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MULTIPURPOSE SUCTION ROLL FOR ENVELOPE MAKING MACHINES

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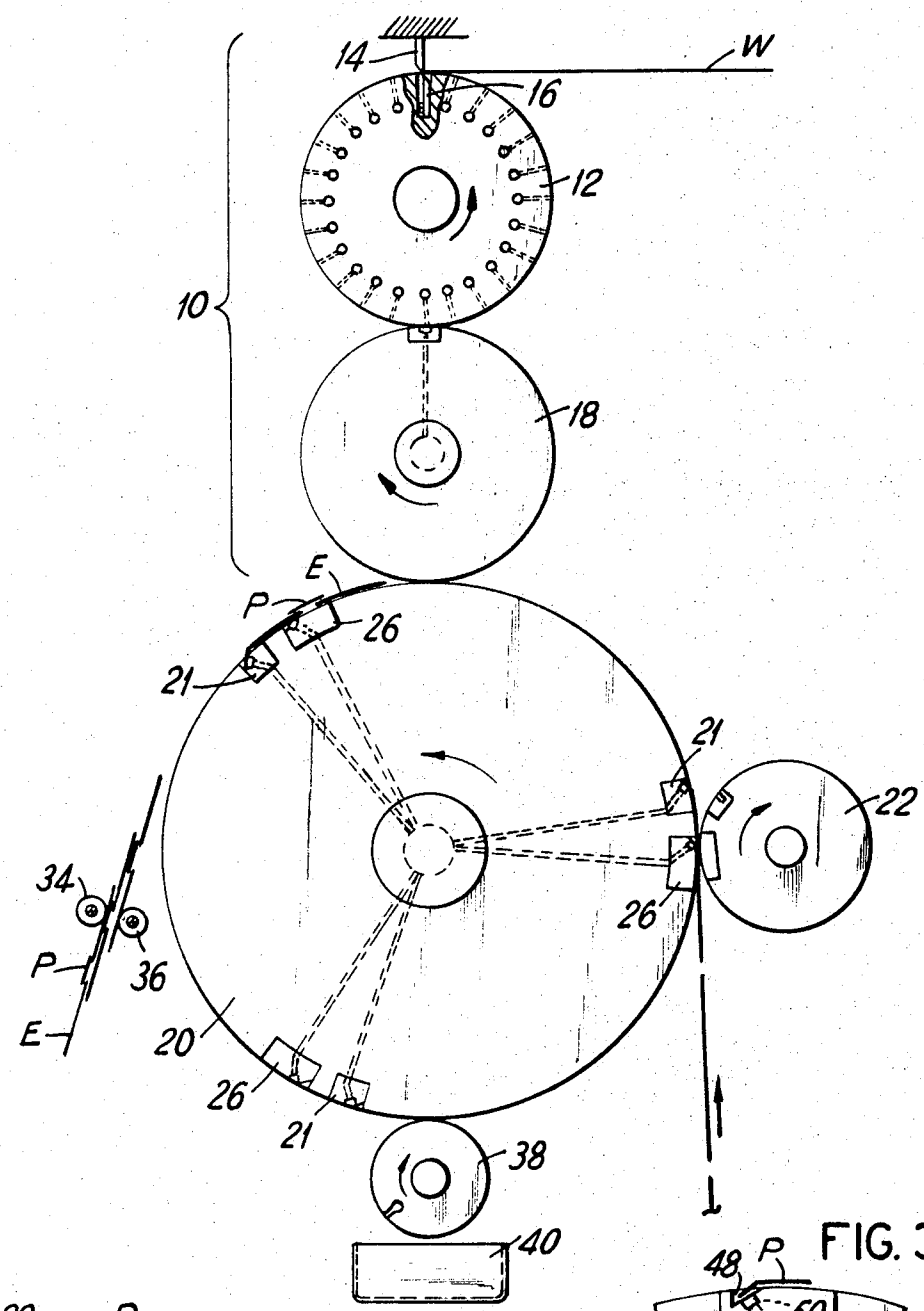


FIG. 1

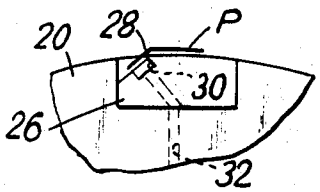


FIG. 2

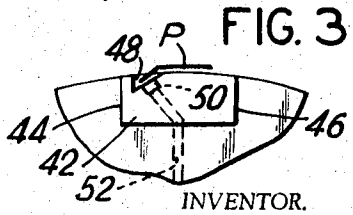


FIG. 3

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MULTIPURPOSE SUCTION ROLL FOR ENVELOPE MAKING MACHINES

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ABSTRACT OF THE DISCLOSURE

In an envelope making machine, a single cylinder provides the multiple functions of successively receiving individual envelope blanks, receiving window patches in timed relationship to the envelope blanks, collating the envelopes after a patch has been applied and removing patches that have not been applied to the envelope blank. Means are provided to carry the blank to apply the patches and to collate the processed blanks. But should a blank be missing from the stream of blanks flowing to the collating apparatus, means are provided to hold down the leading edge of the patch that would normally be associated with the missing blank. The edge of the patch to be removed is held below the surface of the cylinder by suction until the nonapplied patch moves past the collating area and then it is automatically removed from the cylinder.

This invention relates generally to envelope making machines and in particular to a single, multi-purpose cylinder that performs the several separate and distinct functions of separately receiving the patches and envelope blanks, collating the processed blanks and holding non-assembled patches until they can be removed.

The present state of envelope making machine art permits envelopes to be manufactured at tremendously high rates of speed. In one form of envelope currently being used, a window opening is provided in the front face of the envelope and a transparent patch is adhesively applied over the window opening. It is essential that these envelopes be manufactured at a high rate of speed in order that they may be competitively priced. The present invention is particularly directed to apparatus related to the window patch applying section of the machine and which, in adidtion, is able to collate the processed envelope blanks and remove any patches that are not applied because a blank is missing. All of these functions are provided by a single cylinder whereby the machine may be made more compactly and the suction source for the machine may be used more efficiently.

Accordingly, it is an object of this invention to provide, in combination with an envelope making machine, apparatus for applying a patch to a window envelope blank, collating the processed blanks and in addition removing any patches not applied due to missing blanks.

It is another object of this invention to provide the aforementioned operations on a single cylinder.

A particular object of this invention is to provide means on the patching and collating cylinder that will engage and hold a patch that has not been applied because a blank is missing from the stream of blanks.

These and other objects, features and advantages of the invention will, in part, be pointed out with particularity and will, in part, become obvious from the following more detailed description of the invention, taken in

conjunction with the accompanying drawing, which forms an integral part thereof.

In the various figures of the drawing, like reference characters designate like parts.

In the drawing:

FIG. 1 is a schematic side elevational view of one embodiment of the present invention;

FIG. 2 is an enlarged fragmentary side elevational view of one portion of the apparatus shown in FIG. 1; and

FIG. 3 is an other enlarged fragmentary side elevational view of an alternative embodiment of the portion of the apparatus shown in FIG. 2.

Referring now to the drawings, FIG. 1 schematically represents a typical window patch applying station **10** of a conventional type of envelope making machine, although any other method of patch applying could be substituted. The mechanisms which perform the preceding and subsequent operations are well known in the art and for purposes of simplicity need not be illustrated. The present invention utilizes suction patch applying mechanism **10** with a suction roller **12** suitably journalled in the side frames of the machine (not shown). Directly above roller **12** are the means for blanking out the window patches from a continuous web W of window material. The patch blanking means are comprised of roller **12** and coacting knives **14** and **16** that are shown schematically. Vacuum means conventional in the art are arranged to hold the cut patches until such time as they may be delivered to transfer roller **18**.

The main cylinder **20** comprising this invention cooperates with a feed and gumming roller **22** that is arranged to apply adhesive around the window opening and to deliver blanks in suitably timed relation with the delivery of the window patches. Roller **22**, as well as rollers **12** and **18** are journalled in the side frame of the machine and need not be described in greater detail at this time since they are by themselves conventional in the art.

Member **21** is a segment with a bevel, or notch, which by suction means deflects the leading edge of each envelope blank inward so that, when blanks are lapped together the heading edge cannot hook or interfere with the already lapped blanks. This method of blank-edge protection is well known in the art.

Cylinder **20** is also provided with a plurality of segments **26** having the same outside diameter as its main parts so that in the assembled condition the cylinder **20** presents a substantially continuous outer surface. Referring particularly to FIG. 2, it will be seen that each of the segments **26** has a beveled end face **28** provided with an aperture **30** that communicates directly via conduit means **32** with a source of vacuum (not shown). The segments **21** and **26** are housed on discs or wheels which make up the bulk of cylinder **20**. Means are provided to allow segments **21** and **26** to be mutually adjustable so that different patch sizes and positions may be used.

As may be seen in FIG. 1, envelope blanks E are fed one after the other in spaced relation to cylinder **20**. The window patches cut by knives **14** and **16** are fed by rollers **12** and **18** to a superimposed position over the window openings in the blanks. The feeding of the patches P is of course in properly timed relation with the feeding of the blanks. However, should for some reason a blank be absent, that is, not fed or perhaps defective, it is essential that the patch that would be normally applied thereto be retained on the cylinder **20** in such a manner that it does

not interfere with the subsequent feeding of the following envelope blanks. It is also essential that this patch be subsequently removed from cylinder **20** at the appropriate time so that it does not interfere with the oncoming stream of envelope blanks.

For this reason bevel **28** is provided on member **26**. Normally the body portion of an envelope blank is positioned over the bevel and the suction port, for example as shown in FIG. 1, and cannot be pulled down by the suction force. However, if an envelope blank is missing, the leading edge of the patch will be positioned on the segment **26** as shown in FIG. 2 and due to the fact that it is several times thinner and consequently weaker than the enevelope blank, will be sucked down onto the beveled surface **28**. The leading edge of the patch will therefore be held below the surface of cylinder **20** so as not to hook or interfere with the collated blanks. Bending the front edge of the patch over the edge of the radial surface of **26** to the bevel **28** will increase the tension of patch adherence so that any contact of the patch with the collated blanks, as it is pulled past them, will not pull it off member **26**.

The next step performed by the multipurpose cylinder **20** is the collation of envelope blanks having window patches applied thereto. Rollers **34** and **36** are suitably journalled in the machine and are driven at a speed that has a specific relation to the speed at which the cylinder **20** is driven. Rollers **34** and **36** receive the leading edge of each envelope blank and because they are driven at a somewhat slower speed, the envelope blanks will be successively fed so that they are collated in a lapped relationship for subsequent operations thereon. Suction means are provided (not shown) to hold the blank side flaps until the front portions of the blank are gripped by the rollers **34** and **36**. Then the blanks are fed in their lapped relationship to another portion of the machine whereby glue may be applied to the flaps and then the flaps folded in a well known manner to form the finished envelopes. Conventional structure may be utilized to separate the blanks at the folding station.

Assuming that an envelope blank or blanks are missing from the stream of blanks being fed by roller **22**, the patches that would be normally applied thereto and which are being continuously fed in timed relationship by rollers **12** and **18**, would be contained on the surface of cylinder **20**. As described above, the leading edge of these non-applied patches will be pulled down and held on the beveled surface **28**. At the bottom of cylinder **20**, as shown in FIG. 1, still another suction roller **38** is provided, this last mentioned roller being disposed directly above a container **40**. When the non-applied patch reaches the area of roller **38**, the suction in this roller will remove the patch from cylinder **20** and deposit it in the container. The suction in the member **26** is momentarily turned off by automatic means (not shown) and then reapplied once member **26** passes suction roller **38**.

It will be apparent from the foregoing that when a non-applied patch is present as a result of the absence of an envelope blank from the main stream, the leading edge of the patch is effectively deflected from the path of the blanks so as not to interfere with the collating function of the multipurpose cylinder **20**. In addition, the non-applied patch is effectively removed from the surface of the cylinder **20** so that, as that portion of the cylinder **20** approaches the blank feeding and gumming roller **22**, the blanks may be applied to the cylinder as previously described without interference from the non-applied patch.

FIG. 3 illustrates a modification and preferred form of the segment that is utilized to hold down the tip of the non-applied patch. In contrast to the embodiment of FIG. 2, member **42** (FIG. 3) has two radial ends **44** and **46** and a V-shaped notch **48** formed in the outer surface thereof. Radial end **44** acts as a support for the body of the blank near the leading edge of the window opening.

Further, an aperture or port **50** is formed in one of the faces of the V-shaped notch and is in communication with conduit **52** connected to the suction source. Should a blank be absent from the main stream, the leading edge of the patch will be sucked down into the notch by the vacuum and thereby be out of the path of the envelopes that are to be collated in the manner described above in connection with the first embodiment. Non-applied patches are removed from member **42** in the same manner as described in connection with the previous embodiment. Use of these notches, or bevels, is essentially what enables three separate processing functions to be accomplished upon one cylinder.

There has been disclosed heretofore the best embodiment of the invention presently contemplated. It is to be understood however that various changes and modifications may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. In a machine for assembling patches to window envelope blanks and which includes means for delivering envelope blanks to an assembly area, means for cutting, delivering and applying the patches to the envelope blanks in the assembly area and means to remove the assembled envelopes, the improvement comprising:

(a) a rotating member arranged to receive the envelope blanks on the surface thereof;

(b) means rotating with said member for holding a non-applied patch in the absence of an envelope blank with a portion of the patch disposed in a plane out of the path of the envelope blanks; and

(c) means for removing the non-applied patch from said patch holding means.

2. The apparatus in accordance with claim **1**, wherein said patch holding means comprises a segment secured to said rotating member and means for applying a suction force to the non-applied patch to deflect the leading edge of the non-applied patch below the surface of the rotating member and in a plane out of the path of the envelope blanks.

3. The apparatus in accordance with claim **2**, wherein said segment includes a beveled surface and said means for applying suction comprises an aperture communicating said beveled surface and a source of vacuum.

4. The apparatus in accordance with claim **2**, wherein said segment includes a notch defined by at least two surfaces and said means for applying suction comprises an aperture communicating one of said surfaces with a source of vacuum.

5. The apparatus in accordance with claim **1**, wherein said means for removing the non-applied patch comprises a rotating member and means integral therewith for applying a suction force greater than the force of said holding means.

6. A multipurpose assembly for use in combination with a machine for making window envelopes having patches thereon, said assembly comprising:

(a) a rotating member adapted to receive the envelope blanks and patches thereon;

(b) means to deliver the blanks to said rotating member;

(c) means to deliver the patches to said rotating member in timed relationship to the delivery of the blanks and to secure the patches to the blanks;

(d) means to hold the patches on the surface of said rotating member in the absence of a blank with a portion of the patch disposed below the surface of said rotating member and in a plane out of the path of the envelope blanks;

(e) means to remove the assembled envelope from said rotating member for collation;

(f) means to remove non-applied patches from said rotating member.

7. In a machine for assembling patches to envelope blanks which includes means for delivering envelope

blanks to an assembly area, means for cutting, delivering and applying the patches to the envelope blanks in the assembly area, the improvement comprising: means moving with said means for delivering envelope blanks for holding a non-applied patch thereon in the absence of a corresponding envelope blank with a portion of said patch located in a plane out of the path of movement of said envelope blanks, and means for removing the non-applied patch from said patch holding means.

References Cited

UNITED STATES PATENTS

2,996,962	8/1961	Winkler et al.	93—61
3,029,176	4/1962	Schoonmaker	156—567 XR

BERNARD STICKNEY, *Primary Examiner.*

U.S. Cl. X.R.

156—521, 568