

Aug. 4, 1936.

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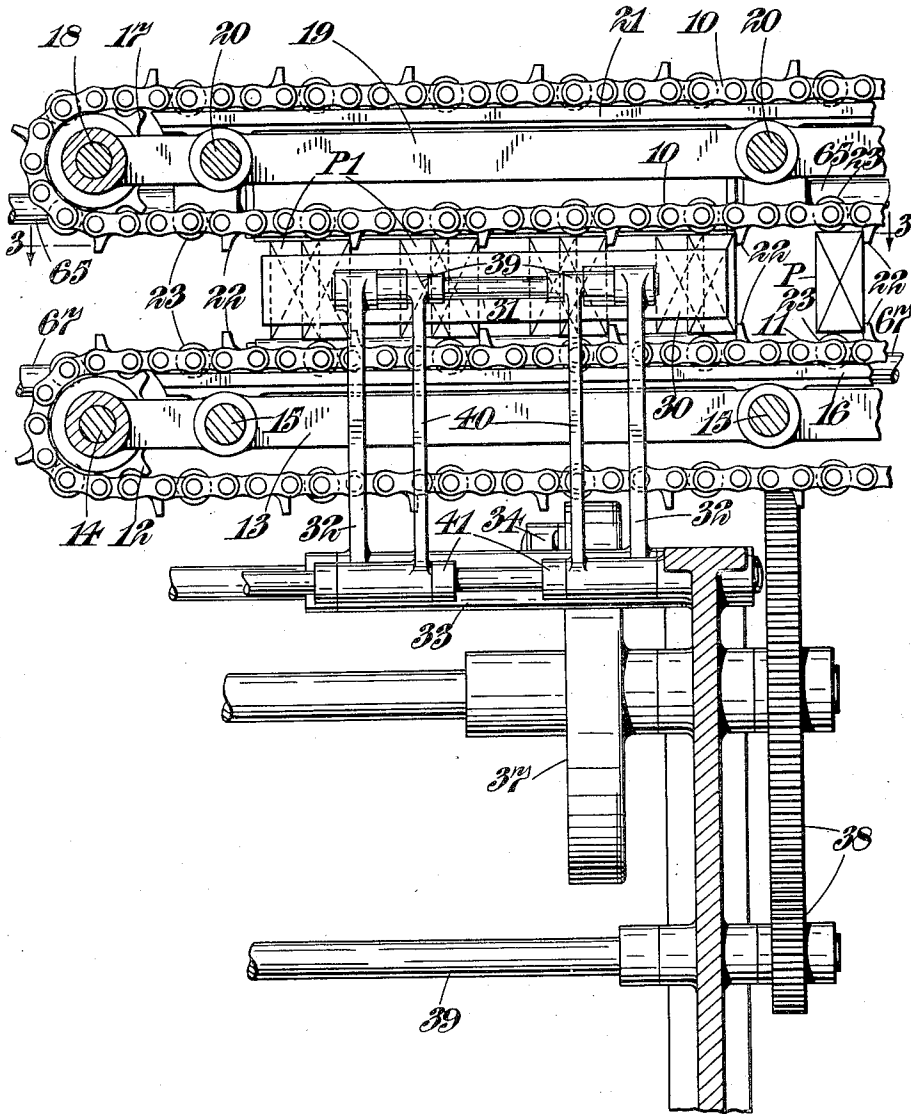
2,050,126

PACKING MACHINE

Filed Aug. 1, 1935

3 Sheets-Sheet 1

Fig. 1.



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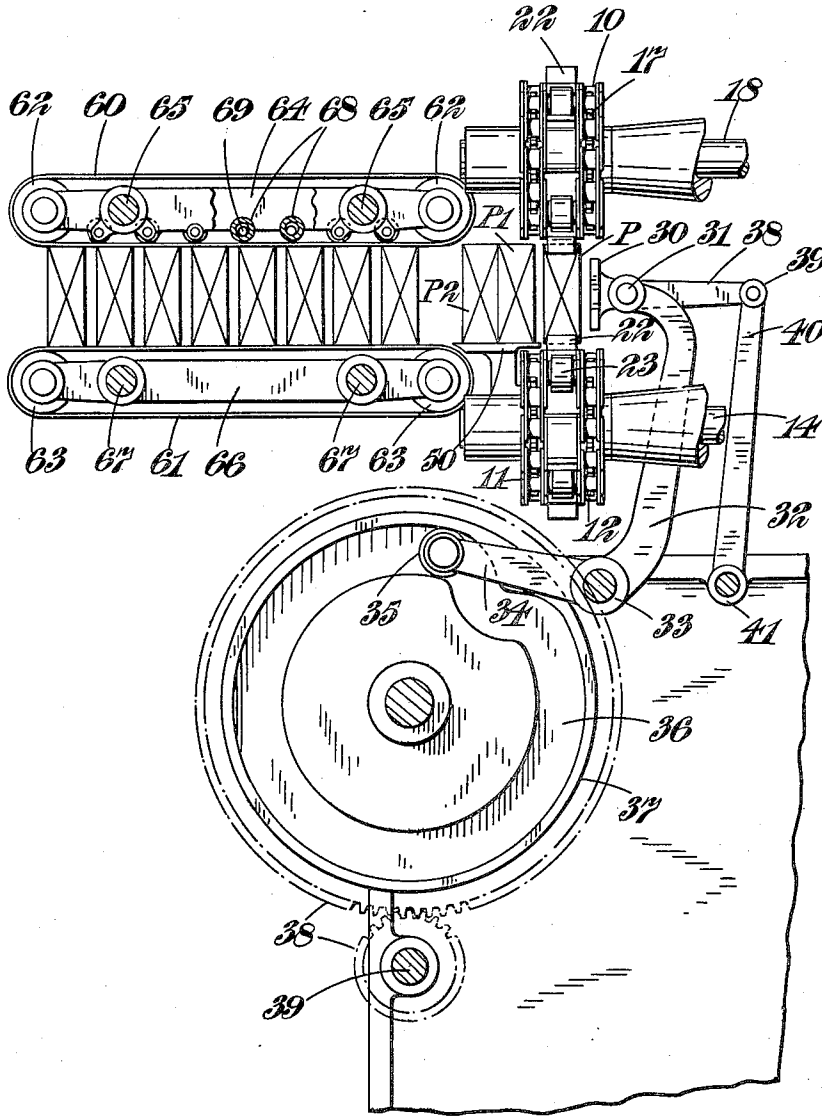
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Fig. 2.



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Fig. 3.

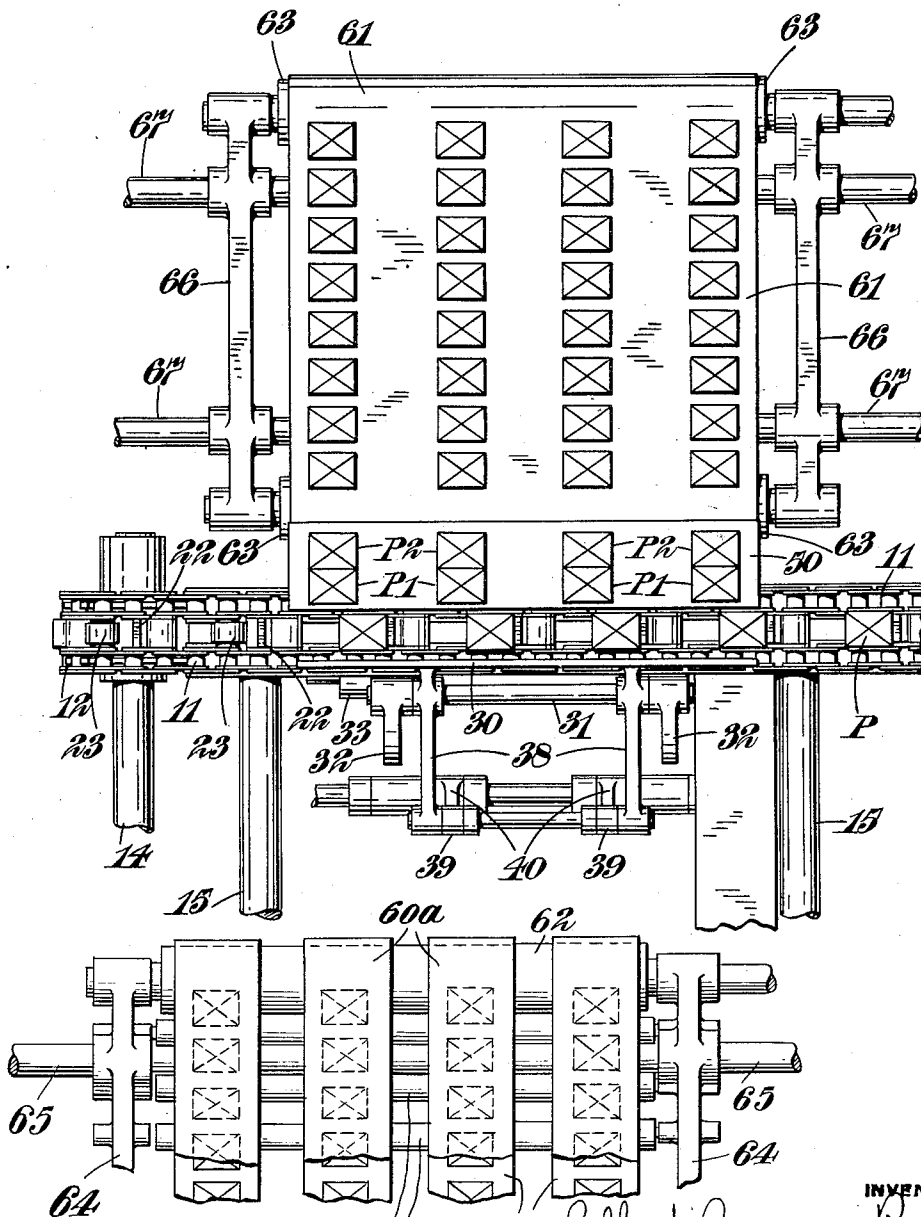


Fig. 4.

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UNITED STATES PATENT OFFICE

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PACKING MACHINE

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11 Claims. (Cl. 93—7)

This invention is concerned with packing machines which pack powdery or granulated material, or articles, into cartons, bags or similar containers, closes each of the containers by folding end portions thereof to which adhesive has been applied and discharges the closed containers, which will hereinafter be referred to as packets, one at a time, each with its closed ends disposed one above the other. The object of this invention is to provide improved apparatus for completing the sealing of the ends by maintaining pressure on the ends of the container until the adhesive has dried and concurrently delivering the sealed packets to a delivery station in numerically equal groups.

An object of the present invention is to provide, in or for a packing machine, packet-sealing and delivering apparatus comprising in combination a first conveying device for feeding a succession of packets of the above kind in single file along a substantially horizontal path each with its closed ends one above the other, transfer-means periodically operable to move a constant number of the leading packets laterally from the first conveying device and a second conveying device into which the packets are inserted by the transfer-means as a succession of numerically equal groups and which exerts pressure on each packet in a vertical direction and conveys the packets substantially horizontally to a delivery station.

A further object of the invention is to provide a first conveying device comprising a pair of endless conveyors, which may conveniently be chain conveyors, which are arranged one above, and the other below, the path of the articles and engage each article at its top and bottom to feed it and of which the lower is arranged to support the articles in the said path and the upper to bear with pressure on the tops of the articles so as to prevent the folded portions of the packet from coming away therefrom.

A preferred embodiment according to the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:—

Figure 1 shows a part of apparatus according to this invention in elevation;

Figure 2 shows the apparatus as seen from the left in Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1; and Figure 4 is a fragmentary plan view of a modified form of apparatus.

The apparatus comprises an upper chain conveyor 10 and a lower chain conveyor 11. The

lower conveyor comprises a pair of chains (see Figure 2) which are supported at each end on a pair of sprocket wheels one of which pairs is shown at 12. The sprocket wheels are supported in a suitable frame 13 and the sprocket wheels 12 are driven continuously by means of a shaft 14 to which they are secured. The frame 13 is supported by cross bars 15 which also carry a support 16 on which the upper lap of the conveyor 11 rests. The upper conveyor 10 is driven the same way by sprocket wheels 17 secured on a rotating shaft 18. The shaft 18 is supported in a frame member 19 which is carried by cross bars 20. These bars carry a support 21 for the upper lap of the conveyor 10.

The shafts 14 and 18 rotate in opposite directions so that the upper lap of the conveyor 11 and the lower lap of the conveyor 10 move to the left as seen in Figures 1 and 3. The conveyors 10 and 11 are provided each with pushing elements 22 and with rollers 23.

The conveyors 10 and 11 form a first conveying device which convey packets from a packing machine one by one in single file. Each packet P is supported on a roller 23 of the lower chain 11 and is fed to the left by pushers 22 on the two chain conveyors 10 and 11 which engage the packet at its top and bottom respectively. A roller 23 on the upper chain conveyor 10 rests on the top of the packet. The packet is closed by folded projections at its upper and/or lower end and these portions have an adhesive applied to them. The lower lap of the upper chain conveyor 10 is not supported so that its weight is applied through its rollers 23 on the top of the packets P and serves to keep the folded portions against the packets while they are being conveyed from the packet forming machine. A group of four packets are moved laterally from between the chain conveyors 10 and 11 by means of a transfer member 30. This member is pivoted at 31 (Figure 2) on the upper end of a pair of arms 32 which are connected together by a sleeve 33 (see Figure 1). An arm 34 extends from this sleeve and carries a roller 35 engaging in a cam slot 36 in a cam 37. The transfer member 30 is formed with a pair of extensions 38 which are pivoted at 39 to a pair of links 40 which in turn are pivoted to the frame of the machine at 41.

The transfer member 30 is thus mounted to move parallel to itself from the position shown in Figure 2 towards the left. This movement is effected by the cam slot 36. The cam 37 is driven by gearing 38 from a constantly rotating shaft 55

39. The gearing is such that the cam 37 turns through one revolution during four revolutions of the shaft 39. The shaft 39 also drives the shafts 14 and 18 of the upper and lower chain conveyors through gearing such that each of the chain conveyors 10 and 11 moves through the distance between adjacent pushing elements 22 during one revolution of the shaft 39.

When the transfer member 30 is moved to the left it engages a group of four packets and moves them from between the chain conveyors 10 and 11 on to a platform 50. These four packets are thus moved to the position marked P1 in Figure 3. It will be observed that they move to the left in Figure 3 during their transfer to the platform 50. This is because they are being fed to the left by the chain conveyors 10 and 11 during their movement on to the platform 50. The transfer member 30 is then restored to its normal position as shown in Figure 2. The transfer member 30 will not again move to the left until the shaft 39 has performed four revolutions and has driven the chain conveyors 10 and 11 through four times the distance between adjacent pushing elements 22. These chain conveyors will thus have brought four leading packets in front of the transfer member 30. The transfer member 30 then transfers these four packets on to the platform 50. As these packets move on to the platform 50 they move the preceding four packets into the position marked P2 in Figure 3.

From the platform 50 the packets are delivered in groups of four into a second conveying device. This device comprises two endless belts 60 and 61 which are supported on pairs of rollers 62 and 63 respectively. The upper rollers 62 are supported in frame members 64 which are in turn supported by bars 65. The lower rollers 63 are supported by frame members 66 which are in turn supported by cross-bars 67. The one roller 62 and one roller 63 are driven in opposite directions so that the upper lap of the lower belt 61 and the lower lap of the upper belt 60 move to the left as seen in Figure 2. The speed with which these belts move is such that each belt moves through a distance which is about 25% greater than the dimension of a packet measured in the direction of movement of the belts, during the interval between two successive operations of the transfer member 30.

When a third group of four packets is moved from the first conveying device on to the platform 50 it pushes a group of four packets from the position P2 into the bite of the belts 60 and 61. These belts then move the packet towards the left as seen in Figure 2. Owing to the speed with which the belts move each packet between the belts 60 and 61 will be spaced to a substantial extent from the preceding packet. This ensures that there is no pressure on the vertical sides of the packets.

The upper belt 60 bears on to the tops of the packets so as to maintain their folded ends closed. To assist this a number of rollers 68 are loosely mounted on spindles 69 extending between the frame 64. These rollers are thus rotatable but their weight is carried by the lower lap of the belt 60 so they assist in pressing this belt on to the tops of the packets.

The length of the belts 60 and 61 is such that the adhesive used in sealing the packets will have completely dried by the time a packet has passed completely between the two belts 60 and 61. The belts deliver the packets on to a suitable

table (not shown) from which they can be removed either mechanically or manually.

Instead of using one wide belt as shown in Figure 3 there may be a number, for example four, of narrow upper belts 60a and an equal number of narrow lower belts 61a, as shown in Figure 4. It will be understood that the mechanism may be modified to allow of a different number of packets being transferred at a time by the transfer member 30.

I claim:

1. In or for a packing machine, packet sealing and delivering apparatus, comprising in combination, a first conveying device, means for exerting pressure on each packet in a vertical direction while it is being conveyed by said conveying device, a second conveying device which comprises a pair of endless conveyors which are arranged one above, and the other below, the path of the packets and engage each packet at its top and bottom to feed it and of which the lower is arranged to support the packets and the upper to bear with pressure on the tops of the packets, and transfer-means periodically operable to move a plurality of packets laterally from the first conveying device into the second conveying device.

2. Apparatus according to claim 1, wherein each conveyor of the second conveying device is constituted by a broad endless belt.

3. Apparatus according to claim 1, wherein each conveyor of the second conveying device is constituted by a plurality of endless belts arranged side by side.

4. In or for a packing machine, packet sealing and delivering apparatus, comprising in combination, a pair of endless chain conveyors for feeding packets in single file along a substantially horizontal path arranged one above, and the other below, the path of the packets, and each provided with pushing elements to engage behind a packet and rollers which engage one end of the packet, a second conveying device which comprises a pair of endless belts arranged one above, and the other below, the path of the packets and which engage each article at its top and bottom to feed it and at least one roller mounted to rotate above the lower lap of the upper conveyor belt and supported thereby and cooperating with the lower lap to press it onto the top of the packets, a transfer member mounted to reciprocate across the path along which the packets are fed by the conveying device, and means for reciprocating the transfer member periodically and thereby feeding a succession of numerically equal groups of packets to the second conveying device.

5. In or for a packing machine, packet sealing and delivering apparatus, comprising in combination, a first conveying device which comprises a pair of endless chain conveyors which are arranged one above, and the other below, the path of the packets, each of said chain conveyors being provided with pushing elements to engage behind a packet at its top and bottom to feed it and with rollers which engage with pressure the upper and lower ends of the packet, transfer means periodically operable to move a plurality of the leading packets from the first conveying device to a second conveying device which conveys the packets substantially horizontally to a delivering station.

6. In or for a packing machine, packet sealing and delivering apparatus, comprising in combination, a first conveying device which comprises

a pair of endless conveyors arranged one above, and the other below, the path of the packets for engaging each packet at its top and bottom to feed it, and of which the upper is arranged to bear with pressure on the top of the packets and the lower is arranged to support the packets and is provided with a succession of pushing elements to engage behind each packet, and a second conveying device which comprises a pair of endless conveyors which are arranged one above, and the other below, the path of the packets and engage each packet at its top and bottom to feed it, and of which the lower is arranged to support the packets and the upper to bear with pressure on the tops of the packets, and transfer means operated in synchronism with the first device for engaging a plurality of packets and moving them laterally from the first device for entering the second device.

7. In or for a packing machine, packet sealing and delivering apparatus, comprising in combination, a first conveying device which comprises a pair of endless conveyors which are arranged one above, and the other below, the path of the packets, at least one of said endless conveyors being provided with a succession of pushing elements to engage behind each packet, and a second conveying device arranged intermediate the ends of the first conveying device and at right angles thereto and which comprises a pair of endless conveyors which are arranged one above, and the other below, the path of the packets, of which the lower is arranged to support the packets and the upper to bear with pressure on the tops of the packets, and transfer means operating in synchronism with the first device for engaging a plurality of packets and moving them laterally from the first device for entering the second device.

8. In or for a packing machine, apparatus for conveying freshly sealed packets while maintaining them closed, comprising a first conveying device for feeding a succession of closed packets along a path, a second conveying device for moving the packets along a path at right angles to the first path, the second conveying device having a receiving end arranged to receive packets from the side of the first conveying device, means for exerting pressure on each packet in a vertical direction while it is being conveyed by said conveying devices, and transfer-means periodically operable to move a plurality of packets laterally from the first conveying device to the second conveying device.

9. In or for a packing machine, packet-sealing and delivering apparatus, comprising in combination, a first conveying device which comprises a

pair of endless conveyors which are arranged one above, and the other below, the path of the packets and engage each article at its top and bottom to feed it and of which the lower is arranged to support the packets and the upper to bear with pressure on the top of the packets, transfer means disposed intermediate the ends of the first conveying device periodically operable to move a plurality of packets laterally from the first conveying device, and a second conveying device which comprises a pair of endless conveyors which are arranged to receive packets moved laterally by said transfer means, the conveyors of the second conveying device being arranged one above and the other below the path of the packets to engage each packet at its top and bottom to feed it, the lower being arranged to support the packets and the upper to bear with pressure on the tops of the packets.

10. In or for a packing machine, packet-sealing and delivering apparatus, comprising in combination, a first conveying device, means for exerting pressure on each packet in a vertical direction while it is being conveyed by said conveying device, a second conveying device which comprises a pair of endless belts arranged one above, and the other below, the path of the packets and means including at least one roller mounted to rotate above the lower lap of the upper conveyor belt and supported thereby for compressing it on to the top of the packets, and transfer means periodically operable to move a plurality of packets from the first conveying device for insertion between the endless belts of the second conveying device, said transfer means and the second conveying device being disposed intermediate the ends of the first conveying device and arranged to move packets laterally therefrom.

11. Apparatus for conveying freshly sealed packets while maintaining them closed, comprising in combination, a first conveying device, means for exerting pressure on each packet in a vertical direction while it is being conveyed by said conveying device, a platform beside the first conveying device, a reciprocable member periodically operable for pushing a plurality of packets from the first conveying device laterally on to said platform, and a second conveying device which comprises a pair of endless conveyors arranged to receive rows of packets from said platform and disposed one below and the other above the path of the packets so as to engage each packet at its bottom and top and to respectively support the packets and bear with pressure on the tops of the packets.

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