

April 1, 1952

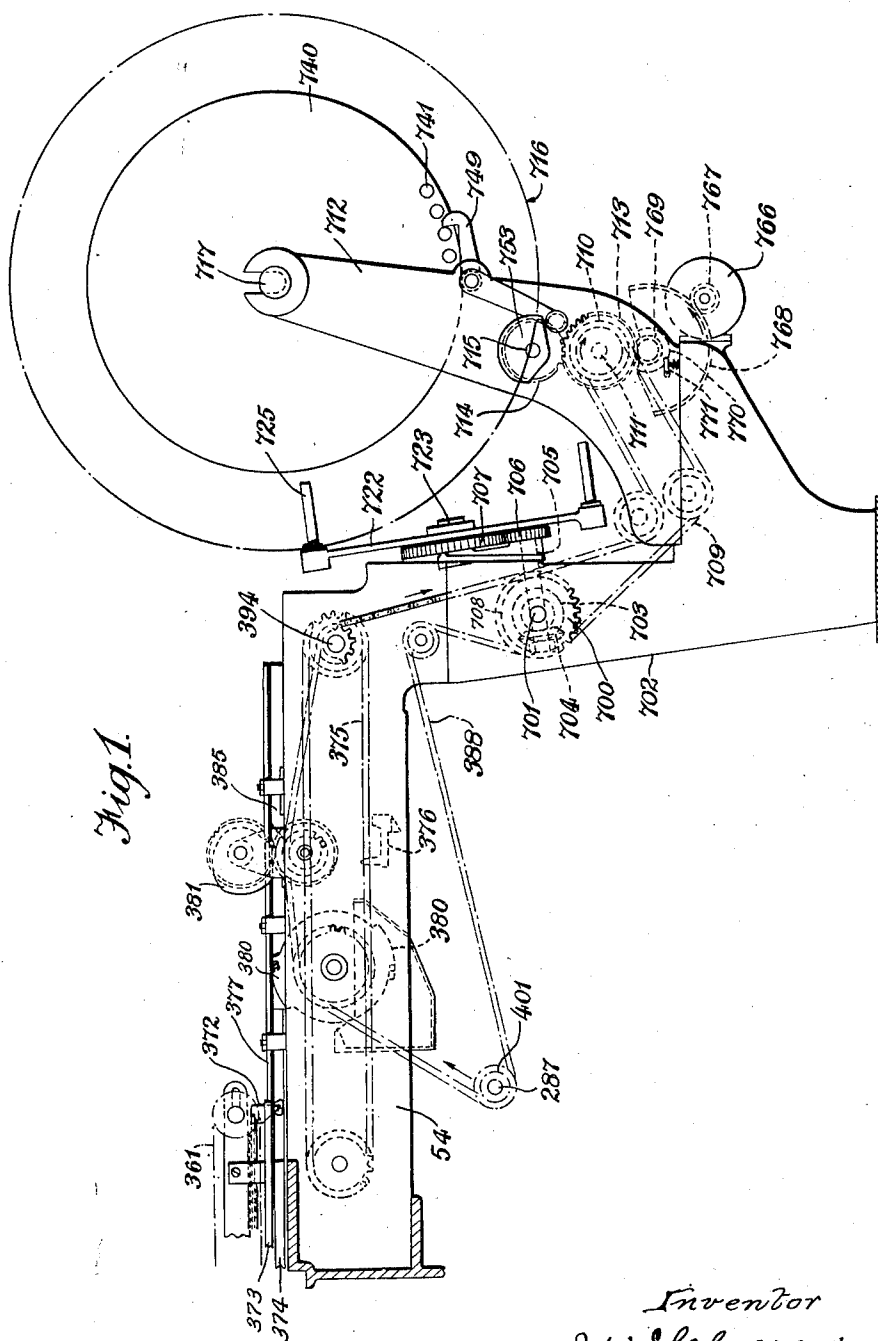
J. W. CHALMERS ET AL

2,591,135

PACKET MAKING MACHINE

Filed June 17, 1946

7 Sheets-Sheet 1



Inventor

J. W. Chalmers &
D. R. P. Jackson

D. R. P. Jackson

By Watson, Col, Grindle &
Watson

Watson

April 1, 1952

J. W. CHALMERS ET AL

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PACKET MAKING MACHINE

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7 Sheets-Sheet 2

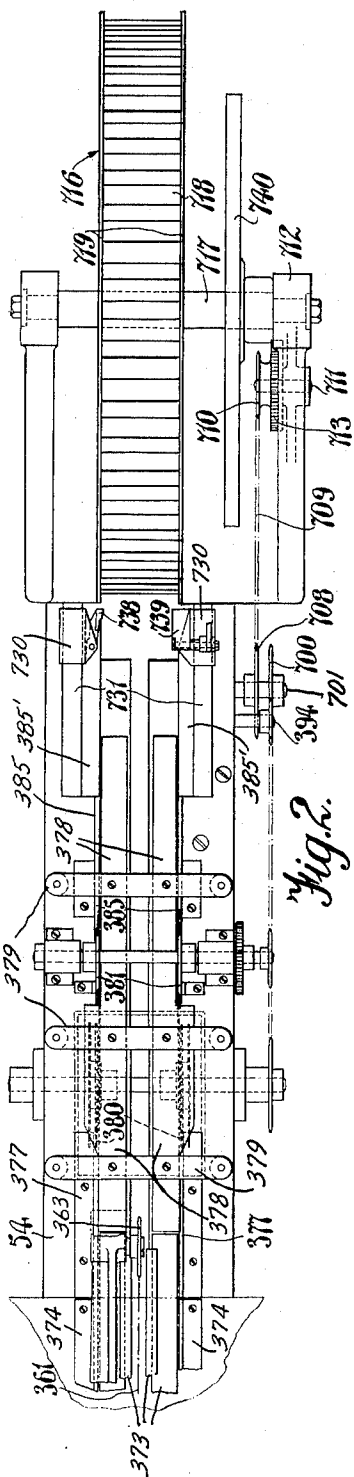


Fig. 2.

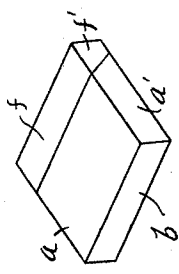


Fig. 12.

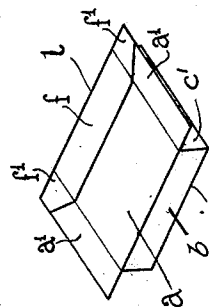


Fig. 11.

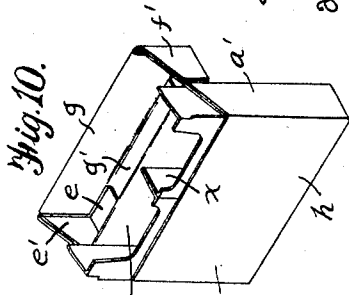


Fig. 10.

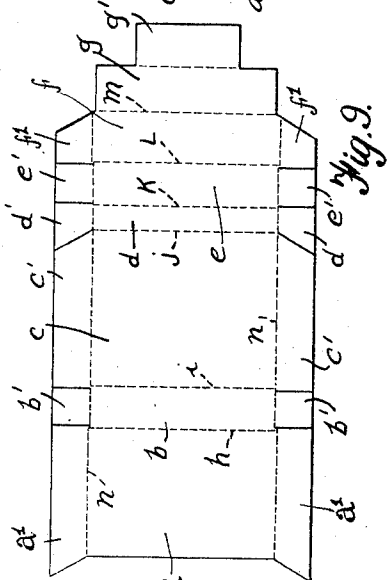


Fig. 9.

Inventor

J. W. Chalmers +
D. R. P. Jackson

By Watson, Cole, Kiehl & Watson

April 1, 1952

J. W. CHALMERS ET AL
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7 Sheets-Sheet 3

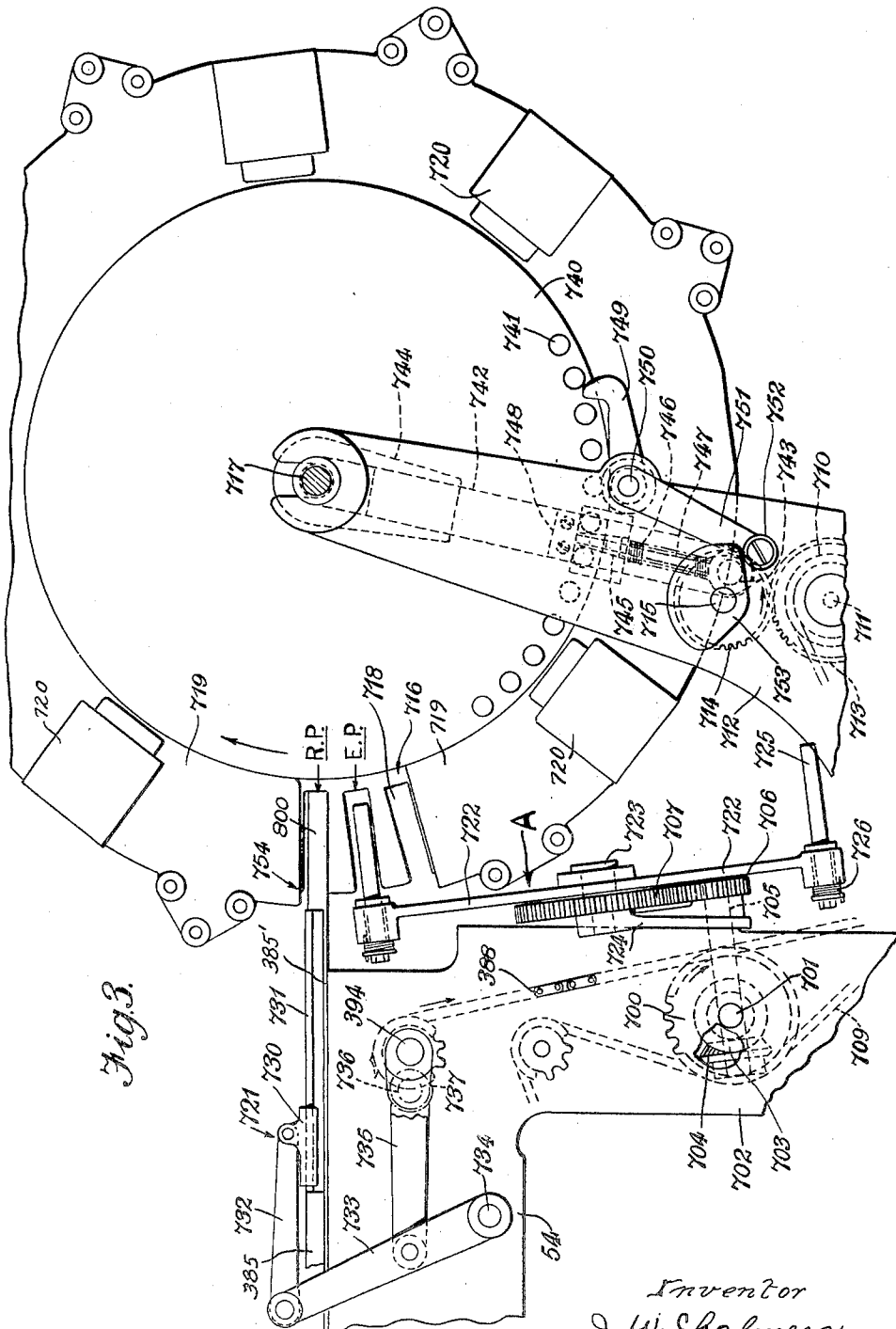


Fig. 3.

Inventor
J. W. Chalmers
+ D. R. B. Jackson
By Watson, Cole, Grindle & Watson

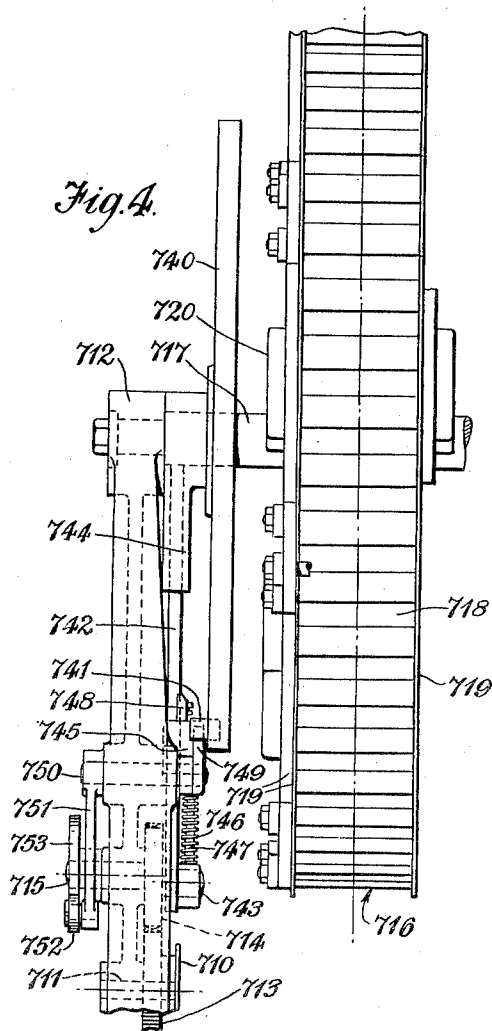
April 1, 1952

J. W. CHALMERS ET AL
PACKET MAKING MACHINE

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7 Sheets-Sheet 4



Inventor

*J. W. Chalmers +
D. R. B. Jackson*

By Watson, Cole, Brindle & Watson

April 1, 1952

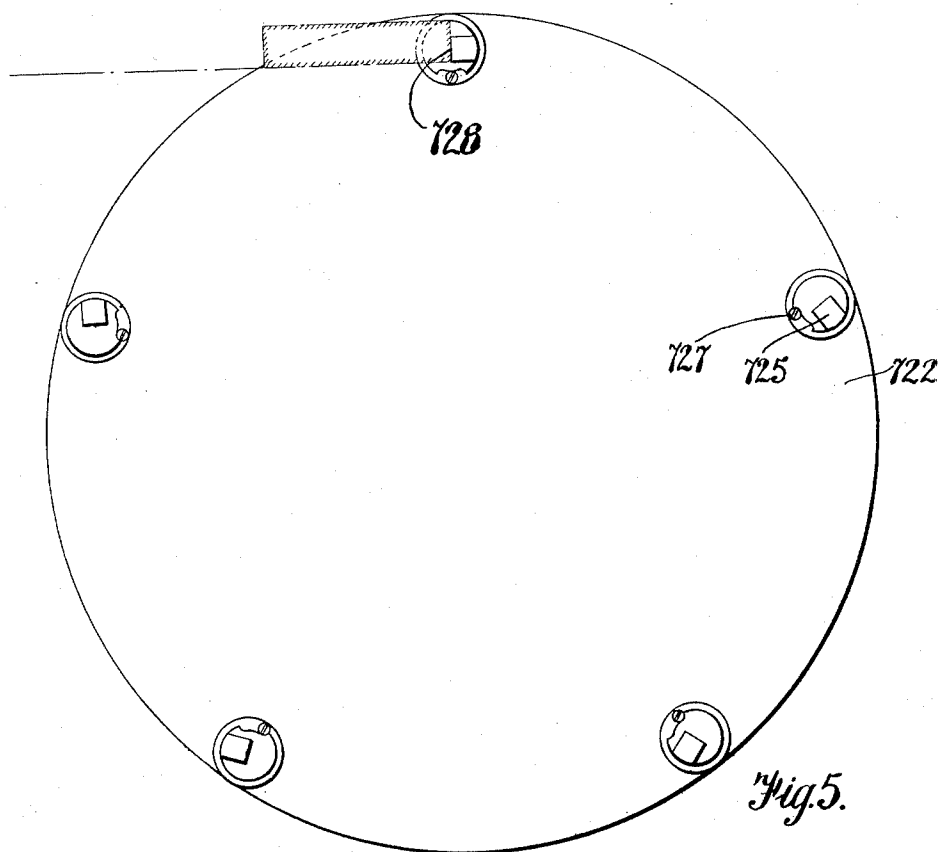
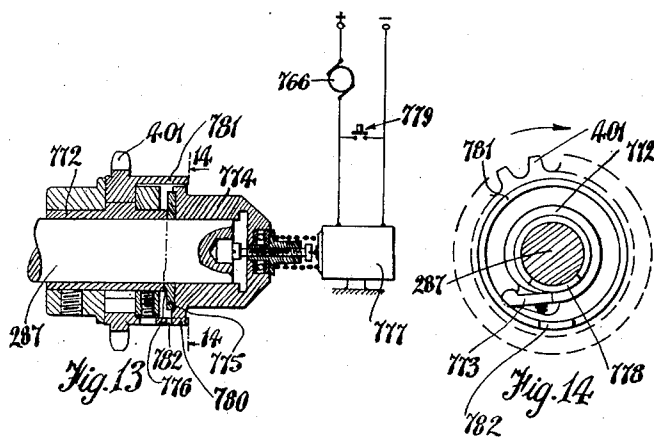
J. W. CHALMERS ET AL

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PACKET MAKING MACHINE

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7 Sheets-Sheet 5



Inventor
J. W. Chalmers &
D. R. P. Jackson
By Watson, Cole, Grindle & Watson

April 1, 1952

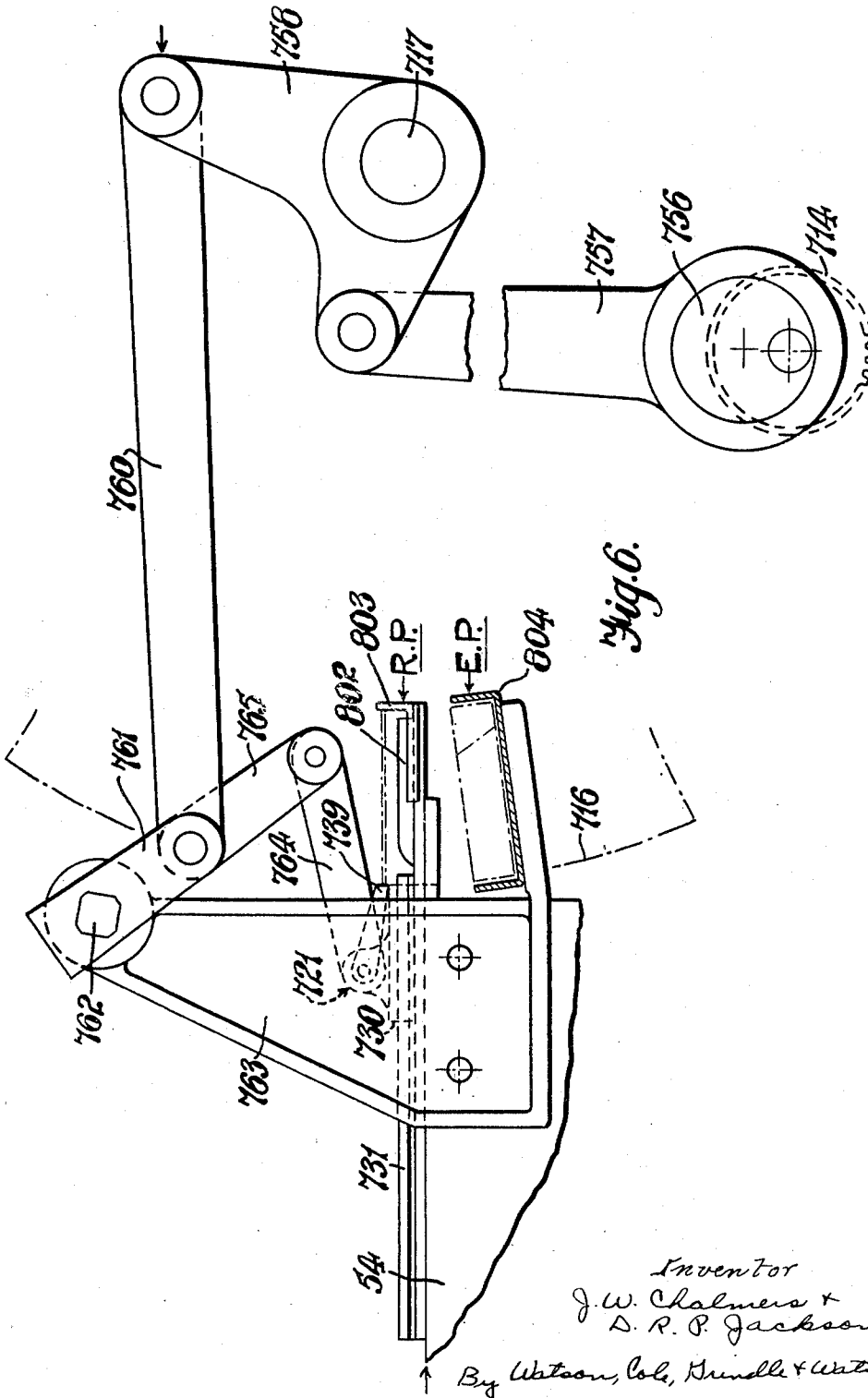
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PACKET MAKING MACHINE

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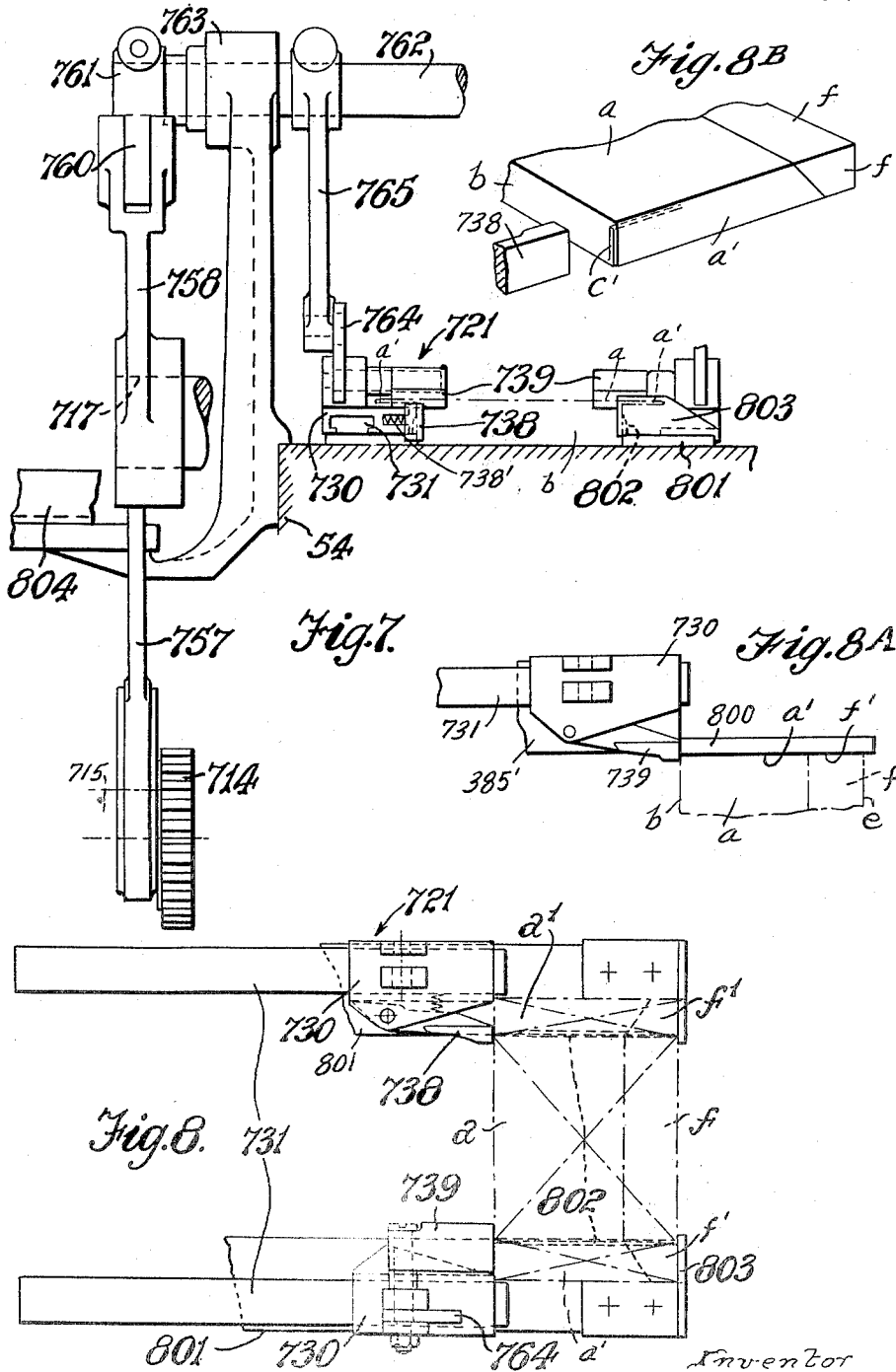
J. W. CHALMERS ET AL

2,591,135

PACKET MAKING MACHINE

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7 Sheets-Sheet 7



Inventor
J. W. Chalmers
+ D. R. P. Jackson
By Watson, Cole, Kneidel & Watson

UNITED STATES PATENT OFFICE

2,591,135

PACKET MAKING MACHINE

John Walker Chalmers and Donald Richard Patrick Jackson, London, England, assignors to Molins Machine Company, Limited, London, England

Application June 17, 1946, Serial No. 677,228
In Great Britain June 18, 1945

9 Claims. (Cl. 93—50)

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This invention concerns packet making 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 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 and prolonged exposure to heat is liable to spoil the contents of a packet.

Further in the manufacture of packets it is important to ensure proper register between the external side folds of the packet and the adjacent parts for the sake of appearance and to produce an entirely satisfactory packet. An example of one such packet is given later. The invention provides a wheel stacker having devices for securing such register.

According to the present invention there is provided apparatus for securing, by means of an adhesive, overlapping portions of a packet, comprising a rotatable wheel having at least one pocket adapted to receive and accurately hold and locate a partly finished packet having flaps adapted to be adhesively secured together, the pockets being open on at least one side of the wheel, a plate located at that side of the pocket and adapted to press against overlapping flaps of a packet in the pocket, and means to heat said plate whereby the adhesive on said flaps is dried whilst the overlapping flaps are accurately held in desired position by the pocket.

The plate may be arranged to have movement relative to the wheel (e. g. the plate may be stationary) whereby the plate provides an ironing effect on the overlapping flaps thus assisting in obtaining the desired shape to the finished packet.

Means may be provided for inserting a packet made of relatively stiff material (such as cardboard) into the said pocket comprising pushers (e. g. pawls) having packet-engaging surfaces arranged to press against end edges of unsealed flaps thereof and thereby to thrust a packet into the pocket whereby the edgewise pressure on the end edges of the unsealed flaps causes the latter to be brought into correct alignment or register.

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The apparatus may comprise means to insert a packet into said pocket with a flap of the packet projecting from the body of the packet, the heater plate being arranged to fold said flap down on rotation of the wheel.

The pocket may be open at both sides of the wheel, and in such a case the apparatus may comprise an ejector device for removing a finished packet from the pocket, said ejector comprising a rotatable member adapted to rotate in synchronism with the wheel and having fingers adapted to pass laterally through the pocket and eject the packet.

The fingers may be axially rotatable in said member and have each a flat side adapted to engage a face of the packet and to move with the packet while keeping the said flat side against said face.

The apparatus may be provided with driving devices (e. g. an independent motor and a clutch) whereby the wheel may be rotated when the packing machine stops thereby enabling the wheel to be emptied of any packet contained therein.

Means may be provided for restoring the wheel to correct timed relationship with the rest of the apparatus after the wheel has been independently driven as aforesaid, said means being substantially as hereinafter described with reference to Figures 13 and 14 of the accompanying drawings.

Means may be provided to drive the wheel intermittently, said means comprising a ring of spaced surfaces arranged concentrically with the wheel, a plunger adapted to engage any pair of said spaced surfaces, said plunger having a movement consisting of reciprocating radial components and reciprocating arcuate movements whereby the plunger is caused to engage a pair of said surfaces during one arcuate stroke and to disengage therefrom during the reverse arcuate stroke.

The radial and arcuate movements of said plunger may be obtained by mounting the plunger on a connecting rod which is pivoted at one end to a crank.

The plunger may be of tapering or wedge shape to ensure close co-operation with the surfaces during the whole of the driving stroke and may be yieldably movable (e. g. against a spring) lengthwise of the connecting rod.

Mechanism made in accordance with the invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a small scale side elevation of the

end of a packing machine showing a stacker wheel made in accordance with the invention.

Figure 2 is a plan of Figure 1.

Figure 3 is a side elevation showing part of Figure 1 drawn to a larger scale.

Figure 4 is an end elevation of part of Figure 3.

Figure 5 is a view in the direction of the arrow A, Figure 3, showing the ejector wheel.

Figure 6 is a side elevation of a modified form of the pusher driving mechanism shown in Figure 3.

Figure 7 is an end elevation of part of Figure 6.

Figure 8 is a plan view of part of Figure 6 showing the pushers in more detail.

Figure 8A is a fragmentary plan view, similar to the upper portion of Figure 8 but showing the arrangement for pushing the packet and aligning the end flaps in the procedure wherein both of said flaps are turned down and overlapped before entry into the packet carrying wheel.

Figure 8B is a fragmentary view in perspective of the rear half of the packet showing one of the pusher elements aligned with the rear corner of the packet for advancing the packet and at the same time aligning and registering the edge flaps thereof, all as in the embodiment shown in Figure 8A.

Figure 9 shows a blank from which a packet for which the machine is suitable is made.

Figure 10 shows a perspective view of a finished packet.

Figures 11 and 12 show stages in the folding operations.

Figure 13 is a sectional elevation of a timing switch device.

Figure 14 is a section of Figure 13 on the lines 14—14, some parts being omitted.

The invention is shown as applied to the machine described and shown in the specification of United States Patent No. 2,209,111 and such parts of that machine as are illustrated have the same references as in the prior specification, while all parts pertinent to the present invention have references from 700 upwards.

Referring to Figures 1 and 2, there is shown a bed 54 provided with a number of adhesive-applying and folding devices which will be briefly referred to, said folding bed being described in great detail in said Patent No. 2,209,111 to which reference should be made for a fuller description.

The cardboard blank from which the packets are formed is shown in Figure 9 of the drawings of the present application. The initial creasing and scoring of the blank and the folding of certain flaps of the top, bottom, and lid portions of the box are accomplished during the movement of the blank along the bed 50 shown at the left-hand side of Figure 1 of the drawings in Patent 2,209,111. During the return movement of the blank along the bed 52, as shown in the same figure, other flaps or tabs are folded up, the article comprising the vendable contents of the packet may be deposited thereon, and the lid and front panels folded over the articles. Thus the packets are in the condition shown in Figure 11 of the present drawings when they arrive at the near end of the bed 52 as viewed in Figure 1 of Patent 2,209,111, and are transferred in this state to the cross bed 54. For greater facility and associating the mechanism of the present invention with the basic installation of Patent 2,209,111, it should be stated that Figure 1 of this present application is the counterpart of Figure 23 of the prior patent, and similarly Figure 2 of

this application corresponds to Figure 26 of that patent; and the conveyor system, adhesive applying devices, and flap folder wheels of the present system are substantially identical with those of the patent.

So that the relative arrangement and functions of the various panels and flaps of the blank and of the partly finished packet may be completely understood, they will all be given reference characters and briefly described at this point. The larger panel of the front of the packet is designated *a*, and it will be seen that this panel is provided with the end or side flaps *a'* having bevelled edges at one end thereof. The bottom panel is shown at *b* and is provided with tabs or flaps *b'* which are adapted to be folded over and glued to the inner side of the main portion of the bottom panel *b*. The greater portion of the back of the packet is indicated at *c* and this panel is provided with end flaps *c'*. The back panel of the pivoted lid assembly is indicated at *d* and is provided with end tabs *d'* which are bevelled to conform to the bevelled configuration of the adjacent flap *c'*. The top panel of the lid portion is indicated at *e* and has end flaps *e'* adapted to be folded over and glued to the main panel. The front panel of the lid is indicated at *f* and has end tabs or flaps *f'* bevelled to conform to the corresponding shaped end edge of the flaps *a'*. Stiffening and reinforcing lid flaps *g* and *g'* are provided which are folded down against the lid panels *f* and *e* respectively and adhesively secured thereto. The boundary folds or creases between the various panels are indicated successively at *h*, *i*, *j*, *k*, *l*, *m*, and *n*, the crease *j* providing the hinge of the lid portion of the packet. Creases *n* separate the side flaps of the various panels from the panels themselves. Figure 10 shows a packet in substantially complete form with the lid open to show the filler or partition *x* which may be inserted at an appropriate point during the progress of the packet through the machine.

The principal stages in the preparation of the packet are illustrated and described in the earlier Patent 2,209,111 and it is sufficient to say that by the mechanism described in that patent and referred to above, partly finished packets, i. e. in the condition shown in Figure 11, are conveyed from the other part of the packing machine by pusher pieces 372 on an endless conveyor 361 and delivered on to the upper surface of the bed 54. The bed 54 is provided with a chain conveyor 375 which runs continuously and has pusher pieces such as that shown at 376 on it at equally spaced intervals. The pusher pieces 376 carry the partly finished packets (Figure 11) between guides 377 and as the packets move along the bed 54 adhesive is applied to the panel or flaps *a'* and *f'* at each side of the packets. The adhesive is applied by the segmental wheels 380 and afterwards the partly finished packets move beneath a rotating folder consisting of disc-like wheels 381 which are mounted and driven as shown. These wheels cause the panels or flaps *a'* and *f'* to be bent down at right angles to the plane of the front panels *a* and *f* of the packets and the operation is completed by spiral folders 385 in the known manner, the resulting packet being as shown in Figure 12, though the adhesive is not yet dry. Side guides 385' confine the flaps *a'* and *f'* in vertically folded position as the packets move from the folders 385.

The conveyor 375, adhesive-applying wheels 380 and folders 381 are all driven by a chain 388

which passes over the sprockets shown in the drawing, the chain itself being driven by a small sprocket wheel 401 which is mounted on a driving shaft 287 of the packing machine. The position of the sprocket wheel 401 is not to scale in Figure 1.

The chain 388 also passes around a sprocket wheel 700 which is fixed on a shaft 701 journaled in a supporting member 702 of the bed 54. A bevel wheel 703 is fixed to the shaft 701 and engages a further bevel wheel 704 on another shaft 705 also journaled in the support 702. A small gear-wheel 706 is fixed to the free end of the shaft 705 and engages with a larger gearwheel 707, these gearwheels being for the purpose of driving an ejector which will be described later.

Another sprocket wheel 708, Figure 2, is also fixed to the shaft 701 and a chain 709 passing around said sprocket and round the idlers shown in Figure 1, drives a sprocket wheel 710 mounted on a shaft 711 which is journaled in a curved supporting bracket 712.

Referring now also to Figures 3 and 4, a gear-wheel 713 is fixed to the shaft 711 and meshes with another gear-wheel 714 fixed on a shaft 715, also journaled in the bracket 712. A large intermittently rotating wheel, generally indicated by the reference 716, is supported on a shaft 717 carried in a fork at the top of the curved bracket 712 and is provided with a number of radial slots 718 in its periphery, equally spaced as will be seen from Figure 3, where three such slots are shown, the circumferential width of a slot being equal to the thickness of a packet. The axis of the wheel is so located that each slot in turn comes into line with a packet being conveyed along the bed 54 and each time the wheel stops a packet is thrust radially into a slot.

The wheel 716 rotates between two fixed rings or plates 719 which constitute side cheeks for the wheel slots, thus forming pockets although in some cases these cheeks might constitute part of the wheel. The plates 719 are fixed to the bed 54 by brackets which have been omitted from the drawings for clearness. The rings are heated by electric heaters 720 in order to dry the adhesive on the packets. The packets are thrust into the slots 718 from between the flap confining guides 385' by reciprocating pushers generally indicated by the reference 721 and described in more detail later, and operating in timed relationship with the movement of packets along the bed 54 and the intermittent rotation of the wheel 716.

As the side panels of the packet are still unsecured as the adhesive is not dry, side guide plates 800, Figure 3, are provided to control them until the packet is in a wheel slot whereupon the wheel moves at once and the panels are engaged by the plates 719. These side guide plates 800 may be considered as continuations of the flap guides 385'.

When a packet of the wheel has travelled through nearly a revolution from the packet-receiving position marked R. P. in Figure 3, it reaches the position E. P. at which the packet is ejected from the wheel as a finished article.

The ejector, see also Figure 5, comprises a rotatable disc or the like 722 journaled on a pin 723 which is fixed in a bracket 724 attached to the support 702. The gear-wheel 707 previously mentioned is fixed to one side of the disc and thus the disc rotates continuously. The disc 722 is provided with several pins 725 (in the form illustrated, four) equally spaced apart and adapt-

ed to pass through a wheel slot 718 sideways, see Figures 3 and 5, the movement being substantially parallel to the wheel axis, and ejecting a packet. Each pin 725 is capable of being rotated axially against the influence of a torsion spring 726 which tends to hold it against a stop 727, Figure 5, and is provided with a flat packet engaging face 728. As a pin 725 moves into contact with a packet face an operative face 728 lies flat against the packet and later the pin can twist to maintain proper engagement between the face 728 and the packet in spite of the rotary path of the pin and the horizontal path of the packet as the latter is ejected sideways from the wheel slot 718.

The detailed construction of the pushers 721 for moving packets into the slots of the wheel from the bed 54 will be better understood from Figures 6, 7 and 8, and the description thereof given later. The pushers comprise a pair of vertically pivoted pawls 738 and a pair of horizontally pivoted pawls 739 (Figures 6, 7, 8, 8A and 8B) carried by slides 730 which are reciprocated along guides 731 fixed at each side of the bed 54. In the construction shown in Figures 1 to 4, the slides are moved to and fro by links 732 which are pivoted to levers 733 pivoted at 734 to the bed 54. Each lever 733 has pivoted thereto a connecting rod 735 which is coupled to a pin 736 on a crank 737, the cranks being fixed to the conveyor spindle 394 of the bed 54. As the crank in Figure 3 is in front of the sprocket wheel on the spindle 394 it is shown in chain lines and the connecting rod 735 is shown broken. Thus the pushers 721 will be moved to and fro in timed relationship with the movements on the conveyor 375 which moves the packets along the bed. The pushers 721 move rather faster than the pusher pieces 376 of said conveyor so as to carry the packets clear of said pusher pieces.

Referring now particularly to Figures 6, 7, 8, 8A and 8B, each slide 730 has two pawls 738 and 739, but for clearness, the pawl 738 only is shown in the upper part of Figure 8 and the pawl 739 only in the lower part. The pawl 738 is adapted to engage the end edges of the side wall flaps *a'* and *f'* of the packet, and the pawl 739 to engage the edge of the neighbouring part of the end wall, and thus the packets are pushed from between the guides 385' into the wheel pockets 718 and come to rest against a fixed stop which in the construction shown in Figures 1-4, is formed by the bottom of a pocket. Since the flaps which comprise the side walls of the packet (i. e. the flaps *a'* and *f'* together with the flaps *c'* and *d'* which they overlap) are at this stage unsecured because the adhesive is not yet dry, there might be a risk of these flaps becoming slightly misaligned and out of registry while the packet is being moved. However, by means of the arrangement first described, and clearly shown in Figures 8A and 8B, the pressure of the pawl 738 against the rearwardly facing end edges of these flaps brings these rear or end edges to the plane of the end wall or bottom *b* of the packet and also ensures that the flaps *a'* are pushed into correct abutting relationship with the flaps *f'* along their diagonal lines of separation. Thus the overlapping flaps comprising the side walls of the packet are squared up and properly aligned and registered (all as clearly depicted in Figure 12) as the packets are pushed into the wheel pockets against the end stop and between the guide strips 800. At the same time the horizontally pivoted pawl

739 pushes against the upper corners of the rear end of the packet.

On the return stroke of slides 730, the pushers 738 and 739 ride over the walls of the next packet, pusher 739 falling into place behind the packet by gravity, and pusher 738 being spring pressed, the positions of the pushers being then as shown in Figure 8.

In Figures 7 and 8 in which the packet is shown in chain-dotted lines, the flaps *a'* and *f'* are shown standing away from the packet in the plane of the panels *a* and *f* in the manner shown in Figure 11. This, however, is for the purpose of illustrating a slightly different method of transferring the packets into the wheel pockets according to a modified construction shortly to be described.

The wheel 716 is rotated by a crank and connecting rod device constructed as follows:

A driving disc 740 is fixed to the spindle 717 of the wheel 716 and provided with a number of pins 741, a few of which are shown in Figure 3, equal to the number of slots in the wheel, and equally spaced around a circle concentric with the axis of the shaft 717 of the disc. A connecting rod 742 is provided which is connected to a crank pin 743 fixed in a crank disc which, as shown in Figure 3, actually consists of a gear-wheel 714. The "little" end of the rod is guided by a guide 744 in which the "little" end slides, the guide itself pivoting around the axis of the shaft 717. The connecting rod 742 is provided at its lower part with a driving block 745 which at times enters between two of the pins 741 as shown in Figure 3. Owing to the swinging movements of the rod, the rod moves the disc through an angle equal to the angle of swing of said rod. The block is as shown of tapering or wedge shape and is slidable on the body of the connecting rod and urged by a spring 746 surrounding a pin 747 upwards against a stop 748 which is screwed to the rod. Owing to the spring mounting, the block, when it has moved between a pair of pins as far as is possible, remains still although the rod continues to move due to the crank action. Thus the wheel 716 moves with the swing of the rod and as the crank passes through the position of maximum angularity, the block 745 is withdrawn from between the pins and the wheel comes to rest. A cam-operated pawl 749 is fixed to a spindle 750 which is journaled in the curved bracket 712. The cam lever 751 is also fixed to the spindle 750 and provided with a roller 752 which engages a cam 753 mounted on the shaft 715 on which the gearwheel or crank disc 714 is also mounted. The cam is so shaped and timed that when the wheel comes to rest as the block 745 is withdrawn from between the pins, the pawl 749 enters between another pair and locks the wheel.

In another construction which will be obvious from the previous description and drawings, the bed 54 is made very much shorter and the packets are engaged by the pushers 721 while they are still beneath the conveyor 361 and pushed into the wheel which is located quite close to said conveyor in this example. The adhesive applying apparatus is arranged beneath the conveyor 361, and the packet is moved into a wheel slot in the condition shown in Figure 11. In this case the flaps *a'* are standing away from the packet in the same plane as the panel *a* and accordingly in this construction the flaps *a'* are engaged at their end edges by the pawls 739 (Figures 7 and 8). The folding down of the side panels or flaps

a' and *f'* of the packet is done when the packets are in the wheel 716, by rotation of the wheel, when said panels engage a slight lead or flare on the side cheeks or rings at the position marked 754, Figure 3.

As the side panels of the packet are not folded down in this case until after the packet has been inserted into a slot it is necessary to provide external stops 803, Figures 6 to 8, against which the ends of the panels *f'* abut to secure the desired register in the finished packet. Since the flaps *a'* and *f'* are not folded down until after the packets are in the wheel 716 the side guides 800 may be omitted, unless it is desired to use them to ensure the approximate vertical position of the under-flaps *c'* and *d'*. These stops are fixed to plates 801 held beneath the pusher guides 731 and provided with thin knife-like parts 802. The latter hold up the inner side panels until the wheel movement begins to bend down the panels *a'* and *f'* on to them. The parts 802 are so thin that adhesive does not touch them and as the packet moves upwards with the wheel the inner side panels are controlled until such time as the panels *a'* and *f'* are bent down sufficiently to hold the inner panels in their proper position. The finished packets ejected from the wheel pass along a trough or chute 804 which is supported on an extension from the bracket 763 shown in Figures 6 and 7.

In this construction a different method of operation of the pushers 721 is provided and shown in detail in Figures 6 and 7. The shaft or axle 715 upon which crank disc or gearwheel 714 is mounted, has an eccentric 756 attached thereto on which an eccentric rod 757 is mounted. The rod is connected to a bell-crank lever 758 pivoted on the wheel axis 717, and one arm of the lever 758 is connected by a link 760 to a lever 761 which is fixed to a shaft 762 supported in bearing brackets 763 fixed to the sides of the machine. The pushers 721 have links 764 pivoted to them, the other ends of the links being pivoted to levers 765 which are fixed to the cross shaft 762.

The rings 719 may be provided with a thermostat to control the current and keep the plates at the desired temperature.

An arrangement for rotating the wheel independently of the rest of the machine so as to enable it to be emptied when the machine is stopped for any prolonged period to prevent the packets from becoming unduly heated is shown in Figures 1, 13 and 14. Referring to Figure 1, an electric motor 766 is shown attached to the support member 702 and with a small gear-wheel 767 on its shaft. This engages with a larger gearwheel 768 journaled in the bracket 712 and coaxial with the gearwheel 768 there is arranged another small gearwheel 769 which engages with the gearwheel 713. The gearwheel 769 has a notched clutch disc 770 fixed to it. This disc 770 can be coupled to the gearwheel 768 by causing a spring-pressed pawl 771 pivoted on the gearwheel 768 to engage the notch in said disc 770. When the machine is in operation the gearwheel 769 is driven by the gearwheel 713 and the clutch collar 770 slips beneath the pawl 771 so that the gearwheel 768 and the motor remain at rest.

When the machine stops for any reason it is, as aforesaid, desirable to continue the rotation of the stacker wheel so that it may be emptied of any packets remaining therein and it is further desirable that the pushers 721 shall continue to operate so that a packet which may have emerged from between the guides 377 is delivered into the

wheel and properly sealed. The independent motor drive described above causes both the wheel and the pushers to continue to operate since in the first construction the pushers are driven by the chain 388 and in the second they are operated from the gear wheel 714. It will be appreciated that this independent motor driving arrangement for the wheel will bring the latter out of the normal timed relationship with the rest of the packing machine and for this reason there is provided a timing switch device which is incorporated with the sprocket wheel 401, which as previously stated is on the main driving shaft of the packing machine.

Referring now also to Figures 13 and 14, the sprocket wheel 401 comprises a free wheel device consisting of a clutch ring 772 fixed to the shaft 287 and on which the sprocket wheel can rotate, and a pawl 773 as shown, the arrangement being such that when the shaft 287 comes to a standstill because the packet machine has stopped, the sprocket wheel 401 will be rotated as soon as the motor 766 is started because the gearwheel 713 is attached to the sprocket 710 around which the chain 709 passes, and the pawl 773 will trip over the clutch ring 772. On the end of the shaft 287 there is fixed a timing device consisting of a sleeve 774 carrying a cam ring 775 having a small projection or cam 776 extending over a few degrees on one of its faces. The sleeve 774 has a small dog 780 on it which fits in a groove 782 in an extension sleeve 781 of the sprocket 401 so that the two parts rotate together. The clutch ring 772 has a depression 778 in its end adjoining the cam ring 775, the arrangement being such that when the parts are in the position shown in Figure 13, the cam 776 lies in the depression but when relative angular movement occurs between the sprocket wheel and the shaft, the cam 776 will ride up out of the depression and move the sleeve 774 to the right. This action causes the contacts of a micro-switch 777 to close.

When the machine is in normal operation, the parts above described are in the relative positions shown in the figures, and the same applies when the machine is stopped, but as soon as the motor 766 is started the free wheel device will commence to rotate and the cam 776 will ride up out of the depression. The circuit shown in Figure 13 is also provided with a press button switch 779 in parallel with the micro-switch, and the operation is as follows: When the machines comes to a standstill the timing and free wheel device will be in the condition shown, but as soon as the operator presses the button switch 779, the motor will start running and continue to do so as long as said switch is "made." When the operator considers that the wheel has been cleared of packets he will release the press button switch or, in the case where starting and stopping buttons are employed, press the stopping button. The motor will, however, continue to run since there is a parallel circuit through the micro-switch 777 until the free wheel device has rotated for a sufficient time to allow the cam 776 to drop down the step of the depression in the sleeve 774, whereupon the circuit is broken, the motor stops, and all the parts are in the proper timed relationship for the re-starting of the whole machine.

It will be appreciated that in a construction where the rings 719 rotate with the wheel a different kind of ejector must be provided from the one illustrated and described.

Further it will be readily understood that if the independent driving motor for the wheel is

not desirable for any reason, the wheel may be driven directly from the main driving motor of the whole machine and the rest of the machine may be driven from such motor through a clutch whereby it can be stopped while the wheel continues to rotate.

Although in the present specification and in that of the prior Patent 2,209,111, the packets have been described as being filled with certain inserts on their way through the mechanism prior to reaching the bed 54, it is apparent that within the scope of the present invention as defined by the following claims, the novel mechanism may operate to close and seal the flaps of an empty packet, which is adapted to be filled later on with any type of article or partition forming inserts.

What we claim as our invention and desire to secure by Letters Patent is:

1. In the manufacture of packets having overlapping flaps adapted to be secured together by means of adhesive, apparatus for securing such overlapping flaps of a packet, comprising a rotatable wheel having pockets of a size and shape adapted to receive and accurately hold in desired shape and locate partly finished packets, the pockets being open on a side of the wheel at which such flaps are located, pushing means for pushing partly finished packets into said pockets, guiding means for maintaining said packets in rectilinear alignment with respect to the pockets into which they are being pushed, said pushing means comprising at least one pusher having a packet-engaging surface arranged to press edgewise against end edges of said unsealed flaps to cause the latter to be brought into correct overlapping registry, a side plate located at such side of the wheel and adapted to press against such overlapping flaps of a packet in a pocket, and means to heat said plate whereby the adhesive on such overlapping flaps is dried while such flaps are held in desired position by the pocket, wherein the plate is supported for movement relative to the wheel to effect ironing of the overlapping flaps thus assisting in obtaining the desired shape to the finished packet.

2. Apparatus as claimed in claim 1, wherein said pushing means is adapted to insert a packet into a pocket with a flap of the packet projecting from the body of the packet, the heater plate being arranged to fold said flap down on rotation of the wheel.

3. Apparatus as set forth in claim 1 in which the overlapping flap arrangement is duplicated at each side of the packet, and the pushing means comprises separate elements bearing said packet-engaging surfaces, at each side of the path of movement of the packets.

4. Apparatus as set forth in claim 1 in which the pushing means comprises a longitudinally reciprocating carrier disposed alongside the path of movement of the packets, and two pivoted packet-contacting elements carried by said carrier, one pivoted on a vertical axis and the other pivoted on a horizontal axis so that they both may be swung aside during the rearward or return stroke of the carrier and to be swung back into the path of the packet near the end of the return stroke so as to be in a position to push on the rear edge of the packet during the next forward movement.

5. Apparatus as set forth in claim 1 in which the pushing means comprises a longitudinally reciprocating carrier disposed alongside the path of movement of the packets and a horizontally swinging member one end of which facing for-

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wardly in the line of movement of the packets is provided with said packet engaging surface, vertical pivots on said carrier for said member, whereby said member may be swung laterally outwardly of the path of movement of the packets during the return stroke of the carrier and be moved in behind the corner of a packet at the end of said retractive movement to push said packet forwardly upon the forward stroke.

6. In the manufacture of packets having overlapping flaps adapted to be secured together by means of adhesive, apparatus for securing such overlapping flaps of a packet, comprising a rotatable wheel having pockets of a size and shape adapted to receive and accurately hold in desired shape and locate partly finished packets, the pockets being open on a side of the wheel at which such flaps are located, a side plate located at such side of the wheel and adapted to press against such overlapping flaps of a packet in a pocket, and means to heat said plate whereby the adhesive on such flaps is dried while the overlapping flaps are accurately held in desired position by the pocket, wherein the plate is supported for movement relative to the wheel to effect ironing of the overlapping flaps thus assisting in obtaining the desired shape to the finished packet, wherein the plate is made discontinuous so that the pockets during a part of the rotation of the wheel are open at both sides, and comprising an ejector device for removing a finished packet from the pocket, said ejector comprising a rotatable member adapted to rotate in synchronism with the wheel and having fingers adapted to pass laterally through the pocket when the latter is open at both sides and eject the packet.

7. Apparatus as claimed in claim 6, wherein the fingers are axially rotatable in said member and have each a flat side adapted to engage a face of the packet and to move with the packet while keeping the said flat side against said face.

8. In the manufacture of packets having overlapping flaps adapted to be secured together by adhesive, apparatus for securing such overlapping flaps of a packet, comprising in combination a rotatable wheel having pockets of a size and shape adapted to receive and accurately hold in desired shape and to locate partly finished packets which have flaps adapted to overlap and be adhesively secured together, means to insert such partly finished packets into a pocket and comprising pushers arranged to push such packets into pockets and having packet-engaging surfaces arranged to press edgewise against the marginal edges of unsealed flaps to cause the latter to be brought into correct overlapping registry, and pressure means to press against the outer surfaces of said overlapping flaps while the packet is within the pocket whereby the overlapping flaps are held in desired position during the drying of the adhesive.

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9. In the manufacture of packets having overlapping flaps adapted to be secured together by means of adhesive, apparatus for securing such overlapping flaps of a packet, comprising a rotatable wheel having pockets of a size and shape adapted to receive and accurately hold in desired shape and locate partly finished packets, the pockets being open on a side of the wheel at which such flaps are located, a side plate located at such side of the wheel and adapted to press against such overlapping flaps of a packet in a pocket, and means to heat said plate whereby the adhesive on such flaps is dried while the overlapping flaps are accurately held in desired position by the pocket, the plate being supported for movement relative to the wheel to effect ironing of the overlapping flaps thus assisting in obtaining the desired shape to the finished packet, wherein the apparatus comprises a packet forming machine which supplies packets to said wheel, the said packet forming machine having driving means including a main driving shaft, and wherein independent driving means is provided for driving the wheel independently of the said packet forming machine, whereby the wheel may be rotated after the packet forming machine stops, thereby enabling the wheel to be emptied of any packet contained therein, means comprising a part rotatable relative to the main driving shaft and arranged to be so rotated by the said independent driving means for connecting the said independent driving means and the main driving means of the packet machine, and control means operated by said part to maintain the operation of the independent driving means until the said part is in correct position relative to the main driving shaft, whereby the wheel is restored to correct timed relationship with the rest of the apparatus after being independently driven.

JOHN WALKER CHALMERS.

DONALD RICHARD PATRICK JACKSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
609,472	Smyser	Aug. 23, 1898
665,241	Ludington	Jan. 1, 1901
1,217,694	Bracy	Feb. 27, 1917
1,991,223	Ledig et al.	Feb. 12, 1935
1,998,287	Pierson	Apr. 16, 1935
2,209,111	Chalmers	July 23, 1940

FOREIGN PATENTS

Number	Country	Date
538,609	Great Britain	Aug. 11, 1941