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AUTOMATIC PACKAGE CONVEYER CONTROL FOR WRAPPING MACHINES

Filed May 13, 1931

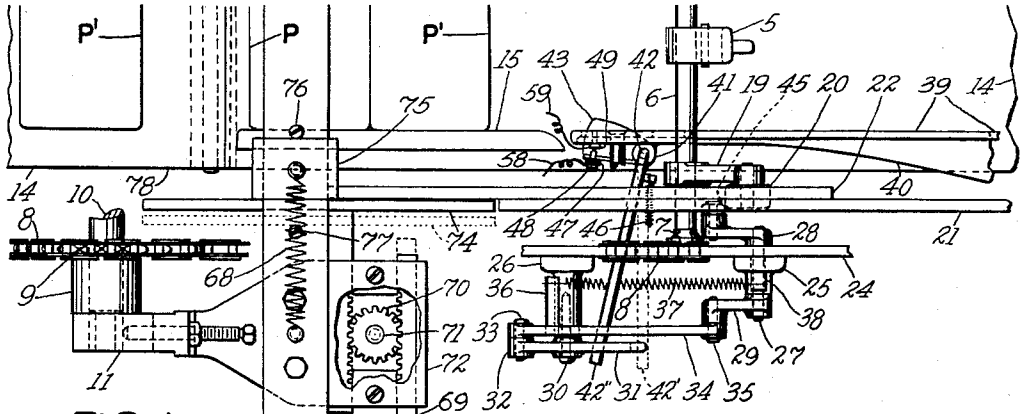
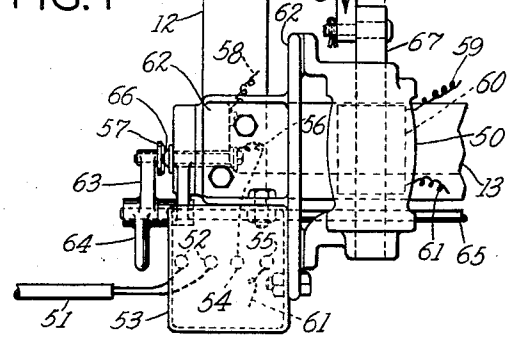


FIG. 1



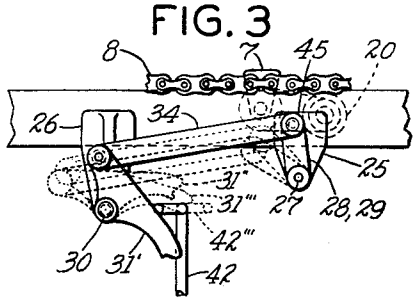


FIG. 3

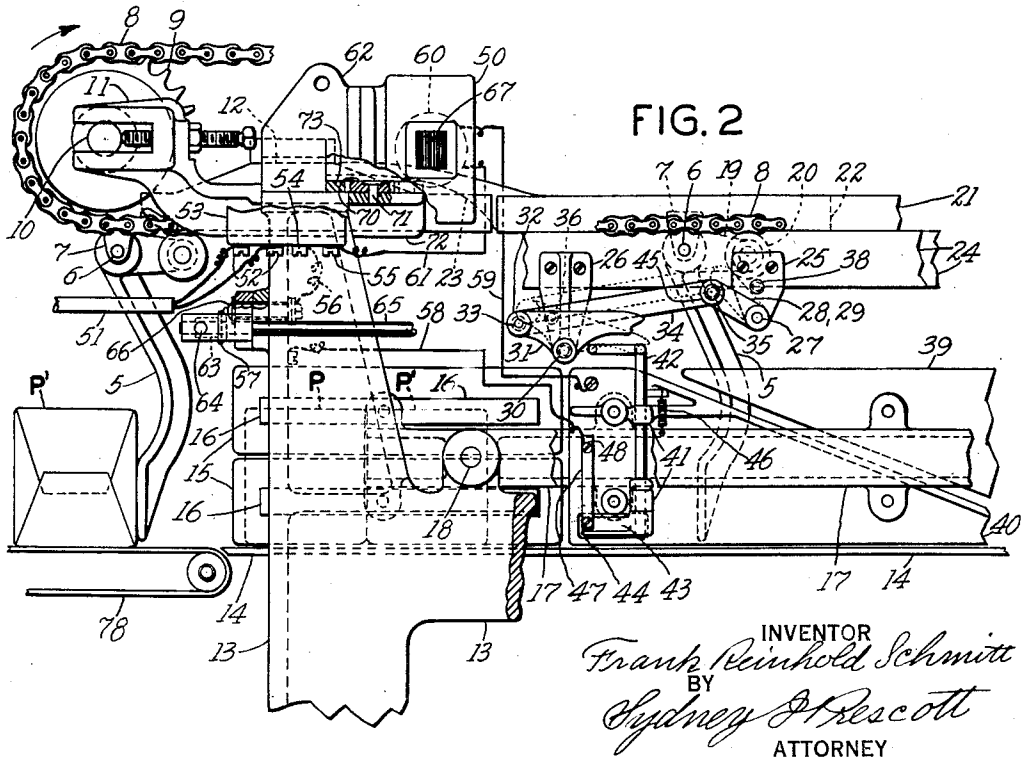


FIG. 2

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AUTOMATIC PACKAGE CONVEYER CONTROL FOR WRAPPING MACHINES

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This invention relates to package conveyers for wrapping machines in which the wrapped packages ar- delivered into a drying or sealing chamber from which they are expelled by the forward pressure of the following packages delivered into the chamber.

Its main object is to provide means for automatically ejecting all the packages from the sealing chamber at the end of a run or at any other cessation of the feed, when there are no following packages to push them out. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then specifically set forth in the claims hereunto appended.

In packaging machines of the type specified, when it was desired to eject all the packages from the sealing chamber, it has heretofore been necessary to manipulate a hand lever which required constant watching, particularly in case of wax paper wrapping, in order to keep the packages from being damaged by remaining too long in the heating chamber if for any reason the feed in the wrapping mechanism has been interrupted.

To obviate this difficulty, the present invention provides mechanism which automatically releases a contact finger when a break in the regular continuity of the package arrival occurs such as by the missing of one or more packages or at the end of a run. This contact finger, when so released, closes an electric circuit to a solenoid thus energizing the latter and thereby operating a gear and rack arrangement which moves a guide plate against a spring into the guide path of the empty package pushing means and thus causes the latter to follow and engage the last package of the continuous series, propelling the same until it has passed through the sealing chamber and been deposited on the delivery conveyer. The solenoid remains in its energized condition until the next package pushes the above said contact finger back and holds it in its neutral position, thereby breaking the electric circuit and restoring the guide plate into its non-operative position. In order not to leave the solenoid in circuit at the end of a regular run, an additional automatic switch is provided in connection with the shift lever of the main clutch of the machine so that the solenoid circuit is broken by stopping the machine.

In the accompanying drawing:

Fig. 1 is a partial plan view of a wrapping machine showing the improved mechanism for automatically ejecting the packages;

Fig. 2 is a side elevation of Fig. 1; and

Fig. 3 is a detail view of Fig. 2 showing the tripping mechanism in disengaged position.

In carrying the invention into effect there is provided a device for heat sealing a row of packages, mechanism normally operating to cause a row of packages to eject the leading package in said row from the sealing device, and means for causing said mechanism to eject all the packages in said sealing device when the package feed is interrupted to prevent overheating of the packages in the sealing device. In the best forms of construction contemplated said mechanism includes conveyer chains having pusher fingers pivotally mounted thereon and guide rails having adjustable end pieces provided with curved guide surface which permit the pushers to swing out of engagement with the packages adjacent the entrance to the sealing device, and said means includes a guide plate movable into position to cover up the curved guide surfaces to form a continuation of the guide rails to cause the pushers to eject all the packages from the sealing device. In the preferred forms of construction said means also includes a solenoid which moves the guide plate into operative position when it is energized, an electrical circuit connected to said solenoid, and a pivoted contact finger urged into the path of the package to close the circuit, whereby the circuit is opened when the contact finger engages a package. These various means and parts may be widely varied in construction within the scope of the claims for the particular machine selected to illustrate the invention is but one of many possible concrete embodiments of the same. The invention therefore is not to be restricted

to the specific construction shown and described.

Referring to Figs. 1 and 2, pusher fingers 5, clamped in pairs onto shaft 6 loosely mounted in bearings 7 attached at equal intervals to an endless conveyer chain 8, convey the packages P to the sealing chamber of the packaging machine. The chains 8 run over the rear sprockets 9 mounted on shaft 10 and over a pair of front drive sprockets, not shown. The shaft 10 is carried by brackets 11 attached to a crossbar 12 held by the side frames 13.

The packages P rest on table 14, the forward end of which forms the bottom of the sealing chamber while adjustable sealer plates 15, heated by suitable electrical heating units not shown, form its sides. The latter are held by flat springs 16 carried by adjustable brackets 17 on rods 18 fastened in the side frames 13 of the wrapping machine. The fingers 5 are spaced apart considerably more than the width of the packages P and are lifted out of engagement with the latter at the entrance to the sealing chamber which is long enough to accommodate a row of packages at a time so that each package remains in the sealing chamber until all the spaces between the packages filling the chamber have been taken up and a new package is entering.

Arms 19 attached to the cross shafts 6 of conveyer chains 8 support rollers 20 which guide the pusher fingers 5 by engaging with guide rails on their travel around the conveyer. When the pusher fingers 5 pass along the lower loop of the conveyer chains, the rollers 20 travel along the bottom of a stationary guide rail 21 having an adjustable end piece 22 terminating in a curved guide surface 23 with which the rollers 20 of each pair of pusher fingers engage when the package advanced by them has entered the sealing chamber and engaged the row of packages in the sealing chamber and ejected the leading package from the chamber, thereby permitting the pusher fingers to be swung upwardly due to the friction of the row of packages in the sealing chamber and allowing the latter to remain stationary until the next package is pushed against it. The end piece 22 is made adjustable so that the point of disengagement of the pusher fingers can be adjusted according to the width of the packages to be wrapped by the machine. The under loops of chains 8 are supported by rails 24 to prevent their sagging which, if excessive, would interfere with the proper action of the pusher fingers.

Fastened to one of the rails 24 are brackets 25 and 26, the former carrying a shaft 27 provided with an arm 28 and a link 29, and the latter supporting a stud 30 on which is pivotally mounted a latch 31. A hub 32 on latch 31 carries a stud 33 on which is mounted one end of a connecting link 34 the other end of which is attached to a stud 35 carried by the link 29. The link 34 has a post 36 to which is attached a spring 37 anchored to post 38 on bracket 25. The brackets 17 carry the folder plates 39 and 40, the latter having projecting hubs 41 in which is turnable the downwardly bent end of a swinging rod 42 engaging with latch 31. Attached to the downward end of rod 42 is a contact finger 43, and the folder plate 40 has an opening 44 which allows the finger 43 to swing into the path of the advancing packages, whenever an empty pusher passes the same.

The rollers 20 on the shafts 6 engage a roller 45 carried by arm 28, thereby depressing the arm 28 and link 29 and through the link 34 causing the latch 31 to rise, thus disengaging the rod 42. When the fingers 5 convey a package, the contact finger 43 rests against the side of the latter and holds the disengaged rod 42 in its inactive position 42′, but when the fingers 5 are empty, the spring 46 attached to bracket 17 turns the rod 42 into position 42″ in which the contact finger 43 is in its displaced position in the empty package path as shown in Fig. 1. The finger 43 on an insulating bar 47 carries a contact screw 48, which, in the displaced position of the finger, comes to rest on a contact 49 attached to folder plate 40, thus completing an electric circuit through a solenoid 50 which operates a mechanism for changing the path of the empty pusher fingers 5.

The wires 51 from an electric line are connected to the primary terminals 52 of a transformer 53 whose secondary terminals 54 and 55, either directly as shown or through a suitable relay, supply the current for the solenoid 50. Terminal 54 is connected by wire 56 to a switch 57 from which a wire 58 leads to the contact screw 48 of contact finger 43. From folder plate 40 having contact 49, a wire 59 leads to the coil 60 of solenoid 50 whence a wire 61 leads back to terminal 55 of the transformer. The solenoid 50 and the transformer 53 are supported by a bracket 62 attached to side frame 13 of the wrapping machine. The switch 57 above referred to consists of an arm 63 attached to clutch shift lever 64 on shaft 65, the said arm carrying a contact 57 registering with an insulated button 66 on the frame of the machine when the main clutch is in operation, and breaking the circuit when the clutch is disconnected and the machine is not running.

When the coil 60 is energized by the establishment of contact 48, 49 effected by the missing of a package, the core 67 of the solenoid 50 is thereby moved in the direction of the arrow shown in Fig. 1, against the tension of a spring 68 attached to crossbar 12 at one end and to slide 75 at its other end. Fastened to the core 67 is a rack 69 meshing with a

stationary gear 70 loosely mounted on a stud 71 in bracket 72, with which gear in turn meshes a second rack 73 guided in bracket 72 and moving in the opposite direction of rack 69. When so moved by the action of the solenoid, the rack 73 engages with a guide plate 74 attached to a slide 75 mounted on crossbar 72 and movable between stops 76 and 77. The guide plate 74 is thus pushed from its normal position, shown in dotted lines, into alignment with the guide rail 21, thus covering up the curved end guide 23 of the latter and forming a continuation of the straight rail 21 so that the roller 20 of the empty fingers 5 is now guided along guide plate 74 as shown in Fig. 2, thus engaging with the package P′ left by the preceding finger and pushing the same together with previous packages still in the sealing chamber, upon the delivery conveyer 78.

If the rod 42, when disengaged by the raising of latch 31, is accidentally moved into a position 42‴ beyond the latch, as shown in Fig. 3, the latch upon descending, will fall below rod 42 into the full line position 31′. When then the guide roller 20 of the next pusher finger engages with the latch operating roller 45, the latch is raised into the high position 31″ shown in heavy dotted lines, from which it drops into the locked position 31‴ shown in light dotted lines after the disengagement of rollers 20 and 45, the rod 42 having in the meantime been restored into its normal position by the spring 46.

What is claimed is:

1. The combination with a device for heat sealing a row of packages, of mechanism normally operating to cause a row of packages to eject the leading package in said sealing device, and means for causing said mechanism to eject all the packages in said sealing device to prevent overheating, said means including a movable guide plate, a solenoid connected to said plate and adapted to move it into operative position, an electrical circuit connected to said solenoid, a movable contact finger adapted to close said circuit when moved into the path of the packages, and a spring urging said finger into the path of the packages, whereby said circuit is opened when said contact finger is engaged by a package.

2. The combination with a device for heat sealing a row of packages, of mechanism normally operating to cause a row of packages to eject the leading package in said sealing device, and means for causing said mechanism to eject all the packages in said sealing device to prevent overheating, said means including a pivoted contact finger, a spring urging said finger into the path of said packages, a latch adapted to lock said finger against the action of said spring, and linkage connected to said latch for releasing it from said finger.

3. The combination with a package feed, of devices for heat sealing packages having a runway, a package feed for said devices, mechanism for moving packages part of the length of said runway and then disengaging the packages, a feeler for engaging the articles fed to the devices and means controlled by said feeler for causing said mechanism to move the articles along the remainder of the runway to clear the sealing devices when no articles are being fed to said devices.

4. The combination with a package feed, of devices for heat sealing packages having a runway, a package feed for said devices, mechanism for moving packages part of the length of said runway and then disengaging the packages, a feeler for engaging the articles fed to the devices, electrically operated means controlled by said feeler for causing said mechanism to move the articles along the remainder of the runway to clear the sealing devices when no articles are being fed to said devices, and a switch actuated by said feeler for opening and closing an electric circuit to said means.

5. The combination with a device for heat sealing a row of packages, of a pusher member, mechanism for causing said member to engage and push a package into said device and then disengage the package, whereby the leading package in said row is ejected from said device, and automatic means to cause said member to push the row of packages in said device out of the same operable only when said member fails to engage a package while moving into said device.

In testimony whereof, I have signed my name to this specification.

FRANK REINHOLD SCHMITT.