Datasheet for the decision
of 20 October 2011

Case Number: T 1872/08 - 3.3.01
Application Number: 96119644.1
Publication Number: 778321
IPC: C09D 11/00
Language of the proceedings: EN

Title of invention:
Ink set for ink jet recording and ink jet recording method using the same

Applicant:
Seiko Epson Corporation

Opponents:
Pelikan Produktions AG
Alan J. Jones

Headword:
Ink set/SEIKO EPSON

Relevant legal provisions:
EPC Art. 114(2), 111(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Admission of late filed documents and comparative tests not admitted before the first instance"
"Sufficiency of disclosure and novelty (yes) - res judicata"
"Main request: inventive step (yes) - non-obvious solution of a problem based on an advantageous effect demonstrated by means of comparative tests"
Decisions cited:
G 0007/93, T 0167/93, T 0197/86

Catchword:
-
Case Number: T 1872/08 - 3.3.01

DECISION
of the Technical Board of Appeal 3.3.01
of 20 October 2011

Appellant: Seiko Epson Corporation
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Decision under appeal: Decision of the Opposition Division of the European Patent Office posted 14 July 2008 revoking European patent No. 778321 pursuant to Article 101(3)(b) EPC.

Composition of the Board:

Chairman: P. Ranguis
Members: C. M. Radke
L. Bühler
Summary of Facts and Submissions

I. The patent in suit, EP-B-0 778 321, relates to ink sets for ink jet recording and to a method for ink jet recording using these ink sets.

II. The two oppositions filed against the grant of said patent were directed against the patent in its entirety; they were based on grounds under Article 100(a) EPC (lack of novelty and of inventive step), 100(b) and (c) EPC.

III. The patent proprietor filed a first appeal against the decision of the Opposition Division to revoke the patent.

IV. With decision T 141/05 of 9 May 2007 the board found that the claims of the third auxiliary request then on file met the requirements of Article 123 EPC, that their subject-matter was novel and that no grounds under Article 100(b) EPC prejudiced the maintenance of the patent based on these claims (see points 3.2, 3.3 and 3.4 of the reasons). It remitted the case to the Opposition Division for further prosecution based on said third auxiliary request.

V. The following documents were inter alia cited during both opposition proceedings:

(D9) EP-A-0 448 055
(D18) Programming Note for EPSON Stylus Pro XL, Stylus Pro, Stylus Color II, Stylus Color IIs, Stylus 820 & Stylus 1500; printed on "01/08/96", 1-18
(D26) G. Benzing, Pigmente und Farbstoffe für die Lackindustrie, 2nd edn., expert verlag, Ehningen/DE 1992, 162-165


VI. In its second decision regarding the patent in suit (hereinafter called the decision under appeal) the Opposition Division revoked the patent on the grounds that the subject-matter claimed lacked inventive step.

The Opposition Division did not admit document (D26) filed by opponent I (and present respondent I) with the letter dated 28 May 2008 into the proceedings as it deemed it to be late filed and not to be prima facie relevant. It also did not admit the comparative tests the patentee (and present appellant) intended to hand in during the oral proceedings on 29 May 2008.

The Opposition Division considered document (D9) to represent the closest prior art. The problem solved was to provide an alternative ink set for ink jet recording having a good light fastness. The subject-matter claimed was deemed to be obvious in view of the examples of document (D27), where C.I. Pigment Blue 15:3 was used in an aqueous paste for image recording.

VII. The present appeal of the patent proprietor is directed against this second revocation.

VIII. The present claims are

- claims 1 to 9 of the main request filed under cover of the letter dated 24 November 2008, and
claims 1 to 9 of the first auxiliary request filed under cover of the letter dated 20 September 2011.

Claim 1 of the main request reads as follows:

"An ink set for ink jet recording, comprising a cyan ink composition, a magenta ink composition, and a yellow ink composition,
the cyan ink composition comprising C. I. pigment blue 15:3
the yellow ink composition comprising a pigment selected from C.I. Pigment Yellow 74, 138, 150 or 180,
the magenta ink composition comprising a pigment represented by the following formula (IV):

\[
\begin{array}{c}
\begin{array}{c}
\text{H} \\
\text{X_1} \\
\text{X_2} \\
\text{X_3} \\
\text{X_4} \\
\text{X_5} \\
\text{X_6} \\
\text{X_7} \\
\text{X_8} \\
\text{X_9} \\
\text{X_{10}}
\end{array}
\end{array}
\end{array}
\]

wherein \(X_1\) to \(X_{10}\) each independently represent a hydrogen or chlorine atom or a methyl group,
wherein the pigment concentration is not more than 6% by weight for all the ink compositions and the ratio of the pigment concentration (% by weight) of the cyan ink composition to the pigment concentration (% by weight) of the magenta ink composition to the pigment concentration (% by weight) of the yellow ink composition is 1 : 1 to 2 : 1 to 3,
wherein the concentration of the magenta pigment in the magenta ink composition and the concentration of the yellow pigment in the yellow ink composition each are higher than the concentration of the cyan pigment in the cyan ink composition."
IX. The appellant's arguments may be summarised as follows:

Document (D26) was late filed, did not relate to inks, thus was not relevant and should not be admitted into the proceedings. The appellant conceded that the comparative tests filed under cover of the letter dated of 24 November 2008 were those not admitted by the Opposition Division. These tests should, however, be admitted as they overcome the objections of the Opposition Division against the comparative tests filed in March 2008.

Document (D9) represented the closest prior art. The comparative tests filed with the letters dated 28 March and 24 November 2008 showed that the claimed ink sets were superior in hue of the composite black with respect to those of the closest prior art. Neither document (D9) nor any other prior art document suggested replacing C.I. Pigment Blue 15 by C.I. Pigment Blue 15:3 when solving this problem.

X. Respondent I considered the claims and experimental data enclosed with the appellant's letter dated 24 November 2008 to be late filed. Document (D26) was filed prior to the oral proceedings so that the parties had sufficient time to study it. Said document disclosed the important fact that C. I. Pigment Blue 15 converted into C. I. Pigment 15:3; the document should thus be admitted into the proceedings.

Due to this fact, the subject-matter of the claims lacked novelty in view of document (D9).
Furthermore, respondent I raised objections based on grounds under Article 100(b) EPC.

Respondent I considered the subject-matter of the claims to be obvious from document (D9) alone and in view of the combination of its disclosure with that of document (D26) which teaches that Pigment Blue 15 is instable. The comparative tests filed by the appellant were not relevant as the papers and printer used were different from those used in document (D9). Document (D18) showed that the $a^*$ and $b^*$ values from which the hue is calculated depend on the paper and the printer used. Moreover, the majority of the comparative examples also showed a good hue. So, the problem solved was merely the provision of alternative ink sets. Its solution was the result of standard experimentation which could not be attributed to an inventive step.

XI. Respondent II did not file any observations during the present appeal proceedings.

XII. The appellant requested that the decision under appeal be set aside and the patent be maintained on the basis of the claims of the main request, or, alternatively, on the basis of the claims of the first auxiliary request. Furthermore, it requested not to admit document (D26) into the proceedings.

Respondent I requested that the appeal be dismissed. Furthermore, it requested not to admit the comparative tests filed with the statement setting out the grounds for appeal dated 24 November 2008 and filed again with letter dated 20 September 2011.
Respondent II did not file any requests during the present appeal proceedings.

XIII. Respondent II did not attend oral proceedings as announced with letter dated 1 August 2011. The proceedings were thus continued in the absence of the duly summoned respondent in accordance with Rule 115(2) EPC and Article 15(3) of the Rules of Procedure of the Boards of Appeal.

At the end of the oral proceedings, the chairman announced the decision of the Board.

Reasons for the Decision

1. The appeal is admissible.

2. Evidence not admitted into the first instance proceedings

2.1 In the summons of the Opposition Division dated 12 November 2007 to attend oral proceedings, 28 March 2008 was set as the final date under Rule 71a EPC 1973 for making submissions and/or amendments.

Document (D26) was enclosed with a letter received by the European Patent Office by fax in the afternoon of 28 May 2008. The comparative tests were intended to be submitted during the oral proceedings of 29 May 2008.

Hence, both the document and the comparative tests were not submitted in due time.
2.2 According to Article 114(2) EPC "The European Patent Office may disregard facts and evidence which are not submitted in due time by the parties concerned." According to Rule 71a EPC 1973, new facts and evidence submitted after the final date set in the communication annexed to the summons "need not be considered, unless admitted on the grounds that the subject-matter of the oral proceedings has changed."

The Opposition Division exercised the discretion conferred on it by the afore-mentioned provisions in the decision under appeal (see, e.g., points 3.1 and 3.3 of its reasons).

It has to be assessed whether or not the Opposition Division exercised its discretion in the right way when not admitting document (D26) and the comparative tests of the patentee into the proceedings (see G 7/93, OJ EPO 1994, 775, point 2.6 of the reasons).

2.3 Document (D26)

The Opposition Division indicated the reasons for not admitting this late filed document under point 3.1 of the reasons of the decision under appeal. There it explained in detail why it was of the opinion that the disclosure of this document was not prima facie relevant for ink jet ink compositions and why this document could have been filed earlier.

Regarding the reasons given by the Opposition Division for not admitting document (D26), the Board is satisfied that the Opposition Division exercised its discretionary power correctly, namely on the basis of
the given relevant facts, in accordance with the right principles and in a reasonable way. Hence, the Board saw no reason to overrule the Opposition Division's decision. Consequently, it did not admit this document into the proceedings.

2.4 The comparative tests which the patentee offered to submit during the oral proceedings on 29 May 2008

2.4.1 The Opposition Division indicated the reasons for not admitting this late filed evidence under point 3.3 of the reasons of the decision under appeal. Therein the Opposition Division stated that comparative tests filed at such a late stage would have taken the opponent by surprise. The Opposition Division goes on to argue as follows: "The fact that example 18 of D9 is highly relevant for the current proceedings has been made clear already during the appeal procedure. Besides, said example consists of a single mixture of pigments, so that there could not have any ambiguity how a fair comparative example should be done."

2.4.2 How a fair comparative example should be done can be derived from point 4.3.1 of the decision under appeal, which refers to the comparative tests filed with the letter dated 28 March 2008. There it is stated that comparative tests should use inks with the same combination of pigments as in example 18 of document (D9). The Opposition Division continued as follows:

"Furthermore, the additional examples were made with one specific paper and one specific printer (both different from the paper and the printer used in D9 and from the examples of the opposed patent). Moreover,
2.4.3 Document (D18) was first cited by opponent II (now respondent II) in its letter dated 20 September 2004 to show that an ink set consists of three or four inks of different colours (see paragraphs 2.1d and 3.5c of said letter). In the opposition and appeal proceedings prior to the issue of the written version of the decision under appeal, no reference was made to the fact that the a* and b*-value depend significantly on the paper and on the printer used. The Opposition Division thus introduced in its decision a new fact as a basis for the additional requirement to use certain types of paper and certain printers when preparing comparative tests.

Moreover, the Opposition Division did not take into account that the offer of the patentee to present additional comparative tests was the immediate reaction to the objection first raised during the oral proceedings, that the comparative tests submitted under cover of the letter dated 28 March 2008 were deemed to be insufficient. It did not weigh the patentee's interest of submitting evidence to overcome this objection against the interest to take a decision soon.

Lastly, in not admitting the comparative tests offered by the patentee, the Opposition Division did not take into account that it deemed further comparative data to be absolutely necessary in order to overcome its objections as to inventive step. The Opposition
Division thus deprived the patentee of the possibility to defend its case effectively.

For these reasons, the Opposition Division did not use its discretion in a reasonable way by not admitting the additional comparative tests.

Therefore, the Board decided to overrule the decision of the Opposition Division in this respect and to admit into the proceedings these comparative tests, which the patentee resubmitted under cover of its statement setting out the grounds for appeal.

2.4.4 However, the reasons given under point 5.2.10 of this decision show, that the admission of these comparative tests has no effect on the outcome of the present decision.

Main Request

3. Article 123 EPC

3.1 Article 123(2) EPC

3.1.1 Claim 1 is based on claims 3 (definition of the cyan ink composition), 6 (definition of the yellow ink composition), 10, 13 (definition of the magenta ink composition), 17, and 18 as originally filed.

As far as the selection of the pigments for the ink set is concerned, the following applies:

Original claim 12 discloses an ink set comprising a cyan, a magenta and a yellow ink composition.
The broadest definitions of the pigments that may be used in these three ink compositions are given in original claim 1 for the cyan, in original claim 6 for the yellow, and in original claim 13 for the magenta ink composition.

In present claim 1 these definitions are limited only in that

- the cyan pigment of formula (II) has been restricted to C.I. Pigment Blue 15:3, i.e. to the only specific example of a pigment of formula (II) disclosed in the application as originally filed (see page 7, lines 5-6 and claim 3), and

- formula (III) has been deleted from the definition of the pigments that may be used in the yellow ink composition.

These limitations merely restrict the pigments of formula (II) to be used in the cyan ink composition and the pigments to be used in the yellow ink composition to those disclosed in the application as originally filed as being listed in the "Color Index" (C.I.), namely to C.I. Pigment Blue 15:3 and to C.I. Pigments Yellow 74, 138, 150 and 180 (The "Color Index" is a non-proprietary industry standard for pigments).

Hence, the combination of pigments indicated in present claim 1 is directly and unambiguously derivable from the application as filed.
3.1.2 Claim 2 is based on claim 14; claim 3 on a combination of claims 5, 9 and 16; claim 4 on claims 19 and 21; and claims 5 to 9 on claims 21-26 as originally filed.

3.2 Article 123(3) EPC

Claim 1 as granted has been restricted by limiting the pigments in the cyan ink composition according to granted claim 3, the ones in the yellow ink composition to the specific C.I. pigments mentioned in granted claim 1, and by the relative concentrations according to claim 17 as originally filed.

3.3 Hence, the claims of the main request meet the requirements of Article 123 EPC.

4. Res judicata

4.1 In the decision T 141/05 dated 9 May 2007, the board remitted the case to the Opposition Division for further prosecution.

To the extent that the issues finally determined in the decision T 141/05 and the facts are the same, the Opposition Division was and the present Board is bound by this decision, i.e. each of the respective issues decided in T 141/05 is res judicata (see Article 111(2) EPC; see T 167/93, OJ EPO 1997, 229, point 2.5 of the reasons).

4.2 The board decided in T 141/05 that the subject-matter of the claims of the third auxiliary request then on file was novel and that no grounds under Article 100(b)
EPC prejudiced the maintenance of the patent based on these claims (see points 3.3 and 3.4 of the reasons).

The present claims differ from those of that third auxiliary request in that
- in claim 1 the mandatory pigment in the cyan ink composition (which was defined to be C.I. Pigment Blue 15:3 and/or a pigment of formula (I)) is now restricted to C.I. Pigment Blue 15:3; and
- claims 2, 3 and 5 were deleted.

These amendments thus limit the subject-matter of the claims remitted in the decision T 141/05. They were prompted by objections raised in the discussion on inventive step. Therefore, these amendments were appropriate and necessary.

As these limitations do not affect the reasoning on novelty and on sufficiency of disclosure, the present Board is bound by the conclusions on these issues in decision T 141/05.

4.3 Consequently, respondent I's arguments relating to novelty and sufficiency of disclosure may be disregarded (see the second and third paragraphs under point X above). The present claims are deemed to be novel and no ground under Article 100(b) EPC prejudices the maintenance of the patent.

5. Inventive step

5.1 The closest prior art

The Board agrees with the parties in that document (D9) is to be considered as the closest prior art.
This document relates to recording liquids for ink jet recording, said liquids containing an aqueous medium, a pigment and a dispersant (see claim 1). It discloses in example 18 ink jet recording liquids containing 3 % by weight of C.I. Pigment Yellow 74 or 2.5 % by weight of C.I. Pigment Blue 15 or 4 % by weight C.I. Pigment Red 122.

The subject-matter of the present claims differs from the disclosure of document (D9) in that the former require the cyan ink to contain C.I. Pigment Blue 15:3 whereas document (D9) does not mention this pigment at all. C.I. Pigment Blue 15:3 differs from C.I. Pigment Blue 15 in that the former is the β-form whereas the latter is the α-form of the respective copper phthalocyanine.

5.2 The problem

5.2.1 When assessing which problem is posed and successfully solved in view of document (D9), it seems to be appropriate to start from the problem initially disclosed in the application on which the patent in suit is based.

The application as originally filed aims at providing "an ink set, for ink jet recording, which can realize ... good images, especially images having good hue" (see page 3, lines 28-31).

5.2.2 The appellant argued that the comparative tests filed on 28 March 2008 showed that the ink sets claimed produced a composite carbon black having a better hue
than those disclosed in document (D9) (see point IX above). Respondent I, however, deemed that these comparative tests do not show an improvement in hue over the closest prior art, as the papers and printer used were different from those used in example 18 of document (D9) (see point X above).

5.2.3 The appellant enclosed comparative tests with its letter dated 28 March 2008. These were received by the EPO on the same day, i.e. on the final date under Rule 71a(1) EPC 1973 set in the summons to attend oral proceedings dated 12 November 2007. These tests were admitted by the Opposition Division and discussed under point 4.3.1 of the decision under appeal.

These tests describe the composition of ink sets consisting of a cyan, a magenta and a yellow ink. The tests comprise examples 5 to 8 and the respective comparative examples which differ only from those according to the invention claimed in that C. I. Pigment Blue 15:3 was replaced by C. I. Pigment Blue 15 in the cyan ink. The respective magenta and yellow inks contain as pigments
- C. I. Pigments Red 122 and Yellow 138 (example 5),
- C. I. Pigments Red 209 and Yellow 150 (example 6),
- C. I. Pigments Red 122 and Yellow 180 (example 7),
- C. I. Pigments Red 209 and Yellow 74 (example 8), respectively.

A solid image of composite black was formed on "Super-Fine paper" using the ink jet printer PXG930. Each of the examples shows less hue (expressed as $\Delta a^* b^*$) than the respective comparative example. This was acknowledged in the decision under appeal (see point
4.3.1 of the reasons) and was not contested by the parties.

5.2.4 The reasons why the Opposition Division did not deem these tests to be relevant were the following:

- none of these tests concerned the combination of C. I. Pigments Blue 15, Red 122 and Yellow 74 used in example 18 of document (D9), and
- the tests were made with one specific printer on one specific paper, both different from the paper and the printer used in example 18 of document (D9), whereas tables 11-13 of document (D18) showed that the values of a* and b* depended on the paper and the printer used.

5.2.5 As to the first reason

According to the established jurisprudence of the Boards of Appeal
"in the case where comparative tests are chosen to demonstrate an inventive step with an improved effect over a claimed area, the nature of the comparison with the closest state of the art must be such that the effect is convincingly shown to have its origin in the distinguishing feature of the invention. For this purpose it may be necessary to modify the elements of comparison so that they differ only by such a distinguishing feature..." (T 197/86, OJ EPO 1989, 371, point 6.1.3 of the reasons).

A modification of the elements of comparison may be achieved by modifying an example of the closest prior art, an example of the patent in suit or both. Hence,
an improved effect may be demonstrated by comparative tests which do not exactly reproduce an example of the prior art as long as "the effect is convincingly shown to have its origin in the distinguishing feature of the invention".

Said distinguishing feature - i.e. the replacement of C. I. Pigment Blue 15 by C. I. Pigment Blue 15:3 - is in fact the only difference in the composition of each of the examples 5 to 8 as compared to the respective comparative example.

Hence, the Board does not share the view of the Opposition Division in this respect.

5.2.6 As to the second reason, the Board contends that document (D18) indeed shows that the values of $a^*$ and $b^*$ depend on the type of printer and paper used. However, this does not necessarily mean that a difference in hue observed when printing with one type of printer on one type of paper will not be observed when another printer or another type of paper is used.

In the comparative tests filed on 28 March 2008, the hue $\Delta a^*b^* = ((a^*)^2 + (b^*)^2)^{1/2}$ is the difference in colour from achromatic black ($a^*=0; b^*=0$). A difference in hue thus is a difference in colour. Although a glossy or matte surface and the absorbing power of the paper, as well as the thickness of the ink drops produced by the printer may have an influence on the colour perceived, a dot produced by green ink will always appear greener than one of a red ink. Likewise, there is no reason to believe that a composite black showing a lower hue on one paper when printed with one printer will not also
show a lower hue when another printer and different paper is used, although the absolute difference in hue may vary.

Hence, the Board concludes that it is sufficient to show a difference in hue when printing with one type of printer on one type of paper.

5.2.7 Respondent I did not provide any additional arguments as to the relevance of these comparative tests (see the first three paragraphs on page 6 of its letter dated 10 June 2009).

5.2.8 The Board thus concludes that the appellant has shown that a composite black produced from ink sets according to the claimed invention shows less hue than a composite black produced from ink sets according to the closest prior art (D9).

Respondent I argued that some of the ink sets of the comparative tests also provide a composite black having a good hue (see under point X above). This does, however, not exclude that a further improvement in hue is desirable for certain applications, such as photographic prints.

Therefore, the problem posed according to point 5.2.1 above may be modified in view of document (D9) as to provide an ink set, for ink jet recording, which can realize images having less hue.

As a solution to this problem the patent in suit proposes an ink set differing from the one disclosed in
document (D9) in that the cyan ink contains C. I. Pigment Blue 15:3.

5.2.9 Finally it has to be assessed whether or not this problem was solved over the whole breadth of the claims.

Present claims 1 and 2 require that
- the cyan ink composition comprises
  C. I. Pigment Blue 15:3,
- the yellow ink composition
  C. I. Pigment Yellow 74, 138, 150 or 180, and
- the magenta ink composition a pigment of formula (IV), preferably C. I. Pigment Red 122 or 209.

Examples 5 to 8 use ink sets comprising C. I. Pigment Blue 15:3 as the cyan pigment and C. I. Pigment Yellow 74, 138, 150 or 180 as the yellow pigment in combination with C. I. Pigment Red 122 or 209 (see under point 5.2.3 above). Hence, they are representative for all combinations of inks according to present claim 1.

Therefore, the Board is satisfied that said problem is solved over the whole breadth of the claims.

5.2.10 Due to the fact that the comparative tests filed on 28 March 2008 provide sufficient evidence that said problem is solved, there is no need to deal with the comparative tests filed on 24 November 2008.

5.3 Document (D9) does not mention or hint at C. I. Pigment Blue 15:3. Respondent I's argument that the replacement of C. I. Pigment Blue 15 by C. I. Pigment Blue 15:3 was the result of standard experimentation (see under point
X above) does not appear to be conclusive in view of the many possible variations of each of the pigments used in example 18 of document (D9). Therefore, (D9) as such cannot render the solution as defined in present claim 1 obvious.

Document (D27) discloses the use of C. I. Pigment Blue 15:3 in ink jet recording (see the examples). It does, however, give no indication that the problem posed could be solved by means of this pigment.

5.4 For these reasons, the subject-matter of claim 1 of the main request is based on an inventive step. The same applies to claims 2 and 3 directed to preferred embodiments of claim 1, to claims 4 to 8 directed to a method for ink jet recording using the ink set of claim 1, and to claim 9 directed to a record printed by said method.

6. Adapted description

Respondent I did not object to the amended description submitted during the oral proceedings before the Board. The Board is satisfied that the amendments merely adapt the description to the amended claims.

7. Therefore, no grounds of opposition prejudice the maintenance of the patent based on the claims of the main request and the description adapted thereto.

8. Consequently, there is no need to deal with the auxiliary request.
Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to grant a patent in the following version:

   Description:
   Pages 2 to 16 received during oral proceedings of 20 October 2011.

   Claims:
   No. 1 to 9 filed as main request with the statement of grounds of appeal dated 24 November 2008.

   Drawings:
   Figures 1 to 6 on pages 24 to 27 of the patent as granted.

The Registrar:     The Chairman:

M. Schalow     P. Ranguis