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D E C I S I O N
of 28 October 1999

Case Number: T 0884/95 - 3.2.5

Application Number: 88900435.4

Publication Number: 0349532

IPC: B41M 5/26

Language of the proceedings: EN

Title of invention:
Thermal imaging medium

Patentee:
Polaroid Corporation

Opponent:
Agfa-Gevaert N.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0884/95 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 28 October 1999

Appellant: (Opponent)
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Representative:
-

Respondent: (Proprietor of the patent)
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Decision under appeal:
Interlocutory decision of the Opposition Division of the European Patent Office posted 7 September 1995 concerning maintenance of European patent No. 0 349 532 in amended form.

Composition of the Board:

Chairman: A. Burkhart
Members: M. Ceyte
M. Aúz Castro

Summary of Facts and Submissions

I. The respondent is the proprietor of European patent No. 0 349 532 (application No. 88 900 435.4).

II. The patent was opposed by the appellant on the grounds of lack of novelty and inventive step.

III. By its interlocutory decision posted on 7 September 1995 the Opposition Division maintained the patent in amended form.

IV. An appeal against this decision was filed by the appellant (opponent) on 27 October 1995, the appeal fee was paid on the same day and the statement of grounds of appeal was filed on 11 January 1996.

V. In the appeal proceedings only the following documents have played a significant role:

D1: DE-A-2 150 803

D3: "Unconventional imaging processes" by E. Brinkman et al, Focal Press limited (1978), page 37.

VI. Oral proceedings before the Board were held on 28 October 1999.

The appellant requested that the decision under appeal be set aside and the patent be revoked in its entirety.

The respondent (patentee) requested that the appeal be dismissed with the proviso that the patent be maintained on the basis of claim 1 submitted at the

oral proceedings, claims 2 to 29 filed on 23 May 1996 and the description as well as the drawings underlying the decision of the Opposition Division.

VII. Claim 1 reads as follows:

"1. A thermal imaging medium (10) for forming images in response to intense imaging-forming radiation (22), comprising:
a support web (12) formed of a material transparent to said radiation and comprising an image forming surface (14) at least a surface zone of which is liquefiable and flowable at a predetermined elevated temperature range;

a layer (16) of porous or particulate image forming substance (18) uniformly coated on said image forming surface (14);

said thermal imaging medium (10) being capable of absorbing radiation rapidly at or near the interface of said image forming surface (14) and said layer (16) of porous or particulate image forming substance and being capable of converting absorbed energy into thermal energy of sufficient intensity to liquefy said surface zone of said image forming surface (14) at said predetermined elevated temperature range;

the surface zone, when liquefied, exhibiting capillary flow into adjacent portions of said image forming substance (18), thereby substantially locking said layer (16) of image forming substance to said support web (12) when said surface zone cools, said surface zone comprising a polymeric material of a type liquefying and solidifying in a short time;

a stripping sheet (24) on the layer (16) of image forming substance on its surface opposite said support

web (12);

wherein said layer (16) of porous or particulate image forming substance (18) exhibits a cohesive strength greater than the adhesive strength greater than the adhesive strength between said image forming substance (18) and said image forming surface (14) so that said layer can be peeled from the support without splitting."

VIII. The appellant argued essentially that the combination of the disclosures of prior art documents D1 and D3 would lead the skilled person to the subject-matter claimed in claim 1:

Prior art document D1 discloses the heat mode recording material of claim 1 save the provision of a stripping sheet which is peeled off after irradiation for removing the layer of image forming substance in its non-exposed areas.

Starting from this citation, the object to be achieved by the invention is to overcome the disadvantages of the imaging method disclosed therein which needs a solvent or water for washing away at least a part of the layer of image forming substance.

For the skilled person wanting to obviate the above drawbacks, it would be obvious to superimpose a stripping sheet on the heat mode recording material disclosed in D1. To add such stripping sheet would not have involved anything but the application of a commonly applied technique.

The recording material disclosed in prior art

document D3 comprises an intermediate layer containing a photopolymerizable composition. The imaging process is obtained in this system by peeling off the upper layer after ultra-violet irradiation, so as to remove the unpolymerized unexposed areas of the intermediate layer. It has thus been known, that is was possible to use a stripping tape for selectively removing after exposure the non-exposed areas of a layer of image forming substance.

It follows that the subject-matter claimed in claim 1 does not involve an inventive step having regard to the combination of the disclosures of prior art documents D1 and D3.

IX. The respondent in support of its request as stated under point VI supra, rejected in detail the arguments brought forward by the appellant.

Reasons for the Decision

1. The appeal is admissible.

2. *Amendments*

There are no formal objections under Article 123(2) to the present claims since they are adequately supported by the original disclosure.

Present claim 1 results from the combination of original claims 1 and 36 with the further feature that said layer (16) of porous or particulate image forming substance exhibits a cohesive strength greater than the

adhesive strength "so that said layer can be peeled from the support without splitting". This feature is supported by the penultimate paragraph of page 10 of the original disclosure (which corresponds to column 7 third paragraph of the European patent specification).

Present claim 1 contains all the features of granted claim 1 so that requirements of Article 123(3) EPC are also met.

3. *Novelty*

The examination as to whether the heat mode recording material claimed in claim 1 is disclosed in prior art documents D1 or D3 leads to the conclusion that the subject-matter of claim 1 is novel having regard to this prior art, due to the fact that

- the heat mode recording material disclosed in document D1 does not comprise the claimed stripping sheet superimposed on the layer of image forming substance,

- document D3 does not disclose the claimed thermal imaging medium, but discloses an imaging medium comprising a photopolymerizable composition for the production of images by information-wise exposure thereof to actinic radiation.

4. *Inventive step*

4.1 The patent in suit is concerned with a heat mode recording material and more particularly with a high resolution thermal imaging medium comprising a heat

sensitive layer interacting, at an image-wise application of heat, with an image forming substance for producing images of high resolution.

A heat mode recording material of this kind is disclosed in prior art document D1. It comprises a transparent substrate and a porous layer of image forming substance. Upon imaging with a laser, the porous layer of image forming substance is heated at the area where it is irradiated by the laser beam and the surface thereof is roughed. At the same time as the surface of the porous layer of image forming substance is roughed, the surface of the transparent substrate which is coated by such layer is also roughed.

According to a first alternative the whole porous layer of image forming substance is removed after irradiation from the transparent substrate. A solvent or water is used to wash away such layer. According to a second alternative, the entire layer of image forming substance is not removed after irradiation, but the substance therein imparting the high light absorption thereto is removed; for example, if the layer is made of hardened gelatin coloured with a water soluble dye, the dye can be washed away with cold water.

According to the appellant's submissions a thermal imaging medium of this kind suffers from the problem that at least a part of the layer must be washed away with the aid of a solvent or water. Furthermore, this imaging process does not allow the production of "positive" and "negative" images.

4.2 Therefore the technical problem to be solved by the

present invention may be seen in providing a heat mode recording material for the production of positive and negative images of high resolution, without the need of washing the layer of image forming substance with a liquid such as a solvent or water.

This problem is solved by the thermal imaging medium comprising the features of claim 1.

4.3 The appellant submitted that the difference between the claimed heat mode recording material and that of document D1 is a minor development amounting merely to adding a well known stripping sheet.

The Board does not follow such reasoning. Upon irradiating with a laser beam the image forming surface of the claimed heat mode recording material is liquefied at the exposed parts thereby improving the adherence of the layer to the substrate in these exposed parts, while at the non-exposed parts liquefying of the image forming surface does not take place and thus the adhesion of the porous layer to the substrate remains poor. The porous layer in the non-exposed areas can then be peeled from the substrate without splitting using the superimposed stripping tape and as a consequence a positive and a negative image are simultaneously formed.

Thus the claimed heat mode recording material is based on the principle of using a difference in adhesion between the exposed and the unexposed parts for producing an image, the unexposed parts being removed by means of the superimposed stripping sheet.

This is clearly not the case in document D1: in the first alternative, the **entire** layer, that is the exposed as well as the unexposed parts, is removed after irradiation by means of water or a solvent. Thus even though the skilled person had thought of providing such heat mode recording material with a stripping sheet, he would not have arrived at the teaching of claim 1, that is the use of a difference in adhesion between the exposed and the unexposed areas to obtain an image and the provision of a stripping sheet for selectively removing the unexposed areas.

According to the second alternative described in document D1, the entire layer is not removed from the substrate after irradiation, but only the colouring agent contained therein is washed away: for example, if the layer is made of hardened gelatin coloured with a water soluble dye, the dye can be washed away by washing with cold water. In such case, it is clear that the addition of a stripping tape would be of no assistance in removing the water soluble dye from the hardened gelatin.

Therefore even if, having regard to the general common knowledge in the art, it seems to be obvious to add a stripping to the heat mode recording material disclosed in document D1, this would still not lead to the subject-matter claimed in claim 1, because the use of the difference in adhesion between unexposed and exposed parts and the provision of a stripping sheet for selectively removing those unexposed parts, would still be lacking.

4.4 Document D3 proposes a photo-sensitive recording material having an intermediate layer which contains a photopolymerizable composition. It is true that such recording material uses the difference in adhesion between unexposed and exposed parts to obtain an image, so that by peeling off the upper layer, the unexposed parts are removed from the intermediate layer and as a consequence a positive image and a negative image are simultaneously formed.

However the imaging element described in document D3 belongs to a very different class of imaging media, i.e. that comprising a photpolymerizable composition for the production of images by information-wise exposure thereof to actinic radiation. In contrast to this the invention claimed belongs to the class of heat mode recording materials which can be image-wise exposed using an image-wise distribution of heat. This type of heat mode recording materials offers the advantage that they do not need to be handled in a dark room nor any other protection from ambient light is needed. If in the first mentioned class the use of the difference in adhesion is known to obtain an image, there is no hint whatsoever in the available prior art

that the difference in adhesion between exposed and unexposed parts can be used in the case of a heat mode recording material.

Furthermore, prior art document D3 is wholly silent with respect to heat mode recording materials and as a consequence would be of no assistance to the skilled person seeking to solve the problem of improving the known heat mode recording material disclosed in document D1.

Finally, since documents D1 and D3 disclose two fundamentally different classes of imaging media, it would be not obvious for the skilled person to combine these two documents let alone selected features thereof, in order to arrive at the invention claimed in claim 1.

4.5 Therefore, in the Board's judgement the subject-matter of claim 1 cannot be derived in an obvious manner from documents D1, D3 or the common general knowledge in the art and thus involves an inventive step. For those reasons, the patent is to be maintained on the basis of claim 1.

5. Dependent claims 2 to 29 concern particular embodiments of the invention claimed in claim 1 and are likewise allowable.

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 maintain the patent in amended form with the following documents:

Claims: 1 filed in oral proceedings of 28 October 1999,
2 to 29 filed on 23 May 1996

Description: pages 2, 3, 6, 7 according to the patent specification,
pages 4, 5, 8, 9, 10 filed on 8 August 1995

Figures: 1 to 12 according to the patent specification

The Registrar: The Chairman:

A. Townend A. Burkhart