

Description

This invention relates to a stretch film packaging machine for packaging an item (A) by a stretch film folded beneath the item, comprising means for placing said item on a transfer belt to carry the item to a heating station to effect sealing and a label printer for issuing a label to adhere it to the item. Such a machine is known from EP-A-0 092 760.

Such machines are applicable for packaging items such as raw fresh foodstuffs and other foodstuffs sold in a super-market or a department store etc., by mounting the items on a container such as a tray etc., and closing said container by a stretch film, the film being folded around the tray.

A stretch film packaging machine which has been developed in recent years is constructed such that both the size of the packaging tray and the height of the stored item are automatically sensed, the length of the film to be cut is defined in response to the result of this sensing operation and a mechanism is operated for ensuring a positive and superior packaging even if the size of the tray to be enclosed is not constant. Such a packaging machine as above is made such that feeding of the tray is normally performed in a direction perpendicular to the film feeding direction. A machine having no above-noted sensing means and providing a setting of specified length for the film is also known. This construction is employed in the event that there are several trays present and having differing lengths ranging from long ones to short ones other than their kinds of width and it aims to have a wide range of trays which can ensure a positive and superior packaging. However, in this case, since the film length in the width direction of the tray is always kept constant (i.e. width of the film) unless the applied film is exchanged, the following disadvantages may be found. That is, it is necessary for a feeding conveyor at the in-feed part of the conventional type to provide an intermittent feeding of the packaged item, so that as shown in Fig. 16 a pusher conveyor (1) is applied. This unit is required in view of the fact that the tray (A) properly mounted on the conveyor is transported in synchronism with the vertical movement of the elevator head (2) and the delivery of the tray (A) onto the elevator head (2) is performed with reference to the end part of the pusher conveyor (1) due to the performance of the pusher conveyor (1).

Therefore, in the event that a narrow width tray such as a tray for storing mackerel pikes is to be packaged, a margin part (C) of the film (b) is substantially left. This margin part (C) does not show any problem in a packaging machine (Figs. 12 to 14) with the feeding-out direction (12) being set at the feeding-in part (11), but, as shown in Fig. 16, in the case of a packaging machine (Figs. 9 to 11) with the tray feeding outlet (12) placed opposite to the feeding-in conveyor (11), as shown in Fig. 17, a folding plate (4) moves the tray (A) toward the feeding-out part (34) when the

feeding-in part is folded, with the result that inferior packaging may be performed and in the worst case packaging could not be performed at all.

(1) in Fig. 16 designates a pushing conveyor, the elevator head (2) is arranged at the feeding-out end of the pushing conveyor (1) in such a way as it may be moved up and down, and lateral folding plates (3), (3), a front folding plate (4), a discharging pusher (35) and a heating belt (34) are arranged over the elevator head (2). When the item (A) is mounted on the elevator head (2) by the pusher conveyor (1) and lifted thereby, additional margin (C) is produced at the film (b) at the heating belt (34). Therefore, when the film is folded by the front folding plate (4), it results in a form as shown in Fig. 17. Due to this arrangement, in the conventional type of the device as above, the kind of tray which may ensure superior packaging is limited.

In order to eliminate the above-mentioned problems, it has been suggested to make such a packaging machine in which the width of the tray to be packaged is detected, and the length of movement of the folding plate is controlled in response to the width of the tray. This device is constructed such that the mechanical parts are not operated by an electric motor, but by compressed air, so that the control of the length of movement of the folding plate is relatively simple. However, in the event that the mechanical parts are operated by the compressed air, a facility for the compressed air such as an air compressor is required to compress air, with the result that the entire unit becomes large in size and heavy in weight. Since the width of the tray is detected and controlled, the control circuit becomes complicated and the processing speed is also restricted.

In the above-noted stretch film packaging machine, the items are packaged with a stretch film, thereafter the packaged items are transferred onto the heating belt (34), the bottom part of the folded stretch film is sealed and at the same time the unit price, weight and price of the items are printed on the label by the label printer and the printed label is applied onto the packaged items. In this way, it is necessary to apply the above-noted label at any one of the four corners of the container (item) due to the fact that the adherence of the label at the center of the item may cause the customer difficulty in observing the contents of the container.

Random adherence of the label at the container or irregular adherence thereof may not only adversely affect the outer appearance, but also degrade the value of the item, so that careful attention is paid for the adherence of the label at the super-market.

The adhering position of the label printer must always be moved each time the size of the item to be packaged is varied and a trial application of the label must be performed, resulting in a quite troublesome operation.

In a conventional type of packaging machine, it has already been proposed that a weighing

device and a label applying device are integrally assembled to apply the label on the item on the heating belt, the label may not be adhered to the same position unless the label adhering position of the label printer is further moved in response to the size of the item to be packaged.

It is an object of the present invention to provide a stretch film packaging machine in which a superior finished packaging condition may always be ensured even in the event that trays having different widths storing the item therein are packaged.

It is another object of the present invention to provide a stretch film packaging machine in which a label can always be applied at a desired position on the item without requiring adjustment even if the size of the item packaged by a stretch film is varied.

According to the invention, the machine defined in the first paragraph of this specification is characterised by: a lateral position setting side plate arranged at a side of said heating and transfer belt and parallel to the transfer direction thereof; a sliding plate arranged at the upper surface of a feed part of the heating and transfer belt in such a way as it may be slid in the lateral direction of the transfer belt for receiving the packaged item; and means for sliding the sliding plate to cause the item to abut against the side plate to move onto the heating and transfer belt and then to be discharged along the side plate.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 is a longitudinal side elevational view in section for showing the packaging machine of the present invention;

Figure 2 is a top plan view in section of Figure 1;

Figure 3 is a longitudinal front elevational view in section of Figure 1;

Figure 4 is an enlarged view for showing a substantial part of Figure 1;

Figure 5 is an enlarged view for showing a substantial part of Figure 2;

Figures 6 to 8 are a view for showing an operation starting from a feeding-in of the item to a packaging by a stretch film in the present invention;

Figure 9 is a side elevational view of outer appearance of the stretch film packaging machine;

Figure 10 is a top plan view of Figure 9;

Figure 11 is a front elevational view of Figure 9;

Figure 12 is a side elevational view of an outer appearance of a packaging machine in operation in which the feeding-in port and the feeding-out port are arranged at the same side;

Figure 13 is a top plan view of Figure 12;

Figure 14 is a front elevational view of Figure 12;

Figure 15 is a longitudinal side elevational

view in section for showing a modified form of an arrangement shown in Figure 4;

Figure 16 is a view for illustrating a principle of the conventional type of the structure;

Figure 17 is a view for illustrating the operation of the unit;

Figure 18 is a front elevational view partly broken away for showing the part near the heating belt of the packaging machine in detail;

Figure 19 is a top plan view of Figure 18;

Figure 20 is a side elevational view of Figure 18 partly broken away;

Figures 21 to 25 are a top plan view for illustrating the operation of the arrangement shown in Figures 18 to 20;

Figure 26 is a top plan view for illustrating another operation in relation with Figures 18 to 20;

Figure 27 is a top plan view for showing a modified form of a lateral aligning mechanism shown in Figures 18 to 20;

Figure 28 is a side elevational view of Figure 27.

In Figures 1 to 5, a machine frame (10) is a substantial rectangular frame provided with an item feeding port (11) at its front central part and a packaged item feeding-out port (12) at the rear upper part thereof.

A feeding frame part (13) is arranged to project forwardly from below the feeding port (11) and a pusher conveyor (1) is arranged to feed from the feeding frame part (13) into the machine frame (10).

The pusher conveyor (1) is constructed such that a chain (1b) is arranged between sprockets (1a) and (1a) and a pusher (1c) projects from the chain (1b), so that an item placed at the feeding end is pushed into the machine frame (10).

A weighing table (14) is arranged at the feeding end of the pusher conveyor (1) so as to weigh an item placed on the weighing table (14) and the pusher conveyor (1) is energised when the weighing table signal is produced.

At the discharging end of the pusher conveyor (1) are arranged some elevator heads (2), (2)... which are flush with the pusher conveyor (1) in the lowest positions thereof.

The elevator heads (2), (2)... constitute an item mounting table lifted via each of the springs (2a)... on raised fixing plates (16, (16)... arranged side-by-side on the mounting plate (15) in a properly spaced-apart relation and the heads are lowered so as not to disturb folding operations performed by the lateral folding plates (3), (13') and the front folding plate (4). The mounting plate (15) is raised and lowered by an elevator mechanism (17). The elevator mechanism (17) rotates a cam (not shown) to move up and down the parallel oscillating arms (17a), (17a) and the highest positions of the elevator heads (2), (2) are adjacent to the opening (6) to be described later.

Belt conveyors (7) are installed to convey from the discharging end of the pusher conveyor (1) to the elevator heads (2), (2)... The belt conveyors

(7) are arranged such that at first a pivot shaft (7a) is rotatably arranged at the feeding-out part of the pusher conveyor (1) and pulleys (7c), (7c) are arranged at the pivot shaft (7a) in such a way that the belts (7d), (7d) to be described later are positioned between the elevator heads (2), (2). Drive rollers (7b) are installed at the rear sides of the elevator heads (2), (2) and belts (7d), (7d) are tensioned between the pulleys (7c), (7c) and the drive rollers (7b). The belt conveyors (7) are operated such that their pivot shafts (7a) are oscillated in an upward and downward direction around the drive shaft (7e) of the drive rollers (7b).

A microswitch or photo-sensor is mounted near the item feeding port (11) so as to detect the size of the item to be fed and the film is cut by a cutter (18) to be described later to a length such as to coincide with the size of the item.

The side plates (7f), (7f) of the pivot shaft (7a) are provided with pivotable connector levers (19), (19). L-shaped levers (20), (20) having fulcrum shafts (20a), (20a) as their rotational centers are rotatably arranged at the connector levers (19), (19). Rollers (21), (21) are arranged below the L-shaped levers (20), (20) and when the elevator heads (2), (2) are placed at the lowest position, triangular projecting pieces (22), (22) arranged at the fixing plates (16), (16) are abutted against the rollers (21), (21) to cause the belt conveyor (7) to project over the push conveyor (1). When the elevator heads (2), (2) are moved upwardly, the rollers (21), (21) are lowered along the inclined surfaces of the projecting pieces (22), (22) so that the belt conveyors (7) are oscillated downwardly around the drive shaft (7e) and positioned below the pusher conveyor (1).

Fixing plates (8a), (8a) are arranged inside the rear part of the machine frame (10), and the position setting plate (8) is arranged at the fixing plates (8a), (8a) in such a way as it may be positioned at a location slightly spaced from the elevator heads (2), (2).

The position setting plate (8) is operated to abut against the item to be transported by the belt conveyors (7) and to position the item at the feeding reference positions of the elevator heads (2), (2).

A feeding speed of the belt conveyors (7) is set at a faster speed than that of the pusher conveyors (1), keeps the packaging cycle to be described later always constant and prevents the processing power from being decreased.

Movement of the pushers (1c) of the pusher conveyors (1) is mechanically synchronous with one cycle of the packaging operation of the packaging machine. That is, the item placed at the feeding part of the pusher conveyors (1) is transported by the pushers (1c) and the item should be transported to the elevator heads (2), (2) in synchronism with one cycle of packaging operation of the packaging machine. Therefore, it becomes necessary to make an intermittent feeding of the item by the feeding-in conveyors. Processing capacity of the packaging machine is defined by the feeding volume of the pushers (1c). Since the

abutting distance of the item starting from the abutting surface of the item to the position setting plate (8) by the pushers (1c) is different by the depth length of the item when the item transported by the pusher conveyors (10) is fed to the elevator heads (2), (2) by the conveyors (7), the transporting time of the item differs from item to item. In order to keep the processing capacity of the packaging machine constant even if the depth length of the item is different, the transporting speed of the belt conveyors (7) is defined at a speed such that the item having the less depth length can be abutted against the position setting plate while the elevator heads (2), (2) are stopped at the lowest position.

In order to increase the processing capacity, it is preferable to shorten the transporting distance of the pusher conveyors (1). In the preferred embodiment, the pusher conveyors (1) and the belt conveyors (7) overlap each other and if the width of the one item is different from that of the other item, the item having a longer width quickly reaches the belt conveyors (7), so that the movement of the item may not coincide with the timing of the upward and downward movement of the elevator heads (2), (2) with the result that the item may not be placed on the elevator heads (2), (2). Therefore, in order to cause the items having different width to always be placed on the elevator heads (2), (2), the belt conveyors (7) are moved upwardly to transport the item when the elevator heads (2), (2) have reached the lowest position. In this case, the driving of the belt conveyors (7) may be controlled or a shutter is arranged without making any upward or downward movement of the belt conveyors (7).

A set of film transporting devices (9), (9') is arranged above the elevator heads (2), (2) in such a way that they cross the feeding direction of the item, and a cutter (18) is arranged above the feeding part of the transporting devices (9), (9'), and the supporting rollers (23), (23), (23), (23) for the film rolls (B₁), (B₂) are arranged below the transporting part.

A set of two supporting rollers (23), (23) and (23), (23) are rotatably arranged so as to support rolls (B₁) and (B₂) having different film width. The stretch film (b₁) fed out of the roll (B₁) is passed through the film feeding roller (24) and reaches the transporting devices (9), (9').

The film transporting roller (24) is arranged at the feeding part of the transporting devices (9), (9'), and is rotated for a certain period of time at a specified speed when the stretch film (b₁) is taken out.

The cutter (18) is arranged above the transporting side of the transporting devices (9), (9') in such a way that it may be moved up and down so as to cut the film (b₁) taken out to the film transporting roller (24) to a desired length.

Each of the holder devices (25), (25) is arranged inside the transporting part of the transporting devices (9), (9'), respectively. Each of the holding devices (25), (25) is composed of a set of upper and lower two rubber belts (25a), (25a), and the

end part of the film (b_1) of the film roll (B_1) is held between the rubber belts (25), (25).

Since the transporting devices (9), (9') are of a symmetrical structure around the center of the opening (6) for their front and rear parts, only one of them will be described. The transporting device (9) is constructed such that some sprockets (not shown) are arranged at both sides of the machine frame (10), chains (not shown) are tensioned between the sprockets, a round belt (9a) is applied along the outer circumference of the chains, and at the same time grippers (9b), (9b) are arranged at a specified spaced apart interval on the chains in such a way that they may be opened or closed, and the stretch film (b_1) is held by the grippers (9b), (9b),... and the round belt (9a) and transported thereby. A guide (not shown) for opening the grippers (9b), (9b) is arranged at the feeding part (E) of the transporting device (9) shown in Fig. 3, and the grippers (9b), (9b) are released at the feeding part (E). An additional guide (not shown) for closing the grippers (9b), (9b) is arranged starting from the feeding part (E) toward the feeding direction so as to close the grippers (9b), (9b). The guide for the grippers (9b), (9b) is divided into three blocks of (F), (G), (H) in Fig. 3, a solenoid (not shown) is arranged for each of the blocks (F), (G), (H), and the guide is made to be movable under an operation of the solenoid to open or close the grippers (9b), (9b). When the stretch film (b_1) is held and transported, all the blocks (F), (G), (H) are closed, and when the lateral folding is performed, the blocks (F), (H) at both ends are released in synchronism with the timing of the lateral folding operation of the lateral folding plates (3), (3'), and in turn when either the front folding or rear folding is to be performed, the block (G) is released in synchronism with the timing of the folding of the front folding plate (4) or the discharging pusher (35).

In the above-mentioned transporting devices (9), (9') the transporting speed of the round belt (9a) and the grippers (9b), (9b) is made a little faster than the feeding-out speed of the film feeding roller (24). Thereby the film (b_1) can be extended along the transporting direction. Similarly, a space between the transporting devices (9), (9') is gradually widened toward the transporting direction, whereby the film (b_1) can be extended in the width direction. In this way, the film is properly extended to enable superior finished packaging to be performed.

Lateral folding plates (3), (3') are arranged horizontally to be opposite to each other at both upper sides of the machine frame (10), a front folding plate (4) is bridged over the front end of the lateral folding plates (3), (3') and at the same time a rear folding roller (5) is arranged at the rear end of the lateral folding plates (3), (3') and the substantial rectangular opening (6) is formed to be positioned just above the elevator heads (2), (2).

The lateral folding plates (3), (3') are a flat plate having both ends of side adjacent to the opening (6) formed as an arcuate form as shown in Fig. 2

so as to fold the film at the side of the item to be described later. At both upper sides of the machine frame (10) is arranged each of the parallel guide bars (26), (26') toward the opening (6), each of the sliding members (27), (27), (27') and (27') is slidably arranged at each of the guide bars (26), (26), (26') and (26'), and the lateral folding plates (3), (3') are fixed to the lower parts of the sliding members (27), (27), (27') and (27'). The sliding members (27), (27), (27') and (27') are cooperatively related to the driving shaft (not shown) through a crank mechanism (not shown) and the lateral folding plates (3), (3') are synchronously moved into or out of the opening (6).

The front folding plate (4) is a flat plate in which the front folding roller (4a) is rotatably arranged at the side adjacent to the opening (6) as shown in Fig. 1 so as to perform the front folding operation after completion of the lateral folding of the lateral folding plates (3), (3'). Each of the side guide rails (28), (28') is arranged at both sides of the opening (6) of the machine frame (10), each of the first sliding members (29), (29') and the second sliding members (30), (30') is slidably arranged at each of the guide rails (28), (28') and the front folding plate (4) is bridged over the first sliding members (29), (29'). The other sliding member (29) and the first driving shaft (31) are cooperatively related to each other via crank shaft (33) so as to cause the front folding plate (4) to be moved into or out of the opening (6). The crank mechanism (33) is made such that the rotating lever (33a) fixed to the first driving shaft (31) and the cooperating lever (33b) are rotatably connected through the pivot shaft (33c).

The discharging pusher (35) is bridged over the second sliding members (30), (30'). One of the sliding members (30) and the second driving shaft (32) are cooperatively connected through a crank mechanism (33') having the same structure as that of the crank mechanism (33) and the item of which lateral folding and front folding are completed is discharged to the heating belt (34) by the discharging pusher (35).

As described above, the guide rails (28) and (28') are commonly applied for the first sliding members (29), (29') and the second sliding members (30), (30'), so that the structure is quite simple and compact.

The first driving shaft (31) and the second driving shaft (32) are arranged at a position of linear symmetry with an equal distance of (l), (l) around the central line (6a) of the opening (6) (Fig. 2).

Since the first driving shaft (31) and the second driving shaft (32) are arranged at a symmetrical position around the center line (6a) of the opening (6), it is possible to make a packaging machine in which the feeding port (11) and the discharging port (12) are oriented toward the same direction as shown in Figs. 12 to 14 by a mere exchange of the positions of each of the folding plates (3), (3') (4), discharging pusher (35) and the heating belt (34) etc..

A rear folding roller (5) is a longitudinal roller

which is rotatably arranged so as to discharge the item by the discharging pusher (35) which is laterally folded and further folded at its front part and at the same time the rear folding of the item is performed.

The heating belt (34) is a belt conveyor having a heater provided therein to cooperate with the rear folding roller (5) so as to heat the film folded at the bottom part of the item and to discharge the same.

At the discharging part of the heating belt (34) is arranged a sliding plate (36) shown in Figs. 9 to 11. The sliding plate (36) is arranged so as to be slidably moved in and out of in a width direction of the heating belt (34) and the item which is pushed by the discharging pusher (35) and folded at its rear part by the rear folding roller (5) is received at once on the sliding plate (36). Then, if the sliding plate (36) is moved down, the item is transferred onto the heating belt (34) while being positioned at one side of the heating belt (34). Therefore, the label adhering position is kept constant when an automatic label adhering operation is performed with the label printer (37) installed above the feeding-out side of the heating belt (34).

The construction near the heating belt (34), in particular the sliding plate (36) and its function, will be described later with reference to Figs. 18 to 28.

Each of the movable parts is cooperatively moved under a mechanical synchronus operation with the upward and downward movement of the elevator.

Operation of the packaging machine of the present invention will be described in reference to Figs. 6 to 8.

At first, the pusher conveyor (1) and the elevator heads (2) and (2) are kept vacant and when the first item (A) is placed on the weighing part (14), the pusher conveyor (1) and the belt conveyor (7) are started to operate to transfer the item (A). The size of the transported item (A) is detected by a microswitch or photo-sensor installed at the feeding port (11) and a length of the film (b₁) coinciding with the item (A) is defined. The film (b₁) having the defined length is taken out by the transporting devices (9), (9') and the film (b₁) is cut by the cutter (18). The cut film (b₁) is transported and held by the transporting devices (9), (9') in such a way that its center part coincides with the center of the opening (6). During this operation, a vacant feeding is performed at once for the elevator heads (2), (2), lateral folding plates (3), (3'), front folding plate (4) and the discharging pusher (35). When the elevator heads (2), (2) are returned back to their lowest position and the first item (A) transported by the belt conveyor (7) is transported until it may abut against the position setting plate (8) and its position is set.

As illustrated in Fig. 6, if the second item (A) is mounted on the weighing part (14), the pusher conveyor (1) and the belt conveyor (7) are energized by a weighing table signal so as to transport

the item (A) and at the same time the first item (A) on the elevator heads (2), (2) is lifted up.

Fig. 7 illustrates the lifting-up of the first item (A) on the elevator heads (2), (2). As the elevator heads (2), (2) are lifted up, the roller (21) in Fig. 4 is released from the projecting piece (22), resulting in that the pivot shaft (7a) of the belt conveyor (7) oscillates downwardly around the driving shaft (7e) as shown in Fig. 7 and is kept immovable.

The item (A) on the elevator heads (2), (2) pushes up the film (b₁) and is stopped at the highest position of the elevator heads (2), (2) i.e. in the opening (6).

Fig. 8 illustrates the lateral folding and front folding conditions. As the elevator heads (2), (2) reach the highest position, the lateral folding plates (3), (3') can be moved up to the center of the bottom surface of the item (A) from both sides of the item (A) while pushing the elevator heads (2), (2), and then the films at both sides of the item (A) are folded into the bottom part of the item (A).

Upon completion of the lateral folding of the film, the front folding plate (4) is moved to the bottom surface of the item (A) to perform the front folding of the film. As the roller (4a) of the front folding plate (4) reaches the rear folding roller (5), the discharging pusher (35) is enabled to move and at the same time the elevator heads (2), (2) are lowered.

The item (A) is transported to the rear folding roller (5) by discharging pusher (35) to perform the rear folding operation.

The item (A) of which rear folding is completed is received on the sliding plate (36) to be described later and its position is set by making the sliding plate (36) immovable and the item is heat sealed by the heating belt (34). Then, the label is applied to the item by the label printer (37).

As the discharging pusher (35) pushes the item (A) against the sliding plate (36) on the heating belt (34), the lateral folding plates (3), (3') and the front folding plate (4) are made immovable and returned to their initial positions and at the same time the elevator heads (2), (2) are returned to the lowest position.

As the elevator heads (2), (2) are returned back to the lowest position, the projecting piece (23) shown in Fig. 4 is abutted again to the roller (21) to cause the pivot shaft (7a) of the belt conveyor (7) to be projected again, resulting in the condition shown in Fig. 6.

Subsequently, when the items of the third order or more are packaged, the processing steps for the second item are to be repeated.

As the packaging operation approaches the end and when the final item (A) is mounted on the weighing part (14), the pusher conveyor (1) and the belt conveyor (7) are started to operate to cause the item (A) to be transported onto the elevator heads (2), (2) and to abut against the position setting plate (8).

At this time, the main driving motor and each of the movable parts are stopped.

Then, when the manual bottom is depressed,

the elevator heads (2), (2) are lifted up to fold the item (A) in the same manner as that of the previous step and then discharged. The lateral folding plates (3), (3'), front folding plate (4) and the discharging pusher (35) are stopped with their immovable conditions being applied as their initial positions and the elevator heads (2), (2) are stopped with their lowest positions being their initial positions.

In the event that the following items are not placed on the weighing part within the desired period of time (for example, a cycle of the pusher), a vacant operation may automatically be performed. In accordance with the present invention described above, the arrangement of the belt conveyor (7) and the position setting plate (8) causes the margin part (C) of the film to be generated at the front folding plate irrespective of such an arrangement as the item is fed-in in synchronism with the upward and downward movement of the elevator. Due to this fact, since the margin part of the film (b) is folded by the front folding plate (4), for example, even in the event that such a narrow tray as one for storing mackerel spikes is packaged, the tray may not be moved and superior packaging can be performed. Further, since superior packaging can always be performed only by driving the belt conveyor (7) arranged at the feeding-out end of the pusher conveyor (1) without having any relation with the width of the tray, there is provided a structure which is suitable for a driving caused by an electric motor, the entire structure is small in size and light in weight as compared with that of the conventional type in which the width of the tray is detected and the moving distance of the front folding plate is controlled in compliance with the width of the tray, and further the arrangement of the control circuit becomes simple and the processing speed required for performing the packaging can be improved. In case that as shown in Figs. 12 to 14 the packaging device is operated under such a condition as the feeding port (11) and the feed-out port (12) are arranged at the same side, the above-noted operation of the belt conveyor (7) is stopped. That is, the belt conveyor (7) is fixed at the position where it may be flush with the pusher conveyor (1) and the rotation is stopped and then the item (A) to be transported by the pusher conveyor (1) is slid on the belt conveyor (7). In the operative condition shown in Figs. 12 and 14, the surface of the pusher of the pusher conveyor (1) may act as a reference plane and no margin (C) described above is produced at the discharging port (11), so that the film may positively be folded. Further, the item to be transported by the pusher conveyor (1) is slid on the belt conveyor (7), resulting in that a substantial inertia may not be acted upon the item (A) due to its sliding friction and so the item (A) can be stopped at the desired position on the elevator head (2) and the reference position can correctly be set.

Fig. 15 illustrates a modified form of the major part of the above-described embodiment, i.e. the

belt conveyor and the position setting plate (see Fig. 4).

In Fig. 15, the members illustrated in Fig. 4 are designated by the similar numbers and therefore their explanation will be omitted.

In Fig. 15, the belt conveyor (7) is fixed at its upper limit position without any upward or downward oscillating movement and has a vertically extending stop (70) arranged between the belts (7d), (7d) of the conveyor (7) in such a way as it may be moved up and down. The stop (70) has a L-shape, a supporting shaft (71) is connected to the lower end of the L-shaped stop and extended downwardly, the supporting shaft (71) is inserted into the guide pipe (73) fixed to the machine frame (10) via bracket (72) in such a manner as it may be slid in an upward or downward direction, a coil spring (74) is engaged with the lower end of the supporting shaft (71) for biasing the supporting shaft (71) upwardly and at the same time an engaging lever (75) projecting toward the fixing plate (16) of the elevator head (2) is integrally fixed. The above-noted fixing plate (16) is integrally provided with an operating rod (77) projected on the engaging lever (75) and abutted against the roller (76) of the engaging lever (75), and the upward and downward movement of the fixing plate (16), that is, the upward and downward movement of the elevator head (2) and the upward and downward movement of the stop (70) are cooperatively related to each other. That is, in Fig. 15, when the elevator head (2) is placed at its lower limit position, the stop (70) is pushed down by the operating lever (77) against the resilient force of the coil spring (74) and positioned at a conduction where it is sunk below the belt (7d) of the belt conveyor (7), the item can be transported by the belt conveyor (7), and when the elevator head (2) is moved upwardly, the stop (70) is projected over the belt (7d) under a resilient force of the coil spring (74). Therefore, when the stop (70) is moved upwardly, the item is prevented from being transported, that is, the item (A) from being transported toward the elevator head (2).

The arrangement for use in moving the above-noted stopper (70) upwardly or downwardly is replaced with the arrangement in which the belt conveyor (7) is moved upwardly or downwardly as shown in Fig. 4. In Fig. 15, the position setting plate (18') is mounted such that its upper end is pivotably supported at the supporting shaft (78) and the position setting plate (8') can be oscillated only in a rearward direction along the transporting direction of the belt conveyor (7) and at the same time weight (79) is arranged at the lower end. The arrangement of the above-noted position setting plate (8') shows that the item (A) transported by the belt conveyor (7) is abutted against the position setting plate (8') and stopped, thereafter is slightly pushed back by a reaction force of the position setting plate (8'). Therefore, even in the event that the item (A) is transported whilst being inclined under the action of the above-noted position setting plate (8'), the

can be corrected to its right attitude after it is abutted against the position setting plate (8'). The position setting plate (8') restricts the item to oscillate from the condition shown to the feeding-in direction. Then, in Figs. 18 to 20, the detailed part near the above-noted heating belt (34), in particular, the above-noted oscillating plate (36) and its mechanism are illustrated.

In Figs. 18 to 20, the position setting side plate (40) is arranged at one side of the heating belt (34) and a sliding plate (36) is arranged on the heating belt in such a manner as it may be flush with the upper surface of the rear folding roller (5).

As shown in Fig. 20, the heating belt (34) is provided with a roller (41) freely rotatable at the rear folding roller (5), and with a driving roller (42) at the discharging end and then the heating belt (34) is placed between both rollers (41) and (42). A heater plate (44) having a heater (43) fixed therein is arranged below the upper heating belt (34) and the inner part of the heating belt (34) is heated by the heating of the heater plate (44). The driving roller (42) is driven under a cooperation of a sprocket (45) coaxially fixed to the roller and a sprocket (46) fixed to a motor (M) via chain (47).

A side plate (40) is of a plate having L-shaped section, one surface of it is vertically arranged on the heating belt (34) and the other surface is fixed to the machine frame (10) in such a manner as it becomes in parallel with the feeding direction of the heating belt (34). The lower part of the vertical surface of the side plate (40) has a clearance to enable the sliding plate (36) to be passed therein. The vertical surface of the side plate (40) may be provided with the resin plate having a lower coefficient of friction.

The sliding plate (36) is of a resin plate having a lower coefficient of friction and is projected outwardly at its part out of the side plate (40) when the sliding plate is slid at the desired position on the heating belt (34). The rear folding roller (5) of the sliding plate (36) is projected out of the end surface of the heating belt (34) and at the same time the rollers (48), (48) are rotatably arranged below the sliding plate (36). The rollers (48), (48) are moved on the rails (49) fixed over the width direction of the heating belt (34). To one end of the sliding plate (36) projected out of the side plate (40) is fixed a sliding element (50). The sliding element (50) is moved along a guide rod (51) slidably fitted and the guide rod (51) being fixed to the machine frame (10) in such a way as the sliding plate (36) is moved in a direction perpendicular to the transferring direction of the heating belt (34). Each of the sprockets (52), (52) is arranged above both ends of the guide rod (51) and the sprockets (52), (52) are arranged in such a manner that the chain (53) tensioned between the sprockets (52), (52) becomes parallel with the guide rod (51). The sliding element (50) is cooperatively related to the chain (53). One of the sprockets (52) is driven by a motor (M₂), the sliding plate (36) is slid from the side plate (40) to the heating belt (34) or returned back to the inside of the side plate (40) in response to the

rotational direction of the motor (M₂). A projecting piece (54) is arranged below the sliding plate (36) to which the sliding element (50) is fixed. The projecting piece (54) is used for detecting the position where the sliding plate (36) is slid onto the upper surface of the heating belt (34) and the position where the sliding plate is returned back to the outside of the side plate (40), and a photo-sensor (55) is arranged at each of the positions corresponding to the projecting piece (54). When the sliding plate (36) is slid onto the upper surface of the heating belt (34), the projecting piece (54) shuts off the photo-sensor (55) and stops the motor (M₂), so that the sliding plate (36) is stopped. Similarly, the sliding plate (36) stops the motor (M₂) by the signal of the photo-sensor when it comes to the outside of the side plate (40).

A label printer (37) arranged on the upper surface of the heating belt (34) is supported by a linkage mechanism (56). The linkage mechanism (56) is composed of three link members (56a), (56b), (56c) and each of which is freely movable. On one end of the linkage mechanism (56) is rotatably mounted the label printer (37) and the other end is rotatably mounted on a fixing frame fixed to the machine frame (10). The label issuing port of the label printer (37) can be moved to any positions on the heating belt (34) and its position can be fixed by a handle (56d) arranged at the intermediate linkage member (56c). Transparent photo-sensors (57), (57') are arranged at both substantial central parts of the heating belt (34) and the items of which lateral coincidences are finished and moved on the heating belt (34) are detected by the photo-sensors.

Operation of the above-noted arrangement illustrated in Figs. 18 to 20 will be described with reference to Figs. 21 to 25.

The sliding plate (36) is stopped on the heating belt (34) where a projecting piece (54) of the sliding plate (36) is sensed by the sensor (55) (Fig. 20), the item (A) pushed by the above-noted pusher (35) passes over the rear folding roller (5) and is folded at its rear part (see Fig. 8) and thereafter the item is transported onto the sliding plate (36) and mounted on it (Fig. 22).

When the transporting operation of the pusher (35) is completed and the item is transported onto the sliding plate (36), the motor (M₂) is rotated and the sliding plate (36) is slid out of the side plate (40). The item (A) on the sliding plate (36) is abutted against the side plate (40) as the sliding plate (36) is moved (Fig. 23).

Further, as the sliding plate (36) is moved and the projecting piece (54) of the sliding plate (36) is sensed by the sensor (55), the rotation of the motor (M₂) is stopped by the sensed signal and the movement of the sliding plate (36) is stopped (Fig. 24).

Upon energization of the driving motor (M₁) for the heating belt (34), the heating belt (34) transports the item (A) in its feeding-out direction. The item (A) is transported along the side plate (40) and as the end extremity of the item (A) is detected by the sensors (57), (57'), the label (L)

having weight, price and unit price etc. printed, issued and suctioned is adhered to the upper surface of the extremity end of the item (A) by compressed air under instruction of the detected signal (Fig. 25).

Further, the item (A) is fed out from the heating belt (34) under rotation of the heating belt (34).

As the next item is pushed up from below the stretch film by the elevator head (2) and its lateral folding is performed, the front folding plate (4) is operated and simultaneously the motor (M₂) is energized to cause the sliding plate (36) to be slid from the side plate (40) onto the upper surface of the heating belt (34). As the sensor (55) detects the projecting piece (54) of the sliding plate (36), the rotation of the motor (M₂) is stopped by the sensing signal and the sliding plate (36) keeps waiting on the heating belt (34) as shown in Fig. 21. The above-noted operation will be repeated.

The label adhering position can be selected by varying the position of the label issuing port of the label printer (37).

In Fig. 26 is illustrated a case in which the label (L) is applied onto the fore position of the item (A).

A handle (56d) arranged in the linkage mechanism (56) of the label printer (37) is loosened and the label issuing port of the label printer (37) is moved in such a way that the label is applied to the fore position of the item (A) and then the label issuing port is fixed by the handle (56d). As the item (A) is transported by the pusher (35), moved onto the sliding plate (36) over the rear folding roller (5) and the pusher (35) finishes a transportation of the item (A), the sliding plate (36) is slid and then the item (A) is abutted against the side plate (40).

As the sliding plate (36) is slid out of the side plate (40), the item (A) is transported onto the heating belt (34). The label (L) having weighing data etc. printed thereon and kept waiting under suctioned condition is detected by the sensor (55) for its complete returning, and then the label (L) is applied onto the upper surface of the item (A) by the sensed signal. The heating belt (34) is rotated and the item (A) is transported. With this arrangement, the reference position of the item (A) is positively defined by the pusher (35) and the side plate (40), so that the adhering position of the label (L) can positively be defined.

It may also be applicable that the feeding-in part of the side plate (40) is applied as a switch mechanism, the switch mechanism is operated when the item (A) is abutted against the side plate (40) and the label (L) may be adhered onto the item (A) by the sensed signal.

Further, it may also be applicable that the operation of the sliding plate (36) is performed when the item (A) is fed onto the heating belt (34) and when the item (A) is transported from the heating belt (34).

Then, in reference to Figs. 27 and 28, a modified form of the present invention will be

described in light of that shown in Figs. 18 to 20, wherein the same arrangement as that of the above-noted first preferred embodiment is designated by the same numbers and so its description will be omitted.

Two side plates (40), (40') are arranged at respective sides of the heating belt (34). Sprockets (60), (60) are arranged horizontally outside of each of the side plates (40), (40'), and a chain (61) is tensioned between the sprockets (60), (60).

Guide rods (62) and (62) are arranged in parallel with the above-noted chain (61), sliding elements (63), (63) are slidably fitted to the guide rods (62), (62) and at the same time the sliding elements (63), (63) are cooperatively related to the chain (61).

The above-noted sliding elements (63), (63) and the sliding plate (36) are cooperatively related to each other and the sprocket (60) is provided with a motor (M₃). There are arranged a sensor (55) for use in sensing that the sliding plate (36) is placed at the desired position on the heating belt (34), and sensors (64), (65) for sensing the condition where the sliding plate (36) is slid out of both side plates (40), (40').

Thus, in the preferred embodiment shown in Figs. 27 and 28, the sliding plate (36) is slid in a rightward or leftward direction to enable its positioning at the right or left side. Therefore, it is possible to adhere the label on either a right or left side of the item and further to arrange two rows of items by alternative rightward or leftward sliding of the sliding plate (36).

As shown in Figs. 18 to 28, the arrangement in which the sliding plate (36) and the position setting side plate (36) as well as a pair of side plates (40), (40') are arranged on the heating belt (34) enables the label to be always adhered on the desired position on the item without having any adjustment even if the size of the item (A) is varied and further the high processing speed can be attained.

Claims

1. A stretch film packaging machine for packaging an item (A) by a stretch film folded beneath the item, comprising means (35) for placing said item on a transfer belt (34) to convey the item to a heating station to effect sealing and a label printer (37) for issuing a label to adhere it to the item, characterised by: a lateral position setting side plate (40, 40') arranged at a side of said transfer belt (34) and parallel to the transfer direction thereof; a sliding plate (36) arranged at the upper surface of a feed part of the transfer belt (34) in such a way as it may be slid in the lateral direction of the transfer belt (34) for receiving the packaged item; and means for sliding the sliding plate (36) to cause the item to abut against the side plate (40, 40'), to move onto the transfer belt (34) and then to be discharged along the side plate (40, 40').

2. A stretch film packaging machine according



having weight, price and unit price etc. printed, issued and suctioned is adhered to the upper surface of the extremity end of the item (A) by compressed air under instruction of the detected signal (Fig. 25).

Further, the item (A) is fed out from the heating belt (34) under rotation of the heating belt (34).

As the next item is pushed up from below the stretch film by the elevator head (2) and its lateral folding is performed, the front folding plate (4) is operated and simultaneously the motor (M₂) is energized to cause the sliding plate (36) to be slid from the side plate (40) onto the upper surface of the heating belt (34). As the sensor (55) detects the projecting piece (54) of the sliding plate (36), the rotation of the motor (M₂) is stopped by the sensing signal and the sliding plate (36) keeps waiting on the heating belt (34) as shown in Fig. 21. The above-noted operation will be repeated.

The label adhering position can be selected by varying the position of the label issuing port of the label printer (37).

In Fig. 26 is illustrated a case in which the label (L) is applied onto the fore position of the item (A).

A handle (56d) arranged in the linkage mechanism (56) of the label printer (37) is loosened and the label issuing port of the label printer (37) is moved in such a way that the label is applied to the fore position of the item (A) and then the label issuing port is fixed by the handle (56d). As the item (A) is transported by the pusher (35), moved onto the sliding plate (36) over the rear folding roller (5) and the pusher (35) finishes a transportation of the item (A), the sliding plate (36) is slid and then the item (A) is abutted against the side plate (40).

As the sliding plate (36) is slid out of the side plate (40), the item (A) is transported onto the heating belt (34). The label (L) having weighing data etc. printed thereon and kept waiting under suctioned condition is detected by the sensor (55) for its complete returning, and then the label (L) is applied onto the upper surface of the item (A) by the sensed signal. The heating belt (34) is rotated and the item (A) is transported. With this arrangement, the reference position of the item (A) is positively defined by the pusher (35) and the side plate (40), so that the adhering position of the label (L) can positively be defined.

It may also be applicable that the feeding-in part of the side plate (40) is applied as a switch mechanism, the switch mechanism is operated when the item (A) is abutted against the side plate (40) and the label (L) may be adhered onto the item (A) by the sensed signal.

Further, it may also be applicable that the operation of the sliding plate (36) is performed when the item (A) is fed onto the heating belt (34) and when the item (A) is transported from the heating belt (34).

Then, in reference to Figs. 27 and 28, a modified form of the present invention will be

described in light of that shown in Figs. 18 to 20 wherein the same arrangement as that of the above-noted first preferred embodiment is designated by the same numbers and so its description will be omitted.

Two side plates (40), (40') are arranged at respective sides of the heating belt (34). Sprockets (60), (60) are arranged horizontally outside of each of the side plates (40), (40'), and a chain (61) is tensioned between the sprockets (60), (60).

Guide rods (62) and (62) are arranged in parallel with the above-noted chain (61), sliding elements (63), (63) are slidably fitted to the guide rods (62) and at the same time the sliding elements (63), (63) are cooperatively related to the chain (61).

The above-noted sliding elements (63), (63) and the sliding plate (36) are cooperatively related to each other and the sprocket (60) is provided with a motor (M₃). There are arranged a sensor (55) for use in sensing that the sliding plate (36) is placed at the desired position on the heating belt (34), and sensors (64), (65) for sensing the condition where the sliding plate (36) is slid out of both side plates (40), (40').

Thus, in the preferred embodiment shown in Figs. 27 and 28, the sliding plate (36) is slid in a rightward or leftward direction to enable its positioning at the right or left side. Therefore, it is possible to adhere the label on either a right or left side of the item and further to arrange two rows of items by alternative rightward or leftward sliding of the sliding plate (36).

As shown in Figs. 18 to 28, the arrangement in which the sliding plate (36) and the positioning setting side plate (36) as well as a pair of side plates (40), (40') are arranged on the heating belt (34) enables the label to be always adhered on the desired position on the item without having any adjustment even if the size of the item (A) is varied and further the high processing speed can be attained.

Claims

1. A stretch film packaging machine for packaging an item (A) by a stretch film folded beneath the item, comprising means (35) for placing said item on a transfer belt (34) to convey the item to a heating station to effect sealing and a label printer (37) for issuing a label to adhere to the item, characterised by: a lateral positioning setting side plate (40, 40') arranged at a side of said transfer belt (34) and parallel to the transfer direction thereof; a sliding plate (36) arranged on the upper surface of a feed part of the transfer belt (34) in such a way as it may be slid in the lateral direction of the transfer belt (34) for receiving the packaged item; and means for sliding the sliding plate (36) to cause the item to abut against the side plate (40, 40'), to move onto the transfer belt (34) and then to be discharged along the side plate (40, 40').

2. A stretch film packaging machine according to claim 1, wherein the sliding plate (36) is slid in a rightward or leftward direction to enable its positioning at the right or left side.



to claim 1 wherein means are provided for determining when said item has reached a predetermined longitudinal position along the transfer belt (34) and means are provided for activating said label printer (37) when said item has both abutted against said side plate (40, 40') and reached said predetermined longitudinal position.

3. A stretch film packaging machine according to claim 2 wherein said position determining means comprises photosensing means (57, 57').

4. A stretch film packaging machine according to claim 1 wherein means are provided for activating said label printer when said item has both reached a predetermined longitudinal position set by said placing means (35) and abutted against said side plate (40, 40').

5. A stretch film packaging machine according to any one of claims 1 to 4 in which said position setting side plate (40, 40') has an L-shaped section, with one surface arranged vertically above the transfer belt (34), and the other surface fixed to the machine frame (10) parallel to the transporting direction of the transfer belt (34), said sliding plate (36) being slidably arranged beneath the vertical surface of the side plate.

6. A stretch film packaging machine according to any one of claims 1 to 5 in which two side plates (40, 40') are arranged in parallel in specified spaced-apart relation at respective sides of the transfer belt (34), the sliding plate (36) being slidably arranged relative to both side plates.

7. A stretch film packaging machine according to any one of the preceding claims wherein said heating station comprises a heating element (43, 44) provided beneath said transfer belt.

8. A stretch film packaging machine according to any one of the preceding claims comprising: an elevator head (2) arranged at a feeding-out end of a pusher conveyor (1) in such manner that it may be moved up and down; means (9, 9') for holding a stretch film (b₁) cut to a desired length above said elevator head (2); an opening (6) at which at least one pair of folding plates (3, 4) provided above the stretch film (b₁) is operable to fold the stretch film (b₁) beneath the item on the elevator head (2) when said elevator head (2) is at its upper position; a discharging passage (12) for discharging the item from the machine after packaging thereof; a transporting belt (7) arranged between a discharge side of said pusher conveyor (1) and the lower position of the elevator head (2); and a position setting plate (8) provided at the discharge side of said transporting belt (7).

9. A stretch film packaging machine according to claim 8 wherein means are provided for operating said transporting belt (7) at a higher transport speed than the transport speed of said pusher conveyor (1).

10. A stretch film packaging machine according to claim 8 or 9 in which said transporting belt (7) is arranged to be moved up and down in cooperation with the upward or downward movement of the elevator head (2), the transporting belt (7) is placed at a position where it projects slightly above the pusher conveyor (1) to enable transportation when

it is placed at the lower limit position, and the transporting belt (7) is arranged to be moved downwardly when the elevator head (2) is moved upwardly to a position below the pusher conveyor (1) where the transportation is not enabled.

11. A stretch film packaging machine as set forth in claim 8 or 9 in which said transporting belt (7) is fixedly arranged at a specified position, a stop (70) is arranged to be moved in or out of said transporting belt (7) in cooperation with the upward or downward movement of the elevator head (2), the stop (70) projects out of the transporting belt (7) when the elevator head (2) is placed at its upper limit position to restrict the transportation of the item, and the stop (70) is moved downwardly when the elevator head (2) is moved downwardly to enable the transportation of the item.

12. A stretch film packaging machine as set forth in claim 8 or 9 in which the transporting speed of the transporting belt (7) is set at a speed at which an item of small width reaches the position setting plate (8) while the elevator head (2) is at its lower limit position.

13. A stretch film packaging machine according to any one of claims 8 to 12 in which said transporting belt (7) and the pusher conveyor (1) are arranged with their parts overlapping each other.

14. A stretch film packaging machine according to any one of claims 8 to 13 in which said position setting plate (8) is fixedly arranged.

15. A stretch film packaging machine according to any one of claims 8 to 13 in which said position setting plate (8) is mounted for oscillation around a supporting shaft arranged at the upper end thereof, and a weight is fixed to the lower end of the position setting plate.

16. A stretch film packaging machine according to any one of claims 8 to 15 in which side guide rails (28) are arranged at respective sides of said opening (6), a pair of first sliding members (29, 29') and a pair of second sliding members (30, 30') are slidably arranged on respective side guide rails (28), a front folding plate (4) is arranged between said pair of first sliding members (29, 29'), one (29) of the first sliding members and a first driving shaft (31) being cooperatively interrelated via a first crank mechanism (33) for reciprocal movement of said front folding plate (4) toward the opening (6), said placing means comprising a discharging pusher (35) arranged between said pair of second sliding members (30, 30'), one (30) of the second sliding members and a second driving shaft (32) being cooperatively interrelated via a second crank mechanism (33') for reciprocal movement of the discharging pusher (35) toward the discharging passage (12), said first and second crank mechanisms (33, 33') being the same construction, and the first and second driving shafts (31, 32) are arranged symmetrically with equal distance from the center line of the opening (6).

17. A stretch film packaging machine according to claim 16 wherein said discharging pusher (35) and discharging passage (12) are arranged opposite sides of the opening (6), the item fed



port (11) and discharging passage (12) are arranged at the same side of the machine; said transporting belt (7) is fixed at a position which is flush with the pusher conveyor (1), and means are provided to stop conveying movement of the transporting belt (7).

18. A stretch film packaging machine according to any one of claims 8 to 16 wherein said discharging passage (12) and said pusher conveyor (1) are arranged at opposite sides of said machine.

19. A stretch film packaging machine according to any one of claims 8 to 15 in which said label printer (37) for use in applying a label to the item is arranged above the transfer belt (34), and a weighing part (14) for weighing the item is arranged at the starting end of the pusher conveyor (1).

20. A stretch film packaging machine according to any one of claims 8 to 15 wherein front and lateral folding plates (3, 3', 4) are provided for folding said stretch film beneath said item (A).

21. A stretch film packaging machine according to claim 20 wherein individual drive sources are provided respectively for the front folding plate (4) and the lateral folding plates (3, 3').

Patentansprüche

1. Eine Dehnfolienverpackungsmaschine zum Verpacken eines Gegenstandes (A) durch eine Dehnfolie, die unter dem Gegenstand gefaltet ist, mit einer Einrichtung (35) zum Anordnen des Gegenstandes auf einem Förderband (34), um den Gegenstand zu einer Erhitzungsstation zu fördern, um eine Abdichtung auszuführen, und mit einem Etikettendrucker (37) zum Erzeugen eines Etikettes, um dieses am Gegenstand zu befestigen, gekennzeichnet durch: eine Seitenstellungseinstellseitenplatte (40, 40'), die an einer Seite des Förderbandes (34) und parallel zur Förderrichtung angeordnet ist; eine Gleitplatte (36), die auf der oberen Fläche eines Förderbands (34) derart angeordnet ist, daß sie in seitlicher Richtung des Förderbandes (34) zur Aufnahme des verpackten Gegenstandes verschoben werden kann; und eine Einrichtung zum Schieben der Gleitplatte (36), um den Gegenstand in Anlage gegen die Seitenplatte (40, 40') zu bringen, um ihn auf das Förderband (34) zu bewegen und um ihn dann entlang der Seitenplatte (40, 40') wegzufördern.

2. Eine Dehnfolienverpackungsmaschine nach Anspruch 1, wobei eine Einrichtung vorgesehen ist, um zu bestimmen, wann der Gegenstand eine vorbestimmte Längsstellung entlang des Förderbandes (34) erreicht hat, und wobei eine Einrichtung vorgesehen ist, um den Etikettendrucker (37) zu aktivieren, wenn der Gegenstand an die Seitenplatte (40, 40') angelegt ist und die vorbestimmte Längsstellung erreicht hat.

3. Eine Dehnfolienverpackungsmaschine nach Anspruch 2, wobei die Stellungsbestimmungseinrichtung eine Photosensoreinrichtung (57, 57') aufweist.

4. Eine Dehnfolienverpackungsmaschine nach Anspruch 1, wobei eine Einrichtung zum Aktivieren des Etikettendruckers vorgesehen ist, wenn der Gegenstand sowohl eine vorbestimmte Längsstellung, die durch die Anordnungseinrichtung (35) eingestellt wird, erreicht hat und sich an der Seitenplatte (40, 40') angelegt hat.

5. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 1 bis 4, bei welcher die Seitenstellungseinstellseitenplatte (40, 40') einen L-förmigen Abschnitt aufweist, wobei eine Fläche vertikal oberhalb des Förderbandes (34) angeordnet ist und wobei die andere Fläche am Maschinenrahmen (10) parallel zur Förderrichtung des Förderbandes (34) befestigt ist, wobei die Gleitplatte (36) gleitbeweglich unterhalb der senkrechten Fläche der Seitenplatte angeordnet ist.

6. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 1 bis 5, bei welcher zwei Seitenplatten (40, 40') parallel in einer bestimmten beabstandeten Beziehung an den jeweiligen Seiten des Förderbandes (34) angeordnet sind, wobei die Gleitplatte (36) gleitbeweglich relativ zwischen beiden Patten angeordnet ist.

7. Eine Dehnfolienverpackungsmaschine nach einem der vorhergehenden Ansprüche, wobei die Erhitzungsstation ein Erhitzungselement (43, 43') aufweist, das unterhalb des Förderbandes angeordnet ist.

8. Eine Dehnfolienverpackungsmaschine nach einem der vorhergehenden Ansprüche mit einem Hebepopf (2), der an einem Ausgabebereich eines Schubförderers (1) derart angeordnet ist, daß er auf- und abbewegt werden kann; eine Einrichtung (9, 9') zum Halten einer auf einer gewünschten Länge zugeschnittenen Dehnfolie (b₁) oberhalb des Hebepopfes (2); eine Öffnung (6), bei der zumindest ein Paar von Faltpfatten (4), die oberhalb der Dehnfolie (b₁) angeordnet sind, betätigbar ist, um die Dehnfolie (b₁) unterhalb des Gegenstandes auf dem Hebepopf (2) zu falten, wenn der Hebepopf (2) in seiner oberen Position angeordnet ist; einen Ausgabekanal (1) zum Ausgeben des Gegenstandes aus der Maschine nach dessen Verpackung; ein Förderband (7), das zwischen einer Ausgabeseite des Schubförderers (1) und der unteren Position des Hebepopfes (2) angeordnet ist; und eine Seitenstellungseinstellplatte (8), die an der Ausgabeseite des Förderbandes (7) angeordnet ist.

9. Eine Dehnfolienverpackungsmaschine nach Anspruch 8, wobei eine Einrichtung zum Begrenzen des Förderbandes (7) mit einer hohen Transportgeschwindigkeit vorgesehen ist, als Transportgeschwindigkeit des Schubförderers (1).

10. Eine Dehnfolienverpackungsmaschine nach Anspruch 8 oder 9, bei welcher das Förderband (7) für eine Auf- und Abbewegung in Zusammenarbeit mit der aufwärts oder abwärts gerichteten Bewegung des Hebepopfes (2) angeordnet ist, wobei das Förderband (7) an einer Stelle angeordnet ist, an der es etwas oberhalb des Schubförderers (1) hervorragt, um einen Transport zu ermöglichen, wenn es in der unteren Grenze



tion angeordnet ist, und wobei der Förderband (7) für eine Abwärtsbewegung angeordnet ist, wenn der Hebekopf (2) aufwärts in eine Stellung unterhalb des Schubförderers (1) bewegt wird, wo der Transport nicht möglich ist.

11. Eine Dehnfolienverpackungsmaschine nach Anspruch 8 oder 9, bei welcher der Förderband (7) an einer bestimmten Stellung fest angeordnet ist, bei welcher ein Anschlag (70) vorgesehen ist, um in den oder aus dem Förderband (7) in Zusammenarbeit mit der aufwärts oder abwärts gerichteten Bewegung des Hebekopfes (2) bewegt zu werden, wobei der Anschlag (70) aus dem Förderband (7) vorragt, wenn der Hebekopf (2) in seiner oberen Grenzstellung angeordnet ist, um den Transport des Gegenstandes einzuschränken, und wobei der Anschlag (70) abwärts bewegt wird, wenn der Hebekopf (2) abwärts bewegt wird, um den Transport des Gegenstandes zu ermöglichen.

12. Eine Dehnfolienverpackungsmaschine nach Anspruch 8 oder 9, bei welcher die Transportgeschwindigkeit des Förderbandes (7) auf eine Geschwindigkeit eingestellt wird, bei welcher ein Gegenstand geringer Breite die Stellungseinstellplatte (8) erreicht, während der Hebekopf (2) in seiner unteren Grenzstellung angeordnet ist.

13. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 12, bei welcher das Förderband (7) und der Schubförderer (1) derart angeordnet sind, daß sich ihre Teile gegenseitig überlappen.

14. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 13, bei welcher die Stellungseinstellplatte (8) fest angeordnet ist.

15. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 13, bei welcher die Stellungseinstellplatte (8) für eine Oszillation um eine Lagerwelle angeordnet ist, die am oberen Ende derselben vorgesehen ist, und wobei ein Gewicht am unteren Ende der Stellungseinstellplatte befestigt ist.

16. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 15, bei welcher Seitenführungsschienen (28) an jeweiligen Seiten der Öffnung (6) angeordnet sind, bei welcher ein Paar erster Gleitteile (29, 29') und ein Paar zweiter Gleitteile (30, 30') gleitbeweglich an entsprechenden Seitenführungsschienen (7) angeordnet sind, bei welcher eine vordere Faltpalte (4) zwischen dem Paar erster Gleitteile (29, 29') angeordnet ist, wobei eines (29) der ersten Gleitteile und eine erste Antriebswelle (31) zusammenwirkend über einen Kurbelmechanismus (33) für eine Hin- und Herbewegung der vorderen Faltpalte (4) zur Öffnung (6) miteinander verbunden sind, wobei die Anordnungseinrichtung einen Ausgabeschieber (35) aufweist, der zwischen dem Paar von zweiten Gleitteilen (30, 30') angeordnet ist, wobei eines (30) der zweiten Gleitteile und eine zweite Antriebswelle (32) zusammenwirkend über einen zweiten Kurbelmechanismus (33') für eine Hin- und Herbewegung des Ausgabeschiebers (35) auf den Ausgabekanal (12) miteinander verbunden sind, wobei der erste und zweite Kurbelmechanis-

mus (33, 33') die gleiche Konstruktion bilden und wobei die ersten und zweiten Antriebswellen (31, 32) symmetrisch mit gleichen Abständen von der Mittallinie der Öffnung (6) angeordnet sind.

17. Eine Dehnfolienverpackungsmaschine nach Anspruch 16, wobei der Ausgabeschieber (35) und der Ausgabekanal (12) an gegenüberliegenden Seiten der Öffnung (6) angeordnet sind, wobei eine Gegenstandsförderöffnung (11) und der Ausgabekanal (12) auf der gleichen Seite der Maschine angeordnet sind, wobei das Förderband (7) an einer Stelle befestigt ist, welche in gleicher Höhe zum Schubförderer (1) angeordnet ist und wobei eine Einrichtung vorgesehen ist, um die Förderbewegung des Förderbandes (7) anzuhalten.

18. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 16, wobei der Ausgabekanal (12) und der Schubförderer (1) an gegenüberliegenden Seiten der Maschine angeordnet sind.

19. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 18, bei welcher der Etikettendrucker (37) zum Anbringen eines Etikettes am Gegenstand oberhalb des Förderbandes (34) angeordnet ist, und bei welcher ein Wiegeteil (14) zum Wiegen des Gegenstandes am Eingangsende des Schubförderers (1) angeordnet ist.

20. Eine Dehnfolienverpackungsmaschine nach einem der Ansprüche 8 bis 15, wobei vordere und seitliche Faltpalten (3, 3', 4) zum Falten der Dehnfolie unterhalb des Gegenstandes (A) vorgesehen sind.

21. Eine Dehnfolienverpackungsmaschine nach Anspruch 20, wobei einzelne Antriebsquellen jeweils für die vordere Faltpalte (4) und die seitlichen Faltpalten (3, 3') vorgesehen sind.

Revendications

1. Machine d'emballage par pellicule extensible pour emballer un article (A) avec une pellicule extensible pliée au-dessous de l'article, comprenant un moyen (35) pour placer l'article sur une courroie de transfert (34) afin d'acheminer l'article jusqu'à un poste de chauffe et effectuer le scellement et une imprimante d'étiquette (37) pour émettre une étiquette afin de la faire adhérer à l'article, caractérisée par: une plaque latérale (40, 40') de réglage de position latérale disposée à un côté de la courroie de transfert (34) et parallèle à son sens de transfert; une plaque coulissante (36) disposée à la surface supérieure d'une partie d'introduction de la courroie de transfert (34) de façon à ce qu'elle puisse glisser dans le sens latéral de la courroie de transfert (34) afin de recevoir l'article emballé; et un moyen pour faire coulisser la plaque coulissante (36) afin que l'article bute contre la plaque latérale (40, 40'), pour déplacement sur la courroie de transfert (34) et ensuite déchargement le long de la plaque latérale (40, 40').

2. Machine d'emballage par pellicule extensible selon la revendication 1, dans laquelle des

moyens sont prévus pour déterminer le moment où l'article a atteint une position longitudinale prédéterminée le long de la courroie de transfert (34) et des moyens sont prévus pour actionner l'imprimante d'étiquette (37) lorsque l'article a buté contre la plaque latérale (40, 40') et atteint la position longitudinale prédéterminée.

3. Machine d'emballage par pellicule extensible selon la revendication 2, caractérisée en ce que le moyen de détermination de position comprend un moyen photosensible (57, 57').

4. Machine d'emballage par pellicule extensible selon la revendication 1, dans laquelle des moyens sont prévus pour actionner l'imprimante d'étiquette lorsque l'article a atteint une position longitudinale prédéterminée établie par le moyen de placement (35) et a buté contre la plaque latérale (40, 40').

5. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 1 à 4, dans laquelle la plaque latérale de réglage de position (40, 40') a une section en forme de L, avec une surface disposée verticalement au-dessus de la courroie de transfert (34), et l'autre surface fixée au châssis (10) de la machine parallèlement au sens de transport de la courroie de transfert (34), la plaque coulissante (36) étant disposée en coulissement au-dessous de la surface verticale de la plaque latérale.

6. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 1 à 5, dans laquelle deux plaques latérales (40, 40') sont disposées en parallèle dans une relation d'espacement spécifiée aux côtés respectifs de la courroie de transfert (34), la plaque coulissante (36) étant agencée en coulissement par rapport aux deux plaques latérales.

7. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications précédentes, dans laquelle le poste de chauffage comprend un élément chauffant (43, 44) prévu au-dessous de la courroie de transfert.

8. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications précédentes, comprenant; une tête (2) d'élévateur disposée à l'extrémité de sortie d'un convoyeur de poussée (1) d'une manière telle qu'elle peut être déplacée vers le haut et vers le bas; un moyen (9, 9') pour maintenir une pellicule extensible (b₁) découpée à une longueur désirée au-dessus de la tête (2) de l'élévateur; une ouverture (6) à laquelle au moins une paire de plaques de pliage (3, 4) prévues au-dessus de la pellicule extensible (b₁) peut fonctionner pour plier la pellicule extensible (b₁) au-dessous de l'article sur la tête (2) de l'élévateur lorsque cette tête (2) se trouve à sa position supérieure; un passage de déchargement (12) pour décharger l'article de la machine après son emballage; une courroie de transport (7) disposée entre un côté de décharge du convoyeur de poussée (1) et la position inférieure de la tête (2) de l'élévateur; et une plaque (8) de réglage de position prévue au côté de décharge de la courroie de transport (7).

9. Machine d'emballage par pellicule extensible

selon la revendication 8, dans laquelle des moyens sont prévus pour actionner la courroie de transport (7) à une vitesse de transport supérieure à celle du convoyeur de poussée (1).

10. Machine d'emballage par pellicule extensible selon la revendication 8 ou la revendication 9, dans laquelle la courroie de transport (7) est disposée de manière à se déplacer vers le haut et vers le bas en coopération avec le mouvement ascendant ou descendant de la tête (2) de l'élévateur, la courroie de transport (7) est placée à une position où elle est légèrement en saillie au-dessus du convoyeur de poussée (1) pour permettre l'acheminement lorsqu'elle est placée à la position limite inférieure, et la courroie de transport (7) est disposée de manière à se déplacer dans le sens descendant lorsque la tête (2) de l'élévateur subit un mouvement ascendant jusqu'à une position située au-dessous du convoyeur de poussée (1) où le transport n'est pas valide.

11. Machine d'emballage par pellicule extensible selon la revendication 8 ou la revendication 9, dans laquelle la courroie de transport (7) est fixée à une position spécifiée, une butée (70) est agencée de manière à entrer dans la courroie de transport (7) et à en sortir en coopération avec le mouvement ascendant ou descendant de la tête (2) de l'élévateur, la butée (70) est en saillie hors de la courroie de transport (7) lorsque la tête (2) de l'élévateur est placée à sa position limite supérieure pour limiter le transport de l'article, et la butée (70) est déplacée vers le bas lorsque la tête (2) de l'élévateur est animée d'un mouvement descendant pour permettre le transport de l'article.

12. Machine d'emballage par pellicule extensible selon la revendication 8 ou la revendication 9, dans laquelle la vitesse de transport de la courroie de transport (7) est établie à une vitesse à laquelle un article de petite largeur atteint la plaque (8) de réglage de position alors que la tête (2) de l'élévateur se trouve à sa position limite inférieure.

13. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 12, dans laquelle la courroie de transport (7) et le convoyeur de poussée (1) sont disposés avec leurs parties se chevauchant.

14. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 13, dans laquelle la plaque (8) de réglage de position est fixe.

15. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 13, dans laquelle la plaque (8) de réglage de position est montée pour oscillation autour d'un arbre de support disposé à son extrémité supérieure, et un poids est fixé à l'extrémité inférieure de la plaque de réglage de position.

16. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 15, dans laquelle des rails de guidage latéral (28) sont disposés aux côtés respectifs de l'ouverture (6), une paire de premiers éléments coulissants



(29, 29') et une paire de seconds éléments coulissants (30, 30') sont disposés en coulissement sur les rails respectifs de guidage latéral (28), une plaque (4) de pliage avant est agencée entre la paire de premiers éléments coulissants (29, 29'), l'un (29) des premiers éléments coulissants et un premier arbre d'entraînement (31) étant liés l'un à l'autre via un premier mécanisme à manivelle (33) pour mouvement de va-et-vient de la plaque (4) a pliage avant dans la direction de l'ouverture (6), le moyen de placement comprenant un poussoir de déchargement (35) disposé entre la paire de seconds éléments coulissants (30, 30'), l'un (30) des seconds éléments coulissants et un second arbre d'entraînement (32) étant liés l'un à l'autre via un second mécanisme à manivelle (33') pour mouvement de va-et-vient du poussoir de déchargement (35) vers le passage de déchargement (12), les premier et second mécanismes à manivelle (33, 33') ayant la même construction, et les premier et second arbres d'entraînement (31, 32) étant disposés symétriquement avec des distances égales par rapport à l'axe de l'ouverture (6).

17. Machine d'emballage par pellicule extensible selon la revendication 16, dans laquelle le poussoir de déchargement (35) et le passage de déchargement (12) sont disposés aux côtés opposés de l'ouverture (6), le point d'introduction

d'article (11) et le passage de déchargement (12) sont agencés au même côté de la machine, la courroie de transport (7) est fixée à une position qui est au ras du convoyeur de poussée (1), et des moyens sont prévus pour arrêter le mouvement d'acheminement de la courroie de transport (7).

18. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 16, dans laquelle le passage de déchargement (12) et le convoyeur de poussée (1) sont disposés aux côtés opposés de la machine.

19. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 18, dans laquelle l'imprimante d'étiquette (37) pour utilisation dans l'application d'une étiquette à l'article est disposée au-dessus de la courroie de transfert (34), et une partie de pesée (14) pour peser l'article est disposée au côté de départ du convoyeur de poussée (1).

20. Machine d'emballage par pellicule extensible selon l'une quelconque des revendications 8 à 15, dans laquelle des plaques de pliage avant et latéral (3, 3', 4) sont prévues pour plier la pellicule extensible au-dessous de l'article (1).

21. Machine d'emballage par pellicule extensible selon la revendication 20, dans laquelle des sources individuelles d'entraînement sont prévues respectivement pour la plaque de pliage avant (4) et les plaques de pliage latéral (3, 3').

