

Sept. 5, 1967

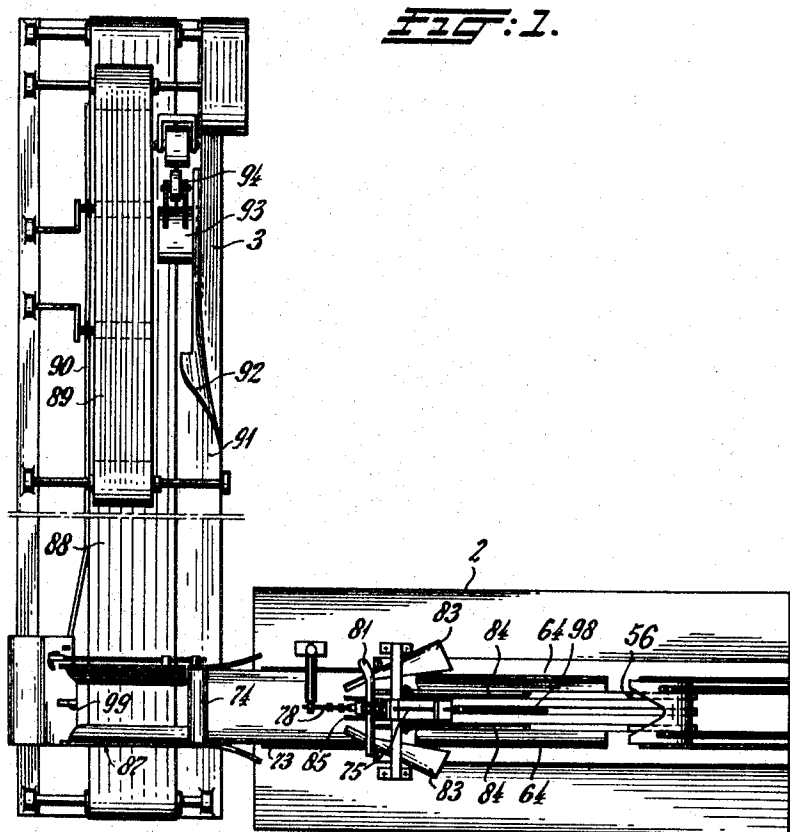
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3,339,338

MACHINE FOR PACKAGING ARTICLES INTO BAGS

Original Filed April 3, 1963

6 Sheets-Sheet 1



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6 Sheets-Sheet 2

**FIG. 2.**

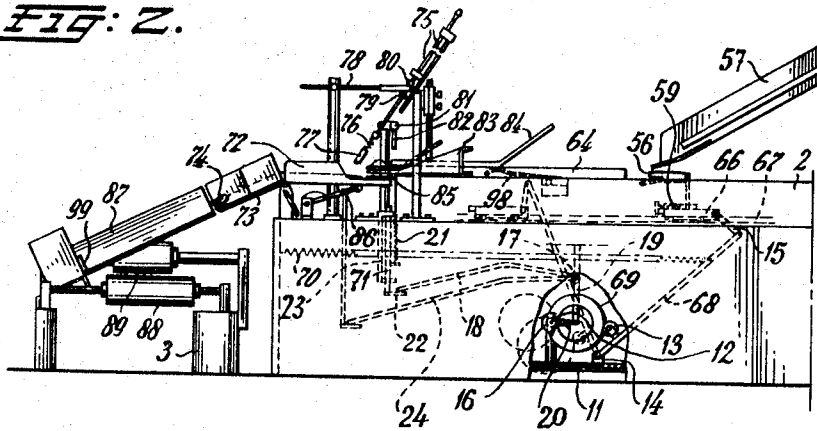
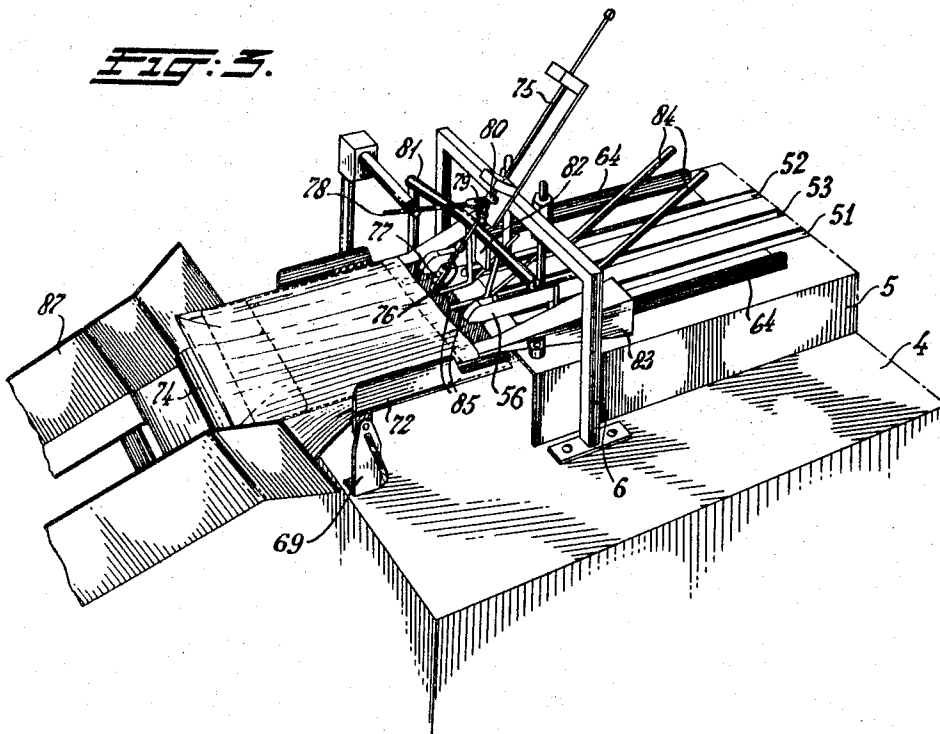


**FIG. 3.**



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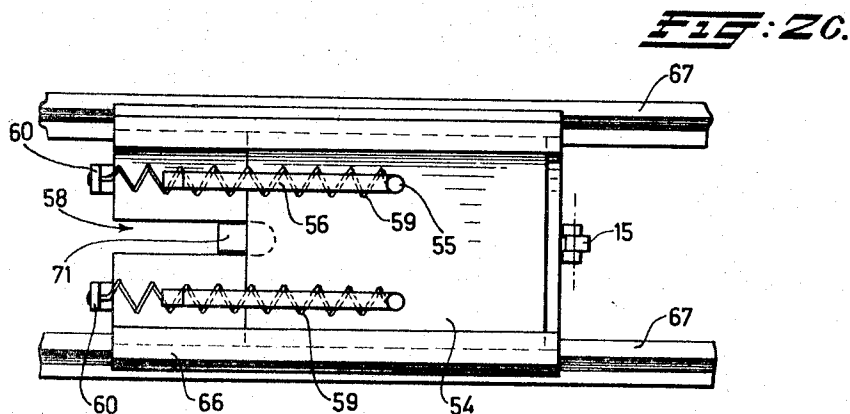
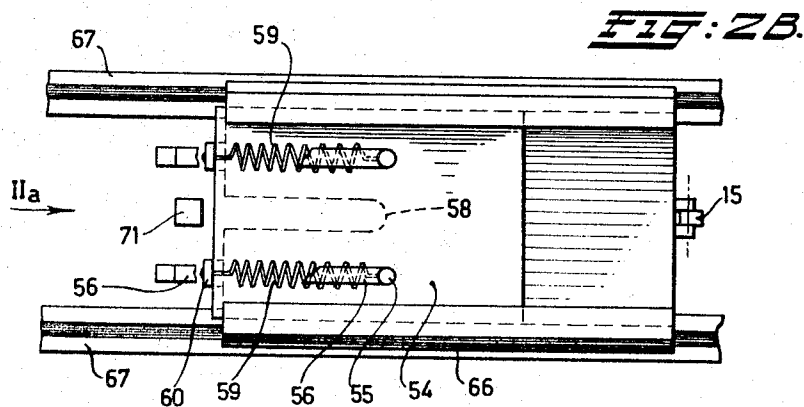
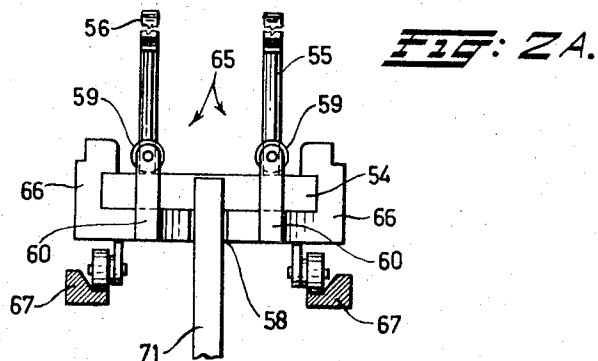
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6 Sheets-Sheet 3



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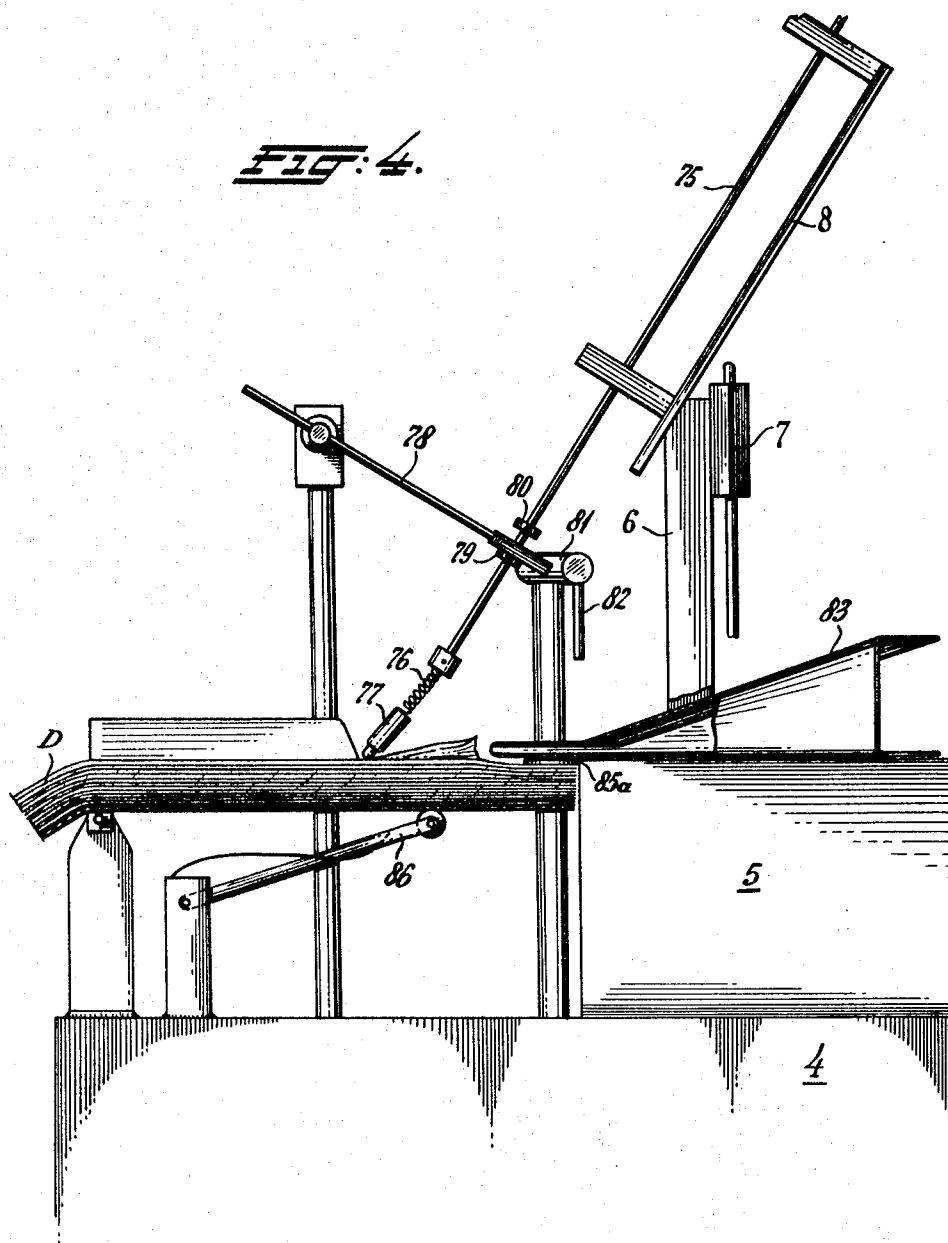
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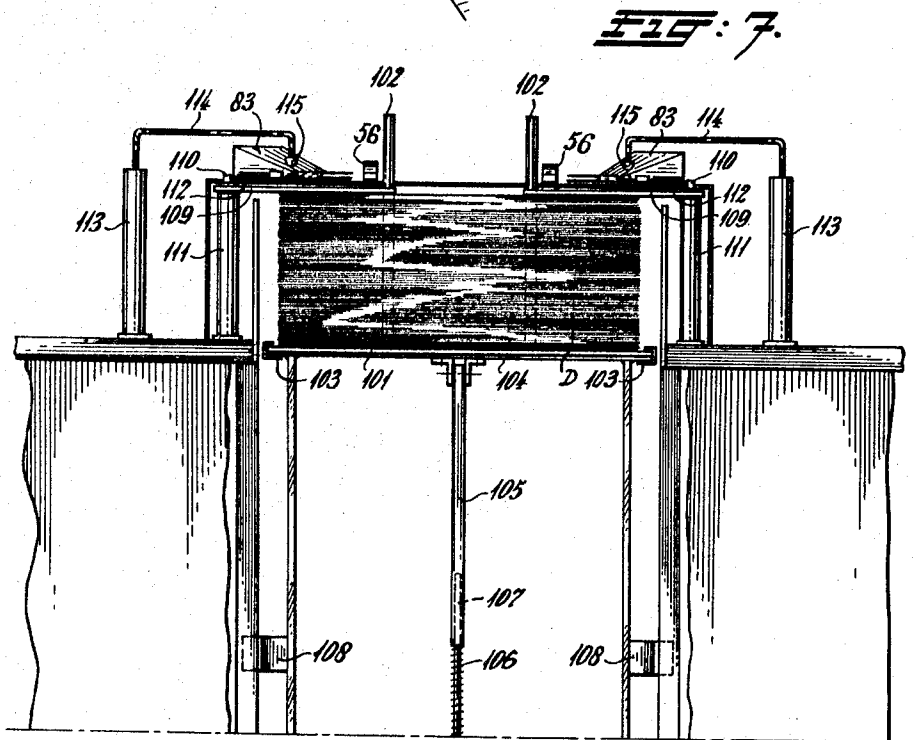
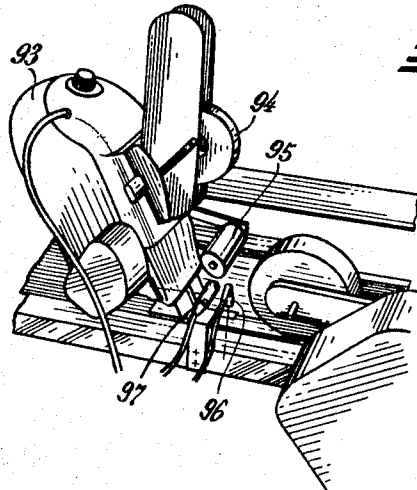
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MACHINE FOR PACKAGING ARTICLES INTO BAGS

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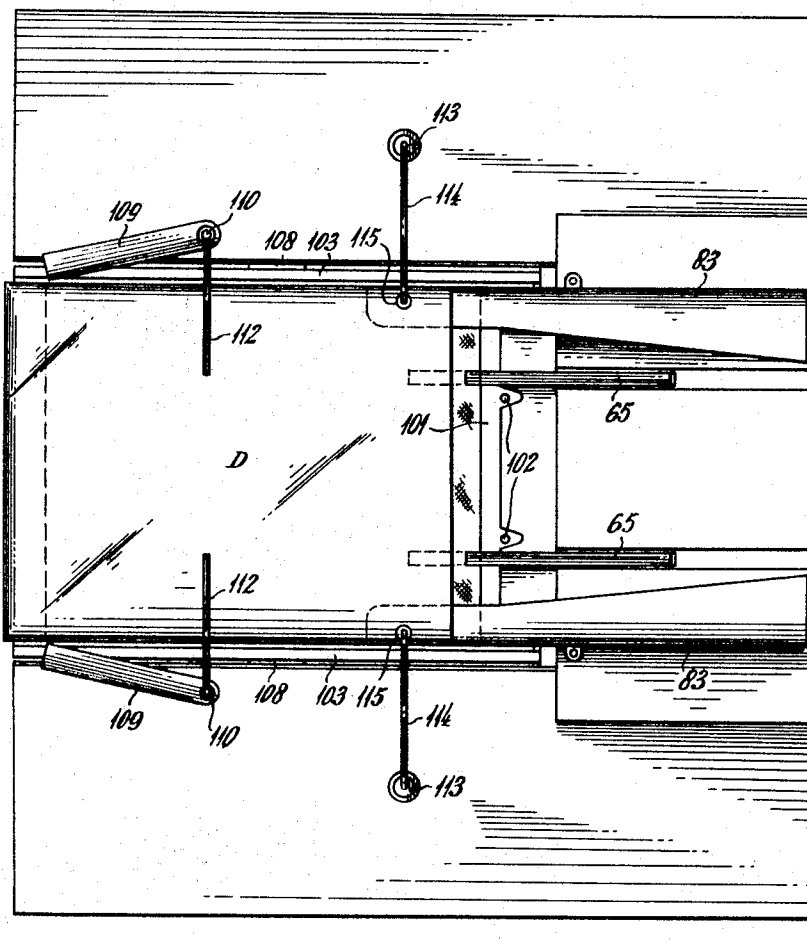
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**FIG. 6.**



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## MACHINE FOR PACKAGING ARTICLES INTO BAGS

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Continuation of application Ser. No. 270,462, Apr. 3, 1963. This application Feb. 1, 1967, Ser. No. 613,206

Claims priority, application Netherlands, Oct. 8, 1962, 284,095; Jan. 7, 1963, 287,480  
11 Claims. (Cl. 53—189)

### ABSTRACT OF THE DISCLOSURE

At the end of a slideway for the articles, successive bags are held open. A pusher for the articles is mounted on a reciprocating carriage so as to be slidable on the carriage. A latch is positioned in the path of the pusher for stopping the pusher momentarily at the moment it has fully inserted an article in a bag. When the latch is retracted, springs cause a sharp acceleration of the pusher to throw the filled bag into a receptacle. A conveyer receiving the articles from the receptacle has means for closing the bag and labeling same.

This application is a continuation of our U.S. patent application Ser. No. 270,462 filed Apr. 3, 1963, now abandoned.

This invention relates to an apparatus for packaging articles into bags and is particularly, but not exclusively, useful for packaging successive pairs of stockings which have been folded and about which has been provided a wrapper, each into a bag of plastics or other material.

The invention has for an object to provide an improved packaging apparatus in which the article is gently inserted into the bag whereupon the filled bag is thrown away into a receptacle by the same means which inserts the article into the bag.

A further object of the invention is to provide an improved packaging apparatus with means for automatically closing each bag after filling.

With these general objects in view and such others as may hereinafter appear, the invention consists in the packaging apparatus and in the various structures, arrangements and combinations of parts hereinafter described and particularly defined in the appending claims.

In the drawings, illustrating a few preferred embodiments of the invention:

FIG. 1 is a top view of the whole machine.

FIG. 2 is a front elevation of the machine.

FIG. 2A is a side view of the carriage and pusher.

FIGS. 2B and 2C are plan views of the carriage and pusher in untensioned and tensioned position of the spring resp.

FIG. 3 is a perspective view of the inserting device.

FIG. 4 is a vertical cross section of the inserting device.

FIG. 5 is a perspective view of the labeling device.

FIG. 6 is a top view of a part of another embodiment of the inserting device, in the position in which a package has been inserted almost completely into a bag.

FIG. 7 is a view of the left side of the device of FIG. 6, in the position before a package is inserted into a bag.

The whole machine can be divided into two main units, namely the inserting device 2 and the delivery conveyor 3, and these two units will be successively described below.

The inserting device 2 is mounted on a box-shaped frame 4 on top of which is a channel-section platform 5

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which carries a horizontal slideway consisting of two parallel, spaced angle section bars 64. Between the two bars 64, the platform 5 has three parallel slots 51, 52, 53 which extend along the slideway. Underneath the platform 5, a pair of rails 67 are mounted on the frame 4, parallel to the angle bars 64 and said rails 67 carry a carriage 66 for reciprocating movement underneath and parallel to the slideway. A pusher 65 is slidably mounted in the carriage 66 so as to be movable with respect to the carriage in longitudinal direction of the slideway. The pusher 65 comprises a base plate 54 which is received between lateral guide parts of the carriage 66, and two pushing arms 55 which extend upwards from the base plate 54 and which project upwards through the slots 51 and 52 of the platform 5. The upper ends of the pushing arms 55 preferably have a forwardly extending bifurcated portion 56 to engage an article disposed on the slideway 64. The articles may e.g. drop on the slideway from a chute 57 ending over the slideway forward of the extreme righthand position of the pusher 65, see FIG. 2.

Under the frame 4 there is a stand 11 on which is journaled the horizontal main drive shaft 12 of the apparatus. The drive shaft 12 makes one revolution for each cycle of the apparatus (under the control of a micro-switch 98 disposed in the slot 53) and carries an annular cam or eccentric 69 the outer circumference of which is in contact with a follower 13 mounted on a rocking lever 68. The lower end of the lever 68 is pivotally mounted at 14 on the stand 11 and the upper end of the lever 68 is connected to the carriage 66 via an intermediate pivoting arm 15. The operating stroke i.e. to the left in FIG. 2 of the carriage 66 is caused by a spring 70 arranged between the lever 68 and a fixed part of the apparatus to the left of the drive shaft 12 in FIG. 2, which spring 70 causes the follower 13 of the lever 68 to follow the circumference of the eccentric 69. The return stroke of the carriage 66 is caused by the eccentric 69.

The main shaft 12 also carries a cam 16, the greater part of the circumference of which is concentric with the main shaft 12 and the remaining part of the circumference of which is flattened. An L-shaped lever 18, 19 is pivotally mounted at 17 on a depending part of the frame 4. The arm 19 of said lever extends substantially vertically and its lower end carries a follower 20 which contacts the cam 16. The other arm 18 of the lever extends substantially horizontally to the left in FIG. 2 and its end rests on a lateral extension 22 of the lower end of an upwardly extending latch 71. Said latch 71 is guided for vertical movement by a brace 23 which is fixed on the frame 4. The latch 71 is urged to upward position by a spring 21 which thus also holds the follower 20 against the cam 16.

In the position of rest of the apparatus, the latch 71 is in the upper position and the base plate 54 abuts against forward extensions 60 of the carriage 66. Between the forward extensions 60 and the pushing arms 55 extend relatively heavy springs 59. The carriage 66 has a central longitudinal slot 58 so that during the movement of the carriage 66 to the left, the latch 71 engages and stops the base plate 54 without interfering with the movement of the carriage 66. After the base plate 54 has moved a few inches away from the forward extensions 60 of the carriage under tensioning of the springs 59, the latch 71 is retracted fully beneath the carriage 66 by riding up of the follower 20 on to the higher, concentric portion of the cam 16. Thus, the springs 59 untension again and the base plate 54 resumes, under a sharp acceleration, its original position relative to the carriage 66 in which it abuts against the forward extensions 60.

In a simplified embodiment, the base plate 54 may be

fixed with respect to the carriage 66, so that the latch 71 stops the whole carriage 66. The spring 70 should then reaccelerate the whole carriage 66, which will be done at a slower rate than the acceleration of the pusher 65 in the first described embodiment.

A tray 72 for carrying a pile of bags D of a plastics or other material is situated at the end of the slideway 64. The end portion 73 of the bottom of the tray 72 remote from the slideway 64 is inclined downwards and the rims 74 of this portion 73 is bent into Z-shape. The pile of bags D rests against the rim 74. The tray 72 is pivotally mounted at its central region on a support 69 on the frame 4. A spring-loaded arm 86 exerts an upward force under the right-hand part of the tray 72 so as to push the open upper ends of the pile of bags from beneath against the left end of the platform 5, see FIG. 4.

Over the left end of the platform 5, there is a bridge piece 6 which carries bushes 7 for holding stationary but adjustable guiding rods 84 and 85 which, together with the angle section 64, guide the articles into the bags D. Also mounted on the bridge piece 6 is an inclined bar 8 which carries a longitudinally movable rod 75. The lower end of the rod 75 carries a spring 76 and the other end of said spring carries a rubber cap 77 acting as a push finger. The rod 75 is reciprocated by a rocking lever 78 acting between the abutments 79 and 80 of the rod 75.

A supply pipe 81 for compressed air extends transversely over the end of the platform 5 and has a central downwardly directed flat nozzle 82.

At the end of the platform 5, between the two angle sections 64 and the tray 72, a pair of funnel-shaped elements 83 open on the side facing each other, are mounted in line with the two angle sections 64 for guiding the articles from the slideway into the bags. The elements 83 are mounted for pivotal movement in a horizontal plane, the narrow ends thereof being insertable into the uppermost bag. Springs, not shown, urge the narrow end of the elements 83 outwards and a microswitch, not shown, is so mounted that the elemented that the elements 83, after release of a bag thereof, will actuate the microswitch at the end of their outward movement. The microswitch is connected to a small electric motor, air-motor or the like, for positively returning the elements 83 to a position in which their narrow ends are directed inwards. The rocking lever 78 may be controlled by the same microswitch and motor which operates the elements 83. The microswitches and motors for operating the elements 83 and the lever 78 may be of conventional construction and need not be described here. The supply of compressed air to the nozzle 82 may be controlled by a valve operated by the same micro-switch controls the elements 83 and the lever 78. Various other manners of controlling and operating said parts are possible, e.g. by additional cams on the main shaft 12.

A receptacle 87 is arranged in line with the portion 73 of the tray 72 and its bottom can pivot downwards under control of a microswitch 99 fitted at the end of it and actuated by a filled bag dropping onto it.

The delivery conveyor 3 comprises a main belt 88 underlying the receptacle 87 and movable transversely to the slideway 64. A hold-down belt 89 which is not provided with a drive but which is rotated by contact with the main belt 88, overlies the main belt 88 at some distance from the receptacle 87. The sides of the main belt 88 are bordered by a guide ledge 90 or 91 respectively, the guide ledge 90 having a tapering initial portion aligning the bags which have dropped onto the belt 88, whereas the guide ledge 91 has a curled portion 92 known per se for folding the flap of the bag as it moves past.

A labeling device 93 of a type known per se is mounted beside the hold-down belt 89. Said labeling device contains a roll of labels 94 and is arranged for delivering labels one by one in downward direction. The labeling

device moreover has a pressure roller 95 for pressing a dispensed label onto the bag so as to adhere thereto.

The labeling device 93 is controlled by two photoelectric cells 96 and 97, of which the cell 96 starts the device whereas the cell 97 stops the device again. The beam of light to the cell 96 is downwardly directed and is intercepted by the passage of the leading edge of a bag, which actuates the device 93, the adjustment being so chosen that the label is delivered exactly onto the middle of the bag over the fold thereof so that the bag is closed.

The beam of light to the photoelectric cell 97 is horizontally directed across the delivery path of the labeling device 93 and is normally intercepted by the next label held in readiness. When said label is delivered, the photoelectric cell 97 is actuated to stop the device again so that it can deliver only one label at a time.

The apparatus described above operates as follows:

A pile of bags D is placed on the tray 72 so that their closed ends rest against the rim 74 and their open ends are under the ledge 85a. The narrow ends of the funnel-shaped elements 83 are held outwards by their springs. Upon starting the apparatus, the microswitch which is held closed by the funnel-shaped elements causes these elements to turn inwards and simultaneously the tray 72 is lowered by pulling away of the arm 86, the rod 75 is moved down by the lever 78 and the rubber cap, 77 is thus forced towards the left over the top of the uppermost bag D in the tray 72, which causes the upper end of this bag to be opened to a certain extent, see FIG. 4. Simultaneously, air is blown through the nozzle 82 onto the top of the platform 5 and the air impinging on said platform flows away in all directions, thus blowing the just-opened bag further open. In the meantime, the elements 83 having reached their innermost position are released, and oscillate by spring action back to the position of FIG. 3, so that their narrow ends enter the opened bag and abut against the sides thereof. The rod 75 has meanwhile been retracted and the supply of compressed air is interrupted. The uppermost bag D is thus held in readiness to receive an article.

A procession of articles is then delivered via the chute 57 onto the slideway 64. Said articles are e.g. wrappers each containing a pair of stockings folded about a piece of paper. When the article, after dropping from the chute 57, slides over the microswitch 98, the main shaft 12 is caused to perform one complete revolution, e.g. by a not-shown electromotor. In the position of rest of the apparatus, the pusher 65 is in the extreme right-hand position, see FIG. 2 and after actuation of the shaft 12, the pusher 65 starts to move toward the left to push the article via the element 83 into the bag D which is held in readiness, see FIG. 3. The article thus lifts the bag D entirely to horizontal position so that its lower end is lifted over the Z-shaped threshold 74. When the article reaches the bottom of the bag D, the base plate 54 of the pusher 65 abuts against the latch 71 so that the pusher 65 is stopped whereas the carriage 66 continues its movement under the influence of its kinetic energy and the pull of the spring 70. Thus, the springs 59 are tensioned. After the carriage has moved a few inches further, the latch 71 is withdrawn by the action of the cam 16 and the base plate 59 is released. The untensioning springs 59 cause a sharp acceleration of the pusher 65 to the left, so that the filled bag D is thrown away across the threshold 74 into the receptacle 87. The carriage 66 then returns to its right-hand position shown in FIG. 2. The elements 83 are freed and are moved outwards by spring action so that the microswitch is actuated and a new bag D is brought in readiness.

It is advantageous to derive the movement of the arm 86 from the main shaft 12, since this enables the tray 72 to be lowered simultaneously with the lowering of the latch 71, so that the uppermost bag D is freed from the ledge 85a before being thrown into the receptacle by

the pusher 65. These movements can be derived in conventional manner from the main shaft 12 by a cam and follower drive and linking gear 24.

The article flung away by the above-described action of the pusher 65 falls in the receptacle 87 and contacts the microswitch 99 on the end thereof, so that the bottom of the receptacle 87 swings down and the filled bag drops onto the belt 88. The bag is taken along by the belt 88, its flap is folded over by the ledge 92, and as the front edge of the bag passes underneath the photoelectric cell 96, the labeling device 93 is actuated and delivers a label which is pressed on the folded flap of the bag.

The beam of light to the photoelectric cell 97 which, up to that moment, was intercepted by the label kept in readiness in the delivery path of the labeling device, can pass through for the excitation of the light sensitive element of the photoelectric cell 97 during the moment between the delivery of the label and before the arrival of a next label, and this excitation stops the device 93 again. If no new label enters the beam of light to the photoelectric cell 97, the latter continues to be excited and it operates a warning signal, via a relay.

In the embodiment of FIGS. 6 and 7 the tray for the pile of bags D consists of a supporting plate 101, on which are fixed two vertical pins 102. The bags D have two accurately located perforations, so that, they all have accurately the same position on the pins 102. The plate 101 can be inserted into guides 103 of the supporting frame 104, and a series of supporting plates 101 on which a pile of bags D has previously been placed, can be kept in readiness.

The supporting frame 104 is fitted on the top of a vertical tube 105 which surrounds a pin 107 and is pushed upwards by a spring 106, surrounding the pin 107. Laterally projecting parts 108 of the supporting frame 104 are guided in vertical guide tracks. The pin 107 is vertically reciprocated by a positive drive and the tube 105 follows this movement as far as is permitted by abutments 109, which are mounted approximately at the level of the previously described funnel-shaped elements 83.

Each of the abutments 109 is fixed on a vertical shaft 110 which is rotatably supported in a column 111, mounted on the top of the frame 4 of the apparatus. Fixed on each of the shafts 110 at an angle of approximately 75° with the abutment 109 is further a laterally projecting pin 112. The two shafts 110 can simultaneously be rotated positively from a position in which the abutments 109 face each other to a position in which the two pins 112 face each other. Outwards of each column 111, another column 113 is mounted, in which a rod 114 is adapted to move up and down. The rod 114 is twice bent through 90° and its end carries a cap 115 of a plastics or similar material, which engages the top of the narrow end of the funnel-shaped element 83.

The device according to FIGS. 6 and 7 operates as follows:

In the position of FIG. 7 the two abutments 109 face each other, the narrow ends of the funnel-shaped elements face each other, the caps 115 on the rods 114 are in their uppermost position, i.e. clear of the ends of the funnel-shaped elements 83, and the supporting frame 104 with the supporting plate 101 and the pile of bags D are in their uppermost position, in which the uppermost bag D is held against the two abutments 109 by the pressure of the spring 106.

When the device comes into operation in the way described for the embodiment of FIGS. 1 to 5, the narrow ends of the funnel-shaped elements 83 pivot outwards, so that they enter the end of the topmost bag D which has been blown open by air, and hold the sides of the latter. The rods 114 with the caps 115 move down until they reach the ends of the funnel-shaped elements 83, and the connecting rods 105, 107 moves down until

the upper ends of the two pins 102 sink below the plane in which the narrow ends of the funnel-shaped elements 83 are situated.

The pusher 65 subsequently inserts an article into the bag D held by the funnel-shaped elements 83. During this, the shafts 110 rotate through approximately 90° so that the abutments 109 pivot away and the pins 112 come to lie underneath the topmost bag D and lift this into a substantially horizontal position so as to facilitate the insertion of the article (FIG. 6). The rods 114 with the caps 115 rise, the funnel-shaped elements 83 moves slightly inwards, and the pusher 65 gives a last push to push the filled bag away towards the receptacle. Finally the components of the device return to their position of rest.

The several movements described above may be obtained from the main shaft 12 as in the embodiment of FIGS. 1 to 5, e.g. by conventional cam and follower mechanisms.

Instead of closing the bags by folding over a flap and adhering a label thereover, the bags may be closed by heat sealing, a heat sealing device being provided on the delivery conveyor to that end.

What we claim is:

1. An apparatus for packaging articles into bags, comprising a slideway for the articles, means for presenting a bag with an open mouth at the end of said slideway, a pusher for shoving an article along said slideway and into the open bag, means for reciprocating said pusher along said slideway, a resilient connection in said reciprocating means, a latch disposed into the path of the pusher during the operating stroke of the latter so as to tension said resilient connection, and means to retract said latch so that the bagged articles will be flung away by said pusher upon the untensioning of said resilient connection.

2. The apparatus of claim 1 in which the resilient connection is arranged between the pusher and a carriage which is reciprocatable longitudinally of said slideway, the pusher being slidably mounted on said carriage.

3. The apparatus of claim 1 further comprising a pivotable bag holder for carrying a stack of bags, a lever acting on said bag holder to normally push the upper-front portion of the stack of bags against the lower face of the end of the slideway, a positive drive connection to said lever, said positive drive being so related to the means for retracting the latch that upon retraction of the latch, the bag holder is simultaneously lowered away from the slideway.

4. The apparatus of claim 1 wherein said means for presenting a bag with an open mouth comprises a pair of funnel-shaped opposed mouthspreading arms for engaging the open mouth of a bag, spring means for outwardly biasing the free ends of said arms and positive drive-means for inwardly rocking said free ends of said arms when the latch for the pusher is withdrawn.

5. The apparatus of claim 1 further comprising conveying means adapted to receive the bagged article from said push member and fold a flap of the bag.

6. The apparatus of claim 5 further comprising a receptacle through which said bagged article passes to said conveying means, said receptacle including a bottom door and means to open and close said door.

7. The apparatus of claim 5 wherein said conveying means comprises a lower supporting belt conveyor, an upper depressing belt conveyor, a guiding ledge fitted along one side of said lower conveyor and a folding ledge fitted along the other side of said lower belt conveyor.

8. The apparatus of claim 5 further comprising a labeling device disposed adjacent said conveying means in the path of said bagged article, said device comprising label feeding means, means to apply a label to said bag, first sensing means for actuating said device in response to the presence of a bagged article, and second sensing means

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for stopping said device in response to a label being fed from said feeding means.

9. The apparatus of claim 1 wherein said means for presenting a bag with an open mouth comprises a tray for holding a pile of said bags, vertical projections on said tray for retaining the bags on said tray, means to raise and lower said tray, and abutting means adapted to be positioned over said tray for limiting the upper movement thereof.

10. The apparatus of claim 9 wherein said abutting means comprises at least one abutting rod, a pin connected to said rod and extending at an angle thereto,

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and means to pivot said rod and said pin in a horizontal plane so that said pins engage underneath the topmost bag as the rods pivot away.

11. The apparatus of claim 9 further comprising clamping means extending over the ends of said spreading arms as they engage said bag, and means to reciprocate said clamping members to and from the ends of said spreading arms to clamp and release said bag.

No references cited.

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