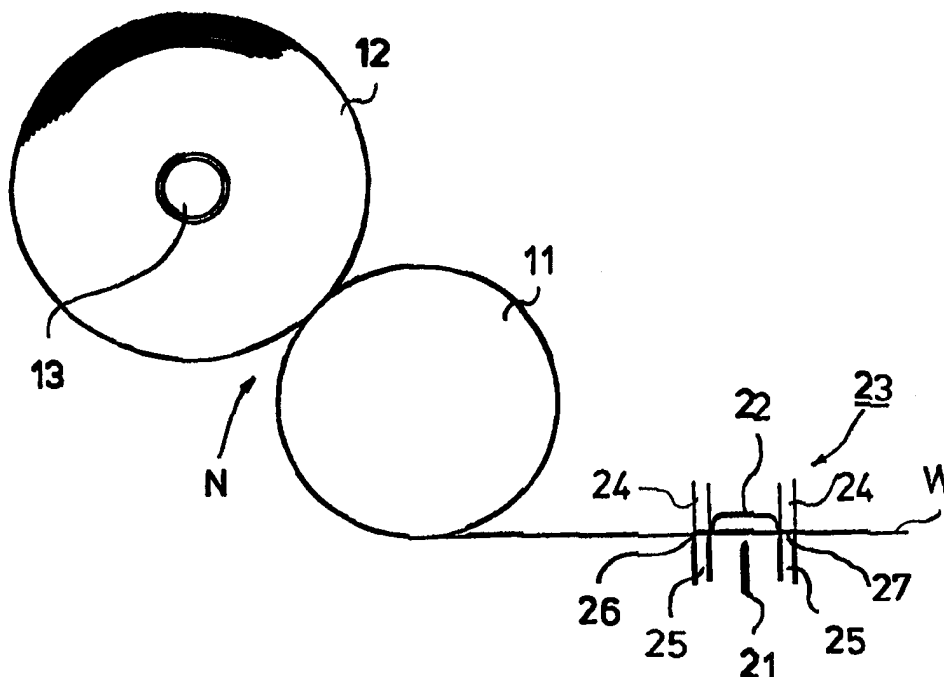




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(21) International Application Number: PCT/FI96/00558 (22) International Filing Date: 22 October 1996 (22.10.96) (71) Applicant (for all designated States except US): VALMET CORPORATION [FI/FI]; Panuntie 6, FIN-00620 Helsinki (FI). (72) Inventor; and (75) Inventor/Applicant (for US only): ERONEN, Pekka [FI/FI]; Oritmuronkuja 53 D, FIN-04430 Järvenpää (FI). (74) Agent: FORSSÉN & SALOMAA OY; Yrjönkatu 30, FIN-00100 Helsinki (FI).		(81) Designated States: CA, JP, KR, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>In English translation (filed in Finnish).</i>

(54) Title: METHOD IN WINDING OF A WEB, IN PARTICULAR OF A PAPER OR BOARD WEB

**(57) Abstract**

A method in winding of a web, in particular of a paper or board web, in which method the web (W) is wound onto a roll spool (13) or equivalent through a nip (N) between a roll (11) or equivalent and the roll spool (13) or equivalent. In the method, when the roll (12) that is formed on the spool (13) becomes complete, a material strip (22) with one adhesive face is fixed to the web (W) at both edges in the running direction (S) of the web to fixing points (26, 27), the distance between said fixing points being substantially shorter than the length of the web (W) between the fixing points (26, 27).

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Method in winding of a web, in particular of a paper or board web

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The invention concerns a method in winding of a web, in particular of a paper or board web, in which method the web is wound onto a roll spool or equivalent through a nip between a roll or equivalent and the roll spool or equivalent.

- 10 The machine reel produced in a paper machine is often slit into component webs in a slitter-winder, out of which component webs customer rolls or commercial rolls of desired width are formed. In the commercial rolls formed in the slitter-winder, automatic fixing of the cutting point, i.e. the tail end of the web, to the full roll after winding and the fixing of the initial end of the web to the new roll spool are to-day
- 15 ever more important properties in further processing of the paper. This comes from the fact that, at present, ever fewer people work at the slitter-winder, and the roll changes, web threading, and other necessary operations require such a high proportion of the working time of said people that there is hardly time for manual fixing of the final ends / initial ends of the rolls by means of tape or equivalent. Moreover,
- 20 rolls whose final ends have not been fixed produce difficulties on the conveyors. Likewise, it is a problem that a roll whose final end has not been fixed has time to become loose before packaging.

- With respect to the prior art, reference is made to the FI Patent *91,054*, in which a
- 25 method and a device are described for automatic cutting and winding of a product web. In said paper, a solution is also suggested for fixing the end of the web, in which solution the web is weakened and strips of adhesive material are provided at the forward side and at the rear side of the weakening area. However, one problem in this prior-art solution, in particular with thicker paper grades, is ply separation of
- 30 the paper, i.e. the paper is separated from the roll or spool in spite of the adhesive fixing. Ply separation of paper means that, while the paper is fixed by gluing onto the spool from one side, rigid paper and, especially, board grades tend to straighten

themselves to their linear form present on the machine reel and are split starting from the end of the web, in which case the starting of winding can fail completely or a fold is formed on the bottom of the roll. It can also be difficult to find a correct degree of weakening of the web when paper grades of different strengths are run.

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The object of the present invention is to provide a method in which the drawbacks of the prior-art solutions are not present and by whose means the ends of the web can be fixed automatically to the roll and to the spool, respectively, simply and reliably.

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It is a particular object of the invention to create a solution that is suitable for use in connection with a slitter-winder when the slitter-winder slows down and stops for roll change.

15 The method in accordance with the invention is mainly characterized in that, in the method, when the roll that is formed on the spool becomes complete, a material strip with one adhesive face is fixed to the web at its edges transverse to the running direction of the web to fixing points so that the edges of the material strip are placed on the web at the fixing points at a distance between said fixing points in the running
20 direction of the web that is shorter than the length of the material strip in the running direction of the web.

According to the invention, a material strip with one adhesive face is fixed to the face of the web, the length of said material strip in the running direction of the web
25 being larger than the distance between its fastening points, and the web is cut off at a suitable point between the fastening points. After this, the material strip with one adhesive face is cut off so that one of its parts fixes the final end of the web to the complete roll and the other part fixes the initial end of the web to a new roll spool or equivalent.

30

According to the invention, the slitter-winder is stopped for the roll change, and the material strip with one adhesive face, preferably a one-sided tape, is fixed to the

face of the web from two zones separate from one another. After this, the web is cut off between the tape fixing points. Since the length of the tape in the running direction of the web is longer than the distance between the fastening points, "unused" tape remains between the ends of the cut-off web. A part of this tape is
5 used for fixing the tail of the roll to the roll, and the rest is used for fixing the web onto the roll spool, respectively.

In an embodiment of the invention the tape has been weakened in advance at the point at which it is supposed to be split between the fastening of the roll tail and the
10 fastening of the web onto the spool.

The fixing by means of the method of the invention is reliable, because it is carried out across the cut-off area, whereby the risk of ply separation is eliminated fully.

15 In the following, the invention will be described in more detail with reference to the figures in the accompanying drawing, the invention being, however, in no way supposed to be strictly confined to the details of said illustrations.

Figure 1 is a schematic illustration of the stage of the method of the invention in
20 which the slitter-winder has been stopped for the purpose of cutting off the web and fixing the tape.

Figure 2 is a schematic illustration of the stage of the method of the invention in which the web is cut off.

25 Figure 3 is a schematic illustration of the stage of the method of the invention in which the web has been cut off and the tape has been fixed between the final portion and the initial portion of the web.

30 Figure 4A is a schematic illustration of an exemplifying embodiment of cutting off the tape and fixing the tape to the face of a full roll.

Figure 4B is a schematic illustration of a second exemplifying embodiment of cutting off the tape and fixing the tape to the face of a full roll.

Figure 5 is a schematic illustration of the stage in the method of the invention in which one part of the tape has fixed the final portion of the web to the face of the complete roll and the other part of the tape has fixed the initial portion of the web onto a new roll spool.

According to Fig. 1, the web W is wound over a roll 11 or equivalent onto the roll spool 13, around which the roll 12 is formed. The winding takes place through the nip N between the roll 11 and the paper roll 12. In the situation as shown in Fig. 1, the web W has been stopped between the upper and lower holding members 24,25 of the web W cutting and tape fixing equipment 23. The tape or equivalent material strip with one adhesive face, to be fixed to the web W, is denoted with the reference numeral 22, and the web W cutting blade with the reference numeral 21. As comes out from Fig. 1, the length Y (Fig. 3) of the tape 22 is larger than the length X of the web portion that remains between the tape 22 fixing points 26,27, because the tape 22 has been bent into a curved or equivalent form.

As comes out from Fig. 2, after the ends of the tape 22 have been fixed at the points 26,27 to the web W face, the web 21 is cut off between the fastening points.

After this, as is shown in Fig. 3, the web is moved in the direction S, in which case the tape 22 is tightened between its fixing points and becomes straight, the adhesive face being placed as the bottom face viewed in the direction of the figure.

According to the exemplifying embodiment shown in Fig. 4A, in the next stage, when the tape approaches the nip N between the roll 11 and the roll 12, the nip is opened, i.e. the roll 12 shifted to a distance apart from the nip contact with the roll 11, and when the tape is between the roll 11 and the roll 12, it is cut off by means of the blade 31, the first part 22A of the tape 22 being guided onto the roll face, and

by means of the press member 32 it 22A is pressed into contact with the roll 21 face, whereby the final end of the web has been fixed.

In the exemplifying embodiment shown in Fig. 4B, the tape 22 has been provided,
5 for example, with a weakening, in which case, when the web W is tightened, the tape 22 is cut off at the weakening. The operations to be carried out after this are similar to those illustrated in Fig. 4A.

As comes out from Fig. 5, after one part 22A of the tape has fixed the final portion
10 of the web W to the complete customer roll, the other part 22B of the tape 22 is fixed to a new roll spool 13B, and after this the winding of the web W is continued onto the new roll spool 13B through the nip N between the roll 11 and the spool 13B. After the roll formed on the spool 13B has reached the desired size, the steps of the method in accordance with the invention are carried out starting from Fig. 1.

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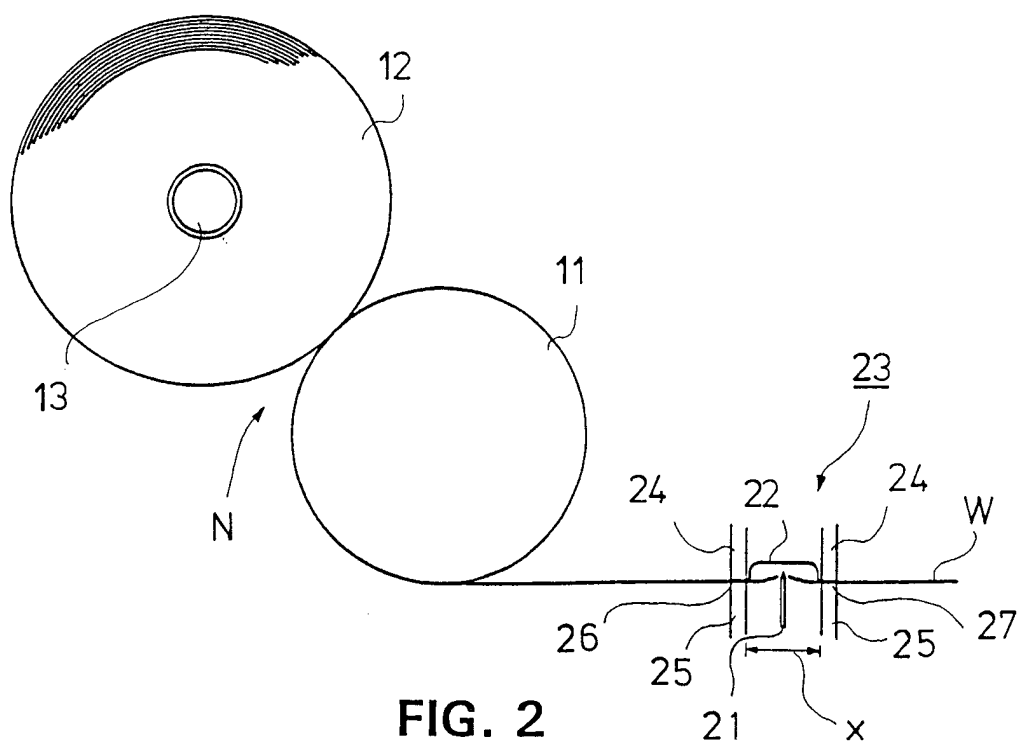
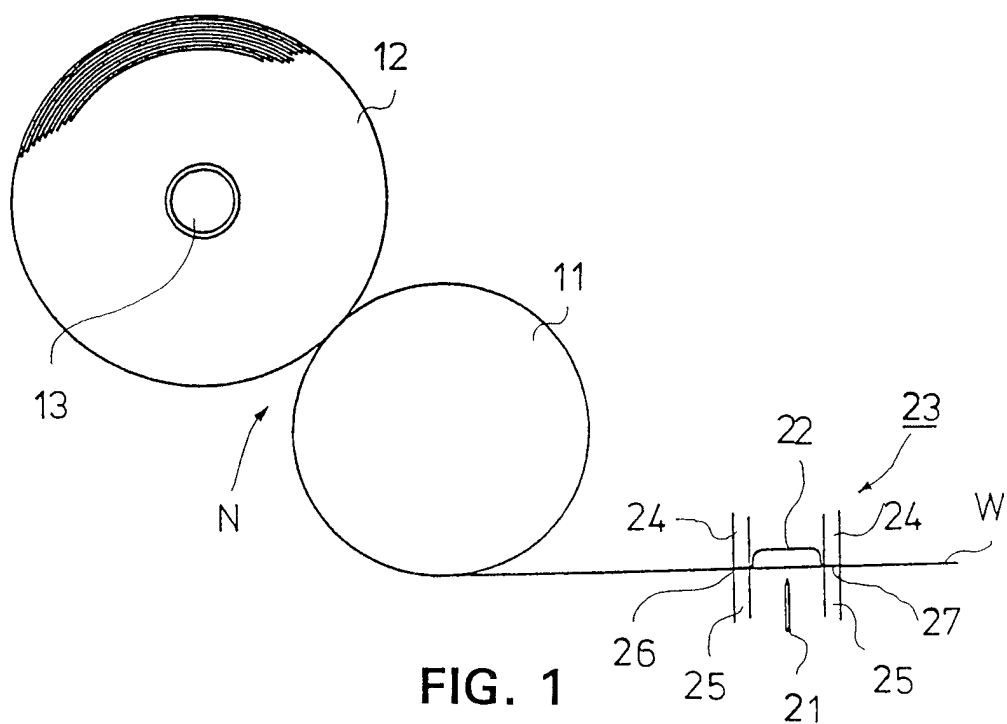
Above, the invention has been described with reference to one preferred exemplifying embodiment only, the invention being, however, by no means supposed to be strictly confined to the details of said embodiment.

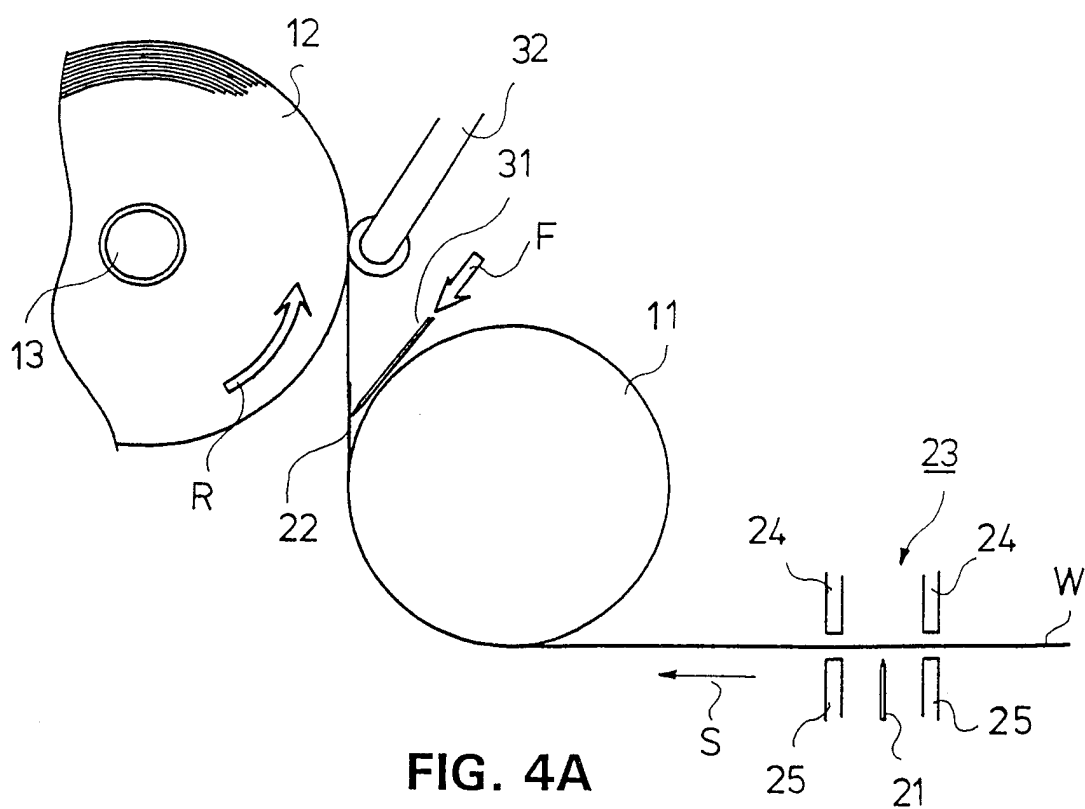
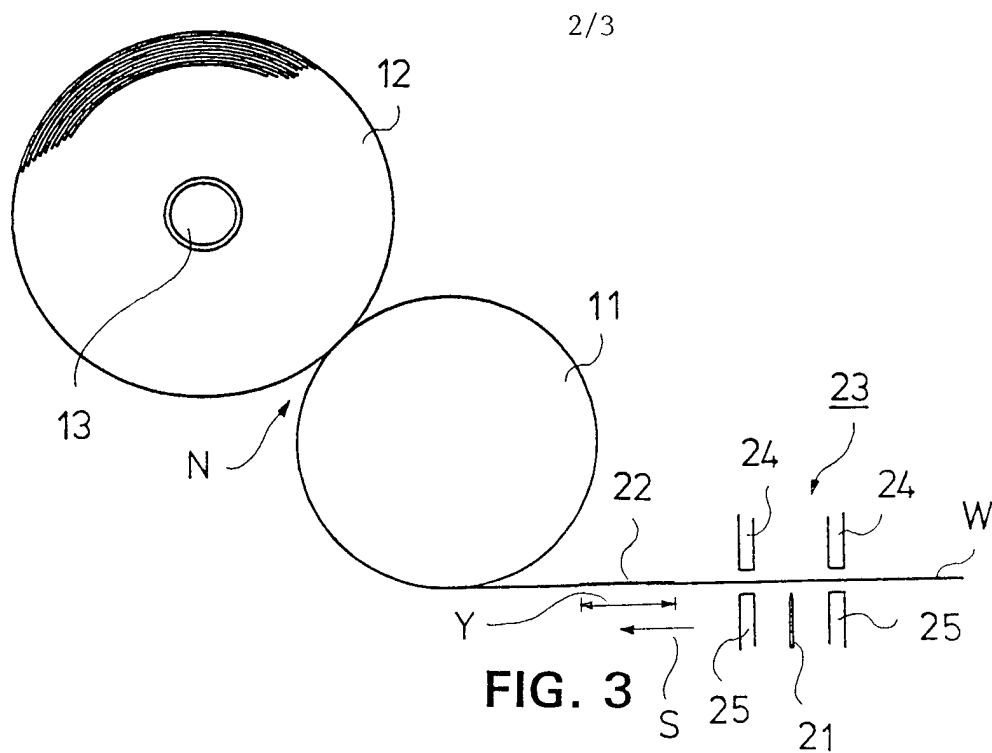
20 Many variations and modifications are possible within the scope of the inventive idea defined in the following patent claims.

Claims

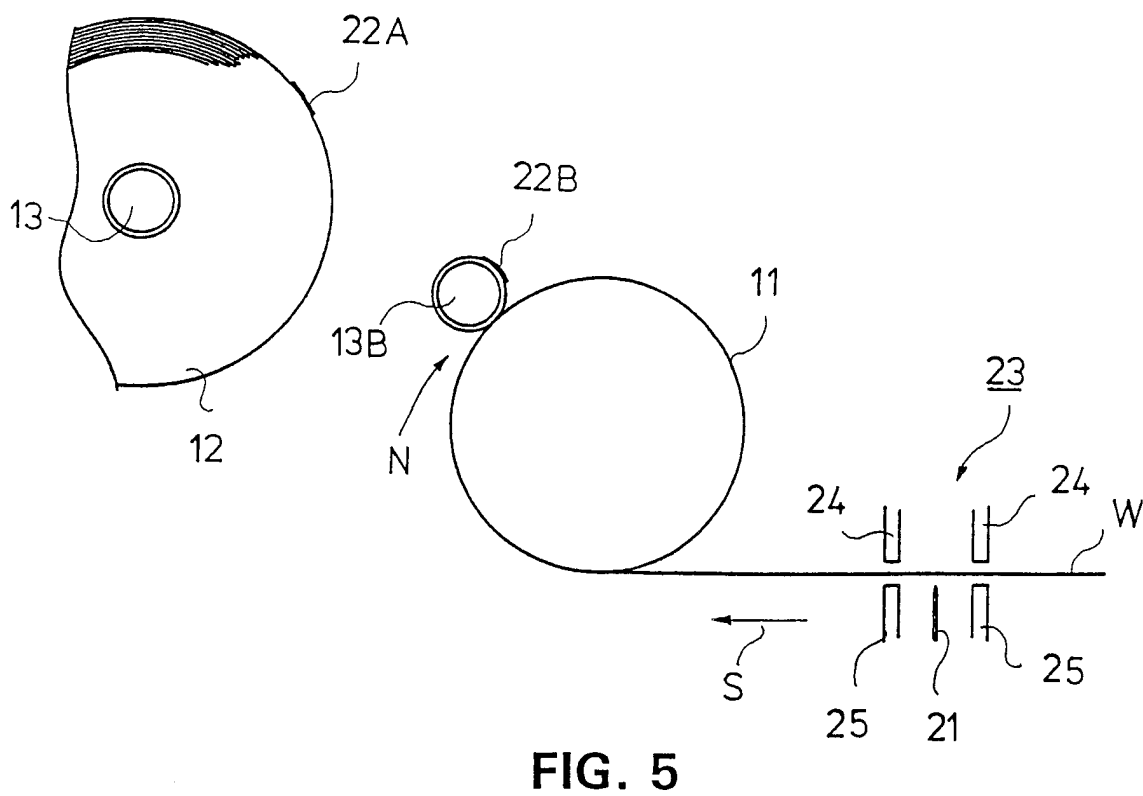
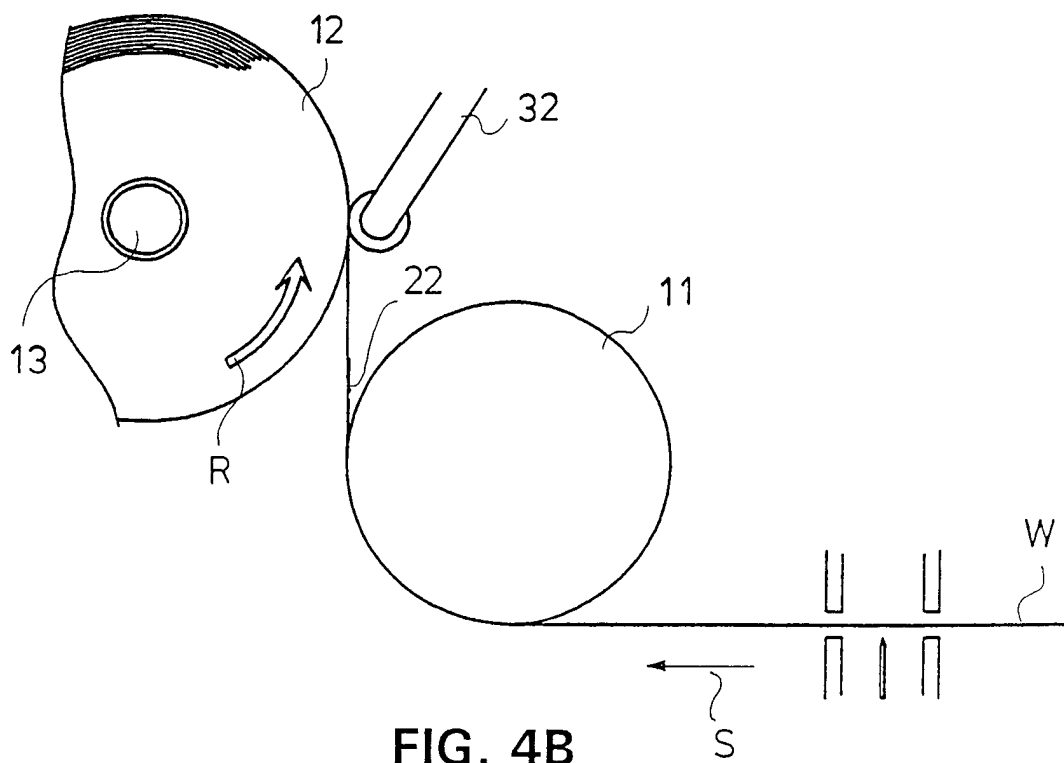
1. A method in winding of a web, in particular of a paper or board web, in which method the web (W) is wound onto a roll spool (13) or equivalent through a nip (N)
5 between a roll (11) or equivalent and the roll spool (13) or equivalent, **characterized** in that, in the method, when the roll (12) that is formed on the spool (13) becomes complete, a material strip (22) with one adhesive face is fixed to the web (W) at its edges transverse to the running direction (S) of the web (W) to fixing points (26,27) so that the edges of the material strip (22) are placed on the web (W) at the fixing
10 points (26,27) at a distance (X) between said fixing points in the running direction (S) of the web (W) that is shorter than the length (Y) of the material strip (22) in the running direction (S) of the web (W).
2. A method as claimed in claim 1, **characterized** in that, in the method, the web
15 (W) is cut off between the fixing points (26,27).
3. A method as claimed in claim 1 or 2, **characterized** in that, in the method, the material strip (22) with one adhesive face is cut off, and one part (22A) of the cut-off material strip (22), which part was fixed to the final portion of the web (W)
20 passing onto the complete roll (12), fixes the final portion of the web (W) onto the face of the complete roll (12), and the other part (22B) of the material strip (22), which part was fixed to the initial end of the web (W), fixes the web (W) onto the new roll spool (13B) for the start of the winding of a new roll.
- 25 4. A method as claimed in claim 3, **characterized** in that, in the method, the material strip (22) is cut off by means of a blade (31) or equivalent.
5. A method as claimed in claim 3, **characterized** in that, in the method, the material strip (22) is provided with a weakened, preferably perforated, portion, from
30 which the material strip (22) is cut off by tightening the web (W) and the material strip (22).

6. A method as claimed in any of the claims 1 to 5, **characterized** in that the part (22A) that is fixed onto the face of the complete roll (12) is pressed into contact with the roll face by means of a press member (32) or equivalent.





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INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 96/00558

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B65H 19/28, B65H 19/29

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	FI 97966 B (VALMET CORPORATION), 13 December 1996 (13.12.96) --	1-6
A	US 5092533 A (GANGEMI), 3 March 1992 (03.03.92), abstract, figures --	1-6
A	DE 4029180 A1 (JAGENBERG AG), 19 March 1992 (19.03.92), abstract, figures --	1-6
A	US 5222679 A (H. DROPCZYNSKI ET AL), 29 June 1993 (29.06.93), abstract, figures --	1-6

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of mailing of the international search report

29 April 1997

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0744365 A2 (VOITH SULZER PAPIERMASCHINEN GMBH), 27 November 1996 (27.11.96), abstract, figures -- -----	1-6

INTERNATIONAL SEARCH REPORT
Information on patent family members

02/04/97

International application No.
PCT/FI 96/00558

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