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PRESSURE ROLL ADJUSTMENT

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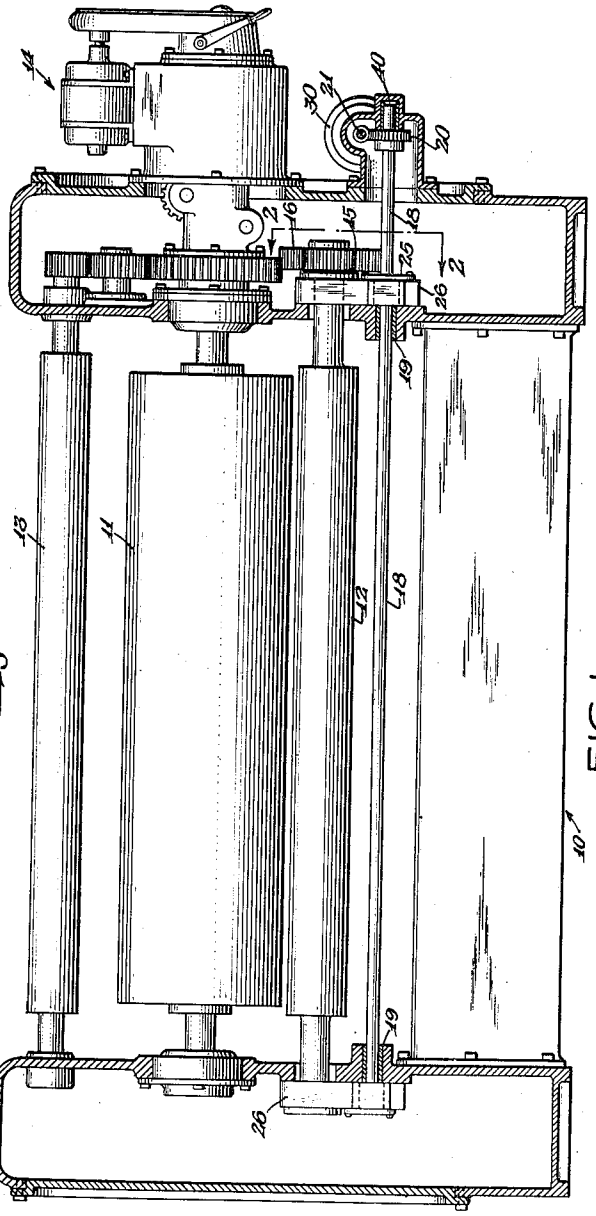


FIG. 1.

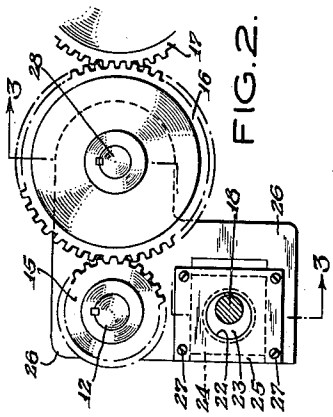


FIG. 2.

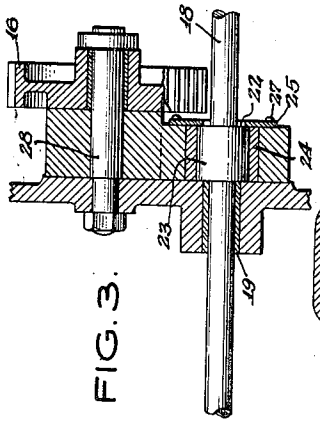


FIG. 3.

INVENTOR.
Albert F. Shields

BY Samuel Astrotenka

ATTORNEYS

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PRESSURE ROLL ADJUSTMENT

Albert F. Shields, Jamaica, N. Y., assignor to S. & S. Corrugated Paper Machinery Co., Inc., Brooklyn, N. Y., a corporation of New York

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4 Claims. (Cl. 101—407)

This invention relates to printing machines and more particularly to a running adjustment for a pressure roller. The adjustment herein for moving the pressure roller towards or away from its associated roller may well be used with other types of mechanism.

It is essential that the gears be maintained in proper mesh while the adjustment is made. Hitherto this adjustment was made in a straight line by moving a box in a vertical plane so that the distance between gear centers was changed somewhat, introducing undesirable conditions including a bad meshing of the gears.

The adjustment of the present invention may be made while the machine is in operation and without in any way interfering therewith. The adjustment further is under continuous control and the exact degree of adjustment may be obtained even though the machine is running at full speed.

An object of this invention therefore is the provision of mechanism for adjusting a pressure roller while the apparatus with which it is associated continues to operate and without interfering with the operation thereof, or with the spacing of the centers of connecting gears with respect to each other.

A further object of this invention is the provision of apparatus and mechanism for moving a rotating shaft in a direction normal to that of its axis while the same is nevertheless under the influence of a power source and caused to rotate thereby.

Another object is to perform this adjustment from one end only of the machine and to raise or lower both sides the same amount.

Other objects and uses of this invention will be apparent from the following description and drawing, in which:

Figure 1 is a general view partly in cross-section of my device showing the same in connection with a printing machine.

Figure 2 is a cross-section on line 2—2 of Figure 1.

Figure 3 is a cross-sectional view on line 3—3 of Figure 2.

Referring now to the figures, the machines 10 in this case shown as a printing machine comprises a main roll 11 and a pressure roll 12 associated therewith as well as associated apparatus such as ink rolls 13 and driving apparatus (not shown) including gears 15. The pressure roll 12 (see also Figure 2) is rotated by appropriate gearing through the gear 15, idler 16 and other gearing connections 17. A shaft 18 is mounted immediately beneath the pressure roller 12 and parallel thereto journalled in appropriate bearings 19, 19 in opposed pillars of the machine. The shaft 18 is not connected in any way with the ordinary power mechanism of the machine itself but is nevertheless rotatably mounted and carries at one end thereof worm gear 20 which meshes with worm 21 for purposes hereinafter noted.

As seen in Figures 1, 2 and 3, an eccentric 22 is keyed to the shaft 18 and rotates therewith. It should be noted that the reason that the eccentric 22, as seen in Figure 3, seems to have an equal radius on either side of the shaft is that the view is a cross section on Figure 2 where it will be seen that the member is truly eccentric, having a greater radius on one side than on the other. Rotation of the shaft 18 causes the eccentric 22 to rotate.

While an eccentric is here shown, it will be clear that other cam forms may be used, and that any other off-center arrangement may be utilized for this purpose.

As will be seen from an inspection of Figures 2 and 3, the eccentric 22 rotates in a perforation 23 in a sliding block 24. The sliding block 24 in turn is free to ride back and forth in the slot 25 of the L-shaped member 26. The sliding block 24 is retained in the slot 25 by the perforated metal plate 27 which is riveted or otherwise attached to the member 26 and insures that the sliding block 24 will not move out of the bracket 26.

The L-shaped member 26, as seen in Figures 2 and 3, is pivoted on the stud 28 which also carries the idler 16. The shaft 12 is rotatably mounted within the L-shaped member 26 and carried thereby. Any raising or lowering of the L-shaped member 26 will result in a corresponding raising or lowering of the pressure roll 12 and will consequently cause the pressure roll 12 to either move towards or away from the principal roll 16.

When the shaft 18 is rotated to a position 90° removed in a clockwise direction from the position shown in Figure 2 then the largest radius of the eccentric 22 will be directed in an upward direction and the L-shaped member 26 will be caused to pivot upwardly about the stud 28. This will cause the pressure roll 12 to rise towards the main roll 11. Should the shaft 18 be rotated in a counterclockwise direction to a position 90° removed from that shown in Figure 2, then the L-shaped member 26 and consequently the pressure roll 12 rotatably carried thereby will be caused to move in a direction away from the main roll 11.

Consequently, rotation of the shaft 18 will result in movement of the pressure roll 12 towards or away from the main roll 11, thus changing the pressure upon any web between the two members in any desired way, that is, increasing or decreasing it.

Since the shaft 18 will in movement of the member 26 describe an arcuate path with respect thereto, sufficient controlled play or adjustment must be provided in order that there be no restriction upon the free motion of the L-shaped member 26 in response to the change in position of eccentric 22; therefore the block 24 is arranged to slide within the slot 25 (the motion thereof, however, being limited by the perforated plate 27) in order to permit the necessary sliding motion which will occur by reason of the shifting of the position of the L-shaped member 26 with respect to the shaft 18.

Obviously, of course, similar mechanism should be mounted on each end of the pressure roller 12 and the pressure roller is supported at each end by a member 26 having all of the parts shown in Figure 2. The member 18 should likewise have an eccentric attached thereto at each end to register with the L-shaped member 26.

Any suitable means may be provided to rotate the shaft 18. In order, however, further to control the rotation thereof and in order to provide a self-operating brake or locking adjustment therefor, I prefer that the rotation of the shaft 18 be through a worm and worm gear combination 21 and 22, the gear ration being so arranged as to provide for a very slow rotation of the shaft 18 with respect to whatever source is causing the rotation of the worm 21 and the gear ratio also being such as to provide an effective braking means.

The worm 21 may, preferably, be rotated by a handle mounted on a shaft attached thereto, although any other suitable rotating means may be used.

It will thus be seen that by a simple rotation of an auxiliary shaft the pressure roller may be adjusted to any desired pressure. The only mechanism used is the mounting of the pressure roller on a member which may be shifted and the mounting of an eccentric or other cam on the adjustment shaft in such a manner that rotation of the adjustment shaft will through the eccentric cause a movement of the member which carries the pressure roller.

The pivoting of the L-shaped member about the stud 28 provides for an additional means of support and for better control of the movement of the pressure roller, while assuring a continuous engagement of the pressure roller with its driving mechanism including roller 16 which is also pivoted on stud 28. Obviously, of course, an adjustment of this type may be used on any mechanism where adjustment of the pressure roller is required during operation of the mechanism. It will also be clear, however, that such a pressure roller adjustment may as readily be used while the machine is not in operation and it will be noted from this description that no springs or yielding adjustments or set adjustments of any kind are required but adjustments may vary from full opening between the pressure roller and drum 11 to complete closure of the gap therebetween and a use of any one of the infinite number of possible openings therebetween, no fixed or predetermined adjustments of any kind being necessary.

Many other modifications of my invention will now be obvious to those skilled in the art. I prefer therefore to be limited not by the specfic disclosures herein but only by the appended claims.

I claim:

1. A printing machine comprising a printing roll and a pressure roll, said pressure roll being adjustable with relation to said printing roll, an adjustable mounting for said pressure roll, said mounting comprising a bracket, a pivotal mounting for said bracket, said pressure roll being rotatably mounted on said bracket, a source of power, a driving means between said source of power and said pressure roll, said driving means comprising a gear rotatably mounted concentrically of the pivotal mounting of said bracket, said pressure roll carrying a gear meshing with said driving gear, said gears meshing with each other irrespective of the position of said bracket and means for rotating said bracket about its pivotal mounting within predetermined limits, each end of said driven rotatable pressure roll being supported in a similar bracket, each of said brackets being simultaneously rotatable, said means for rotating said brackets comprising a shaft carrying a pair of cams, each cam registering with a perforation in a slide of a bracket, each slide being slidably mounted in a slot of a bracket and means for rotating said shaft whereby each end of said adjustably mounted pressure roll may be moved simultaneously.

2. A printing machine comprising an adjustable mounting for a shaft, said mounting comprising a bracket, a pivotal mounting for said bracket, said shaft being rotatably mounted on said bracket, a source of power, a driving means between said source of power and said shaft, said driving means being rotatably mounted concentrically of the pivotal mounting of said bracket, the mounting of said driving means of said shaft being at a constant distance from each other irrespective of the position of said bracket and means for rotating said bracket about its pivotal mounting within predetermined limits, said means comprising a shaft carrying a cam, said cam registering with a slot in said bracket, means for rotating said shaft, and means for locking said shaft in selected position.

3. An adjustable mounting for a driven rotatable shaft, said mounting comprising a bracket, a pivotal mounting for said bracket, said shaft being rotatably mounted on said bracket, a source of power, a driving means between said source of power and said shaft, said driving means being rotatably mounted concentrically of the pivotal mounting of said bracket, the mounting of said driving means and of said shaft being at a constant distance from each other irrespective of the position of said bracket and means for rotating said bracket about its pivotal mounting within predetermined limits, said means comprising a shaft carrying a cam, said cam registering with a perforation in a slide, said slide being slidably mounted in a slot in said bracket and means for rotating said shaft, said means including a worm gear connection between the means for rotating the cam shaft and the cam shaft.

4. An adjustable mounting for a driven rotatable shaft, said mounting comprising a bracket, a pivotal mounting for said bracket, said shaft being rotatably mounted on said bracket, a source of power, a driving means between said source of power and said shaft, said driving means being rotatably mounted concentrically of the pivotal

mounting of said bracket, the mounting of said driving means and of said shaft being at a constant distance from each other irrespective of the position of said bracket and means for rotating said bracket about its pivotal mounting within predetermined limits, said means comprising a shaft carrying a cam, said cam registering with a perforation in a slide, said slide being slidably mounted in a slot in said bracket, means for rotating said shaft, and an indicator rotatable with said cam carrying shaft for indicating the setting of the rotatable shaft.

ALBERT F. SHIELDS.