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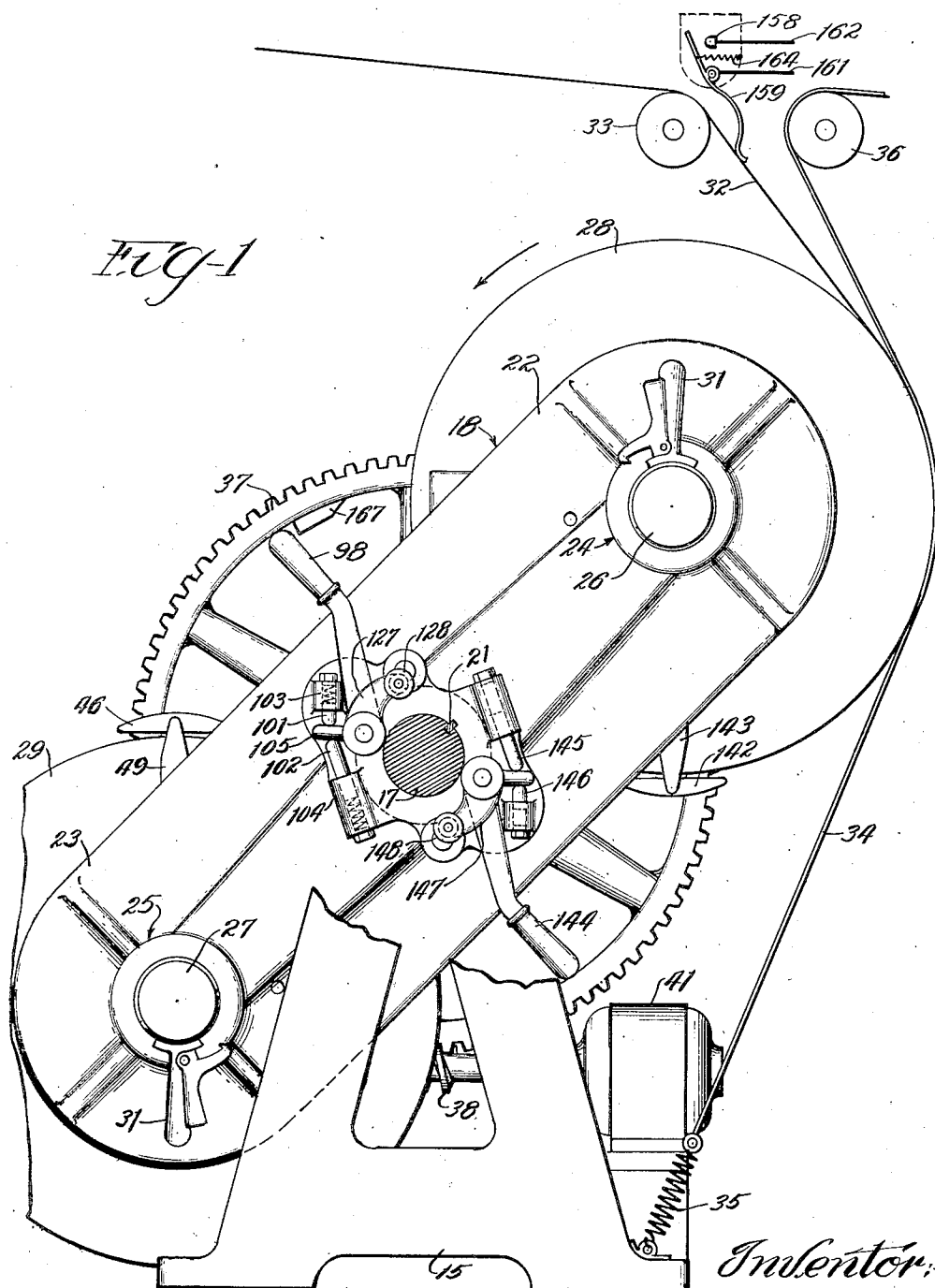
L. M. STRAND

1,895,425

METHOD AND APPARATUS FOR MAKING PASTERS BETWEEN THE WEBS OF  
SUCCESSIVE ROLLS OF PAPER SUPPLYING A PRINTING PRESS

Filed Nov. 20, 1931

7 Sheets-Sheet 1



Inventor:  
Lloyd M. Strand  
By: Carl S. Lloyd  
Atty.

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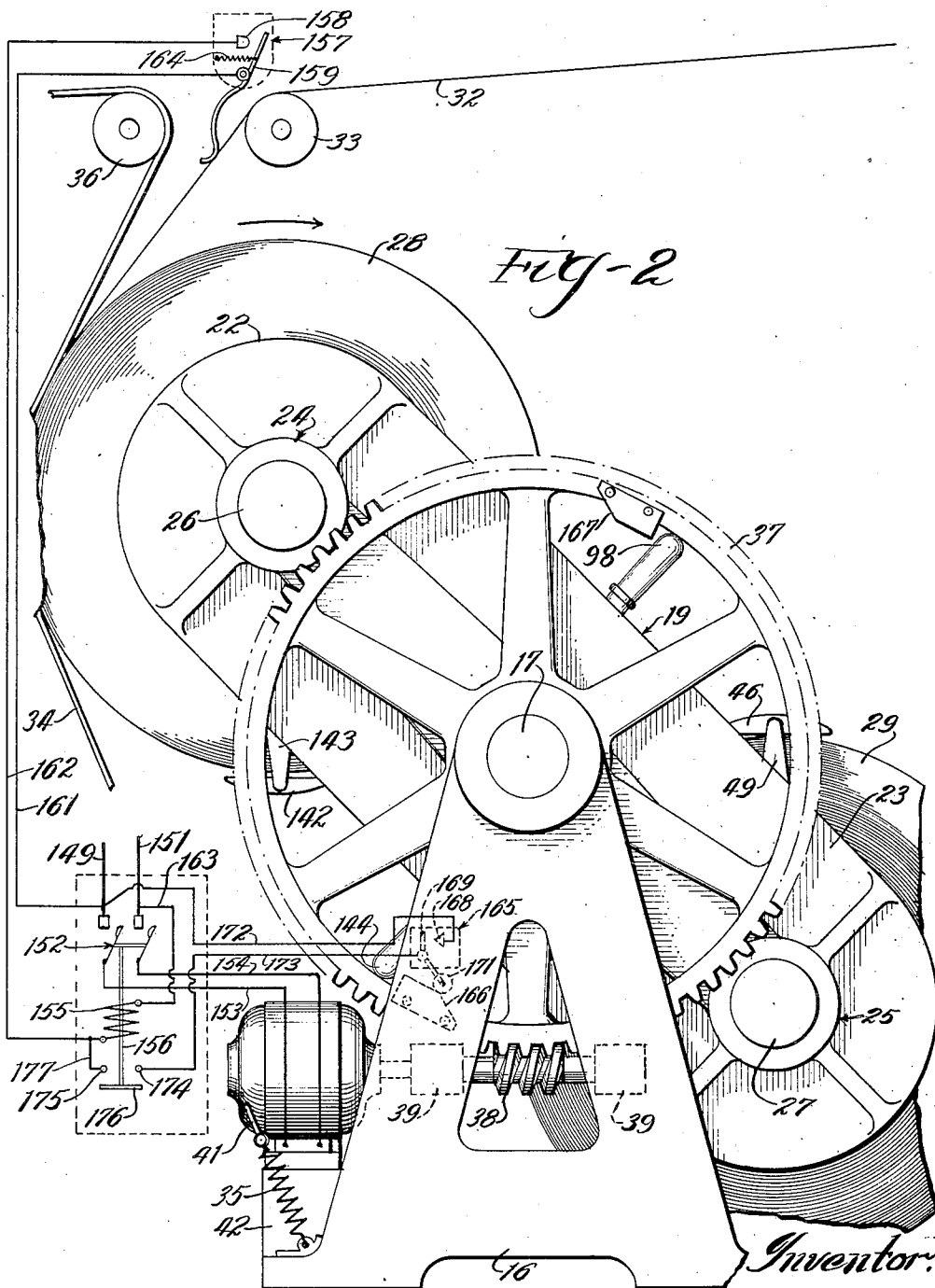
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Lloyd M. Strand  
By: Carl S. Lloyd  
Att'y.

Jan. 24, 1933.

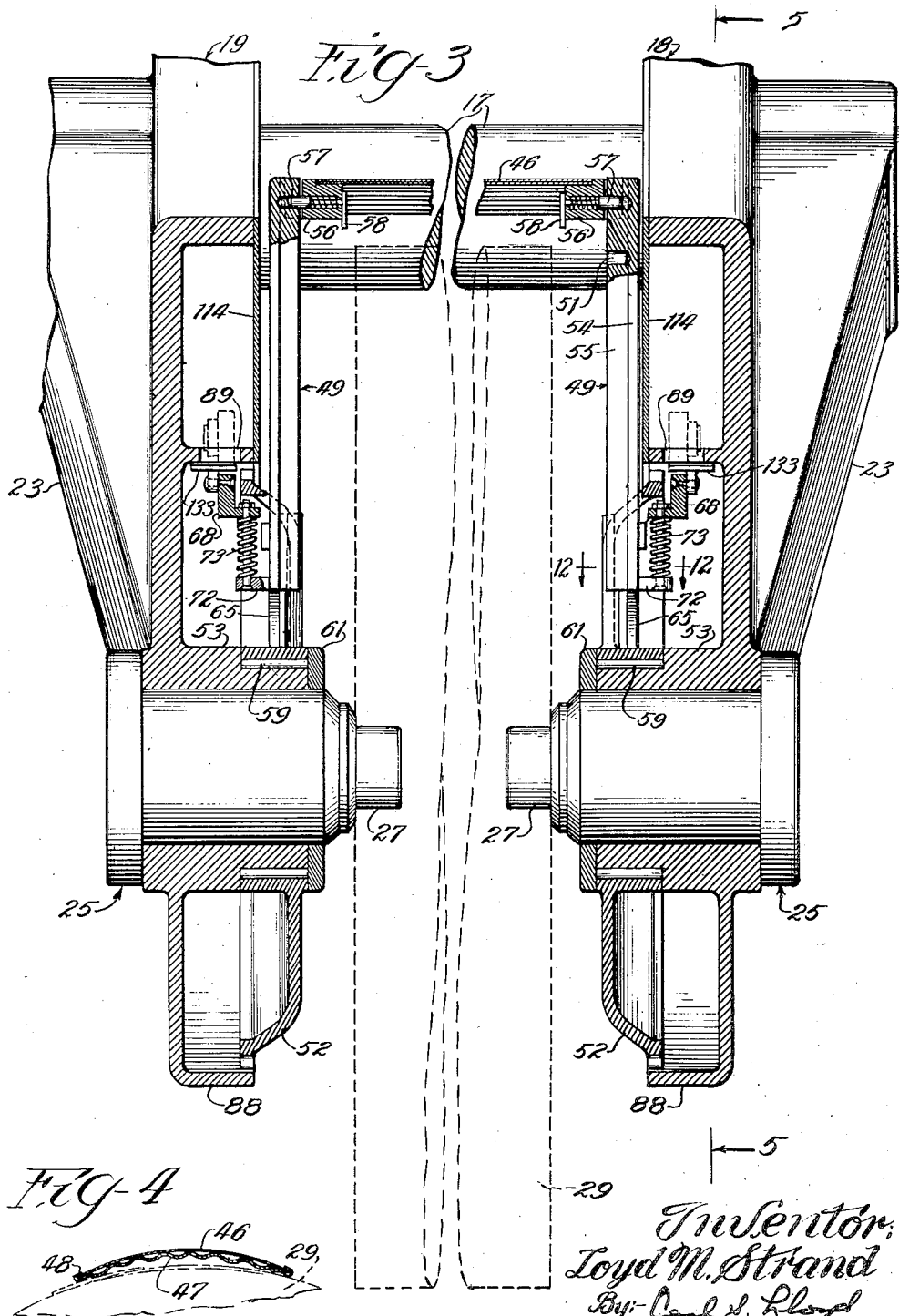
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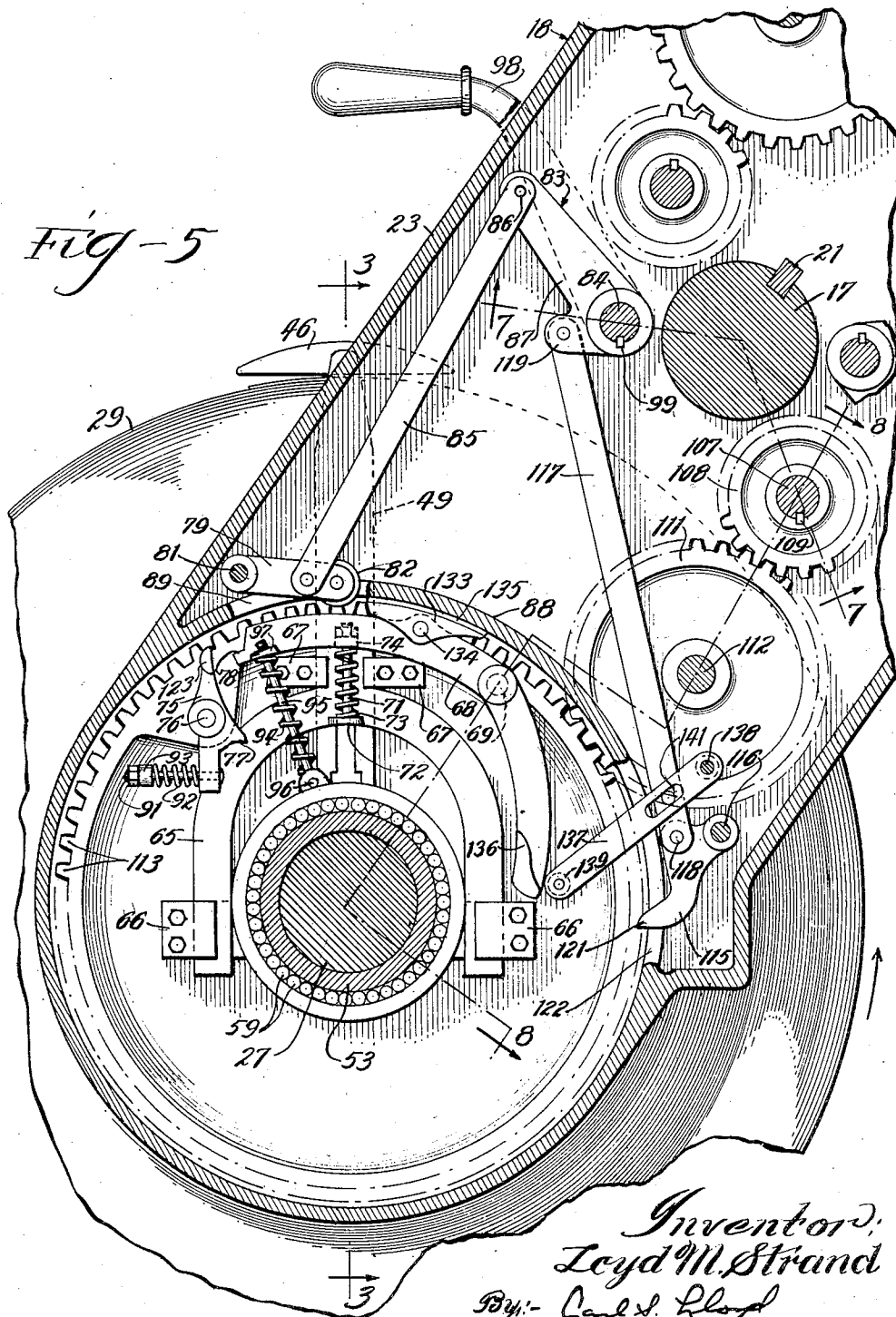
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7 Sheets-Sheet 4



*Inventor:*  
*Lloyd M. Strand*

*By:- Carl L. Lloyd*

*Att'y.*

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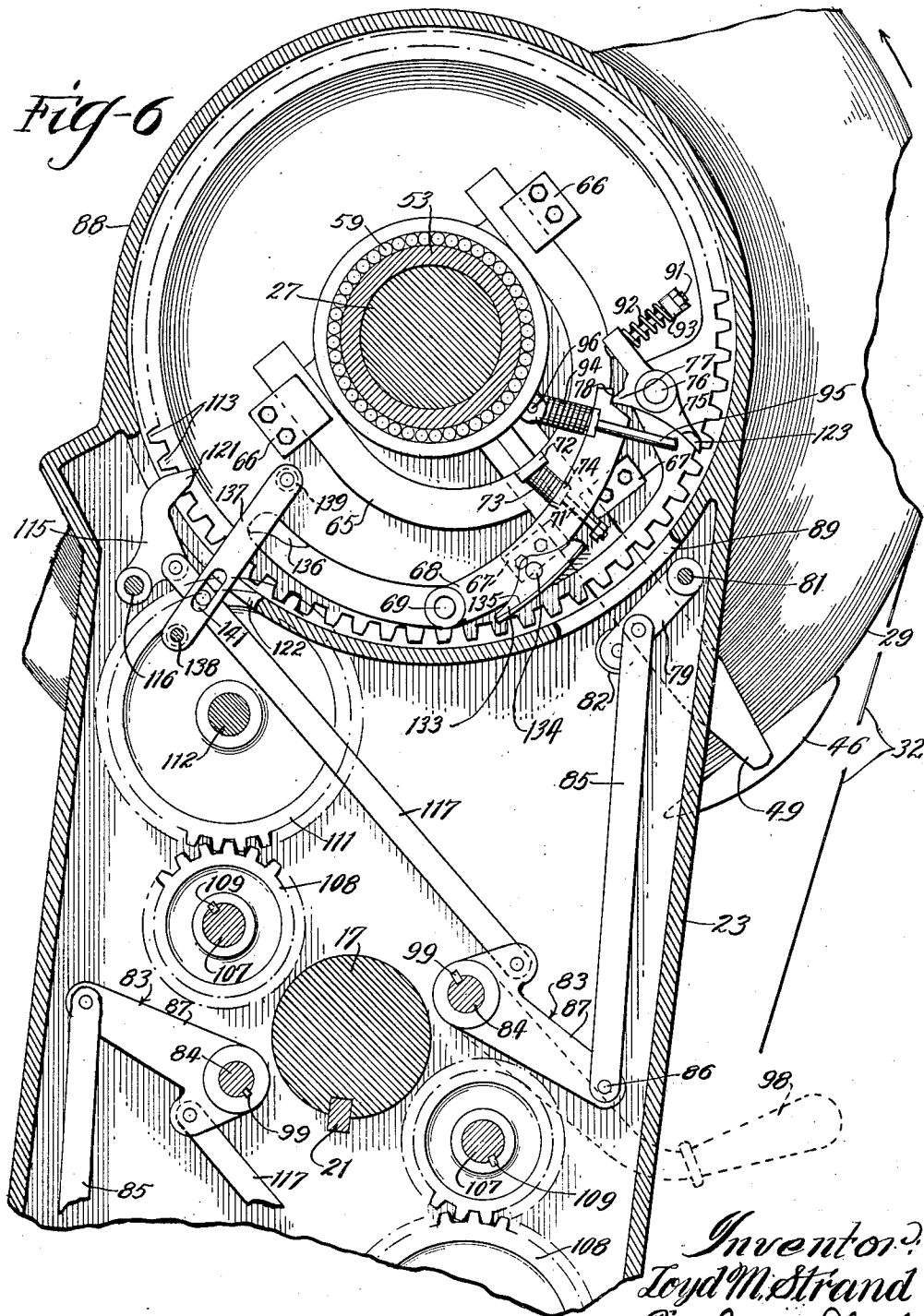
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*Inventor:*  
*Lloyd M. Strand*  
*By: Carl L. Plough*  
*Att'y.*

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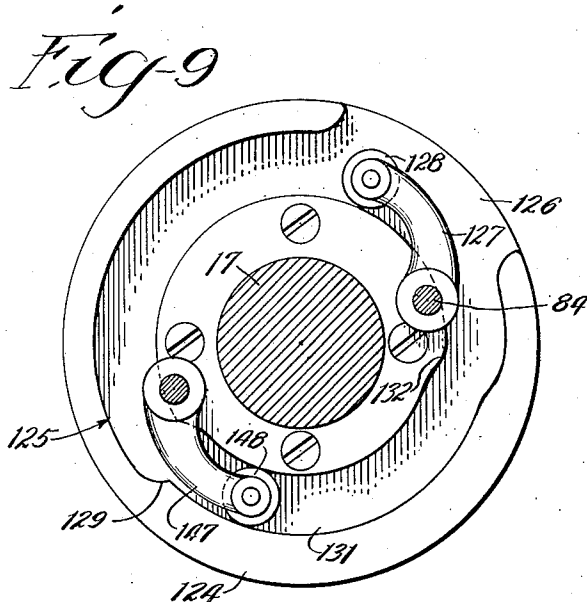
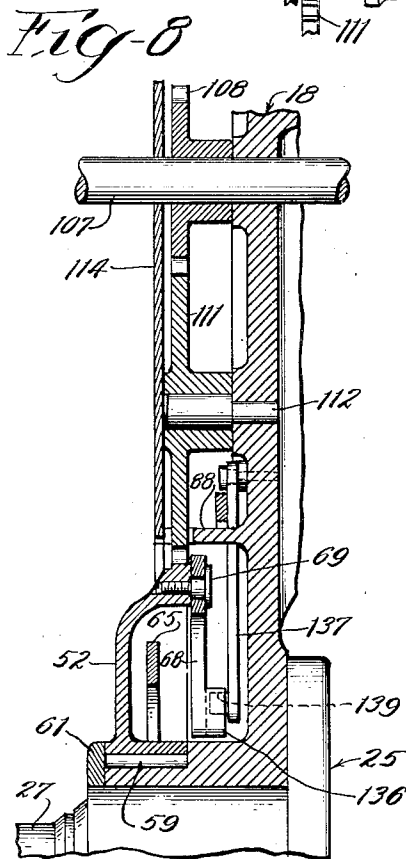
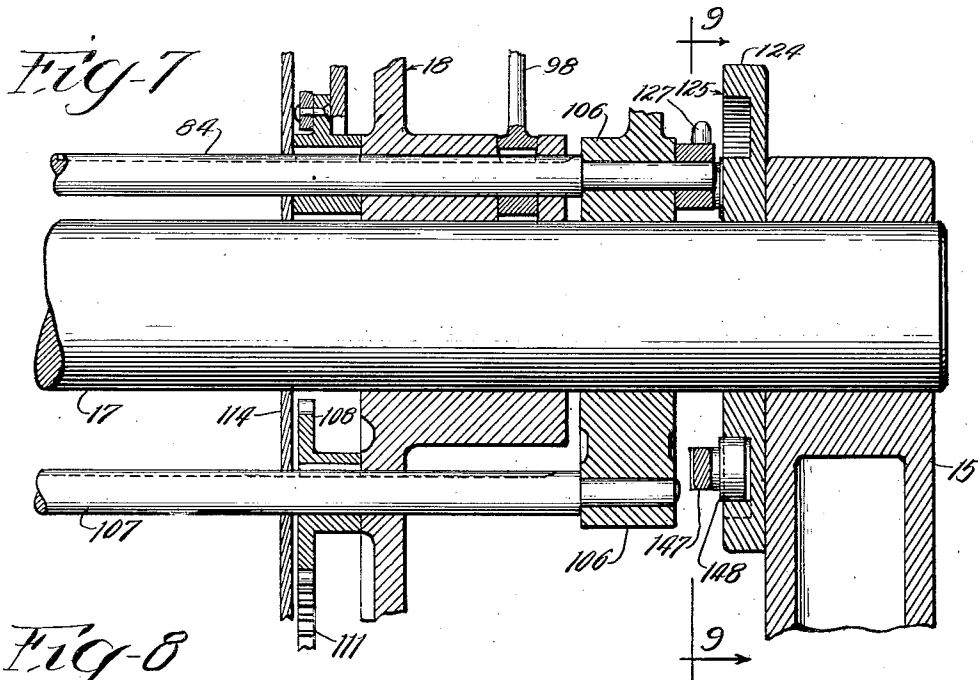
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Inventor  
Loyd M. Strand.  
By: Carl S. Floyd

*Att'y*

Jan. 24, 1933.

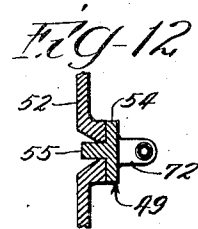
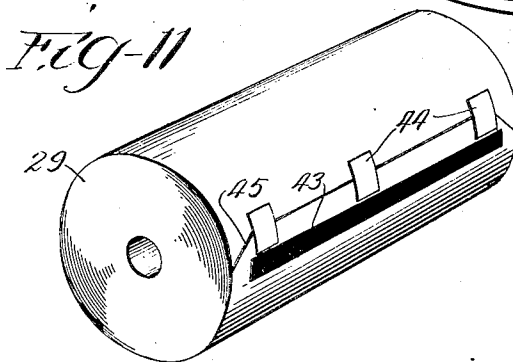
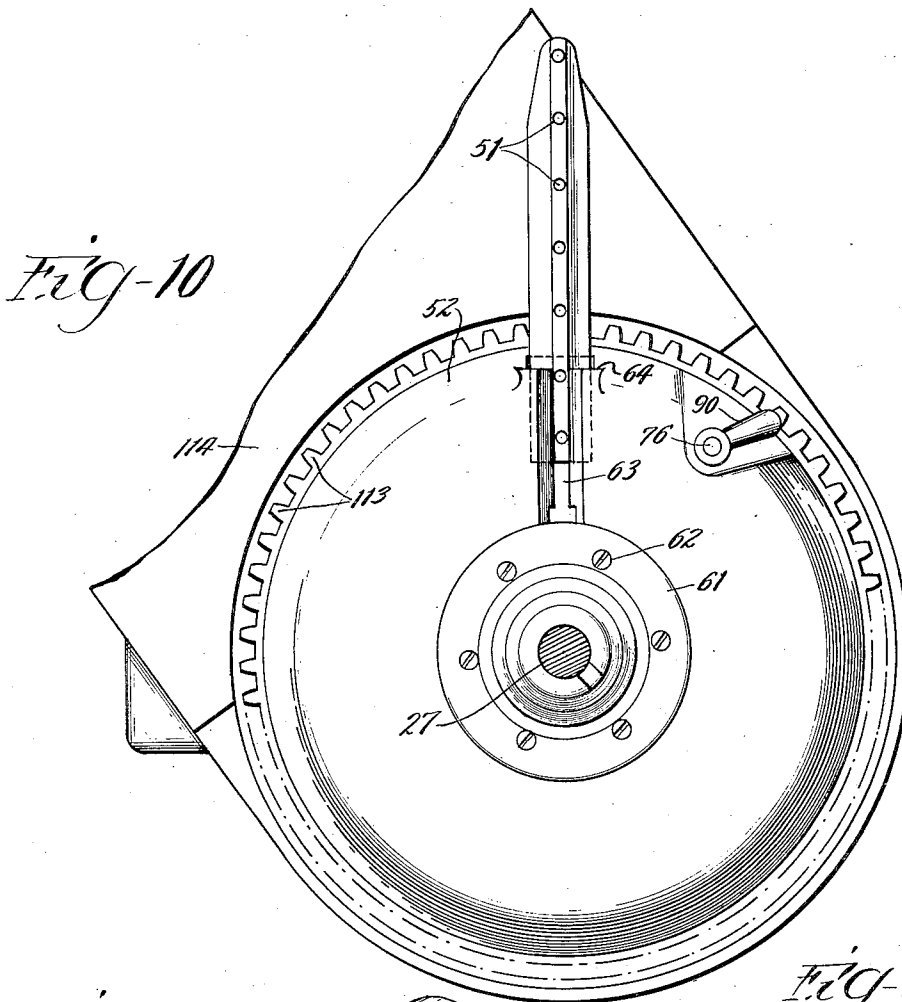
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7 Sheets-Sheet 7



*Inventor:*  
*Loyd M. Strand*  
*By: Carl S. Lloyd*  
*Atty.*

## UNITED STATES PATENT OFFICE

LOYD M. STRAND, OF CHICAGO, ILLINOIS, ASSIGNOR TO ALLAN J. CLINE, OF  
CHICAGO, ILLINOIS

METHOD AND APPARATUS FOR MAKING PASTERS BETWEEN THE WEBS OF SUCCESSIVE  
ROLLS OF PAPER SUPPLYING A PRINTING PRESS

Application filed November 20, 1931. Serial No. 576,300.

This invention relates to a method and apparatus for supplying paper to printing presses and particularly to a method and apparatus for making high speed pasters between the webs of successive rolls of paper supplying the press.

Heretofore in making pasters it has been the general practice to coat the leading edge of the reserve roll with a strip of non-drying glue or paste, and then move the roll into close proximity to the running web without, however, allowing the web to engage the roll. As the active roll is about to expire the press is slowed down to threading speed and the reserve roll is brought into contact with the expiring web and, after a partial revolution of the roll, the wet paste contacts with and adheres to the expiring web, the latter being then severed and the press being gradually returned to operating speed. Because of the great weight of the reserve roll it is impossible to bring it up to full press speed by the action of the running web thereon during the partial rotation of the roll which occurs before the adhesive thereon contacts the web.

The principal object of this invention is to provide means for shielding the adhesive on the reserve roll so that the latter may rotate in contact with the running web, or other means for bringing the roll up to speed, without having its leading edge adhere thereto, and in combination therewith a release mechanism which automatically removes said shielding means to expose the adhesive to contact with the expiring web when the reserve roll has attained substantially press speed, thus transferring the feed from the active roll to the reserve roll without materially, if at all, reducing the speed of the press.

Another object of the invention is to provide means operative upon release of the shield to bring the latter to a stop in such position as to avoid interference with the withdrawal of the web from the newly substituted roll.

Another object of the invention is to provide means for bringing the shield to a stop in such position relative to the roll support as to permit loading of a reserve roll on the

support without interference from the shield.

A further object of the invention is to provide means for timing the shield release means to insure the making of the paster as soon as the active roll becomes reduced to the point where a feed change is necessary.

Further objects and advantages of the invention will be apparent from the following detailed description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Fig. 1 is an end elevational view of a reel in which the invention is embodied, the upper end of the reel upright being broken away to illustrate parts of the shield control mechanism;

Fig. 2 is an end elevational view of the reel taken from the end opposite to that shown in Fig. 1, and also showing in diagrammatic form the automatic control means for starting rotation of the reel as the web is about to expire;

Fig. 3 is a section through one of a pair of roll supporting arms taken on line 3—3 of Fig. 5, the view showing the construction of the shield and the means for clamping the same against the roll;

Fig. 4 is a transverse section through the shield showing the construction of the shield and its relation to the roll when clamped thereon;

Fig. 5 is a sectional view of the roll supporting structure, the section being taken on line 5—5 of Fig. 3 and showing the reserve roll in the loading position with the shield in the released position;

Fig. 6 is a view similar to Fig. 5 but showing the position of the parts with the shield in clamped position and the reserve roll in position for the making of the paster;

Fig. 7 is a section through the reel shaft and a portion of the shield operating mechanism, the section being taken on line 7—7 of Fig. 5;

Fig. 8 is a section through a portion of the shield operating mechanism taken on line 8—8 of Fig. 5;

Fig. 9 is a view of the timing cam which

controls the release of the shield, the view being taken on line 9—9 of Fig. 7;

Fig. 10 is a broken elevational view of one of the rotatable end plates and the shield supporting arm which is mounted thereon;

Fig. 11 is a perspective view of a roll of paper showing the manner in which the leading edge of the web is prepared for making the paster; and

Fig. 12 is a section through one of the shield supporting arms taken on line 12—12 of Fig. 3.

Briefly, the invention consists in providing a shield on the reserve roll for covering an adhesive thereon until such time as it is desired to make the paster. The shield is arranged to be releasably clamped to the reserve roll at the desired point, and both the shield and the clamping means therefor rotate as a unit with the roll so long as the shield remains in the clamped position. After the reserve roll has been brought up to the desired speed the shield is released, thereby exposing the adhesive, which is then brought into pressure contact with the expiring web to which it adheres, thus effecting transfer of the feed to the reserve roll. Immediately upon the release of the shield, both the shield and the clamping means therefor are brought to a stop in such position as to avoid interference with the withdrawal of the web from the newly substituted roll.

The provision of a shield on the reserve roll for covering the adhesive thereon is perhaps particularly applicable in cases where it is desired to bring the reserve roll up to running speed by the action of the running web thereon. However, the invention also contemplates the use of such a shield in cases where running belts such as shown in United States Patent No. 1,738,002, or other means, are provided for preliminarily bringing the reserve roll up to speed before it is moved against the running web.

Considering the drawings in detail, and particularly Figs. 1 and 2, wherein the general construction of the reel is shown, the numerals 15 and 16 designate the reel uprights in the upper ends of which is journaled a shaft 17, the latter being provided near its opposite ends with spiders 18 and 19 which are keyed to the shaft by means of a key 21 which permits longitudinal adjustment of the spiders to accommodate rolls of varying width. In the embodiment shown the reel is of the two-arm type, the spiders 18 and 19 each having oppositely disposed arms 22 and 23, the arms 22 being provided with chucks 24, and the arms 23 being provided with chucks 25. The chucks 24 and 25 include roll supporting spindles designated respectively by numerals 26 and 27, the spindles 26 affording free rotational support for an active or running roll 28, and the spindles 27 similarly affording free rotational support

for a reserve roll 29. The chucks 24 and 25 on one of the spiders are provided with adjusting means 31 which permits the roll engaging spindles to be moved sufficiently to effect engagement and release of the roll.

In the normal running position the reel spiders are positioned at an angle of approximately 45 degrees, as shown in Figs. 1 and 2, the web 32 from the active roll 28 passing upwardly over a guide roller 33, and thence into the press. An external tension mechanism consisting of a plurality of straps 34 is provided for controlling the withdrawal of the web from the running roll. The lower ends of the tension straps 34 are yieldingly connected by springs 35 to fixed points at the base of the reel and the upper ends of said straps extend over a roller 36 to a suitable take-up drum (not shown) which may be actuated by a torque motor, or equivalent means, to produce tension on the straps. Further details of the tension mechanism are not shown since the tension mechanism in and of itself forms no part of the present invention.

The rolls are adapted to be moved bodily by turning of the reel shaft 17, together with spiders 18 and 19, the means for turning said shaft in the embodiment shown consisting of a worm wheel 37, which is keyed to reel shaft 17 and which meshes with a worm gear 38, the latter being journaled at its opposite ends in bearings 39 carried by upright 16. An electric motor 41, mounted on a fixed base 42, and having its armature shaft operatively connected with the shaft of worm gear 38, affords motive power for turning the reel shaft. It will be apparent that when the reel shaft 17 is turned in a clockwise direction, viewing Fig. 1, through an angle of 180 degrees, the reserve roll 29 will be moved from loading to running position while at the same time the core of exhausted roll 28 will be returned to loading position where it may be removed and a fresh roll inserted.

The manner in which the leading edge of the reserve roll is prepared is shown in Fig. 11. A strip 43 of an adhesive of the non-drying type is applied to the leading edge of the web, the latter being tacked down by frangible stickers 44 which prevent air currents from lifting up the end of the web while the roll is rotating and after the shield has been removed. If desired, instead of using stickers 44, the end of the web may be held down by treating the inner surface thereof with hard cup grease. The corners of the leading edge are cut away, as indicated at 45, in order that they may not impede free passage of the web through the press.

Considering now the means provided for shielding the adhesive 43 during preliminary rotation of the reserve roll, reference is first made to Figs. 3 and 4. The numeral 46 designates a shield which preferably consists of a piece of thin sheet steel which is bent into an

arc having a diameter slightly less than the diameter of a full roll. A corrugated reinforcing strip of duralumin 47 is positioned adjacent the concave face of the shield and is secured to the latter by being crimped along its opposite longitudinal edges over the adjacent edges of the shield, as indicated at 48. As will presently appear, in the embodiment shown the shield is arranged to rotate with the reserve roll while the latter is contacting the running web. It therefore must be of such shape as not to interfere with the normal travel of the web into the press. As illustrated in Fig. 4, the curvature of the shield is but slightly greater than that of the roll surface so that very little unevenness in the surface of the roll is caused by the presence of the shield.

Continuing the reference to Fig. 3, the means for mounting the shield on the roll comprises: a pair of radially disposed arms 49 which are provided longitudinally with a series of spaced apertures 51 (Fig. 10); and a pair of rotatable end plates 52 journaled for free rotation on hubs 53, the latter being formed in the ends of spider arms 23. The shield supporting arms 49, as shown in Fig. 12, consist of a main web or body portion 54 which is reinforced by an inwardly projecting tongue portion 55. As will presently appear, the apertures or sockets 51 are provided to accommodate the shield to rolls of different diameters. The shield is provided at its opposite ends with wall portions 56 which are apertured to receive spring-pressed plungers 57, the latter projecting outwardly from wall portions 56 and being provided at their inner ends with finger pieces 58 by means of which the plungers may be pressed inwardly to free them from the cooperating sockets 51 formed in arms 49. This type of demountable connection between the shield and its supporting arms allows the shield to rock sufficiently on its axis to allow proper seating against the face of the roll. Also the provision of the spaced apertures 51 allows the shield to be positioned in whichever pair of apertures may correspond to the approximate diameter of the roll. As will presently appear, the shield 46 is arranged to be drawn inwardly into clamping engagement with the roll surface and it will be noted from Fig. 3 that the shield is of such length that the end wall portions 56 are located beyond the ends of the roll so as to allow the cylindrical body portion of the shield to move into close contact with the roll surface.

The end plates 52 are arranged to rotate freely on hubs 53 through the provision of roller bearings 59, said bearings and the end plates being held on hubs 53 by collars 61 which are secured by screws 62 (Fig. 10) to the inner ends of said hubs. The web portion of each end plate 52 is bent or cupped outwardly as shown in Fig. 3, and shield sup-

porting arm 49 extends through the outwardly curved brim portion of the plate, the web portion of the latter being struck outwardly as indicated in Figs. 10 and 12 to provide a radial slot 63 for receiving the tongue portion 55 of said arm, the web portion 54 of the arm extending through an opening 64 formed in the edge portion of the end plate. The shield 46, the supporting arms 49, and the end plates 52, are arranged to rotate bodily with the roll when the shield is in clamped position, and by extending the inner ends of arms 49 through the webs of end plates 52 in the manner shown a firm connection is provided between said arms and the end plates while at the same time permitting of radial movement of the arms.

Referring to Fig. 5, the inner ends of shield supporting arms 49 terminate in U-shaped members 65, the opposite arms of which have sliding engagement with retaining pieces 66, the latter being secured to the web portion of end plates 52. A second pair of retainers 67, which are also carried by plates 52, slidably engage the arms 49 near the points of connection between the main portion of the arms and the U-shaped members 65. The retainers 66 and 67 thus serve to guide the radial movement of arms 49 and also serve as a means for limiting the extent of such radial movement.

In the position of the parts shown in Fig. 5, shield 46 is in the released position so that a new roll may be placed on the reel arms without interference from the shield. After the new roll has been secured in position on the arms, with the leading edge of the web prepared in the manner already described, shield 46 is clamped against the roll, overlying the glue as shown in Fig. 4. The clamping means is arranged to operate simultaneously on both of the supporting arms 49 and since it is the same for each arm it will be described in the singular. It comprises: a curved lever 68, pivoted at 69 to end plate 52; a limit bolt 71, pivotally secured at its inner end to a lug 72 carried by arm 49, the shank of said bolt being provided with a coil spring 73 which bears at one end against lug 72 and at its opposite end against a lug 74 carried by lever 68; a retaining latch 75 carried on a pivot pin 76, said latch having a retaining nose 77 for engaging a shoulder 78 formed on lever 68; and manually operable means for pushing lever 68 inwardly into latching engagement with latch 75, said last mentioned means including an arm 79, pivotally secured at 81 to the roll support arm and provided at its free end with a roller 82, a bell crank 83 secured to a shaft 84, the latter extending parallel to reel shaft 17, and a link 85 pivotally connected at one end to arm 79, the other end of said link being pivotally connected at 86 to an arm 87 of bell crank 83.

Continuing the reference to Fig. 5, it will

be noted that an external drum housing 88 is formed in the frame of roll support arm 23, said housing extending completely around the periphery of end plate 52. A portion of this housing, however, is broken away as indicated at 89 to allow arm 79 and roller 82 to move inwardly against lever 68. It will be apparent that when roller 82 is caused to bear down on lever 68 the latter will be moved inwardly and, through the yielding connection between lever 68 and arm 49 provided by limit bolt 71 and spring 73, arm 49 will be likewise drawn inwardly, thereby drawing shield 46 against the face of the roll, it being understood that both of the arms 49 at the opposite ends of the roll are moved inwardly simultaneously. Latch 75 is yieldingly held in latched position by means of a bolt 91, the shank of which carries a spring 92 which bears at one end against the latch and at the other end against a lug 93 carried by end plate 52. The clamped position of the parts is shown in Fig. 6. The latch may be manually released by turning a hand-piece 90 (Fig. 10) carried on the inner end of pin 76.

Lever 68 and supporting arm 49, which is yieldingly connected thereto, are returned by spring action from clamped to unclamped position. The means provided for this purpose consists of a heavy coil spring 94 which is carried on the shank of a pin 95, the latter being pivoted at 96 to end plate 52 and the shank thereof having sliding engagement with a lug 97 carried by lever 68. The tendency of spring 94 to expand outwardly against lug 97 is sufficient to return lever 68 and the associated shield supporting arm 49 to unclamped position whenever latch 75 is disengaged from shoulder 78.

The provision of the yielding connection between lever 68 and arm 49 allows the shield to be firmly clamped against the face of the roll regardless of variations in the diameter of the roll, this yielding connection being adapted to accommodate the shield to rolls of various diameters within the limits of the spacing of adjacent pairs of apertures 51 in the arms 49. If the rolls vary in diameter greatly the approximate setting of the shield, as previously explained, is obtained by shifting it to that pair of the apertures 51 which approximately corresponds to the diameter of the roll.

Arm 79 and roller 82 are moved inwardly to effect setting of lever 68 by turning shaft 84 in a counter-clockwise direction, viewing Fig. 5, the motion thus imparted to bell crank 83 being transmitted through link 85 to arm 79. Shaft 84 is turned to thus effect setting of the shield to clamped position by means of a hand lever 98 which is keyed to said shaft by means of a longitudinally extending key 99. As shown in Figs. 1 and 7, hand lever 98 is mounted on shaft 84 within the hub portion

of spider 18 and is movable with said spider along the reel shaft. The hand lever is held in neutral position by means of spring-pressed plungers 101 and 102 which are mounted, respectively, in housings 103 and 104 carried by the spider frame, said plungers acting in opposite directions against an arm 105 which is formed as an integral part of lever 98. It is only necessary to provide one hand lever 98 for each roll inasmuch as the turning of shaft 84 operates the shield-clamping means for both ends of the roll. Shaft 84 is journaled at its opposite ends in end plates 106 (one shown, Fig. 7) which are carried by reel shaft 17 and which rotate with said shaft when the latter is turned to change the position of the rolls.

It is necessary to provide means for operatively connecting the end plates 52 at the opposite ends of the roll so that when the shield is in clamped position said end plates will rotate in unison, thus maintaining supporting arms 49 in the same radial position. The means provided for this purpose is best shown in Figs. 5 and 8 and comprises: a shaft 107, journaled at its opposite ends in plates 106; gear wheels 108, keyed by means of a longitudinally extending key 109 to shaft 107; and idler gear wheels 111, rotatably supported on pins 112 carried by the reel spiders. End plates 52 are provided with gear teeth 113 which mesh with the teeth of idlers 111, the latter in turn meshing with gear wheels 108 on shaft 107. Gear wheels 108 and 111 are enclosed within the housing of the reel spiders by cover plates 114 which are removably secured to the inner faces of the spiders. It will be thus apparent that for a given roll, end plates 52, and shield supporting arms 49 which turn therewith, are connected through shaft 107 and gears 108 and 111 so as to rotate as a unit with the roll when the shield is in the clamped position.

The mechanism provided for releasing the shield from the reserve roll after the latter has attained the desired speed preparatory to making the paster, will now be described, reference being had to Figs. 5 and 6. The mechanism provided for releasing each of the arms 49 is duplicated for the opposite ends of the roll, and hence will be described in the singular. A trip lever 115, pivoted at 116 to the spider frame, is operatively connected with shaft 84 through a link 117, one end of which is pivotally connected at 118 to lever 115, the other end of said link being pivotally connected to an arm 119 of bell crank 83. Trip lever 115 is provided with a nose portion 121 which projects through an opening 122 in drum housing 88 to lie in proximity to the path of travel of a tip portion 123 of release latch 75. When hand lever 98 is held in its normal neutral position, which is the position shown in Fig. 5, release lever 115 is so positioned that the nose portion 121 there-

of does not strike the tip portion 123 of latch 75 when the latter rotates in a counter-clockwise direction. However, means is provided for throwing release lever 115 inwardly to the position shown in Fig. 6 to effect release of the shield when it is desired to make the paster.

The means for actuating release lever 115 operates in timed relation with the rotation of the reel and is illustrated in Figs. 1, 7, and 9. Secured to upright 15 is a face cam 124 having an annular cam groove 125 which extends completely around the cam, except for a clearance portion 126. Secured to the end of shaft 84 is a cam arm 127 having a cam roller 128 thereon which is received in groove 125. As the reel is turned in a clockwise direction, viewing Fig. 1, to bring reserve roll 29 into contact with the expiring web of roll 28, cam roller 128 moves in groove 125 in a counter-clockwise direction, viewing Fig. 9, until it strikes a shoulder 129. As the reel continues to turn after roller 128 strikes shoulder 129, cam arm 127 is moved inwardly into the dwelling portion 131 of cam groove 125, said dwelling portion of the groove extending from shoulder 129 to a second shoulder 132, the purpose of which will presently be explained. The turning of shaft 84 produced by the riding of roller 128 over shoulder 129 throws trip lever 115 from the position shown in Fig. 5 to the position shown in Fig. 6, in which position it will be noted that the nose portion 121 is in the path of the tip 123 of latch lever 75. After roll 29, together with shield 46 and end plates 52, turns in a counter-clockwise direction, viewing Fig. 6, far enough to bring latch 75 opposite trip lever 115, latch 75 will be released from lever 68 and the shield will be immediately raised from the roll by springs 94, it being understood that this release of the clamping means is effected simultaneously at each end of the roll. The adhesive being thus exposed to contact with the running web, adheres to the web and connects the end of the reserve roll thereto, after which the web from the expiring roll is severed.

It will be noted that shoulder 129 of cam 124 is located somewhat less than 180° in advance of clearance portion 126. As the running web approaches the core it assumes a more nearly vertical position, and hence will engage the reserve roll before the latter has been moved through 180° to normal running position. By locating shoulder 129 in the position shown, release of the shield is effected as soon as the reserve roll has rotated against the running web long enough to bring it up to press speed. The making of the paster is thus completed somewhat before the reserve roll is brought to running position.

It is further to be noted that release of the shield is not effected until after the same has

turned away from the position in which it contacts the web. In Fig. 6 the shield is about to move against the running web. However, it will not be released until it has turned in a counter-clockwise direction through an angle of about 210° from the position shown in Fig. 6, that being the angular distance through which latch 75 must move before it strikes lever 115. A fixed relation is thus maintained between the position of the reel spiders and the position of the shield at the instant of its release, thereby insuring that the shield will never be released during the interval in which it contacts the running web.

After the shield is released in the manner just described, it is brought to a stop in such position as to avoid interference with the running web. The means provided for stopping rotation of the shield after it has been released is shown in Fig. 5. This mechanism, which is duplicated for each end of the roll, comprises: a brake shoe 133, pivoted at 134 to lever 68, and having a brake lining 135 on the face thereof for engaging drum 88; a cam piece 136, carried on one end of lever 68; and a stop arm 137, pivoted at 138 to the spider housing, and provided at its opposite end with a pin 139 for engaging cam piece 136.

Stop arm 137 has a pin-and-slot connection with link 117, as indicated at 141. When lever 68 is in clamped position, as shown in Fig. 6, the arm thereof which carries cam piece 136 is close to the edge of plate 52 and is out of the path of stop pin 139, thereby allowing an unobstructed rotation of said end plate. When, however, lever 68 is thrown outwardly to release the shield, brake shoe 133 is thrown against the inner face of drum 88 and is forced into braking engagement therewith by the riding of cam piece 136 against stop pin 139. End plates 52, together with shield supporting arms 49 and the shield 46, are thus brought to a sudden stop with the shield positioned at the bottom of the roll as shown for roll 28 in Fig. 1, thereby avoiding interference with the running web.

It will be noted from Fig. 9 that the dwelling portion 131 of the cam groove extends from shoulder 129 to shoulder 132. So long as roller 128 remains in this portion of the groove the brake arm 137 remains in braking position with pin 139 clamped against cam piece 136. However, when the reel has turned far enough to bring roller 128 against shoulder 132, shaft 84 is turned sufficiently to withdraw pin 139 from clamping engagement with cam piece 136 and also at the same time trip lever 115 is removed from the path of travel of latch 75. This is arranged to take place just before the expired roll is returned to loading position. When the loading position is reached, the cam roller 128 is in the clearance portion 126 of the groove to permit

resetting of the shield through the operation of hand lever 96.

While the foregoing detailed description of the shield mechanism and related parts has been confined to the shield 46 which is associated with reserve roll 29, it will be understood that this means is duplicated for running roll 28. The mechanism, however, which is associated with roll 28 is not shown completely in detail since it is identical in construction with the means described for roll 29. The shield which is provided for roll 28 is shown in the general views of Figs. 1 and 2, and is designated by numeral 142, the supporting arms being indicated at 143. The hand lever for clamping down shield 142 is indicated at 144, the latter being held in neutral position by spring-pressed plungers 145 and 146 in the same manner as described in connection with hand lever 98. The cam arm which times the release of shield 142, and which corresponds to the arm 127 for shield 46, is indicated at 147. A cam roller 148 is carried on arm 147 and is received in groove 125 in the same manner as described in connection with roller 128. The timing mechanism for both shields is therefore controlled by the same cam means 124, the only difference being that arms 127 and 147 are disposed at an angle of 180° relative to one another to correspond to the positioning of the rolls with which they are associated. If it is desired to employ a reel having more than two arms the shield mechanism will be duplicated for each of the rolls and cam means 124 will be so designed as to time the release means in accordance with the extent of movement of the reel required to bring a reserve roll to pasting position.

It is believed that a brief statement of the sequence of steps involved in the operation of the shield and the mechanism associated therewith will aid to a clearer understanding of the invention. With the reel in the loading position shown in Fig. 1, and with shield 46 in released position, reserve roll 29 may be mounted on spindles 27 without interference from the shield. After the roll is thus mounted on the reel, the leading edge thereof having been tacked down and treated with adhesive, the roll is turned by hand until the adhesive-treated portion thereof lies below shield 46. The operator then clamps the shield against the roll to cover the adhesive by pulling downwardly on hand lever 98, the turning of shaft 84 (Fig. 5) produced by such movement of the lever serving to move arms 79 at the opposite ends of the roll inwardly into engagement with levers 68. Shield supporting arms 49, which are yieldingly connected with levers 68, are thus moved inwardly with the latter to bring shield 46 against the face of the roll. As hand lever 98 continues to move downwardly, levers 68 move into latching engagement with latches

75, springs 73 and 94 yielding sufficiently to allow inward movement of said levers after the shield has engaged the roll surface. The movement of levers 68 to latched position moves cam pieces 136 outwardly to avoid interference with stop pins 139. The clamped position of the parts is shown in Fig. 6.

After hand lever 98 has thus been manipulated to clamp the shield against the face of the roll, the reel is turned in a clockwise direction, viewing Fig. 1, to move roll 29 into pressure contact with expiring web 32. During this interval of turning of the reel, cam roller 128 (Fig. 9) is traversing the portion of cam groove 125 which lies between clearance portion 126 and shoulder 129, this interval of turning being somewhat less than 180°. Release of the shield is effected shortly after roller 128 strikes shoulder 129, the turning of shaft 84 produced by such engagement serving to move trip levers 115 inwardly to the position shown in Fig. 6, in which position they will strike the tips of latches 75 as soon as the roll has turned far enough to bring said latches opposite the nose portions 121 of the trip levers. The shield will thus be released while the reserve roll is rotating in contact with web 32 and while the shield itself is out of contact with said web. Incident to the release of the shield, levers 68 are thrown outwardly by springs 94 to bring cam pieces 136 into the path of stop pins 139. After the shield is released the inertia of end plates 52 will cause it to continue to rotate until it is at the bottom of the roll, at which time cam pieces 136 engage stop pins 139 to positively clamp brake shoes 133 against the faces of drums 88, thereby bringing the shield, together with supporting arms 49 and end plates 52, to a positive stop at the bottom of the roll.

After the adhesive has been exposed to effect connection between the leading edge of the reserve roll and the expiring web, the latter is severed and the new web is drawn into the press from roll 29, the reel being stopped after roll 29 has moved through pasting position to normal running position, which is 180° from the position shown in Fig. 1. When roll 29 is about to expire, the reel is again turned to effect a transfer of the feed to the next roll. During this interval of turning the core of roll 29 is carried back to the original loading position during the course of which movement cam roller 128 (Fig. 9) moves along the dwelling portion 131 of cam groove 125. As the core approaches loading position roller 128 strikes shoulder 132 and the turning of shaft 84 thus produced moves stop arms 137 sufficiently to remove stop pins 139 from braking engagement with cam pieces 136, this movement also serving to return trip levers 115 to inoperative position. After the core has been completely returned to the original loading

position, cam roller 128 will lie opposite clearance portion 126, thus allowing sufficient turning of hand lever 98 to effect re-setting of the shield.

Although the control of motor 41, which turns the reel, is ordinarily accomplished through a convenient push-button station located near the reel, I prefer to provide means for automatically controlling the operation of said motor so that rotation of the reel to bring the reserve roll to running position will be started at exactly the proper time. The automatic control means for accomplishing this is shown in Fig. 2. Power to the motor is supplied from main line wires 149 and 151 which connect, respectively, through a switch 152 with wires 153 and 154 which lead to the motor. The closing of switch 152 to start rotation of the reel as the active roll is about to expire is accomplished automatically by means of a relay, the coil of which is indicated at 155, and the armature of which is indicated at 156, the latter being operatively connected with the arms of switch 152. A switch 157, consisting of a fixed contact 158 and a movable contact carried by a pivoted switch arm 159, is normally held in open position by reason of the engagement of arm 159 with the running web 32. Switch 157 is connected in series with relay coil 155, the circuit being from main line wire 149 through wire 161, switch 157, and wire 162 to coil 155, and thence through wire 163 to the opposite main line wire 151. So long as switch 157 remains open coil 155 is de-energized and main line switch 152 remains open. When, however, the running web 32 assumes a more nearly vertical position, by reason of the reduction in the size of roll 28, arm 159 is urged toward closed position by a spring 164, and when the active roll is nearing the point of depletion, switch 157 is closed and in turn closes main line switch 152 to start operation of motor 41.

A switch 165, carried by upright 16, cooperates with a pair of cam plates 166 and 167, disposed at diametrically opposite points on worm wheel 37, to control operation of motor 41 after it has been initially started through the closing of switch 157. Switch 165 includes a fixed contact 168 and a movable contact carried on an arm 169, the latter carrying a roller 171 which extends into the path of movement of cam plates 166 and 167. So long as roller 171 engages one or the other of plates 166 and 167, switch 165 is held in open position. The purpose of having switch 165 is to provide a holding circuit for coil 155 so that motor 41 will continue to run even after switch 157 is opened. This holding circuit is traced from main line wire 149 through wire 172, switch 165, wire 173, to a contact 174, the latter being connected to a second contact 175 through a bridge piece 176 which is carried by the armature 156.

The return from contact 175 is through a wire 177 to coil 155, and thence through wire 163 to the other side of the main line 151.

The operation of this automatic control circuit is as follows: Assuming switch arm 159 to be in the position shown in Fig. 2, as roll 28 becomes reduced to the core, switch 157 is automatically closed and energizes relay coil 155, thus closing switch 152 to start the motor, the latter operating to turn the reel in a counter-clockwise direction, viewing Fig. 2. As soon as coil 155 becomes energized in this manner, bridge piece 176 is drawn upwardly to connect contacts 174 and 175. As soon as the reel is turned a slight amount, roller 171 of switch 165 falls from cam piece 166, thereby closing switch 165 and completing the holding circuit through coil 155. Motor 41 is thereafter subject to the control of switch 165 regardless of the position of switch 157. The reel continues to rotate until cam piece 167 comes into engagement with roller 171 at which time switch 165 is opened and main line switch 152 is in turn opened because coil 155 becomes de-energized. The motor is thus stopped after the reel has turned through approximately 180°, thereby bringing the reserve roll into running position. During the course of the turning of the reel the shield release mechanism has been automatically actuated by cam means 124 to expose the adhesive and make the paster as the reserve roll approaches running position. By the time the reserve roll has been moved to running position, switch arm 159 is again opened by the web from the reserve roll and is in readiness to start another roll change at the proper time.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible in view of the prior art.

What I regard as new and desire to secure by Letters Patent is:

1. The method of joining the expiring web of a roll of paper supplying a printing press to the end of the web of a reserve roll which has been preliminarily treated with an adhesive, which comprises bringing the reserve roll up to desired speed while shielding the adhesive thereon by means of a protective covering superposed over the treated portion of the web and rotatable with the roll, removing said protective covering from the adhesive when the reserve roll has attained the desired speed, and producing pressure between the reserve roll and the web from the expiring roll, whereby the adhesive is caused to contact with and adhere to the expiring web thus connecting the new web thereto without stopping the press.

2. The method of joining the expiring web of a roll of paper supplying a printing press

to the end of the web of a reserve roll which has been preliminarily treated with an adhesive, which comprises bringing the reserve roll into engagement with the running web while shielding said adhesive from contact therewith, thereby bringing the reserve roll up to desired speed by the action of the running web thereon, and removing the shielding means from the adhesive when the active roll is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus connecting the new web thereto without stopping the press.

3. The method of uniting the expiring web of a roll of paper supplying a printing press to the web of a reserve roll, which comprises applying an adhesive to the end of the web of a reserve roll, superposing a protective covering over the adhesive to prevent contact between the same and the running web, moving the reserve roll into engagement with the running web, thereby bringing the reserve roll up to desired speed by the action of the running web thereon, and removing the protective covering from the adhesive when the active roll is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus joining the new web thereto without stopping the press.

4. The method of joining the webs of successive rolls of paper mounted on a rotatable reel for supplying a printing press, which comprises applying an adhesive to the end of the web of the reserve roll, superposing a shield over the adhesive to prevent contact between the same and the running web, turning the reel when the active roll is about to expire to bring the reserve roll against the running web, the reserve roll being brought to desired speed by the action of the running web thereon, and removing the shield from the adhesive when the active roll is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus connecting the new web thereto without stopping the press.

5. The method of making pasters between the webs of successive rolls of paper supplying a printing press which comprises bringing the reserve roll into engagement with the running web while protecting the latter from contact with an adhesive on the reserve roll by means of a shield superposed over the adhesive-treated portion of the web, thereby bringing the reserve roll up to desired speed by the action of the running web thereon, and releasing said shield while the reserve roll is rotating in contact with the running web and when the shield is out of contact with the latter, whereby the adhesive is caused to contact with and adhere to the expiring web thus connecting the new web thereto without stopping the press.

6. The method of making a high speed paster between the expiring web of a roll of

paper supplying a printing press and the end of the web of a reserve roll which has been preliminarily treated with an adhesive, which comprises bringing the reserve roll up to desired speed while shielding the adhesive thereon by means of a protective covering superposed over the treated portion of the web and rotatable with the roll, removing said protective covering from the adhesive when the reserve roll has attained substantially press speed, and producing pressure between the reserve roll and the web from the expiring roll, whereby the adhesive is caused to contact with and adhere to the expiring web thus connecting the new web thereto without materially slowing down the press.

7. The method of making a high speed paster between the expiring web of a roll of paper supplying a printing press and the end of the web of a reserve roll which has been preliminarily treated with an adhesive, which comprises bringing the reserve roll into engagement with the running web while shielding said adhesive from contact therewith, thereby bringing the reserve roll up to desired speed by the action of the running web thereon, and removing the shielding means to allow said adhesive to contact with and adhere to the expiring web when the reserve roll has attained substantially press speed thus connecting the new web to the expiring web without materially slowing down the press.

8. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, means for shielding an adhesive on the reserve roll from contact with the running web while the reserve roll is rotating in contact therewith, and means for releasing said shielding means as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press.

9. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web and bringing the reserve roll up to desired speed by the action of the running web thereon, means for shielding an adhesive on the reserve roll from contact with the running web while the reserve roll is rotating in contact therewith, and means for releasing said shielding means as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus

transferring the feed to the reserve roll without stopping the press.

10. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, means for shielding an adhesive on the reserve roll from contact with the running web while the reserve roll is rotating in contact therewith, and means operative when the active roll is about to expire to release said shielding means while the reserve roll is rotating in contact with the expiring web and when the shield is out of contact with the latter, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press.

11. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, means for shielding an adhesive on the reserve roll from contact with the running web while the reserve roll is rotating in contact therewith, means for releasing said shielding means as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press, and means controlled by the movement of the roll support for timing the operation of said shield releasing means.

12. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, means for shielding an adhesive on the reserve roll from contact with the running web while the reserve roll is rotating in contact therewith, means for releasing said shielding means as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press, means controlled by the movement of the roll support for timing the operation of said shield releasing means, and means for automatically starting movement of the roll support to bring the reserve roll into pasting position when the active roll becomes reduced to a predetermined diameter.

13. Apparatus for making a paster between the expiring web of a roll of paper supplying a printing press and the end of the web of a reserve roll which has been preliminarily

inarily treated with an adhesive comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, means for preventing the adhesive from contacting with the running web while the reserve roll is rotating in contact therewith, said means including a shield for covering the portion of the roll surface to which the adhesive has been applied, means for releasably clamping said shield against the roll, and trip mechanism for operating said clamping means to release the shield as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press.

14. Apparatus for making a paster between the expiring web of a roll of paper supplying a printing press and the end of the web of a reserve roll which has been preliminarily treated with an adhesive comprising, in combination, a rotatable reel for supporting an active roll and a reserve roll, means for turning said reel to bring the reserve roll into pressure contact with the running web, means for shielding the adhesive from contact with the running web while the reserve roll is rotating in contact therewith, and means for releasing said shielding means as the running web is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press.

15. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure contact with the running web, a shield for covering an adhesive on the reserve roll to prevent the running web from contacting with the adhesive while the reserve roll is engaging the web, means for releasably clamping said shield against the roll, said means being carried by the roll support and adapted to rotate with the roll and the shield when the latter is in the clamped position, trip mechanism for operating said clamping means to release the shield while the reserve roll is rotating in contact with the running web, and as the latter is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press, and brake means operable upon the release of the shield to bring the latter, together with the clamping means therefor, to rest in a position avoiding interference with the web feed.

16. Apparatus for making pasters between the webs of successive rolls of paper supplying

ing a printing press comprising, in combination, a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll into pressure  
5 contact with the running web, a shield for covering an adhesive on the reserve roll to prevent the running web from contacting with the adhesive while the reserve roll is engaging the web, means for releasably clamping  
10 said shield against the roll, said means being carried by the roll support and adapted to rotate with the roll and the shield when the latter is in the clamped position, trip mechanism for operating said clamping  
15 means to release the shield while the reserve roll is rotating in contact with the running web, and as the latter is about to expire, whereby the adhesive is caused to contact with and adhere to the expiring web thus  
20 transferring the feed to the reserve roll without stopping the press, and manually operable means for setting the shield clamping means in clamping position.

17. Apparatus for supplying paper to a  
25 printing press comprising a movable support for an active roll and a reserve roll, means for moving said support to bring the reserve roll from loading to running position, a shield for preventing an adhesive on  
30 the reserve roll from contacting with the running web while the reserve roll is rotating in contact therewith preparatory to making a paster, means for removing said shield to expose the adhesive to contact with the running  
35 web as the latter is about to expire, thereby joining the new web thereto without stopping the press, means controlled by the movement of the roll support for timing the operation of said shield removing means,  
40 means for automatically starting movement of the roll support when the active roll becomes reduced to a predetermined diameter, and means for automatically stopping movement of the support after the latter passes  
45 through the position which effects removal of the shield.

18. Apparatus for making pasters between the webs of successive rolls of paper supplying a printing press comprising in combination, a movable support for an active  
50 roll and a reserve roll, means for shielding an adhesive on the reserve roll while the latter is being brought up to desired speed preparatory to making a paster, said means being rotatable with said reserve roll, means  
55 for releasing said shielding means after such speed is attained, and means for producing pressure between the reserve roll and the running web, whereby the adhesive is caused  
60 to contact with and adhere to the expiring web thus transferring the feed to the reserve roll without stopping the press.

In witness whereof, I hereunto subscribe my name to this specification.

65 LOYD M. STRAND.