B. BREWER.

PRINTING PRESS.

APPLICATION FILED FEB. 28, 1921.

1,409,659. Patented Mar. 14, 1922.

Fig. 1.

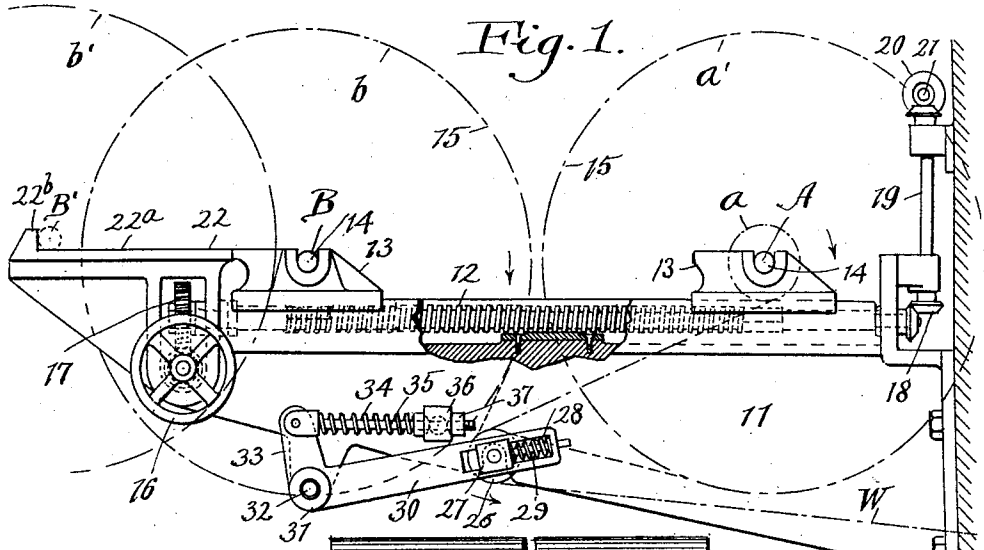


Fig. 2.

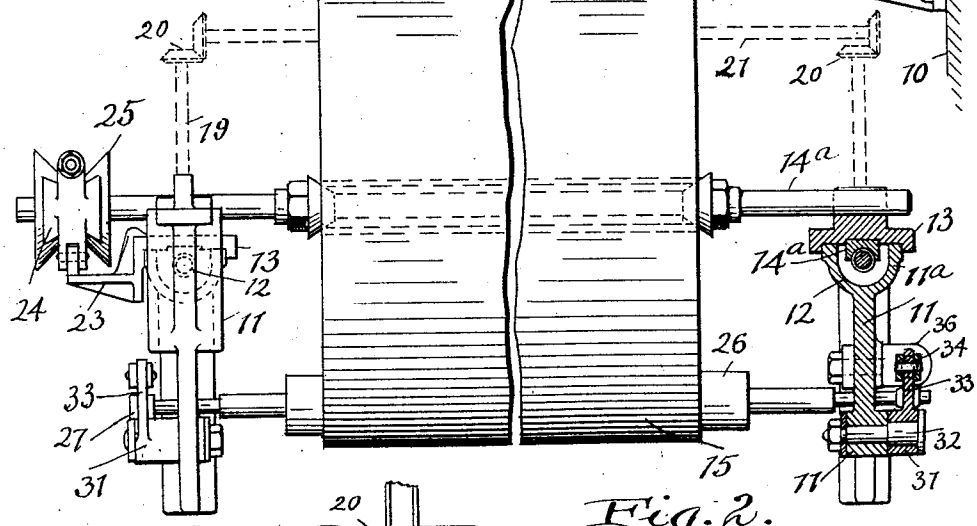
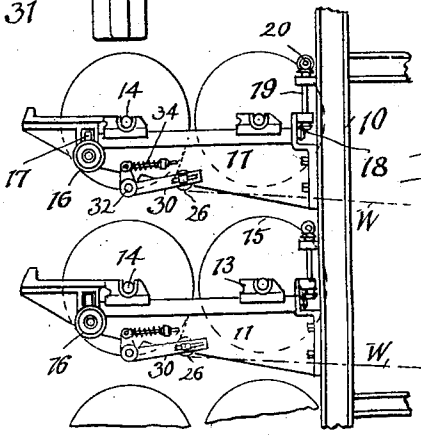


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PRINTING PRESS.

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To all whom it may concern:

Be it known that I, BASIL BREWER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Printing Presses, of which the following is a full, clear, and exact description.

This invention relates to printing presses, and particularly to multiple roll presses of the upright deck type.

In modern presses for printing newspapers, the paper on which the printing is done is fed from rolls which are supported, one above the other, on pairs of substantially horizontal roll supporting arms, with the mandrels of the rolls resting in semi-circular bearings supported in fixed position on the arms.

With these presses it is necessary that the press be stopped when it is desired to substitute a new or unused roll for one from which the paper has been substantially exhausted. In this replacing process the new roll is elevated by hoisting apparatus, and then allowed to rest on the outer portions of the roll supporting arms. Then when the major portion of the paper has been unwound from the roll being used, the press is stopped, after which the paper is severed from what has been termed the used roll, brought back to and pasted onto the outermost layer of the new roll. Then the used roll is lifted from its bearings and removed from the press, the new roll is rolled forward over the arms until the mandrel rests in the bearings previously occupied by the used roll, after which the press is started and the printing continues. This same operation is repeated whenever the paper has been substantially exhausted from any of the several rolls from which it is fed into the press.

The principal object of the invention is to increase the capacity or output of the press by reducing the time and labor required to replace a used roll with a new roll. More particularly, it is the aim of the invention to provide means whereby this can be accomplished without stopping the press.

Briefly stated, by the present invention a new roll can be placed on what may be termed the loading station, and when it is desired to transfer the feed of paper from the used roll to the new roll, the new roll is moved forwardly until its outermost layer can be attached or pasted to the paper or so called web feeding from the used roll, preferably by coming in contact with the same as it passes about the tension roll, and as soon as the feed takes place from both rolls simultaneously the web fed from the used roll can be severed, after which the used roll can be removed from the press and the new roll shifted forwardly along the arms, the change of feed from one roll to the other taking place without stopping the press.

In accomplishing this result I provide on the roll supporting arms traveling mandrel bearings and shifting means therefor which are believed to be entirely new in this art, and I further provide, in order to render effective the attachment of the paper of the new roll onto the traveling web passing from the used roll, an improved way of supporting the tension roll about which the web passes, the same being so mounted that the new roll can be brought up against it so as to form a backing which will enable the outermost layer of the new roll to be attached to the traveling web passing from the used roll, and may then be swung downward so that the new roll can be advanced forwardly of the tension roll to its normal position of feed.

The invention resides in the above method and structural features, and also in various details, and combinations and arrangements of parts by which the invention may be embodied in a practical and efficient mechanism.

In the accompanying sheet of drawings showing an efficient embodiment of the invention, Fig. 1 is a side view of the mechanism which is provided for each pair of roll supporting arms, the major portion of the mechanism shown in this figure being duplicated in the companion arm which is not shown; Fig. 2 is a view looking toward the right of Fig. 1 or toward the outer ends of the arms, one of the arms being shown in section; and Fig. 3 is a view similar to Fig. 1 on a reduced scale, showing how the invention is duplicated for each pair of roll supporting arms.

Referring now to the drawings, 10 represents a vertical column, two of which are provided at the rear end of a multiple roll press of the upright deck type. To these columns 10, are attached special roll supporting arms 11, which are arranged in pairs, as is customary, with the pairs one above the other and

projecting horizontally rearward from the press. The upper portions of each pair of arms 11 are in this instance trough-shaped, as shown at 11ª, and journaled for rotation therein and extending longitudinally thereof are feed screws 12, for bearing blocks 13, a pair of which (one on each arm) are adapted to support the mandrel 14 of the paper roll 15. Each bearing block 13 has a rectangular groove on its lower face which fits down onto the trough-shaped top 11ª of the arm 11, as best shown in Fig. 2, the bearing block resting on the top of the arm and having at its sides downwardly extending flanges which overlap slightly the sides of the arm. Secured to the lower side of each bearing block is a half nut 14 which engages the threads of the feed screw 12 extending lengthwise through the top portion of the arm. With this construction obviously the feed screw is relieved of the weight of the bearing block and the load supported by it, and will feed the same forwardly when this screw is turned.

It is important that the feed screws supported by each pair of roll supporting arms be operated simultaneously so that the two bearing blocks on both arms will have the same or synchronous movements imparted to them. To accomplish this, one of the two arms (or if desired, each arm) is provided with a hand wheel 16 which is connected by spiral gearing or other suitable gearing designated as a whole by the reference character 17, to the associated screw 12, and the two screws are geared together so that the movement of one is imparted to the other. In this instance the inner ends of the screws are connected by bevel gearing 18 to short upright shafts 19 which in turn are connected by bevel gearing 20 to a horizontal cross-shaft 21. In the drawings only one set of gears 18, one upright shaft 10, and one set of gears 20 are shown in Fig. 1, but it will be understood that the part of the movement transmitting mechanism shown in Fig. 1 will be duplicated on the other side of the press. It will be understood also that the mechanism just described will be duplicated for each pair of roll supporting arms.

It will be seen from the machine so far described, that a pair of bearing blocks 13 can be placed down on the arms with the half nuts on the lower faces of the blocks in operative engagement with the feed screws 12, and that the bearing blocks can when desired, be lifted from the arms out of operative engagement with the feed screws. It will be apparent also, that when the mandrel 14, carrying a new roll 15 is lowered into place into the semi-circular or upright facing bearing portions of a pair of bearing blocks supported on the two arms near their outer ends, with the rear ends of the blocks engaging positioning abutments 22 on the arms, the bearing blocks on the two arms will be directly opposite each other. This position of the bearing blocks may be termed the loading position, for the bearing blocks will be placed in this position prior to receiving a new roll of paper. It will be apparent also, that when the roll is supported on the bearing blocks positioned as just stated, both bearing blocks may be shifted forwardly along the arms, and the same movement will be imparted to both bearing blocks by turning the hand wheel.

It is desirable that a certain resistance be applied to the mandrel 14 of the paper roll so as to avoid liability of the roll at times running too fast. To accomplish this I provide on one of the bearing blocks 13 (in this instance on the bearing block shown at the left hand side of Fig. 2) a bracket 23, carrying a pair of adjustable brake shoes 24 adapted to frictionally engage a suitable friction device preferably in the form of a V-shaped drum or wheel 25 carried by the mandrel.

In printing presses of this type, the web passes from a paper roll around a tension roll supported by the arms in a position at the rear of the line at which the web leaves the paper roll, so that the web on leaving the roll passes rearwardly a short distance around the tension roll, and then forwardly into the press. Sometimes these tension rolls are supported in fixed bearings, but generally the bearings are yieldingly supported and capable of slight movement in slots, the pull of the web being resisted by springs so that an even tension may be maintained on the web to compensate for irregularities in the shape of the roll. To render my improvements most effective I have provided a new mounting for the tension roll which will now be described.

The tension roll, one of which is provided for each pair of roll supporting arms 11, is shown at 26. The ends of the shaft or mandrel supporting this roll are supported in bearings 27, each capable of a slight longitudinal movement which is resisted by a spring 28, in a slot 29 in an arm 30 of a bell-crank 31 pivoted on the outer side of the arm 11 on a pin 32, it being understood that similar bell-crank mountings for both ends of the tension roll shaft or mandrel are provided on each pair of roll supporting arms 11. Each bell-crank 31 has a relatively short upstanding arm 33, and the rocking movement of the bell-crank is yieldingly resisted by a spring 34 surrounding a rod 35 passing through an abutment 36 connected to the arm so that it may swivel or turn so as to adjust itself to the swinging of the bell-crank. On the outer end of the rod 35 is a nut 37 which is adjustable and serves as a stop or abutment which determines the normal position of the tension roll 26.

In Fig. 1 let A represent the normal feeding position of the mandrel, and *a* what may be termed the used roll from which the paper has been almost exhausted, the larger circle designated *a'* concentric with *a* representing the original size of roll *a*, although it will be understood, of course, that the rolls of paper supplied to a press are by no means uniform in diameter; also let B represent the mandrel supporting a new paper roll *b*, the mandrel B and roll *b* being in what has previously been termed the loading position. B' represents the position of the mandrel, and *b'* the position of the roll when the mandrel and roll are first hoisted onto the arms, the rear portions of the arms being in the form of flat rails 22^a each terminating in a rear shoulder 22^b so as to prevent the mandrel dropping off the rails, and at their forward ends terminating in the abutments 22 previously referred to, which abutments are engaged with the bearing blocks 13 when the latter are in loading position, as already stated. These rails just referred to, are flush with the top surface of the bearing blocks so that a mandrel can be rolled forward along the rails at the rear ends of the arms onto the bearing blocks, and then into the semi-circular bearings on the latter. Before the roll *b* is hoisted onto the roll supporting arms and moved forward to the loading station, the outer surface thereof is provided with a suitable adhesive in the form of a band extended from one end of the roll to the other. It will be noted also from Fig. 1 that the outer surface or periphery of the roll *b* at the loading station is a short distance away from, and at the rear of the tension roll 26. the distance separating the tension roll and the paper roll depending upon the initial diameter of the paper roll, however, that shown in Fig. 1 and designated by the circle *b* representing a roll of maximum diameter.

When the paper has been substantially exhausted from roll *a*, but while the paper web designated W is still feeding from the roll *a* around the tension roll 26 which normally lies at the rear of the roll *a*, but forwardly of and slightly above the lower part of the roll *b*, the operator will transfer the feed from roll *a* to the roll *b* without stopping the press, in the following manner. He will turn the hand wheel 16 and move both rolls forwardly until roll *b* bears against the tension roll, or rather against the web which is passing from roll *a* around the tension roll, but just before the roll *b* engages the traveling web on the tension roll, the roll *b* is spun by hand or otherwise so as to give it a peripheral movement corresponding nearly to the linear feed of the web W. As soon as the strip of adhesive on roll *b* comes in contact with the web W, the paper on roll *b* sticks to the web, and for a brief time the paper is fed forwardly from both rolls. This attaching of the paper from roll *b* to the web W passing from roll *a* is rendered possible by the backing afforded by the tension roll, this making it possible to press the roll *b* against the web with sufficient pressure to effectively attach the paper of roll *b* to the web.

As soon as the paper begins to feed from roll *b* the operator will sever the paper or web extending from the practically used roll *a*, whereupon the feed takes place only from roll *b*.

In moving the roll *b* forward until it engages the web surrounding the tension roll as just explained, the bearing blocks supporting the mandrel of roll *a* are preferably at the same time shifted forwardly, for it is desirable that the position of both rolls be under the full control of the operator until the feed has been transferred from roll *a* to roll *b* and the paper has been severed from roll *a*. As soon as this is done, it is no longer necessary that the forward pair of bearing blocks be capable of further actuation by the screws, and usually the length of the threaded portions of the screws is such that after the feed has been transferred from the forward roll to the rear roll, any further actuation of the screws, at least the actuation to any material extent will cause the half nuts carried by the forward pair of bearing blocks to ride off the threaded portions of the screws.

As soon as the web is feeding from the rear roll *b*, the roll will be moved forwardly by the screws, at least until the lowermost portion of the roll passes forwardly beyond the tension roll, for in practice it is desired that the web engage a greater portion of the surface of the tension roll than it engages when the center of the paper roll is at the rear of the tension roll. In thus moving the roll forwardly beyond the tension roll the latter is, of course, pressed downward, the long bell-crank arms then swinging downward to permit this movement, and as the paper roll passes forwardly of the tension roll, the swinging of the bell-cranks under the action of the springs 35 is such as to again elevate the tension roll. It is for this purpose of permitting the tension roll to be lowered to permit the paper roll to be moved past the tension roll and subsequently elevated automatically as the paper roll moves past it that this special mounting of the tension roll is provided.

As soon as the paper roll has been moved forwardly a sufficient distance beyond the tension roll, the operator will lift the mandrel A and the unused portion of roll *a* out from the bearing blocks, and swing them back over the roll *b* out of the press. The bearing blocks previously supporting the mandrel and the used roll can then be lifted off the arms for use with the roll next to be

supplied. When the used roll has been removed, as just stated, the roll *b* can be then moved forward to normal feeding position previously occupied by roll *a*.

As before stated, with this mechanism and process the feed is transferred from the forward roll to the rear roll without stopping the press. However, I now deem it advisable that the speed of the press be slowed down somewhat in transferring the feed from one roll to the other, but the slowing of the press need be for a very short period. On the other hand it may not be necessary to even reduce the speed of the press to effect the transfer of feed, but whether or not the speed of the press is reduced, with the present improvements the output of the press is greatly increased, particularly during the rush periods when the frequent stopping of the press to renew the rolls, as at present, greatly restricts the output.

While I have shown only one embodiment of the invention, I do not desire to be confined to the precise details or arrangements shown, as other ways of carrying out the principle of the invention may be devised, and I aim, therefore, in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention as recited in the appended claims.

Having described my invention, I claim:

1. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll around which the web normally passes, said roll being movably mounted and having a range of movement such that it may be displaced vertically a sufficient distance to permit a new paper roll to be moved forwardly past the same.

2. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll around which the web normally passes, and means for supporting the tension roll so that it may be displaced vertically out of the path of an inwardly traveling paper roll and may later be moved to the rear of the paper roll.

3. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll movably mounted so that when engaged by the paper roll it will be displaced in one direction and then in the opposite direction so as to assume a position at the rear of the paper roll.

4. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll around which the web normally passes, and means for supporting the tension roll so that it may swing with a vertical movement to permit the paper roll to pass it.

5. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, a tension roll about which the web fed from the paper is adapted to pass, and yieldingly held swinging members supporting the tension roll whereby by the pressure of the paper roll the tension roll may swing vertically so as to permit the paper roll to pass it.

6. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll movably mounted so that when engaged by the paper roll it will move downward and then upward to the rear of the paper roll.

7. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, in combination with a tension roll, and means for supporting the tension roll so that it may be swung downward to permit the paper roll to pass it.

8. In a printing press, a pair of roll supporting arms along which a roll of paper is adapted to be moved, a tension roll about which the web fed from the paper roll is adapted to pass, and yieldingly held swinging members supporting the tension roll whereby by the pressure of the paper roll the tension roll may swing downward so as to permit the paper roll to pass it.

9. In a printing press, a pair of roll supporting arms having means for receiving and simultaneously feeding forward a pair of supporting blocks for the roll, in combination with a tension roll and mounting for the tension roll which permits the latter to swing downward out of the path of the tension roll as the same is moved forwardly.

10. In a printing press having means for supporting rolls of paper and having a tension roll about which the paper web normally passes, the method of transferring the feed from a new roll to a used roll which comprises moving the new roll until the periphery thereof contacts with the web passing about the tension roll so that it may be caused to adhere to said web.

11. The method of transferring the feed of paper from one roll to another in a press having provision for supporting a new roll and a used roll, which comprises moving one roll toward the other until the periphery of the new roll contacts with the paper feeding from the used roll and becomes attached thereto.

12. The method of transferring the feed of paper from one roll to another in a press having provision for supporting a new roll as well as a used roll, which comprises moving one roll toward the other with a linear movement, and causing its periphery to become attached to the web feeding from the used roll.

13. The method of transferring the feed of

paper from one roll to another in a press having provision for supporting a pair of rolls one at the rear of the other, which comprises moving the rear roll inwardly toward the inner roll with a substantially linear movement until the periphery engages and becomes attached to the web feeding from the forward roll.

14. The method of transferring the feed of paper from one roll to another in a press having provision for supporting a new roll and a used roll, which comprises moving one roll relative to the other until the periphery thereof contacts with the web fed from the used roll, and causing the periphery of the new roll to be pressed against and attached to said web with backing afforded by a tension roll about which the web normally passes.

15. The method of transferring the feed of paper from one roll to another in a press having provision for supporting a pair of rolls one at the rear of the other, which comprises feeding the rear roll forwardly until the periphery thereof contacts with the web where it passes about a tension roll as it is fed from the forward roll and causing the periphery of the rear roll to be pressed against and attached to said web with the backing afforded by the tension roll, and feeding the rear roll forwardly until the center of the roll is beyond the tension roll.

16. The method of transferring the feed of paper from one roll to another in a press having a tension roll around which the web normally passes, which comprises causing the new roll and the tension roll to be moved relatively until the periphery of the new roll engages the web feeding around the tension roll and becomes attached thereto.

In testimony whereof, I hereunto affix my signature.

BASIL BREWER