June 12, 1945. O. C. ROESEN 2,377,971

MEANS FOR USE IN SPLICING WEBS

Filed Dec. 15, 1943

Fig. 1

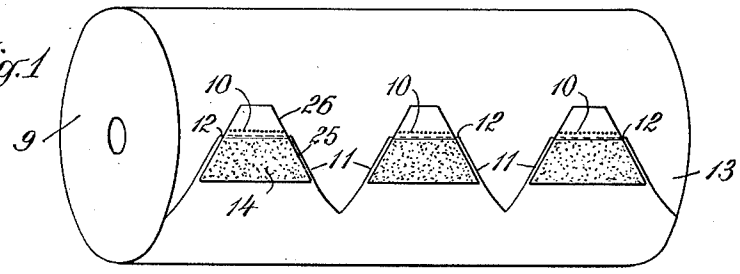


Fig. 2,

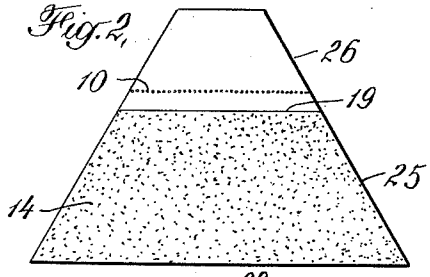


Fig. 3,

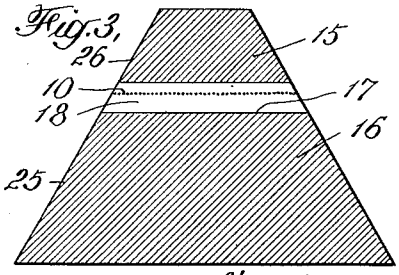


Fig. 4

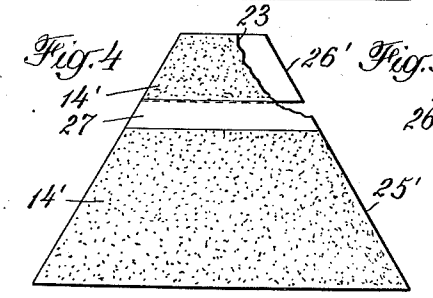


Fig. 5

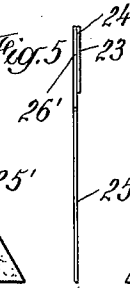


Fig. 6,

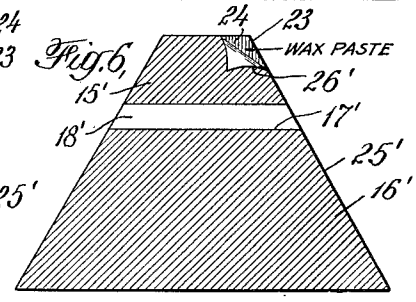


Fig. 7,

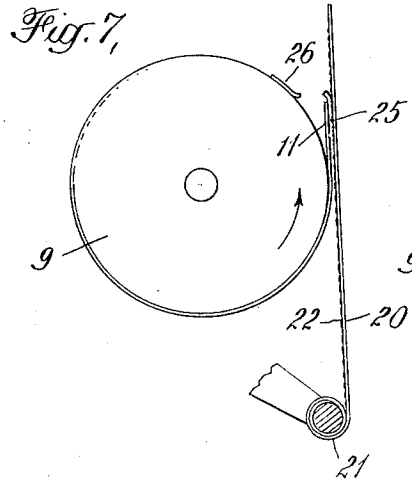
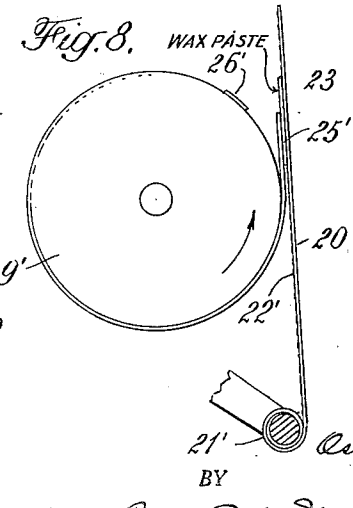


Fig. 8.



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Patented June 12, 1945 2,377,971

UNITED STATES PATENT OFFICE

2,377,971

MEANS FOR USE IN SPLICING WEBS

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Application December 15, 1943, Serial No. 514,349

5 Claims. (Cl. 242—58)

This invention relates to the splicing of webs fed to printing presses and other web-consuming apparatus. It particularly concerns means for use in preparing a web roll for acceleration to splicing speed and for splicing the leading end of the web thereon to a web running to a press or other apparatus from a roll that is substantially depleted.

The paper web fed to a printing press is supplied in large rolls which must be replaced during press operation and preferably without stopping the web or materially reducing its speed. Since the web travels at a very high speed, it is essential that prior to splicing, the new roll be accelerated until its cylindrical surface attains or approximates the velocity of the running web to which it is spliced. During this rotation of the new roll prior to splicing, the leading end of the web thereon must be secured to the roll surface to prevent unwinding. The splice is customarily made by sticking the leading end of the web on the rapidly rotating new roll to the web running from an expiring roll, and at the instant this splice is made, the leading end of the new web must be released from the new roll surface. After the splice is made, the old web is severed between the splice and the expiring roll and the new web runs to the press.

The above described web splicing operation involves placing one or more areas of splicing adhesive on the outer surface of the leading end of the web on the new roll. At the time the web from the new roll is stuck to the running web or immediately thereafter, the new web end must move out from the new roll surface to follow the path of the running web, otherwise the running web will be suddenly deflected from its normal path and torn or broken. In preparing a new roll for the splicing operation, care must be taken that the splicing adhesive is applied over a limited area extending up to but not beyond the leading edge of the new roll web. If the adhesive is applied to the new roll surface beyond the leading web edge, the running web will be stuck to and carried around the surface of the new roll, with resulting web breakage. If the adhesive area does not extend up to the web edge, an undesirable end or "tail" of web trails behind the splice.

With the above and other considerations in mind, it is proposed in accordance with the present invention to provide a device which may be termed a splicing tab that will both releasably hold the leading end of the web to the new roll surface during acceleration and rotation of the new roll prior to the splice, and provide an area of splicing adhesive secured to the web and in the proper position with relation to the leading edge of the web. A further object of the invention is the provision of a device of the type described which is simple and inexpensive and which can be rapidly and accurately applied and positioned on a new web roll. Other specific objects, advantages and characteristics of the invention will be apparent from the following description of certain embodiments thereof.

In describing the invention in detail, reference will be made to the accompanying drawing in which certain embodiments of my improved splicing tab have been illustrated. In the drawing;

Fig. 1 is a perspective view of a new roll prepared for splicing by the use of devices embodying the present invention;

Fig. 2 is an elevation of the outer surface of a splicing tab of the type illustrated in Fig. 1;

Fig. 3 is an elevation of the under surface of the tab shown in Fig. 2;

Fig. 4 is an elevation of the outer surface of a modified form of splicing tab embodying the invention;

Figs. 5 and 6 are respectively edge and under surface views of the tab shown in Fig. 4;

Fig. 7 is a diagrammatic and simplified view illustrating the operation of the splicing tab shown in Figs. 2 and 3; and

Fig. 8 is a similar diagrammatic and simplified view showing the operation of the splicing tab of Figs. 4, 5 and 6 in making a splice.

Referring to the drawing, a new web roll has been illustrated at 9 in Fig. 1. I have shown the leading end of the web forming this roll cut or torn to present a plurality of points 11 terminating in transverse leading edges 12, although this particular arrangement of the leading web end is not essential to the use of splicing tab embodying the present invention. Each of the points 11 illustrated is secured to the underlying course 13 of the web which forms the roll surface by a splicing tab embodying the invention.

As best illustrated in Figs. 2 and 3, each splicing tab is formed of paper or like frangible sheet material having a weakened portion such as the row of perforations 10 extending transversely across the tab between its ends and dividing it into a web end engaging part 25 and a roll surface engaging part 26. A layer of web splicing adhesive 14 is applied to the outer surface of the web end engaging part 25. The under surface of the tab is provided with two gummed or adhesive carrying areas 15 and 16 disposed

respectively on opposite sides of the row of perforations 10 and substantially covering the roll surface and web end engaging parts 26 and 25 as shown in Fig. 3. The adhesive employed to form the areas 15 and 16 is preferably of a type which is water soluble so as to be rendered tacky by moistening, such as is used on gummed tape, envelope flaps and like articles.

The area of adhesive 16 is so applied as to terminate at a line 17 short of the line of perforations 10 to leave a transversely extending uncoated area 18 between this adhesive and the perforations. The splicing adhesive 14 on the outer surface of the web end engaging part 25 of the tab preferably terminates along a line 19 similarly spaced from the row of perforations 10.

The web splicing adhesive 14 may comprise a tacky paste or adhesive such as the rosin glue known in the web splicing art. In a preferred embodiment of the invention, however, the adhesive 14 comprises a special adhesive, hereinafter referred to as a self-sticking adhesive, which is employed in the splicing method disclosed and claimed in my Patent No. 2,320,656. This self-sticking adhesive is one which adheres to the web when applied thereto in fluid form, and when dried, its surface adheres or coheres to a like or similar applied and dried adhesive surface but does not adhere to an uncoated web surface.

An adhesive suitable for the purpose described may comprise any one of a number of known nonvulcanizing rubber cements. In general, these cements comprise raw unvulcanized rubber, usually subjected to a small amount of hot milling, dissolved in a suitable solvent. Solvents employed in such cements include gasoline, benzene, ethylene dichloride, carbon tetrachloride, varnish maker's and painter's naphtha, and a special rubber solvent comprising a petroleum distillate having an initial boiling point of from about 120° to 180° F. and an end point of from about 250° to 288° F. The amount of rubber in such cements runs up to 8% or 10%, and known solvent diluents such as isopropanol, ethanol, butanol, amyl acetate, butyl acetate, acetone, or methyl ethyl ketone are sometimes added. A commercial rubber cement suitable for the described purpose is available on the market under the trade name "Best-Test White Rubber Paper Cement" and is made by the Union Rubber and Asbestos Company of Trenton, New Jersey. Although the above described rubber cements are suitable self-sticking adhesives, it should be understood that the use of similar adhesives having this self-sticking property is not precluded.

In preparing a web roll for splicing, the operator secures the leading end of the web to the web surface by one or more of my improved splicing tabs with the weakened portion lying substantially along the web edge and the web end and roll engaging parts 25 and 26 respectively stuck to the outer surface of the web end and the adjacent surface of the underlying roll course 13 by the adhesive areas 16 and 15 respectively. As shown in Fig. 1, the gummed area 16 on the under surface of the tab may be conveniently aligned with the leading web edge 12 by disposing the leading edge 19 of the outer adhesive layer 14 in alignment with the web edge. This insures that the web end part of the tab is so attached that no "tail" of web will be left to fold backward and trail from the splice, and also that the leading end of the web is not permanently stuck to the roll surface as would be the case if the adhesive edge line 17 extended beyond the web edge 12.

The operation of my improved splicing tab in making a splice will now be described. When the layer 14 comprises tacky splicing adhesive, the web 20 running from an expiring roll 21 to the press or other web consuming apparatus passes parallel to and adjacent the surface of a new roll 9 prepared as described above. The new roll 9 is accelerated to web speed by suitable known means, and when the old roll 21 is substantially depleted, the web 20 is pressed against the new roll surface at a point other than that where the tabs are located. When the web end parts 25 of the tabs bearing the splicing adhesive layer 14 come in contact with the running web 20, the leading end of the new web is stuck to the running web through these parts, and is pulled by the running web away from the roll surface, the tabs tearing along the row of perforations 10 and the roll engaging part continuing around the roll 9 on its surface, as shown in Fig. 7.

When used in a splicing operation involving the method of my above mentioned patent, No. 2,320,656, the inner surface of the expiring web carries a layer of dried self-sticking adhesive 22 adjacent the core end of the roll. This adhesive layer 22 extends longitudinally of the web 20 for a distance at least equal to the circumference of the new roll 9. The adhesive 14 on the web end parts 25 of the splicing tabs comprises an adhesive of the above described self-sticking type. The new roll 9 is accelerated with the running web 20 in surface contact therewith, since the self-sticking adhesive layer 14 does not adhere to the uncoated running web surface. After the roll reaches or approximates running web speed, the layer 22 of self-sticking adhesive adjacent the core end of the running web contacts the self-sticking adhesive 14 on the splicing tab parts 25, the two cohere tenaciously, the splice is made and the tab is severed as explained above to release the web end from the roll surface.

In a modified form of my invention illustrated in Figs. 4, 5, 6 and 8, the roll surface engaging part of the splicing tab comprises a separate sheet 26', and the weakened connection between the web end and roll surface engaging tab parts 25' and 26' comprises a weak adhesive 24 separably joining the roll engaging sheet 26' to an overlying extension 23 of the web end engaging part 25'. The layer 24 of weak adhesive may comprise wax or grease or a preparation made from these or other ingredients and having somewhat sticky but non-hardening qualities. The exposed under surface of the roll surface engaging sheet 23 carries an adhesive layer 15' similar to that used to form the areas 15 and 16 described above. The under surface of the web end engaging part 25' of the tab carries a layer 16' of similar gum or adhesive and a transverse strip 18' separates the adhesive layer 16' from the layer 15' on the sheet 23, as shown in Fig. 6. The outer surface of the tab may be completely covered with the splicing adhesive 14', but a transverse bare strip 27, aligned with the under surface bare strip 18' is preferably provided to facilitate alignment of the leading edge 17' of the under adhesive layer 16' with the leading edge of the web, as previously explained. The splicing adhesive layer 14' preferably comprises applied and dried self-sticking adhesive, but a strong tacky adhesive of the type referred to above may be used.

The modified splicing tab of Figs. 4, 5 and 6 is applied to a new roll in the manner explained

above, the web end part 25' being stuck to a point on the leading end of the web by the adhesive layer 16', and the roll surface engaging part 26' being stuck to the adjacent surface of the underlying web course by the adhesive 15'. The bare strip 27 assists the operator in aligning the leading edge 17' of the adhesive 16' with the leading edge of the web. When the adhesive layer 14' comprises self-sticking adhesive, the roll 9' is accelerated with the running web 20' in contact with the roll surface, and when the core end self-sticking adhesive layer 22' comes in contact with the adhesive layer 14' on the tabs, the two cohere and the tab part 23 is pulled off of the sheet 26' thereby releasing the web end from the roll so that the new web travels with the running web 20' into the press or other web consuming apparatus. If the layer 14' comprises tacky splicing adhesive, the running web 20' is spaced from the roll surface until the roll 9' has been accelerated to web speed and the old roll 21' is substantially depleted.

Splicing tabs embodying the present invention may be inexpensively prepared in quantity, and particularly where self-sticking adhesive is used, may be conveniently shipped to and stored at the point of consumption. They materially reduce the time required to prepare a new roll for splicing, and their use reduces web breaks and missed splices to a minimum.

The description of certain embodiments of my invention in connection with the splicing of webs for printing presses is not to be considered as limiting the invention to use in this field. Splicing tabs embodying my invention are applicable to the splicing of webs generally. It should also be understood that the disclosed splicing tab structure may be considerably modified within the scope of the invention as defined in the appended claims. For example, the center tab may be centrally weakened by various expedients other than perforations, and the shape and related size of the two end parts of the tab may be varied as desired from that shown in the disclosed embodiments.

I claim:

1. A device for use in splicing the leading end of a web on a rotary new web roll to a running web in the manner described comprising a web end engaging part of sheet material having a layer of strong adhesive on its under surface for securing it to the leading end of the web on a new roll, a roll surface engaging part of sheet material having a layer of strong adhesive on its under surface for securing it to the surface of a new roll, an extension on said web end engaging part overlying said roll surface engaging part, a weak adhesive joining said roll surface engaging part to said overlying extension, and a layer of splicing adhesive on the outer surface of said web end engaging part.

2. A device for use in splicing the leading end of a web on a rotary new web roll to a running web in the manner described comprising a web end engaging part of sheet material, a layer of strong dried water soluble adhesive on the under surface of said web end engaging part, a roll surface engaging part of sheet material, a layer of strong dried water soluble adhesive on the under surface of said roll surface engaging part, an extension on said web end engaging part overlying the outer surface of said roll surface engaging part, a weak adhesive joining said roll surface engaging part to said overlying extension, and a layer of self-sticking splicing adhesive on the outer surface of said web end engaging part.

3. A device for use in splicing the leading end of a web on a rotary new web roll to a running web in the manner described comprising a web end engaging part of sheet material, a coating of strong adhesive on the under surface of said part terminating along a line short of one end thereof, a coating of splicing adhesive on the outer surface of said part terminating in substantial alignment with the line of termination of said under surface adhesive coating, a roll surface engaging part underlying the uncoated portion of the under surface of said web end engaging part, a coating of strong adhesive on the under surface of said roll surface engaging part and a layer of weak adhesive connecting said roll surface engaging part and the overlying portion of said web end engaging part.

4. A device for use in splicing the leading end of a web on a rotary new web roll to a running web in the manner described comprising a web end engaging part of sheet material, a coating of strong dried water soluble adhesive on the under surface of said part terminating along a line short of one end thereof, a coating of self-sticking splicing adhesive covering the outer surface of said part with the exception of a bare strip substantially aligned with the line of termination of said under surface adhesive coating, a roll surface engaging part underlying the uncoated portion of the under surface of said web end engaging part, a coating of strong dried water soluble adhesive on the under surface of said roll surface engaging part and a layer of weak adhesive connecting said roll surface engaging part and the overlying portion of said web end engaging part.

5. In combination with a rotary web roll, a device for releasably securing the leading end of the roll web to the roll surface while the roll is accelerated and splicing said end to a running web and releasing it from the roll surface after the roll is accelerated comprising a web end engaging part of sheet material having a layer of strong adhesive on its under surface for securing it to the leading end of the web, a roll surface engaging part of sheet material having a layer of strong adhesive on its under surface for securing it to the roll adjacent the web end, an extension on said web end engaging part overlying the outer surface of said roll surface engaging part, a weak adhesive separably connecting said overlying extension to said roll surface engaging part and a layer of splicing adhesive on the outer surface of said web end engaging part.

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