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D E C I S I O N
of 15 December 2005

Case Number: T 0875/04 - 3.2.05

Application Number: 98302304.5

Publication Number: 0873880

IPC: B41M 5/30

Language of the proceedings: EN

Title of invention:
Thermally-responsive record material using an ether sensitizer

Patentee:
APPLETON PAPERS INC.

Opponents:
OJI PAPER COMPANY, LIMITED
Kanzaki Speciality Papers Inc.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (main request, yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0875/04 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 15 December 2005

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 18 May 2004 revoking European patent No. 0873880 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: W. Moser
Members: P. E. Michel
H. Schram

Summary of Facts and Submissions

I. The appellant (patentee) lodged an appeal against the decision of the Opposition Division revoking European Patent no. 0 873 880.

The Opposition Division held that the subject-matter of claim 1 of a sole request lacked an inventive step.

II. Oral proceedings were held before the Board of Appeal on 15 December 2005.

III. The appellant requested that the decision under appeal be set aside and that the patent be maintained on the basis of the following documents presented in the oral proceedings:

(a) claims 1 to 6 as main request; or

(b) claims 1 to 6, respectively as first to fifth auxiliary requests.

Respondent I (opponent 01) requested that the appeal be dismissed.

Respondent II (opponent 02) informed the Board on 28 October 2005 that it would not attend the oral proceedings. Respondent II did not submit any requests.

IV. The following documents are referred to in the present decision:

D1: US-A-4 870 047

D9: Second declaration of Mr Fisher dated 5 March 2003

D10: Second declaration of Mr Nojima dated 3 December 2003

D12: Supplementary declaration of Mr Fisher filed on 17 September 2004

D13: JP-A-59-54597 and partial translation thereof.

V. Claim 1 of the main request reads as follows:

"1. Thermally-responsive record material useful for bar coding, comprising a support having provided thereon in substantially contiguous relationship in one or more layers a heat-sensitive coating comprising:

a substantially colorless dye precursor comprising 2-anilino-3-methyl-6-dibutylaminofluoran;

a sensitizer selected from the group consisting of 1,2-diphenoxyethane and 1,2-bis(4-methylphenoxy)ethane;

an acidic developer material comprising bis-(3-allyl-4-hydroxyphenyl)sulfone which upon being heated reacts with said dye precursor to develop color; and

a binder material,

wherein the heat-sensitive coating contains less than 13% by weight of pigments."

VI. The appellant argued substantially as follows in the written and oral procedure:

The feature of claim 1 of the main request "wherein the heat-sensitive coating contains less than 13% by weight

of pigments" is disclosed at page 4, lines 15 and 16 of the published version of the application as filed. There is thus no contravention of Article 123(2) EPC.

The composition of Example 6-1 of document D1 comprises 28% of filler. Claim 1, which is limited to less than 13% of filler, is thus novel.

The closest prior art is the composition of Example 6-1 of document D1. The problem to be solved is to provide a thermally-responsive record material which is more resistant to environmental challenges, including contact with oil and PVC. The solution to this problem is to reduce the amount of pigment including filler in the thermal record layer.

Nothing in the prior art points to this solution, nor is this solution *prima facie* obvious.

In addition, the solution gives rise to a technical advantage, reference being made to document D9. The table at page 9 of this declaration relates to record materials made according to Example 1A of the patent in suit, that is, they are provided with a topcoat. The only factor which is changed is the amount of pigment. The table thus demonstrates that there is a deterioration in performance at 20% by weight of pigment.

The presence of a top coat is not significant to this technical advantage. This advantage would *a fortiori* be obtained in the absence of a topcoat. In addition, the table at page 12 of document D9 relates to samples not having a topcoat and demonstrates an improvement in

decode values for samples which have been in contact with oil and PVC.

In addition, Tables 3 and 4 at page 7 of document D12 show an improvement for samples which have been in contact with oil and PVC containing 0% and 10% by weight of pigment as compared with 20% by weight of pigment. On the other hand, the initial values are more or less independent of pigment content.

VII. Respondent I argued substantially as follows in the written and oral procedure:

The subject-matter of claim 1 lacks an inventive step.

The closest prior art is the composition of Example 6-1 of document D1.

The problem to be solved is to provide a thermally-responsive record material having improved print contrast and providing a higher percentage of successful decodes.

To modify the known composition by reducing the pigment content from 28% to less than 13% by weight is *prima facie* obvious, or alternatively obvious in view of the teaching of document D13.

In particular, the person skilled in the art would appreciate that a high content of pigment including fillers will increase the print contrast signal (PCS) which is essential for accurate decoding. Since the filler, which constitutes 28% of the composition of the prior art, is non-imageable, and therefore gives rise

to white flecks in black areas of a bar code, it is an obvious step to reduce the amount of this component and thereby increase the amount of image-forming components.

Document D12, at page 4, lines 6 to 18, indicates that poor decoding can occur in spite of a high print contrast signal. This is also discussed at page 11, lines 3 to 9, of the decision under appeal. This effect is due to the presence of flecks in the bar code which occur as a result of the presence of a non-imageable filler. This is also an indication to the person skilled in the art that the quantity of filler should be reduced so as to reduce this effect.

Advantages in terms of improved resistance to oil and PVC are thus merely bonus effects.

Document D13, second paragraph, indicates that the amount of pigment in the heat-sensitive recording layer should be reduced in order to prevent the penetration of plasticizers and oils. For this reason as well, the person skilled in the art would reduce the quantity of filler so as to reduce such penetration.

Evidence relating to the performance of topcoated record materials is not relevant to the subject-matter of claim 1, which is not restricted to such materials, and should be ignored.

Reasons for the Decision

Main Request

1. *Amendments*

Claim 1 corresponds to claim 1 as granted with the addition of the feature "wherein the heat-sensitive coating contains less than 13% by weight of pigments" and the replacement of the term " 1,2-(4-methylphenoxy)ethane" by "1,2-bis(4-methylphenoxy)ethane". This latter amendment is considered to be a correction of an obvious error.

The feature that the heat-sensitive coating contains less than 13% by weight of pigments is disclosed in the published version of the application as filed at page 4, lines 15 and 16, where it is stated that "pigments, if included, are maintained at less than 13% by weight of the heat sensitive coating composition of the invention." Moreover, the addition of this feature restricts the protection conferred.

The amendment to claim 1 accordingly satisfies the requirements of Article 123(2) and (3) EPC.

2. *Interpretation of claim 1*

Page 4, lines 40 and 41 of the description of the patent in suit discloses that "the composition of the invention preferably is free of pigments including clays and fillers. Preferably, pigments, if included, are maintained at less than 13% by weight of the heat sensitive coating composition of the invention." In the

opinion of the Board, the term "pigments" should bear the same construction in both sentences, so that the reference to pigments in claim 1 is construed as including clays and fillers.

3. *Inventive step*

3.1 Closest prior art

Example 6-1 of document D1 is the closest prior art, and relates to a coating composition which comprises 28% by weight of filler on a dry basis, so that the resulting heat-sensitive coating contains 28% by weight of pigment, including clays and fillers.

The subject-matter of claim 1 of the patent in suit is thus distinguished over this disclosure by a reduction in the amount of pigments including clays and fillers.

3.2 Problem

Document D9, in particular, the table at page 12, shows that a reduction in the amount of pigment below the amount of 28% known from the prior art to 15% and 0% can lead to an improvement in decoding accuracy of a barcode exposed to oil and wet and dry PVC. In this connection, it is noted that claim 1 does not specify whether or not a topcoat is present. Thus, experimental results for materials both with and without a topcoat are relevant.

On the other hand, it is noted that the evidence does not demonstrate that a reduction in the amount of pigment below the amount of 28% known from the prior

art leads to an improvement in decoding accuracy of a barcode which has not been subjected to exposure to oil and PVC. Thus, the table at page 9 of document D9 shows that variations in the amount of pigment present has no appreciable effect on the initial decoding accuracy. On the other hand, when a pigment in the form of calcium carbonate or silica is present in an amount of 20% by weight, a marked decrease in decoding accuracy occurs after contact with PVC and oil.

The assertion that a reduction in the amount of pigment and, in particular, filler will inevitably improve PCS values and decoding rates is thus not supported by the evidence available to the Board. In particular, experiments carried out by Mr Nojima which resulted in unmeasurable values for varying pigment contents do not rule out improvements which may be obtained under less extreme conditions (see Tables 1 and 2 at page 8 of document D8 and at page 11 of document D10).

In addition, comparisons between samples having pigment contents of 0, 10 and 15% by weight, as summarised in Tables 1 and 2 at page 8 of document D8, are not relevant to the question of the effect of reducing pigment content below that known from the closest prior art. It is not contested by respondent I that the benefits of reduced pigment content may be obtained at amounts above 13%.

Whilst Mr Nojima was able to carry out some experiments which show no improvement with a reducing pigment content (see document D10, Table 2 at page 11), it is not clear why Table 2 shows better results for samples without a topcoat than for otherwise identical samples

lacking a topcoat as set out in Table 1 on the same page.

Therefore, in view of the available experimental data, the problem to be solved cannot be regarded as being simply to provide a thermally-responsive record material having improved print contrast and providing a higher percentage of successful decodes which, as a bonus effect, inevitably gives rise to improved performance after having been subjected to exposure to oil and PVC.

The problem to be solved is accordingly regarded as being to obtain an improvement in decoding accuracy of a barcode exposed to oil and wet and dry PVC.

3.3 Solution

The solution to this problem is not prima facie obvious to the person skilled in the art. In particular, as appears from document D13, second paragraph, in order to solve this problem there exist various possibilities, including adding a water repellent or insolubiliser to the heat-sensitive coating, and providing a protective overcoat layer.

It is mentioned by Mr Fisher at page 4, lines 4 to 18 of document D12 that poor decoding can occur in spite of a high print contrast signal. This is also discussed at page 11, lines 3 to 9 of the decision under appeal. It has been suggested that this effect is due to the presence of flecks in the bar code which occur as a result of the presence of a non-imageable filler. However, in the opinion of the Board, such an apparent

inconsistency between the print contrast signal and decoding success would not immediately lead the person skilled in the art to the conclusion that the amount of filler in the heat-sensitive coating should be reduced.

The cited prior art also does not suggest reducing the amount of pigment in order to solve this problem.

Document D13 does not teach a reduction in the amount of pigment. In connection with the reference to an increase in the amount of binder in the second paragraph of the partial English translation, it is disclosed that an increase in the amount of binder results in a decrease in colouring sensibility. Furthermore, there is no indication that an increase in the amount of binder would solve the problem as stated above. There is thus no inducement for the person skilled in the art to consider reducing the amount of pigment in the heat-sensitive coating. Rather, document D13, in the final paragraph, suggests that problems of barcode quality reduction owing to contact with oils or plasticizers can most effectively be solved by the use of an overcoat layer.

In the absence of a suggestion to reduce the amount of pigment below the amount disclosed in the closest prior art, it is not relevant that there is not any criticality in the value of 13% by weight. In addition, whilst it has been pointed out on behalf of respondent I that some materials which fall within the scope of claim 1 of the patent in suit have unsatisfactory Delta Decode values (Tables A to D of the letter of 31 January 2005, received on 2 February 2005), nevertheless, the experimental data indicate that an

improvement in these values is obtained by a reduction in the pigment content.

The subject-matter of claim 1 according to the main request thus involves an inventive step.

Claims 2 to 6 relate to preferred embodiments of the record material according to claim 1. The subject-matter of these claims thus similarly involves an inventive step.

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 on the basis of the following documents:

   (a) claims 1 to 6 presented as main request in the oral proceedings;

   (b) description, pages 3 and 4, presented in the oral proceedings, and pages 2 and 5 to 12 as granted;

   (c) drawings, Figures 1 to 8 as granted.

The Registrar: The Chairman:

M. Dainese W. Moser