Jan. 30, 1973 H. DINTER 3,713,949

METHOD OF AND MACHINE FOR APPLYING ADHESIVE LABELS TO PACKAGES

Filed May 13, 1970 3 Sheets-Sheet 1

FIG. 1.

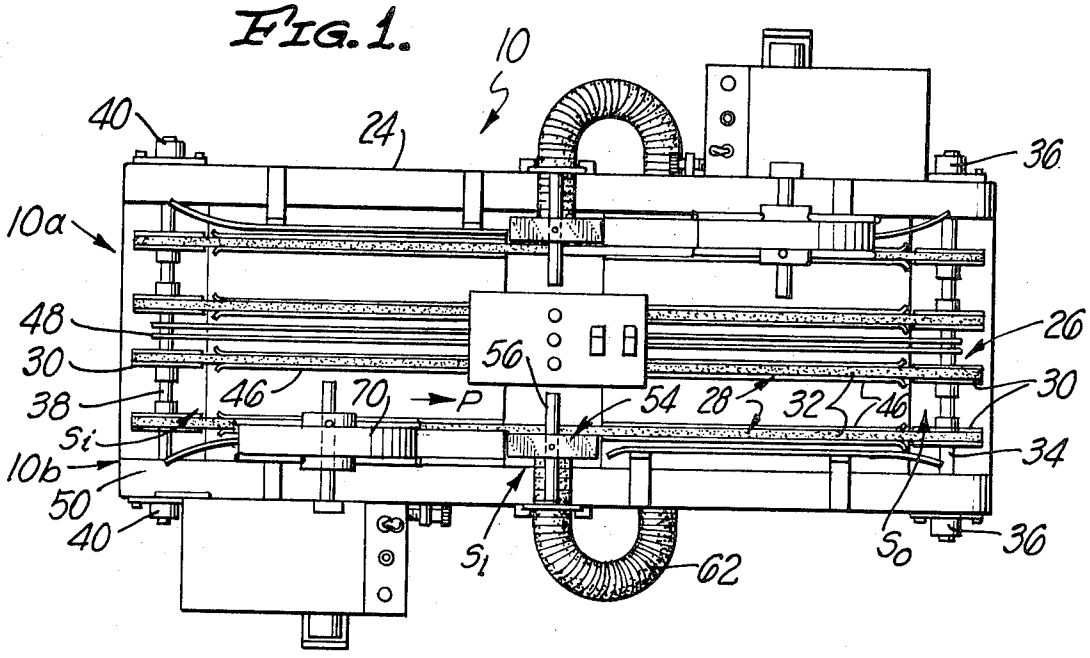


FIG. 2.

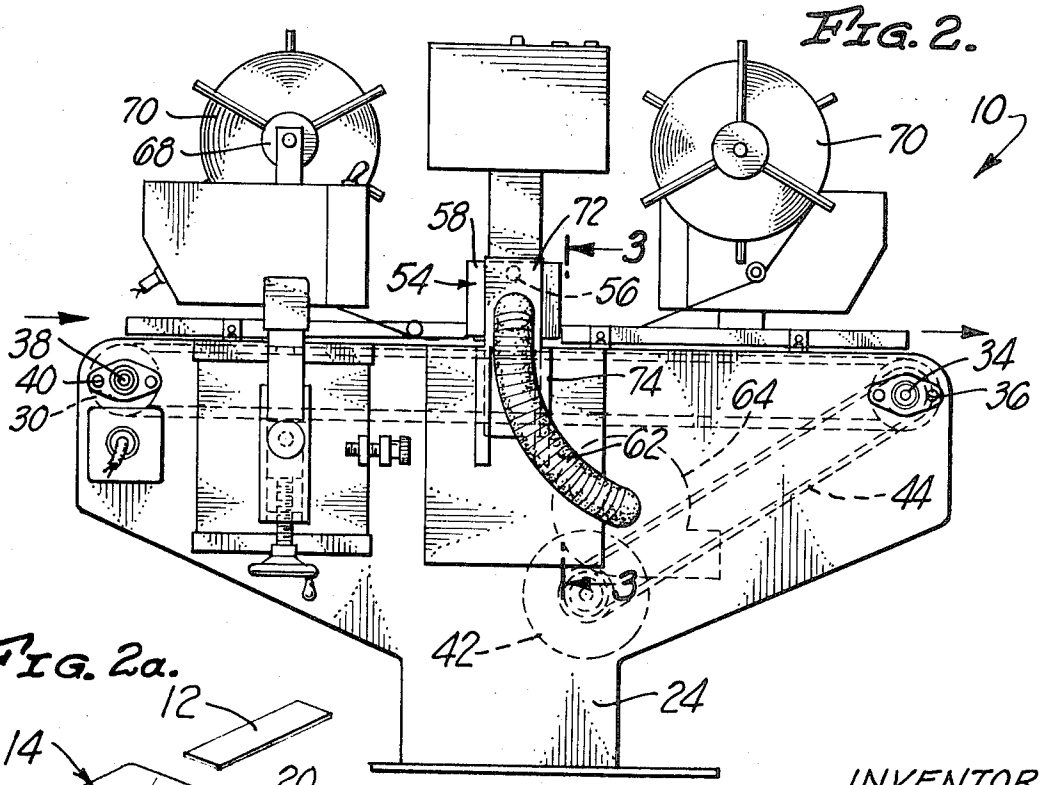
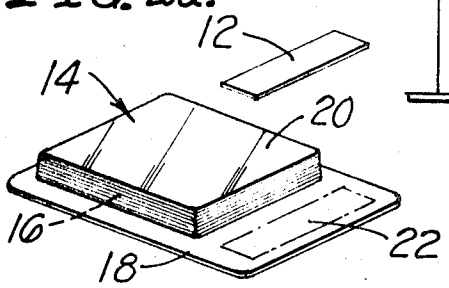


FIG. 2a.



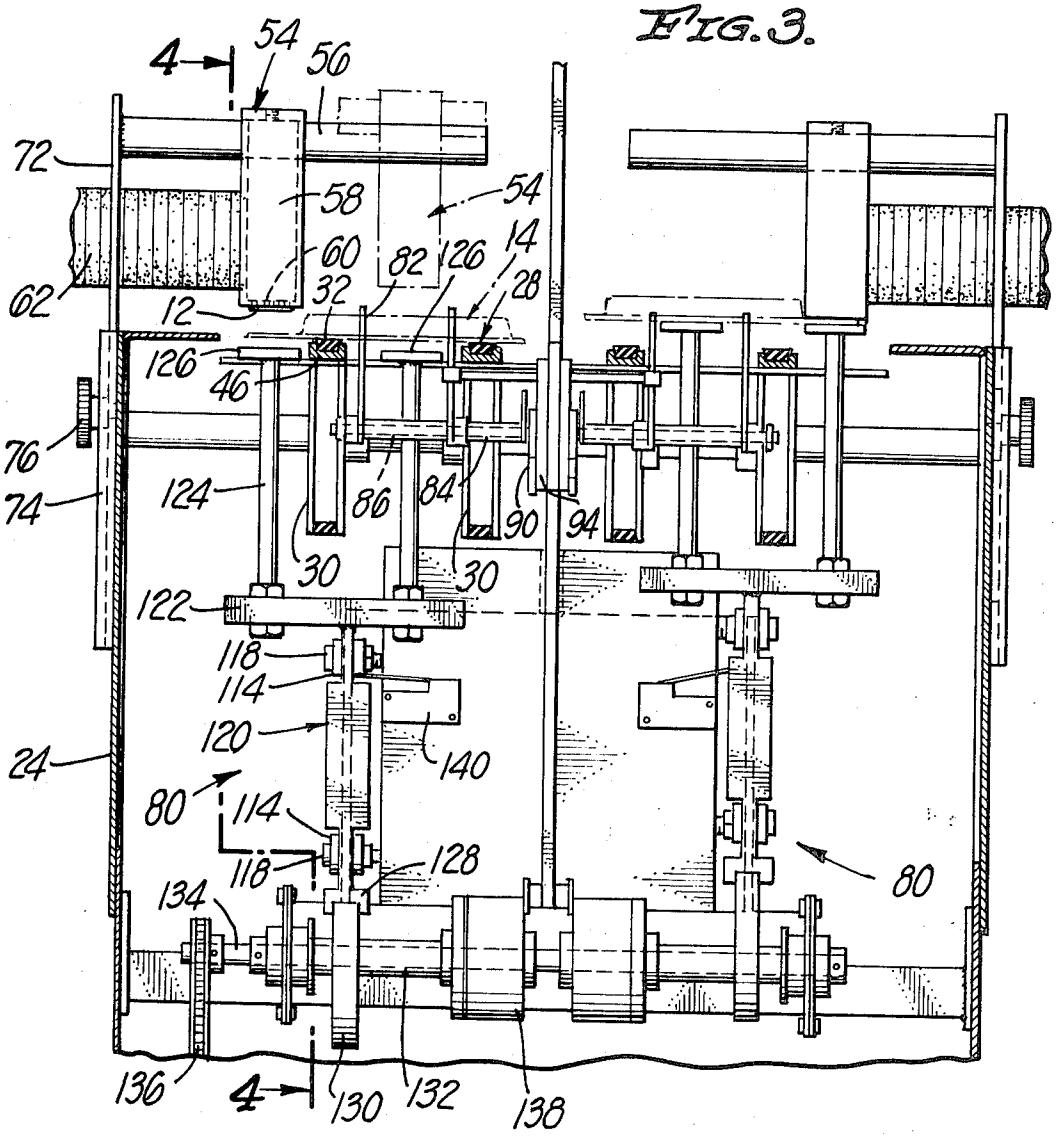
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METHOD OF AND MACHINE FOR APPLYING ADHESIVE LABELS TO PACKAGES

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FIG. 3.



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FIG. 4.

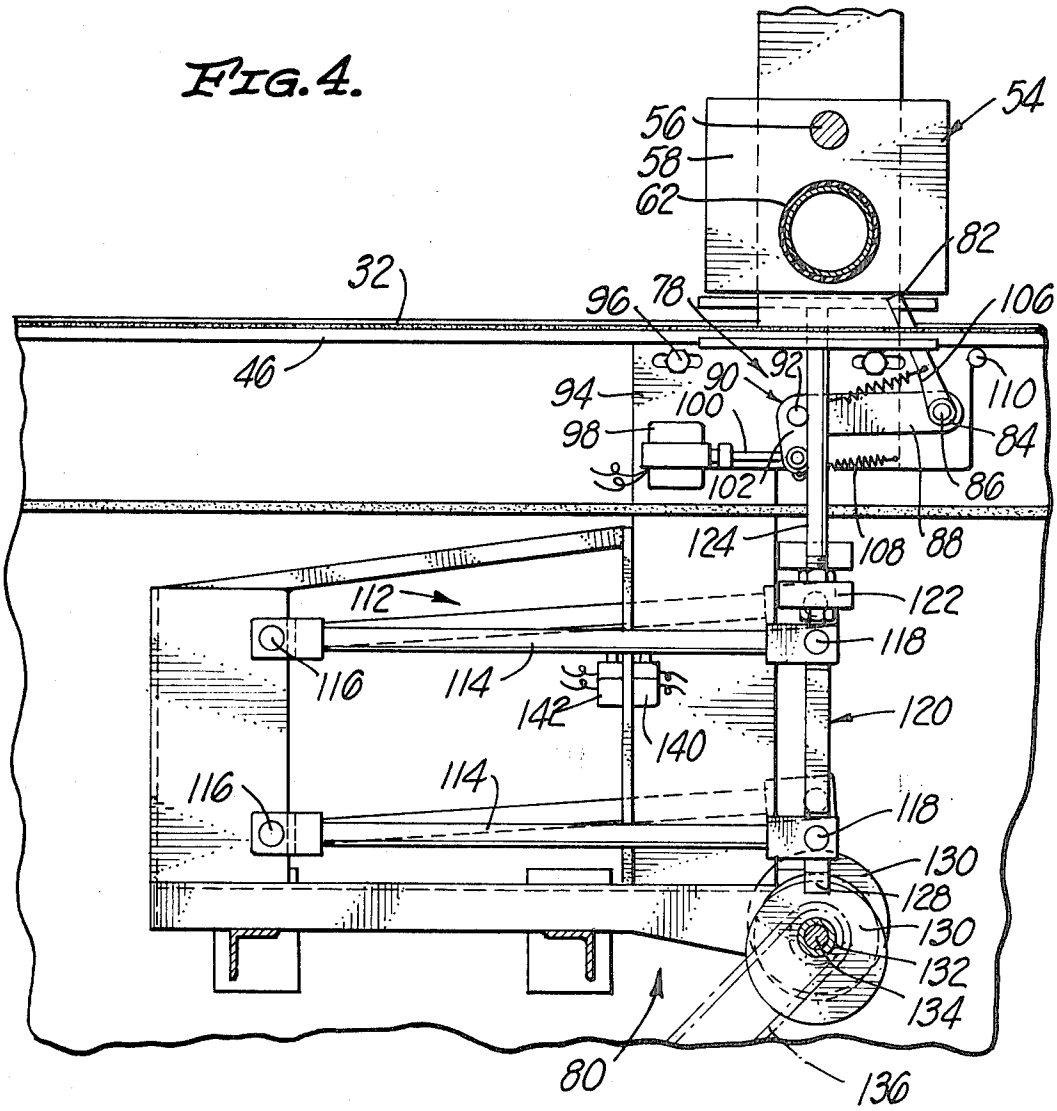
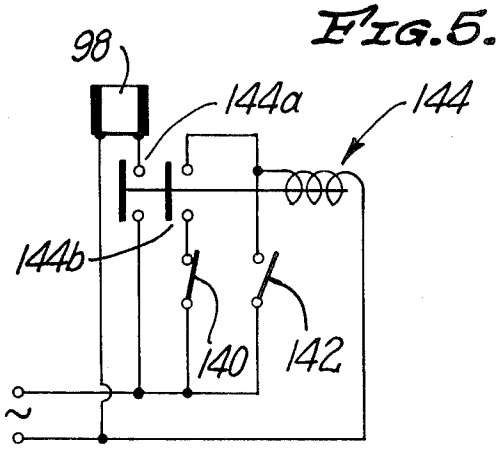


FIG. 5.



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METHOD OF AND MACHINE FOR APPLYING ADHESIVE LABELS TO PACKAGES

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Int. Cl. B32b 31/20; B65c 9/40
U.S. Cl. 156—363 7 Claims

ABSTRACT OF THE DISCLOSURE

A method of and a machine for applying adhesive labels to packages by transporting the packages in succession on a conveyor along a prescribed path to labeling position at a labeling station along the path, supporting a label over each package in labeling position with the adhesive side of the label exposed and facing the package, elevating each package in labeling position from the conveyor into bonding contact with the adhesive side of the label to adhere the label to the package, and finally lowering the labeled package back to the conveyor for outfeed movement from the machine. A primary feature of the machine resides in adjustability to accommodate packages of different size and to apply labels to different surfaces of a package.

BACKGROUND OF THE INVENTION

Field of the invention.—This invention relates generally to the art of labeling packages, particularly prewrapped and weighed packages of a sliced food product such as meat. The invention relates more particularly to a novel labeling method and machine for applying adhesive labels to packages.

Prior art.—As will appear from the ensuing description, the present labeling method and machine may be utilized to apply various types of adhesive labels to various types of packages. However, the invention is concerned primarily with and will be disclosed in relation to the application of adhesive labels to prewrapped and weighed packages containing a sliced food product, such as meat.

Sliced luncheon meats and other sliced food products are often marketed in a package consisting of a cardboard backing member and a transparent plastic cover sheet which is sealed to the backing member. In many cases, one end of the backing member extends a distance beyond the packaged slices to provide a wide marginal portion or lip. After each package has been sealed, it is labeled by applying a label to either or both the projecting backing lip and the transparent cover sheet over the packaged slices. The label contains selected identifying information, such as a description of the packaged product and its weight and the name of the packer or the market in which the package is to be sold.

SUMMARY OF THE INVENTION

The present invention provides a labeling method and machine for applying adhesive labels to packages of the character described. The labeling method and machine involve transporting the packages to be labeled in succession on a conveyor along a prescribed path from an infeed station to labeling position at a labeling station, supporting an adhesive label over each package in labeling position with the adhesive side of the label exposed and facing the package, elevating each package in labeling position from the conveyor into bonding contact with the adhesive side of the label to adhere the label to the package, and finally lowering the labeled package to the conveyor for outfeed movement from the labeling station to an outfeed station.

A novel feature of the labeling machine resides in its adjustability to accommodate packages of different size and to effect placement of the label on different selected surfaces of the package. The disclosed labeling machine, for example, is designed for applying adhesive labels to packages of the kind described earlier containing a sliced food product, such as meat. This disclosed machine is adjustable to accommodate packages containing different numbers of slices and hence having different effective thickness dimensions. The machine is also adjustable to permit application of an adhesive label to either the extending lip portion of the package backing member or to the transparent cover sheet over the mound of packaged slices.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a present labeling machine;
FIG. 2 is a side elevation of the machine;
FIG. 2*a* is a perspective view of a package and label;
FIG. 3 is an enlarged section taken on line 3—3 in FIG. 2;
FIG. 4 is a section taken on line 4—4 in FIG. 3; and
FIG. 5 is a diagram of an electrical circuit embodied in the machine.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The drawings illustrate a labeling machine **10** according to the invention for applying adhesive labels **12** to packages **14**. Each illustrated package contains a packaged commodity **16** which, in this instance, is assumed to be a sliced food product, such as meat. The package has a cardboard backing member **18** on which the packaged slices are placed, and a transparent cover sheet **20** which is sealed tot he backing member and overlies the packaged slices. One end of the backing member **18** extends beyond the packaged slices **16** to form a projecting marginal portion or lip **22**. As will appear presently, the labeling machine **10** is adjustable to permit application of a label **12** to either the backing lip **22** or to the transparent cover sheet **20** over the packaged slices **16**.

The labeling machine **10** has two essentially identical machines **10***a*, **10***b* arranged side by side on a common frame **24**. Each labeling machine has its infeed end at the left end of the frame in FIG. 1 and its outfeed end at the right end of the frame. Since the labeling machines **10***a*, **10***b* are essentially identical, a description of one will suffice for both. Machine **10***b* will be described.

Labeling machine **10***b* has a conveyor **26** including a pair of endless conveyor belts **28** trained about pulleys **30** at opposite ends of the machine frame **24**. The two conveyor belts are arranged side by side with an intervening spacing and have upper runs **32** exposed above the machine frame. The pulleys **30** at the right end of the machine are fixed on a shaft **34** rotatably supported at its ends in bearings **36** mounted on the machine frame **24**. The pulleys at the left end of the machine are fixed on a shaft **38** rotatably supported in bearings **40** on the frame. The right hand shaft **34** is driven from a motor **42** through a belt drive **44** in a direction to drive the upper runs **32** of the conveyor belts **28** in the right hand direction of travel in FIG. **1**.

Conveyor belts **28** are spaced to support the packages **14** with the lengthwise direction of each package extending normal to the direction of belt travel and the backing lip **22** of each package adjacent the near side of the machine frame **24**, i.e., the lower side in FIG. 1. Conveyor belts **28** transport the packages **14** in succession along a prescribed path P from an infeed station S_i at the left end of the machine in FIG. 1, through a central labeling station S_l, to an outfeed station S_o at the right end of the machine. The upper conveyor belt runs **32** are guided and vertically supported by channels **46** mounted on the upper side of the machine frame **24**. These channels ef-

fectively carry the weight of the packages **14** and the conveyor belts **28**, which slide in the channels, merely serve to move or feed the packages along the path P.

Mounted on the frame **24** in the region from the infeed station S_i to the labeling station S_l are guide rails **48**, **50**. These guide rails are spaced to receive the packages **14** between the rails with just a slight clearance, such that packages are retained in proper position on the conveyor belts **28** as the packages travel from the infeed station to the labeling station. The outer guide rails **50** turns outwardly to facilitate entrance of the packages between the rails.

Labeling machine **10***b* also has a labeling mechanism **52**. This labeling mechanism includes a label support **54** slidably mounted on a rod **56** fixed on the machine frame **24**. Rod **56** is located above and extends crosswise of the path P of package movement. Accordingly, the label support **54** is positioned over and adjustable crosswise of the path P. Label support **54** comprises a hollow housing **58** closed on all sides except the bottom. The bottom side of the housing has an opening containing an apertured grid **60**. Label support housing **58** is connected, through a large duct **62**, to a suction pump or exhaust blower **64** for sucking air from the housing. This produces in the housing a partial vacuum which, as will appear presently, is utilized to hold labels against the lower label support grid **60**.

During operation of the labeling machine **10**, labels **12** are fed in succession to a position directly below the label support grid **60**, with the adhesive side of the label facing downwardly away from the grid and toward the path P of movement of the packages **14** through the machine. The partial vacuum or suction in the label support housing **58** causes the label to adhere to the grid until the label is applied to a package in the manner to be explained presently. The labels **12** are fed in succession, adhesive side down, to the label support grid **60** from a large drum **68** containing a roll **70** of labels in strip form. In this disclosure, it is assumed that the labels are removed from the roll **70** and placed on the label support grid **60** by hand. However, it will be understood that a label feed mechanism may be provided for performing this function automatically in response to the later described cyclic operation of the machine.

Conveyor **26** transports the packages **14** in succession from the infeed station S_i to a labeling position at the labeling station S_l and then from this position to the outfeed station S_o. When in labeling position, a selected surface portion of the package is located directly below the label support grid **60** on the label support **54**, as shown in FIG. 3. As will be explained presently, a label **12** on the grid **60** is applied to the package **14** in labeling position by elevating the package to press its selected surface portion against the adhesive under surface of the label, thereby causing the label to adhere to the package.

In this regard, it is significant to recall that an important feature of the labeling machine resides in its adjustability to accommodate placement of labels on different selected surfaces of a package. The particular labeling machine illustrated is adjustable to apply a label to either the transparent cover **20** of each package **14**, over its mound of packaged slices **16**, or to the projecting lip of the package backing member **18**. This adjustment involves adjustment of the label support **54** along its mounting rod **56** to position the label support grid **60** over the lip or transparent cover of the package **14** in labeling position at the labeling station S_l. The illustrated machine is adjusted to apply labels to the package backing lips **22**. However, the broken lines in FIG. 3 illustrate an alternative adjustment of the label support **54** wherein the support is positioned to apply labels to the transparent package covers.

In connection with this latter adjustment of the label support **54**, it will be observed that the surface of the transparent package cover **20** to which the label is applied is substantially higher than the upper label receiving surface of the package backing lip **22**. Accordingly, when adjusting the label support **54** between its full line backing lip labeling position and its broken line cover labeling position of FIG. 3, it is necessary also to adjust the height of the label support. To this end, the label support rod **56** is mounted on a vertical slide **72** movable in a vertical guide **74** on the machine frame **24**. The slide is fixed in adjusted position by a clamp screw **76**. This latter height adjustment of the label support **54** also permits the labeling machine to operate on packages of different effective thickness.

As noted earlier, the labeling machine operates to apply the labels **12** to the packages **14** by elevating each package in labeling position into contact with the adhesive underside of a label held by suction to the underside of the label support grid **60**. To this end, the machine is equipped with stop means **78** for arresting each package in labeling position, and elevator means **80** for elevating the package from the conveyor **26** into contact with the label and then lowering the labeled package to the conveyor for continued movement of the package to the outfeed station S_o.

The package stop means **78** comprises a pair of aligned stop arms **82** fixed to a sleeve **84** rotatable on a shaft **86**. One end of shaft **86** is rigidly joined to one arm **88** of a bell crank **90** pivotally supported at **92** on a mounting plate **94**. Mounting plate **94** is attached by bolt and slot connections **96** to the machine frame **24** for adjustment in the direction of the path P of movement of packages **14** through the machine. Also mounted on the plate **94** is a solenoid **98** whose plunger **100** is pivotally attached to the arm **102** of bell crank **90**. A spring **104** connected between the stop arms **82** and the bell crank arm **88** urges the stop arm to the position of FIG. 4, wherein the stop arm rests against a stop **106**. A spring **108** connected between the bell crank arm **102** and mounting plate **94** urges the bell crank **90** in the counterclockwise direction on its pivot **92** to the limiting position of the solenoid **98**, shown in FIG. 4. In this position, the stop arms **82** project above the upper runs **32** of the conveyor belts **30** for engagement by each package **14** arriving in labeling position.

During operation of the labeling machine, the leading edge of each package **14** arriving in labeling position on the conveyor **26** engages the stop arms **82** and rotates these arms clockwise in FIG. 4 on thier pivot shaft **86** to a position in which the arm nearest the mounting plate **94** engages an electrical contact **110**. As will appear presently, this engagement of the arm with the contact actuates the package elevator **80** for elevating the package into contact with the label currently held by suction on the label support grid **60**. It is significant to note in this regard that when the stop arms **82** are retracted by a package **14** against spring action to the limiting position of engagement of one arm with the contact **110**, the package is located in labeling position.

The package elevator **80** comprises a parallel linkage support **112** including a pair of support arms **114** pivoted at **116** on the machine frame **24**. The opposite ends of the arms are pivotally attached at **118** to a vertically movable carriage **120**. Rigid on the upper end of carriage **120** is a crosshead **122**. A pair of posts **124** are rigidly secured to and rise from the opposite ends of the crosshead. On the upper end of each post **124** is a resilient pressure pad **126**. As may be best observed in FIG. 3, one pressure pad **126** is located to underlie the lip **22** of a package **14** in labeling position. The other pressure pad is located to underlie the package backing member **18** approximately in line with the center of the packaged slices. The upper package engaging surfaces of the pads **126** are located substantially in a common plane.

On the lower end of carriage **120** is a cam follower **128** which rides on a cam **130** fixed to a sleeve **132**

rotatable on a shaft **134**. Shaft **134** is rotatably mounted on the machine frame **24** and is driven from the motor **42** through a sprocket chain **136**. At one end of sleeve **132** is a one revolution clutch **138** which may be selectively energized to connect the sleeve **132** to the shaft **134** for a single revolution with the shaft. Each revolution of the sleeve **132** rotates the cam **130** through a single revolution to move the carriage **120** from its lower limiting position to its upper limited position and back to its lower position. This movement of the carriage constitutes its labeling stroke and is effective to first elevate the carriage pads **126** into contact with a package **14** in labeling position, then elevate the package from the conveyor **26** into contact with the label currently held by suction on the label support **60** to adhere the label to the package, and finally return the labeled package to the conveyor.

Mounted on the machine frame **24** below the upper elevator carriage support arm **114** in FIG. 4 are a pair of switches **140, 142**. Switch **140** is a normally closed switch which is opened by the arm **114** upon arrival of the latter in its lower limiting position. In this lower position, the elevator carriage pads **126** are disposed a distance below the upper runs **32** of the conveyor belts **28**. Switch **142** is a normally open switch which closes upon elevation of the carriage **120** to a position wherein its pads **126** are disposed a distance above the upper runs of the conveyor belts.

Referring to FIG. 5, it will be seen that switches **140, 142** are connected in circuit with a relay **144** having normally open contacts **144*a*** in series with a solenoid **98**, such that energizing of the relay energizes the solenoid. Switches **140, 142** are arranged in a manner such that closure of the switch **142** during the upward stroke of the elevator carriage **120** energizes the relay, and hence the solenoid **98**. The relay is locked in its energized state to retain the solenoid energized through the normally closed switch **140** and a set of relay holding contacts **144*b***. Subsequent arrival of the carriage **120** in its lower position opens the switch **140** to deenergize the relay **144** and hence the solenoid **98**.

Energizing of the solenoid **98** in the manner just explained retracts the solenoid plunger **100** to rotate the bell crank clockwise in FIG. 4 on its pivot **92**. This rotation of the bell crank occurs against the action of the bell crank spring **108** and retracts the stop arms **82** below the level of the path P of the packages **14** through the machine. When the solenoid is deenergized, the spring **108** returns the bell crank to its position of FIG. 4, wherein the stop arms **82** project across the path P.

During operation of the labeling machine **10*b***, the unlabeled packages **14** are fed into the infeed station S_i of the labeling machine and are transported in succession on the conveyor **26** to the labeling station S_l. As each package enters the labeling station, its leading edge engages the stop arms **82** and rotates these arms clockwise in FIG. 4 to engage the contact **110**. This action activates the clutch **138** to effect one revolution of the cam **130** with the continuously rotating cam shaft **134**. The resulting single revolution of the cam imparts a single labeling stroke to the elevator carriage **120**. During the upward travel of the carriage, the package **14** currently in labeling position is elevated off the conveyor **26** into contact with the label **12** currently held by suction on the underside of the label support grid **60** to adhere the label to the package. As the elevator carriage departs its lower position, the relay holding switch **140** closes. Thereafter, as the carriage travels upwardly to elevate the package **14** in labeling position off the conveyor **26**, the relay switch **142** closes to energize the relay **144** and solenoid **98** which then are locked in energized condition through the holding switch **140** and the relay holding contacts **144*b***. Under these conditions, the package stop arms **82** are retracted below the conveyor **26**.

After the elevator carriage **120** reaches the upper end of its labeling stroke to affix the label **12** to the package **14** currently in labeling position, the carriage and labeled package commence their downward return travel. Shortly before the carriage reaches the lower end of its stroke, the package contacts the conveyor **26** and is then transported by the conveyor from the labeling station S_l over the currently retracted stop arms **82**, to the outfeed station S_o. Subsequent arrival of the carriage **120** at its lower position reopens the relay holding switch **140** to deenergize the relay **144** and hence solenoid **98**. The stop arms **82** are then returned by spring **108** to their extended position of FIG. 4 in readiness to arrest the next unlabeled package **14** arriving on the conveyor **26**. As noted earlier, the label support **54** is adjustable to apply a label to the cover **20** or lip **22** of each package. In the particular label support setting illustrated, labels are applied to the package lips.

It will be recalled that the illustrated labeling machine structure **10** has two labeling machines **10*a*, 10*b*** disposed side by side. The above description of labeling machine **10*b*** applies with equal force to labeling machine **10*a***.

What is claimed as new in support of Letters Patent is:

1. The method of applying an adhesive label to a package, comprising the steps of:

transporting said package on a conveyor along a prescribed path of movement into contact with a stop to arrest said package in an initial labeling position over a package elevating means located at a labeling station along said path to locate said package in an initial labeling position,

supporting a label over said package when in labeling position with the adhesive side of the label facing the package,

sensing engagement of said package with said stop,

actuting said elevating means in response to engagement of said package with said stop to elevate said package from said conveyor into contact with said label to affix the latter to said package and then return the package to said conveyor, and

retracting said stop from said path during return of said package to said conveyor to release said package for movement from said station by said conveyor and thereafter extending said stop into said path following departure of the package from the station.

2. A machine for applying adhesive labels to packages comprising:

a frame having infeed, labeling, and outfeed stations spaced along the frame,

a conveyor on said frame for transporting said packages in succession along a prescribed path from said infeed station, through said labeling station, to said outfeed station,

stop means on said frame at said labeling station for arresting each package to initial labeling position at said labeling station,

a label support on said frame at said labeling station for supporting a label over each package in labeling position with the adhesive side of the label facing the package,

elevator means on said frame at said labeling station for elevating each package arriving in labeling position from said conveyor into contact with the overlying label to affix the label to the package and then returning the labeled package to said conveyor,

means for sensing engagement of each package with said stop means and actuating said elevator means to raise the package from and then return the package to the conveyor in response to engagement of the package with said stop means, and

means for retracting said stop means from said path and extending said stop means into said path in timed relation to vertical movement of said elevator means in a manner such that said stop means is retracted during downward return movement of said elevator

means to its lower position to release each labeled package for movement from said labeling station on said conveyor and said stop means is extended to arrest the following package upon arrival of said elevator means at its lower position.

3. A labeling machine according to claim 2 wherein: said label support is adjustable to affix a label to different selected portions of each package.

4. A labeling machine according to claim 2 wherein: said label support is vertically adjustable to accommodate packages of different thickness.

5. A labeling machine according to claim 2 wherein: said label support is adjustable vertically and laterally of said path to apply labels to different selected portions of said packages and to accommodate packages of different thickness.

6. A machine for applying adhesive labels to packages, comprising:

a frame having infeed, labeling, and outfeed stations spaced along the frame,

a conveyor on said frame for transporting said packages in succession along a prescribed path from said infeed station, through said labeling station, to said outfeed station,

stop means on said frame for arresting each package in an initial labeling position at said labeling station, said stop means comprising stop arm means, means supporting said stop arm means for extension into and retraction from said path and for pivotal movement in the direction of said path when extended, said stop arm means when extended being disposed for rotation on its pivot axis from a normal position to a limiting position by a package entering said labeling station, and solenoid means for extending and retracting said stop arm means,

a label support on said frame for supporting a label over each package in labeling position with the adhesive side of the label facing the package,

elevator means on said frame for elevating each package arriving in labeling position from said conveyor into contact with the label on said label support to affix the label to the package and then returning the labeled package to said conveyor, said elevator means comprising an elevator carriage supported on said frame below said conveyor for vertical movement through a labeling stroke involving elevation of each package at said labeling station from said conveyor to said label support and following return of the package to said conveyor, and means for driving said carriage through said stroke,

means responsive to pivotal movement of said stop arm means from normal to limiting position for actuating said elevator carriage drive means for driving said carriage through one labeling stroke, and

means responsive to each labeling stroke of said elevator carriage for operating said solenoid means to retract said stop arm means during upward travel of said carriage and extend said stop arm means upon return of said carriage to its lower limiting position.

7. A labeling machine according to claim 6 wherein: said label support is a suction device which is adjustable to accommodate packages of different thickness and to apply labels to different selected portions of each package.

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U.S. Cl. X.R.

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