufficiently thin so as to retain the texture of the supporting surface. Said reflective layer is therefore configured with random patterns of generally parallel elongate microscopic recesses or projections which are a replicate of the film surface which may be formed by stretching an (unfoamed) polymeric sheet (column 5, lines 7 to 42, where Mylar is a tradename for a polymeric film). In this case the "random patterns" characteristic follows directly from the "stretching a polymeric sheet" characteristic.

3.2 The sheeting useful as a projection screen disclosed in US-A-4 025 160 (D2) (Figure 7; column 6, lines 5 to 34), corresponds to the preamble of Claim 1, i.e. it comprises a film (61) configured on its front surface and back surface with random patterns of generally parallel elongate microscopic recesses or projections and coated on its back surface with a specularly reflective layer (62).

The features of (a), (b) and (c) of the characterising portion of Claim 1 are not mentioned in said document. In particular, the film of D2 is translucent and not transparent.

The embodiment of D2 related to Figure 2, which is independent from that of Figure 7, is similar to and comprises only some of the features of the first embodiment, second alternative of D1, and has, therefore, not been considered.

3.3 US-A-2 480 031 (D3) (Figures 1, 3 and 7 and the corresponding description) describes a projection screen comprising a transparent film 10 configured on its front and back surface with random patterns of generally parallel elongate microscopic recesses or projections. The recesses or projections on the front surface (Figures 3 and 7) are elongate lenticular recesses or projections. The ratio of the number of peaks in the transverse direction to the number of peaks in the longitudinal direction is not given.

Contrary to the subject-matter of Claim 1, D3 refers to a rear projection screen so that there is no specularly reflective layer and the feature concerning the stretched foamed polymeric sheet is not present.

- 3.4 The sheeting disclosed in DE-C-2 655 527 (D4) (Figure 6 and corresponding description; column 5, second paragraph) comprises the features of the sheeting of the second embodiment mentioned in D1 and also the features that polymeric sheet is foamed and said recesses or projections on the front surface are elongate lenticular recesses or projections (Figure 6).
- 3.5 The other cited documents of the prior art are not relevant with respect to the present invention.
- 3.6 For the above reasons the subject-matter of Claim 1, of the dependent Claims 2 to 5 and of Claim 6, which relates to a projection screen comprising the sheeting of any one of the preceding claims, is deemed to be novel within the meaning of Article 54 EPC.
4. Inventive step.
- 4.1 Claim 1 is based, as before outlined, on D2, which is, in the Board's opinion, the nearest prior art. Starting from the disclosure of this document, the problem to be solved is to obtain a good uniformity of the brightness of the reflected images across a widely distributed audience in the horizontal and, to a minor extent, in the vertical direction. (The sheeting of D2 provides a wide horizontal angle as outlined in column 2, line 32, but good uniformity is not mentioned and indeed the brushed surfaces presumably give poor results as far as the uniformity is concerned, similar to those obtained for the first embodiment of D1 which has brushed surfaces as mentioned on page 2, paragraph 3 of the application in suit).

4.2 The identification of the problem is per se not inventive, since a skilled man in the art would, as a matter of course, try to achieve a good uniformity in brightness, in order to offer high quality images to any members of the audience.

4.3 As far as the solution to this problem is concerned, the skilled man would look at prior art sheeting and he would indeed be expected to consider documents D1 and D4.

(Document D3 does not bring anything relevant with respect to documents D1, D2 and D4).

It can be argued that he could theoretically combine, e.g. the teaching of D2 disclosing the features of the preamble of Claim 1, with the teaching of D1, first embodiment, second alternative suggesting the utilisation of a transparent film and the teaching of D4 disclosing feature (c). He would then still have to apply the teaching of D4 concerning the stretched foamed polymeric sheet to the realisation of the back film surface and he would have to add the feature of Claim 1 concerning the ratio of the number of peaks, a feature which is not disclosed in any of the cited prior art documents. He would thus obtain the subject-matter of Claim 1. Or, it can be argued, he could theoretically combine the teaching of D2 with the teaching of D1, first embodiment, first alternative, the latter disclosing features (a) and (c) of Claim 1. He would then have to apply the teaching of D4 concerning the stretched polymeric sheet to the realisation of the back film surface and would have to add the feature of Claim 1 concerning the ratio of the number of peaks. Thus, he would also obtain the subject-matter of Claim 1.

However, the question must be considered whether in the present case the skilled man would indeed recognise the value of combining isolated features from at least three documents out of a multiplicity of documents reflecting work done during a long period to improve projection sheeting in various respects. In the absence of any hint in D1, D2, D3 and D4 that by a combination of certain specific features a satisfactory solution would be found to the problem which the Appellant set out to solve, the Board is of the opinion that this question has to be answered in the negative.

- 4.4 The other cited documents of the prior art are not relevant in judging the inventive step.
- 4.5 In the decision of refusal, the Examining Division argues against the presence of an inventive step that the combination of the features of the two embodiments of D1 renders the subject-matter of Claim 1 obvious, taking also into account the fact that there is no difference between the performance of a matt and a lenticular surface.

The Board of Appeal agrees with the appellant that there is no reason for the skilled man to combine the features of the two embodiments of D1, because they are in a different context. Indeed, the first embodiment, which comprises a transparent film with front and back surfaces, aims to provide a sheeting with proper directional characteristics (column 2, lines 35 and 36), while the second embodiment has no transparent film so that only the front surface is considered. Moreover, said second embodiment has a different aim, namely to considerably increase the gain in brightness.

The Board of Appeal also agrees with the appellant that a substantial difference exists between the performance of a matt surface and a lenticular surface. While in a matt surface the light is transmitted randomly without preferential direction, in a lenticular surface, e.g. with elongate recesses or projections in the vertical direction, the light is spread preferentially in the horizontal plane as also outlined in D2, column 2, lines 7 to 9.

4.6 Thus, the subject-matter of Claim 1 is considered to involve an inventive step within the meaning of Article 56 EPC and Claim 1 is, therefore, allowable under Article 52(1) EPC.

4.7 Claims 2 to 5, depending on Claim 1, correspond to particular embodiments of the invention. Claim 6 refers to the sheeting of one of the preceding claims. They are, therefore, also allowable under Article 52(1) EPC.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a European patent on the basis of the following documents:

2.1 Description:

- pages 1, 6 to 8, 12 and 14 as originally filed;
- pages 2, 3, 5 and 9, filed on 14 April 1987;
- pages 4, 10, 11 and 13, as filed on 1 July 1987.

2.2 Claims: 1 to ~~X~~⁶ as filed on 1 July 1987.

2.3 Drawing: Figures 1 to 3 as originally filed.

The Registrar

The Chairman

F.Klein

E.Turrini