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D E C I S I O N
of 14 April 2005

Case Number: T 0815/03 - 3.2.5

Application Number: 95105281.0

Publication Number: 0685344

IPC: B41M 5/00

Language of the proceedings: EN

Title of invention:
Ink jet recording sheet and process for its production

Patentee:
MITSUBISHI PAPER MILLS, LTD.

Opponent:
Kazuko Sugawara

Headword:
-

Relevant legal provisions:
EPC Art. 84, 54, 56

Keyword:
"Clarity (yes)"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0815/03 - 3.2.5

D E C I S I O N
of the Technical Board of Appeal 3.2.5
of 14 April 2005

Appellant: (Opponent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 13 May 2003 concerning maintenance of European patent No. 0685344 in amended form.**

Composition of the Board:

Chairman: W. R. Zellhuber
Members: P. E. Michel
R. Moufang

Summary of Facts and Submissions

I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division maintaining European patent No. 0 685 344 in amended form.

In the decision under appeal, it was held that the grounds of opposition submitted by the appellant did not prejudice the maintenance of the patent as amended.

II. Oral proceedings were held before the Board of Appeal on 14 April 2005.

III. The appellant requested that the decision under appeal be set aside and that the European Patent No. 0 685 344 be revoked.

The respondent (patentee) requested that the appeal be dismissed, or, in the alternative, that the decision under appeal be set aside and the patent be maintained on the basis of the first or second auxiliary request both filed on 17 March 2003 or of the third, fourth or fifth auxiliary request, all filed on 14 March 2005.

IV. Claim 1 of the patent as maintained by the Opposition Division reads as follows:

"An ink jet recording sheet comprising a support, at least one ink-receiving layer formed on the support, and a gloss-providing layer formed on the ink-receiving layer, said ink-receiving layer consisting essentially of a pigment and a binder, and said gloss-providing layer consisting essentially of a pigment and a

synthetic polymer latex as a binder and having a glossy surface with a 75° specular gloss of at least 25% as stipulated in JIS-Z8741, wherein at least 70 parts by weight in 100 parts by weight of the pigment in the gloss-providing layer are constituted by colloidal particles having an average particle size of at most 300 nm,
and wherein
the amount of the synthetic polymer latex used for the gloss-providing layer is from 2 to 30 parts by weight per 100 parts by weight of the colloidal particles in case where the gloss-providing layer has not been subjected to cast treatment,
or
is from 5 to 70 parts by weight per 100 parts by weight of the colloidal particles in case where the gloss-providing layer has been subjected to cast treatment."

Reference will hereafter be made to the feature analysis of claim 1 as used by the Opposition Division in the decision under appeal, which is as follows:

A An ink jet recording sheet comprising a support, at least one ink-receiving layer formed on the support, and a gloss-providing layer formed on the ink-receiving layer,
B said ink-receiving layer consisting essentially of a pigment and a binder, and
C said gloss-providing layer consisting essentially of a pigment and a synthetic polymer latex as a binder and
D having a glossy surface with a 75° specular gloss of at least 25% as stipulated in JIS-Z8741,

E wherein at least 70 parts by weight in 100 parts by weight of the pigment in the gloss-providing layer are constituted by colloidal particles having an average particle size of at most 300 nm,

and wherein

M1 the amount of the synthetic polymer latex used for the gloss-providing layer is from 2 to 30 parts by weight per 100 parts by weight of the colloidal particles in case where the gloss-providing layer has not been subjected to cast treatment,

or

M2 is from 5 to 70 parts by weight per 100 parts by weight of the colloidal particles in case where the gloss-providing layer has been subjected to cast treatment.

V. The following documents *inter alia* were referred to in the appeal proceedings:

D2: JP-A-6-79967 (together with a full translation in English)

D3: EP-A-0 634 283

D13: Experiment report

Dl4: Ullmanns Encyklopädie der technischen Chemie, 4th Edition, Vol. 19, pages 7 and 11

VI. In written and oral proceedings, the appellant argued essentially as follows in respect of the main request:

Claim 1 is not clear.

It is not clear whether or not the references in the claim to "parts by weight" is intended to refer to parts by dry weight. Paragraph [0114] of the patent in suit only refers to the Examples and not the claims.

The references in features M1 and M2 of claim 1 to "the colloidal particles" are not clear since not only pigment but also latex is present in colloidal form. The term should accordingly be understood to refer to all colloidal particles which are present.

As set out in paragraph [0049] of the patent in suit, the pigment may include organic particles including compounds which are also said to be suitable for use as the synthetic polymer latex as set out at paragraph [0062] of the patent in suit. It is thus not possible to distinguish between, for example, a styrene-butadiene copolymer included as a pigment and a styrene-butadiene copolymer included as a binder. The same substance will have the same behaviour.

Claim 1 lacks novelty in view of Example 6 of document D2.

The reference to "10 parts of SBR latex" should be construed as referring to a commercial latex having a solids content of around 50%, so that the Example discloses a weight ratio of 5 parts latex polymer to 10 parts colloidal pigment, thus falling within the scope of claim 1.

It is further not clear whether the SBR latex should be regarded as being present as a binder or pigment.

Claim 1 also lacks novelty in view of Example II-1 of document D3.

The aqueous dispersion of styrene-2-methylhexyl acrylate copolymer employed in document D3 would be produced by emulsion polymerisation and therefore would be in the form of an aqueous dispersion, that is, a latex. Since the term "colloidal particles" must be construed as referring to the total amount of organic particles and silica present, the requirement of M2 is also satisfied.

Insofar as the subject-matter of claim 1 is regarded as being novel, it nevertheless lacks an inventive step. The closest prior art is represented by Example 6 of document D2. The problem to be solved is set out in the patent in suit at paragraph [0013]. As stated at paragraph [0029] of document D2, binder may be used in varying amounts from 1 to 200 parts per 100 parts alumina hydrate, the reference to 10 parts being an error in both the original document and the translation.

The person skilled in the art will readily select a ratio of binder to pigment in order to obtain the desired qualities.

Thus the disclosure of document D2 renders the subject-matter of claim 1 obvious.

VII. In written and oral proceedings, the respondent argued essentially as follows in respect of the main request:

Claim 1 is clear.

The references in the claim to "parts by weight" are intended to refer to parts by dry weight as is made clear by paragraph [0114] of the patent in suit. This is conventional in the art as exemplified by documents D2 and D3.

The references in features M1 and M2 of claim 1 to "the colloidal particles" clearly refer back to the reference in feature E to colloidal pigment particles.

It is always possible to distinguish between the pigment and the binder in view of the function of the respective components in the layer, since the binder is softened during the cast treatment to form a film, whilst the pigment remains in the form of particles.

Example 6 of document D2 does not disclose feature M2 of claim 1. The gloss-providing layer is subject to cast treatment, however 100 parts by weight latex are present per 100 parts pigment.

Claim 1 is also novel in view of Example II-1 of document D3. The styrene-2-methylhexyl-acrylate copolymer is not disclosed as being present in the form of a latex. Whilst document D14 states that emulsion polymerisation is the most important process for the preparation of polyacrylates, other processes for the preparation of polyacrylates are also known which do not result in colloidal particles, so that the styrene acrylate copolymer of Example II-1 of document D3 is not necessarily in the form of a latex.

The subject-matter of claim 1 is thus novel.

The closest prior art is Example 6 of document D2. The object of the invention is as set out in the patent in suit at paragraph [0013].

According to the invention, the use of latex in the amounts specified in features M1 and M2 give rise to the advantages described in paragraph [0013] of the patent in suit. Document D13 indicates that advantages in terms of ink absorptivity and image density are obtained. There is no indication in the prior art that the use of latex in the amounts specified in features M1 and M2 gives rise to the desired effects. Paragraph [0029] of document D2 suggests that more binder than alumina hydrate should be used.

The subject-matter of claim 1 thus involves an inventive step.

Reasons for the Decision

Main Request

1. *Clarity*

As stated in paragraph 3b2 of the decision of the Opposition Division, the reference in claim 1 to "parts by weight" must be construed in the light of paragraph [0114] of the patent in suit to refer to parts by absolute dry weight. Whilst paragraph [0114] refers to the Examples, it would be unreasonable not to apply the same definition of the term "parts by weight" throughout the description and claims.

The references in features M1 and M2 of claim 1 to "the colloidal particles" have an antecedent in feature E of the claim and thus refer to colloidal particles of pigment. It is not relevant that colloidal particles of latex could also be present.

The Board is of the opinion that, in any given recording sheet, the person skilled in the art would not have any difficulty in distinguishing between the pigment and the binder in the gloss-providing layer. In particular, the pigment is present in the form of colloidal particles which have the function of absorbing ink. The binder is present in the form of a film which has the function of binding the layer together.

Claim 1 thus satisfies the requirement of clarity as specified in Article 84 EPC.

2. *Novelty*

2.1 *Novelty over Document D2*

It is alleged on behalf of the appellant that claim 1 lacks novelty in view of Example 6 of document D2. The Board is, however, of the opinion that feature M2 of claim 1 is not disclosed in this Example.

The Opposition Division was correct in interpreting the composition of the second ink receiving layer (that is, the gloss-providing layer) of Example 6 as containing:

10 parts alumina hydrate pigment
15 parts casein (60 parts aqueous solution having a solid content of 25%)
10 parts SBR latex.

The argument that commercial latices have a solid content of around 50%, so that only 5 parts SBR latex are present per 10 parts pigment, is not accepted by the Board. At paragraph [0040] on page 19 of document D2, it is stated that parts and percentages are by absolute dry weight unless otherwise stated. In Example 6, the stated amounts of alumina hydrate and SBR latex are thus by absolute dry weight. In the case of the casein, on the other hand, it is "otherwise stated" that an aqueous solution having a solid content of 25% is used.

In addition, for the reasons indicated at point 1 above, the SBR latex serves the function of a binder and not a pigment, so that all the latex in the liquid composition serves as a binder in the layer after press-drying.

In Example 6 of document D2, the amount of the synthetic polymer latex used for the gloss-providing layer is thus 100 parts by weight per 100 parts by weight of the colloidal particles of pigment. The requirement of feature M2, that the amount of the synthetic polymer latex used for the gloss-providing layer is from 5 to 70 parts by weight per 100 parts by weight of the colloidal particles is thus not satisfied.

The subject-matter of claim 1 is thus novel over the disclosure of document D2 in view of feature M2.

2.2 *Novelty over Document D3*

Document D3 is considered to be comprised in the state of the art by virtue of Article 54(3) EPC. It is alleged that claim 1 lacks novelty in view of Example II-1 of document D3. The Board is, however, of the opinion that features C and M2 of claim 1 are not disclosed in this Example.

Example II-1 uses a cast coating composition comprising:

40 parts	styrene-2-methylhexyl-acrylate copolymer
60 parts	colloidal silica
2 parts	calcium stearate (release agent)

Although the styrene-2-methylhexyl-acrylate copolymer is present in the form of a dispersion in water, it cannot be regarded as a latex, since it is not necessarily in the form of a colloid. In particular, it is noted that Example II-1 merely refers to a styrene-2-methylhexyl-acrylate copolymer, whereas Example II-5 refers specifically to a styrene butadiene copolymer latex.

In addition, whilst document D14 discloses that emulsion polymerisation is the most important process for producing polyacrylates, it cannot be assumed that the styrene-2-methylhexyl-acrylate copolymer of Example II-1 is produced in this manner.

Example II-1 of document D3 thus does not clearly and unambiguously disclose the use of a latex.

3. *Inventive step*

Document D2 and, in particular, Example 6 thereof, represents the closest prior art. As set out under point 2.1. above, the subject-matter of claim 1 is distinguished over the disclosure of this document in that the amount of the synthetic polymer latex used for the gloss-providing layer is reduced.

According to paragraph [0013] of the patent in suit, the object of the invention is to provide an ink jet recording sheet which has generally desirable qualities when printed with a water colour ink, including a high printed image density and gloss. Document D13 indicates that advantages in terms of ink absorptivity and image density are obtained as a result of a reduction in the amount of acrylic latex binder in the gloss-providing layer. Whilst this document only compares a single coating composition falling within the scope of claim 1 of the patent in suit with a coating composition having 100 parts of latex per 100 parts of colloidal silica, there is no evidence available to the Board which would suggest that these advantages are not obtained in general by virtue of a reduction in the amount of latex binder in the gloss-providing layer.

There is no indication in the prior art that a reduction in the amount of latex binder in the gloss-providing layer gives rise to the desired effects. Whilst paragraph [0029] of document D2 suggests that varying amounts of binder may be used, this does not

amount to a teaching to the person skilled in the art that a desirable result could be obtained by reducing the amount of binder taught in Example 6 of document D2.

The teaching of the prior art as discussed above thus does not lead the person skilled in the art to the subject-matter of claim 1 of the patent in suit.

4. Claims 2 to 20 are directly or indirectly appendant to claim 1. They relate to preferred embodiments of the ink jet recording sheet of claim 1 and thus similarly involve an inventive step. Claims 21 to 26 relate to processes for producing the ink jet recording sheet of claim 1 and thus also involve an inventive step.

5. The patent in suit can accordingly be maintained in the form as maintained by the Opposition Division in accordance with the main request of the respondent, and it is not necessary to consider the auxiliary requests of the respondent.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Dainese W. Zellhuber