Sept. 10, 1929. A. A. THACKER 1,727,679

ENVELOPE OPENING AND SEALING MACHINE

Filed April 4, 1927 3 Sheets-Sheet 1

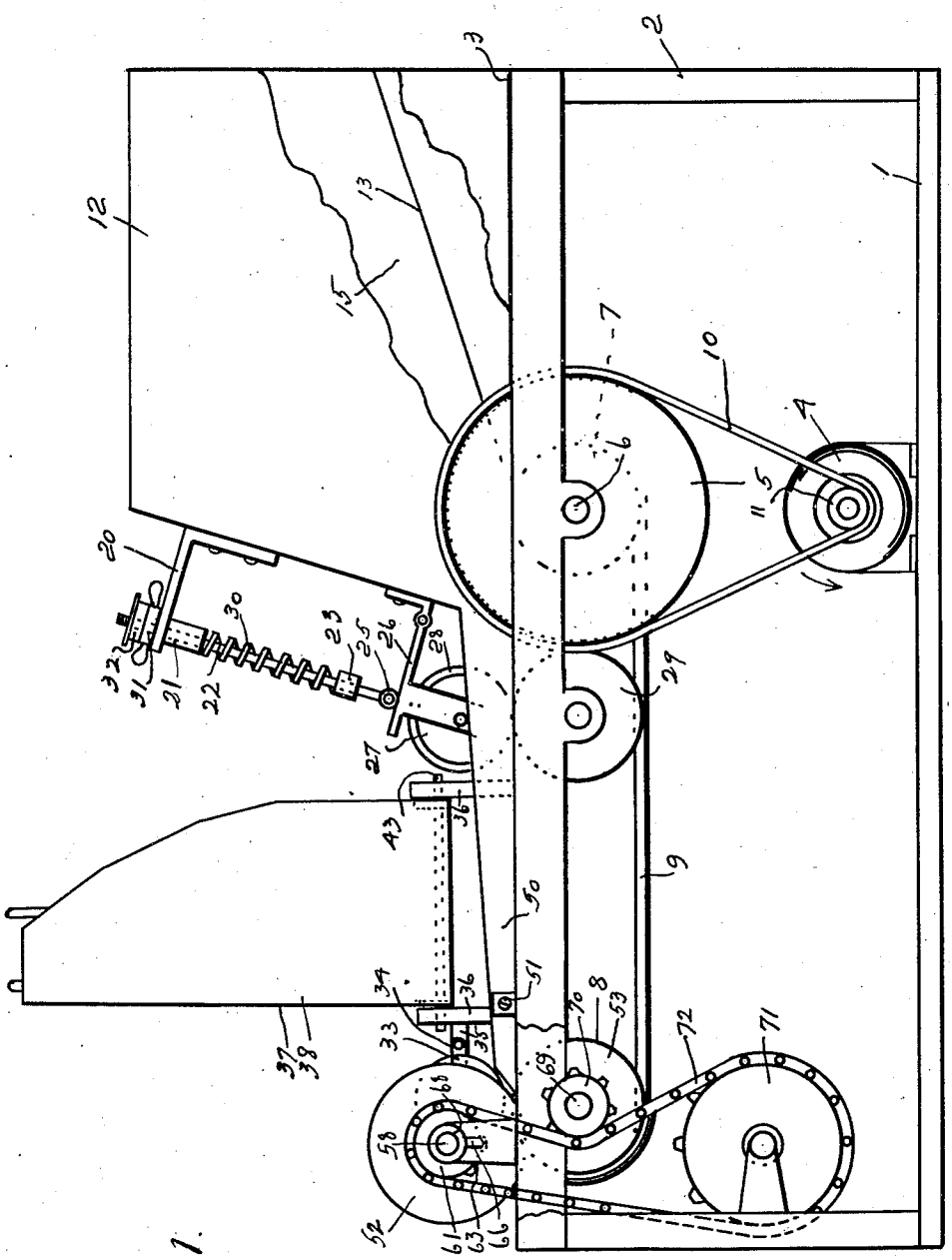


Fig. 1.

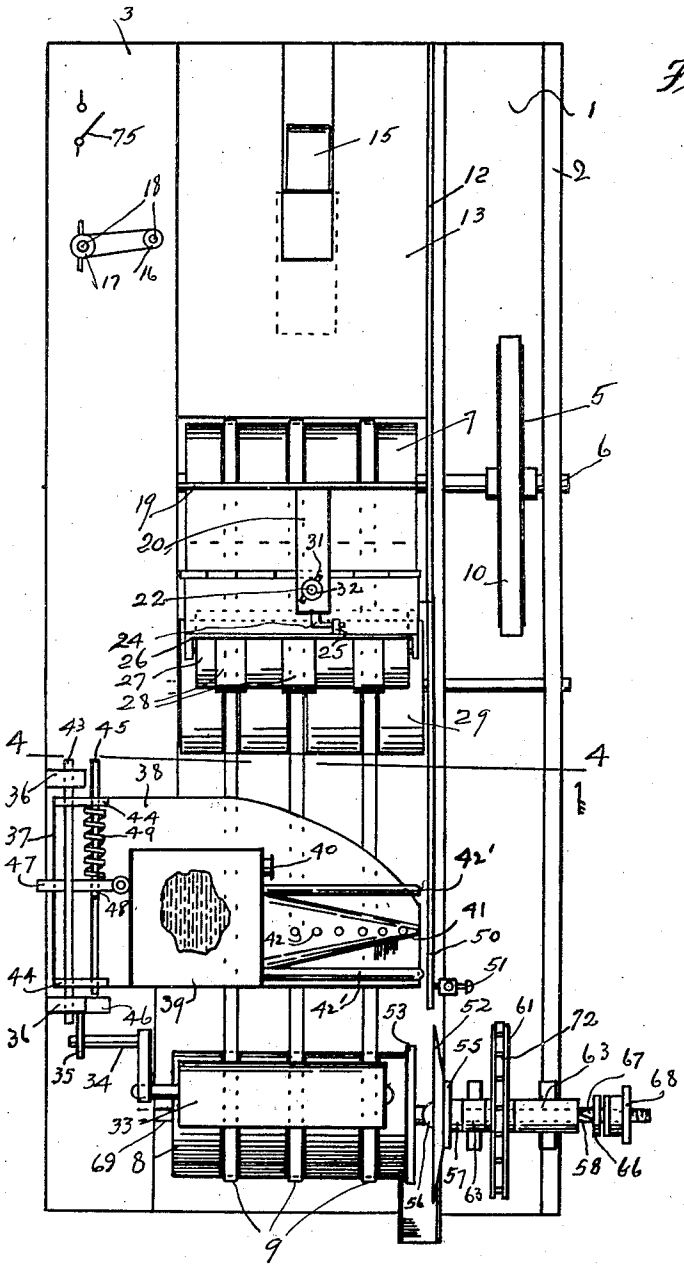
INVENTOR
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ENVELOPE OPENING AND SEALING MACHINE

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Fig. 2.



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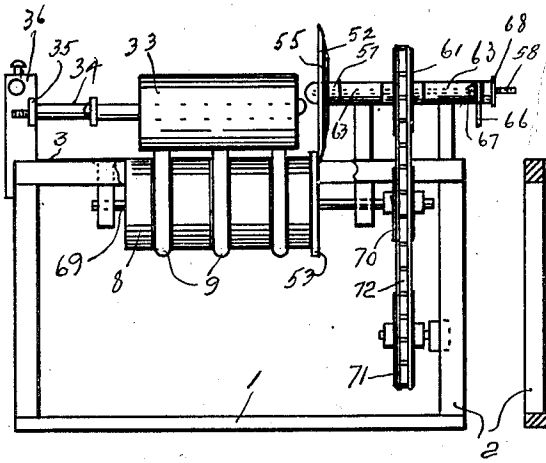
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ENVELOPE OPENING AND SEALING MACHINE

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Fig. 3.



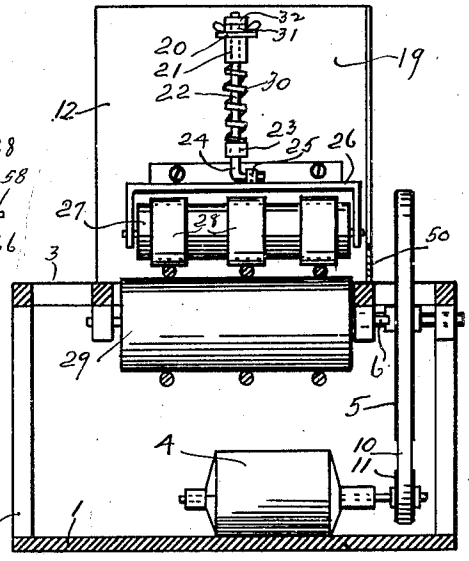
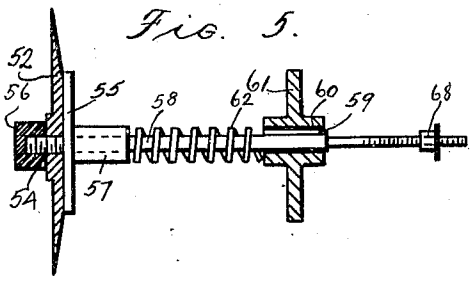


Fig. 4.

Fig. 5.



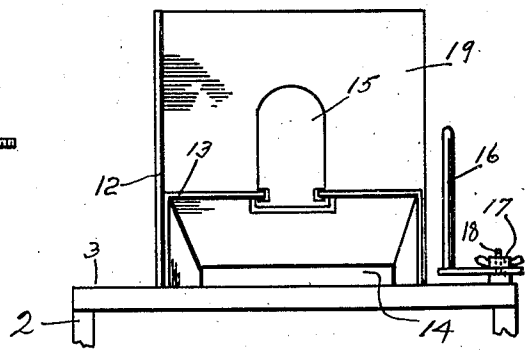
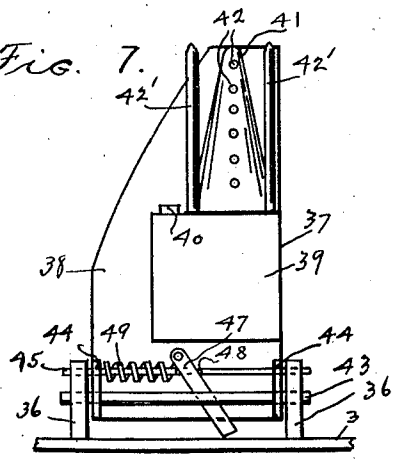


Fig. 6.

Fig. 7.



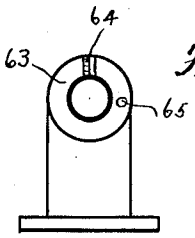


Fig. 8.

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Patented Sept. 10, 1929. 1,727,679

UNITED STATES PATENT OFFICE.

ANSON A. THACKER, OF KANSAS CITY, MISSOURI, ASSIGNOR TO PARAGON MAILING MACHINE COMPANY, OF KANSAS CITY, MISSOURI.

ENVELOPE OPENING AND SEALING MACHINE.

Application filed April 4, 1927. Serial No. 180,986.

My invention relates to envelope opening and sealing machines, and the object of the invention is to provide an inexpensive, simple, and efficient machine of this character having facilities for opening sealed envelopes and facilities for sealing envelopes.

A further object of the invention is to provide facilities for rendering the opening means inoperative when the machine is used for sealing envelopes, and facilities for rendering the sealing means inoperative when the machine is opening envelopes.

I attain these objects and other advantages by means of the mechanism illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of an opening and sealing machine embodying my invention, and showing the same usable for opening envelopes.

Figure 2 is a top plan view of the machine shown in Figure 1, and showing the same usable for sealing envelopes.

Figure 3 is an end view of the machine, and showing the opening mechanism in operative position.

Figure 4 is a sectional view of the machine on the line 4—4 in Figure 2.

Figure 5 is a detail view, partly sectioned, of the cutter and associated parts.

Figure 6 is a rear end view of the machine, and showing the hopper for feeding envelopes to the machine.

Figure 7 is a vertical elevation of the sealing means, and showing the same in inoperative position.

Figure 8 is an end view of the end face of the cutter bearing, and showing the notch therein for the shifting lever to render the cutter operative or inoperative.

Similar reference numerals refer to corresponding parts throughout the several views.

The base 1, the frame 2, and the top plate 3, comprise the supporting medium for the mechanism hereinafter described.

The driving elements of the machine are an electric motor 4, a pulley 5, having a shaft 6 journaled in the frame and provided with a roller 7, a similar roller 8 journaled in the frame at the forward end of the machine and aligned with the roller 7, a plurality of round endless belts 9, preferably made of rubber, arranged on the rollers 7 and 8, and an endless belt 10 arranged on the pulley 11 of the armature and the pulley 5. The elements above described provide the means for conveying envelopes from a feed hopper 12 at the rear end of the machine to the forward end of the same to be either opened or sealed in transit. The hopper is provided with a forwardly inclined table 13 which terminates near the mouth 14 thereof. A guide 15 is slidably mounted in the table and adapted to be extended rearwardly of the table to extend or shorten the table to receive long or short envelopes. A guide 16 is pivotally mounted on the upper side of the machine and adapted to be rotated to guide wide or narrow envelopes. A nut 17 is arranged to screw on the end of the pivot 18 to hold the guide stationary. The hopper has a front plate 19 which is inclined rearwardly and a bracket 20 is secured on the front plate intermediate of its width. In said bracket is mounted a bearing 21 for a rod 22 having a hub 23, and said rod terminates in a hook 24 and which is received by an eye 25 secured on the upper side of a hingedly mounted bearing 26 and which is hinged on the front plate of the hopper. In said hinged bearing is rigidly mounted a cylinder 27 having a plurality of rubber bands 28 thereon and respectively adapted to bear upon the respective rubber belts 9 as they travel upon an idle rolier 29 which is journaled in the frame vertically below said cylinder 27. A coiled spring 30 encircles the rod 22 between the hub 23 and the bearing 21. The upper end portion of the rod 22 is provided with screw threads to receive a nut 31 usable for tensioning the spring 30, and a nut 32 is screwed on the end of the rod and adapted to impinge upon the nut 31 to hold the adjustment of the spring tension. An idle roller 33 is rotatably mounted on a crank 34 which is journaled in an arm 35 extending from a standard 36, said roller normally bearing upon the belts 9 as they travel over the roller 8. The cylinder 27 and roller 33 are mounted to yield to envelopes of various thickness.

At one side of the machine is rotatably

mounted a moistening device 37 in spaced standards 36. Said device consists of an elongated plate 38 having one of its corner portions cut away on a curved line adapted to be received by the flap of unsealed envelopes passing through the machine, a container 39 capable of being sealed air tight and to hold water, secured on said plate and having a filling inlet 40, a hollow V-shaped extension 41 secured on said plate and communicating with said container and having diminutive holes 42 apertured in its upper side, and guiding fingers 42′ extending from the container to the end of the plate at opposite sides of the V extension and in a plane above the plane of the plate and lower than the plane of said extension. The moistening device is mounted on a shaft 43 which is journaled in the standards 36, said shafts being extended through ears 44 integral with the plate 38. A locking rod 45 is slidably mounted in the inner end portions of the ears 44 and at a point therein adapted to allow the rod to normally engage the inner faces of the standards 36 and to be engaged by a stop 46 on the outer standard and thereby hold the device vertical of the machine and in inoperative position. A lever 47 is pivotally mounted on the plate 38 and engages a notch 48 in the rod 45. A coiled spring 49 encircles said rod between the innermost ear 44 and the lever, to automatically return the locking rod to hold the device in inoperative position after a sealing operation. A flexible finger extension 50 of the side plate of the hopper is extended from the hopper to a point outwardly of the moistening device and an adjusting screw 51 is suitably mounted on the frame inwardly adjacent the free end of said finger extension and adapted to engage the outer side of the same to effect relative adjustment of the finger in lateral direction.

At the forward end of the frame and, at one side thereof, is suitably mounted a rotary cutter disk 52 adapted to operate in conjunction with a shearing disk 53 mounted on the end of the roller 8. The cutter disk is demountably mounted on a stud 54 having screw threads and which projects a little distance from the axial center of a head 55. A screw cap 56 is screwed on the stud to bind the cutter disk to the head. Also axially of the outer side of the head is a bushing extension 57 and in which is rigidly secured a shaft 58 having a key portion 59 adapted to slidably engage a key-way 60 in a sprocket wheel 61. The free end of the shaft is provided with screw threads. A coiled spring 62 encircles said shaft between the bushing 57 and the hub of the sprocket wheel 61. The shaft 58 is revolubly supported by two spaced journal bearings 63 suitably mounted on the frame. In the end face of the outer bearing 63 is a V-shaped groove 64 and a stop 65. A lever 66 is loosely mounted on the screw end of the shaft 58 at the end of the outer bearing 63 and is provided on its inner side with a V-shaped lug 67 normally impinging upon the end of said bushing to shift the cutter disk from operative to inoperative position (Fig. 2). Cooperating with said lever is a nut 68 which is screwed on the shaft 58 outwardly of the lever and which is engaged by the lever to withdraw the cutter disk from the shearing disk on the roller 8.

On the outer end of the shaft 69 of the roller 8 is suitably mounted a sprocket wheel 70. A sprocket wheel 71 is mounted on the lower portion of the frame and vertically aligned with the sprocket wheel 61. An endless sprocket chain 72 is arranged on the sprocket wheels 61 and 71 and is outwardly engaged by the sprocket wheel 70, the latter sprocket imparting motion to said sprocket chain and said sprocket wheels 61 and 71 and thereby driving the cutter 52 in a direction opposite to the direction of the revolving shearing disk 53.

The motor drives the pulley 5 in the direction of the arrow marked thereon, thus driving the roller 7 in the same direction and, by means of the endless rubber belts 9, the roller 8 and the shearing disk 53 thereon are also driven in the same direction, the sprocket wheel 70 engaging the outer side of the sprocket chain 72 drives the sprocket wheels 61 and 71, and the cutter disk 52 in an opposite direction.

Normally the opening and sealing means are held inoperative and envelopes may be run through the machine without being opened or sealed, a provision to prevent operation of the opening and sealing elements should the machine be operated by unauthorized persons. If it is desired to seal envelopes, the machine is started by closing the switch 75 and the envelopes to be sealed are stacked flap upward upon the table 13 and the guides 15 and 16 suitably arranged at the outer end and side of the envelopes. The endless rubber belts traveling on the rollers 7 and 8 frictionally engage the lower sides of the forward ends of the lowermost envelope and move the same from the stack and carry them, one at a time, forwardly, the curved portion of the plate of the moistening device entering between the flap and the body of the envelope and thereby forcing the flap to move under the fingers 42′ and over the perforations 42 in the extension 41 and subjecting the gummed portion of the flap to the moisture oozing from the said perforations and then passing under the roller 33 the flap is pressed to the body of the envelope to which it adheres. The operation above described is repeated until all envelopes have been sealed, whereupon, the moistening device is rotated to ver-

tical position (Fig. 1). When the device is rotated to its operative position (Fig. 2) the lever 47 is rotated to the left to force the rod 45 to the left to release the one end of the same from the stop 46 and thus allow the device to fall to horizontal position transversely of the machine. The shifting of the rod tensions the spring 49 and when the lever is released the reaction of the spring moves the rod and lever to normal position. The action is the same when returning the device to its inoperative position. The container being air tight and containing water the latter cannot flow out of the perforations 42 but is there present in small globules sufficient to moisten the adhesive substance on the flap of the envelope passing over them. If envelopes are to be opened the same are placed upon the table 13 in the same manner as when they are to be sealed. The lever 66 is then rotated to bring the V shaped lug 67 thereon into the V-shaped groove 64, whereupon the reaction of the spring 62 will force the shaft inward and place the cutter disk into close relation with the shearing disk 53. Then the machine is started and the finger 50 is adjusted laterally to present a suitable margin of the envelope to the cutter, so that the margin may be cut away and the envelope thereby opened. When the cutting operation is finished, the lever 66 is rotated to bring the V lug thereon out of the groove 64 and bear on the end face of the bearing (Fig. 2) and thereby draw the shaft 58 outwardly by means of the lever pressing against the nut 68 effecting a tensioning of the spring 62 and spacing the cutter from the shearing disk.

The cylinder 27 is mounted to be stationary in the hinged bearing, so that when the envelope is carried forward from the table 13 in the hopper, the rubber bands on the cylinder will frictionally engage the same with a retarding effect, so that should more than one envelope be presented at the cylinder at the same time the lowermost one frictionally engaged by the belts 9 would continue to move forward. The retardation of the cylinder is effective to hold back all envelopes not directly engaged by the belts 9 and actually in transit. The arrangement of the front plate of the hopper at an acute angle to the inclination of the table 13 is a provision to have the lowermost envelope in the stack of envelopes on the table a little in advance of the next one above and so on up to the top of the stack. The belts 9 first engage the advanced end margin of the envelope and draw it from the stack. If for any reason more than one envelope should move forward, the cylinder 27 would function to allow but one to continue, as above explained.

Having described my invention what I claim is—

1. The combination, in an envelope opening and sealing machine selectively operable to open sealed envelopes or to seal envelopes, of a frame for the machine, a transverse flap raising blade rotatably mounted on said frame and adapted to be rotated to horizontal position when the machine is to be operated to seal envelopes and rotated to vertical position when the machine is to be used to open sealed envelopes, said blade consisting of a rectangular plate having one corner of its free end cut away to form a curved edge portion adapted to enter between the flap and body of an envelope moving thereto with its flap uppermost, a longitudinally extending adjustably mounted guide on said frame and adapted to laterally adjust the envelope to the end of the blade, and a latch on said blade to hold the same inoperative.

2. The combination, in an envelope opening and sealing machine selectively operable to open sealed envelopes or to seal envelopes, of a frame for the machine, a transverse flap raising blade rotatably mounted on said frame and adapted to be rotated to horizontal position when the machine is to be used to seal envelopes and rotated to vertical position when the machine is to be used to open envelopes, said blade consisting of a rectangular plate having one corner of its free end cut away to form a curved edge portion adapted to enter between the flap and body of an envelope moving thereto with its flap uppermost, a longitudinally extending laterally adjustable guide mounted on said frame to adjust the envelope to the end of the blade, a moistening device having a converging convexed fluid outlet portion terminating at the end of the blade and carried by the blade, flap guiding arms carried by the blade to guide the flap of the moving envelope upon the fluid outlets of the moistening device when the flap is raised by the blade, and a spring actuated latch carried by the blade and adapted to hold the blade and moistening device thereon inoperative for sealing envelopes.

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