

July 6, 1937.

A. J. CLINE ET AL
ROLL CHANGING APPARATUS

2,086,068

Filed Aug. 14, 1933

5 Sheets-Sheet 3

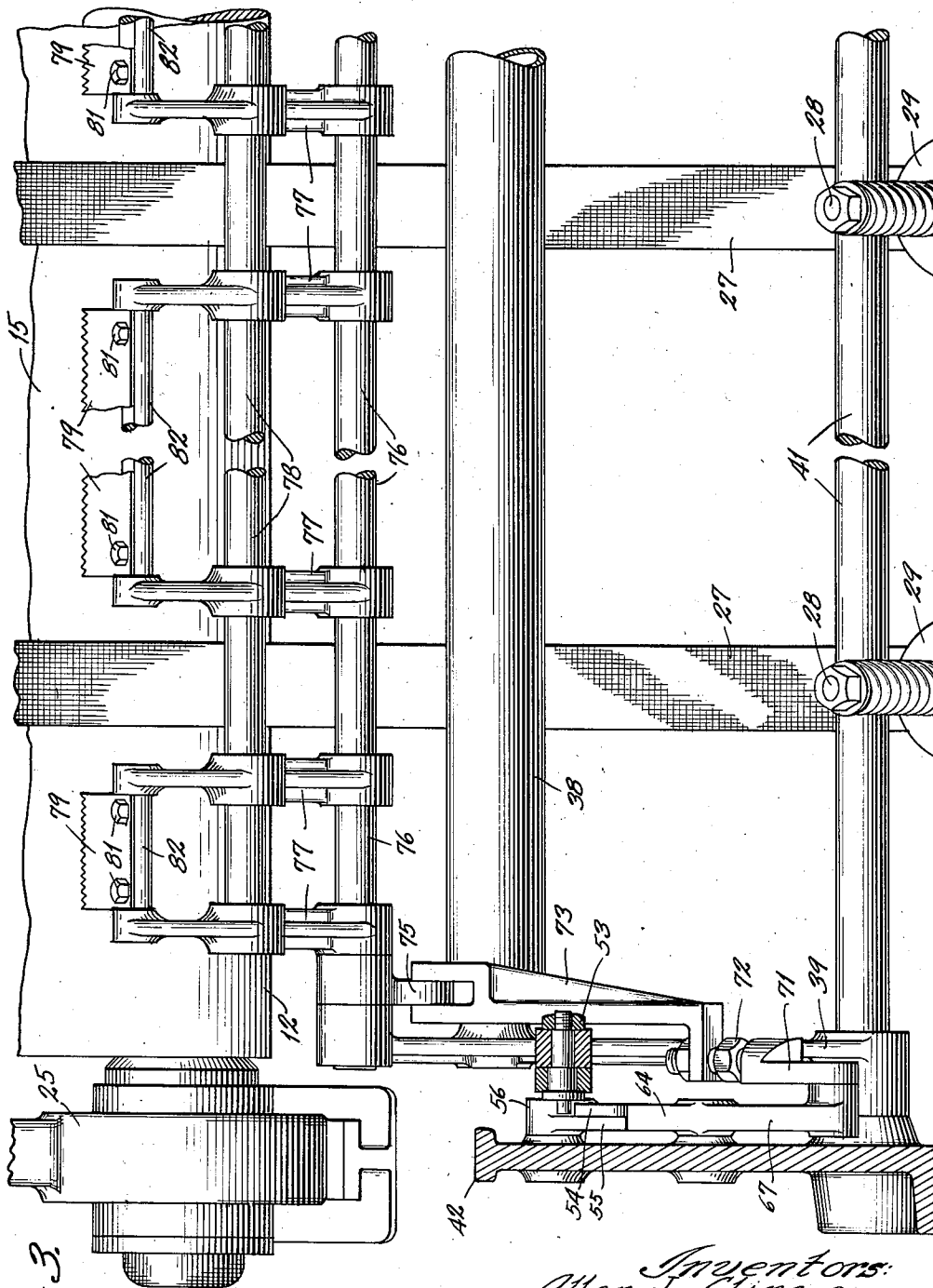


Fig. 3.

Inventors:
Allan J. Cline &
Harold I. McGleery
By Carl S. Lloyd

Atty.

July 6, 1937.

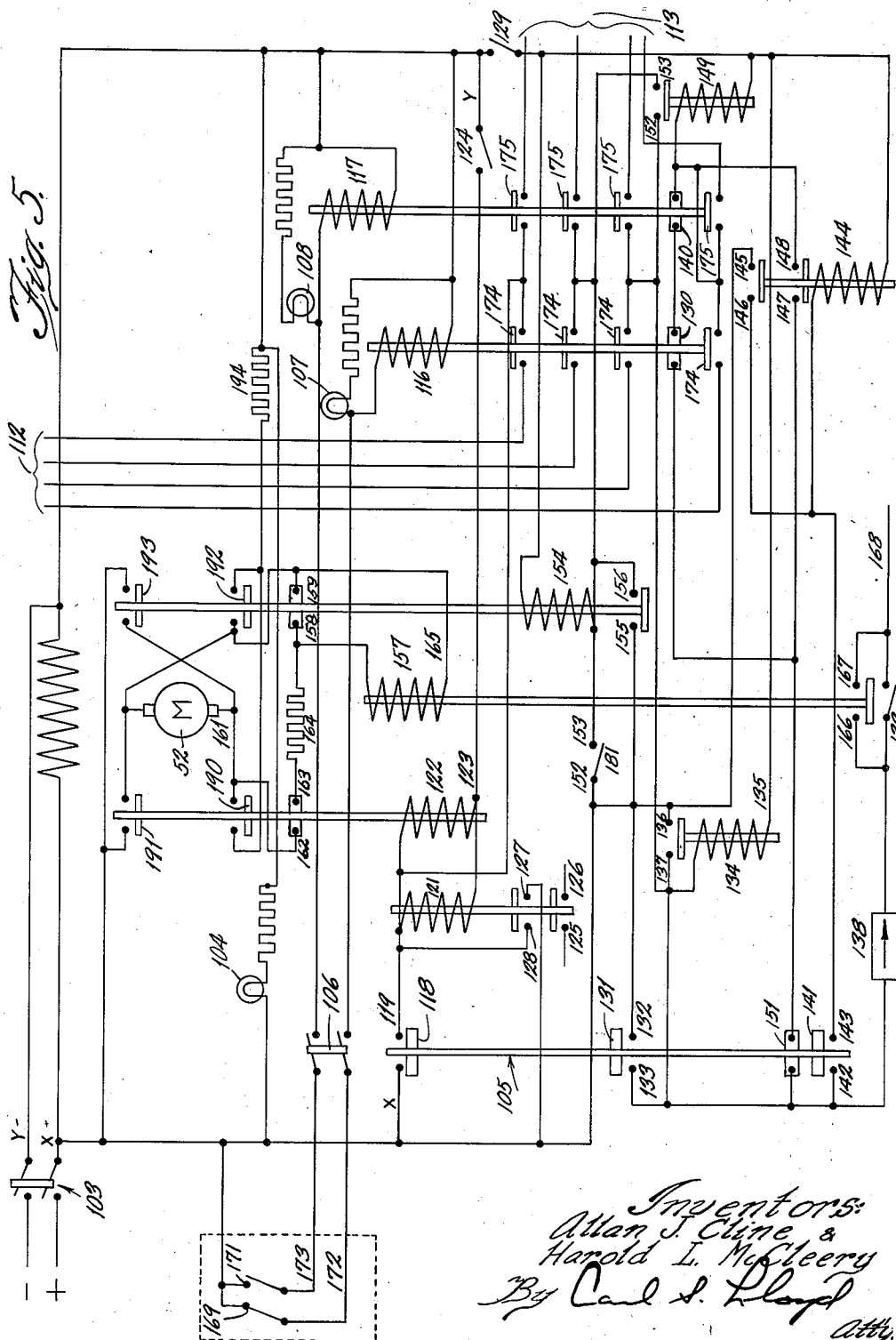
A. J. CLINE ET AL

2,086,068

ROLL CHANGING APPARATUS

Filed Aug. 14, 1933

5 Sheets-Sheet 4



July 6, 1937.

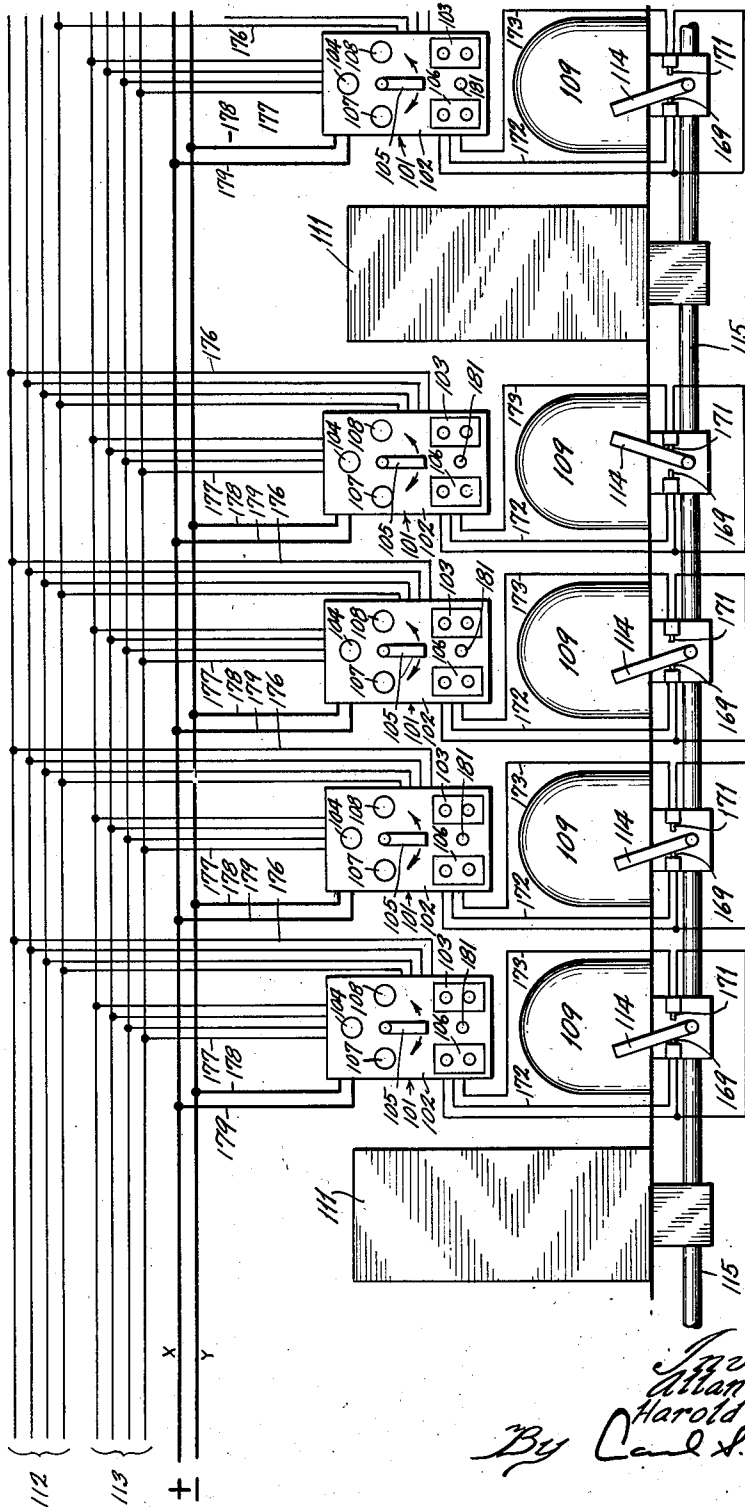
A. J. CLINE ET AL

2,086,068

ROLL CHANGING APPARATUS

Filed Aug. 14, 1933

5 Sheets-Sheet 5



Inventors:
Allan J. Cline &
Harold L. McCleery
By Carl S. Lloyd
Atty.

UNITED STATES PATENT OFFICE

2,086,068

ROLL CHANGING APPARATUS

Allan J. Cline, Chicago, and Harold L. McCleery,
Downers Grove, Ill.; said McCleery assignor to
said Cline

Application August 14, 1933, Serial No. 685,044

21 Claims. (Cl. 242—58)

This invention relates to roll changing apparatus for printing presses whereby the web from an expiring web roll may be pasted to the web of a full roll while the press is running at substantial speed.

5 An important object of the invention is the provision of a multiple or parallel paster apparatus in connection with a series of press units and a plurality of folders, whereby roll changes
10 or pasters may be made simultaneously for all of the press units which may be grouped for operation with any one folder, and whereby any particular unit may be selectively connected for parallel or multiple operation with the group associated with any desired folder.

15 More specifically, the invention relates to a series of press units having a folder disposed at either side thereof, and the object of the invention is to provide means whereby any particular unit may be selectively connected with the group associated with either the folder at the right
20 thereof or the one at the left thereof in accordance with the requirements for any particular run of the press.

25 A further object of the invention is the provision in such an apparatus of indicating means whereby the readiness of any particular unit for the making of a paster and its relation to the other operating units of the press are visibly
30 shown.

It is also an object of the invention to provide improved means for controlling the tension and braking upon the expiring roll preparatory to making a paster.

35 A still further object of the invention is the provision of brushes incorporated in or attached to the usual tension straps and positioned to serve as a backing against which the pasters may be made.

40 With these and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed, without departing from the spirit of the invention.

50 Referring to the drawings:

Fig. 1 is a view, partially in section and partially in elevation, of an apparatus in which our invention is embodied, certain parts thereof being broken away for convenience in illustration;

55 Fig. 2 is an enlarged detail view of the tension

strap positioning mechanism and the web cut-off device, which parts are shown at the lower left hand corner of Fig. 1;

Fig. 3 is a sectional and elevational view taken substantially on the line 3—3 in Fig. 2;

Fig. 4 is a perspective view of the brush section of one of the tension straps, which section is used as a backing against which the pasters are made;

Fig. 5 is a wiring diagram illustrating the various electrical units including the relays and contactors by which the apparatus is controlled and operated; and

Fig. 6 is a schematic view of a number of press units and two folders forming a part of a line of units and folders in the typical arrangement of a unit type press, this view showing diagrammatically the paster control station at each unit and the directional clutch switches for grouping the units as well as the paralleling buses forming a part of the electric circuits.

Upon said drawings, illustrating a preferred embodiment of the invention, the reference numeral 11 indicates a reel upon which are mounted three rolls of paper identified respectively by the numbers 12, 13 and 14, the roll 12 being nearly exhausted and the web 15 thereof being shown running to the press over a guide roller 16, around a floating roller 17 and under a second guide roller 18 supported from an I-beam 19 forming a part of the sub-structure of the press, of which an upright 21 is also shown.

The structure of the reel 11 comprises spaced uprights 22, one of which is shown in Fig. 1 of the drawings, a shaft 23 bearing in said uprights and two spiders 24 (one shown) mounted on said shaft and each having three arms 25, the rolls being mounted between corresponding arms of said spiders. The reel is adapted to be rotated through gearing (not shown) by means of a motor 26 mounted on one of the uprights 22.

Tension straps 27, in suitable number, are mounted adjacent the reel, being secured at one end to spring bolts 28 slidably mounted in flanges 29 of plates 31 secured to an inclined wall 32 of a pit 33 beneath the center part of the reel, the other ends of said straps being secured to an eccentric drum 34 mounted on a shaft 35 having bearings in brackets 36 depending from the I-beam 19. Said drum is, or may be, driven by means of a torque motor (not shown) of the type disclosed in Cline and Hollander Patent No. 1,618,975 to increase or decrease the tension of the straps on the rotating roll as conditions may require. A brush section 37 is

provided in each of the straps 27 for a purpose which will presently appear.

The normal running position of the active roll is that in which the roll 12 is shown in Fig. 1 and the reel is adapted to be rotated in the direction indicated by the arrow in said Fig. 1 to bring a full roll, shown at 13, into position adjacent the running web 15 preparatory to making a paster, provision being made for thereafter moving said roll further to cause the same to press the web against the brushes 37 to make a paster, after which it is moved down into the straps to the running position of the roll 12 as shown in Fig. 1. These operations will later be more fully described.

In accordance with the present invention, devices, shown in Figs. 1, 2 and 3 of the drawings, are provided for tightening the straps against the expiring roll just prior to the making of a paster and for cutting off the expiring web after the paster has been made. The strap tightening device comprises a roller 38 carried by angular levers 39, one of which is shown in the drawings, being pivoted at 41 to a fixed frame 42. A link 43 pivotally attached at 44 to said lever 39 connects the latter with an arm 45 secured to the side of a gear 46 meshing with a pinion 47 on a shaft 48 which also carries a gear 49 driven from the armature shaft 51 of a motor 52 mounted on the frame upright 21. Rotation of the gear 46 in counter-clockwise direction moves said arm 45 from the position shown in Fig. 1 to that shown in Fig. 2 and, in doing so, moves the roller 38 against the straps 27, tightening the latter against the roll 12.

A pin 53 protrudes from the pivot connecting the arm 45 with the link 43 and, upon movement of said parts to the position just described, said pin is carried past a dog 54 pivoted to an arm 55 of a latch 56 pivotally mounted on the frame part 42. The forward end of said dog 54 carries a screw 57, the head of which is held in engagement with the head of a screw 58 on the arm 55 by means of an expansion spring 59 bearing against the opposite end of said dog. A forwardly extending arm 61 on the latch 56 is provided with a shoulder 62 adapted to engage a flange 63 on a latch lever 64 pivoted at 65 to the frame part 42, said forward end 61 of said latch 56 being urged downwardly by means of a spring 66 secured at one end to said arm and at the other end to the frame 42. The lever 64 has a lower arm 67 which is urged in clockwise direction by a spring 68 secured at one end to said arm and at the other end to an eye 69 on the frame. An adjustable stop 70 is provided on the frame to limit the clockwise movement of said arm 67. The lower end of the arm 67 is pivotally connected with a member 71 adjustably connected, by means of a threaded pin 72, with a lever 73 pivotally connected at 74 with an arm 75 on a shaft 76 journaled in the free ends of the levers 39. Said shaft 76 carries a number of arms 77 arranged in pairs, the arms of each pair being connected by shafts 78. Each pair of said arms carries a knife 79 secured by screws 81 to a shaft 82 extending between the arms, said knives being of such length that they may pass between the tension straps 27 to sever the web 15 after a paster has been made. This action is accomplished upon reversal of the motor 52 which takes place simultaneously with or immediately after the making of the paster. Such reversal causes the pin 53 on the arm 45 to force the dog 54 downwardly thereby turning the latch 56 on

its pivot and disengaging the latch shoulder 62 on said latch from the flange 63 on the lever 64 which latter is then turned in clockwise direction by the spring 68, actuating the lever 73 which turns the shaft 76 thereby moving the cutter mechanism from the full line position shown in Fig. 2 to the dotted line position shown in said figure. The parts then return to the position shown in Fig. 1, the member 71 during the course of this movement moving the lever 64 in counter-clockwise direction until the flange 63 thereon engages the shoulder 62 on the latch 56. The mechanism is then in position for a repetition of the operation just described.

For the purpose of preventing breaking of the web when the straps are tightened against the expiring roll at the time of making a paster, the floating roller 17 is provided, being mounted upon an arm 83 pivoted at 84, to an arm 85 pivoted at 86 to a bracket 87 secured to the I-beam 19. A weight 88 is carried upon a rod 89 extending laterally from the pivot 84 and tends to move the roller 17 toward the right (viewing Fig. 1). The arm 83 is of angular formation having a part 90 extending upwardly from and at an obtuse angle to the part of said arm carrying the roller 17, said part 90 being connected by means of a rod 91 with a piston (not shown) of a double-acting dashpot 92 adapted to check the movement of the roller 17 in both directions. A threaded adjusting rod 93 mounted in a bearing 94 carried by the I-beam 19 extends through a threaded opening in the lower part 95 of the arm 85 and is adapted to be located to adjust the position of said arm by means of a rod 96 having a universal joint connection with said rod 93, as indicated at 97, and carrying at its opposite end a hand wheel 98 so located as to be accessible to the pressmen. Operation of said hand wheel moves the arms 85 and 83 thus adjusting one end of the roller 17 for the purpose of taking up slack from one side or the other of the web. It will be evident that in case of a sudden pull on the web due to the tightening of the straps 27 against the expiring roll, or to pressure of the incoming roll against said web at the time of making the paster, or to other causes, the roller 17 may move toward the left (viewing Fig. 1), thereby providing additional paper to be drawn into the press and preventing possible snapping off of the web with the attendant delay and difficulty in again threading the same through the press. This device, operating in conjunction with the remainder of the paster making apparatus, assures a high degree of certainty in the making of the pasters by preventing undue strain on the web, or the forming of slack therein, with resultant danger of the web being snapped upon taking up of the slack by the pull of the press.

It will be understood that a separate reel or roll support is provided for each unit of the press and that the auxiliary roll changing apparatus hereinabove described is duplicated for each reel.

Referring now particularly to Figs. 5 and 6 of the drawings, the electrical control devices of the apparatus and the circuits therefor will be described.

At each press unit there is provided a control station generally indicated by the reference numeral 101. The equipment at each station is mounted on a board 102 and comprises an "on and off" switch, indicated by the reference numeral 103, a signal light 104 to indicate that said switch has been turned to the "on" position, a control switch 105 movable in both directions,

as indicated by the arrows in Fig. 6, a selector switch 106, and signal lights 107 and 108, which preferably are red and green, respectively, and serve to indicate that the unit is connected for parallel operation with certain other units of the press showing the same colored light. In the arrangement shown in the drawings, illumination of the green light indicates that the unit is included in the group associated with the folder at the right thereof, and illumination of the red light indicates that it is included in the group associated with the folder at the left.

The several press units are indicated diagrammatically in Fig. 6 by the reference numeral 109, and the folders by the reference numeral 111. As previously stated, there is a control station 101 for each of the units, and the several stations are connected electrically by paralleling buses indicated at 112 and 113 in Figs. 5 and 6 of the drawings.

The electrical apparatus at each unit also includes a control panel (shown diagrammatically in Fig. 5) consisting of the various relays and forward and reverse switches for controlling the positioning motor 52 and for selecting the parallel operation and commutating the correct circuits.

For the purpose of determining the direction of the commutator circuits when the selector switch is operated to switch from single to parallel operation, clutch switches diagrammatically illustrated at 114 in Fig. 6 are provided on the main clutches of the press, which serve to connect the individual press units with an interconnecting shaft, identified by the numeral 115. This directional feature is made automatic by means of the circuits shown through the various clutch switches on the press, and makes it possible to use the paster mechanism for any particular unit with the folder at the right or the one at the left of the unit, as may be desired.

Assuming that the parts are in the "off" or neutral position, as indicated in Fig. 5, the first operation is to close the "on" switch 103, which immediately illuminates the light 104, which preferably is a white light, to distinguish from the green and red lights 107 and 108, the illumination of said light indicating that the apparatus is in readiness for making a paster by operation of the control switch 105. With the selector switch 106 in the single operating position, neither the red light 107 nor the green light 108 will be illuminated, and the paralleling relays, indicated in Fig. 5, by the reference numerals 116 and 117, will be normally open, which gives the correct circuits for single operation.

With the circuits in this condition, the control switch arm 105, at the control station for the unit to be operated, may be turned in counter-clockwise direction, thereby closing the master switch contact, identified in the drawings by the reference numeral 118, establishing a circuit from the positive side of the line, indicated by the reference character X, to 119, through relay coils 121 and 122 to 123, thence through a forward limit switch, identified by the reference numeral 124, to the negative side of the line, identified by the letter Y. The relay 121 is a two-pole relay, one pole of which closes a circuit from 125 to 126, which is inter-connected with the main control circuit and serves to decrease the press speed automatically to a predetermined speed at which the paster is to be made. The other pole of said relay 121 closes the circuit from 127 to 128 in parallel with the master switch 118, thus providing a holding circuit so that the master switch

arm 105 need not be held in the counter-clockwise position. The forward relay 122 closes the circuits to the motor 52, which positions the tensioning roller 38 and the web cut-off device against the straps 27 at a point determined by the operation of the forward limit switch 124. Said forward limit switch 124 and a reverse limit switch, identified by the reference numeral 129, are operated by the arm 45 at the extreme limits of its stroke as shown in Figs. 1 and 2 respectively. When said limit switch opens, the apparatus is in readiness for the making of a paster at a time determined by the operator as he observes the press speed and the size of the expiring roll. Operation of the switch arm 105 in clockwise direction closes a second master switch contact 131, which provides a circuit from 132 to 133 through relay 134 to 135, thus energizing relay 134, which provides its own holding circuit through the pole 136 to 137. In making the paster, the master switch arm must be held in the clockwise position until time to cut the expiring web, as will hereinafter appear.

The momentary contact made at 125-126 when the relay 121 is energized merely closes the paster relay on the main control panel which establishes its own holding circuit and operates a pilot motor of the main control to bring the press speed down to the preset value. The increase in the speed of the press cannot be brought about except by action of the pressman in depressing the "increase" button on the main control panel, which ordinarily is done as soon as the paster goes through the press.

Since the circuit 132 to 133 is closed, current will flow through a rectifier 138, through a rotation limit switch 139, positioned on the reel and connected through wire 168 with the forward contactor of the reel rotation motor 26. This will cause rotation of the reel so that the incoming roll 13 will be moved against the web 15 and will press the same against the brush sections 37 of the tension straps 27 thus making the paster. When said rotation limit switch 139 opens, the rotation of the reel is stopped, but the circuit 133 is still energized from the positive side of the line. From the circuit 133, through a normally open contact switch 141 of the master switch 105, a circuit from 142 to 143 is established through the coil of a relay 144. The said relay 144 is a two-pole relay, one pole of which is connected from 145 to 146 to provide its own holding circuit, the other pole, from 147 to 148, serving to parallel the back contacts 130 and 140 of the paralleling relays 116 and 117, so that a relay 149 can be energized from the circuit 137 when the master switch arm 105 is returned to neutral position, thus closing a master switch contact 151. When this operation is completed, at the time the paster is made, a circuit is established from 137 through contact poles 152 to 153, which energizes a reversing relay 154, thus reversing the positioning motor 52. As soon as said motor is reversed, the latch 56, 64 is released, allowing operation of the sheet cutters 79, as previously described. When the relay 154 is energized, it closes a normally open interlock 155 to 156 to provide its own holding circuit so that the reverse rotation of the positioning motor will be maintained until the reverse limit switch 129 opens.

A relay 157 is provided to rotate the new roll into operating position below the brushes 37 in the tension straps 27, this being done as soon as possible after the paster is made. The coil of

this relay is connected across a dynamic braking contact 158 to 159 of the reversing motor relay 154. When the positioning motor 52 is reversed, relay coil 157 is energized in parallel with the armature 161 of said motor 52 through contacts 162 to 163, through braking resistance 164, through coil 157 to 165 so that the relay 157 will be closed as long as the motor 52 is running in the reverse direction while bringing the tensioning roller 38 and web cutters 79 to the off position. After a paster has been made, the relay 157 imparts rotation to the reel through the circuit from 137 to the rectifier 138, and normally open contacts 166 and 167 of said relay 157. The circuit indicated at 168 leads to the forward contactor of the control for the reel rotation motor 26, as previously stated.

When it is desired to make simultaneous roll changes for a selected group of units, this can be done by paralleling any selected group of paster controllers in manner which will now be described. When the mechanical clutch for connecting any selected unit to either folder is closed, the clutch switch 114 will engage either a contact 169 or a contact 171, thus selecting the proper paralleling relay for the particular press combination to be used when the paralleling switch 106 is closed. The circuit illustrated for parallel operation is from the contact 169 or 171 to 172 or 173 through the selector switch 106 to the red light 107 or the green light 108, and through one or the other of the paralleling relays 116 or 117. Four paralleling circuits from the relays 116 and 117 are through contacts 174 and 175, respectively, to the paralleling buses 112 and 113, respectively, previously mentioned. These contacts and buses provide common circuits between the several paster controllers for simultaneous operation, the buses being connected to said controllers by wiring, indicated at 176 and 177, respectively, in Fig. 6. Said controllers are connected to the main line X, Y by means of wires 178 and 179, also shown in said Fig. 6. Simultaneous operation of all paster controllers can be obtained by operating the controls at the control station for any press unit in the selected group. As previously stated, an illuminated red or green light at any control station is an indication that the unit is set up for parallel operation with any group of units showing the same colored light.

Operation of a reset button 181 at the control station serves to close the relay 154 which reverses the motor 52 and returns the tensioning roller 38 and the sheet-cutting mechanism to the off position without making a paster, if for any reason it is desired not to complete the pasting operation after it has been started.

Forward rotation of the motor 52 is obtained by the usual two pole relay 122 which operates contacts 190 and 191, and the reverse rotation is obtained by relay 154 which operates contacts 192 and 193. Since the motor 52 operates under a very light load during most of its operation, a permanent resistance 194 is provided merely to limit the peak currents through armature 161. Dynamic braking is accomplished through the normally closed contact 162—163 of forward relay 122, through resistance 164 and normally closed contact 158—159 of reverse relay 154.

It is believed that the operation of the apparatus will be understood from the foregoing description, but it may be briefly summarized as follows:

When the paper is nearly unwound from the

rotating web roll 12, the operator, by rotation of the usual reel controls, rotates the reel so as to bring the incoming roll 13 to a point approximately two inches from the web 15. The master switch handle 105 is then turned in counter-clockwise direction which, through the circuits illustrated in Fig. 5 and previously described, brings the tensioning roller 38 and the sheet cutters 79 to the full line position shown in Fig. 2. This operation will have also slowed down the press to the paster speed and, when the operator observes that the roll has run down as far as it can safely go, he turns the arm 105 in clockwise direction, which, through the electrical devices above described, moves the roll 13 against the web 15, pressing the latter against the brush sections 37 of the straps 27, the roll being stopped in contact with the brushes by limit switch 139. The leading edge of the web of said roll 13 has glue applied thereto, and is positioned just above the point of contact of the roll with said brushes. The motion of the web 15 starts the roll 13 rotating and when said glue comes into contact with said web 15, a paster is made, after which the web from the expiring roll 12 is immediately cut off by means of the knives 79, which move from the full line position to the dotted line position shown in Fig. 2 upon reversal of the positioning motor 52. The roll 13 is then quickly moved further down into the straps 27 through the action of the relay 157, as previously described, the tensioning roller 38 and the sheet-cutting mechanism being at the same time returned to the off position shown in Fig. 1 of the drawings.

The advantages of the paralleling or multiple feature of the invention, as well as the feature of selectivity, and the other features above mentioned, will be apparent to those who are skilled in the art. Assuming that a press combination of five units is being operated, if all the rolls ran out at different times, there would be fifteen roll changes per hour, in accordance with the practice usually followed in the past, since it usually takes about twenty minutes for a roll to run out. This means a very considerable loss of time, and also means that a large number of papers are spoiled, since in ordinary practice six to ten papers have to be thrown out each time a paster is made. Assuming a loss of eight paper for each paster, there would be a loss of forty papers in making individual roll changes on a five roll press, whereas there would be a loss of only eight if the pasters were made simultaneously for all five units in accordance with our invention. Most large newspaper offices are now equipped with means for rewinding rolls so that if a substantial amount of paper is left on any roll it may be wound into full rolls, which may later be used in the ordinary manner. There is, therefore, no need for loss of white paper due to the making of the pasters simultaneously in the manner above described, and the saving of printed papers, as well as the increase in papers printed per hour, will be of great advantage, particularly in the printing of newspapers of large circulation.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the construction hereinbefore described

being merely a preferred embodiment thereof.
We claim:

1. A roll changing apparatus for multiple unit printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, a plurality of operating folders each constructed to receive the webs from a group of press units, and means for selectively connecting the paster making device of any unit for operation in unison with the paster making devices of the units in any desired group.

2. A roll changing apparatus for multiple unit printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, a plurality of operating folders each constructed to receive the webs from a group of press units, control means for operating the paster making devices of all units of any group in unison, and means for selectively connecting the paster making device of any unit with the paster making devices of the units in any desired group.

3. A roll changing apparatus for multiple unit printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, a pair of operating folders, each constructed to receive the webs from a group of press units, and control means whereby the paster making device of any unit may be selectively connected to operate in unison with the paster making devices of the units in the group associated with either one folder or the other.

4. A roll changing apparatus for printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, control means for operating said paster-making devices singly or a number thereof in unison whereby roll changes may be made for one unit at a time or for a number thereof simultaneously, and means including directional switches operable by the main press clutches whereby the paster-making devices for selected groups of units may be connected for multiple operation.

5. A roll changing apparatus for multiple unit printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, control means for operating said paster-making devices singly or a group thereof in unison whereby roll changes may be made for one unit at a time or for a number thereof simultaneously, and means whereby the paster making device of any particular unit may be selectively connected for multiple operation with the paster making devices of a group at either one side or the other thereof, as desired.

6. A roll changing apparatus for printing

presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, control means for operating said paster-making devices singly or a number thereof in unison whereby roll changes may be made for one unit at a time or for a number thereof simultaneously, means whereby the paster-making devices for selected groups of units may be connected for parallel operation and whereby the paster-making devices for any particular unit may be used in connection with a folder at either one side or the other thereof, and signal means for visibly indicating which units are grouped together for multiple operation and the direction of the folder for the group with reference to any particular unit of the group.

7. A roll changing apparatus for multiple unit printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, groups of press units, control means for operating the paster making devices of all units of a group in unison, and means whereby any particular unit may be included in one group or another, as desired.

8. A roll changing apparatus for printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, an electrical controller for the paster devices of each unit including an off and on switch and a switch for selecting single or multiple operation, means for interconnecting the controllers for a selected group of units whereby roll changes for all the units of said group may be made simultaneously, and means whereby said controllers may be operated by the pressman at will to effect such simultaneous roll changes at such stage in the unwinding of the rolls as he may select.

9. A roll changing apparatus for printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from an expiring roll and for pasting said webs together, an electrical controller for the paster devices of each unit including an off and on switch, a switch for selecting single or multiple operation and a master switch for controlling the operation of said paster devices in predetermined sequence, means for interconnecting the controllers for a selected group of units whereby roll changes for all the units of said group may be made simultaneously, and means whereby said controllers may be operated by the pressman at will to effect such simultaneous roll changes at such stage in the unwinding of the rolls as he may select.

10. A roll changing apparatus for printing presses comprising a roll support, tension straps mounted adjacent said support and adapted to engage a roll from which the web is running to the press, means for moving said support to

bring a full roll, having adhesive thereon, against the running web to cause rotation of said roll and the making of a paster between the web thereof and said running web, means movable
5 against said straps to tighten the same against said running roll preparatory to making the paster, a motor for operating said means, and a control station including controls operatively connected with said motor for causing forward
10 and reverse rotation of the latter to move said means against and away from said straps.

11. A roll changing apparatus for printing presses comprising a roll support, tension straps mounted adjacent said support and adapted to
15 engage a roll from which the web is running to the press, means for moving said support to bring a full roll, having adhesive thereon, against the running web to cause rotation of said roll and the making of a paster between
20 the web thereof and said running web, means movable against said straps at a point beneath the running roll to tighten the same against said running roll preparatory to making the paster, a motor for operating said means, and a control
25 station including controls operatively connected with said motor for causing forward and reverse rotation of the latter to move said means against and away from said straps.

12. A roll changing apparatus for printing
30 presses comprising a roll support, tension straps mounted adjacent said support and adapted to engage a roll from which the web is running to the press, means for moving said support to bring a full roll, having adhesive thereon, against the running web to cause rotation of said
35 roll and the making of a paster between the web thereof and said running web, and a web cut-off mechanism including a sheet-breaker, means for carrying said sheet-breaker toward and away
40 from the web, a reversible motor for operating said last-mentioned means, a latching device for holding said sheet-breaker out of action until reversal of said motor after said means has reached the forward limit of its movement, said
45 device being operable upon such reversal of the motor to release said sheet-breaker for action, and means for thereupon moving the sheet-breaker into the web with a quick, snap action to sever said web at a point closely following
50 the paster.

13. A roll changing apparatus for printing presses comprising a support for a plurality of rotatably mounted web rolls, one of said rolls being normally active by having the web thereon
55 drawn into the press, means for moving another of said rolls into engagement with the web running from said active roll to make a paster between said webs, provided a suitable adhesive has been applied to one thereof, and
60 means for severing the web proceeding from the expiring roll after said paster has been made, said means comprising a sheet-breaker, means for carrying said sheet-breaker toward and away from the web, a motor for operating
65 said last-mentioned means, a circuit including forward and reverse limit switches and a control device whereby said motor may be operated in forward direction to position said sheet-breaker adjacent the web just prior to making the paster
70 and may be operated in reverse direction immediately after the making of the paster, and means operable by the initial reverse action of said motor for releasing said sheet-breaker and causing the same to sever said web at a point
75 closely following the paster.

14. A roll changing apparatus for printing presses comprising a roll support, tension straps mounted adjacent said support and adapted to
engage a roll from which the web is running to the press, means for moving said support to
5 bring a full roll, having adhesive thereon, against the running web to cause rotation of said roll and the making of a paster between the web thereof and said running web, means movable against said straps to tighten the same against said running roll preparatory to making
10 the paster, a motor for operating said means, a control station including controls operatively connected with said motor for causing forward and reverse rotation of the latter to move said means against and away from said straps, and web-cutting mechanism operable upon initial
15 reverse rotation of said motor to cut off the web of the expiring roll after the paster has been made.

15. A roll changing apparatus for printing presses comprising a roll support, tension straps mounted adjacent said support and adapted to
engage a roll from which the web is running to the press, means for moving said support to
25 bring a full roll, having adhesive thereon, against the running web to cause rotation of said roll and the making of a paster between the web thereof and said running web, means movable against said straps to tighten the same against said running roll preparatory to making the
30 paster, a motor for operating said means, a control station including controls operatively connected with said motor for causing forward and reverse rotation of the latter to move said means against and away from said straps, and web-cutting mechanism movable by said motor toward
35 and away from the web with said strap-tightening means and including a latch adapted to hold said mechanism out of action until said motor is reversed after said means has reached the forward limit of its movement and the paster has been made, said latch being operable upon such
40 reversal of the motor to release said mechanism and the latter being operable, when so released, to sever the web at a point closely following the paster.

16. A roll changing apparatus for printing presses comprising a movable support for a plurality of web rolls, tension means for engaging
50 the surface of a roll carried by said support, means for making a paster between the web of an expiring roll and the web of a full roll carried by said support, means acting upon said tension means at a point outside the area of contact
55 thereof with the roll for increasing the braking effect of said tension means upon the expiring roll preparatory to making the paster and a web controlling device including fixed guide rollers about which the web passes in traveling to the
60 press and a floating roller positioned in a loop in the web between said guide rollers and movable toward the latter upon substantial increase in the tension on the web, thus supplying paper from said loop to compensate for sudden retard-
65 ing of the roll, thereby preventing breaking of the web.

17. A roll changing apparatus for printing presses comprising a support for a plurality of rotatably mounted web rolls, one of said rolls being
70 normally active by having the web thereof drawn into the press, means for moving another of said rolls into engagement with the web running from said active roll, and a tension strap positioned to engage the surface of said active
75

roll, said strap having a brush section therein against which said web may be pressed by said incoming roll to make a paster between the expiring web and the web of the new roll, provided a suitable adhesive has been applied to one of said webs.

18. A roll changing apparatus for printing presses comprising a support for a plurality of rotatably mounted web rolls, one thereof being active by having the web thereof drawn into the press, a tension strap mounted adjacent said support and adapted to engage the surface of the active roll, a brush section in said strap, means for moving another of said rolls into engagement with the web running from said active roll and pressing the same against said brush section of the tension strap to make a paster between said webs, provided a suitable adhesive has been applied to one of said webs, electrical means for automatically stopping said new roll in correct position to make a paster against said brush, means for automatically cutting off the web of the expiring roll after the paster has been made and electrical means for thereafter automatically moving said new roll further into said strap to a running position beyond said brush.

19. A roll changing apparatus for printing presses comprising a plurality of roll supports, one for each unit of the press, each of said supports being adapted to carry a plurality of web rolls, tension means positioned adjacent each of said supports adapted to control the rotation of the active roll, paster-making devices associated with each said support, including means acting upon said tension means at a point outside the area of contact thereof with the roll for increasing the tension of said tension means upon the active roll preparatory to making a paster between the web of an expiring roll and the web of a replenishing roll, means for moving the support to a predetermined point to press the re-

plenishing roll against the web from the expiring roll to make the paster, means for thereafter automatically cutting off the web from the expiring roll, means for then moving the new roll to a running position with the same in engagement with said tension means, and control means whereby the aforesaid paster-making devices for a plurality of said units may be operated simultaneously.

20. A roll changing apparatus for printing presses comprising a plurality of roll supports, one for each unit of the press, paster-making devices associated with each said support for moving the same to bring the web of a full roll into contact with the web running from the several expiring rolls and for pasting said webs together, control means for operating a plurality of said paster-making devices in unison, whereby roll changes for a number of said units may be made simultaneously, and means acting upon said tension means at a point outside the area of contact thereof with the roll for automatically increasing the tension on each of the expiring rolls just prior to the making of the paster.

21. A roll changing apparatus for printing presses comprising a support for a plurality of rotatably mounted web rolls, one of said rolls being normally active by having the web thereof drawn into the press, means for moving another of said rolls into engagement with the web running from said active roll, tension means for controlling the rotation of said active roll, and means including a brush element attached to said tension means and adapted to serve as a backing against which said web may be pressed by said incoming roll to make a paster between the expiring web and the web of the new roll provided a suitable adhesive has been applied to one of said rolls.

ALLAN J. CLINE.

HAROLD L. McCLEERY.