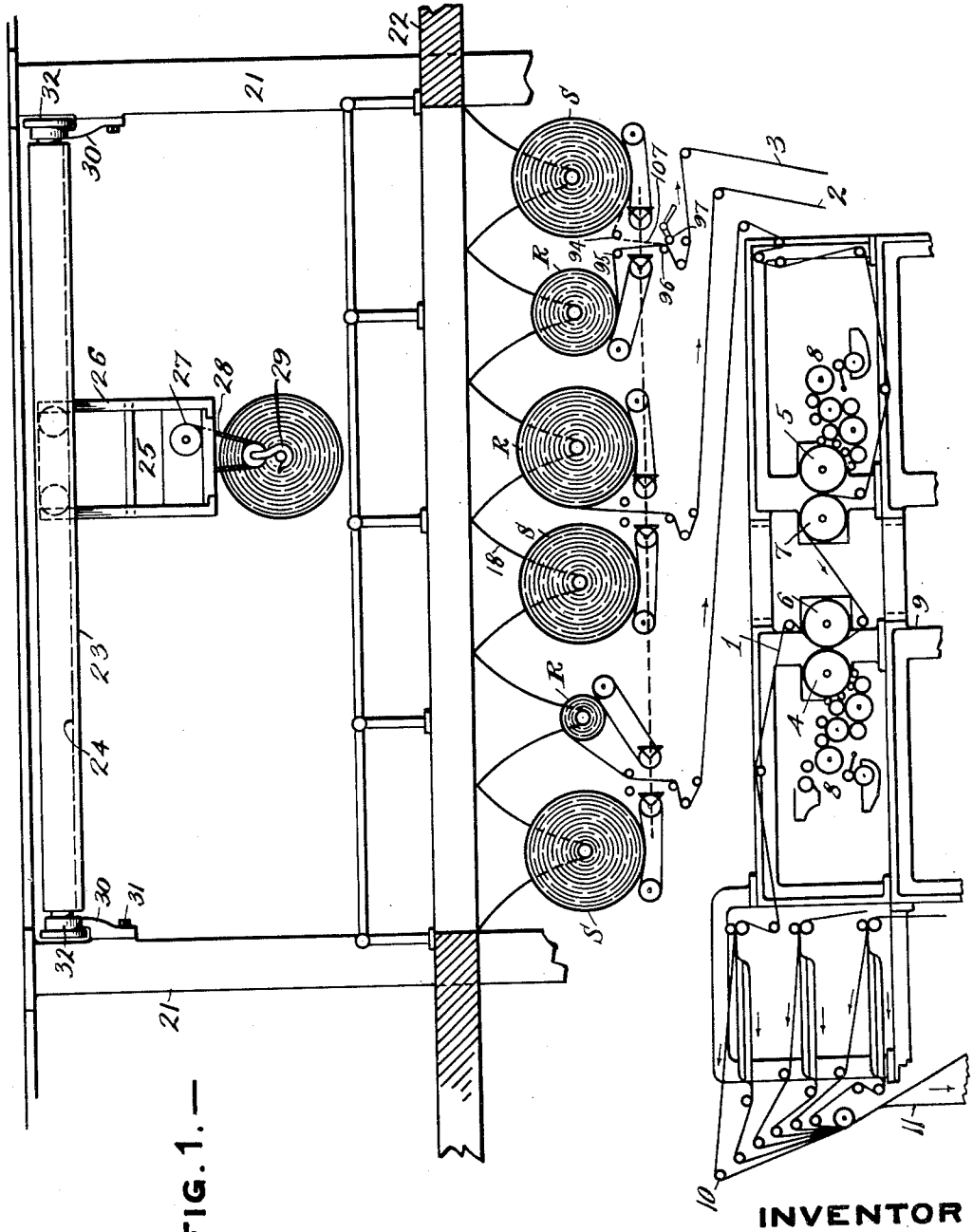
May 15, 1928. 1,669,837

G. E. PANCOAST

WEB ROLL HANDLING AND CONTROLLING MECHANISM

Filed Jan. 22, 1924 3 Sheets-Sheet 1



— FIG. 1. —

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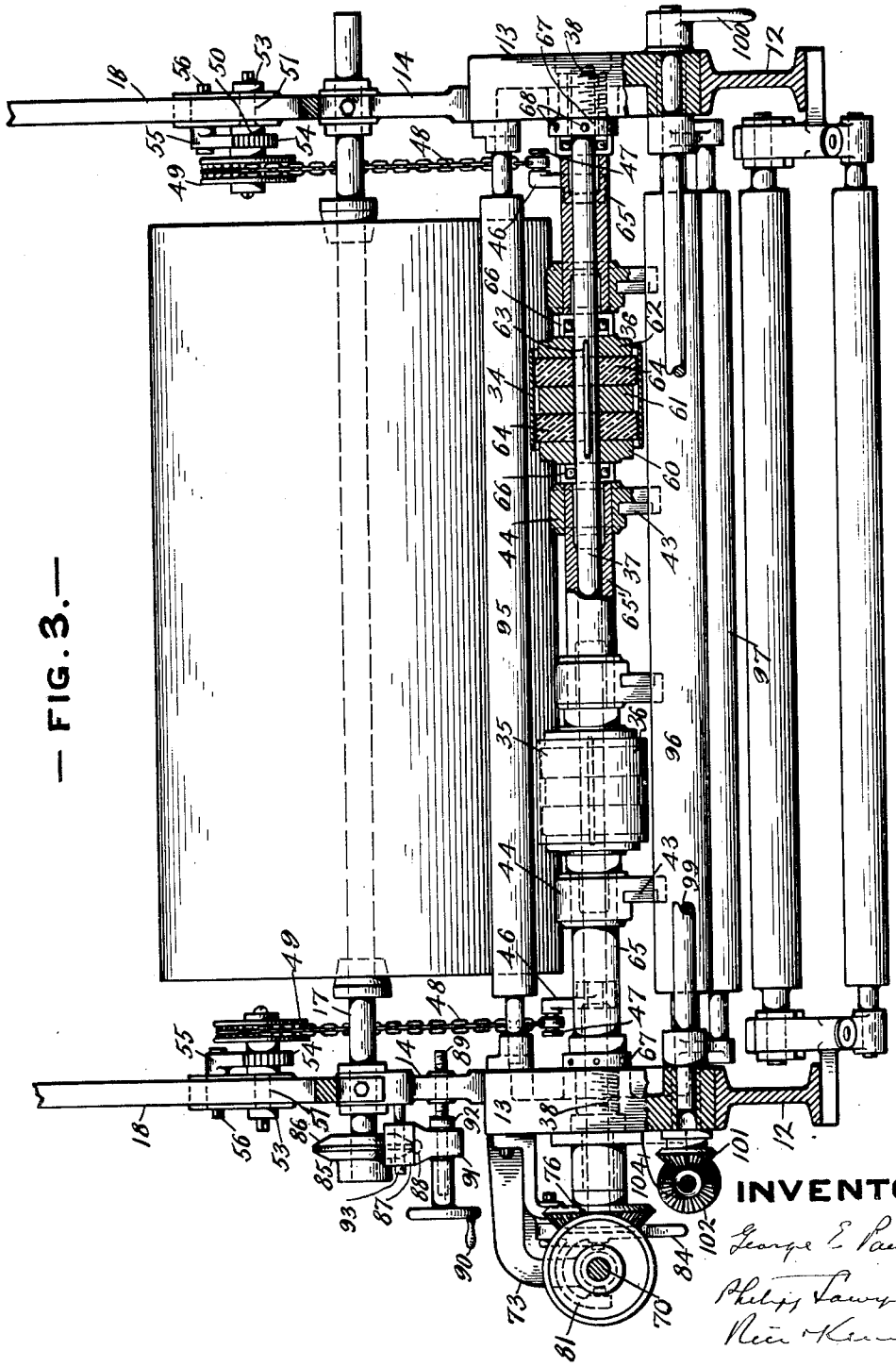
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WEB ROLL HANDLING AND CONTROLLING MECHANISM

Filed Jan. 22, 1924 3 Sheets-Sheet 2



— FIG. 3. —

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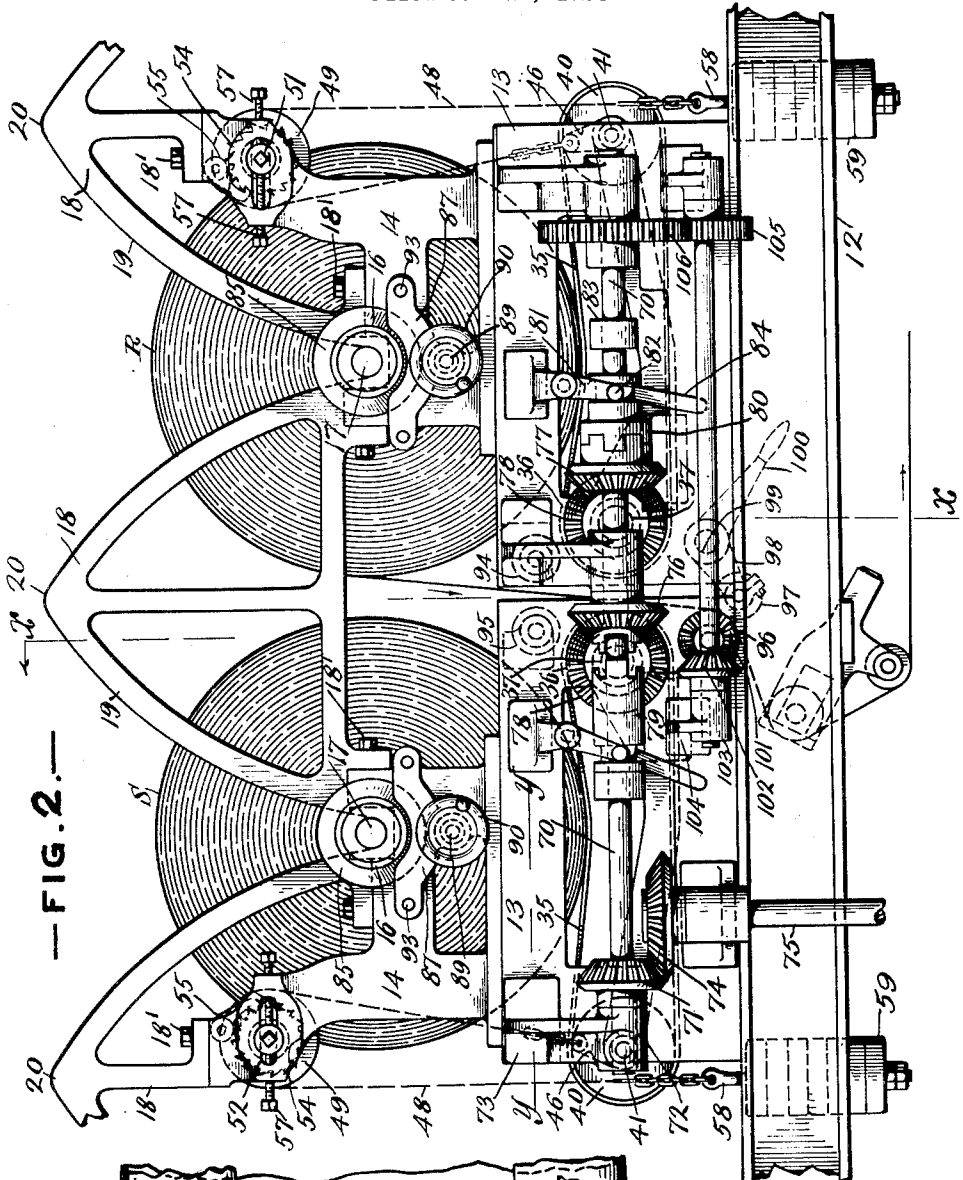
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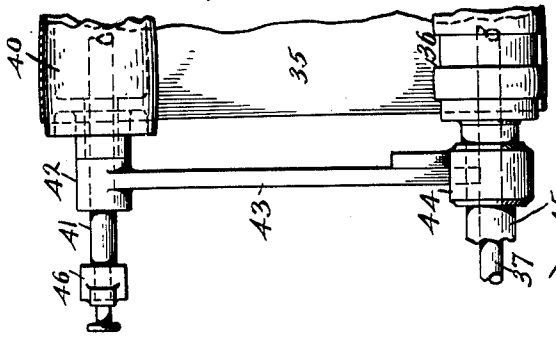
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WEB ROLL HANDLING AND CONTROLLING MECHANISM

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— FIG. 2. —



— FIG. 4. —

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UNITED STATES PATENT OFFICE.

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WEB-ROLL HANDLING AND CONTROLLING MECHANISM.

Application filed January 22, 1924. Serial No. 687,757.

This invention relates to certain improvements in web feeding and controlling devices, and particularly for feeding and controlling a web used in relation with a printing machine.

Generally speaking the invention includes an improved web roll support for a printing machine located above the printing mechanism so that the web rolls may be placed in position and the feed of the web controlled by mechanism located above the printing mechanism, so that the rolls may be loaded into the machine and the feed of the rolls controlled without interference with the various operations that have to be carried on at the printing mechanism itself such as placing the plates on the form cylinders, adjusting the impression, adjusting the inking mechanism, etc. The pressmen thus have a clear chance to work about the printing machine without interference from the operators, who attend to supplying the web rolls and feeding of the rolls.

The invention will also in its best form include an improved feeding mechanism for the rolls by which the webs from the rolls may be fed under the right tension and by which, if desired, the web from a new roll may be united to the web from a nearly expired roll without the necessity of stopping the web feed to any printing couple of the printing mechanism.

The invention has for its object, therefore, the provision of an improved web roll support in which the webs may be positioned and the feed thereof controlled, which is located above the printing mechanism so as to be clear of the latter and in which the rolls may be manipulated without interferring with the manipulating of the press mechanism.

A further object of the invention is to produce an improved feeding and web joining mechanism likewise located above the press proper so as not to interfere with the operation of the latter.

A further object of the invention is to provide an improved web tensioning and feed controlling member the tension of which on the web may be varied with great nicety so as to provide an accurate feed for the web.

A further object of the invention is to provide a simple compact apparatus in which the bearings for the web rolls are provided with guiding mechanism whereby the web rolls may be dropped into the bearings from above and guided to the bearings so that a roll may be dropped into position without having to be accurately loaded into the bearings proper.

With these and other objects not specifically referred to, the invention consists in certain novel parts and arrangements a detail description of which will be given in connection with the accompanying drawings and the novel features then pointed out in the claims hereunto annexed.

In these drawings—

Figure 1 is a diagrammatic side view of the improved web roll supporting and controlling mechanism shown in its relation to a multicouple printing machine.

Figure 2 is an enlarged side view of two of the web controlling mechanisms shown in Fig. 1, the rolls being shown endwise, the view also showing on an enlarged scale the improved roll bearings and guides, certain parts of the structure being illustrated as broken away.

Figure 3 is a side view partly in section of the part of the construction shown in Fig. 2, the view being taken on irregular line x—x of that figure looking in the direction of the arrow.

Figure 4 is a detail plan view, partly in section and partly broken away, of one of the feeding belts and its supporting mechanism, the view being taken on line y—y of Fig. 2, looking in the direction of the arrow.

Referring now to the drawings, the invention has been illustrated as used with a multicouple printing machine employing three active or running webs, though it will be understood that the invention is intended for use and may be used with other press arrangements. As illustrated there is employed a three roll machine, the webs of which are indicated by the numerals 1, 2 and 3, these webs supplying printing couples which may be arranged superposed in three decks, the upper deck only of which is illustrated. Each of these decks is or may include a pair of printing and perfecting couples each including form cylinders 4, 5, and impression cylinders 6, 7, with inking mechanisms 8 for the form cylinders, these parts being supported in suitable frames 9. The webs from these couples are or may be assembled over suitable guides 10 at a longitudinal former 11.

In accordance with the invention the im-

proved roll supporting mechanism is arranged above the press mechanisms so that the rolls may be positioned in their bearings and the feed adjusted and controlled from a point above the printing mechanism so that there is no interference with the printing mechanism itself. In the best constructions there will be provided for each printing and perfecting couple a running roll and spare roll, these running and spare rolls being provided in numbers according to the number of printing mechanisms they are to supply. These running rolls are indicated by the letter R and the spare rolls by the letter S in the drawings. The particular construction for supporting the rolls may be somewhat varied, but in the best constructions there will be provided guides for guiding the rolls to the roll bearings. In the particular construction illustrated there is provided a suitable framing 12, on which in turn is supported a framing 13 hereinafter referred to. This framing 13 forms a support for standards 14 in which are formed the bearings indicated at 16 for the roll spindles 17, one of these bearings and standards being provided for each roll spindle.

Each of the roll bearings is formed and positioned so that a roll may be dropped into it from above, and where a plurality of rolls, such as in the construction illustrated is employed, these roll bearings are arranged in line. Each of the roll supports, however, is provided with guides so that a roll may be guided into the bearing without requiring it to be nicely positioned above the bearing before the roll is dropped into position. While these guides may be varied somewhat, in the particular construction illustrated, these guides comprise frame members 18 suitably secured as by bolts 18′ to the standards 14, before referred to. These frame members 18 have sides which are arranged to converge toward each other on each side of the bar and terminate in the bearing proper, and in the best constructions these sides are curved as shown at 19 to provide a wide space or mouth between the tops 20 of two adjacent guides into which a roll may be dropped, and the converging sides of the guide will direct the roll to the bearing proper.

Various means may be employed for positioning the rolls in the bearings, but a convenient one, and one which is preferred is that illustrated. In the construction shown there is provided above the guides a frame construction including side frames 21 and cross frames 22. These frames support a movable frame 23 having tracks 24 on which may run a traveller 25 in the form of a frame work 26 provided with means for lowering a roll, such as a pulley 27, cable 28 or the like, and hook 29. This traveller 25 can be moved along the frame 24 to a position approximately above one of the bearings and the roll dropped into the bearings, being guided to position by the guide members 18, before referred to.

In the best constructions the frame 23 is made movable sidewise of the machine so that it can be moved away therefrom to clear the mechanism under it and permit the traveller to pick up a roll. In the particular construction illustrated this is effected by a pair of flanged tracks 30 secured to the side frames 21 by bolts 31, and the movable frame 24 is provided with flanged wheels or rolls 32 working in the tracks 30. With this construction a roll may be readily lifted from the floor and moved to a position to be lowered into the bearings, and this without interference with the press mechanism or any webs running to or from the press, so that the press gangs are not in any way interfered with by the positioning of the web rolls.

While the invention as so far described presents certain novel features and arrangements by which an improved positioning of the rolls in a printing machine may be effected, in the best constructions the invention will also include an improved means for controlling the feed of the web rolls to the machine, and a simple mechanism for uniting the end of a spare web to the web running from a nearly expired active roll, and such means have been provided.

While the specific form of these web controlling devices may be somewhat varied, those illustrated have been found to be effective in practice and the form of arrangement illustrated will be that preferred.

In the construction illustrated there is provided a web controlling device for each roll which is arranged to have a frictional engagement with the roll surface, these frictional feeding devices being driven so as to effect and control the unwinding of the roll with the required nicety of tension. These feeding devices are or may be the same and a description of one will suffice for all. In the particular construction illustrated these feeding devices comprise a pair of belts 34, 35 arranged under the rolls but above the printing mechanism. These belts are driven belts and are mounted and driven in the following manner. The belts pass over at one end pulleys indicated generally by the numeral 36 (see Fig. 3), these pulleys being carried on a driving shaft 37 suitably supported in the frames 13, before referred to, and having threaded ends 38, these threaded ends being provided for a purpose hereinafter referred to. The belts at their other ends pass over pulleys 40, mounted on a shaft 41. Secured to this shaft are hubs 42 from which extend arms 43, these arms being secured in hubs 44 mounted so as to have a rotary movement with respect to the shaft

37, the hubs being mounted on sleeves 45 on the shaft, hereinafter referred to. With this construction the belts may be swung upwardly as the roll decreases in size, as diagrammatically indicated in Fig. 1, so as to follow the surface of the roll.

These belt carrying frames or arms at their other ends, that is the ends on the shaft 41, are supported so that they may be constantly pressed upwardly into relation with the surface of the roll, and this pressure applying means in the best constructions, is adjusted so that the pressure may be applied at the desired point of the roll surface for the desired adjustment of the belt pressure on the roll. While various construction may be employed for this purpose, in the particular construction illustrated there is provided a weight so arranged as to exert a constant upward pressure on the frames, this weight being adjustably connected with the frames so that the point of application of pressure caused by the weight may be somewhat varied. In the particular construction illustrated for effecting this, the shaft 41 at each end is provided with an arm 46 having a stud 47 to which is attached one end of a flexible member as a chain 48. This chain 48 passes over a flanged pulley or wheel 49 carried on a hub 50 which is mounted on a stud 51 mounted to have a sidewise movement in a slot 52 (see Fig. 2) formed in the standard 14, before referred to, the parts being held in position by a nut 53 or in any other suitable manner. This hub 50 carries a ratchet 54 with which cooperates a pawl 55 pivoted on a stud 56 also mounted in the frame. The sidewise movement of the wheel 49 and the ratchet 54 is effected by means of set screws 57 bearing against the stud 51. With this construction the position of the arm 46 may be varied with respect to the roll surface and the pressure on the roll by the belts may be effected at different points in the roll periphery so that the pressure may be applied at the point desired, and a great nicety of adjustment of the pressure obtained. The chains 48 have connected thereto at their other ends rods 58 on which may be placed weights 59 these weights being provided in numbers sufficient to effect the required pressure. With this ratchet and pulley construction the belts are held in constant pressure against the surface of the rolls, the belts rising as the rolls decrease in size. Furthermore, with this ratchet and pulley construction by throwing off the pulley the weights can be thrown off and the belt released when desired.

In the best construction means will be provided for regulating or adjusting the tension of the belts so as to compensate for any stretching in the belts, and this may be accomplished as shown by effecting an increase in the diameter of one or both sets of pulleys. To effect this an improved pulley has been devised which may be manipulated to increase or decrease its diameter, and this increase or decrease of diameter is preferably accomplished by the rotation of the shaft on which the pulley is mounted, a simple construction being thus provided. In the particular construction illustrated two of the pulleys, namely those marked 36, are constructed to permit of this adjustment, and as shown each pulley consists of rigid members with deformable members interposed between them, so that when pressure is exerted on the rigid members the deformable members will be squeezed up and their diameters will increase and thus effect an increase in the peripheral surface of the pulley. As shown each pulley comprises three rigid members 60, 61 and 62, mounted to turn with but having a sidewise movement relatively to the shaft 37 by means of a key or feather 63. Between these rigid members are provided a pair of yielding or deformable members which in the particular construction illustrated are in the form of disks of rubber or other suitable material 64.

As before stated, the compression of these yielding disks of rubber or the like is preferably effected by turning of the shaft so as to squeeze these disks between the rigid members. While various specific constructions for effecting this might be provided, in the best constructions there are provided a plurality of operating sleeves 65, one of these sleeves being provided on the outer side of each pulley and one such sleeve being provided interposed between the pulleys, these sleeves surrounding and having a movement horizontally of the shaft 37 and bearing against the rigid members of the pulleys, ball bearings 66 being provided at each side of the pulleys and at the ends of the shaft so as to lessen friction and permit easy movement of the sleeves. The shaft 37 at the other end is provided with a threaded collar 67 which works on the threaded portion of the shaft 38, before referred to, this collar being provided with holes 68 in which a tool may be inserted to turn it. This turning movement of the collar moves the sleeves through the ball bearing 66 and causes a compression of the yielding members of the pulleys, thus causing an increase in the pulley diameter and a corresponding tightening adjustment of the belt. Turning the operating collars 67 the other way, of course will permit the compressible members to collapse and thus decrease the peripheral surface of the driving surface.

These belts may be driven in any suitable manner, but in the best constructions there will be provided a common driving mechanism for all the belts with clutches so arranged that any or all of the belts may be

driven as desired and a construction by which two of the belts are thus driven will be illustrated in detail in Fig. 2. Referring to that figure there is provided a common driving shaft 70 having a driving mitre 71 secured thereto, this shaft 70 being supported in bearings 72 supported in brackets 73 secured from the frames 13, before referred to. This mitre 71 engages with and is driven from a mitre 74 carried on a vertical shaft 75 suitably driven from any part of the machine. This driving shaft 70 has secured thereto a pair of mitres 76, 77 turning loosely on the shaft, these mitres in turn meshing with mitres 78 on the shaft 37, before referred to. Driving connection is effected between the mitres 76, 77 and the mitres 78 by means of clutches 79, 80, slidably mounted on the shaft 70, these clutches being thrown into and out of operative position by means of clutch arms 81 having pins 82 taking in a groove in clutch collars 83, these clutch arms being manipulated by operating handles 84.

In the best constructions means are provided for shifting the web rolls sidewise in their bearings to a slight extent to effect margin adjustment, and in the best construction where these margin adjusters are employed they will be spring seated so as to ensure a wedging contact and hold the rolls in adjusted position. In the machine illustrated this is effected by providing one end of the roll spindles with a margin guide indicated at 85, this guide having a wedge shaped surface indicated at 86, this wedge shaped surface cooperating with an adjusting block 87, which has a sidewise travelling movement, this block having a cooperating wedge shaped surface indicated by dotted lines in Fig. 3. The part of the block having the wedge shaped recess is preferably forced upward by means of the spring so as to ensure a wedging contact between the guide and block, this spring being indicated by the numeral 88. This block is given its sidewise adjusting movement by means of a threaded rod 89 operated by a handle 90, this rod being supported in the standard 14, before referred to, and passing through projections 91 depending from the block, and a thrust collar 92. Guides 93 in the form of pins may be provided for guiding the block in its sidewise movement. With this construction a very delicate adjustment of the web roll may be effected and the roll maintained in adjusted position.

Under some circumstances it may be desirable to unite the end of a fresh web roll to an expiring roll without stopping the feeding movement of the webs, and a simple mechanism for utilizing the web controlling feature of the feeding belts is provided for effecting this. In the particular construction there is provided a pair of guide rolls 94, 95 and what may be termed an abutment roll 96 under which the web in use runs, this abutment roll being a driven roll. Cooperating with this abutment roll is a movable roll 97 carried in arms 98 on the rock shaft 99 suitably journaled in the frames 13, before referred to, this rock shaft being manipulated through an operating handle 100, the roll 97 being thus capacitated to be moved to and from the abutment roll 96. Various means may be employed for driving the abutment roll, but in the preferred construction the abutment roll is provided with a mitre gear 101 which meshes with a mitre 102 carried in bearings 103 supported from brackets 104 extending from the side frames 13, before referred to. This shaft at its other end is provided with a gear 105 which meshes with a gear 106 carried on the driving shaft 70, before referred to, the abutment roll 96 being thus constantly driven. When it is desired to effect a paste between the webs of an expiring roll and a spare roll the end portion of the new web is pulled off at the right, indicated at 107 in Fig. 1 and led over the guide roll 94, the end of this web being provided with paste. This pasted end is dropped down between the abutment roll and the roll 97, and the roll 97 brought into contact with the abutment roll, thus squeezing the pasted new web against the expired web. In the meantime the belts under the spare roll have been manipulated to move this roll and bring it up to speed. After the paste has been made the expiring web may be separated in any usual manner, as by breaking it with a stick or by a breaking roll or wire suitably mounted so that it can be brought into breaking relation with the expiring web, not illustrated.

While the invention as to its several features has been illustrated in the preferred form it will be understood that certain changes and variations in the construction shown and described may be employed without departing from the invention as defined in the appended claims, and that the invention may be employed in various arrangements.

What I claim is:

1. The combination of a plurality of printing mechanisms arranged in line with their cylinders in substantially the same horizontal plane, a plurality of roll supports arranged in line above the printing mechanisms for supporting running rolls and spare rolls, friction feeding devices for the rolls above the printing mechanism and below the rolls and arranged to contact with the surface of the running rolls, and means located above the roll supports for supplying rolls thereto.

2. The combination of a plurality of printing mechanisms arranged in line with

their cylinders in substantially the same horizontal plane, a plurality of roll supports arranged in line above the printing mechanism for supporting running rolls and spare rolls, friction feeding devices for the rolls above the printing mechanism and below the rolls and arranged to contact with the surface of the running rolls, means located above the roll supports for supplying rolls thereto, and means for joining the web from the running rolls and the spare rolls without stopping the former.

3. In a roll controlling mechanism, a support for a running roll, a friction belt pivoted below the roll, a weight, and connections between the weight and belt for holding the belt up against the roll for driving, said connections including a pawl and ratchet having a sidewise adjusting movement to effect a bodily movement of the belt for varying the contact area of the belt on the roll surface.

4. The combination of a plurality of printing mechanisms arranged in line with their cylinders in substantially horizontal relation, a plurality of roll supports arranged in line above the printing mechanisms for supporting running rolls and spare rolls, friction controlling devices for the rolls above the printing mechanisms and arranged to contact with the surface of the running rolls below the horizontal axis thereof, and means located above the roll supports for supplying rolls thereto.

5. The combination of a plurality of printing mechanisms arranged in line with their cylinders in substantially horizontal relation, a plurality of roll supports arranged in line above the printing mechanisms for supporting running rolls and spare rolls, friction controlling devices for the rolls above the printing mechanisms and arranged to contact with the surface of the running rolls below the horizontal axis thereof, means located above the roll supports for supplying rolls thereto, and means for joining the webs from the running rolls and the spare rolls without stopping the former.

In testimony whereof, I have hereunto set my hand.

GEORGE E. PANCOAST.