

Sept. 27, 1932.

J. N. FOUNTAIN

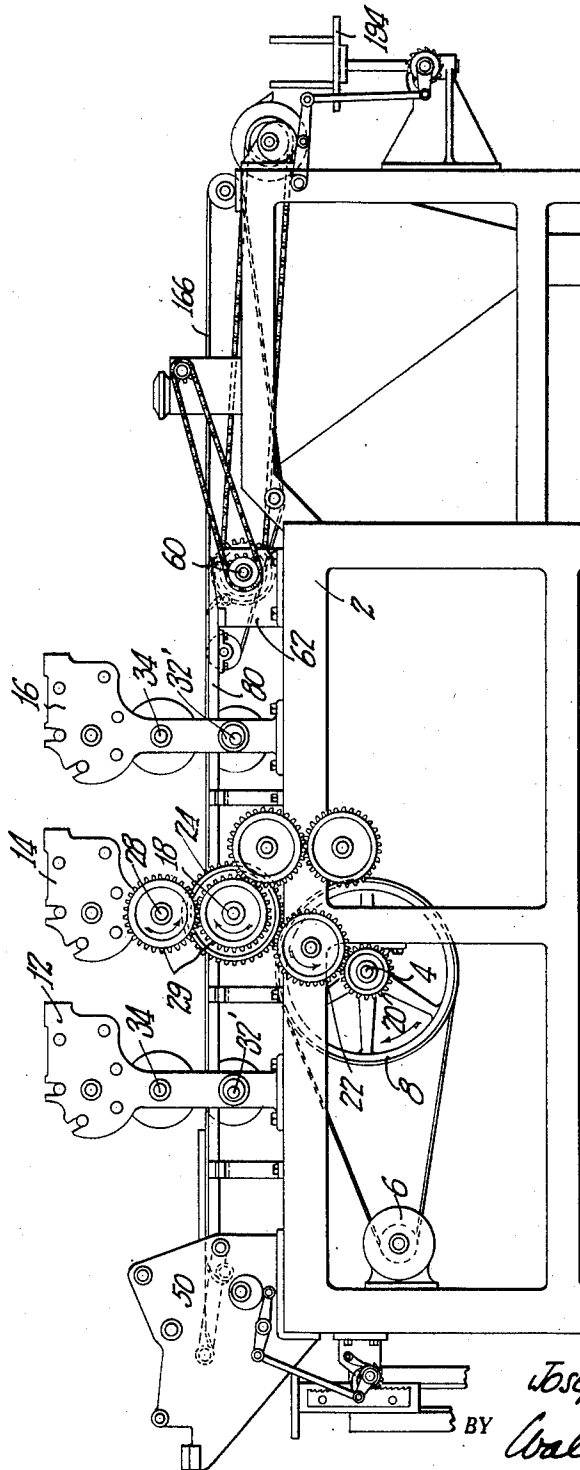
1,879,608

DECORATING MACHINE

Filed Oct. 21, 1930

5 Sheets-Sheet 1

Fig. 1.



INVENTOR.
Joseph N. Fountain.
BY *Walter C. Ross*
his ATTORNEY.

Sept. 27, 1932.

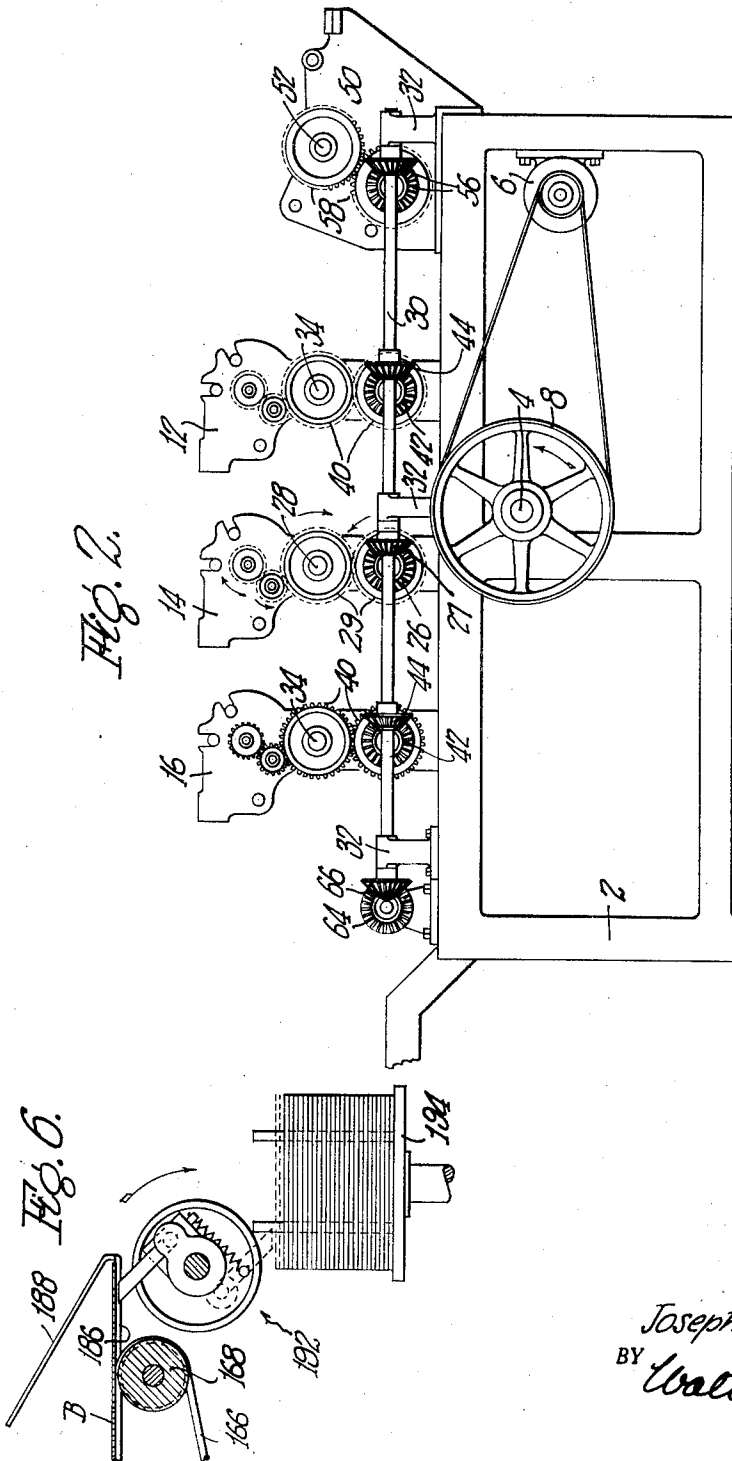
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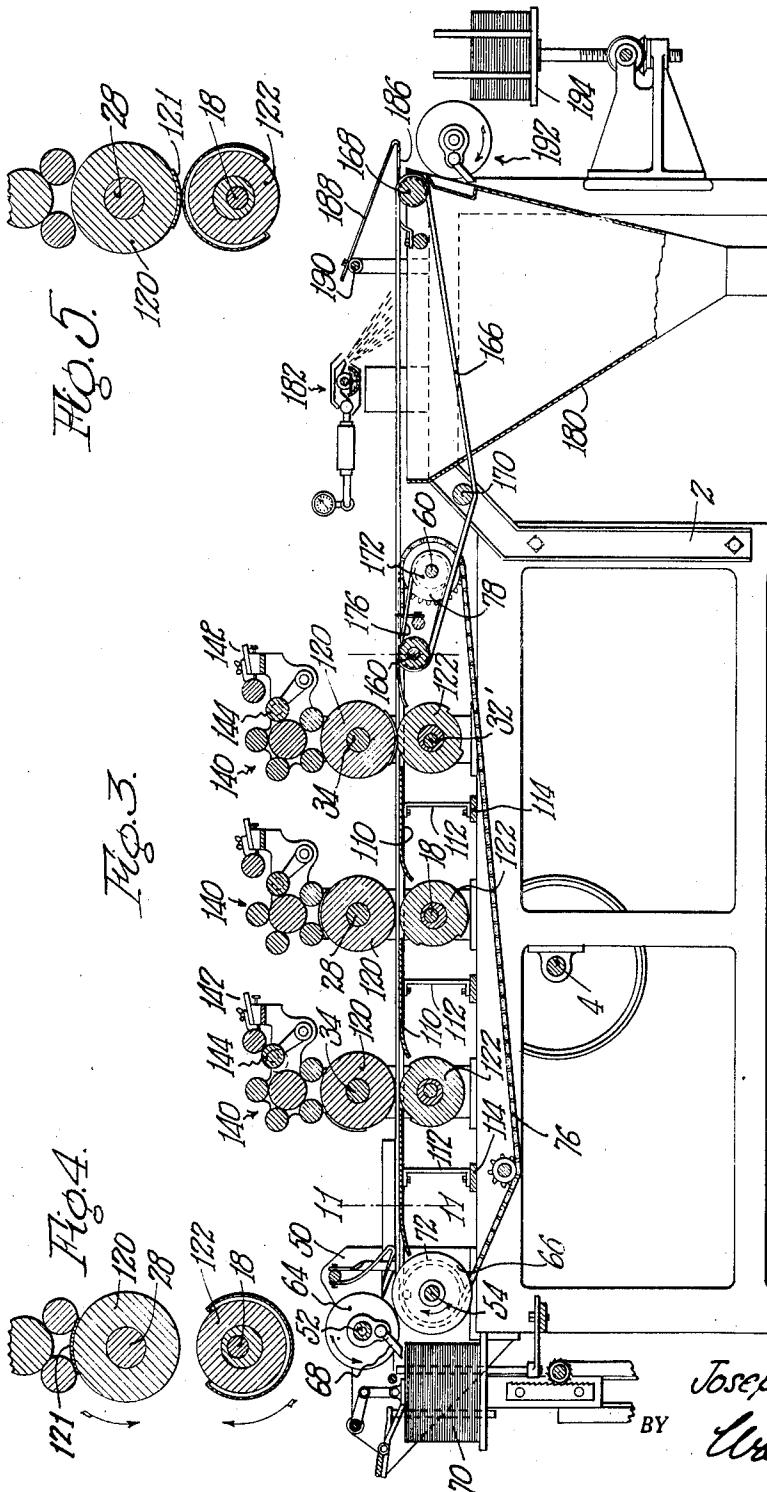
J. N. FOUNTAIN

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5 Sheets-Sheet 3



INVENTOR.
Joseph N. Fountain.
BY
Walter C. Ross
his ATTORNEY.

Sept. 27, 1932.

J. N. FOUNTAIN

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Fig. 8.

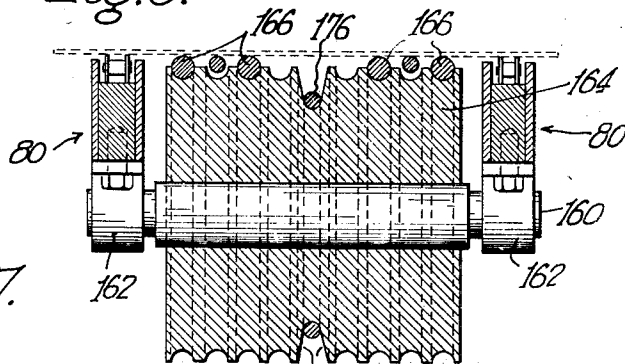


Fig. 7.

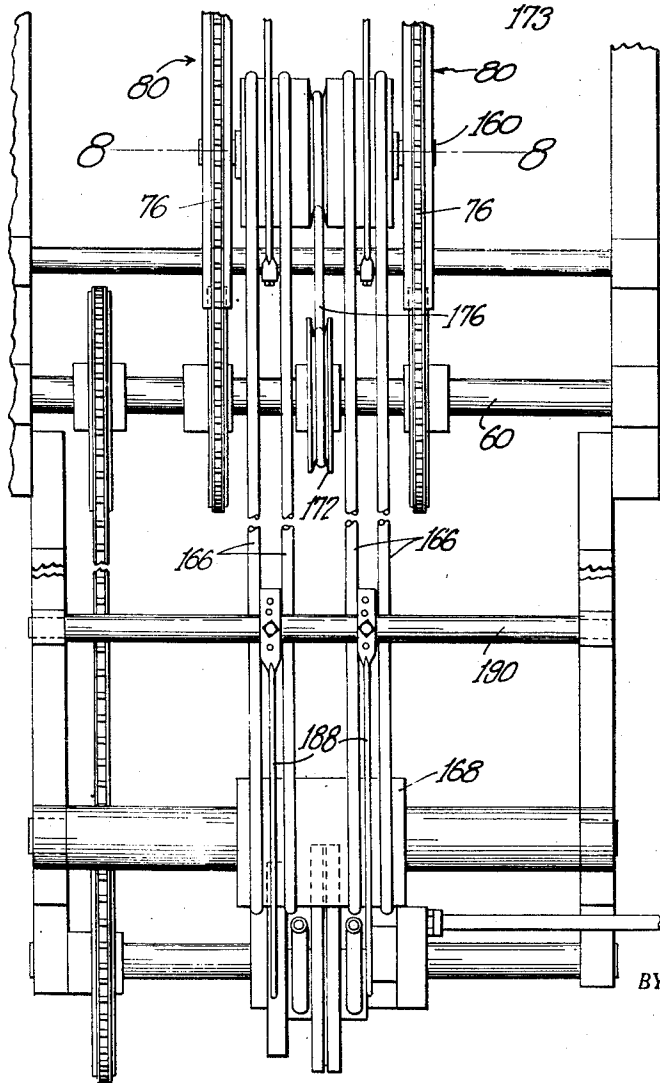
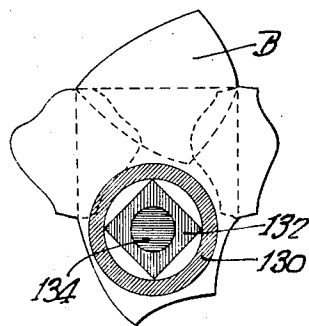


Fig. 9.



INVENTOR.

Joseph N. Fountain.

BY

Charles C. Ross

his ATTORNEY.

Sept. 27, 1932.

J. N. FOUNTAIN

1,879,608

DECORATING MACHINE

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5 Sheets-Sheet 5

Fig. 11.

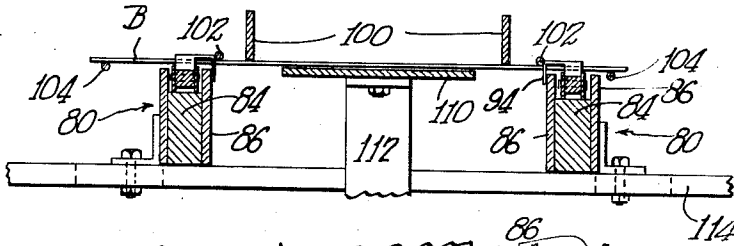


Fig. 10.

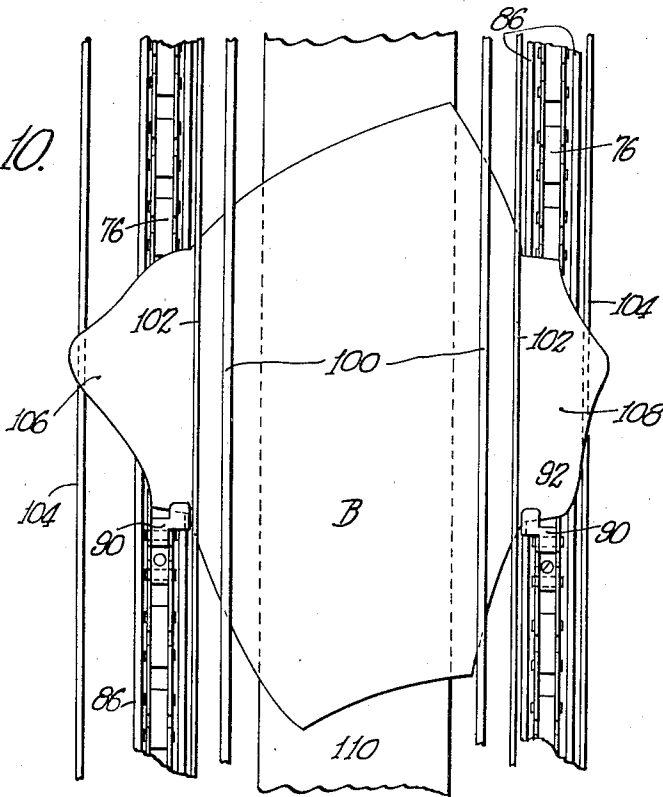
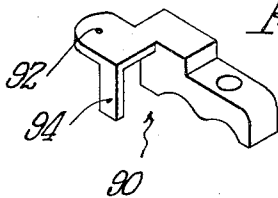


Fig. 12.



INVENTOR.
Joseph N. Fountain.
BY Walter C. Ross
his ATTORNEY.

UNITED STATES PATENT OFFICE

JOSEPH N. FOUNTAIN, OF WESTFIELD, MASSACHUSETTS

DECORATING MACHINE

Application filed October 21, 1930. Serial No. 490,310.

This invention relates to improvements in decorating machines and is directed more particularly to machines for decorating sheets or blanks of material with designs.

5 The principal objects of the invention are directed to the provision of a machine for decorating sheets of material with designs which may consist of several different colors. According to one special feature of the invention the machine is constructed and arranged for decorating the inner faces of the flaps of envelope blanks or the like. That is, instead of securing to the inner side of the flaps of envelopes ornamental interliners the machine of the invention is adapted to decorate the flaps to simulate such decorated interliners.

According to another feature of the invention, the machine is so constructed and arranged that sheets of material such as envelope blanks are removed from a stack of undecorated blanks at one end of the machine and fed into and through the machine where-in they are decorated. Subsequently the decorated surfaces are treated with material to prevent an offsetting action and finally the sheets or envelope blanks are removed from the machine and arranged in stacked relation. In this way the operation of providing envelopes with designs including a number of colors is continuous, whereby production may be increased and the cost of the envelope blanks lessened.

The novel features of the invention are accomplished by the provision of a novel combination and arrangement of parts herein-after more fully described and which for purposes of disclosure are shown in the accompanying drawings wherein:

40 Fig. 1 is a front side elevational view of a machine embodying the novel features of the invention.

Fig. 2 is a rear side elevational view of the machine.

45 Fig. 3 is a longitudinal sectional elevational view through the machine.

Figs. 4 and 5 are sectional views at a relatively larger scale through one pair of co-operating rolls which apply a design to the blanks, the parts in these figures being shown

in different relative position for purposes of description.

Fig. 6 is a partial sectional longitudinal view at a larger scale of certain parts of the machine at the delivery end thereof.

Fig. 7 is an enlarged fragmentary plan view of the conveying means for the blanks at the delivery end of the machine.

Fig. 8 is an elevational sectional view on the line 8—8 of Fig. 7.

Fig. 9 is a plan view of an envelope blank showing a design applied thereto.

Fig. 10 is a partial plan view of mechanism for conveying the blanks through the machine.

Fig. 11 is a sectional elevational view on the line 11—11 in Fig. 3, and

Fig. 12 is a perspective view at a larger scale of a member carried by the conveyor chains for engaging the blanks.

Referring now to the drawings more in detail the invention will be described.

Side frames 2 are provided which are spaced apart and are adapted for supporting the various units of the machine. A main driving shaft 4 is journaled in the machine frames 2 which is driven by means from a motor 6 belted to a pulley 8 on an outer end of the drive shaft.

Brackets 12, 14 and 16, arranged in pairs, are supported at the upper sides of the side frames 2 and a shaft 18 is journaled in the intermediate brackets 14. This shaft 18 is driven from the driving shaft 4 by means of a gear 20 on shaft 4, an idler gear 22 and a driven gear 24 carried by the shaft 18. The rear end of this shaft 18 carries a bevel gear 26 (see Fig. 2). This gear meshes with a bevel gear 27 of a horizontally and longitudinally disposed shaft 30 journaled for rotation in brackets 32 carried by the rear side frames 2. An upper shaft 28 rotatable in the bracket 14 is driven from shaft 18 by means of gears 29 which are in meshing engagement and are fixed to the shafts 18 and 28. Other shafts 32' journaled in the brackets 12 and 16 which correspond to the shaft 18 and upper shafts 34 corresponding with the shaft 28 are journaled thereabove in said brackets 12 and 16. These shafts 32' and 34 are geared

together by means of gears 40 at the rear end thereof and each of the shafts 32' at their rear ends carry a bevel gear 42 which meshes with a bevel gear 44 of the shaft 30. In this way the shafts rotatable in the brackets are driven for rotation in the direction of the arrows. Other brackets 50 at the feed end of the machine are supported by the side frames 2 and upper and lower shafts 52 and 54 are journaled for rotation therein. Intermeshing bevel gears 56 carried by the lower shaft 54 and the shaft 30 at the rear side of the machine are provided so that the shaft 54 is driven from shaft 30.

Intermeshing gears 58 fixed to the shafts 52 and 54 at the rear ends thereof are provided whereby the upper shaft 52 is driven from the lower shaft 54. A transverse shaft 60 at the delivery end of the machine is journaled in brackets 62 which are supported by the side frames and has fixed to its rear end a bevel gear 64' which meshes with a similar bevel gear 66 on the shaft 30, by the means of which this shaft 60 is driven from the shaft 30. A pair of disks 64 and 66 are carried by the shafts 52 and 54 at the feed end of the machine and are arranged so that their peripheries contact with one another for receiving therebetween an envelope blank or the like. The direction of rotation of the disks is such that a blank received therebetween will be fed forwardly into the machine. These disks 64 and 66 are preferably disposed at the center of the machine and the upper disk 64 is provided with a suction picker 68 which as it is rotated by the disk, suctionally engages the uppermost blank of a stack of blanks represented at 70 to swing it between the disks. This suction picker mechanism is fully shown and described in the patent to Joseph N. Fountain, No. 1,762,537 of June 10, 1930 and need not be described more in detail herein. At either side of the disks 64 and 66 there are disposed on the shaft 54 sprockets 72 which engage endless chains 76. Sprockets 78 on the shaft 60 at the other or delivery end of the machine also receive the endless chain 76. As shafts 60 and 54 rotate the chains are driven so that the upper runs thereof travel from the feed end to the delivery end of the machine. The blanks from stack 70 are delivered by the disks 64 and 66 onto these chains 76 and by means of these chains the blanks are fed through the machine to the delivery end thereof.

Guideways 80 extend from end to end of the machine for supporting the upper runs of the chains. As shown in Fig. 11 these preferably comprise central chain supporting members 84 and side guide members 86 secured thereto. The chains rest on the central members 84 whereby they are supported and are guided against sideways movements by the members 86 which extend upwardly at either side of the chains.

Pusher members 90 such as shown in Fig. 12 are carried in spaced relation by the chains. These are arranged to have forwardly extending lip portions 92 and downwardly extending portions 94. The forwardly extending portions 92 spaced from the upper sides of the chains and are arranged to overlie marginal edges of the envelope blanks as shown in Fig. 10. The downwardly extending portions are arranged to engage the side edges of the envelope blanks so as to push the blanks along.

Hold down bars such as 100, as shown in Fig. 10, are disposed between and above the chains so that their lower edges will overlie the envelope blanks B and hold the same against upward movements. Longitudinally extending guide wires 102 and 104 are also provided to receive therebetween certain flaps such as 106 and 108 of the envelope blank. In this way, as the blank is conveyed forwardly by the chains it is held in a flat even condition.

Longitudinally extending supporting tables 110 disposed between the chains are supported on legs 112, which are fixed to transverse bars 114 at the upper sides of the side frames 2. These tables are arranged to underlie the blanks as they are fed forwardly and support them against downward bending movement.

Form rolls 120 are carried by the shafts 28, 34 and 34'; that is, the rolls 120 have on the peripheries thereof certain form plates 121 or the like for receiving coloring material such as ink. Other rolls 122 are carried by the lower shafts 18, 32 and 32 and these are preferably arranged in an eccentric relation on said shafts. As in Figs. 4 and 5, the peripheries of the rolls are brought into contact while the form member of the upper rolls are in position to bear on a blank between the rolls. That is, the blank as it is fed forwardly by the chain passes between the rolls 120 and 122, and as the form or design applying portion of the upper roll bears on a blank for applying a design thereto the lower roll backs up the underside of the blank to exert a considerable pressure thereagainst. The form elements on the several rolls 120 may be different and will preferably consist of related different forms so that a multicolored design may be applied to the blanks. For instance, the first roll may have a form for imparting to the blank, as in Fig. 9, that part of a design designated at 130. The next roll 120 may have a form for imparting to the blank that portion of a design represented by 132, and the last roll may have a design element for completing the design represented at 134 in Fig. 9.

A set of rolls indicated generally by 140 is provided at the upper side of each of the rolls 120 so that each form member may be supplied with ink from a font 142. A swing-

ing roll 144 transfers ink from the font to certain of the rolls 140 which are disposed so as to contact with the design element on the rolls 120.

By means of the mechanism described the blanks are fed forwardly by the chains and pass between the sets of rolls successively. In this way the different parts of the design are applied thereto so that when the blanks leave the last set of rolls the design on the blank is complete.

Where ink is used for the design, it will be readily obvious that should the blanks be stacked one upon another that there will be a tendency for an off-set action. That is, the ink from the face of one blank will be smeared on the underside of the next uppermost blank. The design of course will be smudged by this transfer of color from one blank to another and the underside of the blanks will be smeared.

To overcome this difficulty the means now to be described is provided. See Figs. 1, 3, 7 and 8 particularly.

A shaft 160 is journaled in bearings 162 carried at the under side of the rails 80 at the delivery end of the machine. A pulley or roll 164 is carried by the shaft or may be rotatable thereon and is provided with a plurality of grooves as shown. Some of the grooves, such as the extreme outer grooves and those spaced therefrom, receive endless belts 166. These belts at the extreme end of the machine pass over a roller 168 and the lower runs of the belts pass under a transverse bar 170 as shown. A grooved sheave pulley 172 on shaft 60 receives an endless driving belt 176, which passes over a central groove 173 of roll 164 intermediate its end. In this way the roll 164 is driven from shaft 60 so that the endless belts are driven in such a way that the upper runs thereof travel towards the delivery end of the machine. The blanks as they are carried forwardly by the chains are received by the upper runs on the belts just described, so that the blanks are conveyed thereby forwardly of the machine.

A tank 180 located below the belt is for receiving excess material which is sprayed onto the blank from an apparatus indicated generally by 182 located above the belts 166. This mechanism 182 may take any desired form and will preferably be arranged to spray such material as paraffin, wax or the like downwardly onto the upper side of envelope blanks in the belts 166. According to the invention it is desired to spray the blanks as they are conveyed forwardly by the belts so as to obviate the possibility of the offsetting action referred to.

At the delivery end of the machine, see Fig. 6, there are located lower supporting bars 186 at either side of the belts 166 and upper bars 188 thereabove the ends of which rest on the first-mentioned bars. The upper bars are

carried by a transverse member 190 and they are more or less yieldable or may move relative to the lower bars. They are so disposed that the sides of the blanks pass therebetween as they are engaged by a suction device 192, indicated in Fig. 6. This suction device is similar to that at the feed end of the machine and is arranged to suctionally engage the forward ends of blanks on the belts 166 and swing them forwardly and downwardly onto a table 194, as is indicated. The bars exert some resistance to the removal of the blanks so that they will be positioned properly for the action of the suction picker.

In the operation of the machine blanks are engaged by the suction picker 68 at the feed end of the machine and fed into the rolls 52 and 54 and by them onto the chains 76. The blank-engaging members 90 of the chain are arranged to engage the rear ends of the blanks and as the chains travel forwardly they carry the blanks between the decorating rolls 120 and 122 one after the other so that different portions of a design are applied to the blanks.

As the blanks leave the last pair of rolls and have been decorated the chains carry the blanks forwardly onto the belt 166. These are arranged to support and transport the blanks forwardly beneath the spray apparatus 182 described so that a spray of paraffin or the like is applied to the upper side of the blanks and over the inked design. As the blanks reach the end of their travel on the belts 166, they are engaged by the suction picker device 192 and are transferred thereby from the belts onto the stack of blanks on the table.

In this way blanks are fed into the machine one after the other and are successively decorated and waxed and finally delivered at the discharge end of the machine.

The parts of the machine are so arranged that the blanks are passed through the machine at great speed whereby efficiency results and envelope blanks are decorated at a low cost. As will be noted there are no reciprocating parts, the motion of the various elements being rotary in a single direction, wherefore it is possible to attain the speed and obtain the desired production. The parts are so arranged and timed relative to one another that the blanks are conveyed one after the other so that the design applying elements will operate to position the parts of a design in proper relation on the blanks.

Various changes may be made in the form of the apparatus without departing from the spirit and scope of the invention, and I therefore prefer to be limited, if at all, by the appended claims rather than by the foregoing description.

What I claim is:

1. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, sprockets

spaced apart on said shafts, endless chains on said sprockets, pairs of design applying rolls along the upper runs of said chains, a grooved roll between one of said shafts and an adjacent pair of rolls, a driver on said shaft and connections between said driver and said grooved roll, a roll forwardly of said shafts and endless conveyor belts carried by said roll and said grooved roll.

2. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, spaced sprockets on said shafts, endless chains carried by said sprockets, pairs of design applying rolls spaced along the upper runs of said chains, a grooved roll between one of said shafts and a pair of said rolls adjacent thereto, a driver on said shaft and connections between said driver and said grooved roll, a roll forwardly of said shaft, an endless conveyor belt carried by said roll and said grooved roll and rigid supporting members for blanks between the upper runs of said endless conveyor belts.

3. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, sprockets spaced apart on said shafts, endless chains carried by said sprockets, spaced pairs of design applying rolls along the upper runs of said chains for acting on blanks carried therebetween by said chains, a grooved roll between one of said shafts and an adjacent pair of rolls, a driver on said shaft and connections between said driver and said grooved roll, a roll forwardly of said shaft and an endless conveyor belt carried by said roll and said grooved roll.

4. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, sprockets spaced apart on said shafts, endless chains carried by said sprockets, spaced pairs of design applying rolls along the upper runs of said chains for acting on blanks carried therebetween by said chains, a grooved roll between one of said shafts and an adjacent pair of rolls, a driver on said shaft and connections between said driver and said grooved roll, a roll forwardly of said shaft and an endless conveyor belt carried by said roll and said grooved roll, blank supporting means adjacent said chains and longitudinally extending means for overlying blanks on said chains.

5. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, sprockets spaced apart on said shafts, endless chains carried by said sprockets, the upper runs extending from end to end of said machine, pairs of design applying rolls in spaced relation along the upper runs of said chains, means for supporting upper runs of said chains, longitudinally extending means outside said chains for supporting the marginal

edges of blanks carried by said chains and longitudinally extending members disposed inwardly of the adjacent inner faces of the upper runs of said chains for bearing on blanks carried by said chains.

6. A machine for applying designs to blanks comprising in combination, shafts at opposite ends of said machine, sprockets spaced apart on said shafts, endless chains carried by said sprockets, the upper runs extending from end to end of said machine, pairs of design applying rolls in spaced relation along the upper runs of said chains, means for supporting upper runs of said chains, longitudinally extending means outside said chains for supporting the marginal edges of blank carried by said chains, and longitudinally extending members disposed inwardly of the adjacent inner faces of the upper runs of said chains for bearing on blanks carried by said chains and longitudinally extending members between the chains for supporting blanks between the members which bear on the upper side thereof.

In testimony whereof I affix my signature.
JOSEPH N. FOUNTAIN.