

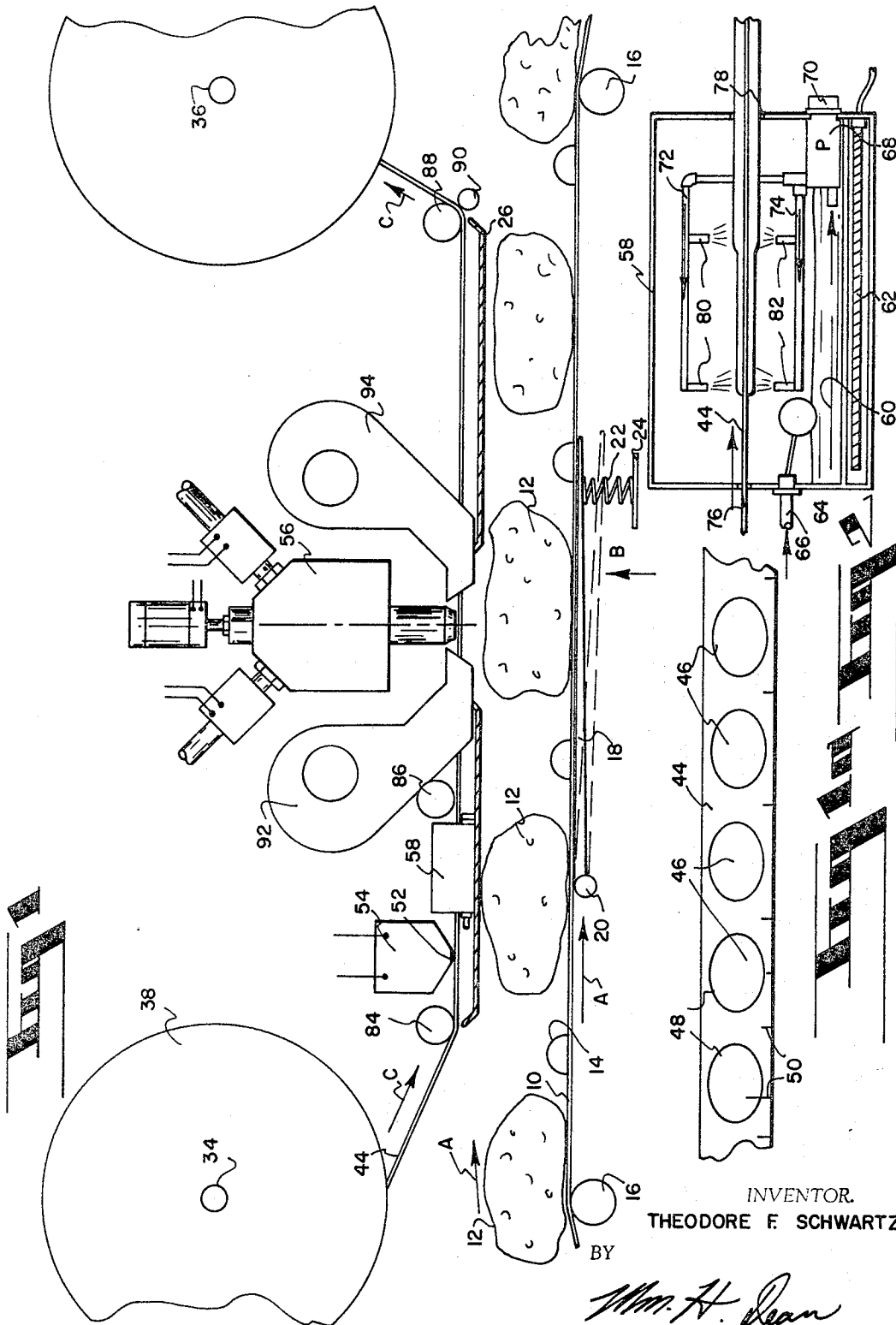
April 23, 1968

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MEANS AND METHOD FOR LABELING EDIBLE ITEMS SUCH AS  
POTATOES, OTHER VEGETABLES AND  
FRUITS OR THE LIKE

3,379,600

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2 Sheets-Sheet 1



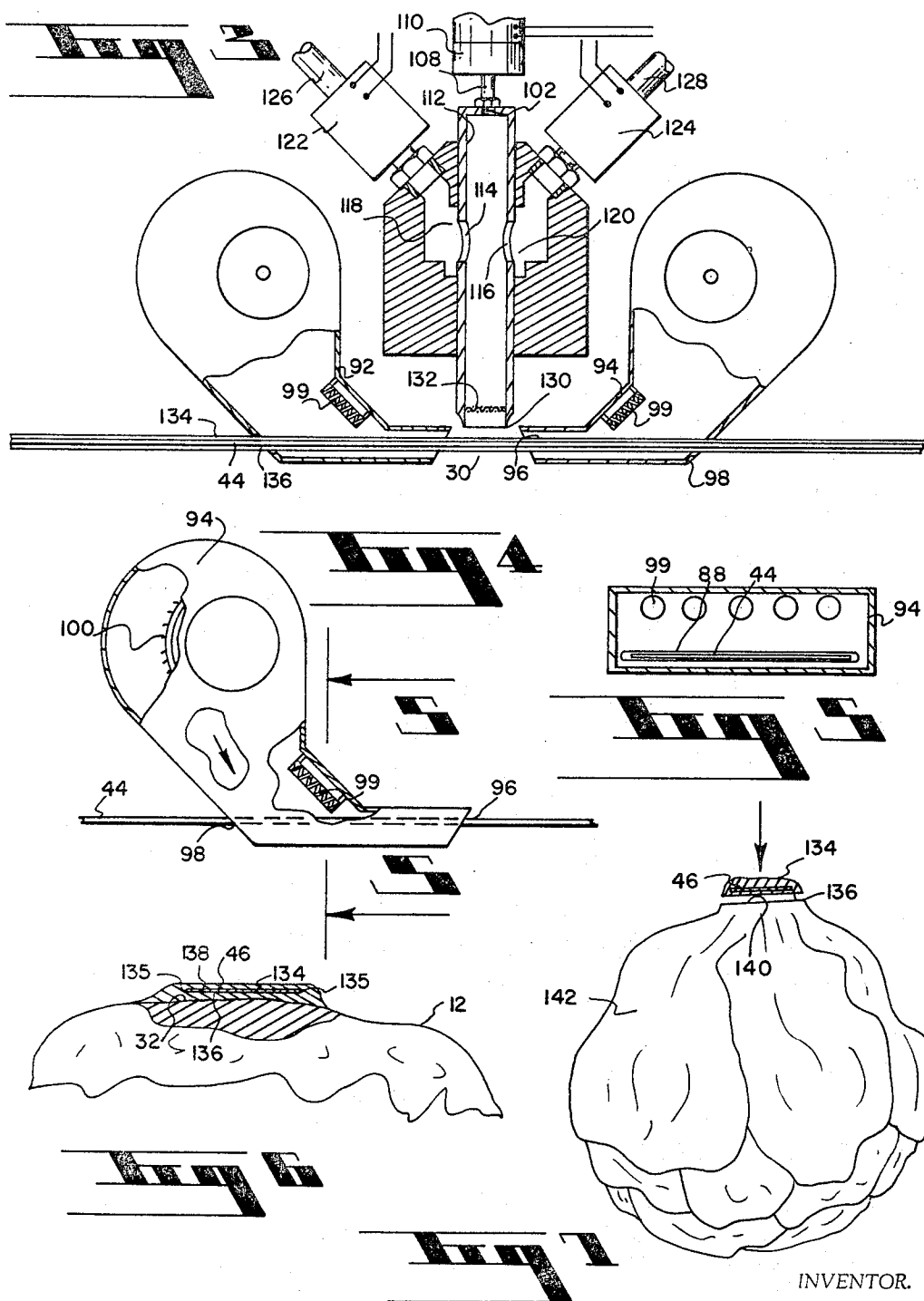
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2 Sheets-Sheet 2



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## MEANS AND METHOD FOR LABELING EDIBLE ITEMS SUCH AS POTATOES, OTHER VEGETABLES AND FRUITS OR THE LIKE

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### ABSTRACT OF THE DISCLOSURE

A means and method for labeling edible items such as potatoes, other vegetables and fruits or the like comprising means for shearing a label from a strip and pneumatically projecting the label together with hot wax onto said items as they are moved along a conveyor.

This invention relates to a means and method for labeling edible items such as potatoes, other vegetables and fruits or the like, and more particularly to a means and method for labeling such items, whereby a printed label may be adhered to a surface of such an item by means of a fusible wax which adheres a label to an item and which is particularly compatible with adhesion of such labels to potatoes or the like.

Heretofore, oranges and other edible items have been labelled by various means, including adhesive stickers and some of these items have been labelled by printing indicia thereon with food coloring or the like.

The adhesive labels, in some instances, are not particularly adaptable for use in labeling potatoes or other edible items and oftentimes the matter of printing on some of these items is difficult due to irregular surface areas, the porosity of the skin of the item and due to the irregular surface contours of such items, such as potatoes. Furthermore, it has been found undesirable from a commercial standpoint to print on potatoes and some other edible items due to the fact that the printing of trademarks or other indicia on such items does not present a quality appearance of a trademark or other indicia which would have a satisfactory commercial function.

Accordingly, it is an object of the present invention to provide a novel means and method for labeling items, such as potatoes, other vegetables and fruits, or the like, wherein a label having printed indicia thereon is secured to such items by fusible wax whereby a quality label may be secured to a great variety of item surfaces having various contours, skin character and surface porosity.

Another object of the invention is to provide a novel means and method for labeling edible items which promotes high quality labeling of such items.

Another object of the invention is to provide a means and method for labeling edible items which employs apparent label adhered to such items by a fusible wax which is also of an edible or non toxic nature.

Another object of the invention is to provide a means and method for labeling edible items wherein a label of flexible character and having indicia printed thereon is pneumatically projected onto the surface of such edible items by pneumatic propulsion with partially fused wax carried by the label and which adheres between the label and the item when the label is pneumatically projected onto the item thereby providing a method of application which causes the label with the partially fused wax to intimately adapt and conform with irregular contours of such items, as potatoes, and whereby such application of the labels does not damage or bruise the surfaces of the edible items in any way.

Another object of the invention is to provide a novel method of labeling edible items wherein a strip of printed

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labels is passed adjacent to a conveyor carrying edible items to be labelled and whereby a shearing and applying device shears labels from the strip and applies them directly to the items on the conveyor thereby providing a very high production labeling device which may be used in the high volume labeling of potatoes or the like.

A further object of the invention is to provide a novel method for applying labels to edible items wherein a fusible wax is used in the application of a label to the surface of an edible item in such a manner that the wax is impinged or impressed between a flexible label and the surface of an edible item whereupon hardening of the wax takes place very rapidly to attain a secure condition of the label in connection with the item.

Another object of the invention is to provide a method for labeling edible items wherein the cut off stem end of a head of lettuce or the like, may be sealed by a partially fused wax layer between the item and the label secured thereto.

Further objects and advantages of the invention may be apparent from the following specification, appended claims and accompanying drawings, in which:

FIG. 1 is a diagrammatic elevational view of a means for use in connection with the method of the present invention for applying labels to edible items by means of fusible wax;

FIG. 1a is a side elevational view of a label indicia strip used in accordance with the present invention;

FIG. 2 is an enlarged sectional view of a molten wax applicator mechanism used to apply wax to surfaces of a flexible strip on which labels are printed;

FIG. 3 is an enlarged fragmentary sectional view of a label applying device of the invention, as shown in FIG. 1, and illustrating hot air valve means and vacuum means with relation to a shearing die and holding grid and also with relation to wax heater means used to heat wax on opposite sides of the label strip used in accordance with the method of the present invention;

FIG. 4 is a side elevational view of one of the label strip heater blower casings of the invention;

FIG. 5 is an enlarged fragmentary sectional view taken from the line 5—5 of FIG. 4;

FIG. 6 is an enlarged fragmentary elevational view of a potato showing a label adhered thereon by wax in accordance with the present invention and illustrating the label and the wax together with a portion of the potato in section; and

FIG. 7 is a side elevational view of a head of lettuce and showing the application of a label to the cut off stem end of the head of lettuce, said application being by means of the method of the invention wherein the label is used and secured to the cut off stem end of the head of lettuce by fusible wax which holds the label on the head of lettuce and also seals the cut off stem end of the head of lettuce and prevents bleeding thereof.

The means utilized in connection with the method of the present invention is shown diagrammatically in FIG. 1, wherein a conveyor 10 carries potatoes 12 in a direction of an arrow A. It will be understood that the conveyor 10 may be a conventional flexible belt type conveyor and may be provided with upwardly projecting cleats 14 or other conventional structure adapted to move the potatoes 12 in the direction of the arrow A.

It will be understood that the potatoes 12 are edible items and equivalent to other vegetables and fruits or the like which also may be labelled by means of the present machine and method according to the present invention.

The conveyor 10 may be supported on conventional rollers 16 while a pressure plate 18 disposed below the conveyor belt 10 is pivoted on a horizontal shaft 20 and a spring 22 supported stationarily on a frame element 24 urges the plate 18 upwardly in a direction of an arrow B

tending to hold the conveyor belt 10 upwardly to dispose one of the potatoes or other items designated 12, in a position to be labelled, as will be hereinafter described in detail.

Disposed in spaced relation with the conveyor 10 and in substantially parallel relation thereabove is a spacer plate 26 having a lower surface 28 against which potatoes or other items 12 may be forced to bear by upward pressure of the plate 18 when urged upwardly by a spring 22. The plate 26 is provided with an aperture 30 through which labels may be projected onto a surface portion 32 of a potato or other item 12, as will be hereinafter described in detail.

Disposed above the conveyor 10 are shafts 34 and 36 on which reels 38 and 40, respectively, are rotatably mounted. These reels may be power driven in a manner similar to movie projector film reels or other conventional mechanism, whereby a label tape 44 may be transferred from the reel 38 to the reel 40 in a direction of arrow C, in FIG. 1 of the drawings. The tape 44 is a thin flexible tape having spaced printed label indicia portions 46 thereon. These label indicia portions 46 may each be surrounded by a partially perforated portion 48 adapted to facilitate the shearing of these label indicia portions 46 from the tape 44, as will be hereinafter described in detail. The tape 44 is preferably of thin flexible material, such as paper or the like, and is provided with printed index portions 50 adapted to be sensed at 52 by a photocell 54 to control the disposition of the label indicia portions 46 in alignment with an axis 56 of the label applying device of the invention, as will be hereinafter described in detail. Thus, it will be seen that the photocell 54 may be used in a conventional manner to control intermittent movement of the reels 38 and 40 to move the tape 44 and stop it in alignment with the axis 56 at one of the label indicia portions 46 to be disposed thereunder.

The tape 44 passing from the reel 38 to the axis 56 moves through a box-like wax applicator 58, shown in detail in FIG. 2 of the drawings. This applicator 58 is provided with a sump 60 wherein molten wax is maintained by a thermostatically controlled heating element 62 beneath the sump. A float valve 64 controls molten wax from a source through an inlet conduit 66 while a pump 68 is driven by an electric motor 70 and delivers molten wax under pressure to manifolds 72 and 74 disposed above and below the strip 44 which enters through an inlet slot 76 and passes outwardly through an exit slot 78 in the housing of the wax applicator 58. The manifolds 72 and 74 are provided with spray nozzles 80 and 82, respectively, directed toward the upper and lower surfaces of the strip 44 to thereby coat the strip on both its upper and lower sides with wax.

Operation of the pump 68 may be controlled in connection with the photocell 54 for intermittently applying the wax so that there is not an undue buildup of wax on the tape during the instant when the tape is stopped, however, when the tape 44 is operated at high speed, the pump 68 may be driven at a proper speed so that the wax may be applied continuously, as desired.

The tape is guided with respect to the photocell 54 by rollers 84 and 86 and the tape entering the reel 40 is guided between rollers 88 and 90.

Heater and blower housings 92 and 94 are provided with entrance and exit slots 96 and 98, as shown in FIG. 4 of the drawings, to permit the tape 44 to pass there-through. Disposed in these housings 92 and 94 are heating elements 99 and blower wheels 100 disposed to deliver air in a direction toward the tape 44, the heating elements 99 being energized to heat the air so that the air delivered around the tape 44 between the blower housings 92 and 94 will be heated to partially fuse the wax on the upper and lower surfaces of the tape around the label indicia portions 46 when each label indicia portion 46 is disposed

in alignment with the axis 56, all as will be hereinafter described in detail.

As shown in FIG. 3, a label applying device of the invention comprises a hollow tubular shearing die element 102 vertically slidably mounted in a bore 104 of a stationary member 106. The hollow tubular shearing die element 102 is carried by a plunger 108 of a solenoid 110 electrically operable in circuit with the photocell 54. The plunger 108 has stops and is operated electromagnetically in one direction and by conventional spring return in the other direction.

The hollow tubular shearing die element 102 is provided with an internal bore 112 with which side wall ports 114 and 116 communicate. These ports 114 and 116 communicate with passages 118 and 120, respectively, which are adapted to conduct fluid vacuum and hot air, respectively. These passages 118 and 120 communicate with solenoid valves 122 and 124 electrically operable in circuit with the photoelectric cell 54. The valve 122 is provided with a conduit 126 communicating with a source of fluid vacuum while the valve 124 is provided with an inlet conduit 128 communicating with a source of hot pressure fluid.

The hollow tubular shearing die element 102 is provided with a sharp downwardly directed peripheral edge portion 130 of substantially identical shape to the label indicia portions 46 of the strip 44. Internally of the bore 112 above the shearing edge 130 is a foraminous grid 132.

It will be seen that the strip 44, as shown in FIG. 3 of the drawings, is provided with an upper surface wax coating 134 and a lower surface wax coating 136 after it has been passed through the coating device 58.

In operation, potatoes or other items 12 disposed below the opening 30, hereinbefore described, receive a label indicia portion 46 from the tape 44 in the following manner: The tape indexed by the photocell 54 in a conventional manner disposes one of the label indicia portions 46 in alignment with the axis 56 and the solenoid 110 is actuated concurrently with the operation of the valve 122 so that while vacuum is created in the bore 112, the tape 44 is drawn upwardly toward the cutting edge 130 while at the same time, the plunger 108 of the solenoid 110 forces the hollow tubular cutting die 102 downwardly accelerating the cutting edge 130 to meet the upwardly moving tape 44. Consequently, the cutting edge 130 cuts out one of the label indicia portions 46 which is drawn by a vacuum upwardly into engagement with the grid 132.

During the time that the tape passes into the proximity of the axis 56, the blowers 92 and 94 are operated to force air over the heating elements 99 in the housings of these blowers so that the wax coatings 134 and 136 on the upper and lower surfaces of the tape 44 are heated to a partially fused condition. Thus, when the label indicia portion 46 is drawn to the grid 132, the valve 122 is closed and the valve 124 is opened admitting hot air under pressure to force the label indicia portion from the grid 132 and downwardly upon the upper surface of the potato or other item, as shown in FIG. 1 of the drawings. Thus, the upper surface 32 of the item 12 receives the label with the hot wax in partially fused condition whereby the hot air under pressure received through the valve 124 pneumatically propels the label with its hot wax surface onto the upper surface 32 of the potato or other item and thereby causes the label to conform with the uneven surface of the potato and causes the hot wax to adhere between the label and the potato or other item. The wax coating 134 on top of the label indicia portion 46 spreads out over the surrounding edges of the label indicia portion 46, as shown in FIG. 6 of the drawings, whereby a surrounding edge portion 134 of the label indicia portion is surrounded by the wax as it is blown downwardly and fused onto the upper surface of the potato or other item by the hot air delivered through the valve 124 and the bore 112 of the hollow tubular element 102.

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It will be seen from FIG. 6 of the drawings that the outer edges 134 of the label indicia portion 46 may be completely covered and secured to the potato or other item 12 since the fused condition of the wax layer 134 projected by hot air issuing through the valve 124 causes the wax to flow around the outer edge portions 134 when projected or propelled at high speed by pneumatic force from the grid 132. The high velocity impingement of the hot flexible assembly of wax layers 134 and 136 and the thin label indicia portion 46 causes the overall assembly to very intimately conform with the regular surfaces of a porous surface potato and to adhere very tenaciously and to form a very smooth surface label, the printed indicia of which may be read from the outer surface 138 of the label indicia portion 46 through the thin layer of wax 134.

With reference to FIG. 7 of the drawings, it will be seen that the same label indicia portion, as illustrated in FIG. 6, may be applied to the cut off stem end 140 of a head of lettuce 142. The stem end 140 oftentimes bleeds and reduces the vital moisture content of the lettuce. The wax layers 134 and 136, according to the present invention, are utilized to seal the cut off stem end 140 of the head of lettuce 142 and also to hold the label indicia portion 46 thereon in a similar manner, as herein described in connection with the labeling of a potato or other item, shown in FIG. 6 of the drawings.

It will be obvious to those skilled in the art that various modifications of the present invention may be resorted to in a manner limited only by a just interpretation of the following claims.

I claim:

1. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to be in spaced relation to items on said conveyor and to project heated wax coated labels through the air and toward said conveyor and into impinging relation with an item carried on said conveyor.

2. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to be in spaced relation to items on said conveyor and to project heated wax coated labels through the air and toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item.

3. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to be in spaced relation to items on said conveyor and to project heated wax coated labels through the air and toward said conveyor and into impinging relation with an

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item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of heated pressure fluid communicating with said last mentioned means, whereby said wax coated labels are projected pneumatically by said fluid toward and onto said item.

4. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element; and a foraminous grid internally of and adjacent said open end forming said holder.

5. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element and a foraminous grid internally of and adjacent said end forming said holder.

6. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element and a foraminous grid internally of and adjacent said end forming said holder; a sharp peripheral cutting edge of said tubular element at said open end adapted to shear labels from a tape adjacent thereto when vacuum in said tubular element draws said tape against said foraminous grid.

7. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element and a foraminous grid internally of and adjacent said end forming said holder; a sharp peripheral cutting edge of said tubular element at said open end adapted to shear labels from a tape adjacent thereto when vacuum in said tubular element draws said tape against said foraminous grid; a pair of valves communicating with the interior of said tubular elements; said valves disposed to communicate hot pressure and vacuum sources of pneumatic fluid relative to the interior of said tubular element.

8. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element and a foraminous grid internally of and adjacent said end forming said holder; a sharp peripheral cutting edge of said tubular element at said open end adapted to shear labels from a tape adjacent thereto when vacuum in said tubular element draws said tape against said foraminous grid; a pair of valves communicating with the interior of said tubular elements; said valves disposed to communicate hot pressure and vacuum sources of pneumatic fluid relative to the interior of said tubular element; and sources of hot pressure pneumatic fluid and pneumatic fluid under partial vacuum communicating with said valves.

9. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said

conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; said propulsion means comprising a label holder; and means disposed to direct pneumatic pressure against a label, held by said holder, and toward said item to propel said label thereagainst whereby said partially fused wax coating adheres said label to said item; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element and a foraminous grid internally of and adjacent said end forming said holder; a sharp peripheral cutting edge of said tubular element at said open end adapted to shear labels from a tape adjacent thereto when vacuum in said tubular element draws said tape against said foraminous grid; a pair of valves communicating with the interior of said tubular elements; said valves disposed to communicate hot pressure and vacuum sources of pneumatic fluid relative to the interior of said tubular element; and sources of hot pressure pneumatic fluid and pneumatic fluid under partial vacuum communicating with said valves; and actuating means disposed to project said tubular element toward said conveyor at high velocity to cooperate with vacuum applied to force said strip toward said cutting edge.

10. In a means for applying labels to edible items such as potatoes, other vegetables and fruits or the like, the combination of: a movable conveyor adapted to carry items thereon; a label applying device adjacent to said conveyor; label feeding means disposed to feed fusible wax coated labels into the proximity of said label applying device; means for heating said wax coated labels in the proximity of said label applying device; and label propulsion means of said label applying device disposed to project heated wax coated labels toward said conveyor and into impinging relation with an item carried on said conveyor; and a source of pneumatic fluid under partial vacuum communicating with said first means; a tubular element of said first means internally of which said pneumatic fluid communicates; an open end of said tubular element; and a foraminous grid internally of and adjacent said open end forming said holder; a sharp peripheral cutting edge of said tubular element at said open end adapted to shear labels from a tape adjacent thereto when vacuum in said tubular element draws said tape against said foraminous grid; a tape having label indicia portions printed thereon and in spaced relation with each other longitudinally of said tape to form said labels; and means disposed to move said tape progressively adjacent said cutting edge, whereby said cutting edge may shear out said label indicia portions of said tape.

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