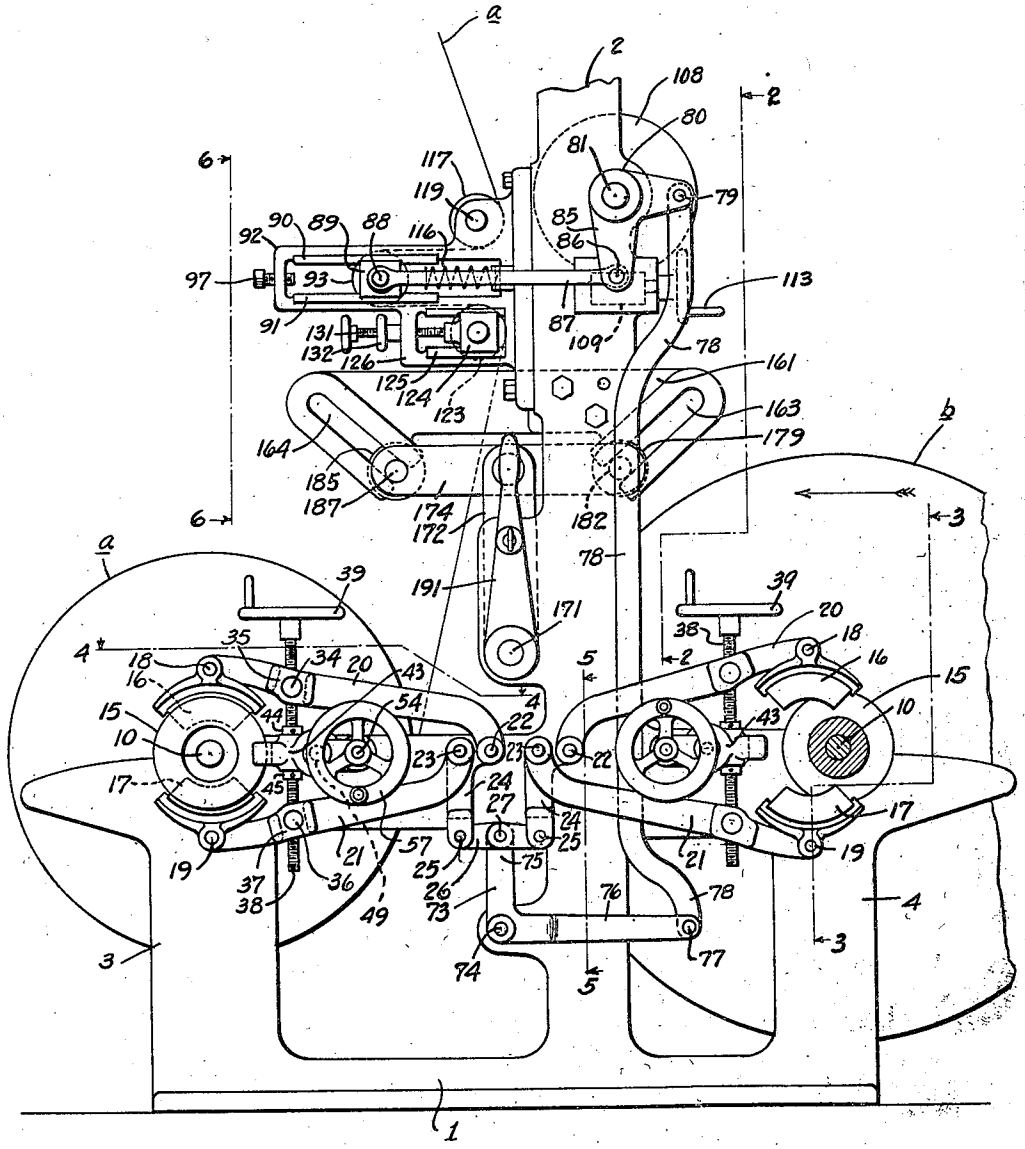
Nov. 28, 1933. C. J. RICHTER 1,936,916

WEB SUPPLYING AND CONTROLLING MECHANISM

Filed March 22, 1928 6 Sheets-Sheet 1

Fig 1



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BY John D Morgan

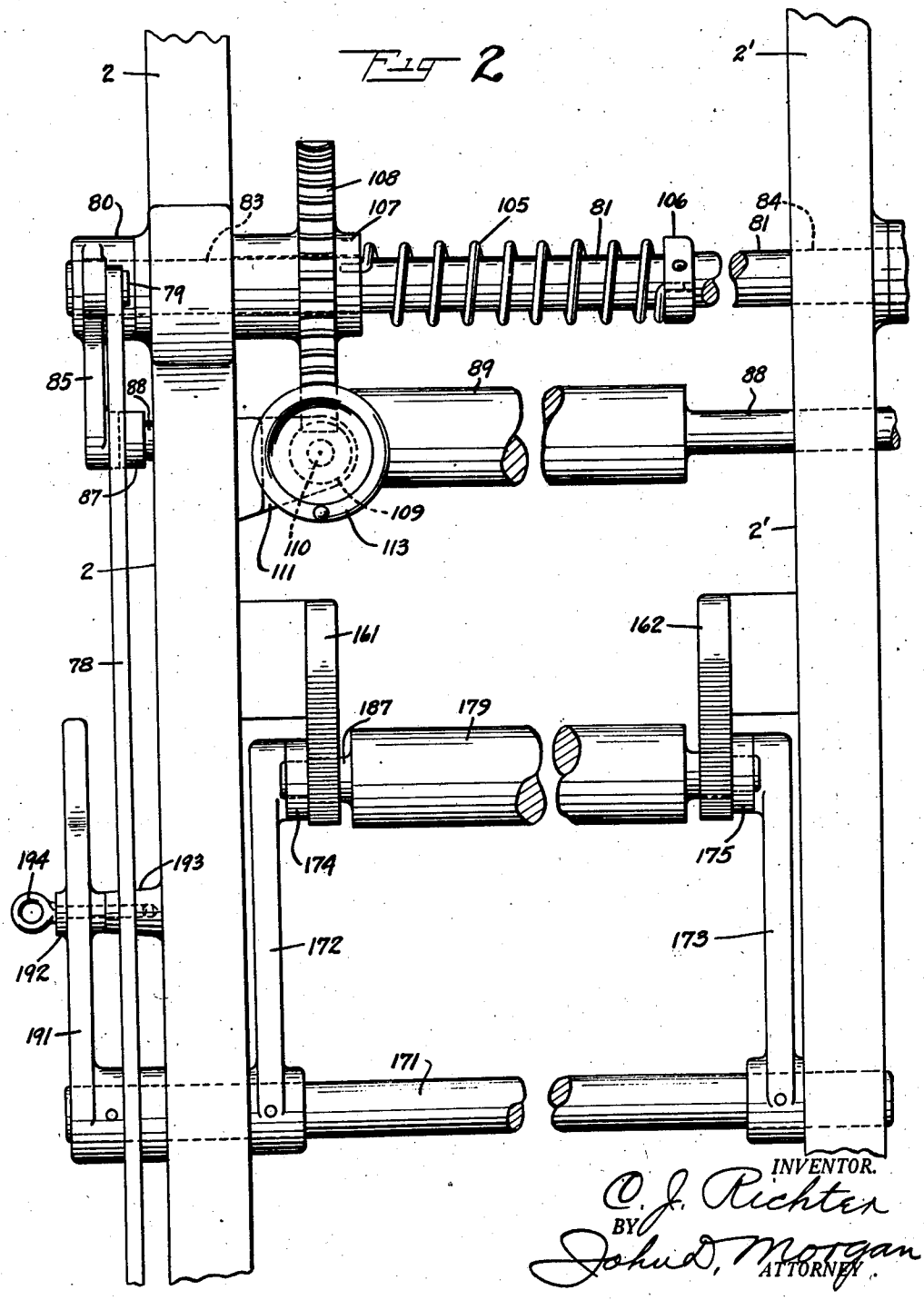
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WEB SUPPLYING AND CONTROLLING MECHANISM

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Fig 2



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WEB SUPPLYING AND CONTROLLING MECHANISM

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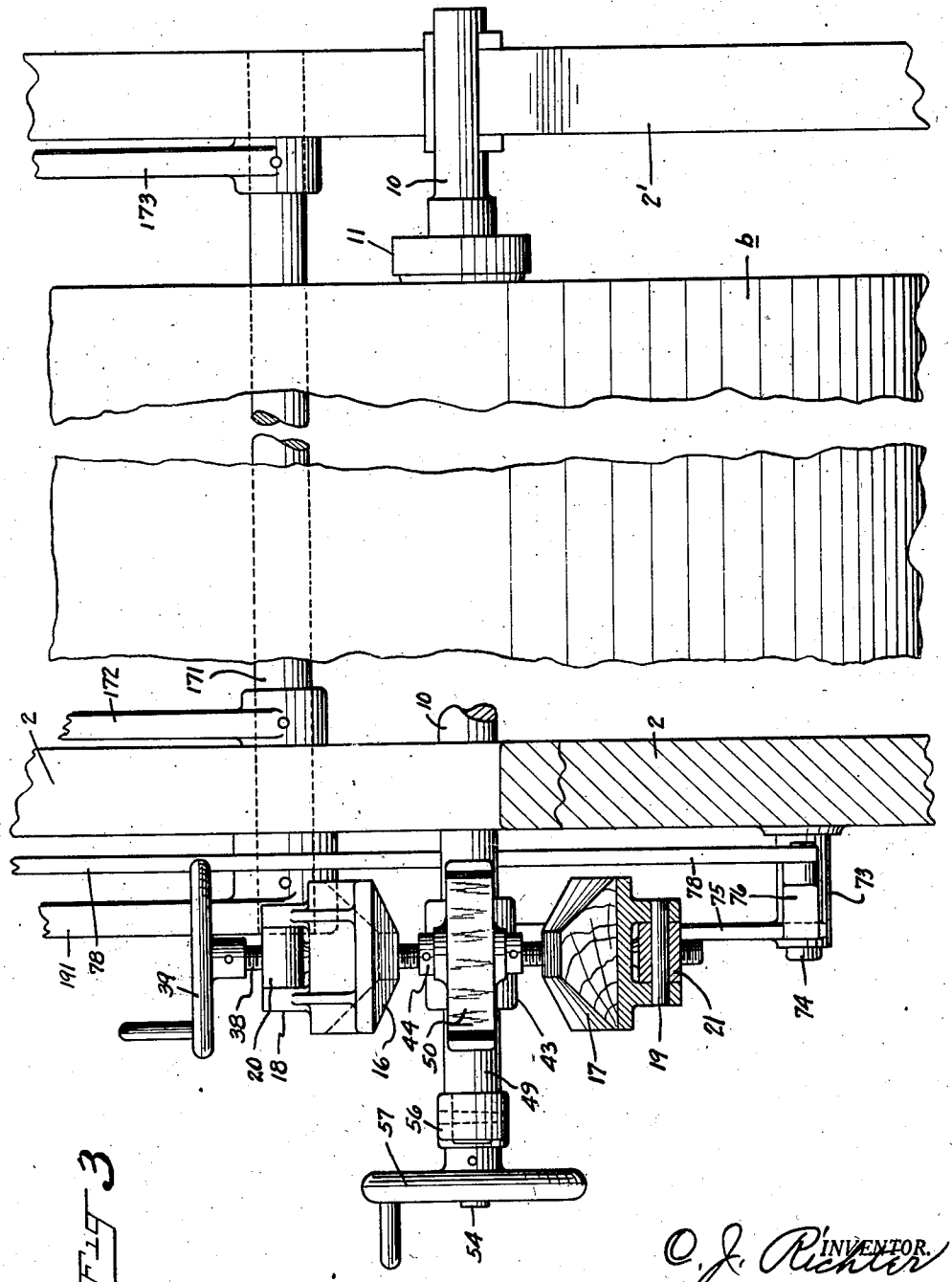


FIG 3

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WEB SUPPLYING AND CONTROLLING MECHANISM

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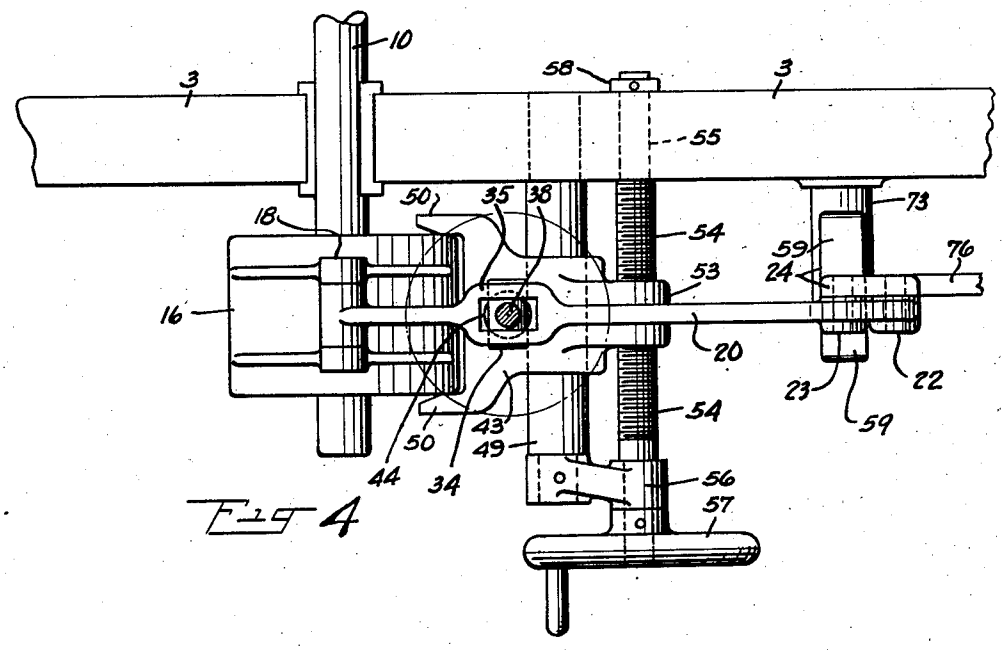
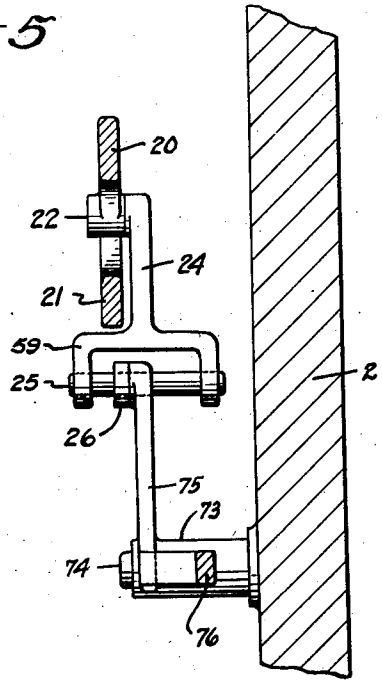


Fig 4

Fig 5



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Nov. 28, 1933. C. J. RICHTER 1,936,916

WEB SUPPLYING AND CONTROLLING MECHANISM

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Fig 6

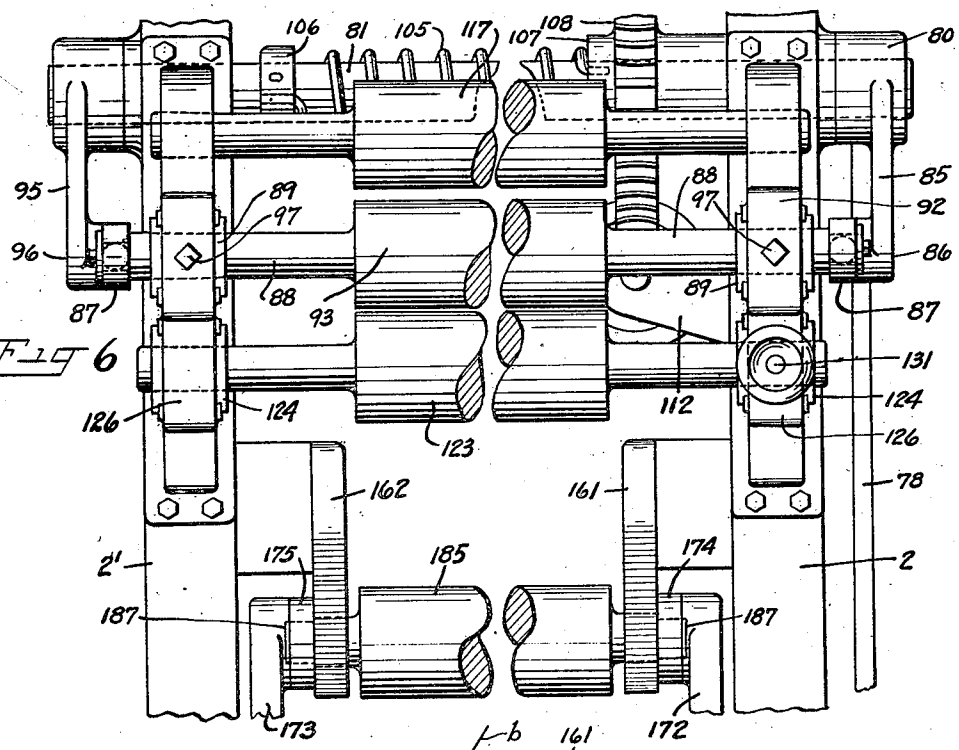
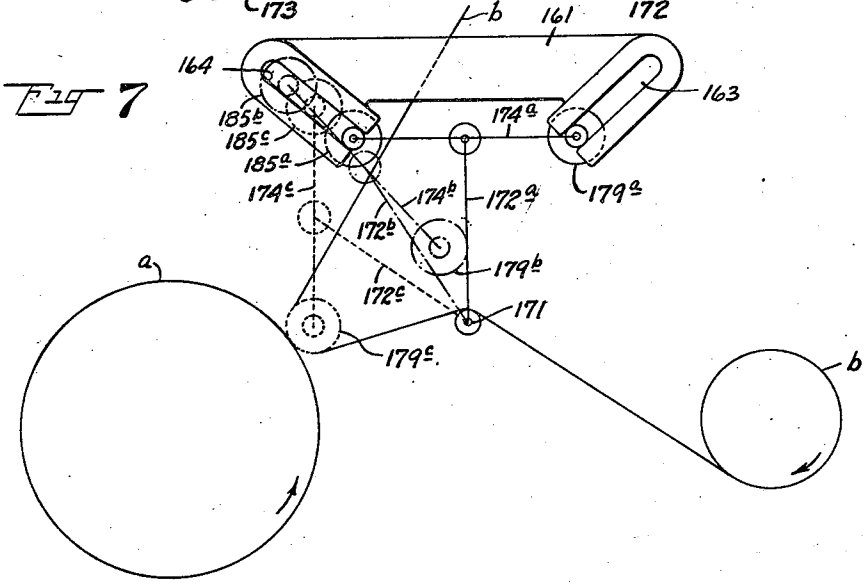


Fig 7



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WEB SUPPLYING AND CONTROLLING MECHANISM

Filed March 22, 1928 6 Sheets-Sheet 6

Fig 9

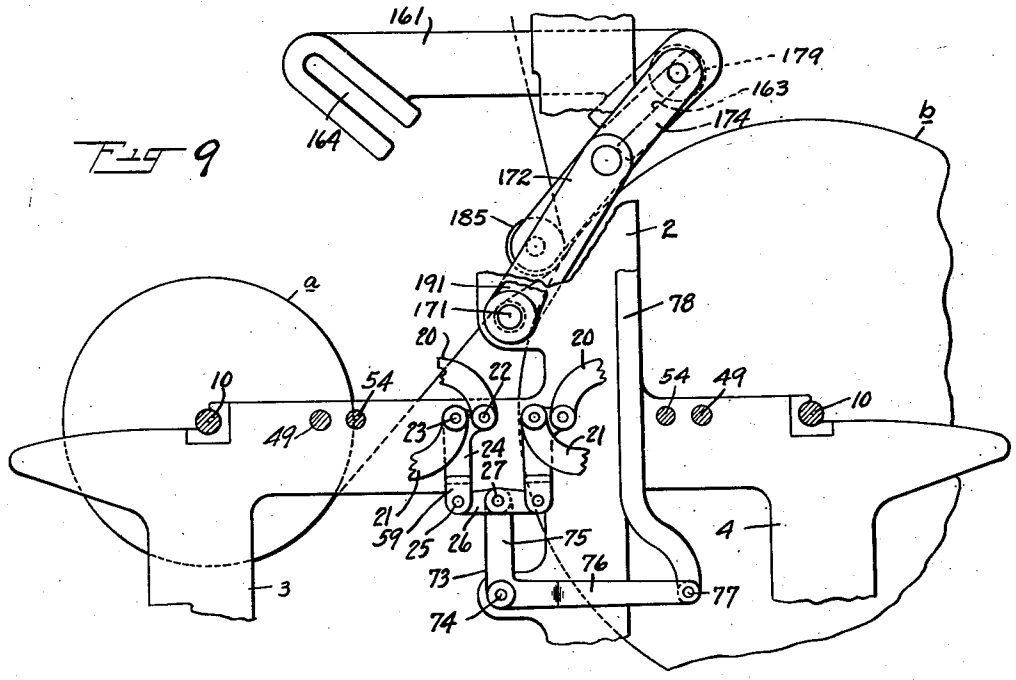
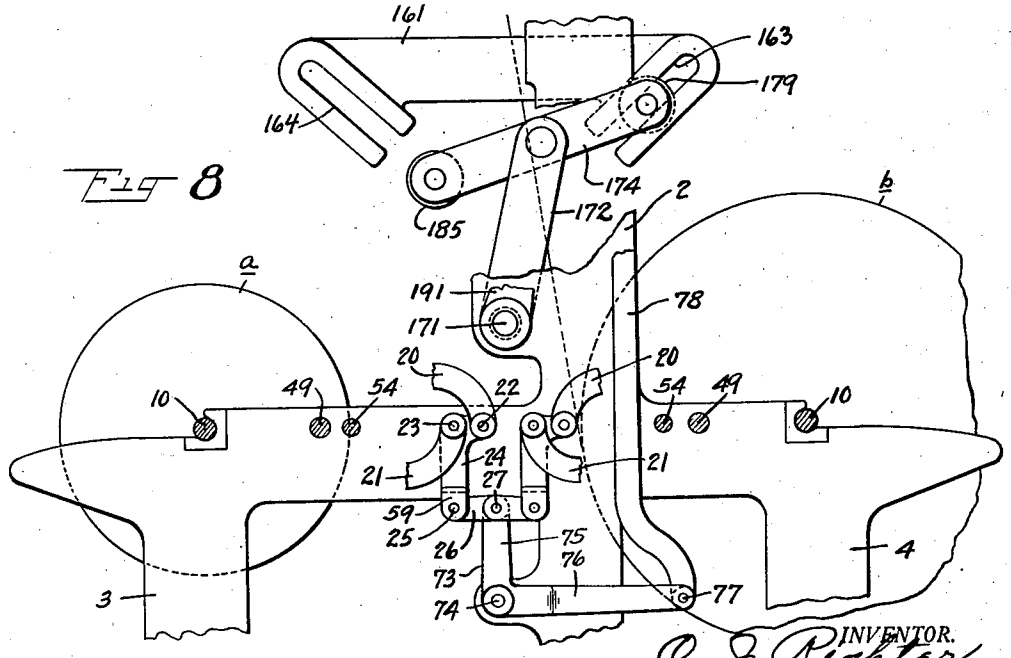


Fig 8



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Patented Nov. 28, 1933 1,936,916

UNITED STATES PATENT OFFICE

1,936,916

WEB SUPPLYING AND CONTROLLING MECHANISM

Charles J. Richter, Berwyn, Ill., assignor to Goss Printing Press Company, a corporation of Illinois

Application March 22, 1928. Serial No. 263,624

6 Claims. (Cl. 242—75)

The invention relates to novel and useful improvements in tension regulating and web pasting means for webs drawn from rotatable rolls, and in certain aspects thereof the invention relates more particularly to such means as applied to fast rotary printing press, although in other of its features the invention has other applications.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Fig. 1 is a side elevation of a mechanism embodying the invention;

Fig. 2 is an enlarged, fragmentary, end elevation, taken substantially on line 2—2 of Fig. 1;

Fig. 3 is an enlarged, fragmentary, transverse section on line 3—3 of Fig. 1;

Fig. 4 is an enlarged, fragmentary plan taken substantially on line 4—4 of Fig. 1;

Fig. 5 is an enlarged section taken substantially on line 5—5 of Fig. 1;

Fig. 6 is an enlarged, fragmentary elevation, taken substantially on line 6—6 of Fig. 1;

Fig. 7 is a positional diagram showing the operation of pasting the webs; and

Figs. 8 and 9 are fragmentary elevations showing different stages in the pasting of the webs.

Referring now in detail to the embodiment of the invention illustrated by way of example in the accompanying drawings, the invention is shown applied to a type of web-supplying means used very extensively in printing presses, wherein two web supply rolls are contiguously mounted on the machine frame, an exhausted roll being removed and replaced by a fresh full roll while the web from the other roll is running to the printing machine. The present invention provides novel web tension operated brake governing means for alternatively controlling the supply of the web proportionately to the demands of the printing machine from either web supply roll by means of a single detector mechanism cooperating with and governed by the running web, and in connection therewith means for bringing a fresh web supply roll approximately up to speed and attaching the two webs together to lead the fresh web through the printing press or other machine.

Referring now in detail to the present preferred embodiment of the web tension control, a frame 1 has at either side upright frame members 2 and 2', and each of these has oppositely-projecting brackets 3 and 4, which are adapted, respectively, to support the shafts of web supply rolls *a* and *b* in operative relation to the tension controlling means and the web pasting mechanism. Two brake mechanisms are provided, one cooperating with web supply roll *a* and the other cooperating with web supply roll *b*, both brake mechanisms being governed by a common control to the web-tension governed controlling means. The brake mechanisms are constructed and arranged so that an exhausted roll may be removed and a new web supply roll may be inserted without displacing the brake mechanisms from their mounting on the machine, or disconnecting them from the common control. A single description is sufficient for both mechanisms.

The roll mounting and brake mechanisms as embodied (Figs. 1, 3, 4 and 5), comprise a shaft or mandrel 10 passing through the web supply roll in the usual manner, the mandrel being journaled in the side brackets 3, 3 or 4, 4 of the frames. A new web supply roll is rolled in from the exterior end of the brackets along the tops thereof to the bearings for its shaft 10. Suitable devices such as bungs or chucks 11 are employed to position and to hold the web supply roll in desired position longitudinally of its shaft 10. A brake pulley 15 is fixed in position on one end of shaft 10 which projects outside of the corresponding bearing in frame bracket 3, the brake pulley being provided with a peripheral V-shaped groove. Working in the groove in the pulley are two arcuate V-shaped brake shoes 16 and 17, which are pivoted, respectively, at 18 and 19 to the ends of opposed pairs of brake arms 20 and 21.

The brake arms 20 and 21 are pivotally mounted at separated points at their rear ends (Figs. 1 and 4), and are likewise pivotally mounted respectively at median points in their length, whereby relative movement of the rear ends will cause the arms to pivot about said median points and will control and vary the braking action. The brake shoes are likewise constructed so that they may be opened out free from the brake pulley, while maintaining the brake mechanism in position, during the changing of the web supply roll. In the embodied means of said rear

end pivotal mounting (Figs. 1, 3, 4 and 5), brake arm 20 is pivotally mounted at 22 and brake arm 21 is pivotally mounted at 23 to an angular arm or link 24. The other end 25 of the member 24 is pivotally connected to one end of a bar 26, and the corresponding member 24 of the other and similar brake mechanism (Fig. 1) is likewise pivotally connected at 25 to the opposite end of the bar 26. The web tension controlling means is pivotally connected at 27 to the central part of the bar 26, thereby providing a common alternative control for either braking mechanism, as will be later more fully described.

The precedingly mentioned median pivotal mountings for the brake arms 20 and 21, as embodied, are combined mechanically with the means for opening and closing the brake arms to bring the brake shoes into and out of operative relation with the brake pulley. That is, the median pivotal mountings for the brake arms are also movable toward and from each other to move the brake shoes from braking position to the open position for removing the exhausted roll and inserting a fresh roll. Further, in this embodiment these means are also associated with means for moving the brake mechanism and the web supply roll laterally to effect adjustment of the web widthwise thereof to bring it into register with respect to the plates on the press cylinder.

As so embodied (Figs. 1, 3 and 4) a lug 34 is rotatively mounted at either end thereof in a yoked part 35 of brake arm 20, and a similar lug 36 is similarly rotatively mounted at its ends in a yoked part 37 of the brake arm 21. The lugs 34 and 36 are each centrally screw-threaded and threaded thereinto, respectively, are right and left handed screw threads on a rod 38, which rod is provided with a hand-wheel 39. Screw rod 38 at its central part is rotatively mounted in an aperture in a carrier 43, the rod being held in position longitudinally by two collars 44 and 45 bearing on either face of the carrier. Thus screw rod 38 may be rotated to cause the pivotal bearings 34 and 36 of the brake arms to approach, or to recede from, each other to open or close the brake shoes, to permit the brake pulley to be removed with the exhausted web roll shaft, and a new brake pulley and web roll to be put in position.

Means are provided for moving the brake mechanism and web roll laterally for the purpose of registering the web with the printing plates, in case this may be necessary. As embodied (Figs. 1, 3, and 4), the carrier 43 is apertured to receive a supporting and guiding rod 49, fixed in and projecting horizontally from the frame bracket 3. The carrier 43 has an open, yoked end 50, which yoke embraces the contiguous edge of the brake pulley, so that the carrier 43 with the pulley, the shaft 10 and the web roll will move together. Screw-threaded means are provided for so moving the carrier 43. As embodied, from the opposite side of the carrier 43 a lug 53 projects, which lug is internally screw-threaded to receive a screw rod 54. Screw rod 54 is rotatively journaled at its inner end 55 in the frame 3, and near its outer end it is journaled in a bracket 56, mounted on the end of the guide rod 49. Screw rod 54 is provided with a hand-wheel 57 and a collar 58 to hold it in position longitudinally. Thus by rotating the hand wheel 57 in either direction the carrier 43, the brake shoe, brake pulley, shaft 10 and the web roll are moved longitudinally of the shaft to register the web as already described. To prevent binding of the mechanism due to the lateral adjustment movement just described, the bottom end of the members 24 are yoked, as shown at 59 in Fig. 5, and the pivot bearing 25 is a pin mounted in this yoke, and adapted to move longitudinally in the aperture in bar 26. Thereby the lateral movement of the brake mechanism will not interfere in any wise with the free pivotal action of the mechanism for regulating the braking effect of the brake arms.

Referring now to the embodied form of the web tension controlled means for governing the action of the braking mechanism, a single mechanism is provided operating upon both brake mechanisms. As embodied (Figs. 1, 3, 4 and 5) a bell-crank lever 73 is pivotally mounted at 74 on the machine frame, and the median pivotal bearing 27 (already described) for the bar 26 is mounted in the end of the arm 75 of the bell-crank lever with sufficient play to permit the requisite free movement. Pivotally mounted at 77 to the end of the opposite arm 76 of the bell-crank is a link 78, the opposite end of this link being pivotally connected at 79 to a bell-crank lever 80. Bell-crank lever 80 (Figs. 1, 2 and 6) is fixed to the shaft 81, journaled at 83 and 84 in the two side frames 2 and 2' of the machine.

The other arm 85 of bell-crank lever 80 is pivotally connected at 86 to a link 87, the opposite end of which is pivoted at 88 to a journal box 89 of the web-engaging detector member, such as a roller 93. Roller 93 has at either end a journal box 89, and these boxes are slidably mounted, respectively, in corresponding pairs of guideways 90 and 91, formed on extensions 92 fixed to the frame of the machine at either side thereof. The connections between the opposite end of detector roller 93 and shaft 81 are substantially the same, and comprise a corresponding link 87, pivoted to the slidable journal box 89 at that end of roller 93. The other end of this link 87 is pivotally connected at 96 to an arm 95, which is fixed to the opposite end of shaft 81 (Figs. 2 and 6). A screw-threaded adjustable stop 97 may be provided for limiting the movement of the detector roller 93 against the running web. The stop screws 97 are set so that the slidable journal boxes 89 of the detector or pilot roller 93 will engage the screws at the same time and both ends of the roller 93 will be thereby stopped simultaneously and will be maintained in parallelism. This will prevent any twisting action on shaft 89 and accompanying strain in the intervening connections. This mechanism provides a direct and straight line movement between the detector roller and the resiliently operating shaft 81, this shaft also having a direct connection to the brake arm operating means.

Means are provided for regulating the resilient pressure of the detector roller against the web and maintaining it substantially uniform throughout the range of movement of the detector roller. In this embodiment, this is effected by providing devices whereby the relative tension of the spring acting on the detector roller, within its limits of movement is substantially uniform. As embodied, I have shown preferably for this purpose a relatively very long spring, in order to secure this uniformity of resilient action. This is conveniently a helical spring 105, coiled about the shaft 81, one end of the spring being fixed in a collar 106 which is fast on the shaft. The opposite end of spring 105 is fixed

in the hub 107 of a worm-wheel 108, loosely mounted on shaft 81.

In the embodied form of means for manually regulating the resilient pressure of the detector roller on the web, a worm wheel 108 meshes with a worm 109, fixed on a shaft 110, journaled in brackets 111 and 112, carried on the machine frame. Shaft 110 is provided with a hand wheel 113, for turning shaft 110 and thereby rotating worm wheel 108 to vary the tension exerted by spring 105 upon the detector roller.

Means are preferably provided, cooperating with the described mechanisms for easing off the motion of the pilot or detector roller when the press starts and the web starts running. As embodied said means comprise a pair of helical springs 116, and these springs are mounted at one end thereof at the inner ends of the guide ways for the pilot roller bearings 89 and the springs extend in the guideways. When the press starts and the pull is exerted on the stationary web, and the pilot roller 93 is moved forcefully to the right in Fig. 1 the journal boxes engage the springs 116, which are thereby compressed and the motion and sudden pressure on the pilot roll is eased and gradually balanced.

Suitable guiding rollers for the running web at either side of the detector roller 93 are provided, and as embodied a web guiding roller 117 is provided, having at either end journals 119 mounted on the machine frame. At the opposite side of the detector roller is a web guiding roller 123, which is movable crosswise of the web to compensate for a loose or tight edge on a web. As embodied one end of the rollers is mounted in a journal box slidable in a guideway by means of a screw-rod. Accordingly, a slidable journal box 124 is mounted in guideways 125, formed in a bracket 126 supported on the machine frame. Loosely connected to one of the journal boxes 124 is a screw-rod 131, which is screw-threaded into the end of bracket 126, and is preferably provided with a locking nut 132. Both journal boxes may be variably positionable, if desired, but in practice this is not essential.

The manner of operation of the web tension controlling mechanism is substantially as follows:—

The web *a* or *b*, as the case may be, runs over the guide roller 123, about the detector roller 93, and around the guide roller 117. Should there be a tight or loose edge on the web, this may be compensated for by turning the screw-rod 131 one way or the other, so that the web will be equalized before it passes over the detector roller 93. When the tension of the web slackens, the detector roller will move to the left in Fig. 1, under the action of the spring 105, and if the tension increases, the web will move the detector roller against the action of the spring 105 to the right in Fig. 1. The motion in either direction is communicated through shaft 81 and bell crank lever 80 to the rod 78, which rocks the bell crank lever 73 in the corresponding direction about its pivot point 74. This will rock the members 24, and therewith will move the pivot points 23 and 22, at the rear ends of the brake arms, to cause the corresponding brake arms 21 and 20 to move about their respective pivot points 36 and 34 to increase or decrease the pressure of the brake shoe 16 and 17 upon the brake pulley 15, whereby the braking action is regulated to maintain the web tension uniform by counteracting any causes which tend to vary the tension and to perform this function as the web unwinds from the roll with the use thereof by the printing press or like machine.

There is provided by the direct and positively connected lever and link mechanism from the pilot or detector roller to the brake mechanism means whereby for any given tension change in the web a corresponding and positive action is exerted on the braking mechanism. Furthermore by this connecting mechanism, the reaction of the brake pressure is positively and accurately communicated backwardly to the pilot roller and reacts directly, with a steadying effect, to neutralize or dampen the movement of the pilot roller, and to prevent any violent or extreme movements thereof. Cooperating with this mechanism in securing the desired regulation of the movement of the pilot roller is the spring tension device whereby the tension on the pilot or detector roller is maintained approximately uniform throughout its range of movement.

In taking out the exhausted roll and its brake pulley, the screw-rod 38 is rotated so as to move the brake shoes 16 and 17 clear of the pulley 15, and the exhausted roll is withdrawn. The new roll is then placed in position with its shaft in the bearings upon the frame brackets 3, and screw-rod 38 is rotated in the opposite direction and the normal pressure of the shoes 16 and 17 upon the brake pulley 15 is established in this manner. If the web roll needs to be moved transversely of the machine to bring the web into register with the printing plates, this will be done by rotating the screw-rod 54. The rotation of this rod moves the carrier 43 along its guide 49, the yoke 50, which is in engagement with the brake pulley 15, causing the brake pulley, the shaft 10 and the web roll, to move correspondingly axially of the shaft 10. At the same time the pin 25 (Fig. 5) will move in its aperture in the bar 26, and thereby prevent binding of the tension governing mechanism. The embodied form of web pasting means (Figs. 1, 2 and 6 to 9) comprises a pair of bracket plates 161 and 162 fixed on the machine frame at either side. At one end of each of the plates 161 and 162 is formed a slot guideway 163, and at the opposite end of each of the plates 161 and 162 is formed a corresponding slot guideway 164, these guideways cooperating respectively with two rollers which are used alternatively to press together a running and nearly exhausted web and the lead end of the web from the fresh supply roll to make what is known as a running paster.

In the embodied form of mounting and moving means for said web pasting rollers, there is journaled in the side frames 2 and 2' of the machine a shaft 171, and fixed thereon are two arms 172 and 173. Pivotally supported in the top of the arm 172 is a bar 174, and pivotally supported in the top of the arm 173 is a bar 175. A roller 179 has its shaft journaled in the corresponding ends of the bars 174 and 175. To hold the roller 179 in longitudinal position and the bars 174 and 175 in alinement and position, the ends of the roller axle are shouldered within the bars (Figs. 2 and 6). The shaft 182 of the roller 179 at either end of the roller and within the respective bars 174 and 175 is adapted to pass into and out of the slot guideways 163 formed in the plates 161 and 162 fixed on the machine frame. In the opposite ends of the bars 174 and 175 is journaled a roller 185, the shaft 187 thereof being held in place against longitudinal displacement, and the corresponding ends of the bars 174 and 175 being held in alinement and position by

similar means to those already described in connection with roller 179. The shaft 187, at either end of the roller 185 and within plates 161 and 162 is adapted to enter into and travel along the slot guideways 164 in the plates, similarly to the mechanism and operation at the other side of the press. Means are provided for manually rocking shaft 171 to effect the pasting operation at either side. Said means as embodied comprises a lever 191, fixed to one end of shaft 171 on the outside of the side frame 2 of the machine. A boss 192 on the lever cooperates with a boss 193 on the frame when the mechanism is in central or inactive position, as shown in Figs. 1 and 2, and a pin 194 passes into internal apertures in the two bosses and holds the lever 191 locked in inactive position. The entire mechanism is rocked either to the right or left about shaft 171, and one of the rollers 179 or 185 is guided by the corresponding pair of slots 163 or 164, moving to and fro in the slots during the rocking of the entire device about shaft 179 to simultaneously swing the oars 174 and 175 about their pivotal mounting on arms 172 and 173 to move the other roller to and from pasting position. This action will be apparent from Figs. 1, 7, 8 and 9. In the diagram of Fig. 7 it is assumed that the web *b*, approaching exhaustion, is to be pasted to a fresh web roll *a*. Handle 191 is turned to the left, and the successive positions of the various parts of the mechanism are indicated by exponents *a*, *b* and *c* applied to the reference numerals for those parts. In practice, the lead end of the web of roll *a* has a band of paste applied thereacross and it is located just beyond the point where roll 179 will contact therewith. When roll 179 is impressed in position 179^c, it presses the running web *b* firmly against roll *a* which is thereby started into rotation, or roll *a* may be otherwise started to rotate. It has practically an enire revolution in which it is brought up to speed by the pressure of running web *b* under roller 179^c. As the band of paste on rotating roll *a* engages with running web *b*, they are pasted together, web *b* is severed, and the lead of web *a* is carried through the printing press or other machine.

One of the advantages of my invention is that a fresh web may be attached to a running web approaching exhaustion, the new web being led past the automatic web-governed brake-controlling means without disturbing the continuity of the brake controlling action by the web.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A web-supplying mechanism including in combination a plurality of means for rotatively supporting web rolls, a plurality of braking mechanisms one for each of the web rolls, and a common web controlled device between the web roll axes for simultaneously governing the action of a plurality of the braking mechanisms.

2. A web-supplying mechanism including in combination a plurality of means for rotatively supporting web rolls, a plurality of braking mechanisms one for each of the web rolls, and a common web controlled device between the web roll axes for simultaneously and continuously governing the action of a plurality of the braking mechanisms.

3. In a web tension regulating mechanism, a support for two web rolls, separate braking means to resist the rotation of each roll, a roller supported to run in a loop in the running web and urged in a direction to enlarge the loop, and connections between the roller and the braking means whereby the pressure of the brakes is equalized and regulated by the web tension.

4. Web roll controlling mechanism including in combination a support for a rotatable web roll to be loaded by horizontal movement of the web roll, a pilot roller, a pair of medianly pivoted arms mounted at one end of the web roll, brake shoes carried by the arms to control the rotation of the web roll, connecting means at the end of the arms away from the shoes and connecting the arms with the pilot roller and means for spreading the arms apart at their shoe ends to permit placement of a new web roll.

5. Web roll controlling mechanism including in combination a support for a rotatable web roll to be loaded by horizontal movement of the web roll, a pilot roller, a pair of medianly pivoted arms mounted at one end of the web roll, brake shoes carried by the arms to control the rotation of the web roll, connecting means at the end of the arms away from the shoes and connecting the arms with the pilot roller and means for moving the brake arm pivots toward and from each other to space the brake shoes when a web roll is replaced.

6. Web roll controlling mechanism including in combination supports for a pair of rotatable web rolls, a pilot roller, a connecting link between the web roll axes and moved by the pilot roller, pairs of brake arms extending away from said link and means for moving the arms of each pair towards each other by movement of said link.

CHARLES J. RICHTER.