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D E C I S I O N
of 26 July 2001

Case Number: T 1127/98 - 3.2.2

Application Number: 90630170.0

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IPC: D21G 9/00

Language of the proceedings: EN

Title of invention:

A transfer apparatus for transferring a tail of a web

Patentee:

BELOIT TECHNOLOGIES, INC

Opponent:

Voith Sulzer Papiermaschinen GmbH

Headword:

-

Relevant legal provisions:

EPC Art. 52, 56

Keyword:

"Inventive step (yes)"

Decisions cited:

-

Catchword:

-



Case Number: T 1127/98 - 3.2.2

D E C I S I O N
of the Technical Board of Appeal 3.2.2
of 26 July 2001

Appellant: Voith Sulzer Papiermaschinen GmbH
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Representative: Gleiss & Grosse
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Respondent: BELOIT TECHNOLOGIES, INC.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 15 October 1998
rejecting the opposition filed against European
patent No. 0 421 911 pursuant to Article 102(2)
EPC.

Composition of the Board:

Chairman: W. D. Weiss
Members: D. Valle
R. T. Menapace

Summary of Facts and Submissions

I. The appellant (opponent) filed an appeal against the decision of the opposition division to reject the opposition, paid the appeal fee and filed the statement of grounds in due time.

II. The patent was opposed on the basis of lack of novelty and inventive step having regard to nine documents of which the documents

E1 = WO-A-83/00514

E5 = US-A-2 874 997

were still discussed at the appeal stage.

The opposition division, in the decision under appeal, found that the grounds of opposition did not prejudice the maintenance of the patent unamended and rejected the opposition.

With letter of 17 May 2001 the appellant cited the further document:

E11 = US-A-2 892 263

reiterating its objection of lack novelty of claim 1.

III. On request of the appellant oral proceedings were held on 26 July 2001. At the end of the oral proceedings the requests of the parties were as follows:

- The appellant requested that the decision under appeal be set aside and the patent revoked.

- The respondent requested that the appeal be dismissed and that the patent be maintained as granted (main request) or that the patent be maintained in amended form with claim 1 according to the first auxiliary request filed with letter of 19 June 2001.

IV. Claim 1 as granted reads as follows:

"A transfer apparatus (10C, 10D) for transferring a tail (TC, TD) of a web (WC, WD) from a press roll (12C) to a dryer (14C) of a dryer section (16C), said apparatus (10C, 10D) comprising:

a lead-in roll (22C, 22D) disposed adjacent to and spaced relative to the press roll (12C) for leading the tail (TC, TD) of the web (WC, WD) from the press roll (12C) towards the dryer (14C);

a dryer felt (20C, 20D) extending around said lead-in roll (22C, 22D) and from said lead-in roll (22C, 22D) to the dryer (14C) such that the tail (TC, TD) of the web (WC, WD) is supported by said felt (20C, 20D) from said lead-in roll (22C, 22D) to the dryer (14C), said felt (20C, 20D) and the dryer (14C) defining there between a positive air pressure in-going nip (NC, ND), the tail (TC, TD) of the web (WC, WD) being disposed between said felt (20C, 20D) and the dryer (14D); and

a rotatable suction roll (30, 30D) disposed between said lead-in roll (22C, 22D) and said dryer (14C) and on the opposite side of said felt (20C, 20D) relative to said in-going nip (NC, ND),

characterized in that

such suction roll (30, 30D) is disposed adjacent to said in-going nip (NC, ND) such that in use of said apparatus (10C, 10D), said suction roll (30, 30D) generates a flow of air (32, 32D) from said positive air pressure in-going nip (NC, ND) through said felt (20C, 20D) such that when the tail (TC, TD) of the web (WC, WD) is being transferred from the press roll (12C) towards the dryer (14C), the tendency for said positive air pressure in the vicinity of said in-going nip (NC, ND) to prevent threading of said tail (TC, TD) between said felt (20C, 20D) and the dryer (14C) is inhibited."

V. The appellant argued as follows:

Document E11 disclosed all the features of claim 1, in particular, in Figure 3, the lead-in roll corresponded to the not referenced roll between the press roll (257) and the suction roll (212). The felt (214) and the dryer roll (211) met together forming the nip (N 213). The suction roll was not only useful for de-watering but also for generating an underpressure on the nip (see column 12, lines 36 to 44).

Claim 1 differed from the teaching of document E5 only in that a suction roll was used instead of the blow box 56. This was however, contrary to the view taken in the decision under appeal, point 2.2.5, page 11, first paragraph, only a non inventive modification of the known teaching. The general purpose in the design of machines of any type was to improve the running speed. The papermaking machines achieved this goal by increasing the conveyance speed of the material, or in other terms, the speed of the rolls and of the belt

conveyors. The increased speed inevitably brought about a pressure increase in the nip between rolls and conveyor belt which inevitably caused the web to flutter which effect was disadvantageous in particular when threading a tail. It was further known that an increased speed of the conveyor belt caused an increased wear of the conveyor belt contacting the (fixed) sucking box, (see eg document E5, column 2, lines 32 to 38). The solution to these known problems suggested by the patent in suit was already hinted at by document E5 which suggested to use an intermediate vacuum roll 52, see Figure 3 and column 11, lines 19, 31. By substituting the blow box in document E5 with a vacuum roll, the skilled person would arrive at the invention in an obvious way.

Alternatively, the solution of the patent in suit for maintaining a reduced pressure near the nip without provoking an increased wear was already known from document E1, Figures 1 and 2.

The respondent argued as follows:

Document E11 should not be considered by the Board because it was late-filed and not relevant. This document concerned a so-called Yankee dryer which was completely different from the claimed apparatus for the following reasons:

A press felt (214) as used in document E11 had to withstand pressure forces and be suitable to absorb and carry away water. In contrast thereto, the dryer felt used with the claimed apparatus had to be permeable to air and vapour. The mutual disposition of the rolls and the felt in document E11 was such that it was not

possible to cut the web as required by the invention. There was no felt-free section in document E11, where the web was unsupported by the felt and therefore could be cut without damaging the felt. The intermediate roll of document E11 was not a lead-in roll which by definition was typically positioned near the press roll at the end of the unsupported length of the web. There was no mention in document E11 of threading of the tail.

Document E5, column 15, lines 33 to 39 was primarily concerned with the guidance of the full width (9 m) of the web along the transfer felt to the first dryer. The transfer of the tail (5,08-15,24 cm width) was realized with a manually handled air jet and additionally by air jets 80 (see column 13, lines 3 to 9, and from line 53 to column 14, line 16; Figure 3). It was therefore incorrect to assume that document E5 would suggest to employ a suction roll in the vicinity of the ingoing nip of the first dryer instead of the blow box 56 to facilitate threading of the tail of the web. Furthermore, contrary to the invention, the partial vacuum generated by the blow box 56 extended over a considerable length upstream of the ingoing nip. In document E5, Figure 3, the web extended along a rectilinear path from the lead-in roll 10 to the first dryer 42b, parallel to the bottom surface of the blow box 56, whereas by the invention, in order for the suction roll to be effective, the felt and the web supported by the felt must wrap a portion of the circumference of the suction roll. All these circumstances implied a completely different geometry of the transfer apparatus.

Regarding document E1, there was no indication that the

suction roll 15, Figure 1, drew air from the ingoing nip in order to improve tail threading. The problem of tail threading was not mentioned at all in document E1. In Figure 1 the suction roll 15 was spaced apart from the dryer 11 and it had no significant effect on the pressure level in the nip. A comparison between Figures 1 and 2 showed that the distance between suction roll 15 and dryer 11 in Figure 1 was not meant to be a small one. Document E1 concerned machines where the transfer distance between pressure section and drying section was small. On the contrary the arrangement according to the patent in suit was of the type comprising a "long" transfer distance, see Figures 1 to 3 of the original disclosure all relating to "long" transfer distance machines of the relevant prior art.

Reasons for the Decision

1. The appeal is admissible.
2. *Late filed document.*

Document E11 has been filed in a very late stage of the procedure without any justification and it is not sufficiently relevant in order to challenge the novelty of claim 1 because it concerns Yankee machines for making glazed paper which is a technology remote from that of the invention. This type of apparatus implies that several of its elements have a form and function which differ from that of the patent in suit. In particular document E11 does not disclose a lead-in roll within the meaning of the invention (adjacent to the press roll), nor a "light" felt within the meaning

of the invention (the felt 214 in document E11 is pressed against the dryer roll).

Accordingly document E11 is disregarded on the ground of Article 114(2) EPC.

3. *Novelty*

None of the documents of the prior art introduced into the procedure discloses all the features of claim 1. The appellant did not challenge the novelty of claim 1 either.

4. *Inventive step*

4.1 Document E5 - particularly in column 13, lines 3 to 9, and in column 13, line 53 to column 14, line 16 - discloses a transfer apparatus for transferring a tail of a web (Wb) from a press roll (12b) to a dryer (42b) of a dryer section (14b), said apparatus comprising:

- a lead-in roll (38b) disposed adjacent to and spaced relative to the press roll (12b) for leading the tail of the web from the press roll (12b) towards the dryer (42b);
- a dryer felt (40b) extending around said lead-in roll (38b) and from said lead-in roll (38b) to the dryer (42b) such that the tail of the web (Wb) is supported by said felt (40b) from said lead-in roll (38b) to the dryer (42b), said felt (40b) and the dryer (42b) defining therebetween a positive air pressure in-going nip (44b), the tail of the web (Wb) being disposed between said felt (40b) and the dryer (42b); and

- a rotatable suction roll (52; column 11, lines 15 to 19) disposed between said lead-in roll (38b) and said dryer (42b) and on the opposite side of said felt (40b) relative to said in-going nip (44b). See in particular Figure 3.

Claim 1 distinguishes therefrom by its characterizing part, that is:

"Such suction roll (30, 30D) is disposed adjacent to said in-going nip (NC, ND) such that in use of said apparatus (10C, 10D), said suction roll (30, 30D) generates a flow of air (32, 32D) from said positive air pressure in-going nip (NC, ND) through said felt (20C, 20D) such that when the tail (TC, TD) of the web (WC, WD) is being transferred from the press roll (12C) towards the dryer (14C), the tendency for said positive air pressure in the vicinity of said in-going nip (NC, ND) to prevent threading of said tail (TC, TD) between said felt (20C, 20D) and the dryer (14C) is inhibited."

The statement of the appellant, that claim 1 differs from the teaching of document E5 only in that a suction roll (such as the intermediate roll 52) is used instead of the blow box 56, is not acceptable.

In fact the part of the apparatus of document E5 designed for threading the tail into the nip (44b) is made of a manually handled air jet and of the air jets 80, Figure 3; see column 13, lines 3 to 9, and from line 53 to column 14, line 16. The function of the box 56 is to blow air laterally along the longitudinal sides of the box (88, Figure 5) and, at its head, longitudinally away from the nip (76, Figures 3 and 5), in order to maintain a reduced pressure on the felt

which helps to keep the web in contact with the felt. Since a tail is considerably narrower than the felt, the box would, however, have no significant effect on it. In particular, the purpose of the head blowing 76 is to prevent drooping of the web in the vicinity of the nip, see column 10, lines 21 to 38; column 12, lines 17 to 28; column 15, line 33 to 39, and column 16, line 10 to 19. Document E5 does not mention the problem of threading of the tail in this connection. The intermediate suction roll 52 according to document E5 is not designed either to facilitate threading of the tail but to reduce the span, i.e. the unsupported distance that the transfer felt must travel, so that the tendency of the transfer felt to bow is limited (column 14, lines 17 to 35).

Consequently the subject-matter of claim 1 differs from the disclosure of document E5 art by the features of the characterizing part.

- 4.2 Starting from the teaching of document E5, which uncontestedly represents the closest prior art, the technical problem to solved by the invention has to be seen in improving tail threading and in avoiding wear of the web and in particular in avoiding thread detachment, see patent specification, column 2, from line 22.

Document E5 itself does not contain any hint for the person skilled in the art to arrive at the invention in an obvious way. If the person skilled in the art noticed that the pressure at the nip in the device according to document E5 is too high causing difficulty in threading of the tail he would either increase the pressure of the hand-held device and of the fixed air

jets 80 or he would increase the box head blowing 76 (see column 12, lines 29 to 44), but he would by no means completely modify the apparatus of document E5 and arrive to the invention in an obvious way.

Also the additional consideration of document E1, see Figure 1, would not lead in an obvious way to the claimed invention, since this document concerns a papermaking machine having only an intermediate roll (15) between the press roll (25) and the drying rolls (11 to 14, 26, 27). Such roll is similar to the rolls 16 to 18 which lie between two successive drying rolls and have the function to avoid overstretching or tear of the paper web as it travels on their arcuate lateral surface. To this purpose a centripetal sucking force is provided which is exactly the same (in magnitude and direction) as the centrifugal force due to the curved path, see page 5, last paragraph.

Document E1 is aware that the negative pressure generated by an intermediate roll can be useful for threading the tail (Überführungsstreifen), and that to this purpose the roll should be positioned adjacent to the drying roll, see page 7, first paragraph, and claim 4.

Nevertheless, the intermediate rolls of document E1 are principally directed to support the web and not the tail. There is no possibility to specialize such rolls either for helping picking up and redirecting the tail (lead-in function) or for inserting it in the nip (sucking function). On the contrary, according to the patent in suit the lead-in function is performed by a specialized roll disposed adjacent to and spaced relative to press roll and designed in order to gently

redirect the tail, whereby the tail itself can remain attached to the web just because it is wet. The sucking roll of the patent in suit on the other hand is especially designed for threading of the tail in the nip and therefore its position and the magnitude and direction of the sucking force can be exactly set in order to achieve the best result according to the specific circumstances.

Accordingly the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

V. Commare

W. D. Weiß