

911,241.

G. E. INMAN.
 LABEL COATING MACHINE.
 APPLICATION FILED NOV. 21, 1907.

Patented Feb. 2, 1909.
 2 SHEETS—SHEET 1.

Fig. 1

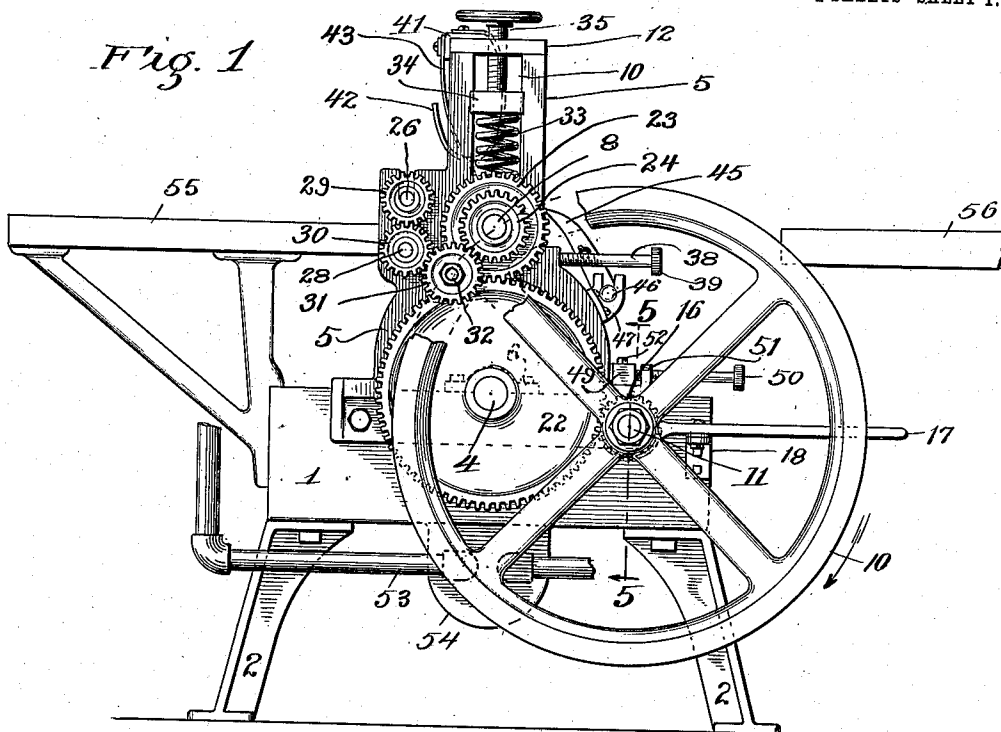


Fig. 2

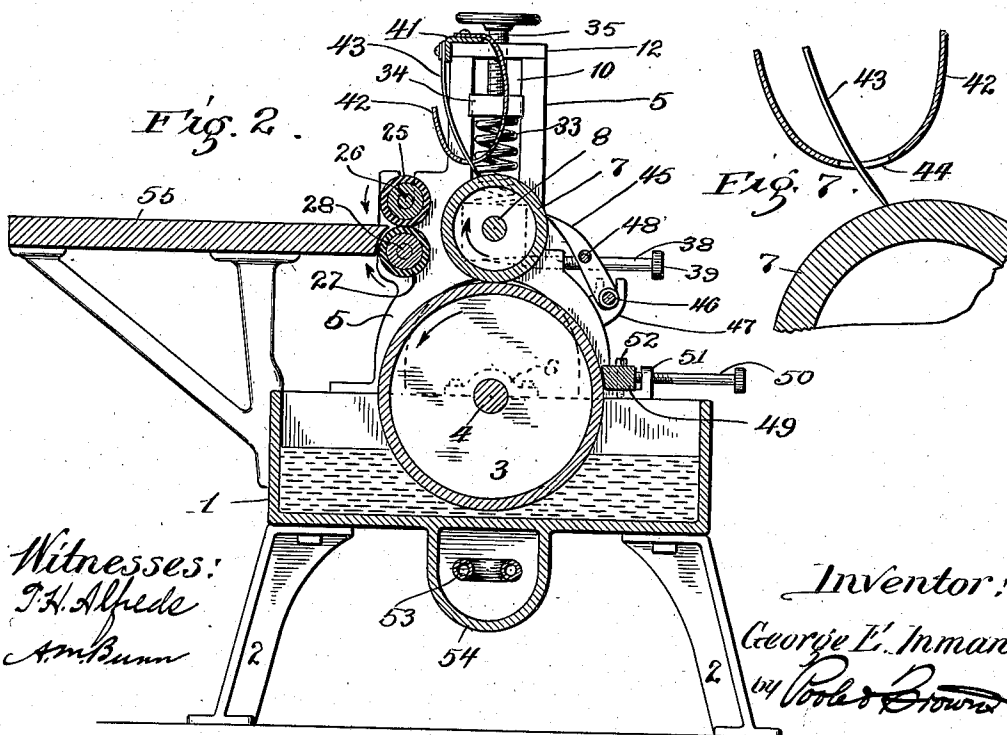


Fig. 7

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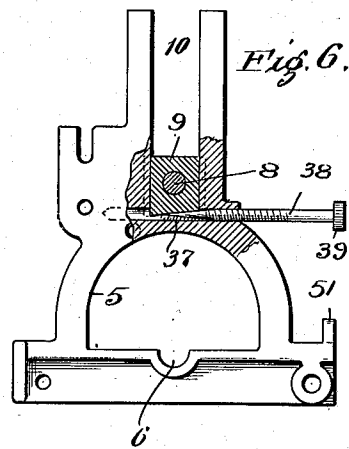
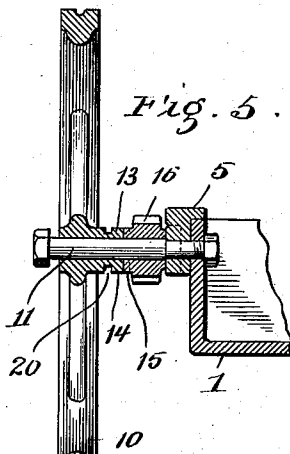
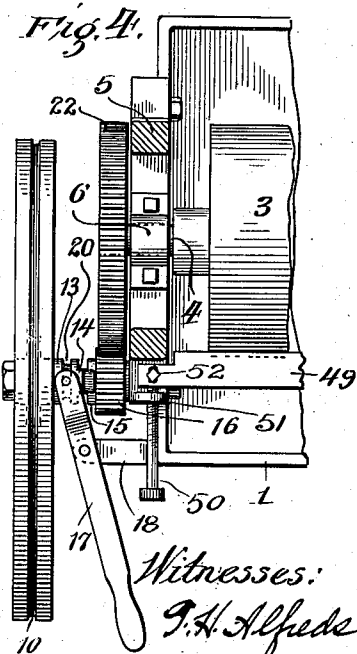
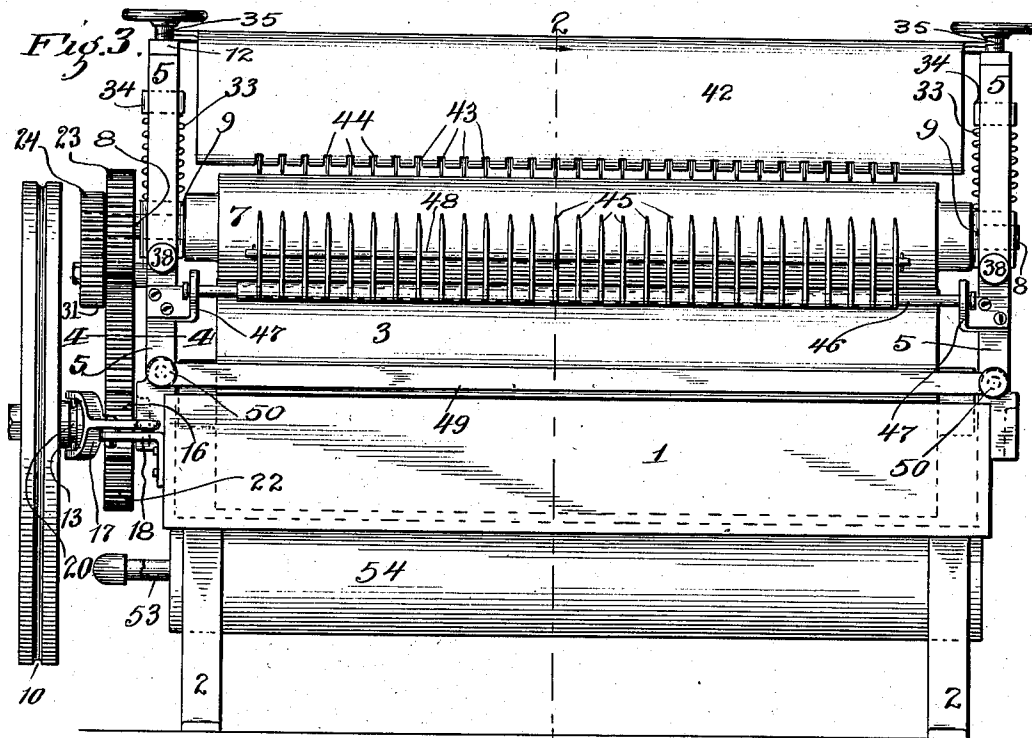
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 George E. Inman,
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UNITED STATES PATENT OFFICE.

GEORGE E. INMAN, OF CHICAGO, ILLINOIS.

LABEL-COATING MACHINE.

No. 911,241.

Specification of Letters Patent.

Patented Feb. 2, 1909.

Application filed November 21, 1907. Serial No. 403,156.

To all whom it may concern:

Be it known that I, GEORGE E. INMAN, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Label-Coating Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in coating machines, and more particularly to that class of coating machines adapted to apply a thin layer of glue or other adhesive material to pieces or sheets of paper used for labels, wrappers or "stickers."

The object of the invention is to provide a machine adapted for applying adhesive material to sheets of various sizes, and to provide means whereby the adhesive material may be applied regularly and smoothly and in desired thicknesses or quantity to all parts of the surface to be coated therewith.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

In the drawings:—Figure 1 is a view in end elevation of a coating machine embodying my invention. Fig. 2 is a sectional view, taken on line 2—2 of Fig. 3. Fig. 3 is a rear elevation of the machine. Fig. 4 is a detail sectional view of the right hand end of the machine, taken on line 4—4 of Fig. 3. Fig. 5 is a sectional view, taken on line 5—5 of Fig. 1. Fig. 6 is a view, partly in elevation and partly in section, showing the frame for supporting the rollers, and the means for varying the vertical distances between the conveyer roller and the transfer roller. Fig. 7 is a sectional view showing the means for holding all points of the surface to be coated in contact with the transfer roller.

As shown in the drawings, 1 indicates a glue trough or receptacle, adapted to contain glue or other adhesive substance. Said trough 1 is mounted upon supports or legs 2, 2 which are fastened thereto by bolts, as shown in Figs. 1 and 2, or otherwise.

3 indicates a rotative supply or conveying roller which extends longitudinally of said trough 1 and is partially immersed in the liquid adhesive material therein. Said roller 3 is provided at its ends with trunnions

4, 4 which turn in bearings 6, 6 formed in the lower part of frame standards 5, 5 which are attached by bolts or otherwise to the end walls of the trough 1, as shown in Fig. 1.

7 indicates a rotative transfer roller which extends parallel with the roller 3 and by which the adhesive material is transferred from the roller 3 to the sheets of paper to be coated. Said roller 7 is provided with trunnions 8, 8 which are supported and turn in bearing blocks 9, 9 which bearing blocks are mounted vertically in vertical guide slots 10, in the upper parts of the frame standards 5, 5, as shown in Fig. 6.

A belt pulley 10 is loosely mounted upon a stud bolt 11 extending outwardly from and at a right angle to, one of the end walls of the glue trough 1. The hub of said pulley 10 is provided with an inwardly extending, annular flange 13 on its side nearest the glue trough. Said flange 13 is provided with a clutch member 14 adapted for interlocking engagement with a clutch member 15 of a pinion 16 rotatively mounted on the stud bolt 11, between the trough 1 and the wheel 10. For operating the said clutch, a lever 17 is pivoted to a bracket 18 on the end wall of the trough and is provided with a forked end engaging with an annular groove 20 in said flange 13.

A gear wheel 22 is keyed or otherwise rigidly fastened to the end of the trunnion 4 of the roller 3, outside of the glue trough, and intermeshes with the pinion 16. The gear wheel 22 is considerably larger than the pinion 16, so that the roller 3 is rotated at a slower speed than the pinion 16. A gear wheel 23 is likewise rigidly mounted upon the end of the trunnion 8 of the roller 7, outside of the frame standard 5 and intermeshes with said gear wheel 22. A second gear wheel 24 is rigidly mounted upon the outwardly extending trunnion 8 of the roller 7 adjacent to the outer face of the gear wheel 23 and concentric therewith.

25 and 27 indicate oppositely rotating, parallel feed rollers mounted in bearings provided in the upper forward part of the frame standards 5, 5, as shown in Figs. 1 and 2. Said feed rollers extend in front of and parallel to the roller 7 the roller 25 being superposed upon the roller 27. The lower roller 27 is permanently mounted in the bearings provided in the frame standard 5, and is not capable of vertical movement, but the trunnions 26 of the upper roller 25 slide in

vertical guide slots provided in the frame bracket 5 so that the upper roller may rest by gravity on the lower one. The trunnions 26 of the roller 25, and the trunnions 28 of the roller 27, are each provided with intermeshing gear wheels 29 and 30, respectively. The feed rollers are driven from the gear wheel 24 through the medium of an idler wheel 31 which is rotatively mounted on a stud bolt 32 on the frame standard 5, and intermeshes with said gear wheels 24 and 30.

By the system of gear wheels and pinions described and illustrated in Fig. 1 of the drawings, it is clearly obvious that, when power is applied to turn the wheel 10 in the direction indicated by the arrow in Fig. 1, the pinion 16, the gear wheels 23 and 24 and the pinion 30, will all be turned in the same direction, while the same power will cause the gear wheel 22, the idler 31, and the pinion 29, to rotate in an opposite direction.

The gear wheels hereinbefore described are so proportioned that the surface speed of the transfer roller 7 is greater than that of the feed rollers 25 and 27.

For holding the transfer roller 7 yieldingly and adjustably at a desired distance from the conveying roller 3, a construction is provided as follows: Coiled springs 33, 33 are located in each of the frame brackets 5, the lower ends of which springs press downwardly against the bearing blocks 9, 9 and serve to hold the roller 7 in contact with the roller 3. The upper ends of said springs 33 bear against follower plates 34 which slide in the guide slots 10. Upright adjusting screws 35, 35 extend through a screw-threaded aperture provided in a cap plate 12 which extends across the top of the slot 10. Said screw acts downwardly on the said follower plate. By turning said adjusting screw 35, the pressure of the springs 33 upon the bearing blocks 9 may be varied as desired to increase or decrease the pressure of the transfer roller 7 upon the conveying roller 3.

The frame brackets 5 are each provided, at the bottom of the slot 10 therein, with an inwardly extending screw-threaded aperture 37, at right angles to said slot 10. An adjusting screw 38, provided with a head 39 extends through said aperture 37. The inner end or point of said screw 38 is conical or tapered, as shown in Fig. 6, and engages the lower face of the bearing block 9. Said lower face of the bearing block is beveled to form a downwardly facing surface for contact with the conical end of the screw 38. The conical ends of said adjusting screws obviously constitute adjustable stops for limiting the downward movement of the bearing blocks 9, 9. It is obvious that by turning the adjusting screws 38 in a direction to move the same inwardly the bearing blocks 9 will be caused to rise in the slots 10, and the distance between the rollers 3 and 7

will be increased and that by turning the screws 38 in the reverse direction, gravity and the pressure of the springs 33 will cause the bearing blocks 9 to descend and the rollers 3 and 7 to approach each other.

A fixed bar 41 extends between the upper ends of the frame standards 5 and to said bar 41 is secured a guide plate 42, which extends between said frame standards 5, parallel to the roller 7. To the front vertical sides of said angle bar 41 are fastened a plurality of downwardly extending, flexible presser fingers 43 spaced closely together along and adapted to bear against the roller 7. Said presser fingers 43 are tapered or pointed, and rest at their ends lightly upon the top surface of the roller 7, as shown in Figs. 1, 2 and 7. The guide plate 42 is made generally of inverted U-shape in cross-section, with its lower portion a short distance above the top of the roller 7. Said guide plate is provided in its lower portion with a plurality of guide slots 44 and the said presser fingers severally extend downwardly through said guide slots by which said fingers are held from lateral movement or displacement. The purpose of said presser fingers is to act on the upper surface of the sheets which are carried between said fingers and the transfer roller 7, so as to press said sheets into close contact with the coated surface of said roller. The slots 44 are provided in the guide plate 42, in order to guard against the fingers 43, which are made very thin in order to have the required flexibility, being laterally bent or distorted or displaced through accidental causes.

It is to be observed that because of the extreme flexibility of said fingers 43 and of the fact that their ends or points are directed rearwardly or in the direction of rotation of the roller 7, I am enabled to taper the same to very fine points without incurring the danger of the outer face of the sheets being torn or scratched thereby. Another, and important purpose of the fine tapered points upon the finger ends is to guard against the transmission of glue from the surface of the roller 7 to the sheet being coated. As the coated sheet passes from under the fingers over the roller 7, said fingers necessarily come in contact with the glue upon the surface of said roller, where they will remain until raised therefrom by the action of the next incoming sheet from the feed rollers. The period of time during which the fingers rest upon the roller 7 is dependent upon the speed of the operator in supplying the labels to the feed roller. While the finger points necessarily receive a small amount of glue, by reason of their contact with the surface of the roller 7, it is to be observed that, because of the very fine points on the ends of said fingers, the advance edge of the incoming sheet will effectually wipe off this glue

and substantially none of the same will be transmitted to the fronts of the sheets by the said fingers.

A plurality of stripper fingers 45 are located at the rear of the roller 7, as plainly indicated in Figs. 1, 2 and 3. Said fingers are apertured near their lower ends and are loosely mounted upon a pivot rod 46, extending through said apertures parallel with, at the rear of and somewhat below the said roller 7, the ends of said rod 46 being rotatively mounted in brackets 47, provided on the frame brackets 5, as shown in Figs. 1, 2 and 3. Each of said stripper fingers is provided with an annular flange, surrounding the aperture in the lower end thereof, the outer rim of which flange contacts with the side of the adjacent finger and prevents any lateral movement thereof. The said stripper fingers 45 are forwardly inclined from the rod 46, and the upper ends thereof rest in contact with the surface of the roller 7. Said upper ends of the fingers 45 are tapered to a point and the upper surfaces of the fingers are outwardly curved, as shown in Figs. 1 and 2. The said fingers are apertured between their ends and a rod 48, parallel with the pivot rod 46, passes through said apertures in all of the fingers, as shown in Figs. 1 and 2, said rod being provided at its ends with heads to hold it from endwise movement. The diameter of said apertures in the fingers is considerably larger than the diameter of the rod, this construction admitting of slight oscillatory movement of each stripper finger 45 independently of the others. This construction is necessary because of the fact that particles of foreign substances or hard lumps of glue occasionally reach and adhere to the roller 7, and the independent movement of the fingers as aforesaid allows any finger to rise to permit the passage under the point thereof of such particles without affecting the stripping action of the other fingers. It is to be observed that, inasmuch as the tapered points of the stripper fingers 45 rest against the surface of the roller 7 and are inclined in a direction opposite to the rotation of said roller, the advance edge of a coated sheet passing over said roller will be lifted or guided away from the surface of the roller, and may be therefore easily received and removed by the operator.

A scraper bar 49 is located to the rear of and extends parallel to the conveyer roller 3, the edge of said bar nearest said roller being concave to conform to the curvature of the roller. The ends of said bar are mounted to slide horizontally on brackets provided on the frame standards 5, and are adapted for backward and forward movement relative to the roller 3, the movement of the bar toward the roller being effected by means of adjusting screws 50. Said adjusting screws extend through screw-threaded apertures

provided in vertical bracket arms 51 on the frame standards 5, as shown in Figs. 1 and 2. Moreover, the ends of said bar 49 are provided with laterally extending slots through which extend upright bolts 52, 52 extending into the brackets on the frame standards, as shown in Figs. 1, 2 and 4, and acting to hold the bar from rising. When it is desired to adjust the bar 49, the bolts 52 are loosened, the adjusting screws 50 turned to carry the bar a desired distance toward the roller, and the said bolts 52 are then tightened to hold the bar in its adjusted position. The purpose of the bar 49 is to control the thickness of the layer of adhesive material carried by the conveyer roller 3 to the transfer roller 7. Moreover, said bar serves to remove foreign particles and lumps of glue which may adhere to the roller 3.

A steam coil 53, connected with a suitable source of supply (not shown in the drawings) is located in a chamber 54 beneath the glue trough 1. The steam circulates in said coil and serves to heat the glue to the desired temperature, in order that it may be properly taken up by the roller 3 and transferred to the roller 7. A work-table 55 is provided at the front of the machine to hold the supply of uncoated sheets or labels, while a similar table 56 is provided at the rear of the machine to receive the labels after they have been coated.

As shown in the drawings, the feed rollers are arranged to advance the sheets in a substantially horizontally path and the axis of the transfer roller is so located that the top of said transfer roller is considerably above the level of such path. As a consequence, the sheets fed by the feed rollers first strike the transfer roller at the upwardly moving side thereof, with the result that the forward edges thereof are brought into immediate contact with the roller, without the use of any guides between the feed rollers and said transfer roller.

In the operation of the machine the operator inserts the sheets between the feed rollers 25 and 27 which carry it forward until its front edge reaches the upwardly moving surface of the roller 7 where it will be caught by the adhesive material on said roller and caused to attach itself to the surface thereof. When the front edge of said sheet reaches the fingers 43, any glue which may have been left on the ends thereof will be taken off thereby. The presser fingers are made so yielding, or act with such light pressure as to allow the label to easily pass thereunder, and all of the fingers will exert a light pressure upon the sheet from the front edge to the back, thereby insuring a proper contact between the under surface of the label and the glued surface of the transfer roller. The front edge of the label, after passing under the fingers 43, will

be taken off the roller, at its downwardly moving side, by the stripper fingers 45 from which the sheets may be received by the operator and laid for drying upon the table 56.

5 A great advantage of the differential speed between the feed rollers 25 and 27, and the transfer roller 7, is to obtain a brushing effect between the surface of the transfer roller 7 and the under surface of the sheet being
10 coated. After the incoming label from the feed roller has been gripped by the glue on the transfer roller, the rear end of the said sheet will be held between the said feed rollers by the gripping action due to the gravity
15 of the roller 25. As the surfaces of the rollers 25 and 27 move more slowly than the surface of the roller 7, the label is not fed on to the roller 7 at the same rate of speed as that of the coated surface of rotation of
20 said roller 7. It follows that a brushing effect will be produced between these two surfaces which will result in an equal and uniform distribution of the adhesive material on the sheet. It is to be noted that the
25 weight of the roller 25 is sufficient to prevent the label from being pulled through between the feed rollers by the adherence thereto of the glue on the transfer roller, at the same speed as that of the surface of said transfer
30 roller.

It is to be noted that the roller 7 herein called a transfer roller is, in fact, an applying roller operating essentially as a means for
35 applying to the sheets to be coated, adhesive material which has been previously applied to said roller. It follows that, so far as the principal feature of my invention is concerned, the means employed for furnishing the said roller 7 with its coating of adhesive
40 material is not essential, and said roller may itself dip at its lower part in a body of the adhesive material, or such material may be applied thereto by the use of any desired or preferred means.

45 I claim as my invention:—

1. A coating machine comprising a trough,

a rotative conveying roller which extends downwardly into said trough, a rotative transfer roller receiving adhesive material from the upper part of said conveying roller, 50 feed rollers acting to feed the paper against the upwardly moving side of said transfer roller, presser fingers acting yieldingly on the upper part of said transfer roller, a plurality of stripper fingers bearing against the down- 55 wardly moving side of said transfer roller, and a scraper bar acting on the upwardly moving side of the conveying roller.

2. In a coating machine, the combination with the transfer roller, of a plurality of 60 flexible presser fingers and a guide-plate for said fingers provided with a plurality of parallel guide slots through which said fingers extend.

3. In a coating machine, the combination 65 with a rotative transfer roller, of a plurality of stripper fingers mounted to turn on a common axis, said fingers being provided with apertures, and a rod extending through said apertures parallel with the pivotal axis 70 of the fingers, said apertures being larger than the rod to afford relative oscillatory movement of the fingers.

4. In a coating machine, the combination with a trough, a conveying roller, a transfer 75 roller located above the conveying roller, of vertically movable bearings for said transfer roller, and means for effecting vertical adjustment of said bearings comprising horizontally arranged adjusting screws provided 80 with conical ends engaging inclined, downwardly facing bearing surfaces on the said bearings.

In testimony, that I claim the foregoing as my invention I affix my signature in the 85 presence of two witnesses, this 18th day of November A. D. 1907.

GEORGE E. INMAN.

Witnesses:

SANFORD E. BROWN,
GEORGE R. WILKINS.