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Bezeichnung der Erfindung: Method of producing a radiographic film package
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : G03C 3/00

ENTSCHEIDUNG / DECISION

vom / of / du 26 September 1990

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /
Titulaire du brevet : Agfa-Gevaert naamloze vennootschap

Einsprechender / Opponent / Opposant : Du Pont de Nemours (Deutschland) GmbH

Stichwort / Headword / Référence : NDT film pack/Agfa-Gevaert

EPÜ / EPC / CBE Article 56

Schlagwort / Keyword / Mot clé : "Inventive step (yes)" - "ex post facto analysis"

Leitsatz / Headnote / Sommaire

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Case Number : T 126/88 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 26 September 1990

Appellant : (Opponent)
Du Pont de Nemours (Deutschland) GmbH
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Respondent : (Proprietor of the patent)
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Decision under appeal :
Decision of the Opposition Division of the European Patent Office dated 26 January 1988 rejecting the opposition filed against European patent No. 0 037 594 pursuant to Article 102(2) EPC

Composition of the Board :

Chairman : K.J.A. Jahn
Members : R. Spangenberg
J. Stephens-Ofner

Summary of Facts and Submissions

I. The grant of European patent No. 0 037 594 in respect of European patent application 81 200 182.4 filed on 17 February 1981 and claiming priority of 25 March 1980 of an earlier application in the Federal Republic of Germany was announced on 28 August 1985 (Bulletin 85/35) on the basis of two claims. The only independent Claim 1 reads as follows:

"Method for producing an air-tight, evacuated radiographic film package for non-destructive testing, comprising a radiographic film in contact on at least one side with a foil of lead or of a lead alloy, comprising the steps of producing a laminated wrapper with a layer of a heat-sealable light-tight thermoplastic, a layer of transparent polymer, and an intermediate layer of aluminium, wrapping said film and said foil in said laminated wrapper, the layer of heat-sealable light-tight thermoplastic facing inwardly, evacuating the film package thus formed and heat-sealing the package while under vacuum, characterised by the step of forming the intermediate layer of aluminium by vacuum deposition of aluminium upon said layer of transparent polymer, the said transparent polymer being polyethylene terephthalate."

II. A notice of opposition was filed by the Appellant on 22 April 1986, requesting revocation of the patent in suit in its entirety on the grounds of lack of novelty and lack of inventive step. From the documents cited in support of this request the following were the most important:

(3) Brochure from the firm of Fanocel (Rhone-Poulenc) with a data sheet bearing the date of March 1978

(5a,b) X-ray film packages designated DELPACK.

During the opposition proceedings, the patent proprietor cited inter alia

(8) DE-U-7 902 283

and the Opponent further referred to

(10) DE-A-2 420 070 and

(11) RESEARCH DISCLOSURE, September 1973, pages 51 to 53, Industrial Opportunities Ltd., Disclosure No. 11339, Havant, GB, K. AVOGADRI: "Radiograhic Film Pack"

III. By a decision dated 26 January 1988 the Opposition Division rejected the opposition, excluding documents (10) and (11) from the proceedings under Article 114(2) EPC and finding that document (8) represented the closest state of the art. The technical problem underlying the patent in suit was seen in improving the durability of a film package comprising a radiographic film and a lead or a lead alloy intensifying screen in a wrapper of polyethyleneterephthalate (PET), without impairing the other useful properties of such a film pack, e.g. light-tightness, and the possibility of its being strongly bent without the loss of an even, fault-free contact between the X-ray film and the intensifying screen.

The solution of this problem by the method of Claim 1 was held unobvious, since a person skilled in the art, while he might have considered using aluminium-coated PET for the wrapper in order to improve the gas tightness, would not have considered replacing the lead-containing layer of the wrapper disclosed in document (8) by a separate

intensifying screen because he would have learnt from that document that this would lead to an increase of undesirable buckling when the film pack was bent.

IV. On 22 March 1988 the Appellant (the Opponent) gave notice of appeal against this decision and paid the prescribed fee. A Statement of Grounds was received on 25 May 1988. Oral proceedings took place on 26 September 1990.

According to the Appellant, an air-tight, evacuated radiographic film pack for non-destructive testing (NDT film pack), comprising a radiographic film in contact with a foil of lead contained in a wrapper made of a transparent polymer, an intermediate layer of aluminium and a heat-sealable light-tight thermoplastic polymer on the inner surface was already known, since this was acknowledged by the wording of the precharacterising part of Claim 1 of the patent in suit. The only new element was the use of PET as the transparent polymer and the formation of the intermediate layer of aluminium by vacuum deposition upon that layer of transparent polymer. PET sheets with a layer of aluminium deposited upon them by vacuum deposition, were however, known from document (3) as packaging materials with wide applicability, particularly if gas- and light-tightness were required. These materials were also known to be suitable for the manufacture of improved evacuated film-packages, such as the Kodak "DELPACK" films, see exhibits (5a) and (5b). These packages were indeed evacuated, according to a letter from the manufacturer submitted during the oral proceedings. Thus it would have been obvious to replace the aluminium containing wrappers known for packaging radiographic films for medical use by the coated PET film known from document (3).

He further argued, that since it was shown by document (10) that the manufacture of both kinds of radiographic film-packs belonged to the same field of technology, it would also have been obvious to replace the radiographic film for medical purposes by a film suitable for non-destructive testing, which would inevitably have led to the use of lead foils as intensifying screens. Thus, even if it were admitted that document (8) represented the closest state of the art, the claimed method would have been obvious. If the method according to that document would have been found unsatisfactory because the product so obtained had insufficient vacuum-tightness, it would have been logical to abandon the concept of laminating the lead foils on the inner surface of the wrapper, and to go back to the old concept of document (11), providing separate lead foils in an evacuated heat-sealed wrapper. This was especially so because document (8) already stated that the decisive requirement for avoiding undesirable buckling of the film pack was merely the evacuation of the film-pack. Thus the only remaining technical problem was to find the most suitable material for the wrapper and in this respect the skilled person would inevitably have considered the materials of document (3).

V. The Respondent (the patent proprietor) emphasised that the known film packages (5a) and (5b) were not comparable with the NDT film packs obtainable by the method of the patent in suit. These packages were daylight loading packages containing a plurality of sheet films which were not X-ray films. In the camera, the packages were ruptured before exposing the film to radiation, hence the wrapper of these packages served quite a different purpose, for which the problem of buckling was of no importance. If these packages were evacuated, the vacuum could only have been weak as a consequence of the specific design and purpose of these film packages. In this respect, reference was

made to

(12) US-A-4 158 409

cited in the search report. He also contested that a person skilled in the art faced with the problem of improving the flexibility of NDT film packs would find in the technical field of X-ray films for medical use any suggestion as to how to solve this specific problem. In addition, the relevant prior art methods for manufacturing NDT film packs could not suggest the method according to the patent in suit. As it could be seen from document (8), representing the most recent development in this technical field, it was previously thought necessary to deviate from the known design of conventional NDT film packs, to make the lead intensifying screen directly part of the outer wrapping thereby reducing the number of separate layers in the package from 5 to 3, and to maintain a vacuum within the film pack which was strong enough to prevent any movement of the film sheet and the wrapper relative to one another.

It was demonstrated during the oral proceedings that a film pack made according to the patent in suit can be bent without buckling. However, if the vacuum is removed by opening one edge of the film pack, buckling occurs immediately. Such an unevacuated film pack was similar to a film pack according to document (10), thus it was not possible to avoid buckling with a film pack according to that document. In document (11) it was in principle proposed to reduce the buckling by providing for a limited freedom of movement of the lead foils relative to the film sheet. For this purpose, the presence of a predetermined volume of air was necessary, i.e. the vacuum could not have been strong. In contrast to this, according to the patent in suit it was recognised for the first time that the flexibility of the known film packs comprising

separate lead foils could be improved by the application of vacuum which is strong enough to prevent any movement between the separate sheets of the film pack. This concept could be derived from document (8) only with the benefit of hindsight.

VI. The Appellant requests that the decision under appeal be set aside and the patent revoked.

The Respondent requests that the appeal be dismissed.

At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

1. The appeal complies with the requirements of Articles 106 to 108 EPC as well as Rule 64 and is, therefore, admissible.

2. Documents (10) and (11), submitted late, i.e. after expiry of the opposition period, are nonetheless admitted to the appeal proceedings, since they are considered to represent important steps in the development of NDT film packs and are therefore relevant to the question of patentability. On the other hand, the Board could not find the question whether or not the known "DELPACK" film packages are evacuated, relevant to the issues to be decided here. Consequently, the evidence submitted in this respect by both parties during the appeal proceedings is disregarded (Article 114(2) EPC).

3. Novelty:

The Board is satisfied that the subject-matter of the present claims is novel, and since this issue was not

contested during the appeal proceedings there is no need to give detailed reasons for his finding.

4. Inventive step:

4.1 The patent in suit relates to a so-called NDT film pack. Contrary to what may be inferred from the preamble of Claim 1, the documents cited in the patent specification, column 1, lines 27 to 33, do not relate to such film packs but to those for medical purposes. The handling requirements, especially with respect to flexibility in this technical field are, however, quite different. Thus these documents do not qualify as closest state of the art. Contrary to the Appellant's submission, in the Board's judgment the state of the art has to be assessed in an objective manner. Thus, it is not decisive what might have been "acknowledged" in the patent in suit as being the content of a particular document : what is decisive is what is in fact disclosed in that document. Among the documents cited during the opposition proceedings, only (8), (10) and (11) relate to NDT film packs.

Document (10) is concerned with the problem of testing larger areas of pipelines which require the application of several windings in exact edge-to-edge position (see the paragraphs bridging pages 2 and 3 and 5 and 6). For this purpose, a film pack is proposed which contains separate intensifying screens and a radiographic film in a wrapper of light-tight, thermoplastic material which is tightly welded around the film and the screens, thus providing for a reproducible position of the film within the wrapper (Claims 1, 2 and the description relating to Figures 1, 4 and 5). The required length of this film pack may be cut from a long strip (page 7, lines 2 to 8). Consequently,

vacuum sealing is not envisaged in this document. Therefore, this prior art is not closely related to the subject-matter of the patent in suit.

Document (11) relates to a NDT film pack comprising an outer light-tight heat-sealed polyethylene wrapper containing an X-ray film sheet located between two lead/paper foils (page 51, right column, last paragraph and page 52, left column, first paragraph). The film pack is evacuated to a certain extent (see page 52, right column, 3rd paragraph). This document proposes to provide a limited freedom of movement of the various sheets of the film pack relative to one another by sealing the wrapper at a length greater than the length of the sheets by a predetermined amount (page 51, right column, 2nd and 3rd paragraphs). The presence of a predetermined volume of air in the film pack, as well as the use of high-slip polyethylene for the wrapper assist in such movement (page 52, left column, second paragraph). Therefore, while this document relates to a technical problem also addressed in the patent in suit, the proposed solution does not require absolute vacuum-tightness of the film pack, and thus this document, too, is not considered as representing the closest state of the art.

Document (8) relates to the problem of a sufficiently close contact between the intensifying screens and the film, especially if the film pack is bent around pipes of small diameter (page 2, lines 20 to 28 and page 7, lines 2 to 5). As a solution to this problem, it proposes to combine the wrapper and the intensifying screen in the form of a laminate of a lead foil and a thermoplastic material. Additionally, the film pack is to be evacuated in order to press the lead foils closely to the film by the atmospheric pressure (page 3, lines 1 to 12). A heat-sealable material applied to the edges of the lead foil is used for sealing the package (page 3, lines 25 to 27). In

the Board's judgment, therefore, this document represents the closest prior art.

5.2 According to the patent specification, the problem with respect to the film pack according to document (8) was that the vacuum did not last sufficiently long (see column 1, lines 53 to 58). This statement has not been challenged by the Opponent. At first glance, however, it seems to be in conflict with that in (8), page 7, lines 9 to 16, according to which the vacuum is maintained for more than one year, i.e. exactly for the period of time mentioned in the patent in suit, column 4, lines 57 and 58. However, during the oral proceedings the Respondent, who is also the applicant of document (8), submitted that this statement was only based on a quick laboratory test whereas prolonged practice revealed that these film packs lost their vacuum during storage. The Board accepts this explanation. The technical problem underlying the patent in suit may therefore be seen in improving the vacuum-tightness of the film packs known from document (8) without impairing its other advantageous properties.

5.3 In order to solve this problem, the patent in suit sets out to produce an NDT film pack containing a radiographic film and at least one foil of lead or a lead alloy by the steps of producing a laminated wrapper with a layer of a heat-sealable light-tight thermoplastic, a layer of PET and an intermediate layer of aluminium formed by vacuum deposition on the PET, wrapping said film and said foil in said laminated wrapper, the layer of heat-sealable light-tight thermoplastic facing inwardly, evacuating the film package thus formed and heat-sealing the package while under vacuum.

In the Board's judgment it is crediblee, in line with the Respondent's submissions during the oral proceedings, that the existing problem is effectively thereby solved.

5.4 The next step is to investigate whether any of the cited documents contain a suggestion to solve the existing problem by these same measures.

In this respect, documents which relate to other X-ray films designed for purposes where flexibility is not required or even undesirable, such as those mentioned in the patent in suit, column 1, lines 27 to 33, and intended for medical purposes, are not relevant, because the problem was not to improve vacuum-tightness in general but that of the specific product of document (8). Therefore, documents relating to vacuum packs of different types, i.e. the Kodak "DELPACK" film packs (5a) and (5b) and document (3) relating to the general usefulness of a composite sheet practically identical with that produced according to the patent in suit to be used as the wrapper, could also not suggest a solution to this problem.

These documents could only become important after the skilled person has recognised that one basic concept of document (8), i.e. the lamination of the lead foil on the inner surface of the wrapper, could be abandoned without impairing the desired flexibility of the NDT film pack.

5.5 The Board, however, is unable to accept the Appellant's submission that document (8) already contains a suggestion in this direction. According to page 3 of (8), first paragraph, it is proposed to solve the problem of making an NDT film pack which does not buckle upon bending by using a wrapper which is a composite sheet containing a lead foil as the inner layer and which is folded around the film by heat-sealing under vacuum. In the following paragraph the advantageous properties of such a film pack are explained by the lack of freedom of movement between the layers of the pack, and the close contact between film and lead foils. In the Board's judgment it is not

possible, without the benefit of hindsight, to derive from this disclosure the idea that vacuum alone is sufficient to prevent any freedom of movement in the film pack and thus to obtain the same properties as well by sealing a conventional NDT film pack comprising five separate layers under vacuum. On the contrary, the clear meaning of the cited paragraph is that the advantageous properties obtained according to document (8) are the result of the combination of two different measures, i.e. the fixing of the lead foils to the wrapper and the evacuation of the film pack. Thus, in the Board's judgment it was not obvious from document (8) to consider these measures separately and to apply only one of them.

Moreover, the Board is satisfied that a person skilled in the art faced with the problem of improving the vacuum-tightness of the film pack obtained according to document (8) would have had a number of choices of approaching that problem, without deviating from the basic principles set out in that document, e.g. to improve the heat sealable frame. Therefore this document alone cannot successfully support the Appellant's case.

5.6 In document (11), published 1973, the vacuum is clearly not applied in order to prevent the various sheets of the film pack from moving relative to one another, since the basic teaching of this document is to allow a certain freedom of movement between the sheets in order to avoid the buckling of the film pack during bending by the use of, inter alia, a limited amount of air (page 51, right column, 3rd paragraph and page 52, paragraph 2). This solution to the problem is quite opposite to that proposed in document (8) as well as in the patent in suit, i.e. to keep the sheets together to such an extent that they behave like one single sheet when the film pack is bent. There is no convincing reason why a skilled person seeking for an improvement of the film pack known from

document (8), which was published in 1979, should have returned to a measure which was already recognised in that document as being disadvantageous (see the paragraph bridging pages 1 and 2).

The same considerations apply a fortifiori with respect to document (10), published 1974, which describes the manufacturing of an NDT film pack which is not evacuated at all. Thus these documents, in context with the disclosure of document (8), clearly point away from separating the lead foils from the wrapper as the basic step for improving the film pack described in document (8).

5.7 It is clear that this unobvious step, taken separately, is not sufficient to solve the problem of improving the vacuum-tightness. However, as already outlined in paragraph 5.4 above, it is the key which opens the door to the advantageous solution proposed by the patent in suit, since the further step of finding a suitable wrapper material could only have been taken after realising that such wrapper material need not necessarily include a lead foil on the inner surface. Consequently, in the Board's judgment the question whether or not the choice of the wrapper material proposed in the patent in suit, taken separately, would or would not have been obvious, is not relevant to the question whether the method of the patent in suit, as a whole, involves an inventive step. Thus, all submissions in this respect, e.g. whether or not document (3) or the known Kodak "DELPAK" film packs (5a) and (5b) suggest the use of this wrapper material or whether or not it was inventive to replace the aluminium foil of the known X-ray film packs for medical use by a vacuum-deposited layer of aluminium, need not be considered further, since the Board is satisfied that the method according to Claim 1 of the patent in suit already

involves an inventive step on the ground that the very first step away from the closest prior art was not obvious to a person skilled in the art.

6. Claim 2 relates to a specific embodiment of the method according to Claim 1 and derives its patentability from that claim.

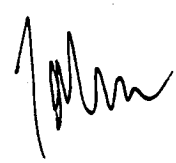
Order

For these reasons, it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Beer



K.J.A. Jahn