Nov. 10, 1931. J. W. HOAG 1,831,113

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Filed Oct. 26, 1927 4 Sheets-Sheet 1

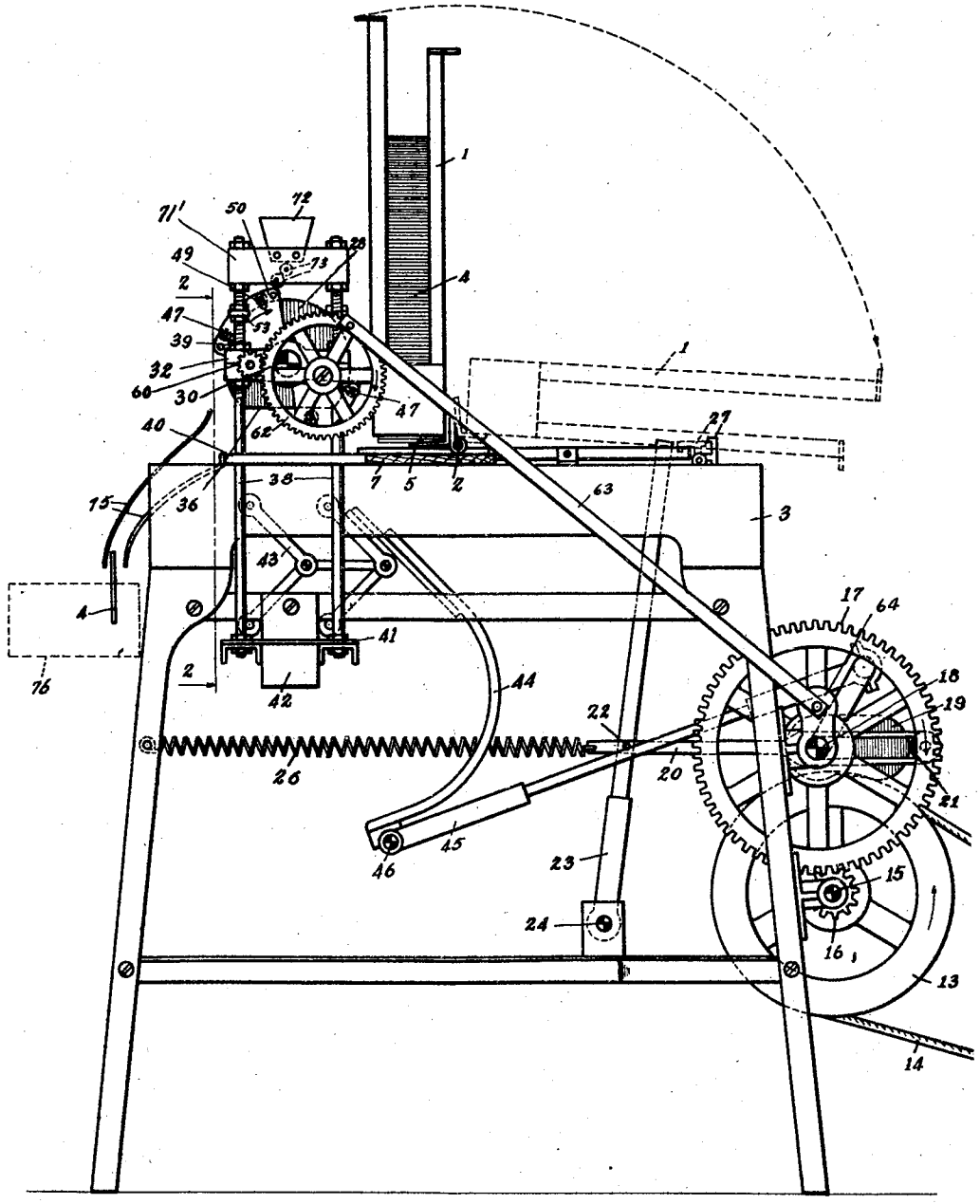


Fig. 1.

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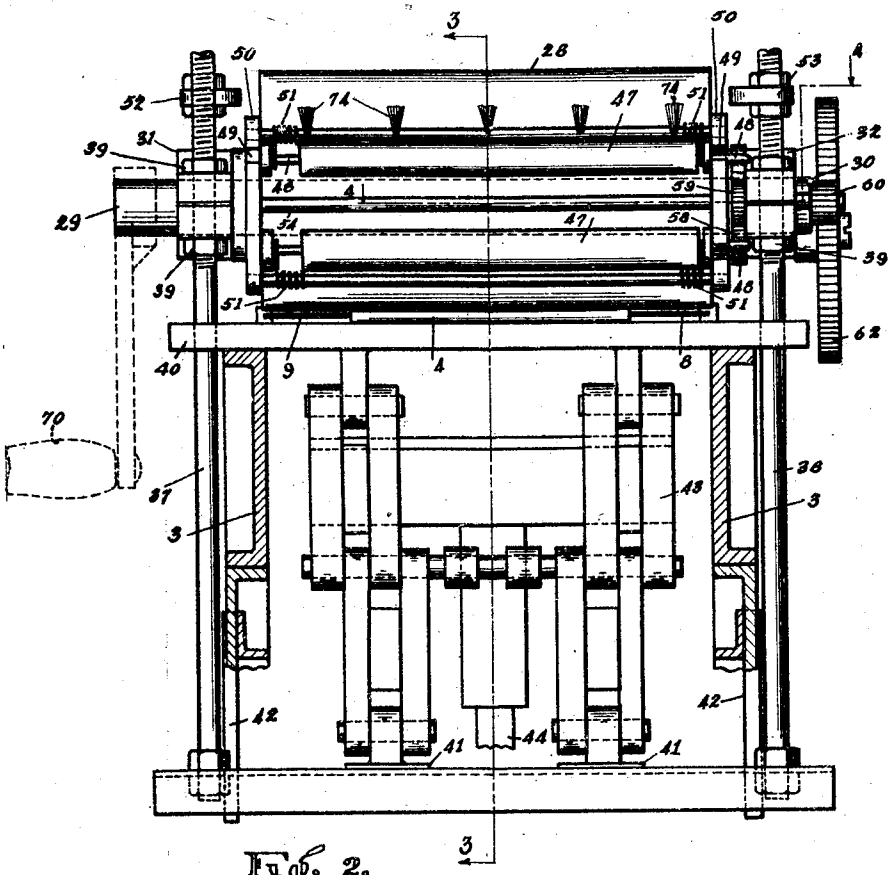


Fig. 2.

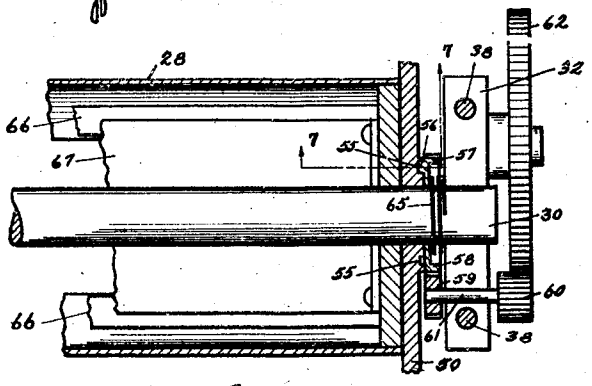


Fig. 4.

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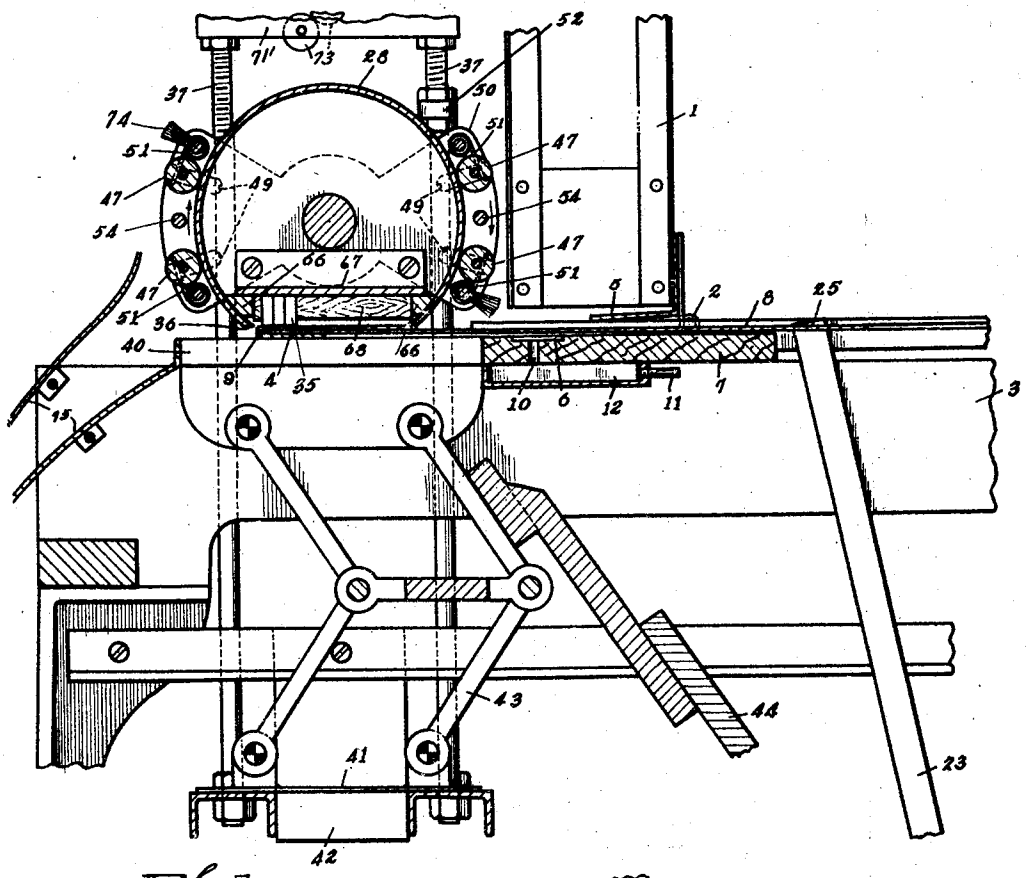


Fig. 3.

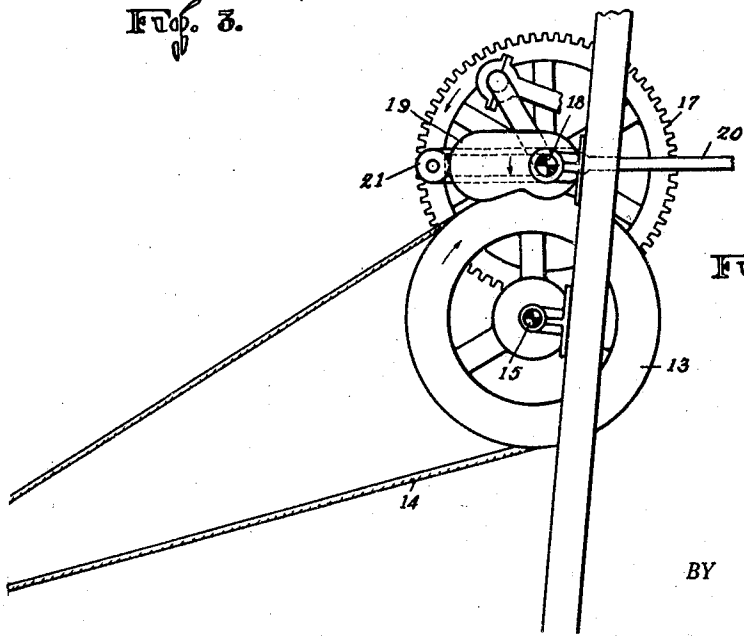


Fig. 5.

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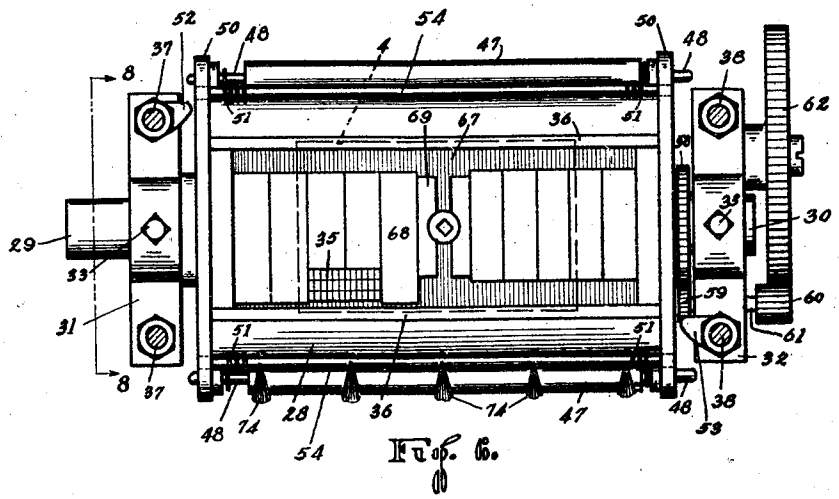


Fig. 6.

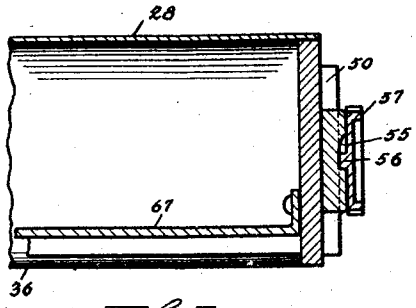


Fig. 7.

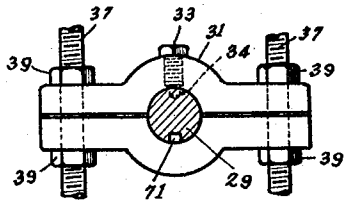


Fig. 8.

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Patented Nov. 10, 1931 1,831,113

UNITED STATES PATENT OFFICE

JAMES W. HOAG, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF TO THOMAS L. SHULTZ, OF OAKLAND, CALIFORNIA

PRINTING PRESS

Application filed October 26, 1927. Serial No. 228,923.

My invention relates to improvements in printing presses, and it consists in the combinations, constructions, and arrangements hereinafter described and claimed.

An object of my invention is to provide a printing press in which the inking cylinder carries the type and is moved by a special mechanism for printing envelopes, and the like, while the cylinder is being moved vertically. Inking rollers cooperate with the cylinder and are intermittently moved in a predetermined manner for applying ink to the type during the time the cylinder is spaced away from the matter to be printed. The invention further contemplates novel means carried by the mechanism that actuates the inking rollers for ejecting the printed matter.

A further object of my invention is to provide a device of the type described in which the inking cylinder is movable for bringing the type into a position where it may be readily changed by the operator.

Still a further object of the invention is to provide means for feeding envelopes one at a time to the printing device, this feeding means being disconnected at the will of the operator, and utilizing a suction principle as described and claimed in my co-pending application, Serial No. 197,065, filed June 7th, 1927.

Other objects and advantages will appear in the following specification, and the novel features of my invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings forming a part of this application, in which:

Figure 1 is a side elevation of the device;

Figure 2 is an enlarged section along the line 2—2 of Figure 1;

Figure 3 is a section along the line 3—3 of Figure 2; showing the parts enlarged;

Figure 4 is a section along the line 4—4 of Figure 2;

Figure 5 is an opposite side elevation of the crank, cam, and gear mechanism shown in Figure 1;

Figure 6 is a view of the type holding mechanism carried by the inking cylinder;

Figure 7 is a section along the line 7—7 of Figure 4; and

Figure 8 is a section along the line 8—8 of Figure 6.

The device comprises a magazine for envelopes, an envelope feed mechanism, a printing mechanism, and an ejecting mechanism. I will take up these different features in their turn.

Magazine for envelopes

The magazine for the envelopes is shown in Figures 1 and 3, and it will be noted that the holder 1, rectangular in cross section, is pivotally secured at 2 to the frame 3 of the machine. The holder 1 is formed of four angle irons that act as guides for envelopes 4. The pivots 2 permit the holder to be swung into the dotted line position shown in Figure 1 when it is desired to remove the envelopes from the bottom of the holder in case the envelopes become stuck. An L-shaped plate 5 is secured to the bottom of the holder 1 and supports the lowermost envelope. The magazine may hold cards, or other matter to be printed, if desired. It is obvious that the shape of the magazine may be changed for accommodating different articles to be printed, although the present machine is designed primarily for printing envelopes.

Feeding mechanism

The envolpes 4 are placed in the holder 1 so that their flaps extend downwardly. My co-pending application shows how the flaps are adapted to be sucked into a recess 6 as each flap is brought into a position above the recess. Figure 3 shows this recess and shows it as being disposed in a supporting platform 7. A portion of the lowermost envelope in the holder 1 rests upon the plate 5, while the flap of the envelope extends clear of the plate. Figure 3 shows an envelope feeding member 8 as being in operative position, that is, in a position where it has carried one of the envelopes 4 beneath the printing mechanism hereinafter described. The envelope feeding member 8 when in its in-operative position has its end 9 moved far enough to the right,

when looking at Figure 3, to permit the flap of the lowermost envelope in the holder 1 to be sucked into the recess 6.

The recess communicates with a passageway 10, that in turn is in direct communication with a suction pipe 11, by means of a compartment 12. Any means for creating a suction in the pipe 11 will suffice for the proper operation of the device. The suction will draw down the flap of the lowermost envelope into a position to underlie the member 8. The member, when advanced, will thereupon move between the flap and the body of the envelope until it engages with the top of the envelope, whereupon it will carry the envelope away from the holder 1 and into a position to underlie the printing mechanism. The means for actuating the member 8 is shown in Figures 1, 3, and 5. A pulley 13, see Figure 5, is rotated in the direction of the arrow by means of a cable 14 connected to the pulley and to a source of power, such as a motor. The pulley is mounted upon a shaft 15 and Figure 1 shows the shaft as being provided with a pinion 16 that meshes with a gear 17. The gear 17 is mounted upon a crank shaft 18 that carries a cam 19 of the shape shown in Figure 5. A cam follower 20 has a roller 21 bearing against the periphery of the cam and the follower is pivotally connected at 22 to an arm 23, see Figure 1. Movement of the cam 19 will rock the arm about its pivot 24 in a predetermined manner. The cam times the swinging of the arm 23 so that the arm will move the member 8 and carry an envelope beneath the printing mechanism at the proper time. Figure 3 shows how the arm 23 is received in a slot 25 in the member 8, so that movement of the arm will move the member.

It might be well to note at this time that I provide a catch for holding the member 8 in in-operative position, even though the rest of the machine is operating. In case the envelopes become jammed either in the holder, or beneath the printing mechanism, I can instantly stop further movement of the member 8. I have already described how the cam moves the member 8 into in-operative position. A spring 26, see Figure 1, is connected to the frame 3, and to the cam follower 20, and is employed for moving the member 8 into operative position. The spring is prevented from moving the arm 23 too rapidly, due to the fact that the roller 21 bears against the cam 19, and decreases the amount of movement that the spring 26 can impart to the cam follower 20.

If the operator wishes to hold the member 8 in in-operative position, he merely swings a catch 27 mounted upon the frame 3, see Figure 1, into the dotted line position whereupon this catch will enter an opening in the member 8 and will prevent the spring 26 from moving the member into operative position. The rest of the machine may continue to operate without effecting the envelope feeding mechanism.

Printing mechanism

I have carried the operation of the machine down to a point where one of the envelopes 4 is positioned beneath the printing mechanism. This printing mechanism is novel in that it also carries the inking means and in addition carries the device that ejects the printed envelopes. The printing mechanism consists of a cylinder 28 that is hollow, as shown in Figure 3. This cylinder has trunnions 29 and 30, see Figure 6, that are mounted in bearings 31 and 32. The cylinder normally does not rotate in the bearings 31 and 32 and is prevented from movement by lock screws 33 that enter depressions 34 in the trunnions 29 and 30, see Figure 8. When it is desired to change the type carried by the cylinder, the screws 33 are loosened to permit the cylinder to be rotated in the bearings, but this point will be described later.

The cylinder carries type 35, see Figures 3 and 6, and the cylinder is cut away at 36 for this purpose. I will first describe the movement of the cylinder before setting forth the special construction which permits the type to be changed at will.

Figure 8 shows how the bearings 31 and 32 are mounted upon rods 37—37 and 38—38, these rods being threaded for receiving nuts 39 that secure the bearings in proper positions on the rods. The rods are threaded at the upper ends for this purpose. Figures 1 and 2 show how the rods are slidably mounted in a bearing plate 40. In Figure 1 I show how the lower ends of the rods are secured to a cross-piece 41 that is guided in its vertical movement by guide strips 42. The cross-piece 41 is raised and lowered by a toggle mechanism 43, shown in Figures 1, 2, and 3. The toggle is connected to the cross-piece 41 and to the frame 3 and is moved by an arcuate-shaped arm 44, see Figure 1, that is connected to the toggle and to a link 45 at 46. Figure 1 further shows how the opposite end of the link is connected to the crank shaft 18 so that a rotation of the crank shaft will reciprocate the link. This movement causes the toggle 43 to move the cylinder 28 vertically from a position overlying the plate 40 into printing position, as shown in Figure 3. This movement is timed by the positioning of the crank shaft 18 and the cam 19 so that an envelope will be fed beneath the cylinder 28 and the printed envelope will be ejected from the device while the cylinder 28 is in its uppermost position.

I will now set forth the mechanism that inks the type 35. The outer surface of the cylinder 28 carries a coat of ink and this ink is delivered to inking rollers 47 that are provided in pairs, these being disposed dia-

metrically opposite each other. The rollers 47 have trunnions 48, see Figure 6, that are slidably mounted in slots 49, see Figure 3, in end plates 50. Figure 3 shows the shape of each end plate 50, while Figure 6 shows how these end plates are mounted at the ends of the cylinder 28. The plates are rotatably mounted on the trunnions 29 and 30 and have a movement independent of the cylinder 28. The trunnions 48 are kept in their respective slots 49 by spring 51, see Figures 3 and 6.

The inking rollers 47 are given a longitudinal movement as they are carried around the cylinder 28, and this is accomplished by cam members 52 and 53 that are carried by the rods 37 and 38, respectively. The cams 52 and 53 are positioned so as to strike the ends of the trunnions 48 and to force the trunnions so that they will be moved in the direction of their longitudinal axis. It will be noted that the cam 52 is disposed at one end of the cylinder 28, while the cam 53 is disposed at the opposite end. This causes the rollers to first be moved in one direction and then in the opposite, thus smoothing out the ink on the rollers and on the cylinder 28 so that a uniform coating of ink will be applied to the type 35, as the rollers are carried thereby.

I will now describe the mechanism for carrying the rollers 47 around the cylinder 28. This movement is intermittent and the rollers are moved through an arc of 180 degrees and then are brought to an abrupt stop to permit the cylinder to print. In Figures 1, 2, 4, 6, and 7 I show the end plates 50 as being connected to each other by rods 54; these rods, together with the end plates, form a cage that rotates as a unit about the trunnions 29 and 30. One of the end plates has tooth-shaped depressions 55 formed therein, see Figure 7, and these depressions receive teeth 56 of a clutch member 57. The clutch member has external teeth 58 and is in reality a gear that meshes with a pinion 59, see Figure 6. The pinion in turn is operatively connected to a pinion 60 by means of a stub shaft 61. The pinion 60 meshes with a large gear 62, see Figure 1, and this gear in turn is connected to the crank shaft 18 by means of a link 63 and an arm 64 that is attached to the shaft.

This mechanism is so interconnected that a rotation of the crank shaft 18 will oscillate the gear 62 even though the gear is moved vertically by the printing cylinder 28. An oscillation of the gear 62 will rotate the pinions 59 and 60, first in one direction and then in the opposite direction. This movement will be carried to the gear clutch 58, see Figures 6 and 7, so that this gear will oscillate. The ratio between the various gears is such as to cause the gear 58 to engage with the end 50 carrying the tooth-shaped depressions when the gear 58 is being rotated in one direction. The gear 58 is rotated far enough in this direction to cause the ends 50 to carry the inking rollers 47 through an arc of 180 degrees. When the gear rotates in the opposite direction the teeth 56 will ride out of the teeth 55, as shown in Figure 7 and will therefore not rotate the ends 50. Figure 4 clearly shows how the gear 58 is yieldingly held in contact with the adjacent end plate 50 by a spring 65. This spring permits the gear 58 to rotate with respect to the end plate 50 when the gears rotate in one direction and to engage with the end plate when rotated in the opposite direction.

It should be noted from Figure 3 that the slots 49 are deep enough to permit the spring 51 to force the inking rollers inwardly so that the rollers will contact with the type 35, as the rollers are carried thereby. The cylinder 28 is, of course, in its uppermost position during this movement and there is enough clearness between the cylinder and the plate 40, to permit the rollers 47 to freely pass therebetween.

I will now described the manner of setting the type 35. In Figures 3 and 6 I show the cylinder 28 as being pivoted with a rectangular frame 66 that is disposed in the opening 36. This frame is supported by a shelf 67 that extends across the cylinder and is secured to the ends of the cylinder. A plurality of blocks 68, see Figure 6, commonly used by the printing trade, are disposed in the frame and are clamped in place by a spider 69 of standard construction. I have shown the type 35 as being positioned to print the corner card of an envelope 4, shown by the dotted lines in Figure 6. It is obvious that the blocks 68 may be rearranged for holding type in any position within the frame 66.

When it is desired to change the type the cylinder 28 is rotated through a half circle, so as to bring the type into a position where it can be worked upon readily. The set screws 33 are loosened from the depressions 34, see Figure 8, and a crank handle 70 is mounted upon the trunnion 29 and enters a groove 71 in the trunnion, see Figure 8, so that a turning of the crank handle will swing the cylinder. The nuts 39 are also loosened to permit this ready movement. The cylinder is swung into a position where the operator may change the type and after this change has been made, the cylinder is again rotated to position the type beneath the cylinder, then the nuts 39 and the set screws 33 are tightened.

I have shown one type of ink fountain for feeding ink to the rollers 47, although any other type may be used without departing from the spirit and scope of my invention. A frame 71′ is mounted on the top of the rods 37 and 38 and carries an ink reservoir 72, see Figure 1. This reservoir feeds ink to a set

of rollers 73 and the lowermost roller of this set contacts with the rollers 47 as they are carried around the cylinder 28. In this way ink is delivered from the roller 73 to the rollers 47 and the ink is smoothed out upon the rollers 47, because the rollers 47 ride upon the cylinder 28.

Ejecting mechanism

Reference to Figures 2 and 3 illustrate the manner employed for ejecting the printed envelopes. Certain of the rods 54 carry brushes 74 and these brushes are long enough to give a sweeping action to the top of the plate 40, as the rods are carried above the plate, and this sweeping action ejects the envelope resting upon the plate and moves it into the guide members 75, see Figure 1, from which the envelope 4 is turned into a box or other container 76.

I claim:

1. A printing press comprising a printing cylinder movable toward and away from the matter to be printed, a plurality of sets of inking rollers carried by said cylinder, means for moving said cylinder and said rollers, said means actuating said rollers when said cylinder is in non-printing position, and means carried by the roller moving means for ejecting the printed matter.

2. A printing press comprising a printing cylinder movable toward and away from the matter to be printed, a plurality of sets of inking rollers carried by said cylinder, means for moving said cylinder and said rollers, said means actuating said rollers when said cylinder is in non-printing position, and means carried by the roller moving means for ejecting the printed matter, and means for moving said rollers laterally over the surface of said cylinder.

3. In a printing press, a cylindrical printing member, said member being movable toward and away from the matter to be printed, a rotatable member movable around said printing member, and means carried by said rotatable member for ejecting the printed matter when said cylinder is in a non-printing position.

4. In a printing press, a cylindrical printing member, said member being movable toward and away from the matter to be printed, a rotatable member movable around said printing member, and ejecting members carried by said rotatable member for ejecting the printed matter when said cylinder is in a non-printing position.

5. In a printing press, a cylindrical printing member, said member being movable toward and away from the matter to be printed, a rotatable member movable around said printing member, and brushes carried by said rotatable member for ejecting the printed matter when said cylinder is in a non-printing position.

6. A printing press comprising a printing cylinder, a rotatable inking member movable around said printing cylinder, a magazine for holding matter to be printed, a reciprocating member for feeding said matter from said magazine to a position beneath said printing cylinder, said member supporting said matter during the printing operation, and means for moving said cylinder toward and away from the matter to be printed.

7. A printing press comprising a printing cylinder, a rotatable inking member movable around said printing cylinder, a magazine for holding matter to be printed, a reciprocating member for feeding said matter from the magazine to a position beneath said cylinder, said member supporting said matter during the printing operation, said reciprocating member being actuated when the cylinder is in a non-printing position, and means for moving said printing cylinder toward and away from the matter to be printed.

8. A printing press comprising a printing cylinder, a rotatable inking member movable around said printing cylinder, means for moving said cylinder toward and away from the matter to be printed, and a reciprocating feeding member for successively feeding matter to be printed beneath said printing cylinder, said member supporting said matter during the printing operation and being actuated when said cylinder is in a non-printing position.

9. A printing press comprising a printing cylinder, said cylinder being movable toward and away from the matter to be printed, a plurality of inking rollers carried by said cylinder, means for moving said cylinder and said rollers, and means carried by the roller-moving means for ejecting the printed matter, said means being disposed in advance of said inking rollers.

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