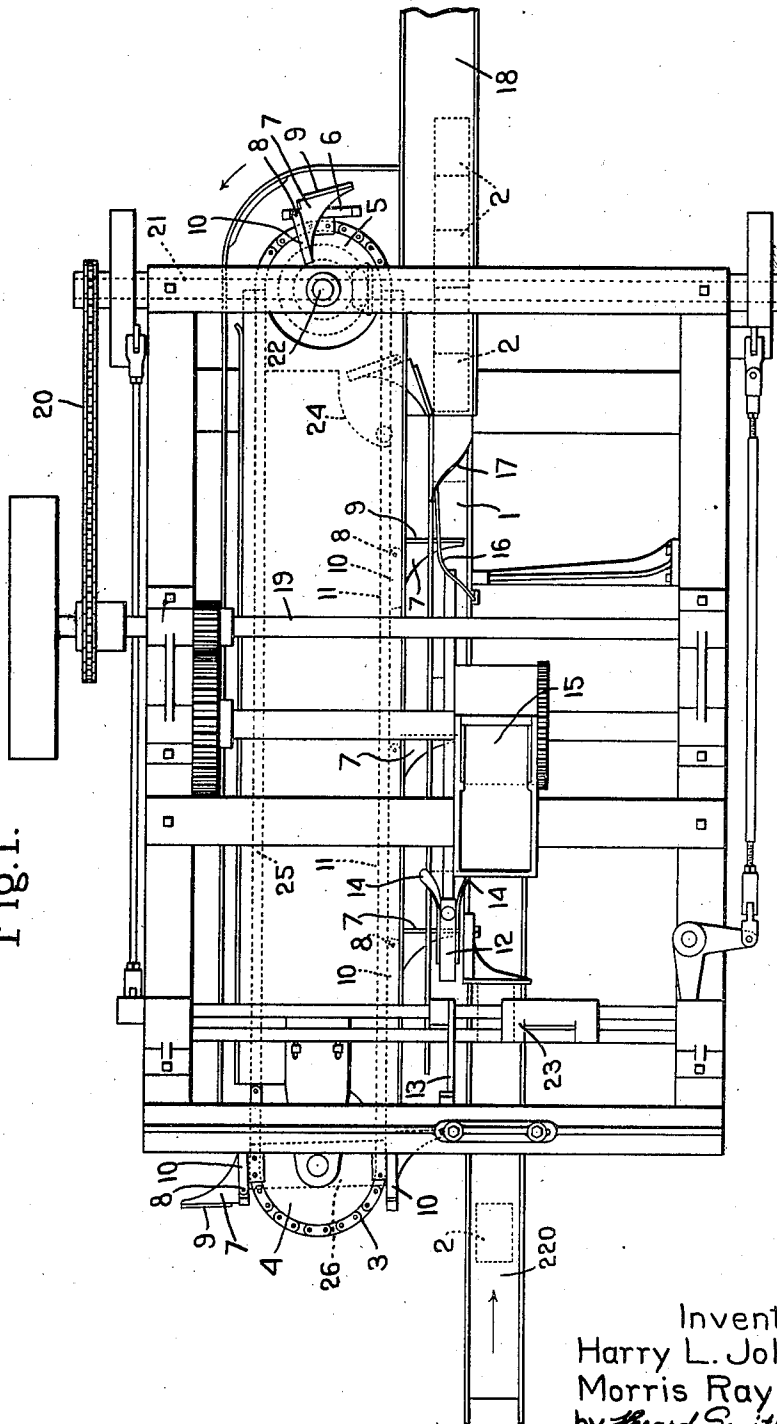


H. L. JOHNSON AND M. RAYMER.
MACHINE FOR SEALING CARTONS.
APPLICATION FILED APR. 1, 1918.

1,352,197.

Patented Sept. 7, 1920.
2 SHEETS—SHEET 1.

Fig. 1.

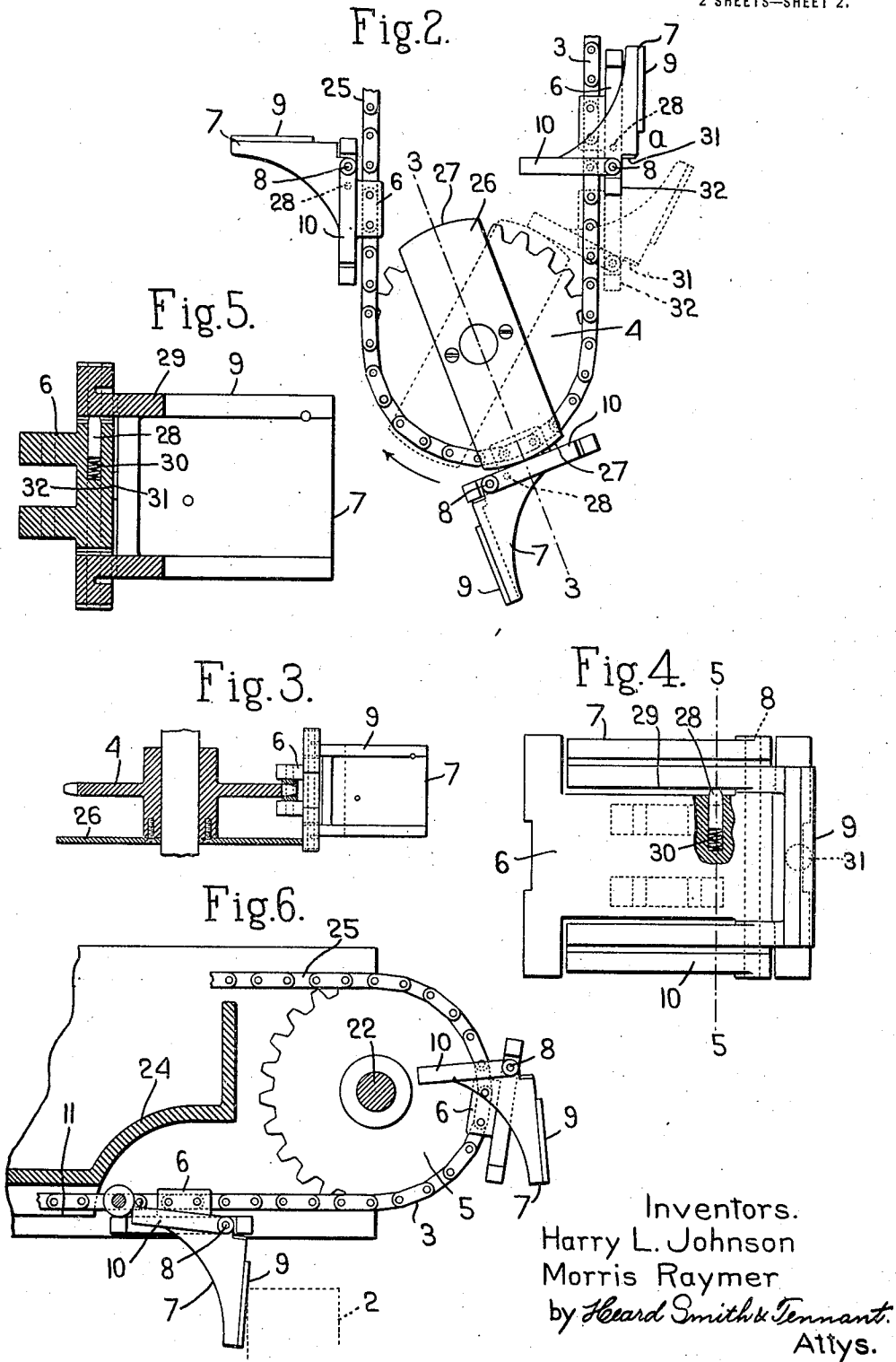


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UNITED STATES PATENT OFFICE.

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MACHINE FOR SEALING CARTONS.

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Specification of Letters Patent.

Patented Sept. 7, 1920.

Application filed April 1, 1918. Serial No. 225,878.

To all whom it may concern:

Be it known that we, HARRY L. JOHNSON and MORRIS RAYMER, citizens of the United States, and residents of Boston, county of Suffolk, State of Massachusetts, and Battle Creek, county of Calhoun, State of Michigan, respectively, have invented an Improvement in Machines for Sealing Cartons, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to a machine for sealing cartons of the type known to the trade as a "top sealer", and particularly to a so-called top sealer which is provided with a guideway along which the filled cartons are propelled, folding and sealing devices for folding the front, rear and side flaps of each carton as it is propelled along the guideway, and a conveyer for thus propelling said cartons, which conveyer is provided with an endless chain driving element, and pushers pivotally connected thereto and which engage the cartons and carry them along the guideway as the endless chain element is moved.

In machines of this type where the pushers of the conveyer are pivotally connected to an endless chain element, it is a common expedient to make each pusher with a tail portion which extends at right angles to the body thereof and to provide a guide-rail which extends along the guideway and with which the tail portions of the pushers have contact thereby to hold the pushers at right angles to the chain as they are passing over the guideway. Near the delivery end of the guideway the guide-rail is recessed or cut away thereby to allow the pushers to swing backwardly as they advance, the purpose of this construction being to prevent the pushers from injuring or side-wiping the cartons as they pass around the end of the chain from one run into the other thereof.

When a machine of this sort is operated above a certain speed, the momentum of the pushers and the action of the centrifugal force thereon causes them to flap or slap as they are passing around the guiding or sprocket wheels at the end of the conveyer. This flapping or slapping movement of the pushers at the delivery end of the conveyer is a source of undesirable noise and at the

entering end of the conveyer it not only is a source of noise, but the action of straightening the pushers as they come into engagement with the guide-rail produces more or less undesirable jar and vibration.

It is the object of our present invention to provide improved means for controlling the pushers by which this undesirable flapping or slapping movement is eliminated and by which each pusher will be straightened up and brought into operative position at the entering end of the guideway with an easy gentle movement. By means of these improvements, it is possible to increase considerably the speed of operation of the machine.

In order to give an understanding of our invention, we have illustrated in the drawings a selected embodiment thereof which will now be described, after which the novel features of the invention will be pointed out in the appended claims.

Figure 1 is a plan view of a carton-sealing machine embodying our invention;

Fig. 2 is an under side view of one end of the endless chain conveyer;

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

Fig. 4 is a side view of one of the pushers;

Fig. 5 is a section on the line 5—5, Fig. 4.

Fig. 6 is a view of the delivery end of the conveyer.

In the machine herein shown 1 indicates a guideway along which the filled cartons 2 (shown in dotted lines) are propelled during the flap-folding and sealing operation by means of a conveyer which comprises an endless chain element 3 which passes around sprocket wheels 4 and 5 and carries blocks or slides 6 to which are pivoted carton-pushing elements 7. Each carton-pushing element is shown as having an L-shape, it being pivoted to its block at 8 and being provided with the carton-pushing portion 9 and with the tail portion 10. Extending along the guideway 1 is a guide-bar 11 against which the tail portions 10 of the pushers rest, said guide-bar cooperating with the tail portions to hold the carton-pushing portions 9 at right angles to the chain and in position to propel the cartons along the guideway. As the cartons are thus propelled along the guideway by the pushers 7, the front and rear flaps thereof are acted upon by front and rear flap folders 12 and 13 which fold the flaps, the side flaps are

then acted on by the spreaders 14 which spread them, and one of said flaps is supplied with glue as it passes through a glue-applying device 15 and then said side flaps are acted on successively by side flap folders 16 and 17 which operate to fold the side flaps one onto the other. After the flaps are thus folded the sealed cartons are discharged onto a receiving element 18.

The guide rail 11 is cut away or recessed at the delivery end of the guideway, as shown at 24, so that each pusher is released and allowed to swing backwardly just before it passes around the sprocket wheel 5, the purpose of this being to prevent the pushers as they are carried around the sprocket wheel 5 from disturbing or side-wiping the cartons. The cartons will, therefore, always be propelled forwardly in a straight direction.

The endless chain 3 is driven from a driving shaft 19 which is connected by a sprocket chain 20 with a shaft 21 which in turn is geared to the shaft 22 which carries the sprocket wheel 5. The filled cartons are fed into the machine by means of a feeding-in belt 220 and are transferred from the belt to the guideway 1 by means of a reciprocating transfer device 23. The parts thus far described are or may be all as usually found in top sealers of this type and may have any suitable or approved construction.

In prior machines of this type, so far as we are aware, the pushers have been free to swing about their pivots as they are passing around the sprocket wheels 5 and 4 and while they are traveling along the outer run 25 of the chain, said pushers being positioned at right angles to the chain by the engagement of the tail portions thereof with the end of the guide-rail 11. With this construction the momentum of the pushers and the centrifugal action to which they are subjected cause them to flap or swing more or less as they are passing around the sprocket wheels 5 and 4, especially if the speed of the machine is increased at all. This not only occasions considerable undesirable noise, but also causes an undesirable vibration.

Furthermore, if the straightening up of the pushers is accomplished by the engagement of the tails with the end of the guide-rail 11, this operation produces more or less jar or vibration, especially if the machine is run at any speed.

We have provided herein novel means for eliminating this undesirable flapping or swinging of the pushers when they are not held in position by the guide-rail 11, and also novel means for gradually bringing the pushers into operative position as they pass around the sprocket wheel 4, which means accomplishes the result without any jar or vibration, even though the machine is run at a high speed. By means of our improve-

ment, it is possible to speed up the machine to a considerable extent without producing any undesirable noise or vibration.

In the preferred embodiment of our invention the means for bringing the pushers gradually into proper position as they pass around the sprocket wheel 4 comprises a positioning plate 26 which is secured to the under side of the sprocket wheel 4 and is adapted to act on the tail portion 10 of each pusher as the pusher passes around said sprocket wheel 4. This positioning plate is shown as having rounded ends 27 which are formed on the arc of a circle having the same radius as that of the sprocket wheel, and said positioning plate is so constructed that the tail portion 10 of each pusher will be engaged by one or the other end thereof as the pusher passes around the sprocket wheel 4. The operation of this device will be clearly seen from Fig. 2. The pushers will usually be folded back against the chain as they pass along the outer run 25 thereof, as shown at *a* in Fig. 2, and the tail portion of the pusher will thus extend inwardly from the chain. As the pusher approaches the sprocket wheel 4, the inwardly-projecting tail portion will engage one of the ends of the positioning plate 26, and said plate will have a rocking sliding action against the tail, as shown in dotted lines Fig. 2, which causes the pusher to be gradually swung from its inoperative position to its operative position in which the carton-pushing portion 9 stands at right angles to the chain. The pusher is provided with a boss 31 which rests against the surface 32 of the slide or block when the pusher is in its operative position. The action of the positioning plate 26 against the pusher brings the boss 31 against the surface 32 and holds the pusher rigidly in its straightened-up or right-angular position until it leaves the sprocket wheel, at which time the tail portion of the pusher will come into engagement with the guide-rail. While the pusher is traveling through the guideway it is held in its operative position by the guide-rail 11, as above described. This action of the positioning plate against the pushers causes them to be straightened up with a gradual movement and without any jar or vibration, even though the machine is operating at a high speed.

When the pushers pass beyond the end of the guide-rail 11 at the delivery end of the guideway, the pressure of the cartons against the carton-propelling portion 9 thereof will cause them to swing backwardly, and if the machine is operating at high speed, the backward folding movement of the pushers as the tails reach the recessed portion 24 is apt to be a rapid one which will cause a chattering movement of the pushers. Further, as the pushers pass

around the sprocket wheel 5, the centrifugal force is apt to throw the pushers outwardly, thus increasing their chattering or flapping movement. To prevent this, we have provided means for controlling the swinging movement of the pushers after they leave the guide-rail 11, which means eliminates the chattering or flapping movement thereof. In the present embodiment of our invention, this controlling means is in the form of a friction device interposed between each pusher and the slide or block 6 to which it is pivoted, said friction device being constructed so that it will prevent this undesirable chattering or flapping movement. While any suitable friction device capable of accomplishing the desired end may be used, we have herein shown for this purpose a friction device in the form of a friction pin 28 carried by each block or slide 6 and frictionally engaging the surface 29 of the corresponding pusher. Each pin is acted upon by a spring 30 which yieldingly holds it against the surface 29. This friction pin produces sufficient friction to hold the pushers in any position which they may assume while they are passing around the sprocket wheel 5 and along the rear run 25 of the endless chain. All undesirable swinging and flapping of the pushers is thus eliminated.

We claim:

1. In a carton-sealing machine, the combination with a guideway, of an endless chain element extending longitudinally thereof, a sprocket wheel at the entering end of said guideway around which said chain passes, a plurality of pushers pivotally connected to said endless chain and by which cartons are propelled along the guideway, said pushers being constructed to fold back against the chain, and means carried directly by the sprocket wheel to positively position each pusher in its operative position relative to the chain.

2. In a device of the class described, the combination with an endless-chain element, of sprocket wheels around which said element passes, a guideway extending longitudinally of one of the runs of said chain element, a plurality of blocks secured to said chain and situated on the exterior face

thereof, a pusher pivotally carried by each block, each pusher being situated on the exterior of the chain and constructed to fold backwardly against said chain, a forked tail extending from each pusher at right angles thereto, the arms of said forked tail swinging across the chain when the pusher folds backwardly thereagainst, and means carried by the sprocket wheel at the entering end of the guideway to engage one branch of the tail of each pusher as said pusher passes around said wheel thereby to positively bring the pusher into operative position relative to the chain.

3. In a device of the class described, the combination with an endless chain element, of a plurality of blocks carried thereby, a carton-propelling element pivotally connected to each block, and a friction device interposed between each carton-propelling element and its block and which is operative in all positions of said element to control the swinging movement thereof.

4. In a device of the class described, the combination with a guideway, of an endless chain element extending longitudinally thereof, a plurality of blocks carried by said endless chain, a pusher pivotally connected to each block and adapted to propel a carton along the guideway, and a friction device interposed between each pusher and its block and which is operative in all positions of said pusher for controlling the swinging movement thereof relative to the block.

5. In a device of the class described, the combination with a guideway, of an endless-chain element extending longitudinally thereof, a plurality of carton-propelling elements pivotally connected to said endless-chain element, means for retaining the carton-propelling elements in operative position as they pass along the guideway, said means being constructed to release the carton-propelling elements at the discharge end of the guideway, and frictional means to control the swinging movement of the carton-propelling elements relative to the chain after they are released.

In testimony whereof, we have signed our names to this specification.

HARRY L. JOHNSON.
MORRIS RAYMER.