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Anmeldenummer / Filing No / N^o de la demande : 82 301 875.9

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Bezeichnung der Erfindung: Method and apparatus for decurling web material
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : B65H 23/34

ENTSCHEIDUNG / DECISION
vom / of / du 6 March 1989

Anmelder / Applicant / Demandeur : Appleton Papers Inc.

Patentinhaber / Proprietor of the patent /
Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Article 56 EPC

Schlagwort / Keyword / Mot clé : "Inventive step (yes)"

Leitsatz / Headnote / Sommaire

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Office

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des brevets

Beschwerdekammern

Boards of Appeal

Chambres de recours

Case Number : T 84/86 - 3.2.1



D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 6 March 1989

Appellant : Appleton Papers Inc.
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Decision under appeal : Decision of Examining Division 084
dated 2 October 1985 refusing
European patent application
No. 82 301 875.9 pursuant to
Article 97(1) EPC

Composition of the Board :

Chairman : F. Gumbel
Members : C.T. Wilson
J.C. Saisset

Summary of Facts and Submissions

- I. European patent application No. 82 301 875.9, filed on 8 April 1982 and published under publication No. 0 063 889, was refused by decision of the Examining Division dated 2 October 1985. The decision was based on the original Claims 1 to 14.
- II. By reference to the following documents:-
- US-A-2 797 074 column 6, lines 40-45 and Figure 1
 - US-A-2 627 667 column 3, lines 9-17 and Figure 2
 - FR-A-2 397 221 page 11, lines 16-23 and Figure 2
 - US-A-3 453 742 column 2, line 65 to column 3, line 3 and Figure 1
 - GB-A-732 558 page 2, lines 30-35, 87, 88 and Figure 1
 - US-A-3 467 541 column 4, line 59 to column 5, line 5 and Figure 1
 - CH-A-3 44 813 page 1, line 62 to page 2, line 5 and
 - FR-A-2 273 246 Claim 1 and Figure 1

the Examining Division asserted in its decision that the subject-matter of the present application consists merely in the use of a known technique in a loosely analogous situation. It involves only the application of known measures in an obvious way and in respect of which an inventive step is therefore to be ruled out. Accordingly, the subject-matter of the claims, whilst new, is obvious and the claims are unallowable.

- III. On 22 November 1985 the Applicant lodged an appeal against that decision, at the same time paying the appeal fee. In his Statement of Grounds of Appeal, filed on 31 January 1986, he contested the arguments of the Examining Division and filed two new sets of claims constituting a main

request, Claims 1 to 13, and a subsidiary request, Claims 1 to 7.

The Applicant submitted that the decision fails to pay due attention to the differences between steam decurling and other web treatment processes, and in consequence, arrives at an erroneous view of the "problem to be solved", the relevance of the prior art relied upon, and the presence of an inventive step. The decision also relies impermissibly on hindsight, and wrongly assumes that the significance of maintaining a constant web to steam shower distance was well-known at the priority date and was, in effect, part of the state of the art.

- IV. In response to communications from the Board dated 14 July 1987, 25 May 1988 and 28 December 1988, expressing inter alia doubts about the patentability of the proposed claims, particularly in the light of the disclosure of US-A-2 370 811 (referred to in the original application) the Appellant submitted new Claims 1 to 5, received on 10 January 1989, and suitable amendments to the description and to the drawings, withdrawing all previous requests and requesting grant of a European patent on the basis of the new documents.

The independent claims of the new request read as follows:

- "1. A method for decurling an unsupported floating web by substantially uniform application of moisture thereto, comprising the step of subjecting one surface of the web to a steam shower as the web passes through a steam treatment station, characterized in that a substantially constant distance is maintained between the web material and the source of the steam shower by web stabilizing means in the form of a roller disposed adjacent the opposite surface of the web from the

steam shower, so as to contact the web and thereby restrain the web if the displacement of the web under the influence of the steam shower threatens to cause said substantially constant distance to be exceeded, the displacement of the roller from the source of the steam shower, as considered in a direction perpendicular to that of web movement, being not more than about 0.0190 m (3/4 inch) and the surface of the roller nearest the centre line through the source of the steam shower being offset with respect to the centre line through the source of the steam shower by a distance of approximately 0.0125 m (1/2 inch), so as to be just prior thereto as viewed in the direction of web movement."

- "4. Apparatus for decurling a web by substantially uniform application of moisture thereto comprising means for passing the web through a steam treatment station and a steam source for directing a steam shower at one surface of the web, characterized in that web stabilizing means in the form of a roller is provided on the opposite surface of the web path from the steam source, whereby a substantially constant distance is maintained in use between the web and the steam source as a result of contact of the web and the roller so as to restrain the web if the displacement of the web under the influence of the steam shower threatens to cause said substantially constant distance to be exceeded, the displacement of the roller from the source of the steam shower, as considered in a direction perpendicular to that of web movement, being not more than about 0.0190 m (3/4 inch) and the surface of the roller nearest the centre line through the source of the steam shower being offset with respect to the centre line through the source of the

steam shower by a distance of approximately 0.0125 m (1/2 inch), so as to be just prior thereto as viewed in the direction of web movement."

Reasons for the Decision

1. The appeal is admissible.
2. There are not formal objections to the new claims which are based on the original claims and on the description of the embodiment shown in Figure 2. They therefore comply in particular with Article 123(2) EPC.
3. The precharacterising parts of Claims 1 and 4 are based on the prior art as revealed for example in, and described with respect to, Figure 1 of the present application. This discloses a method and apparatus for decurling an unsupported floating web by substantially uniform application of moisture thereto, comprising the step of subjecting one surface of the web to a steam shower as the web passes through a steam treatment station. This method (and apparatus) has the disadvantage, according to the present application, that the distance between the web and the shower source tends to increase and steam tends to billow. This results in an increased total amount of steam being used to ensure that the amount of steam required for bringing about decurling actually reaches the web.
4. The problem to be solved by the present invention is to avoid this disadvantage.
5. The solution to this problem is set out in the characterising parts of Claims 1 and 4.

6. An examination of the revealed prior art has satisfied the Board that the subject-matter of independent Claims 1 and 4 is novel. Since this has never been disputed, there is no need for further detailed substantiation of this matter.
7. It therefore remains to be examined whether the subject-matter of these claims involves an inventive step. This examination results in the following observations:
 - 7.1 In US-A-2 370 811, (referred to in the application) is described a method and apparatus for conditioning and finishing absorbent flexible webs involving moisturising the web by applying steam. This moistening is stated on page 1 of the patent to serve "to control the tendency of the paper to curl" (column 1, lines 9-17) and "to control the curl of the paper". Since curl is undesirable, these statements must be understood to mean prevent or correct curl, (see column 1, lines 18-21, "It is known that paper having a relatively high moisture content will fold better and give less trouble from curling".)

The method described in this patent involves impinging a ribbon-like jet of steam with a portion of the web opposite that in continuous contact with a cooled roller from a jet positioned not more than about one inch from the web. The cooled roller serves to induce condensation on the web and to maintain it at a constant distance from the steam source. However, the web is not an "unsupported floating web", nor is there any disclosure of offsetting the roller.

- 7.2 Turning now to the prior art documents explicitly referred to in the decision, it should first of all be noted that only two of these (US-A-3 467 541 and CH-A-344 813)

disclose the application of moisture to a moving web and that only one (US-A-3 467 541) is specifically concerned with decurling. Of the remainder, five relate to drying, and one to energy recovery.

- 7.2.1 US-A-3 467 541, which is acknowledged in the present application, relates to an electrostatic process for moisturising a paper or other web. The moisture is directed at the web in the form of a spray from one or more nozzles (34) which are supplied from a water tank (51). The nozzles each constitute part of an emission electrode (31). Collector electrodes are disposed adjacent the opposite surface of the web from the nozzles, and take the form of blow boxes, the purpose of the gas flow from which is to prevent the web from touching the collector electrodes rather than to maintain a substantially constant distance between the web and the nozzles as in the present invention. Moreover, the blow boxes cannot be considered to constitute web stabilizing means, as they are precluded from contacting, and thereby stabilizing, the web. Furthermore, the spacing between the web and the electrodes from which the water spray is emitted is disclosed as being of the order of 7 inches (see column 4, lines 48 to 58) which is substantially greater than the corresponding spacing of a steam decurling system, and far in excess of the 0.0190 m (3/4 inch) specified in the present claims.
- 7.2.2 CH-A-344 813 discloses a device for moistening a moving pliable material, e.g. of plastics coated paper, whereby the material to be treated is transported by a conveyor positioned above a dispersing pipe for a moistening liquid. A current of air is directed against the material to cause the material to be pressed against the liquid from the pipes rather than to maintain a substantially constant distance between the web and the water supply pipes.

7.2.3 US-A-2 797 074 relates to operating controls for print-drying apparatus, including a guide roller which supports the web to prevent damage as a result of the web fluttering under the air knife. The spacing of the web from the air knife in the direction of web movement is so great as to suggest that although the guide roller may reduce the flutter which would otherwise occur in the long passage (38), it would not be effective to maintain the "substantially constant distance" required by the present claims. Furthermore, there is no indication of the displacement of the air knife from the guide roller, as viewed in a direction perpendicular to that of web movement.

7.2.4 US-A-2 627 relates to a method and apparatus for drying inks on a web in which the web is prevented from fluttering by means of a grid-like supporting surface.

Moisturisation is to be avoided, (see column 4, lines 13-15, which discloses that "it is important that there shall be no condensation as will moisten the web"). Also at column 1, lines 52 and 53 it is stated that the superheated steam employed for the drying fulfils its function "before the steam has a chance to condense and wet or spot the paper". The grid-like supporting surface is provided to support the web against suction pressure, and there is no indication of the displacement of the grid from the steam nozzle tips.

7.2.5 US-A-3 453 742 relates to an apparatus for drying printing inks on a plastic film. A backing plate defines a pathway for the film opposite the dryer housing. Drying air issues from a housing spaced 1 1/4 inches from a backing plate (see Figure 3), i.e. well above the 3/4 inch spacing now specified in the claims.

- 7.2.6 GB-A-732 558 relates to a drier adapted to operate at the output end of a printing machine. Superheated steam in circulatory motion is used as a drying agent. The web is conveyed on rollers whilst jets of superheated steam act on the opposite side. There is no indication of the spacing of the nozzles from the guide rollers.
- 7.2.7 FR-A-2 273 246 relates to a drier for material which has been coated on two surfaces. The web of material to be dried is supported by opposed air flows acting on its opposite surfaces.
- 7.2.8 FR-A-2 397 221 relates to a method and apparatus for recovering energy in a thermal oxidation system of a printing press. A roller supports the web against pressure of incoming air. As with FR-A-2 273 246, there is no indication of the spacing between the air ducts and the rollers 44.
8. In summary therefore, the revealed prior art is silent as to the idea of maintaining a constant distance between the web material and the source of the steam shower by means of a roller offset specified distances away from the source both in a direction perpendicular to the movement of the web and in the direction of web movement. There is no suggestion in the prior art for the person skilled in the art as to how these distances could be arrived at to solve the problem set out in paragraph (4) above. The subject-matter of each of Claims 1 and 4 therefore involves an inventive step.

These claims are therefore allowable.

9. Claims 2 and 3 and Claim 5, dependent on Claims 1 and 4 respectively, relate to particular embodiments of the invention defined in these claims and are thus also allowable.

10. The amendments to the description, and the deletion of Figure 3 of the drawings, bring them into line with the new claims and are also allowable.

Order

For these reasons, it is decided that:

1. The Decision of the Examining Division dated 2 October 1985 is set aside.
2. The application is remitted to the first instance with the order to grant a European patent on the basis of the following documents:

Claims 1 to 5 received 10 January 1989
Description, originally filed pages 1, 2 and 7,
replacement pages 3 and 4 received 10 January 1989, and
manuscript-amended pages 5, 6 and 8 received on
22 July 1988,
Drawings, sheets 1/2 and 2/2 received on 22 July 1988.

The Registrar:

The Chairman:

S. Fabiani

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F. Gumbel

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