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**Datasheet for the decision  
of 30 March 2006**

**Case Number:** T 0750/01 - 3.3.07

**Application Number:** 94110610.6

**Publication Number:** 0633346

**IPC:** D06P 1/00

**Language of the proceedings:** EN

**Title of invention:**

Ink-jet textile printing process using disperse dyes and  
printed textiles obtainable thereby

**Patentee:**

CANON KABUSHIKI KAISHA

**Opponent:**

Kimberly-Clark Worldwide, Inc.

**Headword:**

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**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

"Inventive step - (yes)"

**Decisions cited:**

-

**Catchword:**

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Case Number: T 0750/01 - 3.3.07

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.07  
of 30 March 2006

**Appellants:** Kimberly-Clark Worldwide, Inc.  
(Opponents) 401 North Lake Street  
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**Respondents:** CANON KABUSHIKI KAISHA  
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**Representative:** TBK-Patent  
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**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 2 May 2001  
rejecting the opposition filed against European  
patent No. 0633346 pursuant to Article 102(2)  
EPC.

**Composition of the Board:**

**Chairman:** S. Perryman  
**Members:** G. Santavicca  
B. Struif

## Summary of Facts and Submissions

I. The appeal is against the decision of the opposition division to reject the opposition to European patent No. 0 633 346 claiming a right of priority in Japan of 9 July 1993.

II. Claim 1 as granted for the contracting states AT, BE, DK, ES, GB, GR, IE, LU, NL, PT, SE (and corresponding to claim 2 as originally filed) read as follows:

"1. A printing process in which at least two inks of red and blue colors are applied to a cloth according to an ink-jet system to conduct printing, which comprises at least three steps of:

(a) applying the two inks to the cloth in such a manner that at least a part of the inks overlap each other;

(b) subjecting the cloth, to which the inks have been applied, to a heat treatment; and

(c) washing the heat-treated cloth,

wherein the cloth is a cloth comprising fibres dyeable with disperse dyes,

each of the inks comprises a coloring matter, a compound for dispersing the coloring matter and an aqueous liquid medium,

the red ink comprises, as the coloring matter, at least one selected from the group consisting of C.I. Disperse Red 54, 72, 73, 86, 88, 91, 92, 93, 111, 126, 127, 134, 135, 143, 145, 152, 153, 154, 159, 164, 167:1, 177, 181, 204, 206, 207, 221, 258, 278, 283, 288, 311, 323, 343, 348 and 356 and C.I. Disperse Violet 33

and the blue ink comprises, as the coloring matter, at least one selected from the group consisting of C.I. Disperse Blue 56, 73, 113, 128, 148, 154, 158, 165, 165:1, 165:2, 183, 197, 201, 214, 224, 225, 257, 266, 267, 287, 358 and 368."

For the same contracting states dependent claims as granted included:

- "2. The printing process of claim 1, wherein said coloring matter of red color is selected from the group consisting of C.I. Disperse Red 86, 88, 92, 126, 135, 145, 152, 159, 177, 181, 206, 283 and 348.
  
3. The printing process of claim 1, wherein said coloring matter of blue color is selected from the group consisting of C.I. Disperse Blue 56, 73, 128, 154, 165, 183, 201, 214, 224, 257, 266, 267, 287 and 368.
  
- ...
  
6. The printing process of claim 1, wherein the total amount of individual coloring matters applied in the color-mixed portion is in the range of from 0.01 to 1 mg/cm<sup>2</sup>."

For the same contracting states there was also an independent claim 15 directed to a printed cloth, obtainable by a printing process wherein the cloth comprises fibres dyeable with disperse dyes and is dyed by applying two coloring matters of red and blue color, such that at least a part of the coloring matters

overlap each other, the red and blue coloring matters being those stated in claim 1, and further a claim 22 reading "An article obtained by cutting the printed cloth of any one of claims 15 to 21, and sewing, bonding and/or welding the pieces."

For the contracting states CH, DE, FR, IT, LI, claim 1 for a printing process and claim 13 for a printed cloth corresponded to claims 1 and 15 for the other designated contracting states but further restricted to the features listed in above cited dependent claims 2 and 6 for these states.

III. The patent was opposed on the grounds that it did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 100(b) EPC) and that the claimed subject-matter was not patentable because it lacked an inventive step (Article 100(a) EPC) having regard to documents:

D1 : US-A-4 702 742;

D2 : EP-A-0 212 655;

D3 : US-A-4 725 849;

D4 : JP-A-61 118 477 (Abstract); and,

D5 : GB-A-1 527 396.

IV. In the decision posted on 2 May 2001, which was based on the claims as granted, the opposition was rejected. The reasoning of the opposition division can be summarized as follows:

(a) No convincing evidence had been brought forward that the invention underlying the patent in suit could not be carried out by a person skilled in the

art using common general knowledge. The allegation of missing essential features in the independent claims related to Article 84 EPC, was not a valid ground for opposition. No objection under Article 100(b) EPC had been made out.

- (b) As regards inventive step, D4 and D5 described the closest prior art. Following the submissions of both parties the invention was regarded as a "selection invention". While the data supporting the view that there was a surprising effect were very scarce the patentee was given the benefit of doubt and the presence of an inventive step acknowledged.

V. The opponents (appellants) appealed. In their statement setting out the grounds of appeal, received on 12 September 2001, the appellants maintained the grounds for opposition under Article 100(a) (under Article 56) and 100(b) EPC, and referred to new post-published documents D6 to D10, as evidence of what the skilled person would have known before the priority date. Copies of these documents however were not filed.

VI. In response to the statement setting out the grounds of the appeal (letter dated 20 March 2002), the proprietors (respondents) enclosed amended claims for the respective contracting states as well as additional experiment results.

In a letter dated 28 October 2003, the respondents enclosed further amended claims for the respective contracting states, to replace the claims filed with letter dated 20 March 2002.

In response to the communication of the Board accompanying the summons to the oral proceedings, and commenting on the issues, the respondents submitted still further amended claims for the respective contracting states, as the sole request (letter dated 28 February 2006).

VII. Oral proceedings were held on 30 March 2006. The appellants submitted pages 91, 338, 399 and 400 of the Römpp's Chemie Lexikon, *Lacke und Druckfarben*, 1998, and 2 pages taken from [www.farbimpulse.de](http://www.farbimpulse.de), as well a new main request having amended claims as follows, with consequent renumbering of dependent claims:

Compared to the wording of the respective claims 1 as granted, feature (a) in each claim 1 has been amplified to read (addition indicated in italics by the Board):  
"(a) applying the two inks to the cloth in such a manner that at least a part of the inks overlap each other *to obtain a dyed part in purple or purple-blue according to the Munsell color system;*"

Further both claims 1 are now restricted to the same red and blue coloring matter, namely those defined in claims 2 and 3 as granted for the contracting states AT, BE, DK, ES, GB, GR, IE, LU, NL, PT, SE (see point II above).

The introduction to Claim 13 (replacing claim 15 as granted) for the contracting states AT, BE, DK, ES, GB, GR, IE, LU, NL, PT, SE, as well as the introduction to Claim 12 (replacing claim 13 as granted) for the

contracting states CH, DE, FR, IT, LI, now in each case reads:

"A printed cloth, obtainable by *the* printing process as defined in claim 1 wherein the cloth comprises fibres dyeable with disperse dyes and is dyed by applying two coloring matters of red and blue color, such that at least a part of the coloring matters overlap *each other* to obtain a dyed part in purple or purple-blue according to the Munsell color system,.."

These Claims 13 and 12 respectively are now also restricted to the sets of red and blue coloring matter, namely that defined in claims 2 and 3 as granted for the contracting states AT, BE, DK, ES, GB, GR, IE, LU, NL, PT, SE (see point II above).

After discussion of the matter with the parties, the debate was closed. After deliberation by the Board, the decision was announced publicly on the same day.

VIII. The appellants essentially argued as follows:

- (a) Insufficiency of the disclosure was not pursued as a ground of appeal, but the serious doubts raised as to whether any unexpected effects could be obtained over the whole range claimed should be taken into account when considering inventive step. The claims covered also cloths having a high percentage of fibres such as cotton and wool which were not or were only poorly dyeable with disperse dyes. The examples involved at least 70% polyester fibres and pre-treatment steps as exemplified, neither of which were required by the claims.



- (b) As regards lack of inventive step, the dyes used in the claimed process and the methods for multicolour printing of disperse dyes on cloths by ink jet printing were known before the priority date of the patent in suit. Any of D1 to D4 might be considered as the closest prior art document.

Having regard to that art, the claimed subject-matter, which was within that art, should be considered as a selection invention. Any alleged advantages of that selection was expected to be obtained in the "colour-mixed" portion on the printed cloth. In particular, the advantages relied upon by the proprietors were the "colouring stability" and the "colour reproduction range", as shown in Table 2 of the patent in suit. The colouring stability indicated the dependency of the K/S values of the print samples on the heating conditions and the colour reproduction range denoted the dependency of the chroma (colour depth) on the different printing densities used.

However, colouring stability would automatically be attained by merely taking a colouring matter which was stable and dominant, or even by taking two colouring matters having the same stability. Hence, the K/S values stated in Table 2 neither provided any information about the mixed colour portion nor any basis for an alleged better "colour stability". Therefore, only the "colour reproduction range" could be used to demonstrate any advantages resulting from the selection of the

dyes according to Claim 1 for the mixed colour portion.

Contrary to the position taken by the Opposition Division, the tests described in the legend of Table 2 of the patent in suit lacked essential parameters such as "illuminant" and "standard observer". Moreover, the colour reproduction range was expressed in term of chroma but was measured according to Munsell, although in view of the chromatic coordinates "a" and "b" it should have been measured according to the CIElab standard.

Also, the proprietors had deliberately chosen comparative colouring matters which were poor in chroma, such as C.I. Disperse Blue 81:1, which was a "dull blue". In fact, the skilled person knew how to take single colouring matters having appropriate values for "a" and "b" to obtain the desired result, depending on the textile, the features of which were not specified in Claim 1 in suit. Thus, the tests were insufficient to show any alleged advantages in that respect. In the absence of any evidence that an advantage was obtained, there was no basis for justifying a selection invention.

As regards the argument that the skilled person could obviously have taken a violet colouring matter instead of mixing cyan and magenta, it was a basic principle in ink jet printing processes that a number of inks and a mixture thereof was used to reproduce the colours of an image, and this was also acknowledged in the patent in suit.

Hence, the skilled person would not have considered a violet colouring matter.

IX. The arguments of the respondents can be summarised as follows:

- (a) Each independent claim had been restricted to a more specific group of colouring matters as defined in granted claims 2 and 3. Further each independent claim now defined that a cloth was obtained having a dyed part in purple or purple-blue according to the Munsell color system, as mentioned in Footnote \*1 to Table 2 of the patent in suit. Therefore, the amended claims were allowable.
  
- (b) The closest prior art document was D4, which disclosed an entire series of colouring matters for ink jet printing on textiles made of synthetic fibres, as acknowledged in the patent in suit. D4 also exemplified the use of two colouring matters.

The problem to be solved was, as stated in the patent in suit, to provide an ink jet printing process which imparted an improved colouring stability and more intense colour "tones" in blue and purple-blue, which were not affected by the subsequent thermal fixing steps.

The examples in the patent in suit and the additional experimental results as submitted showed that each and every combination of the dispersed dyes defined in the independent claims were effective in the two decisive parameters

described in the patent specification. Thus, they also led to surprising results, which clearly indicate an unexpected selection.

D4 did not contain any information about any particular problem with blue and purple-blue colour tones, but rather disclosed specific violet dyes. Hence, the skilled person had neither any reasons nor any motivation to arrive at the claimed subject-matter, which consequently was non-obvious.

- X. The appellants (opponents) requested that the decision under appeal be set aside and that the European patent be revoked.
  
- XI. The respondents (proprietors) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the main request submitted at the oral proceedings and a description yet to be adapted.

## **Reasons for the Decision**

- 1. The appeal is admissible.

### **Main request**

- 2. *Amendments*

- 2.1 The amendments made to the claims are mainly restrictions based on combining various granted claims. The additional feature "to obtain a dyed part in purple

or purple-blue according to the Munsell color system", is based on the footnotes \*1 and (note 1) to Table 2 (pages 43 and 44) of the application as filed. The amendments are made to meet a ground of opposition, lack of inventive step. The appellants have raised no objections, and the Board too sees none.

3. *Sufficiency of the disclosure and novelty*

3.1 Sufficiency of the disclosure is no longer disputed by the appellants. The Board agrees with the reasons given by the opposition division for dismissing this objection. Novelty has never been put in issue.

4. *Inventive step*

4.1 The patent in suit (page 2, lines 46 to 56) gives as background that whereas in conventional textile printing, a printing paste is prepared for every color and therefore a great many dies of different tones may be used freely, in ink-jet textile printing various colors are produced by mixing inks on cloth and the colors of the inks are limited to several colors only so that colors from the violescent to bluish region have been unable to be fully reproduced by the technique of mixing magenta and cyan dyes when printing with inks containing a disperse dye on a cloth composed mainly of polyester or the like.

4.2 The problem to be solved (see patent page 3, lines 3 to 7) is thus stated in the patent as being to provide an ink-jet printing process which when printing on a cloth composed mainly of fibers dyeable with disperse dyes, can provide a print markedly wide in color reproduction

range, particularly, from violescent to bluish region, and can stably form images even when the conditions of dyeing treatment by heating are somewhat changed, and a print and a processed article obtained thereby.

- 4.3 On the evidence before the Board relating to the subject matter of the claims as now restricted, the above problem can be regarded as solved by the claimed subject matter at least to the extent of color reproduction in violescent to bluish region with some degree of color stability.

*Closest prior art*

- 4.4 The patent in suit itself refers to, *inter alia*, D2 and D4. The latter D4 is available to the Board only as an English abstract of a Japanese application. The abstract for D4 is very short and contains no information that it is concerned with the above problem. In the absence of an agreed translation of the full Japanese text of D4 being available in the proceedings, the Board is not prepared to use it as closest prior art or for any other purpose.
- 4.5 Document D2, relates to a process for cloth printing by the ink-jet system, suggesting use of a particular ink-receiving material and numerous suitable Disperse dyes, of different colors. It lists particularly preferred Disperse dyes of different colors, of which it is said they can be favorably used when cloth to be printed is made mainly of synthetic fibres such as polyester. These lists include some 26 Disperse Violet dyes, some 95 Disperse Blue dyes, and some 109 Disperse Red dyes. D2 nowhere explicitly states or suggests that the different

colors are to be used together on one cloth, and so naturally gives no information on what color might be produced if two such dye colors overlapped. In D2, the lists of Disperse Red dyes include 11 of the 13 Disperse Red dyes now claimed and the lists of Disperse Blue dyes include 12 of the 14 Disperse Red dyes now claimed.

- 4.6 Of the other documents in the proceedings, D3 is the US patent specification corresponding to D2. D1, like D2, concerns the use of an acceptor for the ink which is deposited on the fibres before the printing step. The examples of D1 also show the use of only one dye. D1 discloses a shorter list of disperse dyes than D2, and so appears less relevant than D2.
- 4.7 There is no prior art document in the proceedings that is concerned with achieving an ink-jet printing process which when printing on a cloth composed mainly of fibres dyeable with disperse dyes, can provide a print in the violescent to bluish region. In the absence of such document, D2 is the best starting point available.
- 4.8 Starting from D2 the obviously derivable solution for the skilled man would be to evaluate the many suggested violet and blue dyes, to come up with a single suitable dye. This single dye solution would also have been the solution suggested by conventional textile printing. There is no suggestion in the prior art put before the Board that to cover the violescent to bluish region a combination of red and blue Disperse dyes would be suitable.
- 4.9 The Board accepts the argument put forward by the appellants that the skilled person would be aware of the

Cyan-Magenta-Yellow (CMY) subtractive color system as used for ink-jet printing in other fields. In fact the Board had the advantage of having heard the day before the present case, a case (see decision T 742/01) between the same parties relating to multi-color ink-jet printing of the same type of fibres. But CMY systems are known to have inherent limitations as to the range of hues covered, and the prior art available in this case, even taken together with common general knowledge of CMY systems, does not point the skilled person in the direction of the solution now claimed.

- 4.10 Regarding the criticisms of the respondents evidence put forward to show an unexpected effect, this is irrelevant for the Board because unlike the first instance it does not regard the invention as a "selection invention". In the case law of the Boards of Appeal "selection inventions" are special cases normally confined to the situation where a later invention is defined for a given set of components by new ranges for the weight percentage of each component present, which new ranges fall within broader ranges already suggested for the same set of components. An invention may sometimes be found to exist where the new narrowly defined ranges give rise to some new unexpected property. The board does not consider that the principles on which this case law is based can appropriately be extended to cover the present facts, where there is no evidence that the combination of dyes now claimed has ever been suggested. Thus presence or absence of evidence as to any "unexpected effect" is irrelevant.



5. The Board concludes that the sole ground of opposition maintained in the appeal proceedings does not prejudice the maintenance of the opposed patent as amended.

## **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 claims of the main request submitted at the oral proceedings on 30 March 2006 and a description yet to be adapted.

The Registrar:

The Chairman:

C. Eickhoff

S. Perryman