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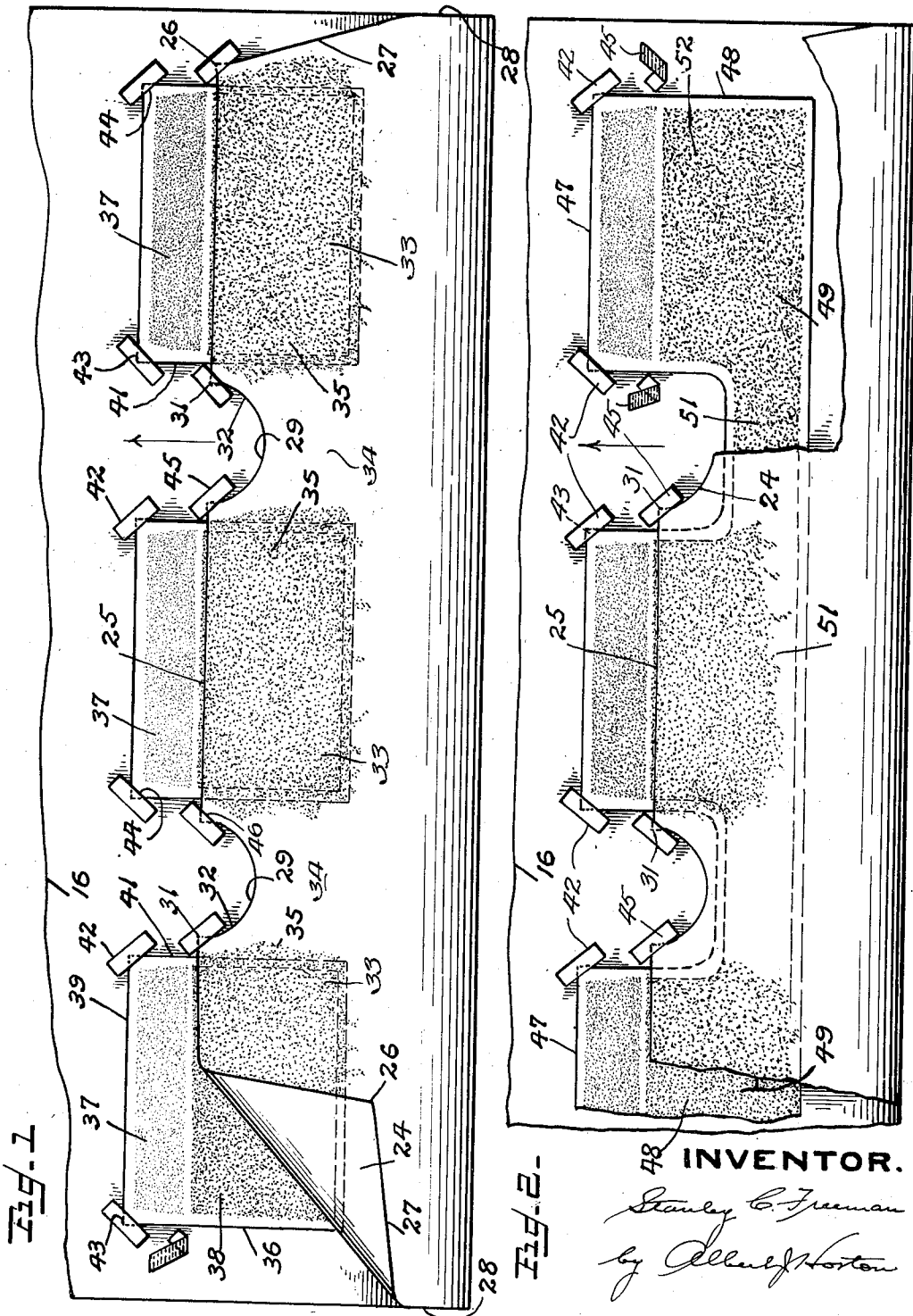
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2,214,719

METHOD AND MEANS FOR RENEWING WEB ROLLS IN A PRINTING MACHINE

Filed Dec. 24, 1936

2 Sheets-Sheet 1



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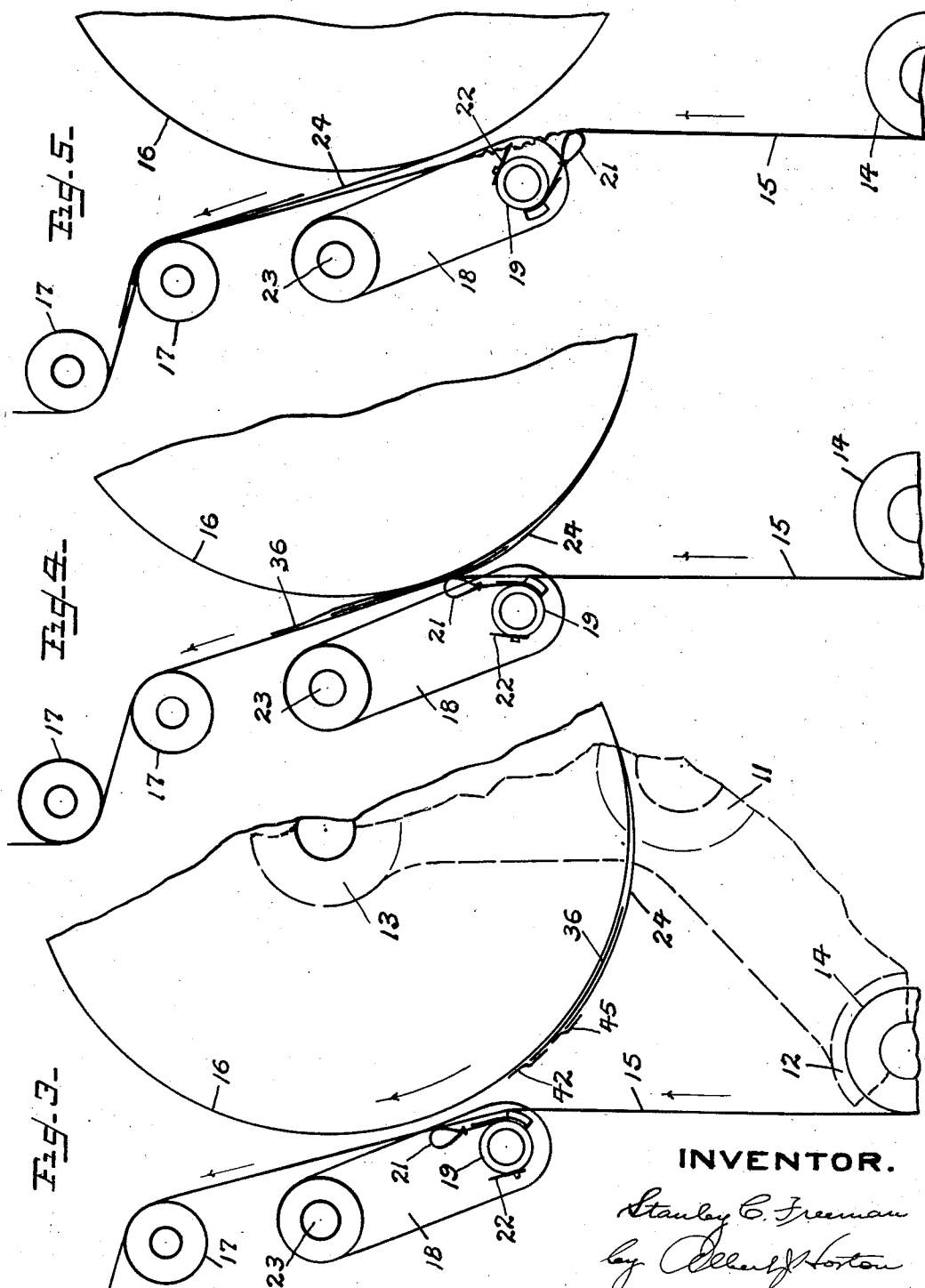
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UNITED STATES PATENT OFFICE

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METHOD AND MEANS FOR RENEWING
WEB ROLLS IN A PRINTING MACHINEStanley C. Freeman, Mount Vernon, N. Y., assign-
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13 Claims. (Cl. 242—58)

This invention relates to the means and procedure used during the operation of a full speed roll changing mechanism for printing machines, and more particularly to means for and method of preparing a replacement roll for joining its web to the running web of an expiring web roll, and of holding the end of the web of the replacement roll against the body thereof in such a manner that it will be readily released at the time the join is made.

Before joining the web of a web replacement roll with the web of an expiring web roll, adhesive is usually applied upon the outer surface of the leading end of the web of the replacement roll, and the roll is then rotated up to the speed of the running web. The roll and running web are then moved relatively to each other into contact to cause the adhesive covered portion of the replacement roll to adhere to the running web of the expiring roll, which latter web is then severed and the new web is drawn into the printing machine.

Various means and mechanisms have been suggested and used for holding the free end of the web of the replacement roll closely thereto while it is being brought up to the speed of the running web and before it is joined thereto. All of these have contemplated the provision of means to cause a quick release of the aforesaid free web end at the moment the web join is made, so as not to unduly strain the respective webs or cause interruption in the machine operation. Among these means is the provision of so-called gummed tabs for securing the free end of the web to the roll body by having a portion thereof adhering to both the free end and the body and tearing or otherwise separating, when the join is being made. Some forms of these tabs have been provided with weakened portions to facilitate the separation thereof, while others are arranged in such a manner as to readily rupture upon having a strain imposed thereon, such as occurs when lifting the free web end from the roll body. These tabs are of a particular form which require care in handling and in their proper application. The weakened form of tab has been found to be especially difficult to apply properly, without tearing it at the time of application and difficulty has been experienced due to their separating before the join is made and prematurely releasing the web.

Another form of web end holding means requires the weakening of the web portion between the point at which the web end is secured to the roll and the portion of the web end directly

following the same. This procedure necessitates additional work and it is difficult to avoid weakening the web excessively.

The present invention contemplates the provision of a holding means whereby no weakening of the web end is required and the full strength of the web portion adjacent the securing point is retained to insure that there will be no premature parting and release of the web end from the roll.

This invention, while using gummed strips or tab-like members in carrying out certain of the principles thereof, contemplates no particular form of such, a short piece of gummed strip from a roll of binding paper being suited for the purpose. Another feature, particularly contemplated by this invention, is the provision of suitable means and arrangements whereby the abrupt strains imposed upon the webs when they are joined together and particularly those imposed on the rapidly made joint will be relieved, and reduced to a minimum, whereby the joint will not be pulled apart and neither of the webs torn while passing into and through the machine.

One of the principal objects of this invention is to provide means for securely holding the end of the web of the replacement web roll against the body thereof, while the replacement roll is being handled and rotated in preparation for having the web thereon joined to the web of an expiring web roll.

Another object is to provide a method of holding and of permitting a quick release of the leading end of the web of a replacement web roll, when it is joined to the running web of an expiring web roll.

Still another object is to provide means of comparatively simple and inexpensive form and structure to secure the web of a replacement web roll to the body thereof, which will insure substantially instant release thereof when a join is made between this web and the web of an expiring web roll.

A further object is to provide an improved web end holding means for the above use which will be particularly efficient in use to relieve and prevent undue strains being imposed upon the webs when they are joined, whereby neither will tend to tear apart, and which will permit a slight slippage of the connection between the webs at the join, whereby an excessive strain or tension, possibly produced at the time of making the join will be reduced and relieved, while still insuring that the joint will not fail and the webs

separate, as they pass into and through a machine adapted to operate thereon.

To accomplish these and other objects herein-after disclosed, the invention consists in the novel features and combinations thereof to be hereinafter disclosed and claimed.

Preferred embodiments of the invention are illustrated in the accompanying drawings, wherein:

10 Figures 1 and 2 are face views of replacement web rolls illustrating different forms and arrangements of web end securing means, and of preparing the same for use in the carrying out of the principles of this invention; and

15 Figures 3, 4 and 5 illustrate diagrammatically the operations of a web joining mechanism and the positions assumed by the elements of this invention before, during, and after a web join is made.

20 The web joining mechanism diagrammatically illustrated in Figures 3, 4 and 5 is a part of a web roll feeding and changing mechanism adapted for use with a printing machine and which is of a form shown in a copending application

25 Serial No. 114,763, filed December 8, 1936. Provision is made of a rotatable reel 11 having opposing pairs of arms 12 and 13. Between and by each pair of arms 12 and 13 a web roll is rotatably mounted, herein shown as an expiring

30 web roll 14 from which a web 15 is running into the machine and a replacement web roll 16. The web 15 is fed from the roll 14 over guiding rollers 17 into the printing or other machine adapted to operate thereon. In these figures,

35 the reel 11 is shown after having been rotated to dispose the rolls 14 and 16 into web joining position with the replacement roll 16 in normal running position and the expiring web roll 14 in position to dispose the running web 15 adjacent the periphery of the replacement roll 16 in web prejoin position.

40 A holder 18 rotatably supporting a sleeve member 19, upon which is mounted a web deflector 21 and a web severing blade 22 is pivoted at 23 to be swung toward and away from the replacement roll 16 into and out of the web prejoin position as shown in Figure 3. The web deflector 21 and the severing blade 22 are actuated in sequence by the rotation of the sleeve

45 member 19 to respectively press the web 15 against the replacement roll to join it to the web 24 thereof as shown in Figure 4 and then to sever the web 15 in back of the joint as indicated in Figure 5. Suitable mechanism (not

50 shown) is provided to rotate the sleeve member in timed relation with the rotation of the roll 16 to insure proper operation of the web deflector 21 and the severing blade 22. Suitable means (also not shown) is provided for rotating the replacement roll 16, when it is positioned as shown to bring it substantially up to the speed of the running web 15 before a web join is made.

55 In accordance with the principles and features of this invention, the replacement roll 16 is prepared for having its web 24 joined to the running web 15 by preferably forming the leading edge 25 of the web 24 as shown in Figure 1, wherein the outer corners of the leading edge are cut or torn diagonally to provide a web

60 corner 26 spaced inwardly from the adjacent roll end, and a diagonally disposed side edge 27, which edge 27 extends backwardly and outwardly from the leading edge 25 to the adjacent side edge 28 of the web at the roll end. A cut away

65 portion or portions 29 are also provided spaced

apart intermediate the side edges 28 of the web end and from said edges to provide other corners 31 and side edges 32. The cut away portions 29 extend backwardly from the leading edge 25 along the web 24. The formation of the leading end of the web 24 as above described provides what may be and will be hereinafter termed leading web tongue portions 35.

Separate sheets 36 of material, preferably paper, and hereinafter termed "slip sheets" are each provided with an adhesive, such as glue, upon a portion 37 of its upper surface. A coating of joining material, such as grease, or other material of like nature having somewhat sticky but non-hardening qualities, which will adhere

15 to the surface of a web end placed thereon, and which, under strain will permit a slight degree of slippage, but not total separation between the slip sheet and the web end is applied to the remaining portion 38 of the upper surface of each of the sheets 36. A slip sheet 36 is disposed beneath each of the tongue portions 35 with the adhesive covered portion 37 thereof left uncovered by disposing the same with an edge 39 thereof extended beyond the leading edge

20 25, while the grease or like covered portion 38 is disposed beneath the tongue 35 to slippingly engage and be connected to the same. The slip sheets 36 are preferably not as wide as the tongues 35 so that when they are disposed beneath the same the side edges 32 and edges 27 are disposed beyond the adjacent side edges 41 of the sheets 36, as shown.

25 Grease or like material similar to that applied on the slip sheet 36 at 38 may be applied to the leading web tongue portions 35 if desired as indicated at 33, spaces 34 being provided between the same to provide a path for the usual roll driving belts which engage the periphery of the roll 16 to bring it up to speed before a join is made. This arrangement may be desired to increase the hold between the running web 15 and the web 24 and to insure that the tail end of the severed web 15 is retained to the web 24 and does not flap due to being loose while it passes into and through the machine into which it is guided by the rollers 17.

30 The slip sheets 36 are attached to the next course of the web 24 by tabs or stickers 42 preferably constituted by short lengths of adhesive paper tape. The tabs 42 are herein shown disposed across the outer corners 43 of the respective sheet 36 with an edge 44 thereof extending diagonally from the leading edge 39 of the sheet 36 across the corner 43 and to the side edge 41 thereof, and are securely stuck to the sheet 36 where it overlies the same and to the next course of the web 24. Similar tabs 45 are shown disposed across the corners 31 of the web tongues 35 with an edge 46 of each extending diagonally from the leading edge 25 of the web 24 across the corner 31 and to the side edges 32 and 27 respectively. The tabs 45 are securely stuck to the web 24 where it overlies the same and also to the next course of the web 24.

35 40 45

40 45

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50 55 60

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65 70 75

70 75

75

be left along each edge of the sheets 36 of Figure 1 and about the periphery of the strip of material 48 of Figure 2.

All of the forms and arrangements shown in the drawings and described above insure a rapid joining of the running web 15 with the web 24 of the replacement roll 16, when the web deflector 21 is actuated by rotation of the sleeve 19, to press the web 15 against the roll 16. As shown in Figure 3, the prepared replacement roll 16 is being rotated to advance the leading end 25 of the web 24 thereof toward the deflector 21. As soon as the prepared web end 25 is in proper position, the web deflector 21 is actuated to press the web 15 against the same whereupon the adhesive covered area 37 on each of the slip sheets 36 adheres to the running web 15 and the sheets are carried along thereby as shown in Figure 4. As soon as the web join, referred to above, is completed, the sleeve 19 is actuated to rock the blade 22 into the position shown in Figure 5 to sever the web 15 whereupon the web 24 is fed from the roll 16 into the machine, over the rollers 17. After the web join is completed, the swingable holder 18 is swung up out of the way.

When the web join is made as above described by the pressing of the running web 15 against the adhesive area 37 on the slip sheet 36 by the deflector 21, the running web, due to its movement upwardly and the rotative movement of the replacement roll 16 away from this web, pulls the slip sheet or sheets 36 away from the roll 16, tearing the same diagonally across the corners 43 adjacent and along the diagonally disposed edge 44 of the tabs 42. This action raises the slip sheets 36 away from the roll 16 and at the same time raises the leading edge 25 of the web 24 away from the roll 16 and tears the web 24 diagonally across the corners 31 along or adjacent to the diagonal edge 46 of the tabs 45. The connection between the slip sheets 36 and the web 24 constituted by the grease on the area 38 is maintained due to the sticky characteristic of the same. Any excessive strain or tension imposed on the webs at the time of making the join will cause the slip sheets 36, now secured to the web 15 to slip along the end of, and in the direction of the run of, the web 24, this action being permitted to a more or less degree due to the quality of the grease used and the area over which the grease is applied, and the degree of the strain or tension imposed, whereby the webs are relieved from the excessive strains, tension or sudden shock, and any possibility of either of the webs being torn, or the web join abruptly separated is obviated. The provision of a slip sheet or sheets 36 between the running web and the web of a replacement roll as the connecting means therebetween, whereby a slight slippage is permitted between the running web, and the replacement web to obviate the above referred to possibilities, allows a web joining mechanism to be more rapidly and efficiently operated than was possible heretofore.

It will be understood that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, as for instance, it has been found practical in some cases to omit the use of tabs for securing the leading end of the web to the body of the roll, and depend on the holding power of the slip permitting adhesive and the tabs between the slip sheet and the roll, to prevent the leading end of the web from being separated from the body of the roll prematurely. It is therefore desired

that the present embodiment be considered in all respects as illustrative and not restrictive, and it will be further understood that each and every novel feature and combination present in or possessed by the mechanism herein disclosed forms a part of the invention included in this application.

What I claim is:

1. In combination, holding means for securing the free end of the web of a web roll to the body of the roll, including a slip sheet having an adhesive covered end extending beyond the leading edge of the web of the web roll and being slipingly connected to this web.

2. In combination, holding means for securing the free end of the web of a web roll to the body of the roll, including a slip sheet having an adhesive covered end extending beyond the leading edge of the web of the web roll and being slipingly connected to this web, and tear directing means to secure said slip sheet to the body of the roll and arranged to cause the sheet to tear away from the roll when the splice is made.

3. Means to secure the web end of a web roll to the body thereof comprising a slip sheet having an adhesive covered end thereof extending beyond the leading edge of the web end and being slipingly secured to the web end, and means to releasably secure said slip sheet to the body of the roll.

4. Means to secure the web end of a web roll to the body of the roll including a slip sheet having securely holding adhesive on a portion of one of its surfaces and a web joining slip-permitting material on another portion of one of its surfaces.

5. In combination, holding means for retaining the leading end of the web of a web roll to the body of the roll including a slip sheet having securely holding adhesive on a portion of one of its surfaces and a web joining slip-permitting material on another portion of one of its surfaces, said slip-permitting material covered portion of the slip sheet being in contact with the leading end of the web, and means to releasably connect the slip sheet to the body of the roll.

6. In combination, holding means for retaining the leading end of the web of a web roll to the body of the roll including a slip sheet having securely holding adhesive on a portion of one of its surfaces and a web joining slip-permitting material on another portion of one of its surfaces, said slip-permitting material covered portion of the slip sheet being in contact with the leading end of the web, said securely holding adhesive covered portion of the slip sheet extending beyond the leading end of the web, and means to connect the last mentioned slip sheet portion to the body of the roll.

7. In combination, holding means for retaining the leading end of the web of a web roll to the body of the roll including a slip sheet having securely holding adhesive on a portion of one of its surfaces and a web joining slip-permitting material on another portion of one of its surfaces, said slip-permitting material covered portion of the slip sheet being in contact with the leading end of the web, said securely holding adhesive covered portion of the slip sheet extending beyond the leading end of the web, and means to connect the last mentioned slip sheet portion to the body of the roll, said connecting means being adapted to direct the tearing of the slip sheet from the roll.

8. In combination, holding means for retaining

the leading end of the web of a web roll to the body of the roll including a slip sheet having securely holding adhesive on a portion of one of its surfaces and a web joining slip-permitting material on another portion of one of its surfaces, said slip-permitting material covered portion of the slip sheet being in contact with the leading end of the web, said securely holding adhesive covered portion of the slip sheet extending beyond the leading end of the web, and a tab extending across each of the outer corners of said slip sheet to connect it to the body of the roll, said tab presenting an edge disposed diagonally across the sheet corner to direct the tearing of the sheet away from the roll.

9. The method of preparing a replacement web roll for a non-stop roll changing device in a machine operating upon a web, which consists in disposing a slip sheet against the leading end of the web with a slip-permitting substance therebetween, and then securing the slip sheet to the next course of the web on the roll by tabs at the forward end of the sheet.

10. In combination, holding means for securing the free end of the web of a web roll to the body of the roll, including a strip of material, a first means to join said strip to a web running adjacent to the web roll and, a slippable connecting means to join said strip to the free end of the web of the web roll, whereby movement between said strip and the free end of the web of the web roll will be permitted when a strain is imposed thereon by an increase in tension on the running web.

11. In combination, a holding means for securing the free end of the web of a web roll to the body of the roll, including a member having means thereon

to join it at a point to a running web and having means thereon to join it to the free end of the web on the web roll, one of said means being slippably joined to the respective web to permit movement of the point of jointure of said member with the running web from the free end of the web of the web roll when an increased tension is imposed on the running web.

12. In a means for joining the web end of a full web roll to a web running from an expiring web roll, mechanism arranged to move the said web relatively towards and into engagement with the web roll, and a member having a connection with the web end and arranged to make a connection with the running web when the running web is brought into engagement with the web roll, one of said connections being arranged to permit a limited relative motion between the running web and the web end, without allowing their separation.

13. In a means for joining the web end of a full web roll to a web running from an expiring web roll, a mechanism arranged to move the said web relatively towards and into engagement with the web roll, means for temporarily connecting the web end to the body of the web roll in preparation for making a web join, a member having a connection with the web end and temporarily connected to the body of the web roll, said member being arranged to make a connection with the running web and to free itself and the web end from the web roll when the running web engages the web roll, one of said connections being arranged to permit a limited relative motion between the running web and the web end, without allowing their separation.

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