Oct. 28, 1930. M. O. JONES ET AL 1,779,816

FEEDING MECHANISM

Filed Oct. 3, 1928 2 Sheets-Sheet 1

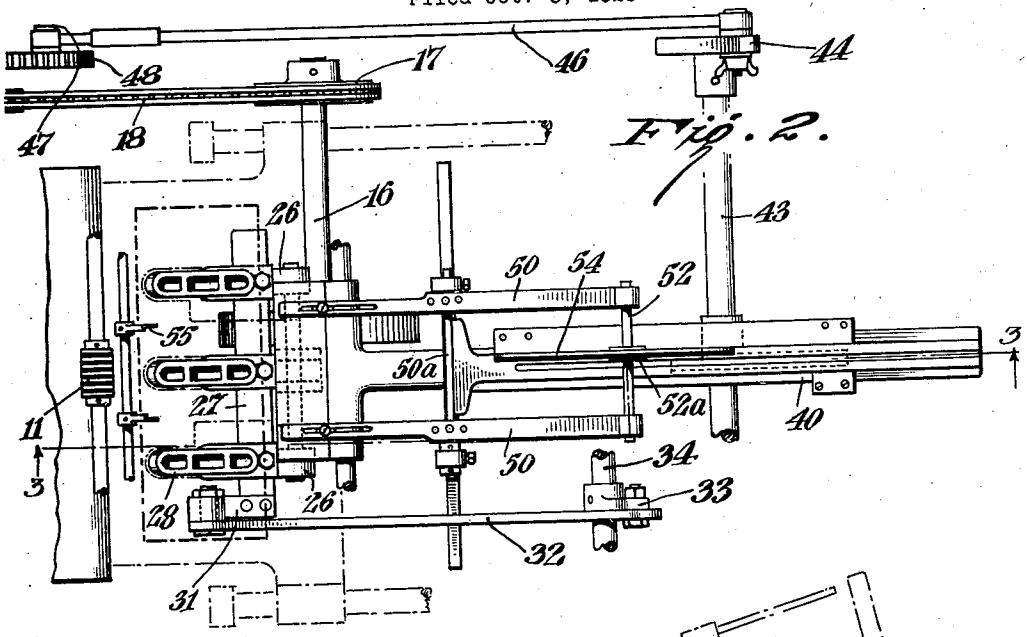


Fig. 2.

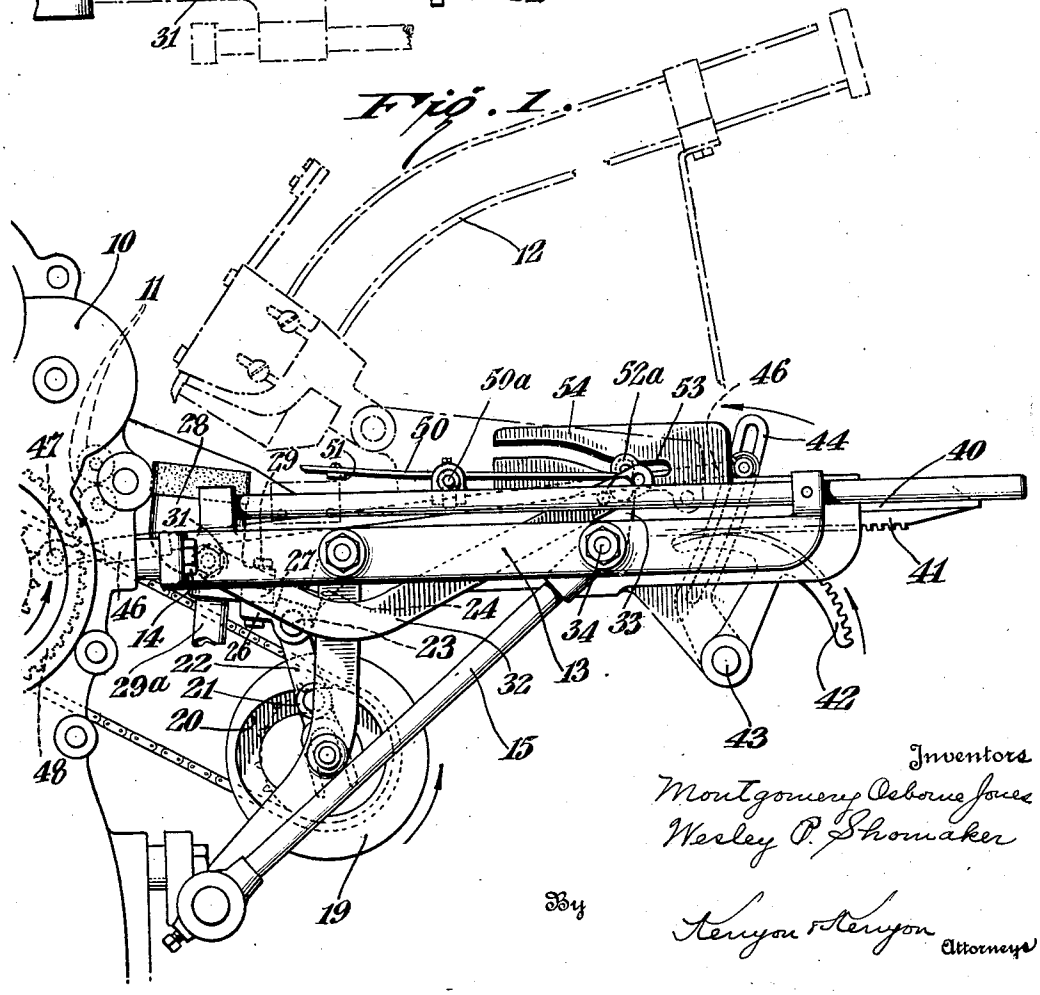


Fig. 1.

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FEEDING MECHANISM

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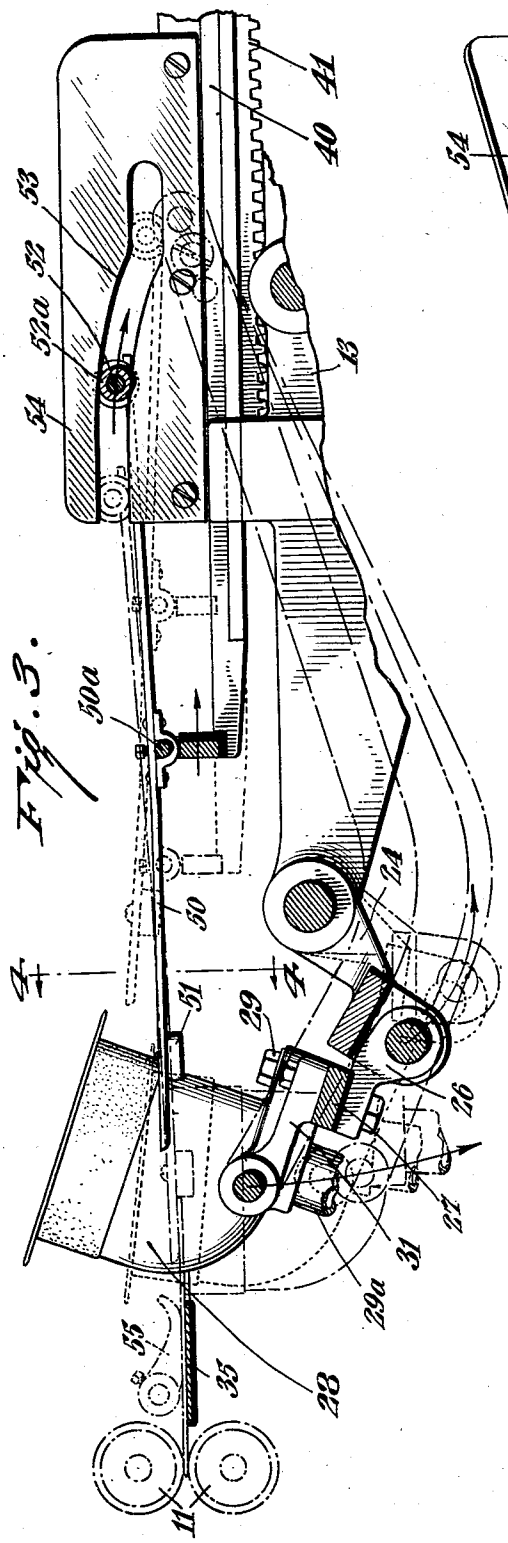


Fig. 3.

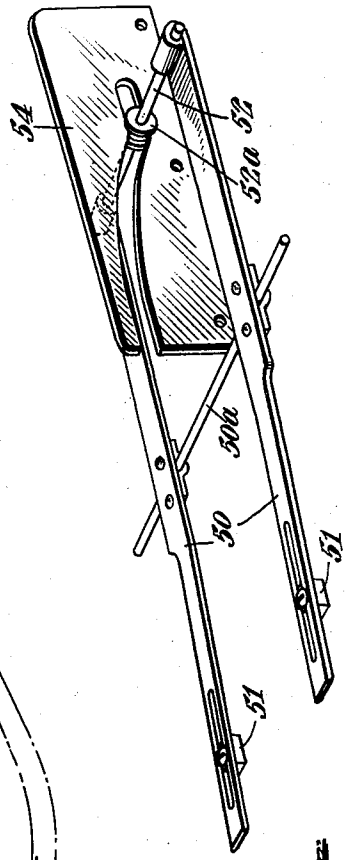


Fig. 5.

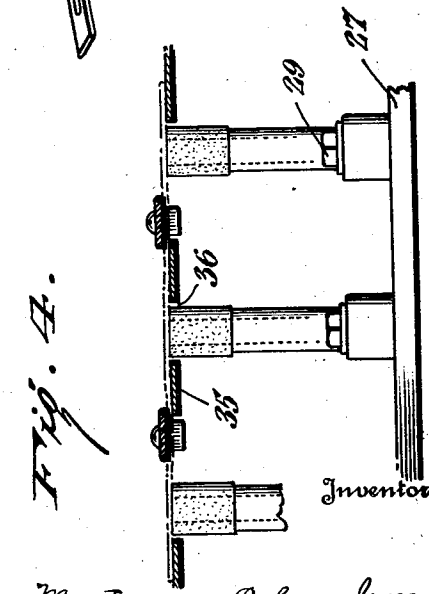


Fig. 4.

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1,779,816

UNITED STATES PATENT OFFICE

MONTGOMERY OSBORNE JONES AND WESLEY P. SHOMAKER, OF RICHMOND, VIRGINIA, ASSIGNORS TO THE DUPLEX ENVELOPE CO. INC., OF RICHMOND, VIRGINIA, A CORPORATION OF VIRGINIA

FEEDING MECHANISM

Application filed October 3, 1928. Serial No. 310,020.

This invention relates to mechanism for feeding sheets, envelopes or other articles of paper and pertains particularly to feeding mechanism for a rotary printing press designed for operating on successively presented sheets or envelopes.

In certain types of feeding mechanisms for printing presses the sheets or envelopes are stacked in a hopper, the discharge end of which slopes downwardly and the stack is supported by inwardly projecting tabs engaging the bottom envelope or sheet. The bottom envelope or sheet is withdrawn from the hopper through the medium of a suction block which is caused to move toward and away from the same. In the case of wide sheets or envelopes, the bottom one is supported by tabs engaging the middle portion of the longer edges as well as the ends. Under such circumstances it is desirable to pull the envelope or sheet substantially parallel to the axis of the stack, otherwise the tab engaging the middle portion of the edge of the sheet or envelope is apt to turn back the edge, crumple the envelope and prevent normal operation.

An object of this invention is an improved, efficient and simple feeding mechanism for withdrawing sheets or envelopes or the like from the bottom of a stack of the same and presenting said articles to the feed rollers of a printing press without crumpling or buckling of the article.

Other objects, novel features and advantages of this invention will be apparent from the following specification and accompanying drawings wherein:

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

Fig. 2 is a plan view thereof,

Fig. 3 is a section on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3 and

Fig. 5 is a perspective view of a detail of the apparatus.

The rotary printing press with which the feeding mechanism is used is designated by the reference character 10 and is provided with a pair of feed rollers 11. 12 designates a magazine for envelopes or the like which are to be fed to the press, the magazine being shown phantom as it does not constitute a part of the invention.

A frame 13 is attached to the printing press 10 by bolts 14 and brace rods 15. The shaft 16 is supported on a bracket carried by the frame 13 and carries at one end a sprocket 17 which is driven from the printing press through the medium of the chain 18. On the shaft 16 is mounted a box cam 19 in the groove 20 of which is received a roller 21 mounted on an arm 22 having a forked end within which is received the shaft 16. In the other end of the arm 22 is provided a pin 23 which is also mounted in the end of a bracket 24 pivoted to the frame 13. A pair of arms 26 are mounted on the pin 23 and a bar 27 extends across the ends of such arms. A plurality of suction blocks 28 are attached to the bar 27 by bolts 29, two of which fasten the bar 27 to the arms 26. An arm 31 is riveted to one end of the bar 26 and has pivotally attached thereto one end of a link 32, the other end of which is pivotally attached to an arm 33 mounted on a cross rod 34 of the frame 13. A feed plate 35 is positioned to support an article to be delivered to the feed rollers 11 and is provided with slots 36 through which the suction blocks 28 may move vertically.

In the operation of the machine the suction blocks are moved upwardly into contact with the bottom envelope or the like in the magazine 12 and by means of a valve (not shown) the suction blocks are connected through the pipe 29^a with a suction producing mechanism. The suction blocks are then moved downwardly carrying with them the envelope. This downward movement continues until the top of the suction blocks is flush with the feed plate 35 and the edges of the envelope rest upon such plate. The suction is then cut off and the envelope released after which the envelope is pushed between the feed rollers by means later to be described. Different positions assumed by the suction blocks are indicated in Fig. 3. The movement of the suction blocks is effected by means of the cam 19, roller 21 and arm 22. The arm 22 is moved upwardly and downwardly by

the cam and causes oscillation of the bracket 24. Oscillation of the bracket causes vertical movement of the arms 26 and bar 27 which carries the suction blocks. The link 32 serves to guide the suction blocks along an arc of sufficiently slight curvature that they move substantially parallel to the axis of the stack while withdrawing the envelope, whereas the bracket and arms cause oscillation of the blocks alternately to present their upper faces flush with the feed plate and with the bottom envelope of the stack.

A carrier 40 is slidably mounted on the frame and is provided with a rack 41 which meshes with a segmental gear 42 carried by the shaft 43. An arm 44 is mounted on the shaft 43 and to the end of this arm is connected one end of a link 46, the other end of which is connected to a crank pin 47 carried by the gear 48. Rotation of this gear effects oscillation of the shaft 43 thereby causing reciprocation of the carrier 40.

A pair of arms 50 are pivotally supported on the carrier 40 by means of the rod 50a. At one end of these arms are adjustably mounted abutments 51 which project downwardly for the purpose of engaging the edge of an envelope resting on the feed plate 35. These abutments are spaced somewhat from the ends of the arms 50 so that portions thereof overlap an envelope on the plate 35. The other ends of the arms 50 are connected by a bar 52 upon which is mounted a roller 52a which fits in a curved slot 53 in a stationary plate 54. As the carriage 40 reciprocates the pusher rod is caused to oscillate as indicated in Fig. 3. When the carrier is at the extreme right end of its stroke, the front ends of the arms are elevated. As the carrier moves forwardly, the front ends of the arms gradually drop. The movement is such that the front ends of the arms project over an envelope on the plate 35 and then as they move forward they also move downwardly so that when the abutments 51 strike the edge of the envelope the front ends of the arms rest upon the envelope and prevent crumpling of the same when it is being moved forward toward the feed rollers by further movement of the carrier.

Guide fingers 55 are pivotally mounted adjacent the plate 36 and co-operate therewith in holding the envelopes smooth while being moved forward to the feed rollers. These fingers are intermittently lifted in the usual manner by mechanism not shown to avoid interference with an envelope on the suction blocks while being transferred from the magazine to the plate 36.

We claim:—

1. In a device of the character described, a pivoted bracket, an arm having one end pivotally connected to said bracket, a suction block carried by said arm, a link having one end pivotally connected to said arm and the other end pivotally connected to a stationary member and means for oscillating said bracket.

2. In a device of the character described, a pivoted bracket, an arm having one end pivotally connected to said bracket, a suction block carried by said arm, a link having one end pivotally connected to said arm and the other end pivotally connected to a stationary member and means including a cam for imparting oscillatory movement to said bracket.

3. In a device of the character described, a pivoted bracket, an arm having one end pivotally connected to said bracket, a suction block carried by said arm, a link having one end pivotally connected to said arm and the other end pivotally connected to a stationary member, a second arm having one end connected to said bracket, a cam and a cam follower supported by said second arm in operative relationship to said cam.

4. In a device of the character described, a pivoted bracket, an arm, a pin connecting one end of said arm to said bracket, a suction block carried by said arm, a link having one end pivotally connected to said arm and the other end to a stationary member, a second arm mounted on said pin, a cam and a cam follower on said second arm operatively associated with said cam.

5. In a device of the character described, a suction block, a bracket rotatably supported by one end and pivotally supporting a suction block at the other end, a link rotatably mounted at one end pivotally connected to said suction block and means to oscillate said bracket.

6. In a device of the character described, an oscillatable picker, a reciprocating carrier, means to reciprocate the same toward and away from the path of said picker, a pusher pivotally mounted on said carrier, a stationary guide plate having a curved slot and a pin extending from said pusher into said slot whereby reciprocation of the carriage effects oscillation of the pusher.

7. In a device of the character described, an oscillatable picker, a reciprocating carrier, means to reciprocate the same toward and away from the path of said picker, a pair of arms pivotally mounted on said carrier, abutments carried by said arms adjacent one end thereof, a stationary plate having a curved slot, a rod connecting the other ends of said arms and arranged in said slot.

8. In a device of the character described, an oscillatable suction block, a carrier, a pusher pivotally mounted on said carrier, said carrier being slidable to move one end of said pusher into and out of the path of the suction block, means to oscillate said suction block and reciprocate said carrier, and means to effect oscillation of said pusher upon reciprocation of said carrier.

9. In a device of the character described, a

vertically oscillatable suction block, a carrier, a pusher pivotally mounted on said carrier, said carrier being slidable to move one end of said pusher into and out of the path of said suction block, means to oscillate said suction block and reciprocate said carrier, and means to elevate the front end of said pusher as the carrier moves it out of the path of the suction block and to depress the same as the carrier moves it into the path of the suction block.

10. In a device of the character described, an oscillatable suction block, a carrier, a pusher pivotally mounted thereon, said carrier being slidable to move one end of said pusher into and out of the path of said suction block, a stationary plate having a curved slot and a pin extending from said pusher into said slot, whereby reciprocation of the carrier effects oscillation of the pusher.

11. In a device of the character described, an oscillatable suction block, a carrier, a pair of arms pivotally mounted thereon, abutments carried by said arms adjacent one end thereof, said carrier being slidable to move one pair of ends of said arms into and out of the path of said suction block, a stationary plate having a curved slot, a rod connecting the other pair of ends of said arms and arranged in said slot, and means to oscillate said suction block and reciprocate said carrier.

12. In a device of the character described, an oscillatable picker, a carrier, a pusher pivotally mounted on said carrier, said carrier being slidable to move one end of said pusher into and out of the path of said picker, means to oscillate said picker and reciprocate said carrier, and means to effect oscillation of said pusher upon reciprocation of said carrier.

13. In a device of the character described, a vertically oscillatable picker, a carrier, a pusher pivotally mounted on said carrier, said carrier being slidable to move one end of said pusher into and out of the path of said picker, means to oscillate said picker and reciprocate said carrier, and means to elevate the front end of said pusher as it is withdrawn from the path of the picker and depress it as it returns into the path of the picker.

In testimony whereof, we have signed our names to this specification.

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WESLEY P. SHOMAKER.