May 13, 1930. C. L. POST 1,758,535

PRINTING APPARATUS

Filed April 4, 1927 3 Sheets-Sheet 1

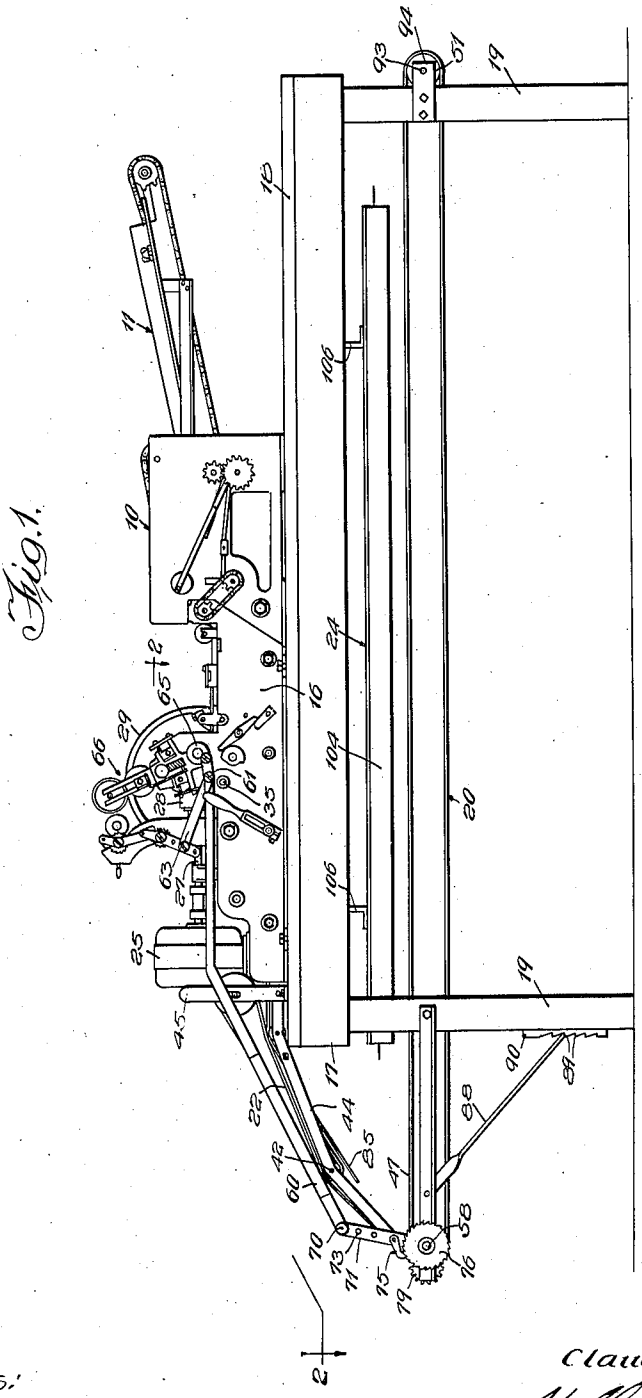


Fig. 1.

Witness:
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PRINTING APPARATUS

Filed April 4, 1927 3 Sheets-Sheet 2

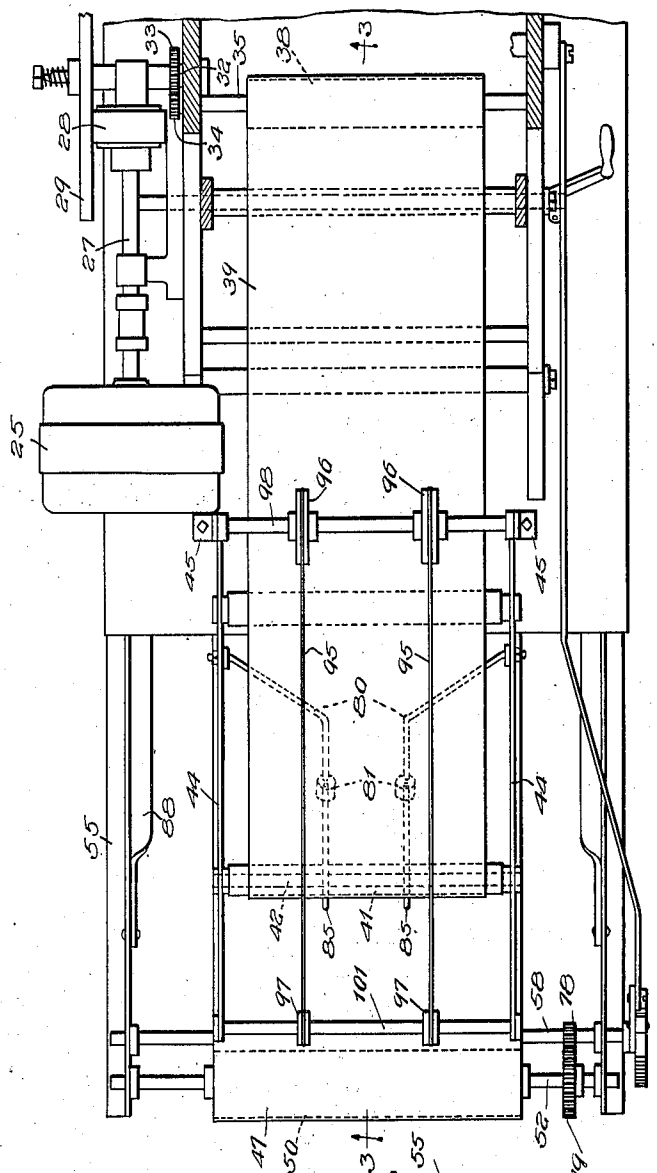


Fig. 2.

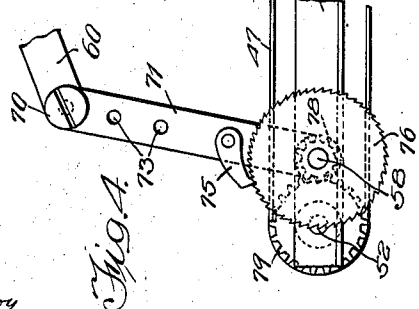


Fig. 4.

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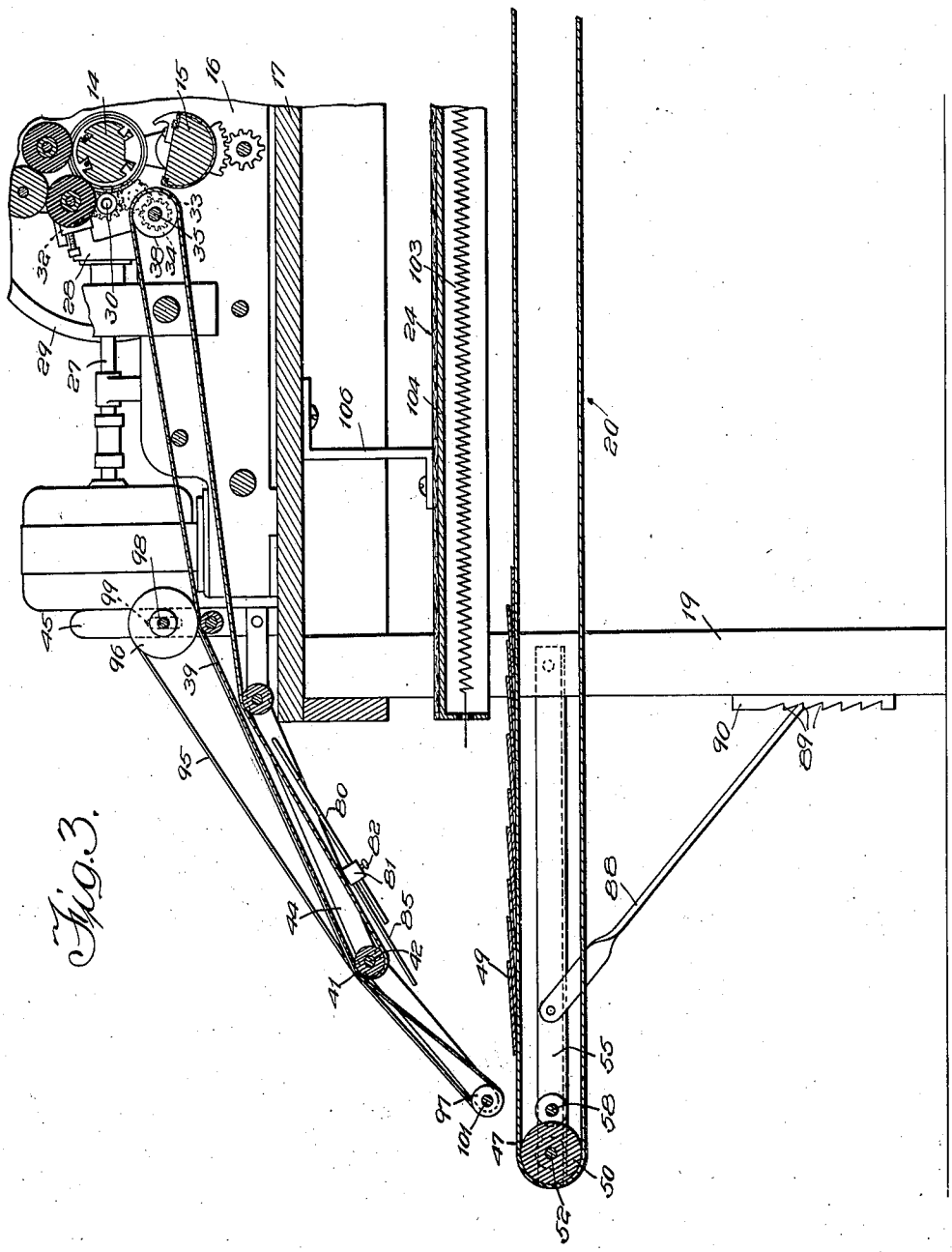


Fig. 3.

Witness:
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Patented May 13, 1930 1,758,535

UNITED STATES PATENT OFFICE

CLAUDE L. POST, OF CHICAGO, ILLINOIS

PRINTING APPARATUS

Application filed April 4, 1927. Serial No. 180,804.

My invention relates to printing apparatus and has among its other objects the provision of apparatus of the kind described which is convenient, compact, durable, efficient and satisfactory for use wherever found applicable.

A particular object of the invention is to provide improved means for drying the ink upon a card, sheet of paper, envelope or the like after the printing operation to prevent blurring thereof.

One form of the invention is embodied in apparatus adapted to print cards, envelopes, or the like, the printed article being transferred to a conveyer which is advanced in a step-by-step manner so that the articles are distributed along the conveyer. The conveyer may be adjusted to operate at a plurality of speeds relative to a speed at which the articles are printed and the conveyer may be moved into a plurality of adjusted positions to accommodate cards of different sizes. Means is provided for insuring that the cards or envelopes will fall into predetermined positions upon the conveyer and suitable means is provided for subjecting the ink upon the printed articles to heat so that it will dry.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a side elevation of apparatus embodying the invention;

Fig. 2 is an enlarged section taken on line 2—2 of Fig. 1;

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

Fig. 4 is an enlarged elevation of mechanism adapted to advance a conveyer which forms part of the improved apparatus.

Referring to the drawings, the reference character 10 designates a printing machine which may be of any suitable construction. In this instance, I have shown a printing machine of the kind shown and described more fully in my copending application, Serial No. 741,428, filed October 3, 1924, the feeding apparatus shown in that copending application being replaced by feeding apparatus which is designated generally by the reference character 11 and is more fully shown and described in my copending application, Serial No. 92,631, filed March 5, 1926. It will be noticed that the printing machine 10 comprises a type roll 14 and an impression roll 15 which are mounted in a frame 16 and that the frame 16 is mounted upon a table 17 comprising a top 18 and legs 19. Positioned beneath the top 18 is a conveyer 20 which is adapted to receive articles to be printed in the printing machine 10, a conveyer 22 being adapted to transfer the printed articles from the printing machine to the conveyer 20. Briefly, the operation is substantially as follows: Cards, sheets of paper, envelopes or other articles which are to be printed are placed in the feeding apparatus 11 which delivers the articles to the printing machine 10 in such manner that they pass between the rolls 14 and 15 and are printed. When the cards leave the rolls 14 and 15 they are transferred by the conveyer 22 to the conveyer 20 which carries the articles underneath a heating device 24 suspended from the table top 18 and then discharges them into any suitable receptacle (not shown).

In the illustrated embodiment of the invention, the printing machine 10 is preferably driven by an electrical motor 25, or the equivalent, adapted to drive a shaft 27. Adjustably mounted upon the shaft 27 is a friction wheel 28 engageable with a disc 29 which is rigidly secured to a shaft 30 (see Fig. 3). The shaft 30 is operatively connected to the rolls 14 and 15 and to the feeding apparatus 11 by means more fully shown and described in my copending applications.

Secured to the shaft 30 is a pinion 32 which meshes with a pinion 33 and meshing with the pinion 33 is a pinion 34 which is secured to a shaft 35 rotatably journaled in the frame 16. As best shown in Fig. 3, the conveyer 22 comprises a roller 38 carried by a shaft 35

and trained around this roller is a belt 39 which is also trained around a roller 41 mounted upon a shaft 42, the shaft 42 being rotatably journaled in bars 44 which are secured to bracket members 45 mounted upon the table top 18. It is readily understood that when the printing machine 10 is in operation, the articles being printed will pass between the rolls 14 and 15 to the belt 39 which will carry them away from the rolls 14 and 15 and deposit them upon a belt 47 which forms part of the conveyer 20.

In Fig. 3 I have shown a plurality of cards 49 upon the belt 47 to illustrate the manner in which the cards are distributed upon the belt when they are discharged from the belt 39 onto the belt 47. The belt 47 is preferably trained over rollers 50 and 51, the roller 50 being carried by a shaft 52 which is rotatably journaled in a pair of bars 55 pivotally secured to legs 19 of the table 17. As shown, a shaft 58 rotatably journaled in the free ends of the bars 55 is positioned adjacent to the shaft 52.

The means for advancing the belt 47 to distribute the cards 49, or the equivalent, thereon preferably comprises a link 60 which is pivotally connected by a pin 61, or the equivalent, to a link 63, the link 63 being pivotally connected to a boss or collar 65 constrained to rotate with the printing roll 14. The link 63 is adapted to drive inking mechanism which is designated, in this instance, by the reference character 66. The construction is such that the link 63 is reciprocated when the printing machine is in operation. Pivotally secured to the link 60 by a pin 70 is a lever 71 which is pivoted upon the shaft 58, the arrangement being such that when the link 63 is reciprocated, this reciprocatory motion is imparted to the link 60 which then oscillates the lever 71 around its pivotal axis. The lever 71 is preferably provided with a plurality of apertures 73 adapted to receive the pin 70 so that the link 60 can be secured to the lever 71 at a plurality of distances from the shaft 58. Obviously, the closer the pin 70 is positioned relative to the shaft 58, the greater will be the angle through which the lever 71 is oscillated by the link 60.

Pivoted upon the lever 71 is a pawl 75 engageable with a ratchet 76 which is rigidly secured to the shaft 58. Constrained to rotate with the shaft 58 is a pinion 78 which meshes with a gear 79 secured to the shaft 52.

It is readily understood that when the lever 71 is oscillated, the pawl 75 will advance the ratchet 76 in a step-by-step manner so that the pinion 78 will impart the same movement to the roller 50 through the medium of the gear 79 and the shaft 52. The roller 50 will, of course, advance the belt 47 in a like manner so that printed articles discharged upon the belt 47 one at a time by the belt 39 will be distributed upon the belt 47 in the manner indicated in Fig. 3.

Secured to each of the bars 44 is a bent rod 80 upon which a collar 81 is slidably journaled, a set-screw 82 being provided for each collar 81 to secure it in a plurality of adjusted positions upon its associated rod 80. Rigidly secured to the collars 81 and projecting therefrom are rods 85 which preferably project beyond the discharge end of the conveyer 22, the construction being such that the rods 85 may be brought into a plurality of adjusted positions with respect to the rollers 41 so that cards or other printed articles of different sizes may be correctly positioned upon the conveyer belt 47. Thus, if relatively long cards or sheets are being printed, the rods may be positioned substantially as shown in Fig. 3, and the cards will barely engage the rods 85 when they drop from the conveyer belt 39 to the conveyer belt 47, but if the articles being printed are relatively short, the rods 85 are preferably brought into positions wherein they extend a relatively large distance beyond the discharge end of the conveyer 22 so that the articles may slide downward upon the rods 85 when they drop from the conveyer belt 39 to the conveyer belt 47. This insures that relatively small cards will not be turned into undesirable positions when they drop upon the conveyer belt 47.

I also provide means for bringing the receiving end of the conveyer 20 into a plurality of adjusted positions to take care of cards of different sizes. Thus, I provide bars 88 each of which has one of its ends pivotally secured to one of the bars 55, the free ends of the bars 88 being engageable with detents 89 formed in bars 90 rigidly secured to two of the legs 19. Obviously, if the free ends of the bars 88 are positioned in the lowermost detents 89, the receiving end of the conveyer 20 will be spaced a relatively large distance from the discharge end of the conveyer 22 and if the free ends of the bars 88 are positioned in the uppermost detents 89, the receiving end of the conveyer 20 will be positioned relatively close to the discharge end of the conveyer 22. Of course, the free ends of the bars 88 may be positioned in intermediate detents to bring the receiving end of the conveyer 20 into any desired position relative to the discharge end of the conveyer 22. It is readily understood, therefore, that the rods 85 and the adjustable feature of the receiving end of the conveyer 20 permit the apparatus to be adjusted for cards, envelopes, sheets of paper or the like of different sizes. The roller 51 at the discharge end of the conveyer 20 is preferably mounted upon a shaft 93, rotatably journaled in brackets 94 which are rigidly secured to two of the legs 19.

To hold the printed articles in place upon the belt 39 when they are being transferred from the printing machine 10 to the belt 47,

I preferably provide mechanism which comprises sheaves 96 and 97 over which relatively narrow belts or strings 95 are trained, the sheaves 96 being preferably of relatively heavy construction and are preferably mounted upon a shaft 98 rotatably and slidably journaled in substantially vertical slots 99 formed in the bracket 45. The sheaves 97 are mounted upon a shaft 101 rotatably journaled in the free ends of the bars 44. When the apparatus is in operation, the frictional engagement of the belts or strings 95 and the sheaves 96 with the belt 39 causes the belts or strings 95 to be advanced in unison with the belt 39. Of course, the printed articles pass between the belts or strings 95 and the belt 39 and are retained against accidental displacement relative to belt 39.

The aforementioned heating device 24 may be of any suitable construction but for the purpose of illustration, I have shown an electrical resistance 103 mounted in a box-like housing 104 suspended from the table top 17 by brackets 106, or the equivalent. The bottom side of the box 104 is preferably open so that when the resistance is subjected to an electrical current, the heat radiating from the resistance will dry the ink upon the articles 49 as they pass beneath the resistance. The resistance 103 may be connected to any suitable source of electrical energy.

When the above described apparatus is in operation, the articles to be printed are fed to the rolls 14 and 15 by the feeding apparatus 11 and are discharged from the rolls 14 and 15 on to the conveyer belt 39 which discharges them on to the conveyer belt 47. Of course, in the illustrated embodiment of the invention, the articles being printed are passed between the rolls 14 and 15 one at a time and are delivered in this manner to the conveyer belt 39 which then delivers them one at a time to the conveyer belt 47. It is readily understood that as the conveyer belt 47 is advanced in a step-by-step manner during the operation of the apparatus, the cards will be distributed along this conveyer belt as illustrated in Fig. 3. The apparatus may be arranged so that the printed portions of each article will not come in engagement with any portion of another article but in practice, it has been found that the articles rest upon each other so lightly that there is no tendency to blur the printing even if the printing is engaged by another article. The heating device 24 dries the ink as the articles are advanced beneath it and it is readily understood that a receptacle, or the equivalent, may be positioned beneath the discharge end of the conveyer 20 to receive the articles when they are discharged therefrom. If desired, an attendant may collect the articles when they arrive at the discharge end of the conveyer 20.

While I have shown the frame 16 formed separately from the table 17, it is readily understood that in some embodiment of the invention, I may prefer to form the frame 16 in such manner that it supports the heating device 24 and is provided with legs which provide a space beneath the printing machine proper for the conveyer 20. I also contemplate apparatus of this kind described wherein the conveyer 20 extends away from the frame 16 and does not pass underneath it but it is obvious that the illustrated form of the invention is advantageous in that it is compact and convenient.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. The combination with a printing machine, of a conveyer for receiving the printed articles, means for advancing the conveyer and means for securing the receiving end of the conveyer in a plurality of adjusted positions with respect to the printing machine.

2. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer, and means operatively connected to the printing press for intermittently advancing the conveyer, said advancing means including means for regulating the distance travelled by the conveyer each time it is advanced.

3. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer for receiving the printed articles, means for depositing said printed articles upon the conveyer in overlapping relation, and means for accelerating the drying of articles carried by said conveyer, said means being arranged above the conveyer and between the press and the conveyer, and the means for depositing the printed articles upon said conveyer.

4. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer adapted to receive the printed articles from the printing press, a second conveyer to receive the printed articles from the first-mentioned conveyer, and means for bringing the receiving end of said second conveyer into a plurality of adjusted positions with respect to the discharge end of the first-mentioned conveyer.

5. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer adapted to receive the printed articles from the printing press, a second conveyer adapted to receive the printed articles from the first-mentioned conveyer, and means movable longitudinally

of the first-mentioned conveyer for guiding the printed articles into predetermined positions upon the second conveyer.

6. Apparatus for drying the ink on articles printed in a printing press, said apparatus comprising a conveyer, means for depositing said printed articles upon the conveyer in overlapping relation, and means for subjecting said printed articles to heat while they are on the conveyer.

7. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer, means for guiding said printed articles from the printing press to said conveyer, and means for bringing the receiving end of said conveyer into a plurality of adjusted positions with respect to the printing press.

8. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer adapted to receive the printed articles from the printing press, means moving with said conveyer for preventing displacement of articles on said conveyer, a second conveyer to receive the printed articles from the first mentioned conveyer, and means for bringing the end of said second conveyer into a plurality of adjusted positions with respect to the discharge end of the first mentioned conveyer.

9. Apparatus for drying the ink upon articles printed in a printing press, said apparatus comprising a conveyer adapted to receive the printed articles from the printing press, a second conveyer adapted to receive the printed articles from the first mentioned conveyer, means moving with said first mentioned conveyer for preventing displacement of articles thereon, and means movable longitudinally of the first mentioned conveyer for guiding the printed articles into a predetermined position upon the second conveyer.

10. In an apparatus for drying the ink upon articles printed in a printing press, a belt conveyer including an inclined portion, and a plurality of belts frictionally engaged by said inclined portion of the conveyer, so as to be movable therewith and so as to engage articles therebetween for preventing displacement of articles on said conveyer.

In testimony whereof, I have hereunto signed my name.

CLAUDE L. POST.