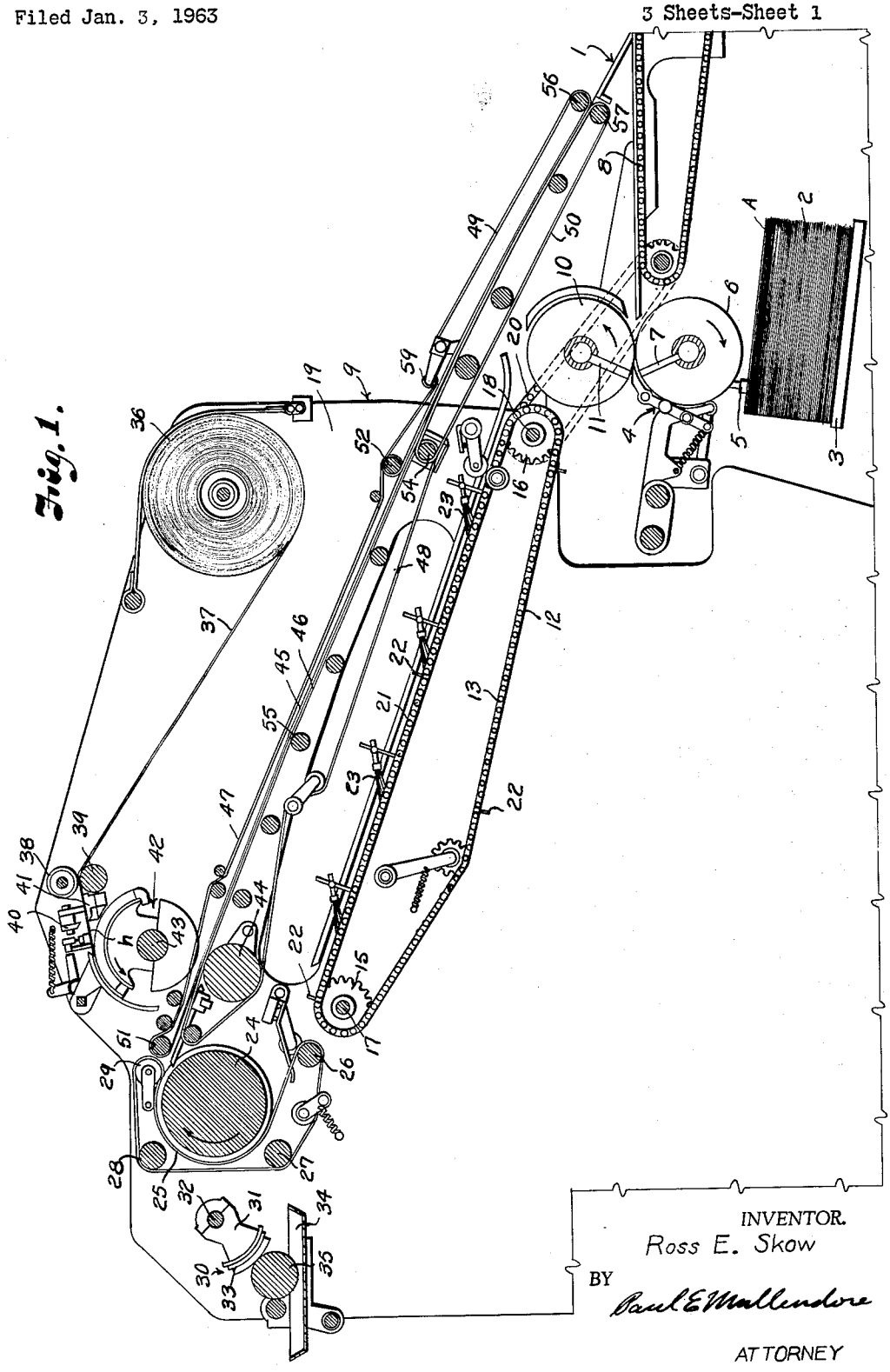
June 7, 1966 R. E. SKOW 3,254,575

APPARATUS FOR APPLYING LININGS OR PATCHES TO ENVELOPE BLANKS

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Fig. 1.



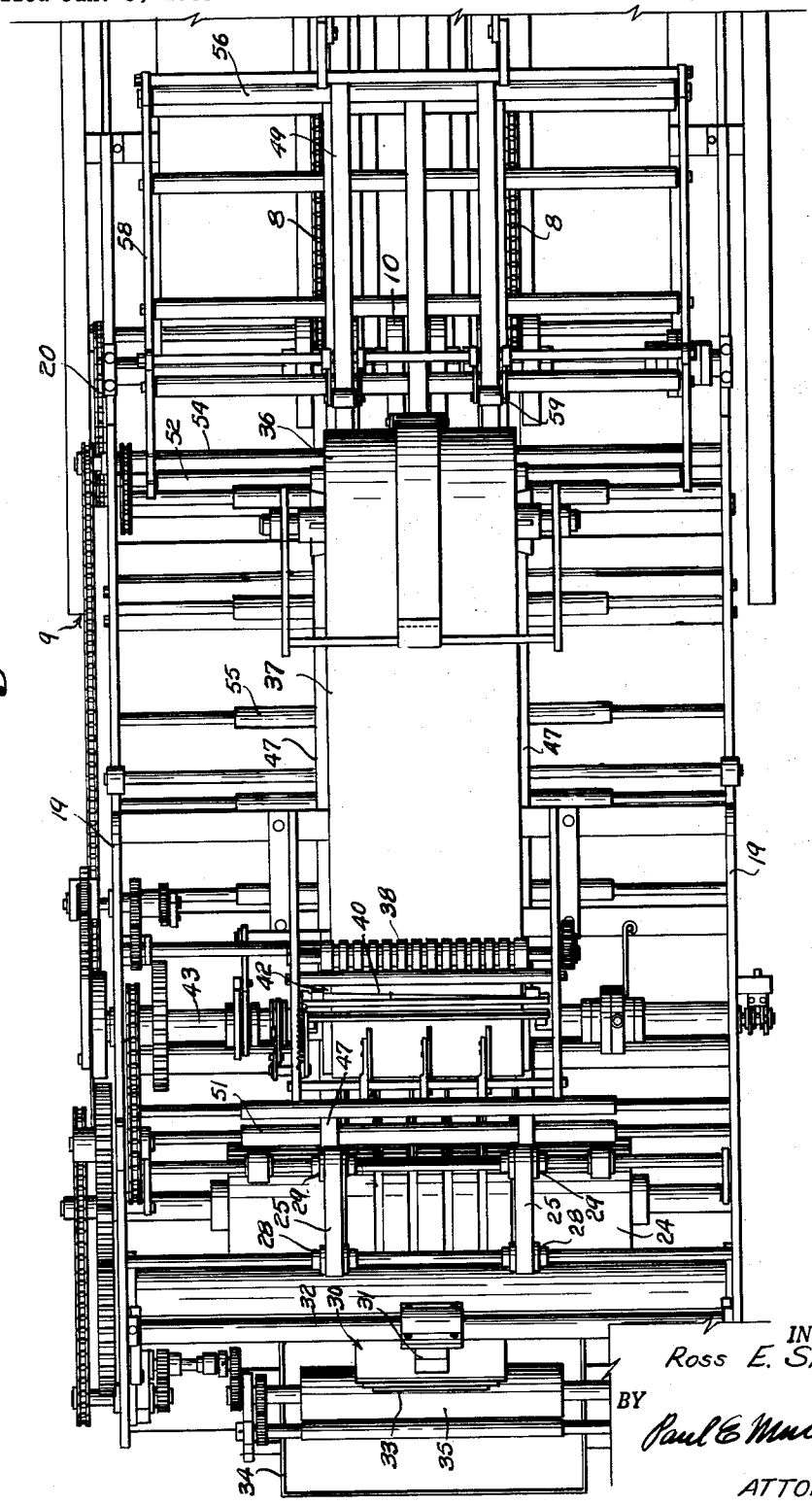
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APPARATUS FOR APPLYING LININGS OR PATCHES TO ENVELOPE BLANKS

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Fig. 2.



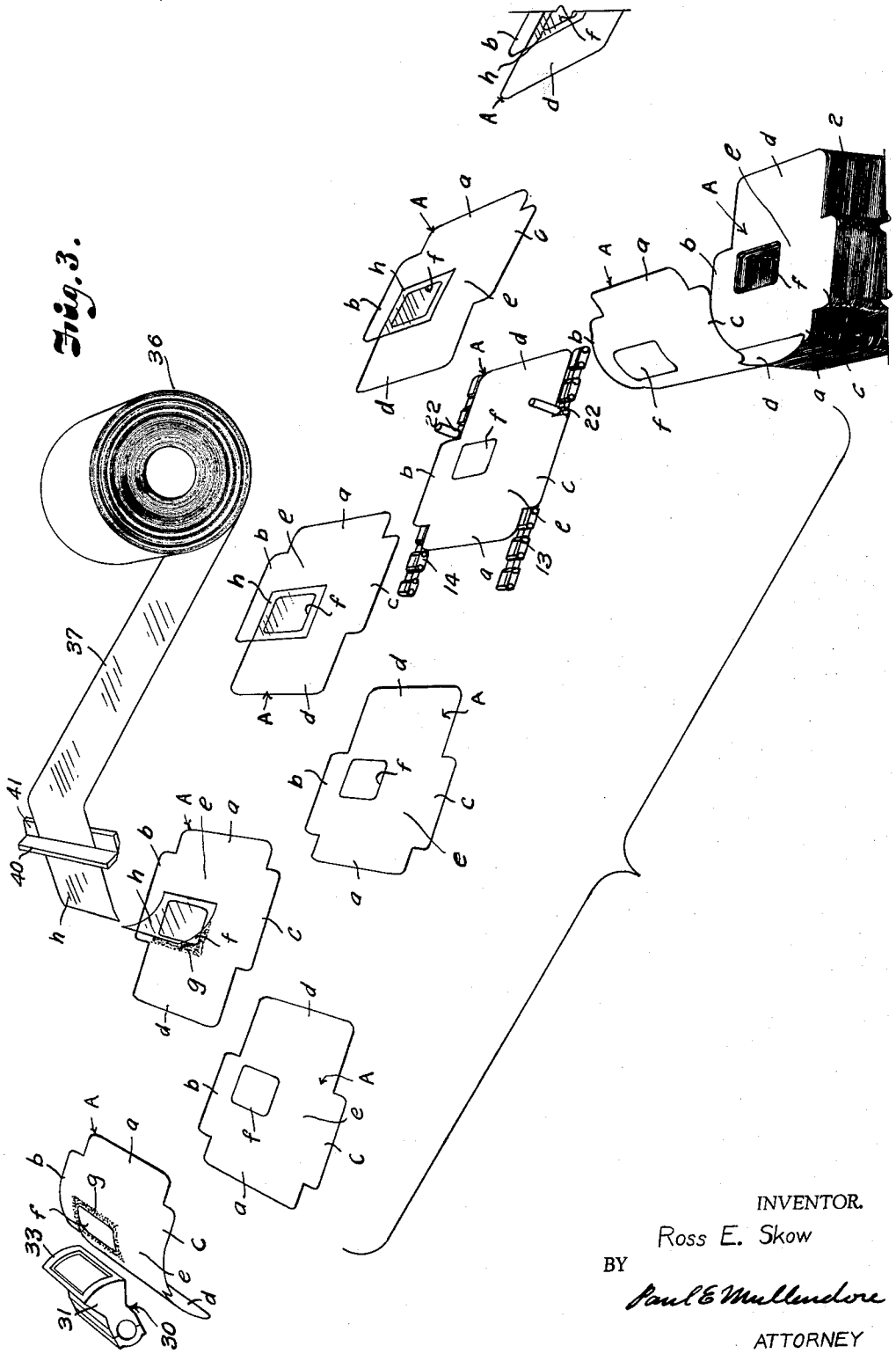
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APPARATUS FOR APPLYING LININGS OR PATCHES TO ENVELOPE BLANKS

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Fig. 3.



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United States Patent Office 3,254,575 Patented June 7, 1966

3,254,575

APPARATUS FOR APPLYING LININGS OR PATCHES TO ENVELOPE BLANKS

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Filed Jan. 3, 1963, Ser. No. 249,403
2 Claims. (Cl. 93—61)

This invention relates to a method and apparatus for making envelopes with internal linings or window patches and the like.

Such envelopes are made from blanks, to which the lining or patch is applied before the blanks are made into envelopes. Consequently, it is the present practice to apply the linings or patches in a patching machine, remove the blanks after application of the lining or patch, restack the envelope blanks, and run them through an envelope folding machine. Therefore, the cost of producing envelopes with linings or patches is higher because of the additional work involved in operating a patching machine, restacking the blanks, and running the blanks in an envelope folding machine.

It is, therefore, the principal object of the present invention to avoid the above named difficulties by providing a single machine for applying the linings or patches and for subsequently gumming and folding the blanks into envelopes.

It is also an object of the invention to provide an auxiliary machine or an attachment to convert a conventional envelope making machine into a machine for making lined or patched envelopes.

The invention contemplates withdrawing the blanks from a stack for travel through a gumming station, where adhesive is applied in proper location on the inner face of each blank, during which time a lining or patch of proper size is being cut from a roll, and each lining or patch is deposited onto the adhesive area of each blank, while the blanks are being conveyed with their inner faces uppermost directly and continuously into the folding and gumming section of an envelope making machine.

In the case of the attachment, it is a further object of the invention to remove the blanks from the top of the stack of the conventional envelope making machine, for continuous transfer in timed relation to the lining or patch applying mechanism, and to return the blanks individually and in continuous consecutive order in properly faced relation to the envelope making machine, in bypassing relation with the supply stack thereof.

In accomplishing these and other objects of the invention as hereinafter described, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

FIG. 1 is a longitudinal section of the feed end of an envelope making machine equipped with a lining or patch applying mechanism constructed in accordance with the present invention, the mechanisms being shown somewhat diagrammatically to simplify the illustration.

FIG. 2 is a plan view of the mechanism shown in FIG. 1.

FIG. 3 is a diagrammatic view showing the travel of the blanks from the stack through the adhesive applying station, the lining or patch applying station, and the direct travel thereof into the envelope making machine with the lined or patched faces uppermost and in proper position for completing formation of envelopes in the envelope making machine.

Referring more in detail to the drawings:

1 designates a portion of a standard envelope making machine in which envelope blanks are formed, folded and gummed, to provide finished envelopes. The machine illustrated is of a type wherein the blanks "A," from

which the envelopes are to be formed, are carried in a stack 2, which is supported on an elevator, indicated by the platform 3, for movement upwardly to keep the topmost blank of the stack in working relation with a blank withdrawing mechanism 4 by which the blanks are withdrawn from the top of the stack and delivered into the machine. The withdrawing mechanism includes a suction head 5 that is movable in timed relation with the cycle of the envelope making machine to lift a portion of the topmost blank "A" into contact with a suction cylinder 6 having suction ports 7 for seizing the forward marginal portion of a blank "A" and carrying the blank onto a conveyor mechanism 8 that advances the blank into the forming, gumming and folding machine 1. It is obvious that the cylinder 6 and conveyor mechanism 8 comprise a substantially direct path for movement of the blanks to the machine 1 in which the blanks have adhesive applied thereto and the flap portions folded over and sealed to complete ordinary envelopes.

The envelope making machine 1 is a conventional envelope making machine that is available on the market and is in use in many envelope manufacturing plants. The machine 1 is well adapted for making ordinary envelopes, but sometimes it is necessary to make special envelopes, such as envelopes having linings or patches on the inner surfaces thereof. The present invention is to adapt such a machine for making these types of envelopes. While my attachment, which is generally designated 9, is readily adaptable to the envelope making machine illustrated, it is also adapted to other makes and types of envelope making machines.

In order to adapt my invention, the machine 1 is modified by the addition of a second vacuum cylinder 10 that is rotatably mounted above the cylinder 6 and which is a substantial counterpart thereof in that it has vacuum ports 11 cooperating with the vacuum in the ports 7 to transfer the blanks from the cylinder 6 to the periphery of the cylinder 10, thereby diverting the blanks from the conveyor 8 onto a conveyor 12 (FIG. 1) of the attachment 9, as now to be described. The conveyor 12 is a continuous conveyor and has lateral spaced apart chains 13 and 14 (FIG. 2) carried on pairs of sprockets 15 and 16 fixed to spaced shafts 17 and 18 (FIG. 1) that are journaled in side frames 19 of the attachment 9. The shaft 18 is suitably driven in time with the operating cycle of the envelope making machine 1, for example, by a driving mechanism illustrated by a connection 20, although other driving connections may be employed between the envelope making machine and the lining or patch applying attachment 9.

The pairs of sprockets 15 and 16 are so arranged that the upper run 21 extends rearwardly of the envelope making machine 1 and preferably upwardly on a slight incline, as shown in FIG. 1. The conveyor chains carry pins 22 that are spaced apart along the length thereof (as shown in FIG. 1) to engage rear edge portions of the blanks "A" that are delivered with closure flaps *"a"* leading, side flaps *"b"–"c"* thereof extending laterally, and the bottom flaps *"d"* trailing, onto the conveyor 12 by the vacuum cylinder 10. The pins 22 are spaced apart to give the desired spacing of the envelope blanks "A," and the notched portions of the blanks between the side flaps *"b"–"c"* and bottom flaps *"d"* are retained in contact with the lugs 22 by retarding means such as brushes 23 that bear upon the bodies *"e"* of the blanks. The pins 22 then register the blanks both longitudinally as well as transversely on the conveyor 12. Mounted between the side frames 19 at the delivery end of the conveyor is a means for reversing the travel of the blanks which includes a cylinder 24, and operating over the

periphery thereof on the rear side of the cylinder are lateral spaced apart endless tapes 25 which run over guide rollers 26, 27 and 28, and a tightening roller 29, so as to grip the side flaps "b" and "c" of the blanks "A" between the tapes and the periphery of the cylinder 24.

Cooperating with the cylinder 24 and arranged to rotate in contact with the body "e" of the blanks and in registry with window openings "f" is an adhesive applicator 30, including an arm 31 that is fixed to a rotating shaft 32 that is driven in time with the travel of the blanks. Carried by the outer end of the arm 31 is an adhesive applicating head 33, conforming to the contour of the adhesive to be applied to the inner face of the blank or around the window opening "f" as indicated at "g." A supply of adhesive is carried in a pan 34 that is suitably supported between the side frames of the machine, as shown in FIGS. 1 and 2. Rotatable in the pan is an adhesive pickup cylinder 35 that is suitably journaled on opposite sides of the pan for rolling contact with the applicating face of the head 33 of the applicator at the time the applicating face comes into contact therewith, so that adhesive picked up by the cylinder 35 is transferred to the contour face of the applicator for subsequent deposit onto a blank "A" as that blank is carried around the cylinder 24.

During this time, the lining or patch "h" is being severed from a supply roll 36 of a width conforming to the size of the patch or lining to be applied to the blanks, as the case may require. FIG. 2 shows a roll of relatively wide material set up in the machine, which constitutes a lining for envelope blanks, and FIG. 3 shows a narrow roll for application over windows of the blanks. In either case, the tape or web 37 is withdrawn under tension from the roll 36 and passed between guide rollers 38 and 39 which lead the web between upper and lower cutters 40 and 41 that are also operated in timed relation with the movement of the blanks "A," to cut off a proper length of web to form the lining or patch "h" for the particular envelope blanks that are being run through the machine. The patch or lining "h," after being cut off, is picked up by a rotary applicator 42 that is fixed to a shaft 43 that is journaled between the side frames 19 of the machine and also driven in timed relation with travel of the blanks. The applicator 42 is located on the shaft 43 in position to deposit the patch or lining upon the adhesive "g" as a blank "A" is being carried over a counter cylinder 44 and downwardly between runs 45 and 46 of the upper and lower conveyor belts 47 and 48 that carry the blanks from the patch applying cylinders forwardly and downwardly onto continuing belts 49 and 50, to deposit the blanks, with the patches or linings thereon, face uppermost, onto the conveyor 8 of the envelope making machine 1. The upper belts 47 are carried at the ends on rollers 51 and 52, while the lower belts are carried at the ends on rollers 53 and 54. The runs 45 and 46 are supported on intermediate rollers 55. The belts 49 and 50 operate over the rollers 52 and 54 and over rollers 56 and 57 that are carried by a frame 58 (FIG. 2) that is pivoted about the axis of the roller 54. The purpose of the pivoted frame is to raise the conveyor belts out of the way when making ordinary envelopes. In this case the blanks are delivered from the stack 2 directly onto the conveyor 8. The upper belt 49 is kept tight by tensioning rollers 59. The conveyor 8 forwards the blanks in the same interval and timing into the processing mechanisms of the envelope making machine, to be finished into envelopes.

In installing an apparatus constructed as described, in the form of an attachment to an envelope making machine, the envelope making machine 1 is provided with a suction cylinder 10 above the cylinder 6, and the attachment 9 is moved into a juxtaposition with the stack end of the envelope making machine, after which it is suitably connected in time with a rotating shaft of the envelope making machine 1, as by the connection 20. It is obvious that the conveyor 12, cylinder 24 and associated tapes 25, conveyor belts 47–48, and continuing belts 49 and 50 constitute a conveyor means providing a substantially longer diverse path to the folding mechanism than the direct path, to give time to register the blanks, apply the adhesive and patches, and give time for the adhesive to set by the time the blanks are returned to the conveyor 8.

Envelope blanks are previously cut to desired shape and assembled into the stack 2 for support on the platform 3, the blanks "A" being located with the outer faces uppermost and in position so that the uppermost blank is engaged by the suction nozzle or head 5 of the envelope making machine 1.

With the apparatus 9 in operation, in conjunction with the operating mechanisms of the envelope making machine, the cylinder 6 rotates in a clockwise direction, to carry the topmost blank "A" that has been lifted by the suction nozzle 5 into position to be seized by the suction created through the ports 7. As the cylinder 6 rotates, the blank is reversed, to bring the inner face into contact with the cylindrical surface of the cylinder 10, for transfer thereto upon engagement of the suction ports 11 with the leading edge of the blank, at which time the suction through the ports 17 is suspended. The blank is then carried by the cylinder 10, which rotates in a counterclockwise direction, thereby again reversing the blank so that the outer face is again uppermost as it is deposited upon the chains 13 and 14 of the conveyor 12. Upon contact of the pins 22 with the notches between the side flaps "b" and "c" and the bottom flap "d," the blank is registered on the chains 13 and 14 and is held in contact with the pins 22 by the brushes 23. Succeeding blanks are removed from the top of the stack in like manner, to follow the first blank in properly spaced relation according to the working cycle of the envelope making machine.

The foremost blank is delivered from the rear end of the conveyor 12 and onto the tapes 25, to be carried around the cylinder 24, to again reverse the blank and bring the inner face of the blank outermost and into position to be contacted by the adhesive applicator 30, which applies adhesive around the window opening "f" of the blank as indicated at "g" in FIG. 2. The cylinder 24 and tapes 25 continue movement of the blank, to bring the inner surface thereof uppermost as the blank is engaged between the upper and lower runs 45 and 46 of the conveyors 47 and 48. The inner face of the blank is now in position to receive a patch "h" that is deposited thereon by the vacuum cylinder 42. The patch "h" has been drawn out from the roll 36 by engagement of the suction of the patch applying cylinder and cut off by the cutters 40 and 41. After cutting off of the patch, the suction is maintained on the patch so that the patch is carried by the face of the applicator and deposited over the window opening "f" of the blank that is then moving over the counter cylinder 44, to make sealing contact with the adhesive "g." The blank continues its movement by engagement between the runs 45 and 46 of the belts, and is deposited from the forward ends of the conveyor belts onto the feeding belt 8 of the envelope making machine, with the inner face uppermost, whereon the blanks continue through the operating sections of the envelope making machine 1.

It is obvious that the method of applying the patches involves steps of piling the blanks in a stack with outer faces upwardly; removing the uppermost blank from the stack while keeping the outer face uppermost; reversing the face of the blank during removal of the blank from the conveying means 12 to bring the inner face uppermost; applying adhesive to said inner face during said last reversal; applying a patch to the upturned inner face of the

blank in sealing contact with the adhesive; and conveying the blank to the forming, folding and gumming sections of the envelope making machine. It is also obvious that the blanks are diverted from the suction roll in a path running in the opposite direction from the path leading to the folding mechanism, to have the adhesive and patches applied, and that the blanks are conveyed in a return path back to the path leading to the folding mechanism.

While I have particularly illustrated and described the invention as applying transparent patches over the window openings of envelope blanks, it is obvious that the inner faces of the body portions *"e"* of the blanks may be lined, or partially lined, with a patch large enough to cover the desired area, and which is deposited and sealed in the same manner as the window patch.

The term "patch" as used in the specification and included in the following claims is intended to refer to either a patch of lining material, a window patch, or a patch for any other purpose when applied to an envelope blank.

While I have particularly illustrated the invention as relating to an attachment for an existing envelope making machine, it is obvious that the mechanism of the present invention may be incorporated in the construction of a standard envelope making machine during the building thereof.

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

1. In a machine for making either ordinary envelopes or envelopes with patches sealed thereto, using a single folding and sealing mechanism,

means for feeding envelope blanks in succesive order,

conveying means connecting the blank feeding means with a blank folding and sealing means for carrying blanks directly to the folding and sealing means in making ordinary envelopes without patches,

a patch applying means remote from the folding and sealing means,

a conveyor separate from said conveying means and connecting the blank feeding means with the patch applying means for carrying blanks to the patch applying means when making envelopes with patches,

conveying means connecting the patch applying means with said first named conveying means for delivery of the blanks with the patches applied thereto to said blank folding and sealing means, and

means between the blank feeding means and said conveyor for diverting blanks from the blank feeding means to said conveyor.

2. In a machine for making either ordinary envelopes or envelopes with patches sealed thereto, using a single folding and sealing mechanism,

means for feeding envelope blanks from a stack in successive order,

conveying means between the blank feeding means and a blank folding and sealing means for carrying blanks directly to the folding and sealing means when making ordinary envelopes without patches,

means for diverting blanks from said feeding means for making the envelopes having patches,

a conveyor receiving the blanks from said diverting means and extending away from the blank folding and sealing means,

said conveyor having pins thereon to register the blanks transported thereon,

means at the delivery end of the conveyor for reversing travel of the blanks,

means cooperating with said reversing means for applying adhesive to the blanks,

return conveyor means receiving the blanks from the reversing means and extending back over the first named conveying means to deliver said last named blanks to the folding and sealing means, and

means near the receiving end of the return conveyor for applying patches onto the adhesive on said blanks whereby the patches are set by the time said blanks reach the folding and sealing means.

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