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APPARATUS FOR FEEDING BLADES FROM A STACK

Filed Feb. 7, 1946

2 Sheets-Sheet 1

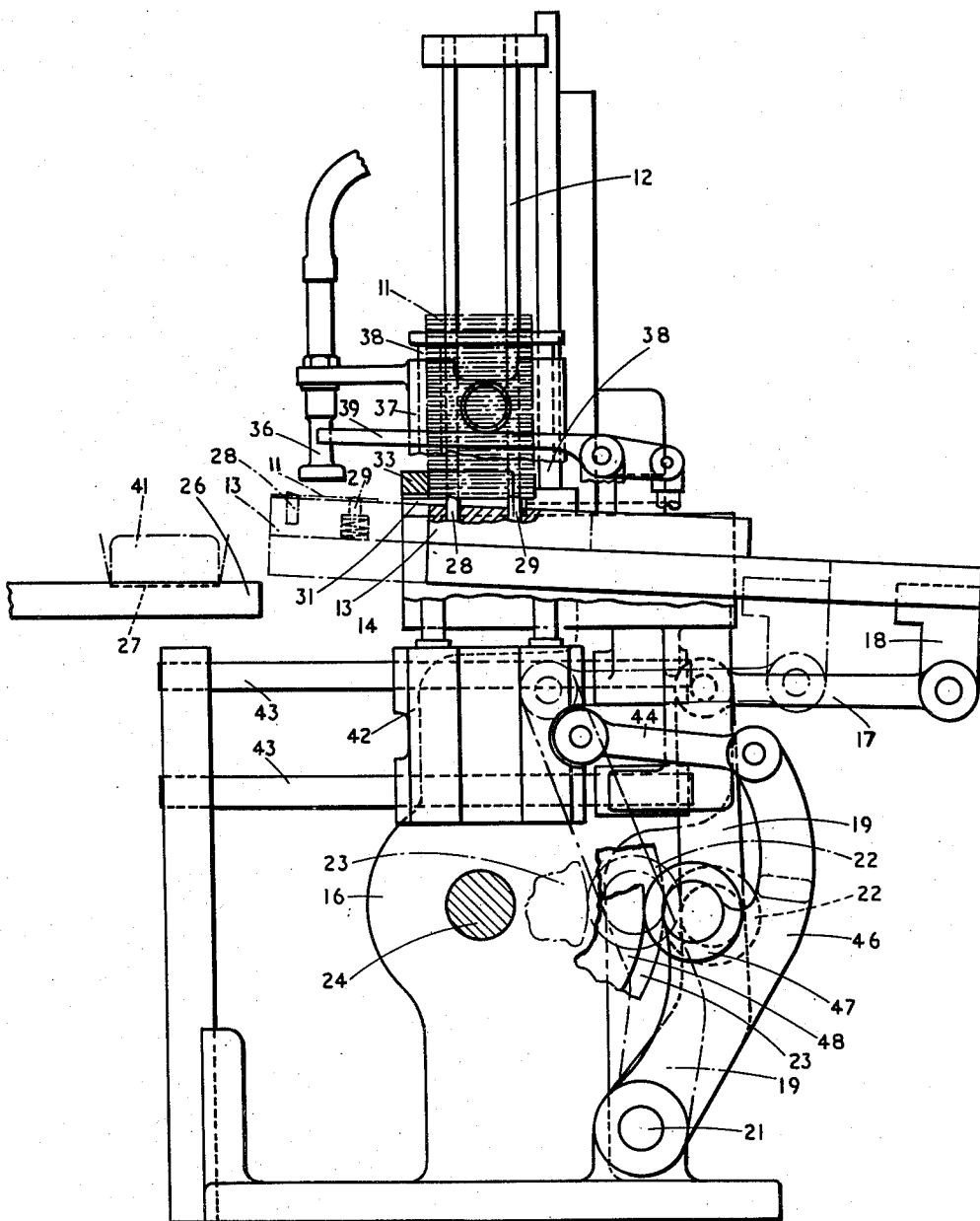


FIG. 1.

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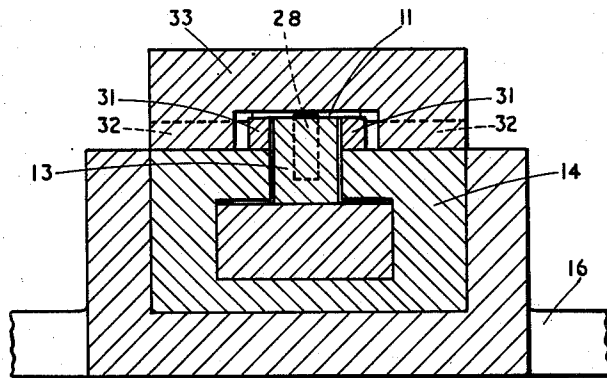


FIG. 3.

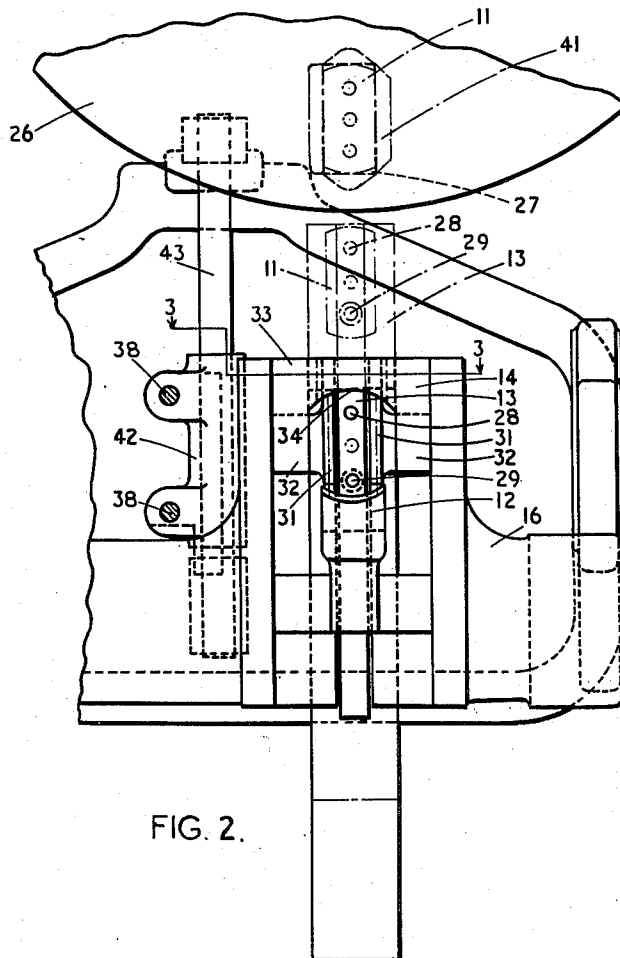


FIG. 2.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR FEEDING BLADES
FROM A STACK

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3 Claims. (Cl. 271-44)

1

This invention relates to machines for wrapping razor blades or similar articles (hereinafter referred to as "blades"), and more particularly to the feeding of the blades to the wrapping elements of such machines.

In a known form of apparatus (referred to hereinafter as the "kind described"), the blades are fed from a magazine in which they are contained in the form of a stack by means of a reciprocating pusher arranged to slide along the base of the magazine and push the lowermost blade out of the magazine into a suitable guideway along which it is forwarded to the wrapping elements by a forwarding device.

The thickness of a blade is very small, i. e., of the order of .005 of an inch or less, and consequently, there is little surface on which the tip of the pusher can bear. This has given rise to difficulties in the feeding of the blades, and it is an object of the present invention to avoid such difficulties.

According to the invention, therefore, there is provided an apparatus of the kind described in which the tip of the pusher during its feeding movement across the base of the magazine is caused to move towards the magazine in a transverse direction.

A convenient manner of bringing about such transverse movement of the pusher is to mount the pusher in a slide which is inclined towards the base of the magazine with respect to the direction of travel of the blade so that, during the pushing of the blade from the magazine, the tip of the pusher moves across the edge of the blade and thus obtains a firmer hold on the blade. The degree of inclination of the slide need only be very slight, i. e., of the order of half a degree.

It will be understood that, with blades of such small thickness, the setting of the tip of the pusher in relation to the lowermost blade in the magazine, must be very accurate for efficient operation, and it is found that, with an inclined pusher according to the invention, a satisfactory setting is obtained when the tip of the pusher, at the point of contact with the blade, lies very slightly below the upper surface of the blade, say one thousandth of an inch below, at the beginning of the stroke of the pusher. During further movement of the pusher, the tip of the blade rises, due to the inclination of the slide, above the level of the upper surface of the blade, slightly lifting the remaining blades in the stack in consequence.

The invention will now be described in greater

2

detail with reference to the accompanying drawings, in which

Figure 1 is an elevation of part of the mechanism at the blade-feeding station of a razor blade wrapping machine,

Figure 2 is a plan view of the portion of the apparatus shown in Figure 1 with portions of the upper structure removed for clarity of illustration, and

Figure 3 is a sectional view of a portion of the apparatus shown in Figures 1 and 2 taken along the line 3-3 in Figure 2.

Referring to the drawings, the blades 11 are contained in a magazine 12 and are fed from the base of the magazine by a reciprocating pusher 13 arranged for reciprocation in a slide 14 forming part of the main framework 16. The pusher 13 is actuated by a link 17 pivotally attached at one end to a bracket 18 depending from the rear end of the pusher 13 and at the other end to an arm 19 pivotally mounted at 21 in the main framework and provided with a cam roller 22 arranged to bear against the face of a rotatable cam 23 secured to a cam shaft 24. The shaft 24 is arranged to operate in timed relationship with a rotatable pocket member 26 provided with a series of radially disposed pockets 27, the pocket member 26 being brought to rest as each pocket 27 in turn reaches the feeding station.

The pusher 13 is in the form of a bar having a cross-section of inverted T-shape and is provided with a pair of pins 28 and 29, the pin 28 being the pusher pin and fixed to the pusher 13 while the pin 29 acts as a guide for keeping the blade straight during its transference from the magazine to the pocket wheel and is in the form of a spring-loaded plunger capable of being depressed to the level of the pusher 13.

The operative surfaces of the slide 14 are inclined towards the base of the magazine 12 with respect to the direction of travel of the blade 11 so that, during the pushing of the blade 11 from the magazine, the pusher pin 28 is caused to move transversely of the blade in the magazine. The degree of inclination of the slide 14 is of the order of half a degree, and for clarity of illustration, such inclination has been grossly exaggerated in Figure 1. The thickness of the blades 11 is also exaggerated for the same reason.

The base of the magazine 12 is in the form of a pair of supporting rails 31 which are attached to the upper surface of the slide 14 by brackets 32, the rails 31 being spaced apart to allow of the passage of the pins 28 and 29.

The stack of blades 11 is thus supported only

3

on the two rails 31, and it will be seen that as the pusher 13 is moved forward in the slide 14 from the position shown in full lines in Figure 1, the pusher pin 28, the tip of which is normally set so that it lies just below the upper surface of the bottom blade in the magazine when the pusher 13 is at the beginning of its stroke, engages the forward edge of the forward hole of the blade 11 and causes it to slide from the stack, the pin 29 having engaged the rear hole for purposes of keeping the blade straight on the pusher 13. As the blade 11 moves forward, the pusher pin 28 moves transversely of the hole in the blade by virtue of the inclination of the track so as to obtain a firmer hold on the blade, and finally passes right through the hole in the blade, the blade being finally pushed off the rails 31 and allowed to rest on the surface of the pusher 13. A bridge piece 33 is provided on the slide way 14 and is formed with a curved middle portion 34 which is shaped to suit the front edge of the blades and to act as an abutment for the blades at the base of the stack (except the bottom blade) so as to prevent any tendency of the lower blade to drag the next blade above by friction as it is pushed out of the magazine by the pusher 13. The bridge piece 33 passes over the rails 31 and the space between the upper surface of the rails 31 and the lower surface of the bridge piece, i. e., the space through which the blade is pushed by the pusher, is only very slightly more than the thickness of a blade so that only one blade may pass through at a time.

After the blade 11 has been fed forward by the pusher 13 to the position shown in chain dotted lines in Figures 1 and 2, a suction nozzle 36, extending from a carriage 37 mounted upon two pillars 38, is caused to descend on to the blade 11 and lift it clear of the pusher 13 by means of a cam-operated arm 39. The suction nozzle 36 is then caused to move forwardly and descend towards the pocket member 26 to deposit the blade on to a liner and wrapper 41 previously inserted into the pocket 27. The forward and rearward movement of the suction nozzle 36 is brought about by reason of the attachment of the rods 38 to a carriage 42 slidably mounted on a pair of rods 43 and adapted to be reciprocated on the rods 43 by means of a link 44 connecting the carriage 42 to an arm 46 pivotally mounted at 21 and provided with a cam roller 47 arranged to engage the face of a rotatable cam 48 secured to the shaft 24.

After the blade 11 has been removed from the pusher 13 by the suction nozzle 36, the pusher is returned by the arm 19 to the position shown in full lines in Figure 1 in readiness for the next feeding operation, and in order to allow the

4

pusher pin 28 to pass smoothly below the base of the stack in the magazine 12, the upper surface of the pin 28 is inclined downwardly towards its rear edge so as to give a "lead-in" as it passes below the stack.

It will be seen that, by the use of the present invention, the tip of the pusher pin 28 obtains a firm hold on the edge of the blade, while at the same time, excessive wear is prevented at the extreme tip of the pin by reason of the transverse movement.

I claim:

1. Apparatus for feeding blades from the base of a stack, comprising a reciprocating pusher arranged to move across the base of the stack to engage the lowermost blade in the stack by contact with an area of the blade extending transversely to the direction of feeding movement of the pusher, a slide arranged to support said pusher, said slide being inclined towards the base of the stack with respect to the direction of travel of the blade so as to cause the tip of the pusher during its feeding action to move in a direction transverse to its direction of feeding movement so as progressively to engage a greater area of the blade, and means for reciprocating said pusher in said slide.

2. Apparatus according to claim 1, wherein the degree of inclination of said slide is such that the tip of the pusher while in contact with the blade being fed moves transversely by an amount substantially equal to the thickness of the blade.

3. Apparatus according to claim 1, wherein the pusher comprises at least one pin protruding from its upper surface and arranged to engage the forward edge of a hole in the blade.

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