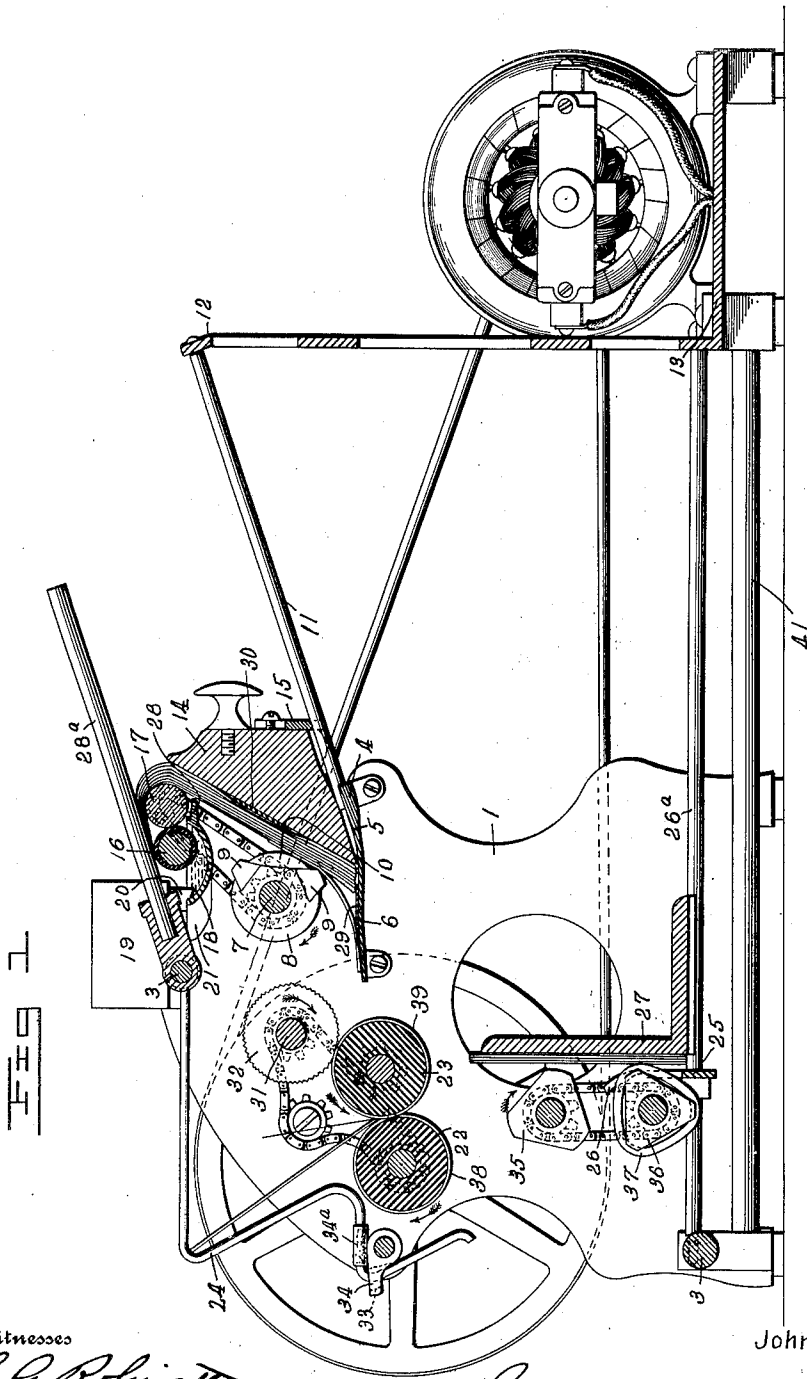


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 ROTARY ENVELOP SEALING MACHINE.
 APPLICATION FILED NOV. 10, 1909.

1,058,770.

Patented Apr. 15, 1913.

3 SHEETS—SHEET 1.



Inventor

John A. Markoe

Witnesses
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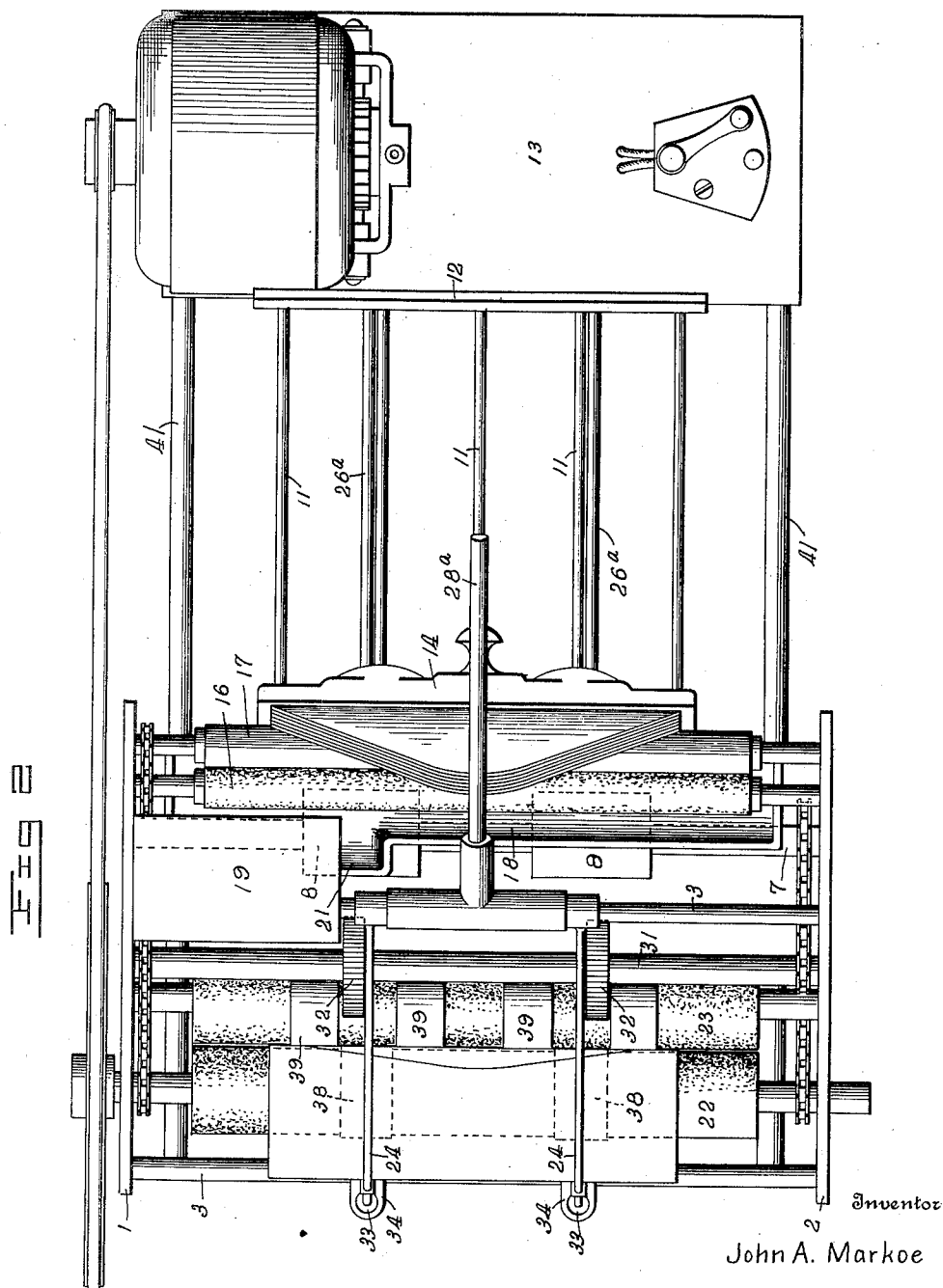
By *Myron Cushman & Co.*
 Attorney

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Inventor
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 [Signature]

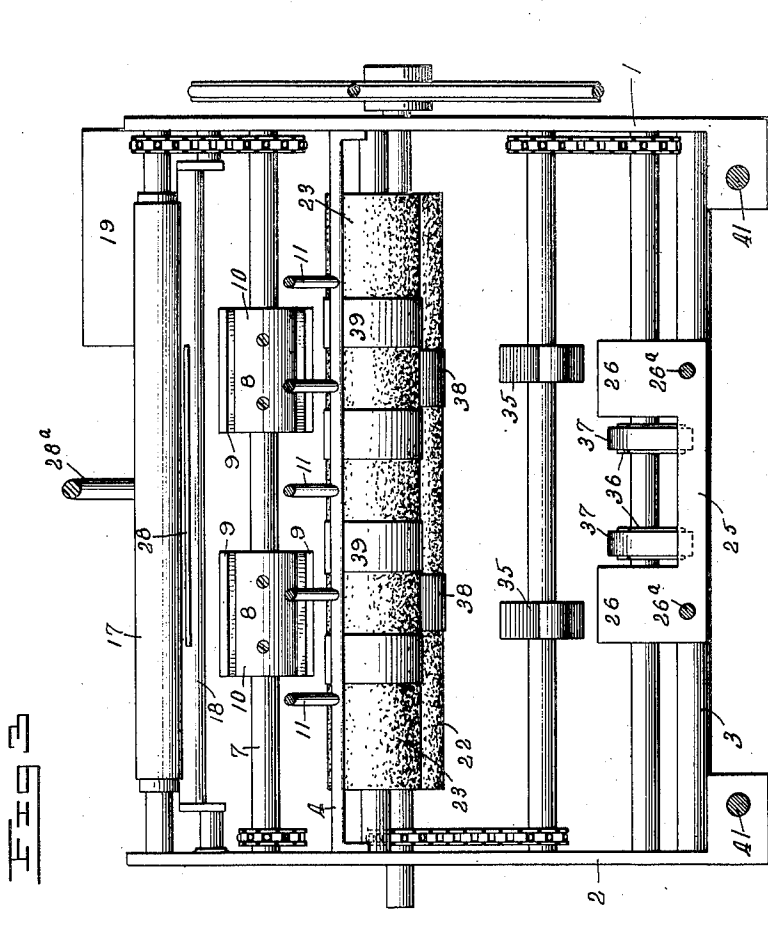
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN A. MARKOE, OF ST. PAUL, MINNESOTA.

ROTARY ENVELOP-SEALING MACHINE.

1,058,770.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed November 10, 1909. Serial No. 527,219.

To all whom it may concern:

Be it known that I, JOHN A. MARKOE, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented new and useful Improvements in Rotary Envelop-Sealing Machines, of which the following is a specification.

My invention relates particularly to rotary envelop machines of the type now commonly used for feeding envelopes, and has for its chief object to improve the efficiency of this rotary machine.

The particular machine which I have improved is the machine forming the subject matter of Letters Patent No. 820,427, granted May 15, 1906, and No. 891,277, granted June 23, 1908 to me. The machines described in these Letters Patent comprise in brief four mechanisms, to wit: the feeding mechanism, the moistening mechanism, the sealing mechanism, and the stacking mechanism. Various improvements which take the form of additions for the most part to the above noted feed mechanism, are made by the present invention. These various improvements, and the increased efficiency resulting therefrom, will be apparent from the following description, taken in connection with the accompanying drawing, in which,

Figure 1 is a central longitudinal section of my improved machine, Fig. 2 is a plan view with the front frame work of the machine and the follower with the supporting rack removed. Fig. 3 is a transverse, vertical section of the same.

Referring to the drawings 1 and 2 are the main supporting members or side frames of the machine. These members are spaced apart by rods 3 located at convenient points and support the four mechanisms above mentioned. On one side of the upper part of this frame is supported a bed or feed plate 4, which has an upper surface which is straight and sloping upwardly at its outer end, as at 5, and curved downwardly at its inner end, as at 6. The purpose of this will presently appear. Immediately above and adjacent to this feed plate is a feed shaft 7. This shaft is equipped with two cylinders 8 spaced apart and located equidistant from the longitudinal center of the machine, as shown in Fig. 2. Dove-tailed into the surfaces of these cylinders are rubber strips 9, two being provided approximately 120°

apart on each cylinder. Preferably a section of each cylinder on a chord of the cylinder as at 10 is cut away in such a manner that this section when removed opens longitudinal grooves into which the rubber strips 9 are placed. Associated with and forming a part of this feeding mechanism is a rack made up of rods 11, one end of which rests on the front of the feed plate 4 and the other end of which is supported by a pedestal 12 rising from an extension 13 from the main frame of the machine. Sliding on these rods is a follower member 14 whose position is determined by an adjustable slotted member 15 engaging one of the rods 11.

Above the feed plate shaft and a little in advance of it is the moistening mechanism. This mechanism comprises a pair of rolls 16 and 17, the roll 16 being of rubber and located somewhat below the roll 17 which is of metal and has a smooth surface. A water trough 18 is placed below the roller 16 in such a position that the roller 16 revolves with its lower side in the water, thus taking up the water and wetting the roller 17 with which it rolls in contact.

19 is a supply tank, which, as shown, is rectangular, and is removably mounted on the transverse frame rod 3. It is entirely closed except for the outlet 20 which is in the form of a mouth piece which extends into an offset 21 of the trough, the water being thus confined to the tank by atmospheric pressure and automatically fed to the trough as needed.

On the other side of the machine to the rear of the feed mechanism and in a position to receive the envelopes or packets therefrom, is the sealing mechanism. This mechanism comprises in the main a pair of rubber rollers 22 and 23 between which the moistened envelopes received from the feeding mechanism are passed, being directed into these rollers by guide members 24.

Immediately below the rollers 22 and 23 is the stacking mechanism comprising in the main a fixed guide plate 25, with the curved upper extremity 26 for directing envelopes supported upon the longitudinal rods 26^a. Also supported by the rods 26^a is a follower member 27 which slides on the rods and is guided thereby.

The machine as thus far described operates as follows: An electric motor mounted on the forward extension of the frame, drives the feed roller 22. The feed roller

22 is geared by a chain passing over sprocket wheels to the roller 23, and this in turn is geared through intermediate sprockets and chains to the feed shaft 7 and moistening rollers 16 and 17. A number of envelops with their flaps extended and lapping each other are placed upon the feed rack with their flaps in the position shown, with the flap of the front envelop extending over the metallic feed roller 17 and the follower member 14 behind it. A rod 28^a is pivoted to the upper rod 8 and this is moved to the position shown where it rests on the flaps, and by its weight holds them down and lapped over the roller 17 in position where they can be most effectually moistened. The machine being started the parts revolve in the direction shown by the arrows. The flap of the front envelop is moistened by the roller 17 which is kept wet by the roller 16, and as the shaft 7 revolves, is caught by the rubber friction strips 9 and drawn downward across the feed plate 4, each flap being moistened completely to the tip as it is drawn in. It is then thrown upwardly against the members 24, when its flap end, which at this point is lowermost is caught between the rolls 22 and 23, and the envelop is passed between them, the flap being sealed as it passes through. It is delivered to the stacking means below the rolls, the follower member 27 being forced away from the plate 25 as the envelops are successively sealed.

The operation as just described is essentially that of my prior machines. I have found however that in several ways the operation is not all that could be desired with these machines. In the first place I have found that at times when the very last envelops of the stack are about to have their flaps moistened, or when the flap and envelop happen to be down instead of up, the envelop is sometimes drawn in between the moistening rollers 16 and 17. In the present machine I prevent this by providing a projection 28 in front of the trough 18 which extends beneath the roller 17 and forms a transverse shoulder across the trough 18, preventing the flap of the envelop from bending up beneath the moistening roller 17 and engaging against the upwardly moving part of the same.

When a packet composed of an envelop and its contents is relatively thin, it sometimes happens that two packets will be drawn into the machine at the same time, and thus only one of them will be sealed. A friction device in the shape of a strip of rubber 29 let into the face of the bed plate at its center effectually avoids this trouble. The rubber strip projects a slight distance beyond the face of the feed plate and engages the second envelop at its bottom edge, thus making the friction against movement greater than the friction tending to cause

movement and existing between the smooth face of the two adjacent packets. As an additional safe-guard against this trouble, which is especially likely to occur when all but two of the envelops have been sealed, I provide friction devices on the face of the follower member 14. This is also a strip of rubber, which is shown at 30, and is of substantially greater proportions than the strip 29 in the center of the feed plate 4.

Not a little annoyance in prior machines, not only of my own make, but in other machines I have known, has been caused by a clogging of the machine due to too slow a removal of the packets after the flaps of the packets have been moistened. There is no reason why they should not be rapidly removed. I accomplish this in the present machine in two ways. First I provide a delivery shaft or member operating in conjunction with the sealing rolls. This is shown at 31 as a shaft provided with two knurled disks 32 bearing on the near sealing roller 23. The knurled disks and the roller 23 catch the packets as they are thrown forward by the feed shaft 7 carrying rubber strips 9, and move them positively into engagement with the member 24 and into position to be caught by the sealing rollers 22 and 23. By using this delivery shaft 31, I avoid sharp bending of the packets at this point, the packet following almost the same straight line as directed by the bed plate. In addition to this positive means which removes the moistened packets I drive the shaft 31 and the sealing rollers at a materially higher speed than the feed shaft 7. This speed I prefer to make 50% higher than the speed of the feed shaft 7. I find that this results in a rapid removal of the packets, and effectually prevents clogging of the machine.

By the construction of the feed member or shaft 7 as already mentioned, with the particular angular spacing of the rubber friction strips 9, I cause the packets to be drawn in one at a time, there being an appreciable distance between successive packets owing to the 240° spacing between adjacent strips, the strips on either side closest to each other being 120° apart, and both engaging a packet at the same time. This arrangement of the feed shaft always assures the smooth regular operation of the machine.

In many machines use is made of fixed or spring pressed members 24 for reversing the envelop and presenting its flap end to the sealing rolls. These members in such cases have to be adjusted, and unless adjusted are likely to cause clogging when an envelop of larger size than that for which the machine is adjusted, is used. I make this adjustment automatic by pivoting the members 24 to the rod 3 in the upper part of the frame, and passing their ends freely

through holes 33 in guide lugs 34 on the rod 3 to the rear of the sealing rollers. The members 24 which are light, being made of bent wire, are easily raised by the thinnest packets, thus reversing the direction of the packet without bending or crumpling it in any manner. The strips or rubber tubes 34^a on the members 24 at the lugs 34 serve as buffers and prevent rattling of the members during rapid operation.

Lastly I have found that the stacker mechanism as described above consisting of the end guide plate 25 and a follower, as 27, does not always stack the envelop smoothly, certain of the packets projecting beyond and above others, and sometimes being disarranged in such a manner as to interrupt the stacking operation altogether. I improve the efficiency of this mechanism by the use of two stacker shafts provided with star-wheels. The star-wheels of the uppermost of these shafts 35 act as shakers, the shaft being a shaker shaft, while the star-wheels of the lower shaft 36 are provided with rubber friction bands 37 for engaging the surface of the packet and forcing it down upon the base frame rods 26. I find that a uniform stack is made by this mechanism, and that it operates continuously without fault of any kind. Each packet is discharged from the sealing rolls between the guide plate 25 and the preceding packet, and it is rapidly carried to its place by the star-wheels of the lower shaft, the star-wheels of the upper shaft working the packet down by its shaking action. I find it advantageous to run the shafts 35 and 36 at a speed still higher than that of the sealing rolls. A packet is thus handled at successively increasing speeds as it passes through the machine thus keeping all mechanisms clear.

My machine as thus constructed performs all its functions in a most efficient manner. Its parts are well proportioned, very simple, and very durable. In addition, the machine is not over expensive to construct, the most expensive part of the machine being the rubber sealing rolls. I have found a method of decreasing the cost of these rolls so as to make them comparatively inexpensive. Owing to the fact that such rolls must have a high co-efficient friction with the packet in order to firmly hold it and keep it forward during the sealing operation, they have heretofore been made of a very high grade of rubber. This high grade is not at all necessary in order to give the rollers the proper elasticity and flexibility to effect a good sealing. I have found if I make my sealing rolls of an inferior grade of rubber, such as above mentioned, and which is elastic enough to give the proper sealing, and provide one or more bands of rubber of a superior grade on the surface of the rolls, the operation is quite as efficient as it is

when the entire roll is made of a superior grade. I have shown these bands at 38 and 39, and as shown, they project a trifle above the surface of the rolls, as I prefer to have them, though this is not necessary. I also show bands on the sealing roll 23 in staggered relation to the bands 38 and 39 on the roller 22.

It is to be observed that I have used rods wherever possible in the frame of the machine, so constructing the main frame and extension supporting the motor that a base frame of rods 41 may be used to connect them together. This construction of rods is at once cheap, light and neat in appearance.

While I have described the best form of my invention now known to me, many modifications may be made in the improvements embodied therein without departing from the spirit of the invention. I desire to cover all such modifications by the claims annexed hereto.

What I claim is:

1. In a machine of the character described, a frame, a feed plate arranged in the frame and having an upwardly sloping outer end and a downwardly curved inner end, a friction strip carried upon the feed plate at its middle portion and projecting slightly beyond the surface thereof, a follower arranged for movement over the upper face of the feed plate and adapted to carry packets thereover, and a relatively large friction strip secured to the inner face of the follower for coöperation with said first friction strip to separate the packets.

2. In a machine of the class described, a frame, a guideway in the frame, a feed plate disposed at the lower end of the guideway, a follower slidable upon the guideway, and an adjusting plate slidable on the guideway and having connection with the outer side of the follower to hold the upper end thereof at the desired angle.

3. In a machine of the character described, a feed plate having an upwardly sloping outer end and a downwardly curved inner end, said inner curved end being adapted to deflect the lower ends of packets at a downward angle from the feed plate, a follower coöperating with the feed plate and adapted to move by gravity over the upwardly sloping end of the feed plate, and guiding means adjustably mounted on the follower adapted to guide the same in its movement and hold the follower at the desired angle.

4. A machine of the class described comprising a frame, a substantially horizontal feed plate in the frame, an inclined guideway sloping upwardly and forwardly from the feed plate, a follower on the guideway adapted to support a number of packets upon the feed plate, a feed roller arranged

above the plate, and a pair of slightly spaced friction strips located in the periphery and at one side of the feed roller for engagement with the adjacent packet to feed the same over the feed plate upon each revolution of the roller.

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10 5. A machine of the class described, comprising a frame, a substantially horizontal feed plate in the frame, an inclined guideway sloping upwardly and forwardly from the feed plate, a follower on the guideway adapted to support a number of packets upon the feed plate, a feed roller arranged

above the plate, and spaced friction members located in the periphery and at one side of the feed roller for engagement with the adjacent packet to feed the same over the feed plate upon each revolution of the roller.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN A. MARKOE.

Witnesses:

CHAS. S. HOFF,

F. A. PIKE.