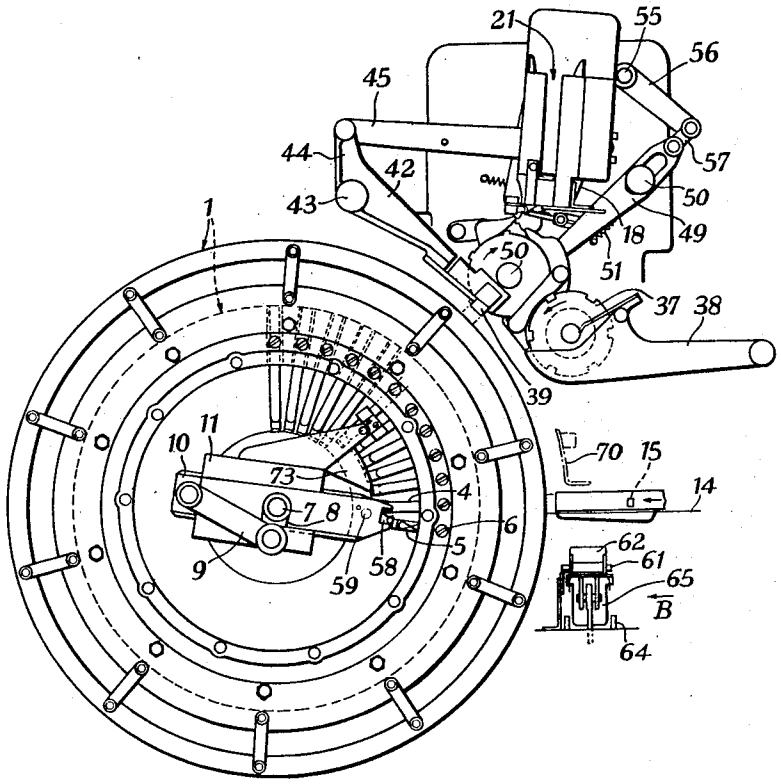
Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 1

Fig.1.



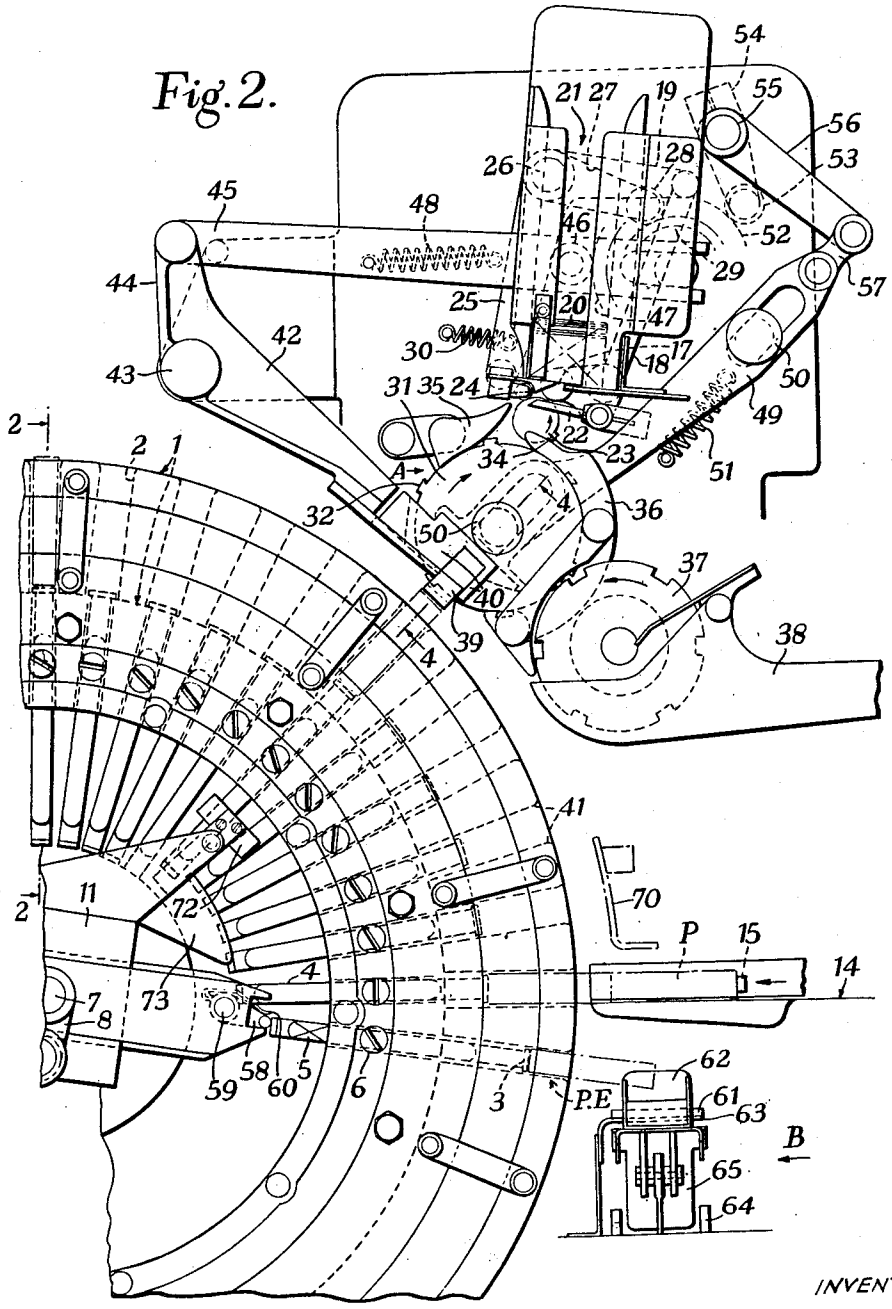
INVENTOR
D. R. P. Jackson
BY
Watson, Cole, Grindle & Watson
ATTORNEY

Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 2

Fig. 2.



INVENTOR

D. R. P. Jackson

BY

Watson, Cole, Grindle & Watson

ATTORNEY

Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 3

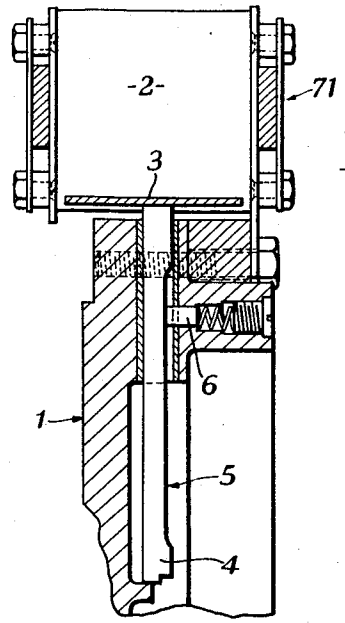


Fig.3.

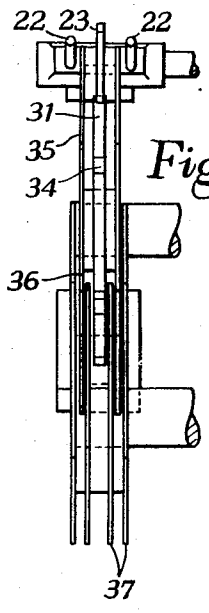


Fig.4.

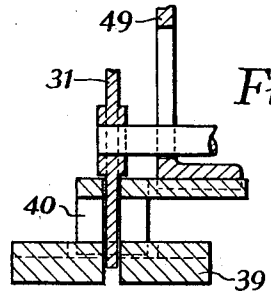
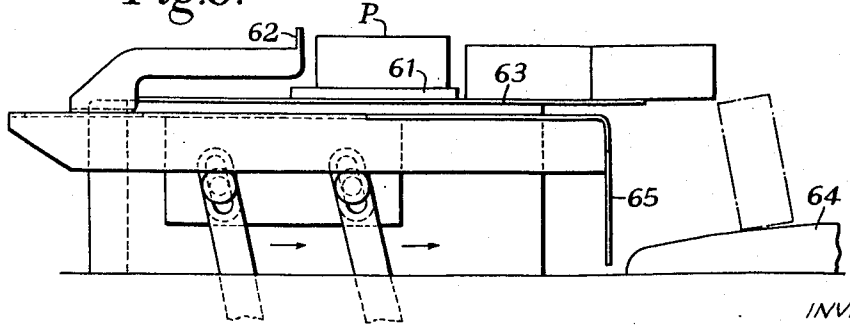


Fig.5.

Fig.6.



INVENTOR

D. R. P. Jackson

BY

Watson, Cole, Grindle & Watson

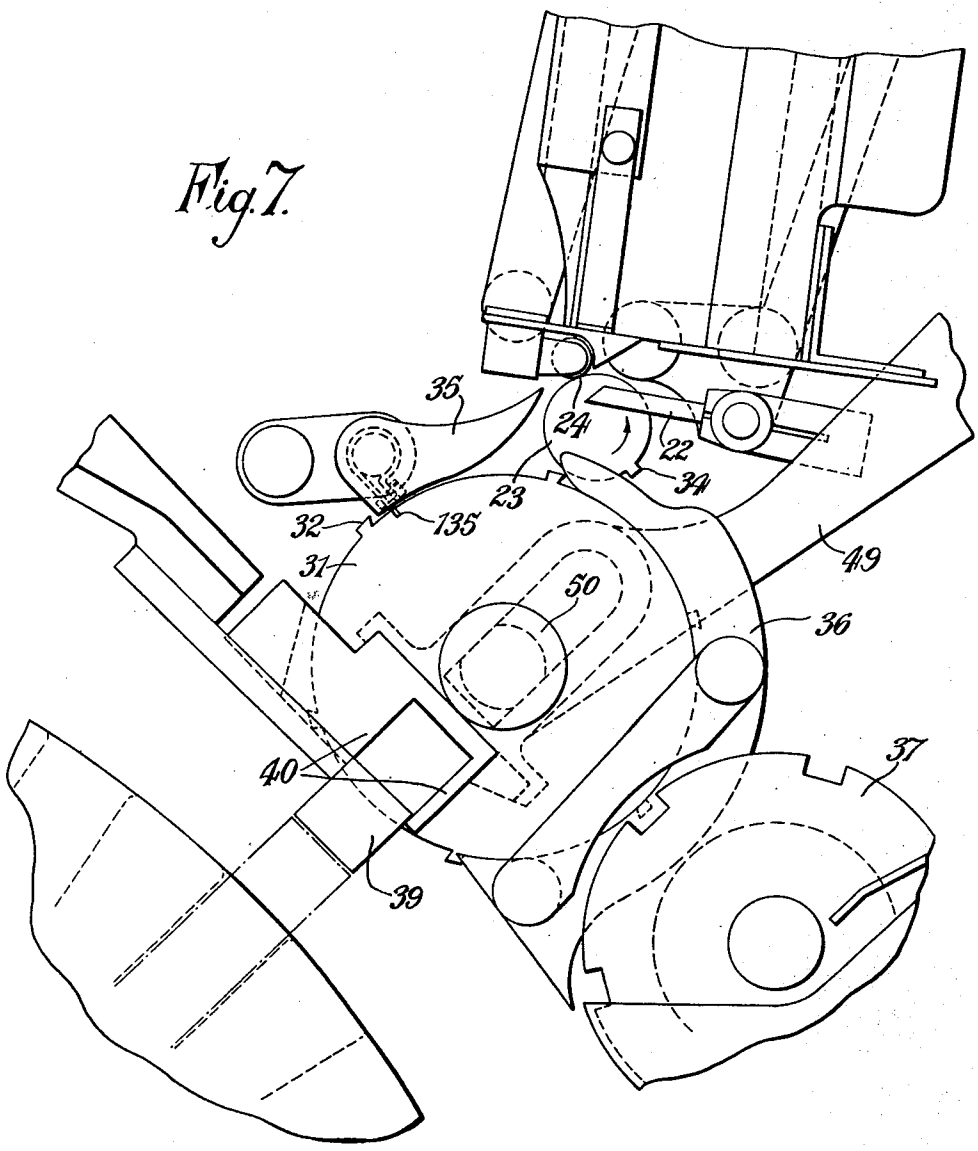
ATTORNEY

Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 4

Fig. 7.



INVENTOR

DONALD R. P. JACKSON

By: Watson, Cole, Grindle & Watson

Attorneys

Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 5

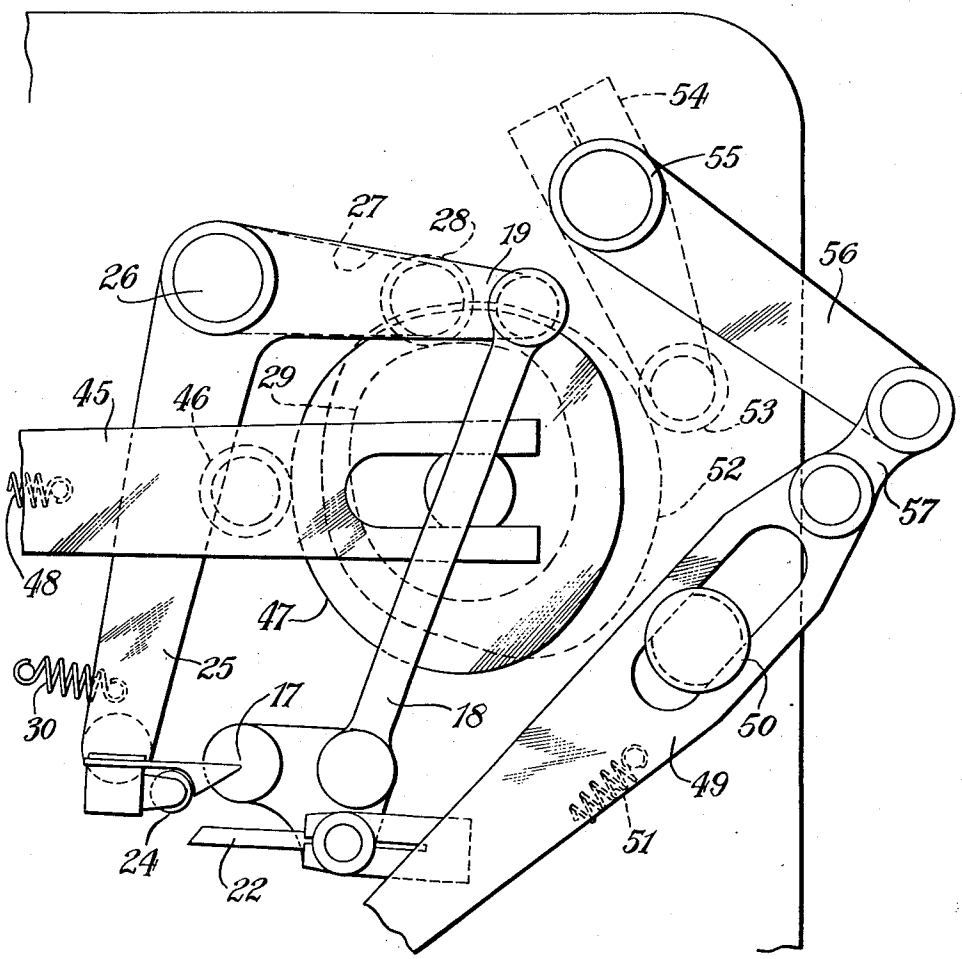


Fig. 8.

INVENTOR

DONALD R. P. JACKSON

By: Watson, Cole, Grindle & Watson

Attorneys

Feb. 2, 1954 D. R. P. JACKSON 2,667,987

PACKING MACHINE

Filed Aug. 27, 1951 6 Sheets-Sheet 6

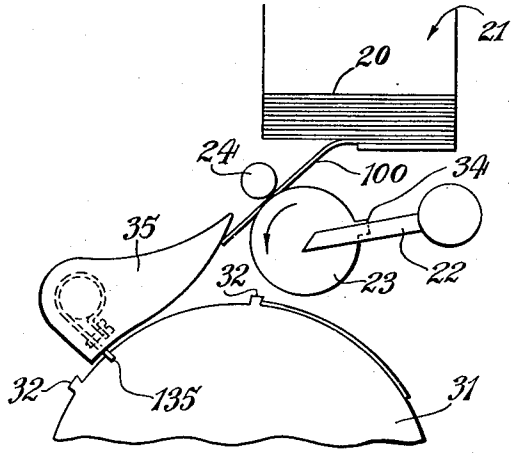


Fig. 9.

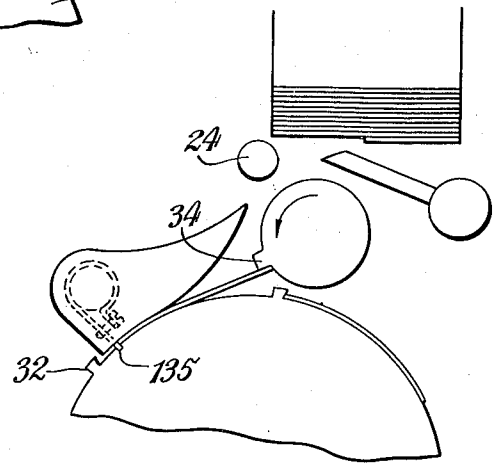
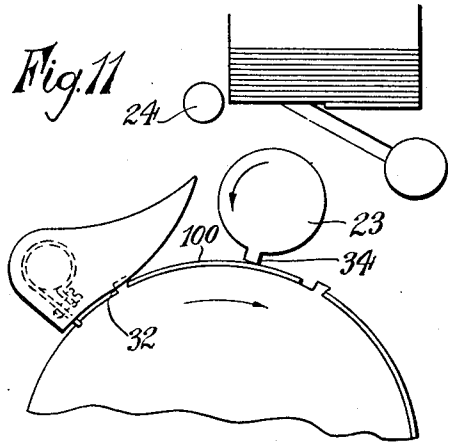


Fig. 10.

Fig. 11



INVENTOR

DONALD R. P. JACKSON

By: Watson, Cole, Brindle & Watson

Attorneys

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2,667,987

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2,667,987

PACKING MACHINE

Donald Richard Patrick Jackson, Deptford, London, England, assignor to Molins Machine Company Limited, Deptford, London, England, a British company

Application August 27, 1951, Serial No. 243,877

Claims priority, application Great Britain September 5, 1950

6 Claims. (Cl. 216—55)

1

This invention concerns improvements in or relating to packing machines, and refers more particularly to the delivery end of such machines where the packets are usually accumulated in a magazine or the like which is commonly called a stacker.

Such stackers frequently comprise a wheel furnished with a number of radially disposed pockets each adapted to contain a packet and rotatable to convey the packets from the stacker inlet to the outlet, during which movement adhesive may be dried, flaps of the packet folded, stamps affixed or other final operations performed on the packet, and the present invention is concerned with such wheel stackers.

In the case of stackers in which adhesive is to be dried it is usual to provide heaters to hasten the drying.

The stacker wheel with which the present invention is concerned is primarily intended for use with packets which bear a revenue stamp as, for instance, the well-known American type packets, and for this purpose the pockets of the wheel into which the packets are thrust radially, are provided with bottom plates which move radially to and from the axis of the pocket wheel. The plates move comparatively stiffly so that a packet can be thrust endwise into the wheel for about two-thirds of its length, whereafter the packet and bottom plate will stay in that position until further pressure is exerted on the packet to push it further into the wheel. In the following description the words "comparatively stiffly movable" are intended to refer to a bottom plate of this nature, and the devices for controlling its movement will be described in detail later.

According to the present invention there is provided a stacker wheel of the kind referred to comprising bottom plates to the pockets, which plates are comparatively stiffly movable, means for inserting a packet endwise into a pocket of the wheel so that part of the packet projects above the rim of the wheel, means for inserting the packet entirely within the wheel after the latter has moved from the first position, and means for moving the bottom plates so as to eject the packets when the wheel has completed substantially a revolution from the position at which the packet was first inserted.

In combination with said wheel there may be

2

provided stamp applying mechanism, adapted to apply an adhesive coated stamp so that it lies flat across the end face of the packet and protrudes beyond the planes of the broad faces thereof, and a pressure plate adapted to hold the stamp in said position while movable tuckers fold down the protruding ends on to the broad faces of the packet, the pressure plate thereupon moving to press the packet entirely into the pocket of the wheel while the tuckers press upon the side portions of the stamp to guide and hold them in position.

The invention will be more fully described with reference to the accompanying drawings in which:

Figure 1 is a front elevation of a stacker wheel and stamp applying apparatus drawn to a small scale.

Figure 2 is an enlarged view of part of Figure 1.

Figure 3 is a section of Figure 2 on the line 2—2.

Figure 4 is an elevation of a few parts of Figure 2 looking in the direction of the arrow A.

Figure 5 is a section of Figure 2 on the line 4—4.

Figure 6 is a view of part of Figure 2 looking in the direction of the arrow B.

Figure 7 is an enlarged view of a part of Figure 2.

Figure 8 shows an arrangement of cams for operating various parts of the stamp applying mechanism.

Figures 9, 10 and 11 are diagrammatic views showing stages in the feeding of a stamp from a magazine.

Referring to the drawings, the wheel 1 is very similar in general construction to that shown in United States application Serial No. 677,228, now Patent 2,591,135, issued April 1, 1952, and is intermittently rotated for example by a crank and connecting rod of substantially the same kind as shown in said specification. A locking lever of substantially the same kind as in said specification is also provided to hold the wheel in position at the end of each intermittent movement. Any other suitable intermittent drive may be used and it does not appear to be necessary to show the drive.

Each pocket 2 of the wheel is provided with a movable bottom plate consisting of a plate 3 of

the same shape as the cross section of the pocket, but slightly smaller, and having a rod or tail 4 projecting at right angles and inwards from it towards the centre of the wheel. The rod is of circular shape but has a flat 5 formed thereon and a spring pressed plunger or like pressing device 6 is arranged to engage with the flat surface so that the bottom plate moves comparatively stiffly and will stay in any position to which it is moved. The flat and the plunger also prevent the bottom plate from twisting at any time. A rotatable shaft 7 is provided at the centre of the wheel, and this has a crank 8 on it to which a short connecting rod 9 is attached, the other end of the rod being connected to a slide 10 which slides in suitable guides 11 attached to a fixed member at the middle of the wheel. The outer end of the slide comprises a pivoted member 58 described in more detail later adapted to engage the aforesaid rods of the movable bottom plates in turn so as to push each rod outwards and eject a packet from the wheel at the appropriate time.

Cigarette packets coming from a packing machine 14 are pressed into the pockets 2 of the wheel in turn as the wheel rotates intermittently in timed relationship with the packing machine. It is convenient to insert a packet when the corresponding pocket is horizontal and stationary as shown in Figure 1. The packets may be inserted in any desired manner but it is convenient to arrange the wheel so that a packet, the one bearing the reference P, moving under the pressure of the conveyor 15 of the packing machine pushes a preceding packet into a pocket of the wheel. Further the arrangement is such that the packet entering the wheel is only pushed in for about two-thirds of its length. As soon as a packet has entered in this way the wheel moves one stage and the operations repeat.

In due course the first said packet reaches a position about 45° away from the inserting position and this second position constitutes the stamp applying position. The stamps are fed from the base of a pile 20 in a magazine 21.

An oscillating sucker 22 swings up to engage the lowest stamp towards one end thereof and then moves down, drawing the stamp 100 on to a feed roller 23 which is periodically engaged by a roller 24 carried at one end of an arm 25 of a bell crank lever pivoted at 26. The other arm 27 of the bell crank has a roller 28 on it which engages a cam 29 under the pressure of a spring 30. As the stamp is pulled down by the sucker 22 onto the feed roller 23, the roller 24 moves in onto the top of the stamp, as shown in Figure 9, so that the stamp is gripped between the rollers 23 and 24. Continued rotation of the roller 23 causes the stamp to be fed downwardly and to the left as viewed in Figure 9, and during this movement the stamp is guided by thin steel guides 35 onto an intermittently rotating roller 31 which at this time is stationary. A pair of stops 135 extend downwardly from the guides 35, and the leading edge of a stamp engages these stops, see Figure 10, while continued rotation of the roller 23 causes the stamp to be engaged at its rear end by a tooth 34 on the roller 23 and thereby pushed down toward the roller 31 as shown in Figure 10, the roller 24 moving away from the roller 23 to allow the tooth 34 to pass. Before the stamp is wholly deposited on the roller 31, however, the latter commences to move in the direction of the arrow, Figures 2 and 11, and slips beneath the stamp until a tooth 32 engages the edge of the stamp which is resting against the stops 135. On continued rotation of the roller 31 the tooth 32 pushes the stamp in the reverse direction to that in which it was fed onto the roller 31, and at the same time the tooth 34 presses the stamp down onto the roller 31 so that the stamp is momentarily gripped by the tooth 34 and roller 31, as shown in Figure 11. After the tooth 34 moves away from the stamp the latter is controlled and guided on the roller 31 by thin steel guides 36, see Figures 2 and 7. The wheel 31 conveys the stamp past a segmental gumming roller 37 receiving gum from a dish 38. Eventually the gummed stamp reaches the applying position and is rolled on to a packet moving with the wheel 1 by the carrier roller 31. The sucker 22 is oscillated on its pivot 17 by a link 18 receiving motion from an arm 19 of the above mentioned bell crank lever. In this way a stamp is stuck on to the end face of the packet, usually about mid-way thereof and transversely to the width of the packet, the stamp being of such length that the ends thereof project beyond the broad faces of the packet. It is necessary to fold down these projecting parts on to the broad faces of the packet and this is done in the following manner.

A reciprocating presser plate 39 is provided having an end surface substantially of the same shape and size as the end of the packet and this is moved by mechanism described later into engagement with the end of the packet after the stamp has been applied and it will be seen that the plate 39 then holds the stamp firmly in position. As soon as this is done, two movable tuckers 40 consisting merely of reciprocating flat surfaces formed by a grooved block move down the broad faces of the packet and smooth down the projecting ends of the stamp on to said faces. The edges of the pocket which contact with the broad faces of the packet may have a convex section 41 of small radius, but the radius can be very small, as with the construction described the ends of the stamp will enter the pocket with the packet without any material tendency to shift or or curl up, and the mere movement of the presser plate 39 to press the packet the remaining distance into the pocket is sufficient to cause the pressed down ends of the stamp to pass into the pocket with the packet and then the application of the stamp is completed. After this, the wheel continues to rotate intermittently until, when it has completed a revolution, less the pitch of one pocket, from the position where the packet first entered the wheel, during which time the gum on the packet and stamp is dried, the stamped packet is ejected from the pocket.

The presser plate 39 is fixed to an arm 42 of a bell crank lever pivoted at 43.

To the other arm 44 of the lever is connected a cam rod 45 having a roller 46 on it. A cam 47 and spring 48 reciprocate the rod and impart the desired movements to the presser plate.

The movable tuckers 40 are fixed at one end of a cam rod 49 guided by studs 50 for straight line movement. A spring 51 effects pressing movements and the tuckers are drawn back by a cam 52 engaging a roller 53 on an arm 54 pivoted at 55. A further arm 56 is fixed to the pivot and connected to the cam rod 49 by a link 57.

The ejection takes place radially at the position P. E. and for this purpose the member 58 on the aforesaid slide 10 engages with the rod 4 of the particular bottom plate of the pocket containing the packet and moves it outwards

so that the packet is ejected. As the slide returns from moving one rod to eject a packet, it passes close to the rod of the next pocket below and as the wheel may then be moving, the slide comprises the member 58 previously mentioned which is pivoted and sprung so that it turns on the pivot and trails along the second said rod, whereafter it assumes its normal position for the outward thrust, to eject the next packet. The end member 58 is pivoted at 59 and pressed by spring 60 the end of the slide 10 being forked as shown in Figure 2 to provide stops to control the part 58. The packet is received, on one of its broad faces, on a platform 61 over which moves a reciprocating pusher 62 and as the packet comes on to said platform the pusher moves the packet on to a fixed table 63.

Succeeding packets push preceding ones along table 63 and eventually the first packet falls off as shown in Figure 6 on to a table 64 where a pusher 65 movable with 62 pushes packets along as a stack between guides, not shown. Thus a row of packets is formed all standing on their edges and in contact with one another. This delivery arrangement is very convenient as operators can lift batches of packets out of the guides if necessary or they can be inserted into an outer carton by continued movement along the table and guides.

If desired a folder plate 70 may be arranged near the rim of the wheel to fold down a flap of the packet, as it is convenient on some packing machines to make three closure folds on the machine and leave the fourth for folding while the packet is in the wheel. Such a folder plate will, of course, be positioned in advance of the stamp applying device, for example, as shown in Figures 1 and 2.

As a pocket is necessarily a fairly close fit on a packet and there are many such pockets, it is not easy to adjust them for size if the packet size is changed. . It is therefore proposed to provide the wheel with a detachable rim 71, comprising the pockets, so that several such rims will cover a suitable range of packet sizes. The bottom plates can be constructed to suit the smallest packet and remain permanently in position.

It has been found in operating the machine that a fairly stiff movement of the rods 4 is necessary at the stamp applying position to avoid premature displacement of the packets but that the necessary stiffness is more than is desirable at the packet inserting position. The plungers 6 are therefore suitably sprung for the latter purpose while at the stamp applying position an additional spring 72 is provided which presses on the flats of the rods. As the spring pressure exerted by the plungers 6 is comparatively weak a ramp 73 is provided to ensure that the rods are accurately positioned as their corresponding pockets approach the stamp applying position.

What I claim as my invention and desire to secure by Letters Patent is:

1. Stamp applying mechanism, adapted to apply an adhesive coated stamp to a packet so that the stamp lies flat across the end face of the packet and protrudes beyond the planes of the broad faces thereof, a pressure plate adapted to engage and hold the stamp in said position, movable tuckers to engage and fold down the protruding ends of the stamp on to the broad faces of the packet, and means operable thereafter to move the pressure plate in a direction to push the packet away from the tuckers while the latter remain stationary.

2. Mechanism for applying a stamp on a packet, comprising a wheel having pockets formed in its periphery, a movable plate in each pocket forming the bottom thereof, means acting on each said plate to prevent undesired movement thereof while allowing movement of the plate in response to a predetermined pressure, means to insert a packet partially into a pocket so as to rest against said plate, and so that a part of the packet projects from the pocket, means to apply a stamp to the end surface of the projecting end of said packet, means to fold the end portions of the stamp onto exposed portions of opposed surfaces of the packet, and means operable thereafter to press against the said end surface of the packet so as to cause the packet to be inserted wholly into the pocket.

3. Mechanism for applying a stamp on a packet, comprising a rotatable wheel having pockets formed in its periphery, means to insert a packet partially into a pocket so that a part of the packet projects from the pocket, means to apply a stamp to the end surface of said projecting part of said packet, a presser member and means to press it against said stamp on said end surface to hold the stamp in position, means to fold the end portions of the stamp onto exposed portions of opposed surfaces of the packet, and means operable thereafter to move said presser member so as to push the packet entirely within the pocket.

4. Mechanism for applying a stamp on a packet, comprising a rotatable wheel having pockets formed in its periphery, means to rotate said wheel to bring each pocket in turn to each of a series of stations, means operable at one station to insert a packet partially into a pocket so that a part of the packet projects from the pocket, means operable at a further station to apply a stamp to the end surface of said projecting part of said packet, folding means operable at said further station to fold the end portions of the stamp onto exposed portions of opposed surfaces of the packet, presser means operable thereafter at said further station to push the packet wholly within the pocket, and ejector means operable at an ejecting station to eject the said packet from the pocket.

5. Mechanism for applying a stamp to a packet, comprising a rotatable wheel having pockets in its periphery, means to insert a packet partially into a pocket so that a part of the packet projects from the pocket, stamp-applying mechanism to apply a stamp to the end surface of said projecting part of the packet, a presser member and means to move it into engagement with a stamp on said end surface to hold the said stamp in said position a pair of folders movable thereafter to fold the end portions of said stamp onto exposed portions of opposed surfaces of the packet while said presser member remains stationary, and thereafter to remain stationary in engagement with said folded end portions and means operable thereafter to move said presser member further so as to push the packet wholly into the pocket away from the folders while the latter remains stationary.

6. Mechanism for applying a stamp to a packet, comprising a wheel having pockets in its periphery, each pocket comprising a movable plate forming the bottom of a pocket, means to insert a packet partially into a pocket against said plate and so that a part of the packet projects from the pocket, means to apply a stamp to opposed side faces of said projecting part of the pocket presser, means operable thereafter to

push said packet wholly into said pocket, a movable plate in said pocket forming the bottom thereof, means acting on said plate to prevent inward movement thereof during application of the stamp to said packet while allowing movement of the plate in response to pressure exerted by said presser means to push the packet wholly into the pocket, and means operable to push said plate in the opposite direction to cause it to eject the packet from the pocket.

DONALD RICHARD PATRICK JACKSON.

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