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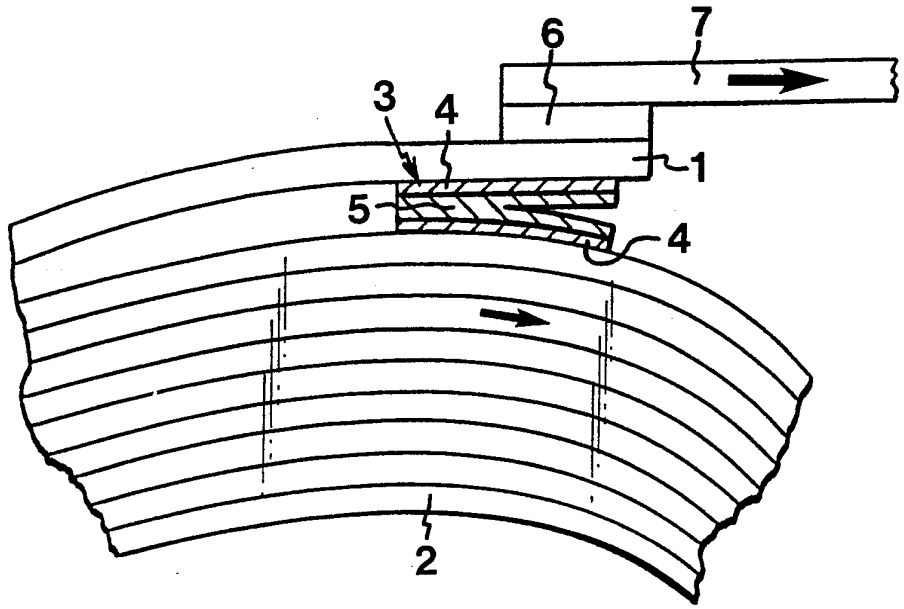

(57) Abstract

The invention relates to a method for splicing a running web (7), where a replacement roll (2) is accelerated to the speed of the running web (7). During the acceleration, the end tab (1) of the replacement roll (2) is maintained against this roll (2) by a delaminable adhesive element (3) disposed under the end tab (1). At the moment of splicing, the replacement roll (2) is pasted to the running web (7), the end tab (1) being torn loose from the roll (2) by delamination of the adhesive element (3). The adhesive element consists of two pressure-sensitive adhesive surface layers (4) and an intermediate fibrous layer (3).

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METHOD FOR SPLICING A RUNNING WEB

The present invention relates to a method for splicing a running web, where a replacement roll is accelerated to a speed corresponding to that of the running web and where a portion of the outermost roll layer of said replacement roll is pasted to the running web, the end tab of the replacement roll being maintained during the acceleration on the replacement roll by means of an adhesive element.

In the packaging industry and in papermaking, use is made of both manual and automatic splicing of a replacement roll to a running web. The splicing operation is carried out by accelerating the replacement roll to the same speed as the running web. The outermost roll layer of the replacement roll is then pasted to the running web.

In the industrial manufacture of packaging materials, the replacement roll must be manually prepared prior to splicing. This is generally done by cutting the terminal edge portion of the roll into a tab which is fixed to the roll with a number of pieces of single-adhesive tape. These tape pieces are then cut throughout a portion of their width so as to intentionally reduce the tape strength. Such cutting however requires highly experienced personnel. On the one hand, the cuts must be of such a restricted length that the terminal edge of the outermost roll layer of the replacement roll will be retained by means of the tape pieces against the roll when it is accelerated up to a peripheral speed of rotation of about 300-500 m/min. On the other hand, the cuts should be of such an extended length that when the automatic splicing operation commences, the terminal edge of the outermost roll layer of the replacement roll is torn loose therefrom and is entrained when pasted onto the running web.

US-A-2,920,835 and US-A-3,006,568 disclose the use of a double-adhesive tape for splicing two paper rolls and for fixing the terminal edge of the replacement roll

on the running roll. The pieces of single-adhesive tape making up the double-adhesive tape are spot-gummed together and can be pulled apart during the splicing operation. Like the cuts in the single-adhesive tape above, the gum spots must be applied with the utmost care to ensure a correct and reproducible retaining and detaching function. Further, the gum spots entail undesired pollution problems in the manufacturing process and by adhering to rollers downstream of the splicing site may cause web rupture.

An object of the present invention is to provide, e.g. in the packaging industry, a simpler, safer and less costly method for manual or automatic splicing as compared with conventional techniques.

According to the invention, this and other objects have been achieved by a method for splicing a running web of the type described in the introduction to this specification, which is characterised in that use is made of an adhesive element consisting of two adhesive surface layers facing away from each other and enclosing a cleavable intermediate layer which consists of a fibrous material and is so fixedly attached to said adhesive layers that these layers will be completely covered by the fibrous material upon cleavage.

The invention will now be described in more detail with reference to the accompanying drawings, in which

Fig. 1 schematically shows how the outermost roll layer of the replacement roll is attached to the roll.

Fig. 2 illustrates a roll of packaging material prepared for automatic splicing.

Fig. 3 schematically illustrates the automatic splicing of packaging material onto a running web.

Fig. 4 shows the roll of Fig. 1 at the moment of splicing.

Fig. 1 shows a replacement roll 2 where the end tab 1 of the outermost roll layer is prepared for splicing by

being attached to the replacement roll 2 by means of a delaminable adhesive element 3.

The adhesive element 3 is a laminate consisting of two self-adhesive surface layers 4 held together by a cleavable intermediate layer 5. The layer 5 may also be enclosed on both sides by homogeneous layers carrying the adhesive surface layers 4. The intermediate layer 5 is fibrous, consisting of paper. The homogeneous layers may be a plastic coating, or consist of e.g. foamed plastic, fabric or other material which is easily cleavable when a tractive force is applied at the edge of the adhesive element 3. Further, the intermediate layer 5 has a Z-strength, i.e. a resistance to forces perpendicular to the adhesive layers 4, which is so substantial that the intermediate layer 5 is capable of holding the two adhesive surface layers 4 together when the force directed towards or away from the layers 4 is relatively evenly distributed throughout the entire pasted surface. However, the Z-strength should be such as to permit a major force which is applied at the edge of the pasted surface to pull the adhesive layers 4 apart, whereby to cleave the intermediate layer 5 between the two adhesive surface layers 4.

The adhesive layers 4 should be so fixedly attached to the intermediate layer 5 that when a cleavage force is applied to the intermediate layer 5, cleavage occurs approximately at the centre of the thickness of the intermediate layer 5, such that the two adhesive surface layers 4 will be completely covered by the fibre material of the cleaved intermediate layer 5. The reason for this is that the adhesive surface layers should not be exposed, which might cause problems of undesired adhesion in subsequent manufacturing steps. To this end, the paper fibres of the intermediate layer 5 are preferably oriented substantially parallel to the adhesive surface layers 4.

Fig. 2 shows a roll of packaging material 2 manually prepared for automatic splicing to a running web 7. The terminal edge portion of the outermost roll layer has been cut into a tab 1 retained on the roll 2 by means of an adhesive element 3 disposed under the end tab 1. This ensures safe retention of the pre-cut end tab 1 when the roll 2 is caused, during the splicing operation, to rotate and when the forces which during the rotation tend to fling the end tab 1 away from the roll 2 are preferably evenly distributed across the pasted surface. Further, the roll is provided on its outside with a conventional double-adhesive tape 6. At the moment of splicing, the tape 6 should adhere to the surface of the running web 7.

Fig. 3 shows how the replacement roll 2 described above is accelerated to a speed equal to that of the running web 7. A transducer emits a signal to initiate splicing when only a small amount of web remains on the old roll 8. The running web 7 is passed up against the rotating replacement roll 2 where it is pasted to the outer face of the replacement roll 2 by means of the conventional double-adhesive tape 6 (not shown in Fig. 3). The old roll 8 is thereafter cut off from the running web 7. The end tab 1 of the replacement roll 2 and hence the adhesive element 3 are then subjected to the tractive force exerted by the running web 7 at the edge of the adhesive element 3, which is then cleaved or delaminated, starting at said edge, closest to the edge of the end tab, Fig. 4, and the material of the replacement roll 2 will be entrained by the web 7 of the old roll without any risk of operational disturbance and production stoppage.

As will have been appreciated from the above, the present invention provides a method for splicing a running web which obviates the risks inherent in conventional techniques and which yields a dependable, simple and inexpensive splicing method.

CLAIMS

1. Method for splicing a running web (7), where a replacement roll (2) is accelerated to a speed corresponding to that of the running web (7) and where a portion of the outermost roll layer of said replacement roll (2) is pasted to the running web (7), the end tab (1) of the replacement roll (2) being retained during said acceleration on the replacement roll (2) by means of an adhesive element (3), c h a r a c t e r i s e d in that use is made of an adhesive element consisting of two adhesive surface layers (4) facing away from each other and enclosing a cleavable intermediate layer (5) which consists of a fibrous material and is so fixedly attached to said adhesive layers (4) that these layers will be completely covered by the fibrous material upon cleavage.

2. Method for splicing a running web (7) as claimed in claim 2, c h a r a c t e r i s e d in that the intermediate layer (5) is enclosed on both sides by homogeneous layers carrying said adhesive layers.

3. Method for splicing a running web as claimed in claim 1 or 2, c h a r a c t e r i s e d in that the fibres of the fibrous material are oriented substantially parallel to the adhesive surface layers (4).

4. Method for splicing a running web (7) as claimed in any one of claims 1-3, c h a r a c t e r i s e d in that the adhesive element (3) is disposed under the end tab (1) of the replacement roll (2).

5. Method for splicing a running web as claimed in any one of claims 1-4, c h a r a c t e r i s e d in that the fibrous material is paper.

FIG.1

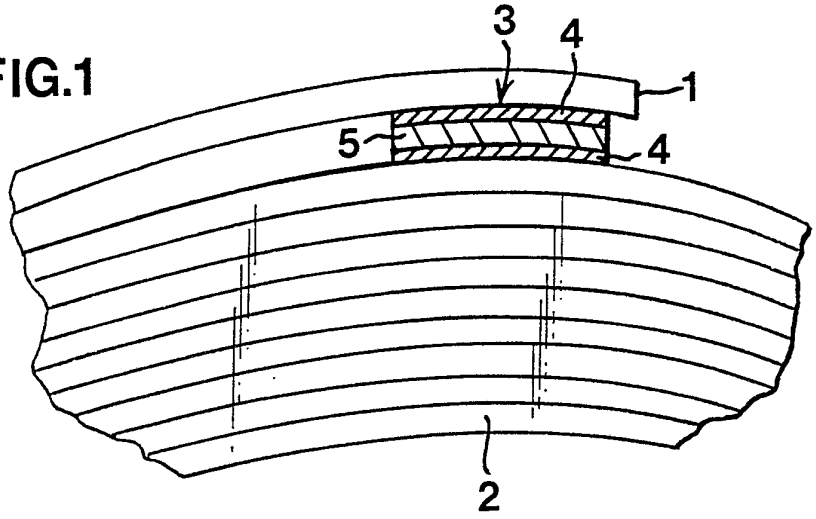


FIG.4

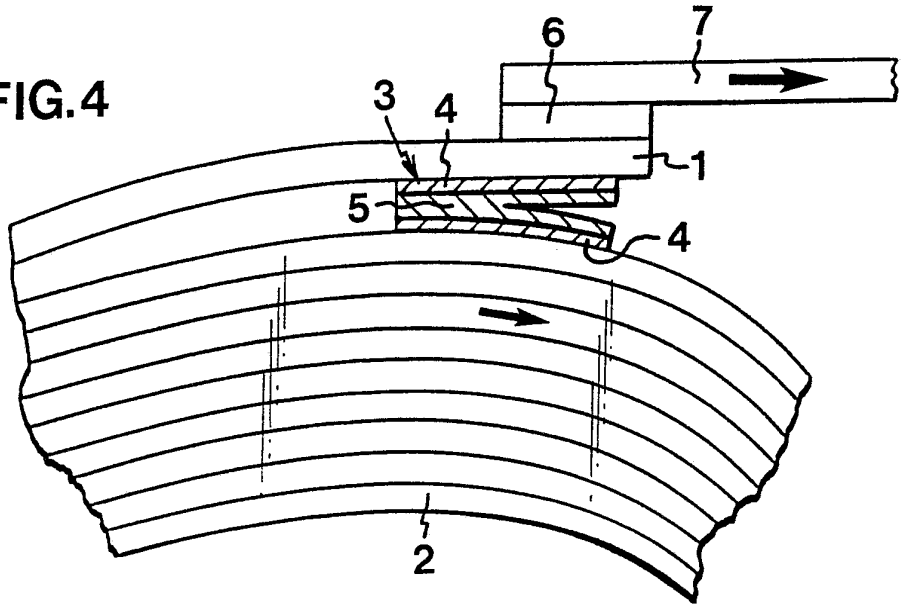


FIG.2

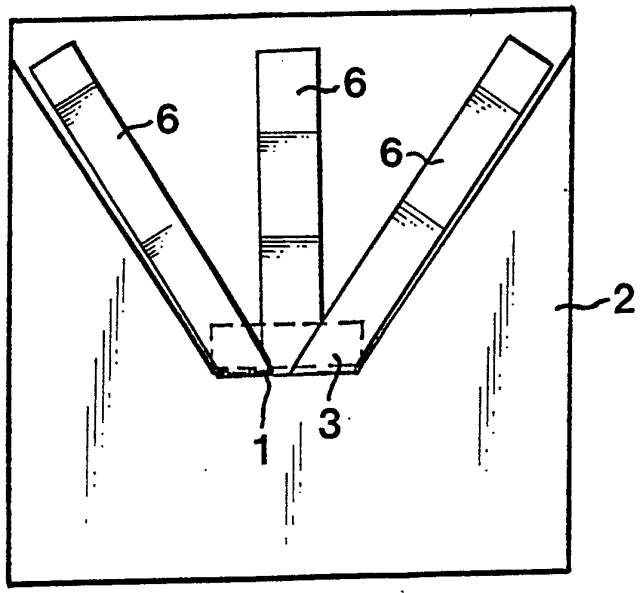
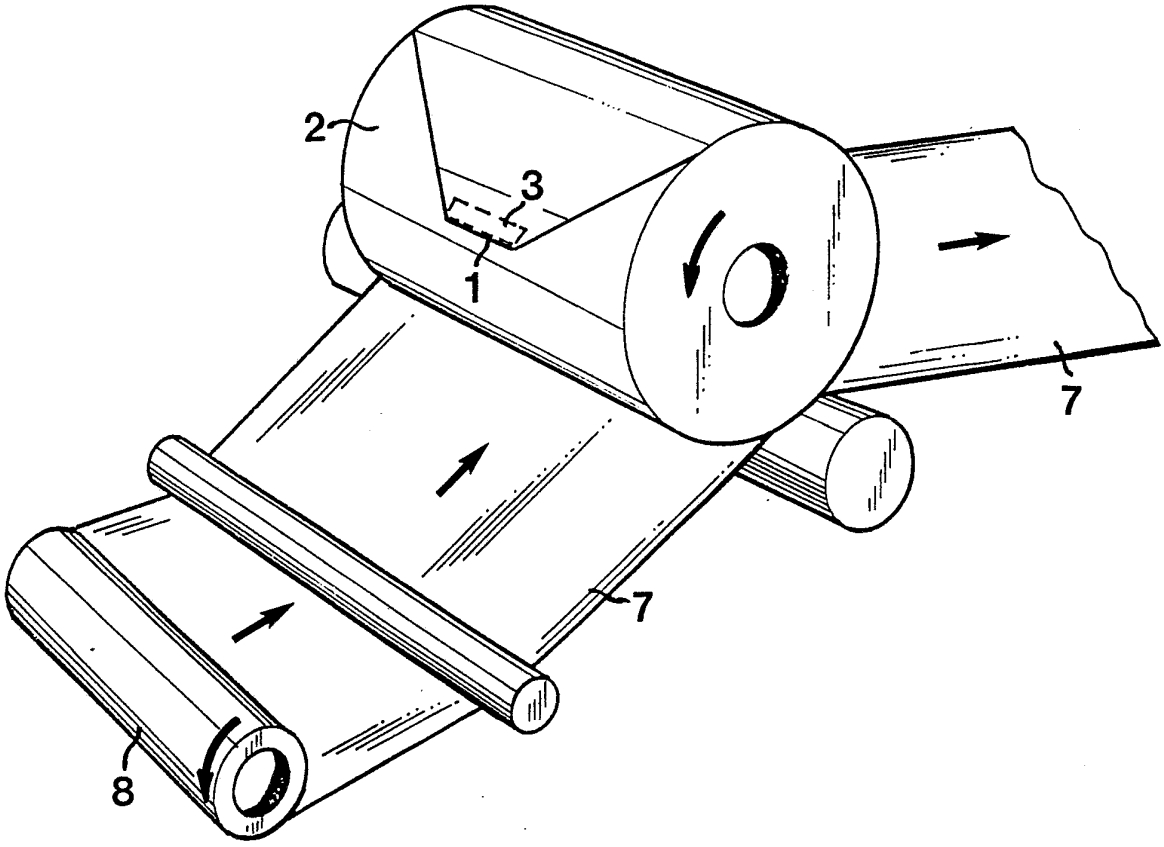


FIG.3



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 90/00796

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: B 65 H 19/18

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	B 65 H

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
A	SE, B, 403760 (RENGO CO., LTD.) 4 September 1978, see page 6; figures 10-11 --	1,2,3,6
A	US, A, 2212937 (A.J. HORTON) 27 August 1940, see page 2; figures 2-6 --	1,2,3,6
A	US, A, 2377971 (O.C. ROESEN) 12 June 1945, see page 2 - page 3; figures 4,5,6,8 --	1,2,3,6
A	US, A, 2920835 (W. GIBSON) 12 January 1960, see column 2 - column 3; figure 5 --	1,2,3,6
A	US, A, 3006568 (C.E.F. WILLIS) 31 October 1961, see column 2 - column 3; figures 2,5 --	1,2,3,6
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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
12th February 1991	1991 -02- 20
International Searching Authority: SWEDISH PATENT OFFICE	Signature of Authorized Officer: Kjell Lundahl

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ANNEX TO THE INTERNATIONAL SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
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