Sept. 19, 1933. F. SPENCE 1,927,759

INKING MECHANISM OF PRINTING MACHINES

Filed July 14, 1932 3 Sheets-Sheet 1

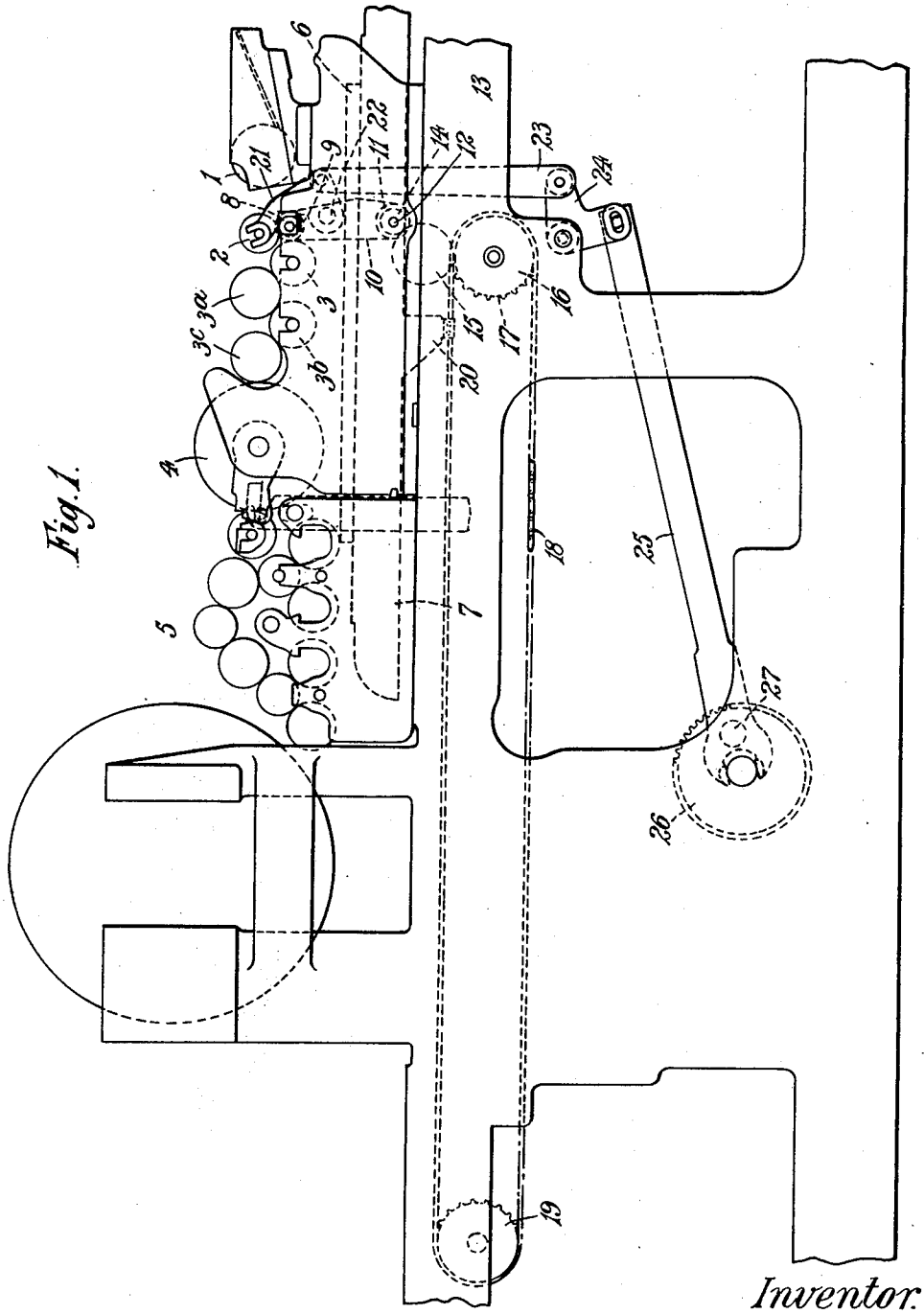


Fig. 1.

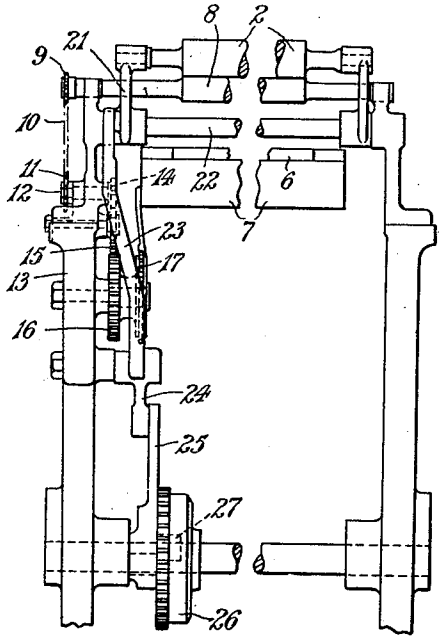
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Filed July 14, 1932 3 Sheets-Sheet 2

Fig. 2.



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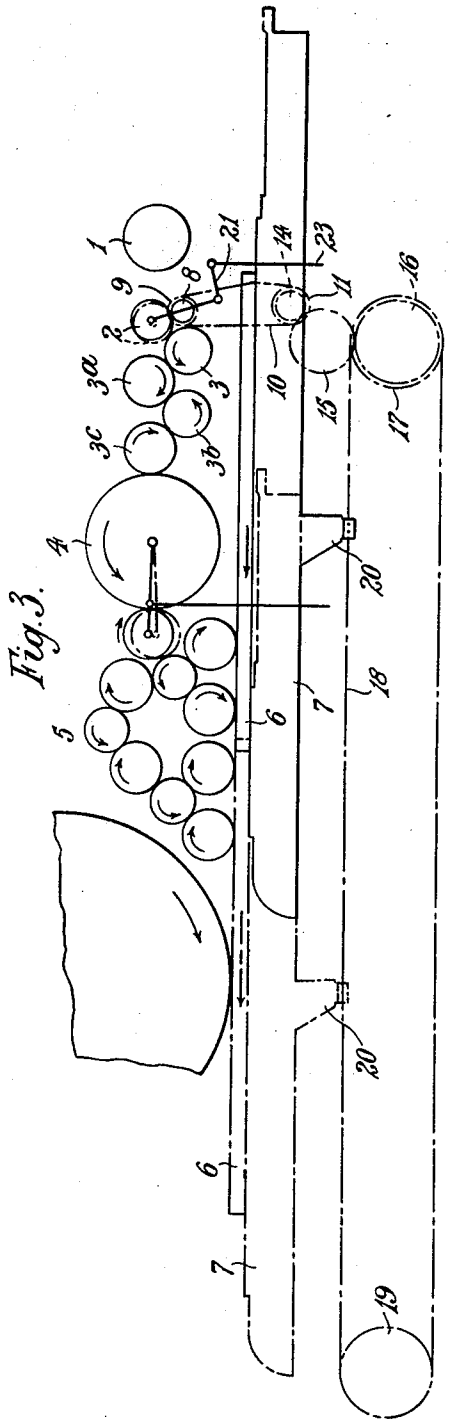


Fig. 3.

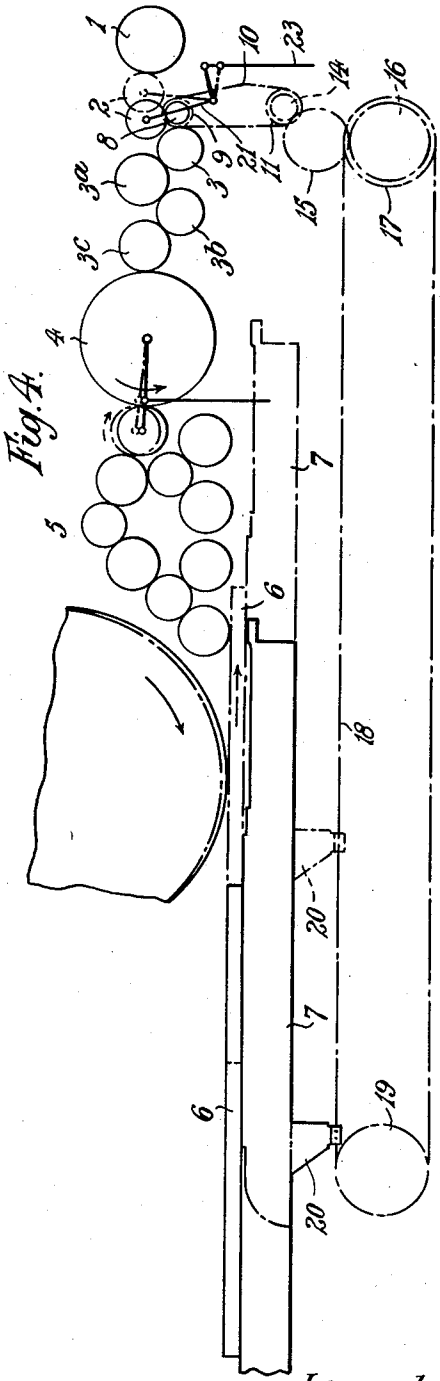


Fig. 4.

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UNITED STATES PATENT OFFICE

1,927,759

INKING MECHANISM OF PRINTING MACHINES

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Application July 14, 1932, Serial No. 622,419, and in Great Britain July 17, 1931

8 Claims. (Cl. 101—356)

This invention relates to inking mechanism of printing machines, and more particularly to mechanism comprising a set of ink distributing rollers which rotate continuously in one direction and work up the ink fed thereto from an ink fountain roller by a ductor roller which contacts alternately with an intermittently rotating ink fountain roller and one of the continuously rotated rollers of the ink distributor set, hereinafter termed the "first distributor roller".

A principal object of the invention is to provide means for positively rotating the ductor roller, during its swinging movement from the ink fountain roller towards the first distributor roller so that contact with the latter is made only when the two rollers are rotating at the same surface speed, thus avoiding shock and damage to the rollers and driving gear which would otherwise occur.

A further object of the invention is to provide means for controlling the rotation of the ductor roller during its swinging movement out of contact with the first distributor roller and into contact with the fountain roller, whereby during such movement it may be slowed down or brought to rest so that contact with the ink fountain roller may also be made without any risk or damage.

For rotating and increasing the speed of rotation of the ductor roller during its swinging movement towards the first distributor roller, the invention contemplates the provision of a driven member located between the ink fountain roller and the first distributor roller in such a position as to make driving contact with the ductor roller at an intermediate stage of the before-mentioned swinging movement, the speed of such driven member being increased during a succeeding stage thereof until the ductor roller is rotated at the proper speed for contacting with the first distributor roller.

This same driven member is conveniently utilized for controlling the rotation of the ductor roller during its return swinging movement towards the fountain roller. For this purpose, the speed of such driven member is reduced during such return movement, and while it is in driving contact with the ductor roller.

The invention is hereinafter described with reference to the accompanying drawings showing one constructional form thereof applied to a machine in which a flat bed is reciprocated beneath a printing cylinder.

In the said drawings:—

Figure 1 is a side elevation of the pertinent parts of the machine;

Figure 2 is an end elevation as viewed from the right of Figure 1, and

Figures 3 and 4 are diagrammatic side elevations showing the mechanism at successive stages of its operation.

Referring first to Figures 1 and 2, the inking mechanism represented comprises an ink fountain roller 1, a ductor roller 2 arranged to contact alternately with said fountain roller and the first distributor roller 3, which, with the companion distributor rollers 3^a, 3^b, 3^c, and the ink drum 4, continuously rotates in one direction. The ink worked up by these continuously rotating inking rollers and drum is transferred to the set of forme rollers, herein designated as a whole by the reference numeral 5, by which the ink is finally applied to the printing forme 6 on the reciprocating bed 7. The means for controlling the transfer of ink to the forme rollers and to the forme constitute no part of the present invention and may be of any convenient construction.

The above named driven member may be conveniently in the form of a roller 8, hereinafter termed the starting roller, which is driven from the reciprocating bed. In the arrangement shown a sprocket wheel 9 on the end of the roller shaft is driven by a chain 10 from a sprocket wheel 11 fast on a short shaft 12 extending through the machine frame 13 and carrying at its inner end a toothed-wheel 14. The wheel 14 in turn meshes with a gear wheel 15 driven by a gear wheel 16 which rotates with a sprocket wheel 17 from which later a chain 18 passes to a second sprocket wheel 19. The upper flight of the chain 18 is secured to a bracket 20 depending from the bed 7.

The ductor roller is rotatable in bearings supported by arms 21 fast on a transverse shaft 22, which is rocked to swing the ductor roller in timed relationship to the reciprocations of the bed by a link 23 pivoted at its upper end to one of the arms 21 and at its lower end to one arm of a bell crank lever 24 whose other arm is connected to a link 25 which is reciprocated by a grooved cam 26 with which engages a roller 27 on the link 25. The axis of the shaft 22 about which the ductor roller 2 swings, is so located with reference to the axis of the starting roller 8 that the roller 2, during its swing towards the ink fountain roller 1, breaks contact therewith.

It will be understood that through the reciprocations of the bed 7, the starting roller 8 will be

rotated alternately in opposite directions, and that the reversal of the bed will be accompanied by a slowing down to rest of the starting roller, followed by a speeding up in the opposite direction.

The cycle of operations will now be described with particular reference to Figures 1, 3 and 4. Figure 1 shows the bed 7 in its stationary position at the extreme end of the non-printing stroke, at which juncture the ductor roller 2 has just made contact with the starting roller 8, the latter being also stationary. As the bed moves from the position in which it is shown in Figure 1 to that in which it is represented by the full lines in Figure 3 it accelerates to its uniform speed for the printing stroke, and the starting roller 8 as well as the ductor roller 2 in contact therewith is correspondingly accelerated. The roller 2 is then moved into contact with the first distributor roller 3 where it remains until near the end of the printing stroke of the bed. The positions of the bed and ductor roller 2 represented in dotted lines in Figure 3 are those occupied at about the middle of the printing stroke. In full lines in Figure 4, the bed 7 is indicated at the extreme rear end of the printing stroke where it is brought to rest prior to reversal, and the ductor roller 2 just breaking contact with the starting roller 8, while the latter is at rest, during its movement towards the ink fountain roller 1, which movement will have been commenced during the travel of the bed at its uniform printing speed and just prior to the deceleration thereof for the reversal. The succeeding stage of the cycle of operations is shown by the dotted-line position of the bed and ductor roller in Figure 4, the bed in that position being in the middle of its return non-printing stroke, and the ductor roller 2 in contact with the fountain roller 1, where it remains until just prior to the completion of the non-printing stroke when it is again moved towards the starting roller 8 and contacts therewith at the end of that stroke as indicated in Figure 1.

The constructional form of the invention above described, and the particular cycle of operations described in connection therewith, are given merely as convenient examples, and it will be recognized that the construction of the mechanism for controlling the rotation of the ductor roller and its movement between the distributor rollers and the ink fountain roller, as well as the timing of such movement in relation to the printing operation, may be varied without departing from the invention. Moreover, the control of the rotation of the ductor roller according to the invention is not restricted in its application to the particular construction of inking mechanism in connection with which it is herein illustrated and described, but may be applied conveniently to other constructions of inking mechanism involving the use of a set of ink distributing rollers rotated continuously in one direction.

Having described my invention I declare that what I claim and desire to secure by Letters Patent is:—

1. In inking mechanism for printing machines, the combination with an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller and means adapted to move the ductor roller laterally alternately into contact with the ink fountain roller and one of the distributor rollers, of a driven member rotating on an axis eccentric to the lateral path of the ductor roller, and located in such a position as to make driving contact with the ductor roller at an intermediate stage of its passage from the ink fountain roller to the distributor roller.

2. In inking mechanism for printing machines, the combination with an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller and means adapted to move the ductor roller laterally alternately into contact with the ink fountain roller and one of the distributor rollers, of a driven member rotating on an axis eccentric to the lateral path of the ductor roller, and located in such a position as to make driving contact with the ductor roller at an intermediate stage of its passage from the ink fountain roller to the distributor roller and means adapted to increase the speed of the driven member while the ductor roller is in driving contact therewith and before said ductor roller contacts with the distributor roller.

3. In inking mechanism for printing machines, the combination with an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller and means adapted to move the ductor roller laterally alternately into contact with the ink fountain roller and one of the distributor rollers, of a driven member rotating on an axis eccentric to the lateral path of the ductor roller, and located in such a position as to make driving contact with the ductor roller at an intermediate stage of its passage from the ink fountain roller to the distributor roller, means adapted to increase the speed of the driven member while the ductor roller is in driving contact therewith and before said ductor roller contacts with the distributor roller and means adapted to decrease the speed of said driven member while the ductor roller is in contact therewith at an intermediate stage of the passage of the ductor roller from the distributor roller to the ink fountain roller.

4. In a printing machine, the combination with a flat bed and a printing cylinder relatively to which said bed is reciprocated, of inking mechanism comprising an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller, means adapted to move the ductor roller alternately into contact with the ink fountain roller and one of the distributor rollers, and a driven roller, located in such a position as to make driving contact with the ductor roller during intermediate stages of the movement of the latter towards and away from the distributor roller, said driven roller being rotated alternately in reverse directions and at varying speeds in unison with the reversal and varying speed of the reciprocating bed.

5. In a printing machine, the combination with a flat bed and a printing cylinder relatively to which said bed is reciprocated, of inking mechanism comprising an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller, means adapted to move the ductor roller alternately into contact with the ink fountain roller and one of the distributor rollers, a driven roller located in such a position as to make driving contact with the ductor roller during intermediate stages of the movement of the latter towards and away from the distributor roller, and a driving connection between said driven roller and the reciprocating bed whereby said driven roller is rotated alternately in reverse directions and at

varying speeds in unison with the reversal and varying speed of the reciprocating bed.

6. In a printing machine, the combination with a flat bed and a printing cylinder relatively to which said bed is reciprocated, of inking mechanism comprising an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller, means adapted to move the ductor roller, in timed relationship with the reciprocation of the bed, alternately into contact with the ink fountain roller and one of the distributor rollers, and a driven roller located in such a position as to make driving contact with the ductor roller during intermediate stages of the movement of the latter towards and away from the distributor roller, said driven roller being rotated alternately in reverse directions and at varying speed in unison with the reversal and varying speed of the reciprocating bed.

7. In a printing machine, the combination with a flat bed and a printing cylinder relatively to which said bed is reciprocated, of inking mechanism comprising an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller movable alternately into contact with the ink fountain roller and one of the distributor rollers, a driven roller located in such a position as to make driving contact with the ductor roller at intermediate stages of the movements of the latter between the ink fountain roller and the distributor roller, a driving connection between said driven roller and the reciprocating bed adapted to drive that roller alternately in reverse directions and at varying speeds in unison with the reversal and varying speed of the reciprocating bed, and means adapted to move the ductor roller in timed relationship with the reciprocations of the bed so as to bring said ductor roller into and out of contact with the driven roller during the movement of the ductor roller away from and towards the ink fountain roller at periods when the driven roller is at rest.

8. In a printing machine, the combination with a flat bed and a printing cylinder relatively to which said bed is reciprocated, of inking mechanism comprising an ink fountain roller, a set of distributing rollers continuously rotated in one direction, a ductor roller movable alternately into contact with the ink fountain roller and one of the distributor rollers, a driven roller located in such a position as to make driving contact with the ductor roller at intermediate stages of the movements of the latter between the ink fountain roller and the distributor roller, a driving connection between said driven roller and the reciprocating bed adapted to drive that roller alternately in reverse directions and at varying speeds in unison with the reversal and varying speed of the reciprocating bed, and means adapted to move the ductor roller in timed relationship with the reciprocations of the bed so as to bring said ductor roller into and out of contact with the distributor roller while in contact with the driven roller and while rotating at the same peripheral speed as the distributor roller.

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