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D E C I S I O N
of 11 March 1999

Case Number: T 0939/96 - 3.2.3

Application Number: 92850301.0

Publication Number: 0549553

IPC: D21F 3/04

Language of the proceedings: EN

Title of invention:
Press section of a paper machine, in particular for printing paper qualities

Applicant:
Valmet Corporation

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56, 113(1)

Keyword:
"Inventive step (no)"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0939/96 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 11 March 1999

Appellant: Valmet Corporation
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 17 May 1996 refusing European patent application No. 92 850 301.0 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. T. Wilson
Members: J. du Pouget de Nadaillac
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. The appeal is filed against the decision dated 17 May 1996 of an Examining Division of the European Patent Office, which refused the European patent application No. 92 850 301.0 (Publication EP-A1-0 549 553) for lack of inventive step of the claimed subject-matter, having regard to the disclosures of documents D1, D2 and D3, among the following prior art citations which were considered during the examination proceedings:

D1: DE-A-3 515 576

D2: WO-A-91 17 308

D3: EP-A-0 296 138

D4: WO-A-87 06 634

D5: GB-A-2 239 268

D6: DE-A-3 336 462

II. The appellant (applicant) lodged the appeal on 17 June 1996 and paid the appeal fee on the same day. In the statement of grounds filed on 19 September 1996, he first requested the case to be remitted to the first instance and the appeal fee to be reimbursed, since in his opinion a procedural violation was involved with the contested decision, the reason for the obviousness of combining documents D1 to D3 being not given. By way of auxiliary requests, he requested a patent to be granted on the basis of either the refused claims or of

a claim set joined to the statement of grounds and, if necessary, oral proceedings to be held.

In a communication dated 6 February 1998 accompanying the summons for oral proceedings, the Board of appeal expressed its provisional opinion that an infringement of Article 113(1) and Rule 68(2) EPC could not be seen, since the decision under appeal appeared to be well grounded, and that the subject-matter of both sets of claims, submitted by the appellant, did not appear to involve an inventive step, in particular having regard to documents D3 and D4.

III. By a fax received on 10 December 1998 and confirmed, the appellant withdrew all his previous requests, including that for oral proceedings, and submitted a single claim as his sole request, which reads as follows:

"Press section of a paper machine, in particular for printing paper qualities whose grammage is in the range of 40...80 g/m^2, which press section comprises a first roll (13) which is a suction pick-up roll (13), the suction pick-up roll having a suction zone (13a) for picking up a web (W) from a pick-up point (P) on a forming wire (10) of a forming section, a first felt (15) which is a pick-up felt and which is looped around the suction pick-up roll (13) and which first felt (15) serves as a water receiving press fabric, a second roll (16) which is a hollow faced press roll and forms a first nip (N1) with the pick-up roll (13), a second felt (17) passing around the second roll (16) such that, in the first nip (N1), which is a roll nip, the web is passed between the first felt (15) and the

second felt (17), and which press section includes a second nip (Np) which is arranged after said first nip (N1) and into which second nip (Np) the web (W) is passed as a closed draw on support of the pick-up felt and which second nip (Np) is formed between a third roll (20) and a fourth roll (40) which has a smooth face (40'), and where the first felt (15) passes through the second nip (Np) such that the web is contacted on one side by the first felt (15) and on the other side by the fourth roll (40), the second nip (Np) being the only nip formed against the fourth roll (40), c h a r a c t e r i z e d in that said first nip (N1) has relatively low load and in the area of said nip almost or approximately one half of the total amount of the water contained in the web (W) is removed, that the third roll (20) is a shoe roll such that the second nip (Np) is an extended nip, having a length of >100 mm, and in that the press section includes only said first and second press nips (N1, Np) such that after the extended nip (Np) the web (W) is separated from said pick-up felt (15) and follows the smooth face (40') of the fourth roll (40), from which it is detached as a short open draw (Wp) for transfer to the drying section of the paper machine."

IV. The oral proceedings having been cancelled, the written arguments of the appellant can be summarised as follows:

Even if citation D3 suggests using either one second nip N2 or two following nips N2 and N3, it does not teach the provision of a press section with only two press nips. The term "includes" leaves open the number of nips, and this prior art provides no suggestion that

the paper web should be transferred to the drying section after passing through no more than two nips. Further, there is no hint in this document of a transfer of the paper web from a smooth-faced centre roll having only one nip to the drying section as a short open draw.

In document D4, there is no teaching to make use of the pick-up felt as a press felt for carrying the paper web through the extended nip, since the pick-up felt is disclosed separately from the press felts. Moreover, the first nip is between two suction rolls, which are noisy and expensive. As to the extended nip in this prior art, there is no requirement that its length should be above the limit given in the single claim of the patent application in suit. This feature of the present invention contributes to the remarkable high dry solids content of the web at the end of the press section, as claimed. Therefore, it would not be obvious to combine D3 and D4.

V. The appellant requested the decision under appeal to be set aside and a patent to be granted on the basis of the single claim submitted on 10 December 1998.

Reasons for the Decision

1. The appeal is admissible.

2. The press section according to this single claim is illustrated in Figure 1 of the patent application, as originally filed. All the features of the single claim

can be found in the detailed description of this embodiment, starting from line 21 of page 7 to the last line of page 9 of the original description. Thus, the subject-matter of the single claim does not extend beyond the content of the application as filed (Article 123(2) EPC).

3. Since none of the cited prior art documents discloses a press section having all the features of the single claim, its subject-matter is considered to be new (Articles 52 and 54 EPC).

4. The prior art, which is the closest to the present invention, is represented by the device described in Figure 1 of citation D3, which describes a three-nip press section. According to the appellant, the two-part form of the single claim is based upon this known press section. This press section indeed comprises all the features of the preamble of this claim. Important thereby is the first nip N1, also called the front nip, since it is realized between the pick-up roll - acting as a first press roll - and a second press roll, and since further the pick-up felt is used as a press felt. One advantage of this arrangement, which is mentioned in D3, is the compacity thereby obtained of the press section. Moreover, the pick-up felt not only serves as a press felt for the front nip, but also for the following or second nip N2 disclosed in this prior art, so that the paper web constantly remains on support (without open draw), allowing high speeds of the press machine. This pick-up felt is the only felt which receives water and which passes through the first and second nip.

In this prior art, the second nip N2 is defined by a press roll and a smooth-faced centre roll. The term "centre roll" usually means a press roll with preferably a rather greater diameter than usual. Around and against such a roll, one or two press rolls of lower radius are arranged, so that one or two press nips are provided. A compact press configuration is thereby reached. In the introductory part of the description of D3 and in its Claim 1, it is indicated that "at least one, preferably two single-felt nips (N2, N3) are formed against the centre roll". The third nip is only the subject-matter of the dependent Claim 3. It follows that, without an a posteriori view, one possibility disclosed or at least suggested in D3, although not being the preferred embodiment, is a press section with only two successive nips.

It is moreover disclosed in this prior art (see in particular column 6, lines 5 to 10), that the paper "web can be detached from the centre roll face sufficiently readily by the effect of a difference in speed as the web is transferred as an open draw from the press section to the drying section or...". It it is also indicated in column 4, lines 36 to 44, that the resultant loading of the pick-up suction roll is lower than ..., because the pick-up roll is loaded by one nip only. Linear load values about 80 kN/m for the front nip N1 are given in column 7, corresponding to the values given in the present application for the front nip N1 (see column 6, lines 12, 13 of the published specification), namely a linear load between 10 to 120 kN/m, preferably in the range of 30 to 80 kN/m. A consequence of these two disclosures is on the one hand that the first and last features of the characterising

part of the single claim are known from D3 and on the other hand that, having in the device according to D3 the same structural features for the front nip N1 and the same load as in the present invention, it is to be assumed that also the result claimed in the characterising part of the single claim, namely that almost one half of the total amount of the water contained in the web is removed in the front nip N1, is reached in the front nip according to D3.

Thus, the single claim is not divided in a correct two-part form according to Rule 29(1) EPC.

5. Ignoring nevertheless the above possibility or suggestion in D3 of having only two nips for the press section, the press section according to the single claim differs from that of D3 in that:

- the second nip (N2) is an extended nip (Np), since the third roll is a shoe roll, the fourth press roll still being a smooth-faced press roll,

- the extended nip (Np) has a length of not more than 100 mm, and

- the press section includes only said first and second nips (N1, Np).

6. In the introductory part of the description of the patent application in suit, known "Sym-Press"(trade mark) press sections of the appellant are mentioned. These known press sections also include the compact arrangement shown in D3 with the centre roll and the at least one or two nips thereabout. According to the

patent application in suit, one object of the present invention is the further development of the prior art press sections, so that a more efficient and compact press section is provided. Further objects mentioned in the last paragraph of page 4 and first paragraph of page 5 of the description, as originally filed, although pointed out by the appellant in his statement of grounds, cannot be considered, since they either mention a part of the solution, namely the provision of an extended nip, or are already solved by the device according to D3 (front nip with relatively low linear loads).

Having regard to the problems created by the several nips around a centre roll, it is indicated in the description of the patent application in suit that, with the increase in speeds of the paper machine, the nip times remain unduly short, whereas the peak of compression cannot be increased beyond a certain limit without destruction of the structure of the web.

7. The person skilled in the art, who is confronted with the above problems and wishes to improve the press section according to D3, will be aware of the disclosure of document D4, since the press section therein described shows great similarities, namely firstly a compact press configuration, which is also achieved by the use of the pick-up roll as a press roll, and secondly a constant support of the web by means of a single felt which passes through the first and second nips, thereby eliminating the need for transfer means between the nips and the use of two felts between the nips. These results are clearly mentioned in this prior art citation (see in particular

page 5, lines 1 to 3; page 9, lines 1 to 16 and page 11, lines 1 to 14).

Moreover this prior art also starts from a known press section including two successive press nips, the second nip however not being an extended nip, and an improvement of this known press section is wished, the main object remaining the removal of as much water as possible. D4, as solution, teaches to provide, as second nip, an extended nip for imparting further dewatering to the web, even when an optimal amount of water has been removed during passage through the first nip (see page 1, second paragraph; page 4, last sentence of the first paragraph, and page 9, lines 14 to 16).

For all these reasons, the Board cannot agree with the appellant, that the person skilled in the art would not combine D3 and D4. On the contrary, as seen above, he has many reasons to do so or at least to consider the teaching of D4, especially as at the priority date of the present application, the person skilled in the art was well aware of the improved dewatering effect of the extended nip press means, which was one of the main improvements in the paper machine industry during the 70's and 80's.

8. The press section embodiment according to Figure 2 of D4 comprises a front nip N1 defined by two suction rolls, one being the pick-up suction roll, and a second nip, which is an extended nip defined by a press shoe and a press roll. In Figure 2, this last press roll is apparently shown as a grooved or hollow-faced roll. However, a plain roll could as well be used, as shown

in Figure 1 and disclosed by the last lines of page 7. Although not expressly indicated in this prior art, the press section disclosed therein only comprises these two nips, since Claim 1 of this document teaches that the press section comprises two nips, without further mention of any following nip in the whole document, and all the figures of this citation show a web leaving the extended nip without support or following transfer means, implying therefore a transfer of the web into the drying section. In the embodiments according to Figures 1, 3 and 4, which each also comprises a first nip followed by an extended nip, the web after the extended nip is clearly directed downwards, in an open draw.

For the person skilled in the art, having regard to the teaching of this document, it is obvious to replace the one or two nips around the smooth-faced centre roll according to D3 by the extended nip of D4. The improved dewatering effect of such an extended nip is known, one reason being that the nip time is greatly increased, compared to the short nip times of the second and eventually third nips according to D3. It may be, as argued by the appellant, that the press rolls surrounding the center roll in D3 are much cheaper than a press shoe, but such an economical argument becomes irrelevant when these press rolls are seen to be inefficient.

9. The appellant has argued that one reason for not combining D3 with D4 was the front nip defined by two suction rolls in the device according to D4. However, one object of D3 was to avoid or at least to reduce the number of suction rolls and consequently it teaches to

provide a front nip as claimed, said nip reaching moreover an improved dewatering effect, as seen above. The person skilled in the art, starting from D3, has therefore no reason to modify the front nip and he concentrates his search on an improvement of the following nip. The fact that D4, further, teaches the use of a felt separate from the pick-up felt for the run through both nips is of minor importance, since D3 teaches to use the pick-up felt for the same purpose. It is up to the person skilled in the art to choose one of these two possibilities according to the circumstances.

10. There is no mention of a particular lower limit for the length of the extended nip in D4. However, such a feature cannot involve an inventive step, since such a lower limit is common for an extended nip : Document D1 for the same kind of printing papers discloses a length between 15 to 25 cm, preferably 20 cm, and document D5 mentions 25 cm as a typical length. It would moreover not involve more than routine experiments to determine the appropriate lengths.

11. Therefore, the subject-matter of the single claim does not involve an inventive step, so that the present patent application cannot lead to a patent.

12. The same conclusion is reached when combining D3 with the teaching of D1. The idea of a compact configuration is already solved in the press section according to D3, since the first nip is a front nip corresponding to the one claimed and having the same effects. Thus, starting from this closest prior art D3, the remaining object is to improve the efficiency of the press section, in particular having regard to the deficient dewatering effect of the following nips of D3 because of the low nip times they imply.

The main object of document D1 is to obtain a very high dewatering effect for the same printing papers as in the present invention, and that with only two nips, see page 7, lines 14 to 27. For this reason, the person skilled in the art would consider this prior art. It is clearly taught in this prior art that the dewatering effect is greatly improved, when the second nip is an extended nip (see the first lines of page 12), so that the solution immediately appears at once. For the first nip, which is not a front nip in this prior art, but nevertheles is defined by a suction roll and a press roll, as is the case with the front nip according to D3, a load between 50 to 100 kN/m is given, corresponding to the load of the front nip according to D3. Therefore, the person skilled in the art has all reasons to maintain the compact configuration according to D3 and, in order to solve the above mentioned remaining problem, to modify only the second and third nip arrangement of D3 by introducing an extended nip according to the main solution of D1. The idea of a single felt is already given in D3, and no difficulty can be seen in the replacement of the third roll according to D3 by a shoe roll according to D1.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman:

N. Maslin C. T. Wilson