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Datasheet for the decision of 4 August 2014

Case Number: T 0896/12 - 3.2.05

Application Number: 02258569.9

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Language of the proceedings: EN

Title of invention:
Dual-sided imaging element

Applicant:
NCR International, Inc.

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (yes)

Decisions cited:

Catchword:

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Case Number: T 0896/12 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 4 August 2014

Appellant: (Applicant)	NCR International, Inc. 3097 Satellite Blvd. Duluth, GA 30096 (US)
Representative:	Roderick William MacLeod NCR Limited Architecture & Technology Discovery Centre 3 Fulton Road Dundee DD2 4SW (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 5 October 2011 refusing European patent application No. 02258569.9 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman: M. Poock
Members: H. Schram
M. J. Vogel

Summary of Facts and Submissions

I. The appellant (applicant) filed a notice of appeal on 21 October 2011 against the decision of the examining division, posted on 5 October 2011, by which European patent application No. 02 258 569.9 was refused on the grounds that the subject-matter of claim 1 of the sole request filed on 13 July 2011 did not involve an inventive step, Article 56 EPC 1973. The statement of grounds was filed on 13 January 2012.

II. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the main request filed on 18 February 2014 or on the basis of the auxiliary request filed on 13 January 2012.

III. Claims 1 and 8 of the main request read as follows:

"1. A thermal image element (10) for dual-sided imaging, comprising:

a cellulosic substrate (20) comprising first and second surfaces (30, 50);

a first coating (80) applied to the first surface (30), wherein the first coating (80) comprises a first imaging material for creating, in situ, a first image; and

a second coating (100) applied to the second surface, wherein the second coating (100) comprises a second imaging material for creating, in situ, a second image;

wherein the cellulosic substrate (20) has sufficient thermal resistance to prevent heat applied to one coating (80 or 100) activating the imaging material in the other coating (100 or 80);

characterised in that the first imaging material activates at a different temperature than the second imaging material."

"8. A method of manufacturing a thermal image element (10) for dual-sided imaging, comprising:

a cellulosic substrate (20) comprising first and second surfaces (30, 50); the method comprising:

applying a first coating (80) to the first surface (30), wherein the coating (80) comprises a first imaging material for creating, in situ, a first image;

applying a second coating (100) to the second surface (50), wherein the coating (100) comprises a second imaging material for creating, in situ, a second image;

wherein the cellulosic substrate (20) has sufficient thermal resistance to prevent heat applied to one coating (80 or 100) activating the imaging material in the other coating (100 or 80);

characterised in that the first imaging material activates at a different temperature than the second imaging material."

IV. The documents referred to in the appeal proceedings include the following:

D1 Patent Abstracts of Japan vol. 007, no. 063 (M-200), 16 March 1983 & JP 57 208298 A (Ricoh KK), 21 December 1982, with English translation of JP 57 208298 A, pages 513 to 518;

D4 US 4,956,251.

V. In support of his request, the appellant submitted the following:

The invention related to thermal image elements for dual-sided imaging, that is to say, image elements that have information in the form of images provided on both sides of a substrate. Each image was formed by subjecting an imaging material on the corresponding side of the substrate to heat. A problem with such dual-sided imaging was how to prevent heat applied to one side of the substrate from causing the premature formation of an image on the other side of the substrate, as referred to at lines 25 to 28 on page 6 and lines 16 to 19 on page 7.

The invention was characterised by a combination of two features: firstly, the first imaging material on the first side of the substrate activated at a different temperature to the second imaging material on the second side of the substrate; and, secondly, the substrate had sufficient thermal resistance to prevent heat applied to one coating activating the imaging material in the other coating.

Document D4 disclosed a heat sensitive recording material comprising different colour producing layers wherein each layer was activated at a different temperature. Different temperature activating layers were applied to different sides of a support. Therefore, the first characterising feature was known from document D4. Document D1 disclosed a multicolour heat sensitive recording material wherein a heat sensitive colour forming layer was provided on both sides of a base having limited thermal conductivity. Therefore, the second characterising feature was known from document D1. In other words, the invention was characterised by a combination of two known features.

However, this did not mean that the invention lacked an inventive step. If one feature was inadequate, the natural thing for the skilled person to do would be to try the alternative feature instead, not to supplement the inadequate feature with the other feature to form a combination. There is no reason for the skilled person to supplement one feature with the other feature without specific direction to do so and to make such a supplement required the two features to be readily compatible. However, neither document D1 nor document D4 contained such direction. Indeed, document D4 actually stated (cf column 3, lines 3 to 11) that document JP 208298/57 (D1) was one of a number of pieces of prior art whose teachings would not solve the problem addressed by document D4, implying that the two features were not compatible or, at least, that to combine the teachings of documents D1 and D4 went against the teaching of the prior art. Hence, there was no basis for the contention that the invention as claimed lacks an inventive step.

Reasons for the Decision

1. The appeal is admissible.

2. *Allowability of the amendments, Article 123(2) EPC*

Claim 1 of the main request differs substantially from claim 1 as originally filed in that the wording "An image element" has been replaced by the wording "A thermal image element" and in that the following features have been added at the end of the claim:

(i) wherein the cellulosic substrate (20) has sufficient thermal resistance to prevent heat

applied to one coating (80 or 100) activating the imaging material in the other coating (100 or 80);

(ii) characterised in that the first imaging material activates at a different temperature than the second imaging material.

A basis for "a thermal image element" is claim 10 as originally filed. A basis for feature (i) is the passage in column 3, lines 54 to 57 in combination with the passage in column 5, lines 28 to 33, of the application as filed (published version). A basis for feature (ii) is claim 11 as originally filed.

Claim 1 of the main request thus meets the requirements of Article 123(2) EPC.

This also applies to method claim 8, which has no counterpart in the set of claims as filed, but corresponds to device claim 1 of the main request.

3. *Inventive step, Article 56 EPC 1973*

3.1 The invention relates to a thermal image element for dual-sided imaging comprising a cellulosic substrate having first and second coatings applied to the front- and backside of the substrate for creating first and second images thereon. The term cellulosic substrate or material refers to a nonwoven web including cellulosic fibers, which webs may be formed by eg a paper-making process, cf paragraph [0012] of the application as filed (published version).

Thermal printers are used in many applications to create first and second images on the front- and backside of the substrate of the thermal image element.

The invention proposes two measures (cf features (i) and (ii) mentioned in point 2 above) with a view to prevent blurring of images.

The expression "at a different temperature" in the characterising feature of claim 1 of the main request (cf feature (ii) in point 2 above) must be construed, in the light of the application documents read as a whole, that the difference in activation temperature between the first and second imaging materials is *sufficient* to prevent an image from forming on the other side of the image element, cf column 5, lines 28 to 33.

3.2 Document D1, which is cited in paragraph [0004] of the application as filed (published version), represents the closest prior art. This document discloses a thermal image element comprising a cellulosic substrate (here: paper, see page 518, left column, penultimate paragraph) comprising first and second coatings. Since the substrate has a thermal conductivity of 0,1 kcal/ m.hr.°C or below, preferably 0,04 kcal/m.hr.°C (see claim 1 and Patent Abstracts of Japan), this document also discloses the last feature of the preamble of claim 1 of the main request.

Document D1 discloses different heat-sensitive colour forming solutions or compositions A to J. In embodiment 2, first and second coatings prepared by dispersing the compositions B + D and dispersion E are applied to the front and back surface, respectively, see page 518, table (not numbered) and table 1. However, document D1 is silent about activation temperatures of the various dispersions.

Moreover, document D1 does not contain any hint or suggestion, let alone a teaching that the activation temperature of the first coating must be *sufficiently* different from the activation temperature of the second coating in order to prevent an image from forming on the other side of the image element, cf the last paragraph of point 3.1 above.

The subject-matter of claim 1 of the main request differs therefore from the image element for dual-sided imaging known from document D1 in that the first imaging material activates at a different temperature than the second imaging material, cf feature (ii).

3.3 In the decision under appeal the examining division held (see point 1.8) that this distinguishing feature had no technical effect, since the problem it aimed to solve, viz preventing the blurring of images, was already solved by the feature "the cellulosic substrate (20) has sufficient thermal resistance to prevent heat applied to one coating activating the imaging material in the other coating", cf feature (i).

However, claim 1 of the main request is directed to a thermal image element as such, not to the use of said element in a particular printer. The heating energy applied to the thermal image element, the timely order of the front- and backside heating steps and whether the thermal image element is cooled between heating steps, are not known in advance. For that reason the last feature of the preamble of claim 1 of the main request should not be understood as meaning that the cellulosic substrate prevents *any* heat applied to one coating activating the imaging material in the other coating.

Both measures, (i) using a substrate having a sufficiently high thermal resistance, ie a low thermal conductivity, and (ii) using imaging materials on the front- and backside of the substrate that activate at different temperatures, contribute in their own way to solve the problem of minimizing the risk of blurring of the respective images, see the passage in column 5, lines 28 to 32, of the application as filed (published version).

3.4 The objective technical problem that is solved by distinguishing feature (ii) with respect to document D1 is thus to *further* reduce the risk of blurring of the images on different sides thereof. The person skilled in the art, starting from the thermal image element for dual-sided imaging known from document D1, is aware of document D4, which is also cited in paragraph [0004] of the application as filed (published version), and may look for a solution for this problem.

3.5 Document D4 discloses a multicolour heat-sensitive recording material comprising at least two colour-producing layers on a *transparent* support. Figure 1 shows a cyan colour-producing layer and a magenta colour-producing layer on the front and back side of a transparent support, respectively. If thermal recordings are made on both sides using heat pens or thermal heads having the same energy, some areas of the material appear to be cyan coloured, other areas appear to be magenta coloured and still other areas (cyan + magenta activated) appear to be blue coloured, see column 4, lines 36 to 50, and figure 2. The image that is visible to a viewer is in fact a superposition of two colour patterns made on the front- and backside, respectively. The support in document D4 is transparent rather than opaque as the cellulosic support according

to claim 1 of the main request. The superposed image has three colours and is, apart from being a mirror image, the same image when viewed from the front or back side of the material due to the use of the transparent support (unlike the thermal image element of the invention which allows that truly different images may be printed on the respective sides of the support).

As a further example, three colour-producing layers are provided, see column 4, lines 51 to column 5, line 12, and Figure 3. The yellow and cyan colorations, which are present in layers applied on opposite surfaces of the multicolour heat-sensitive material, are produced at a low temperature, the colours are subsequently fixed by photolysis, and then the magenta coloration is produced at a higher temperature. Whereas in the first example the cyan and magenta colour-producing layers are coloured with the same thermal energy, in the further example a thermally low sensitive magenta layer is used, which requires a relatively high thermal energy as compared to the yellow and cyan colour-producing layers. With this thermal image element an image having seven basic colours can be produced, see column 5, lines 12 to 20, Figure 4.

This general teaching is further elaborated in a specific example, see example 2, column 24, line 62, to column 25, line 16. The support of example 2 is made of a 75 µm thick polyethylene terephthalate film (see column 23, line 51). Such a PET film has a relatively high thermal conductivity, about three to five times higher that that of paper. The yellow and cyan layers are produced by heating each side of the recording sheet for 1 second using a block heated to 100 °C, the colours are subsequently fixed by photolysis and then

the magenta colour-producing layer, which is present between the support and the cyan colour-producing layer, is heated from the yellow coloured side of the substrate using a block heated to 120 °C. The magenta coloration is thus produced by applying thermal energy at a time when blurring of the yellow and cyan colours can no longer occur. Document D4 does not disclose feature (i) of claim 1 of the main request. In fact, the person skilled in the art can derive from this document that the thermal resistance of the transparent support of the recording sheet of example 2 should preferably be low, since that would be advantageous for producing the yellow and cyan colours simultaneously, and for producing the magenta colour through the substrate.

From the different block temperatures of 100 °C and 120 °C for producing the cyan and magenta colour-producing layers, respectively it cannot be concluded that the respective activation temperatures in example 2 are necessarily sufficiently different to prevent an image from forming on the other side of the image element where the heat is applied. The somewhat higher temperature of 120 °C of the heating block for producing the magenta coloration may be necessary since the magenta colour-producing layer is heated through the yellow layer and the substrate. It may be noticed that in the embodiment described in column 4, lines 36 to 50, of document D4 the thermal energy for producing the cyan and magenta colours are the same.

In the judgment of the board, document D4 does therefore not disclose feature (ii) of claim 1 of the main request. The person skilled in the art, starting from document D1 and seeking to solve the problem of *further* reducing the risk of blurring of the images on

different sides of the substrate, will hence not find a solution for this problem in document D4.

3.6 Consequently, the subject-matter of claim 1 of the main request involves an inventive step. This holds mutatis mutandis for the subject-matter of claim 8 of the main request.

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 patent on the basis of the following documents:

Claims, numbers:
1 to 8 filed on 18 February 2014 as main request;

Description, pages:
1 to 3 and 6 to 8 filed on 12 December 2013;
4 and 5 filed on 18 February 2014;

Drawings, sheets:
Figures 1 to 5 as originally filed.

The Registrar: The Chairman:

D. Meyfarth M. Poock

Decision electronically authenticated