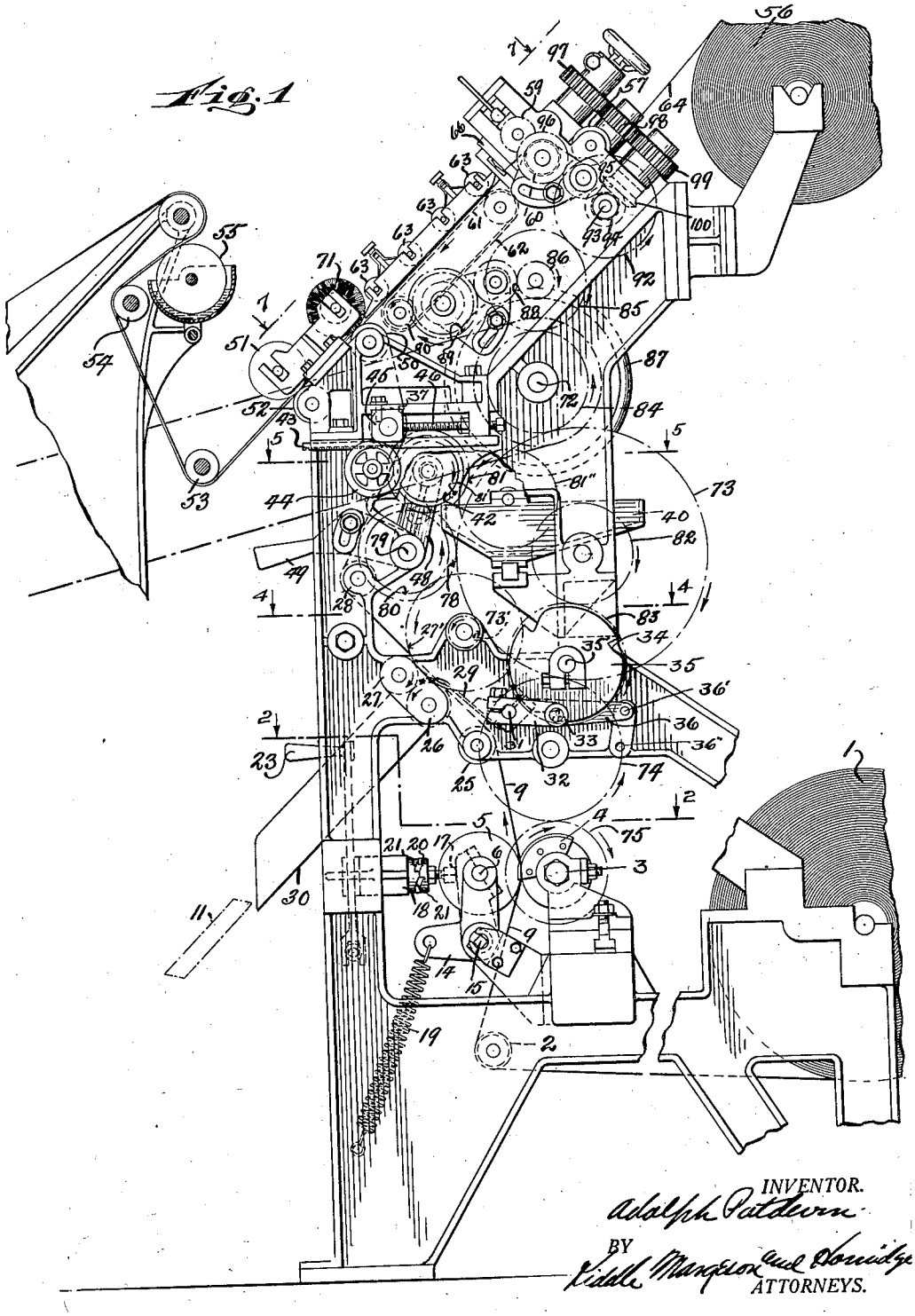
March 26, 1935. A. POTDEVIN 1,995,719

APPARATUS FOR HANDLING STRIP MATERIAL

Filed April 14, 1932 4 Sheets-Sheet 1

Fig. 1



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APPARATUS FOR HANDLING STRIP MATERIAL

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Fig. 5

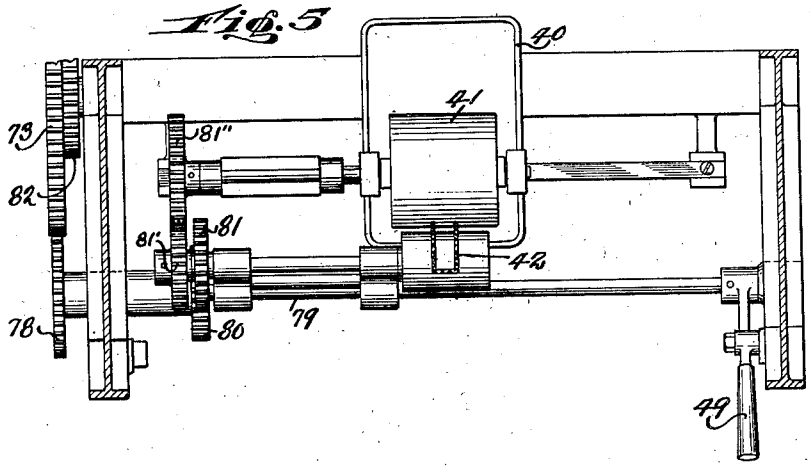


Fig. 4

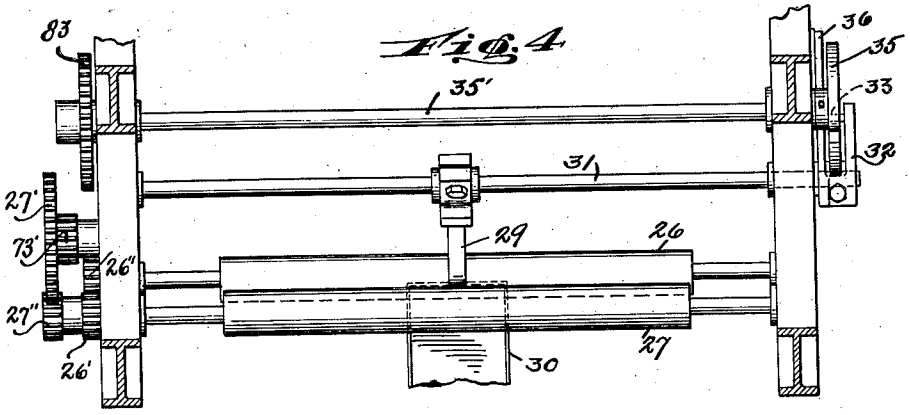


Fig. 2

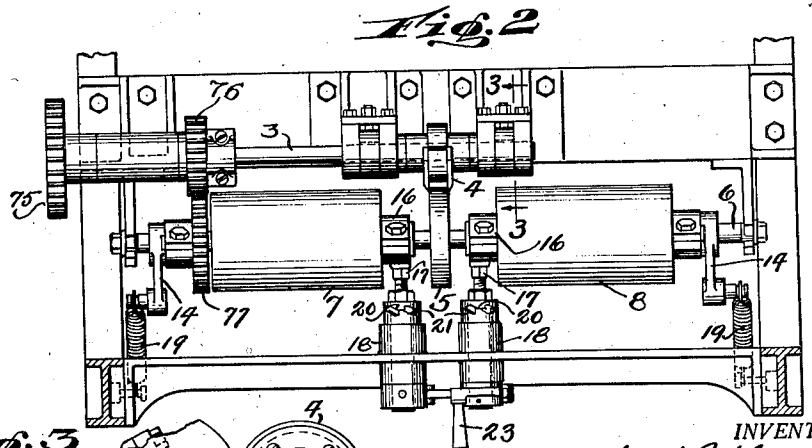
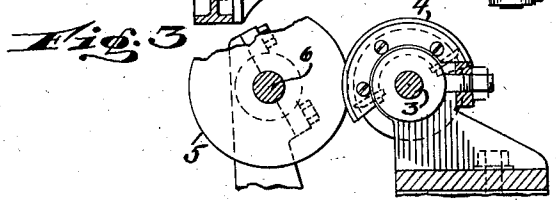


Fig. 3



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APPARATUS FOR HANDLING STRIP MATERIAL

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Fig. 7

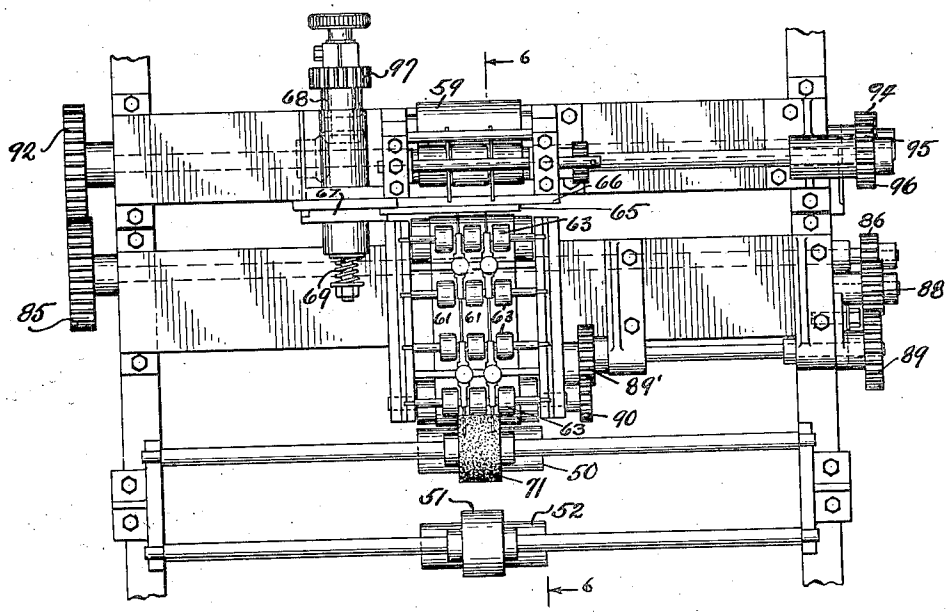
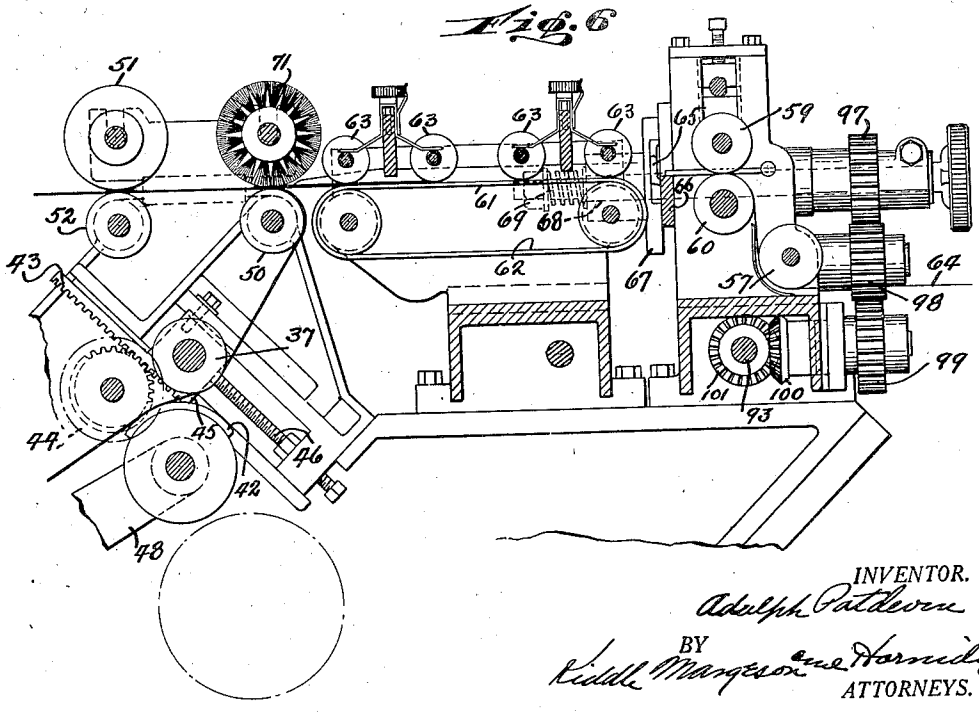


Fig. 6



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APPARATUS FOR HANDLING STRIP MATERIAL

Filed April 14, 1932 4 Sheets-Sheet 4

Fig. 12

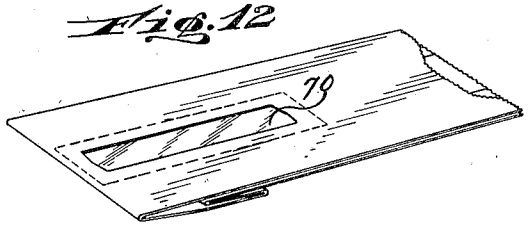


Fig. 10

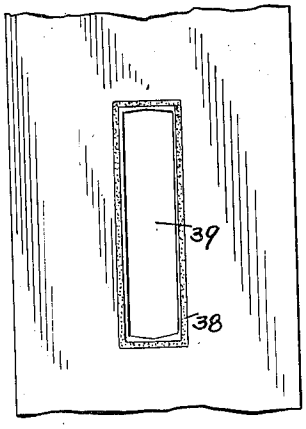


Fig. 11

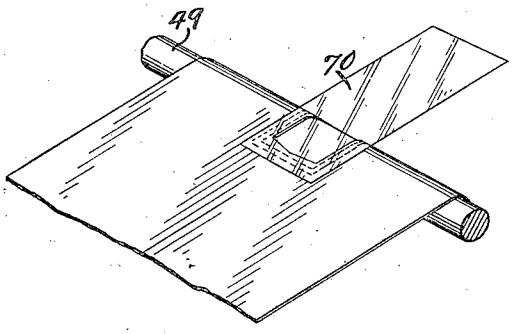


Fig. 8

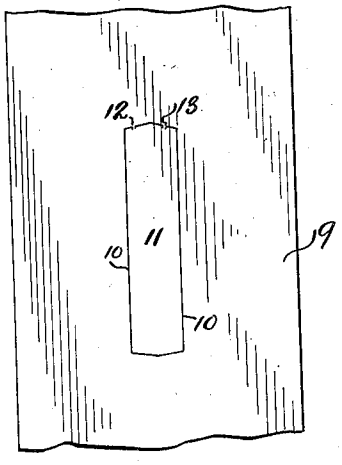
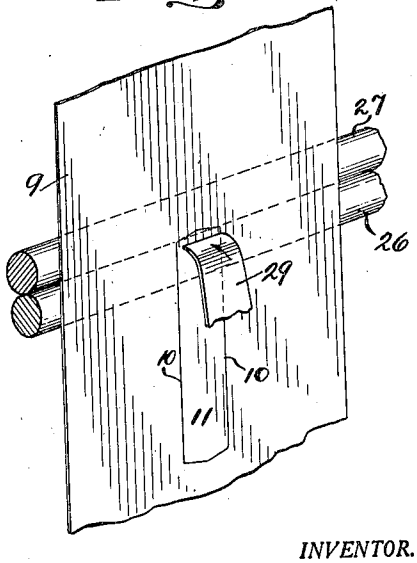


Fig. 9



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UNITED STATES PATENT OFFICE

1,995,719

APPARATUS FOR HANDLING STRIP MATERIAL

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Application April 14, 1932, Serial No. 605,280

25 Claims. (Cl. 93—8)

The present invention relates to machines for handling strip materials and provides an apparatus adapted for continuously providing window openings in a traveling strip and applying windows thereto.

In the drawings accompanying this application:

Fig. 1 is an elevational view of a machine or apparatus adapted for the practice of my invention;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a section on the line 3—3 of Fig. 2,

Figs. 4 and 5 are sections on the lines 4—4 and 5—5, respectively, of Fig. 1;

Fig. 6 is a section on the line 6—6 of Fig. 7;

Fig. 7 is a section on the line 7—7 of Fig. 1;

Figs. 8, 9, 10 and 11 are more or less diagrammatic views illustrating the several steps involved in the practice of my invention in the provision of a window opening in a strip of material and the application of a window thereto; and

Fig. 12 is a perspective view of a bag provided with a window constructed in accordance with the present invention.

Referring to the drawings in detail, 1 designates a supply roll of paper or other suitable material, this material continuously passing from the roll around an idler roller 2 and from thence to punching mechanism where a window opening is formed in the material. The piece of material which is to be removed in the forming of the window opening is not removed at this point however.

Referring to Figs. 1, 2 and 8 particularly, it will be seen that I have provided a shaft 3 extending transversely of the machine, this shaft carrying a rotary punch 4 cooperating with rotary anvil 5.

As will be seen from Fig. 2 the anvil 5 is mounted on a shaft 6 extending transversely of the machine carrying rollers 7 and 8 at each side of the anvil 5 so that the machine will accommodate paper of any desired width.

The punch 4 is of such construction that the material 9 will be cut as shown in Fig. 8 along the lines 10 defining a more or less rectangular shaped window opening, the material 11 which is to be removed to provide the window opening still being held to the main sheet by two or more uncut portions 12 and 13. I might say in passing that the shape of the opening provided by the punch 4 will of course depend upon the style of punch employed, the particular opening illustrated being merely by way of example.

The spacing of the window openings in the material 9 depends upon the diameter and length of the punch 4. The shaft 3 carrying the punch 4 is fixed, therefore when the diameter of the punch 4 is changed in varying the spacing of the window openings the anvil 5 must be adjusted. This is accomplished by mounting the shaft 6 on bell cranks 14 pivoted at 15. The shaft 6 is also provided with collars 16 adapted to cooperate with stops 17 which are adjustable in mounts 18 and the collars 16 are held in engagement with the stops 17 by springs 19 one end of each of which is fastened to each arm of the bell cranks, the other end being fastened to a suitable part of the machine frame. By adjustment of the stops 17 therefore the anvil 5 can be accommodated to any changes in the diameter of the punch 4 so as to accommodate the machine to cutting window openings at different distances apart. It is desired also that the machine be so arranged that the material 9 may readily be threaded through the machine initially and for this purpose I provide the rear of each of the mounts 18 with a rotatable cam 20 adapted to cooperate with a cam 21. The members 20 are adapted to be rotated by a handle 23 and when this handle is actuated in one direction the members 20 will be turned to position to permit the springs 19 to retract the anvil 5 moving the same away from the punch 4 and providing a space between the members 4 and 5 so that the paper may be threaded through the machine. After the paper has been placed in position the handle 23 may be turned in the opposite direction, and the parts will assume the positions shown in Figs. 1 and 2 from which figures it will be seen the anvil 5 is in operative position with respect to the punch 4.

After passing the punch mechanism just described the paper 9 passes over idler roller 25 and over a pair of driven rollers 26 and 27 to roller 28. As above noted the section 11 is not quite completely severed from the web 9 by the punch mechanism in the window-forming operation just described and accordingly to remove this section 11 I provide a striker bar 29 adjacent the two rollers 26 and 27 which bar is intermittently operated at regularly timed intervals to strike the section 11 to cause the same to be torn away from the web 9 and to pass between the driven rollers 26 and 27 which discharge the section 11 into a trough 30 by which the section is discharged outside the machine. This disposes of the sections 11 in a simple manner and prevents their clogging the machine.

The striker bar 29 is mounted on a shaft 31 which extends transversely of the machine. One

end of this shaft carries a short arm 32 provided with cam-engaging fingers 33 at its free end adapted to cooperate with notches or cams 34 in the periphery of a rotatable actuating member 35. This same end of the shaft 31 carries an arm 36. With the machine operating this arm is in the position shown in Fig. 1. When threading the machine initially the pin 36' is withdrawn, arm 36 moved down and the pin 36' inserted in hole 36'', so as to raise knockout or striker bar 29 and move finger 33 away from the face of member 35.

The construction above described provides an arrangement whereby as the member 35 is rotated, in the direction of the arrow on the drawings, the shaft 31 will be intermittently rocked to cause the striker bar 29 to engage the sections 11 which are to be removed from the web 9. The striker 29 is shown just about to engage one of these sections 11 of the web in Fig. 9, and it will be appreciated that the striker will disconnect this section from the web, as above noted, and force the leading end thereof between the rollers 26 and 27 so that the section will be pulled out of the machine and into the trough 30 from which it will discharge as already described.

From the roller 28 the web 9 passes to an adjustable roller 37. The web in its passage from 28 to 37 passing the pasting mechanism which is adapted to apply paste to the face of the web as shown at 38 in Fig. 10 around the edges of the window opening which is now provided and which I shall designate 39. The pasting mechanism comprises a paste tank 40, pasting roller 41 and pasting segment 42. The form of this segment 42 is best seen in Fig. 5 from which it will be apparent that the same is so shaped as to apply paste to the web 9 in a rectangular form as shown in Fig. 10 about the window opening 39. Of course it will be appreciated that the form of the segment 42 will be varied to correspond to window openings of various shapes, a rectangular opening, as already mentioned, having been shown merely by way of illustration.

The roller 37 is made adjustable so that the strip of paper from the rollers 28 to 37 may be adjusted with respect to the paste-applying segment 42. This adjustability is accomplished by providing racks 43 adapted to be actuated by a hand wheel 44, these racks carrying mounts 45 for the roller. In addition threaded adjusting members 46 are provided for a finer adjustment of mounts 45. This not only permits the web to be adjusted with respect to the pasting segment 42 but also adapts the machine to different bag lengths, a change in the bag length necessitating a change in the diameter of the pasting segment 42 as will be appreciated, just as a change is necessary in the diameter of the punch 4, as above explained. In this connection the pasting segment 42 is mounted on arm 48 adapted to be moved by a handle 49 by which the pasting segment 42 is moved toward or away from the pasting roller 41.

After the web 9 has passed the pasting mechanism and about the roller 37 it is bent around a roller 50 as shown in Fig. 1, and passes between the two rollers 51 and 52 about idler rollers 53, 54 to pasting mechanism 55 and from thence to tube-forming mechanism (not shown) if the web is to be formed into a bag. If the web is not immediately to be formed into a bag, or if it is desired continuously to provide a traveling paper web with windows, the strip to be used for wrappers, for instance, then the paper after leaving the rollers 51 and 52 will merely be rolled up on a receiving roller.

From the description thus far given it will be seen that I have provided an apparatus adapted continuously to cut out sections of a traveling paper web at predetermined intervals to provide window openings, and to apply paste about the edges of these openings for the reception of the window.

I shall now proceed to describe the handling of the window material and its application to the window openings. This apparatus is clearly illustrated in Figs. 1, 6 and 7.

56 designates a supply roll of the material which is to be employed for the windows, which may be cellophane for instance, or glassine or any other suitable transparent or semi-transparent material. This window material passes from the supply roll around the roller 57, between rollers 59 and 60 and between the upper lead 61 of traveling belts 62 and a plurality of spring-loaded rollers 63, and finally into position above the web 9 as the same passes about the roller 50, previously referred to. As the window material, which I shall designate 64, passes from the rollers 59 and 60 to the belt 62 it is cut off by a knife 65 which engages the material intermittently. The knife is in the form of a bar cooperating with stationary member 66 which as will be seen from Fig. 6 is provided with a shoulder along which the material travels on its way to the belt or conveyor. The knife 65 is in the form of a bar carried by disc 67 which is mounted on a shaft 68. The drive for this shaft will be referred to later. The disc 67 is keyed to its shaft but is adapted to slide longitudinally thereof and a spring 69 is provided for the purpose of holding the member 65 against the cooperating cut-off plate 66.

The conveyors 61 travel at the same speed as the web 9. As before mentioned the several sections of the material 64 as they are cut off are advanced by the conveyors 61 and the machine is so timed that as the leading end of the window opening 39 reaches the top of the roller 50 the leading end of a window section 70 will have reached the same point and the window will gradually be applied to the window opening 39, the web 9 as above explained having previously been pasted around the edges of the window opening.

Immediately above the roller 50 is a brush roller 71 for pressing the window sections 70 into firm engagement with the traveling web 9. I have found that this type of roller is very effective for this purpose particularly where the window sections 70 are of glassine, "Cellophane", or similar materials which are rather difficult to paste to paper, the bristles of the brush seemingly having a much better pressing action on the window section than a solid roller.

The main drive shaft for the machine is 72, this shaft being driven from any suitable source of power. The shaft 72 carries a gear 84 meshing with large gear 73. The gear 73 meshes with intermediate gear 74 in mesh with gear 75 on the shaft 3 for the punch 4. The shaft 3 also carries a gear 76 meshing with gear 77 on the shaft 6 of the anvil 5, this gear train providing a drive for the punch and its cooperating anvil.

The stud carrying gear 73 carries gear 82 meshing with gear 83 on the shaft 35' carrying the knockout control member 35, to provide a drive for this control member.

The knockout rolls 26 and 27 are also driven

from the gear 73, through gears 73', 27', 27'', 26' and 26''.

The gear 73 also meshes with gear 78 on shaft 79, this shaft carrying a gear 80 meshing with a gear 81 on the shaft of the pasting segment 42. This shaft carries gear 81' meshing with gear 81'' on the shaft of the glue roller.

If the interval between window openings should be changed then of course as I have already explained the diameter of the punch 4 would have to be changed and the anvil 5 moved either to the right or left, as viewed in Fig. 1, as the case may be, depending upon whether the diameter of the punch 4 were increased or decreased.

The belts 61 are driven through gear 84 which is in mesh with a gear 85, the shaft carrying this gear being provided with a change gear 86 meshing with intermediate gear 88 in turn meshing with gear 89, this gear 89 in turn meshing with gear 90 on the drive shaft for the belts 61. By changing the gear 86 the speed of the belts 61 may be varied as desired to correspond to any changes in the linear speed of the web 9.

The gear 85 meshes with a gear 92 on a shaft 93, this shaft carrying a change gear 94 meshing with intermediate gear 95 in turn meshing with gear 96 on the shaft of the roller 60 which is one of the advancing rollers for advancing the material 64. By changing the gear 94 the speed of the advance of the material 64 to the cutting-off station may be varied so as to accomdate the machine to any changes that may be made in the linear speed of the strip 9.

The shaft 68 which carries the knife 65 is provided with a gear 97 meshing with intermediate gear 98 in mesh with gear 99. The gear 99 is mounted on a shaft provided with a bevel gear 100 driven off a bevel gear 101 on the shaft 93.

From the foregoing, therefore, it will be seen that I have provided a machine adapted for continuous operation in which an advancing web of paper has window openings formed therein over which is applied a window, the window material being taken from a roll, the window sections severed therefrom and advanced to the point where this window material is brought into contact with the advancing web of paper at the right time to apply the window over the window opening.

It is to be understood that the material produced by this machine may be employed for various purposes, that is, may be left in strip form if desired or may be fed into a bag making machine to be formed into bags in a continuous operation.

What I claim is:—

1. In a machine for providing window openings in a continuously advancing web, the combination of a rotary punch shaped to correspond substantially to the shape of the opening to be made, a cooperating rotary anvil, said punch being provided with a formation adapted to leave the window section attached to the web in the formation of the window opening, and means permitting of the bodily movement of the anvil away from the punch to permit of threading the machine, and means for varying the permanent setting of the anvil relative to the punch to permit of the use of punches of different dimensions.

2. In a machine for providing window openings at regular intervals along the length of a continuously advancing web, the combination of a rotary punch, means for driving the same, a cooperating rotary anvil, means for temporarily varying the setting of the anvil with respect to said punch to permit of initial threading of the web between the punch and anvil, and means for varying the permanent setting of the anvil with respect to the punch to permit of the use of punches of different diameters.

3. In a machine for providing window openings at intervals along the length of an advancing web, the combination of a rotary punch, a cooperating rotary anvil, a shaft pivotally mounted carrying said anvil, and means for pivoting said shaft in its mount to vary the position of the anvil relatively to the punch to permit the web initially to be threaded into the machine between the punch and anvil.

4. In a machine of the class described, the combination of a rotary punch, a cooperating rotary anvil, a shaft mounting said anvil, springs for effecting bodily movement of the shaft and anvil to separate the same to permit of threading the machine initially, and cam mechanism thereafter to bring the anvil into operative position relatively to the punch.

5. In a machine of the class described, the combination of mechanism for providing partially severed window openings in a continuously advancing web, knock-out mechanism following the first mentioned mechanism and engaging the unsevered portion of the window sections positively to complete the severing operation, and driven rollers for receiving the severed web section from the knock-out mechanism and discharging the web sections out of the machine.

6. In a machine of the class described, the combination of mechanism for providing partially severed window openings in a continuously advancing web, knock-out mechanism following the first mentioned mechanism and engaging the unsevered portion of the window sections positively to complete the severing operation, driven rollers for receiving the web sections knocked out by said knock-out mechanism, and a discharge spout for receiving said web sections from the said rollers to discharge them out of the machine.

7. In a machine of the class described, the combination of a knock-out member, a shaft mounting the same, a cam, a cam-engaging member carried by said shaft, whereby said knock-out member is rocked into and out of the plane of a continuously advancing web, and means for moving said cam-engaging member out of engagement with said cam to hold the knock-out member out of the plane of the advancing web to permit of threading the machine.

8. In a machine of the class described, the combination of punch and anvil mechanism for forming window openings at regular intervals in a continuously advancing web, knock-out mechanism following the first mentioned mechanism for removing the web sections at the window openings, and pasting mechanism following the knock-out mechanism for applying paste about the edges of the window openings, and means for varying the pasting mechanism to accommodate the same to changes in window opening spacing.

9. In a machine for providing window openings at intervals in a continuously advancing web, means for applying paste about the edges of the window openings, a web guiding roller following the pasting mechanism, and rack and pinion mechanism for varying the setting of said roller with respect to the pasting mechanism.

10. In a machine for providing window openings at intervals in a continuously advancing web,

pasting mechanism for applying paste about the edges of the window openings, a web guiding roller following the pasting mechanism, rack and pinion mechanism for varying the setting of the said roller with respect to the pasting mechanism, and means additional to said rack and pinion mechanism for obtaining an additional and finer adjustment of the setting of said roller.

11. In a machine of the class described, the combination of means for continuously advancing window material, a striker bar for successively severing window sections from the continuously advancing window material, belts for advancing the window sections to the window openings to which they are to be applied, and change gearing for driving said advancing means and said belts.

12. In a machine of the class described, the combination of means for continuously advancing window material in web form, a striker bar for cutting off the window material to provide windows of the desired length, belts and cooperating rollers for forwarding the window sections to the window openings to which they are to be applied, and change gearing for driving said advancing mechanism and said forwarding belts.

13. In a machine of the class described, the combination of a rotatable cutter and cooperating anvil for forming window openings at intervals along the length of a continuously advancing web, means for applying paste about the edges of the window openings, means for adjusting said anvil to accommodate cutters of different diameter whereby the spacing of the window openings will be varied, and means for forwarding window sections to said window openings in correspondence with the variable spacing of said openings and with the window sections traveling in the same direction as the window openings and in superposed relation thereto.

14. In a machine of the class described, mechanism for providing window openings at intervals along the length of a continuously advancing web, pasting mechanism thereafter to apply paste about said openings, window section forming mechanism and forwarding mechanism for forming window sections for said openings and forwarding the same to said openings with the window sections traveling in the same direction as the window openings, and in superposed relation thereto, and a brush roller for engaging the window sections as the same are successively fed to the window openings.

15. In a machine of the class described, the combination of means for forming window openings at regular intervals in a continuously advancing web, means for applying paste about the window openings during the advance of the web, and belts and cooperating spring loaded rollers for conveying window sections to said window openings in timed relation thereto, with the window sections and the web traveling in the same direction and at the same speed.

16. In a machine for providing window openings in a continuously advancing web, the combination of a rotary punch shaped to correspond substantially to the shape of the opening to be made, a cooperating rotary anvil, said punch being provided with a formation adapted to leave the window section attached to the web in the formation of the window opening, a pivotally mounted shaft carrying said anvil, means for pivoting said shaft in its mount to move the anvil away from the punch to permit of threading the machine, and adjustable stop mechanism for varying the permanent setting of the anvil relatively to the punch to permit of the use of punches of different dimensions.

17. In a machine for providing window openings at intervals in a continuously advancing web, pasting mechanism for applying paste about the edges of the window openings, a web guiding roller following the pasting mechanism, mounts for the roller, rack and pinion mechanism for varying the setting of said mounts, to vary the setting of the said roller with respect to the pasting mechanism, and threaded adjusting means additional to said rack and pinion mechanism for obtaining an additional and finer adjustment of the setting of said roller mount.

18. In a machine of the class described, the combination of punch and anvil mechanism for providing window openings at regular intervals in a continuously advancing web, said punch and anvil mechanism only partially severing the window section from the web, knock-out mechanism following the punch and anvil mechanism, said knock-out mechanism comprising a pivoted arm adapted to engage the partially severed section for completing the severing operation, and means for removing the window section from the machine.

19. In a machine of the class described, the combination of a mechanism for providing window openings in a continuously advancing web, knock-out mechanism following the first-mentioned mechanism and comprising a pivoted arm adapted to engage the web section for completing the detaching of the web sections from the web in the forming of the window openings, said arm forcing these sections laterally out of the plane of the web and paste applying means for applying paste about the window openings after the removal of said web sections.

20. In combination means for providing window openings at intervals along the length of a continuously advancing web, means for advancing a supply of window material, a striker bar for severing window sections successively from said advancing window material and belts for advancing the severed window sections to the window openings.

21. In a machine of the class described, the combination of means for forming window openings at regular intervals in a continuously advancing web, means for applying paste about the window openings on the continuous advance of the wab, belts and cooperating rollers for forwarding the window sections to the window openings in timed relation thereto with the window sections of the window openings advancing in the same direction, and a brush roller engaging the window sections as the same are successively fed to the window openings for firmly pressing the sections into engagement with the traveling web.

22. In a machine of the class described, mechanism for providing window openings at intervals along the length of a continuously advancing web, pasting mechanism thereafter to apply paste about said openings, window section forming mechanism for forming window sections for said openings, forwarding mechanism comprising belts and cooperating rollers for forwarding the window section to said openings in superimposed relation thereto with the window sections traveling in the same direction as the window openings, and a roller for engaging the window sections as the same are successively fed to the window openings.

23. In a machine for providing window open-

ings in a continuously advancing web, the combination of a rotary punch shaped to correspond substantially to the shape of a window opening to be made, a cooperating rotary anvil, said punch being provided with a formation adapted to leave the window section attached to the web in the formation of the window opening, means for permitting of bodily movement of the anvil away from the punch to permit of threading the machine, means for varying the permanent setting of the anvil relative to the punch to permit the use of punches of different dimensions and means for completing the detaching of the web sections from the web in the forming of the window openings.

24. In a machine for providing window openings in a continuously advancing web, the combination of a rotary punch shaped to correspond substantially to the shape of a window opening to be made, a cooperating rotary anvil, said punch being provided with a formation adapted to leave the window section attached to the web in the formation of the window opening, means for permitting of bodily movement of the anvil away from the punch to permit of threading the machine, means for varying the permanent setting of the anvil relative to the punch to permit the use of punches of different dimensions and knock-out mechanism comprising a pivoted arm adapted to engage the partially detached section for completing the detaching of the sections from the web in the forming of the window openings.

25. In a machine for providing window openings in a continuously advancing web, the combination of a rotary punch shaped to correspond substantially to the shape of a window opening to be made, a cooperating rotary anvil, said punch being provided with a formation adapted to leave the window section attached to the web in the formation of the window opening, means for permitting of bodily movement of the anvil away from the punch to permit of threading the machine, means for varying the permanent setting of the anvil relative to the punch to permit the use of punches of different dimensions, knock-out mechanism comprising a pivoted arm adapted to engage the partially detached section for completing the detaching of the sections from the web in the forming of the window openings and a pair of driven rollers for receiving the detached window sections and discharging the same from the machine.

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