Feb. 9, 1954 R. F. ZIMPEL 2,668,632

LABELING MACHINE

Filed Nov. 8, 1949 2 Sheets-Sheet 1

Fig. 1.

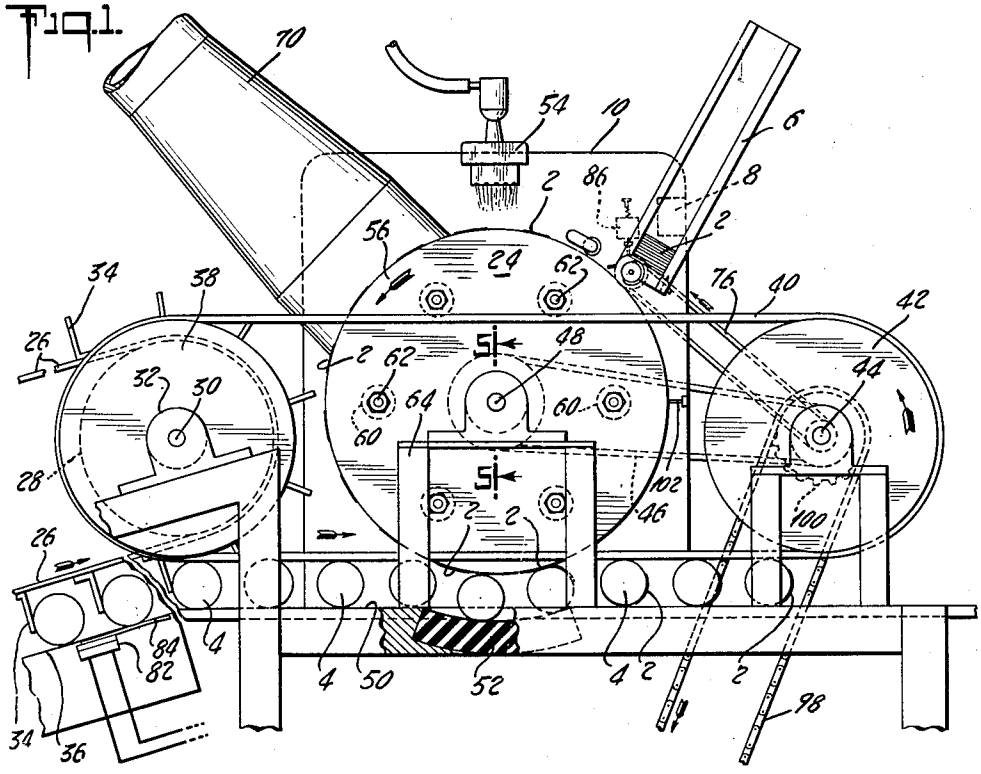
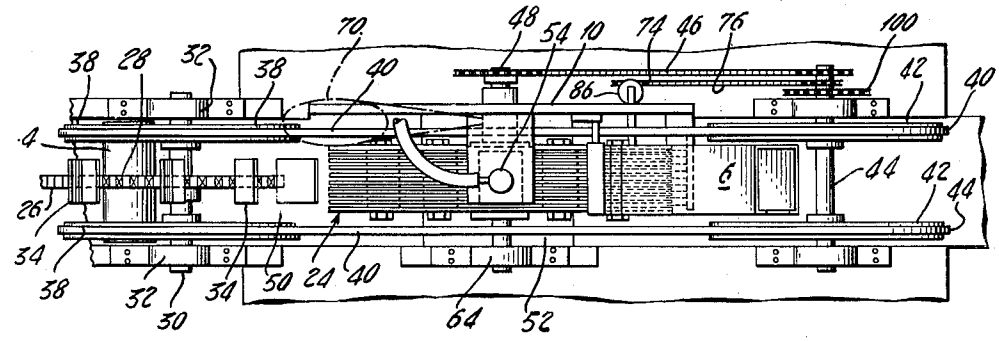


Fig. 2.



INVENTOR.
RICHARD F. ZIMPEL
BY
Bartlett Eyre Neal & Dargusch
ATTORNEYS

Feb. 9, 1954 R. F. ZIMPEL 2,668,632

LABELING MACHINE

Filed Nov. 8, 1949 2 Sheets-Sheet 2

Fig. 5.

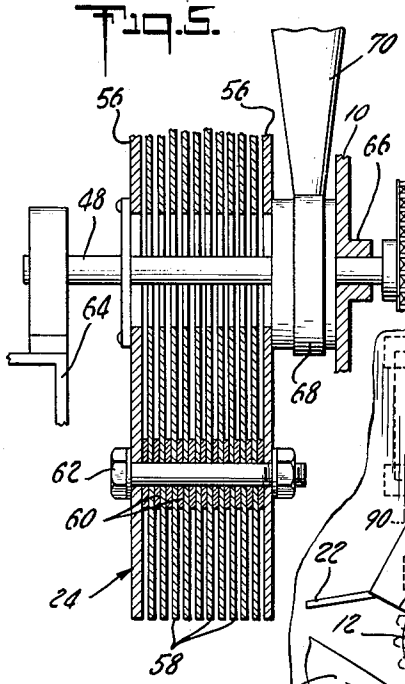


Fig. 3.

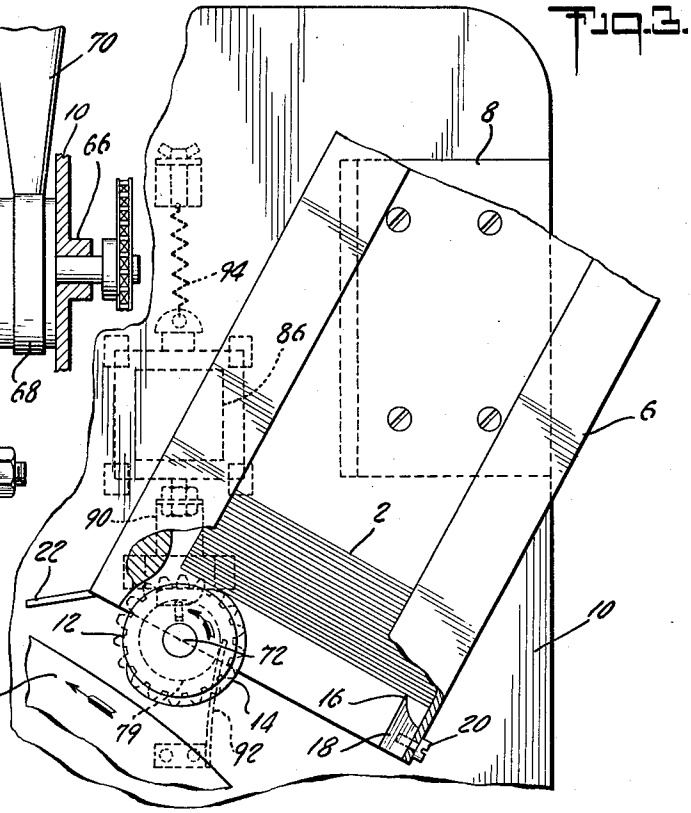
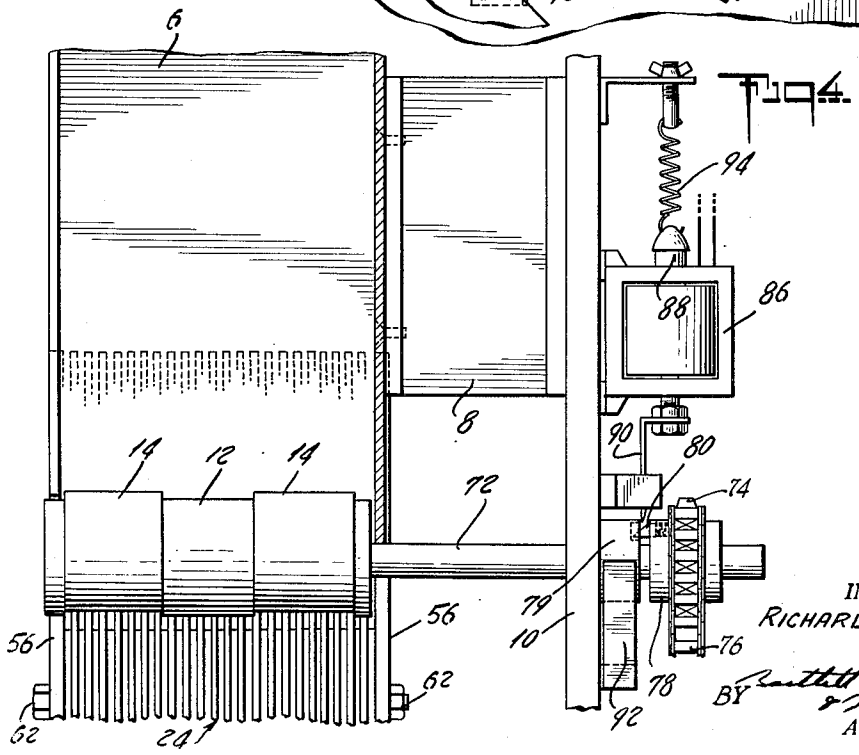


Fig. 4.



INVENTOR.
RICHARD F. ZIMPEL

BY Smith, Eyre, Hall & Marquette
ATTORNEYS

Patented Feb. 9, 1954 2,668,632

UNITED STATES PATENT OFFICE

2,668,632

LABELING MACHINE

Richard F. Zimpel, Canajoharie, N. Y., assignor to Beech-Nut Packing Company, Canajoharie, N. Y., a corporation of New York

Application November 8, 1949, Serial No. 126,133

4 Claims. (Cl. 216—52)

1

The present invention relates to labeling machines, and has special reference to machines for applying paper labels to cylindrical containers such as glass jars and tin cans, the labels having a coating of heat-sensitive or thermoplastic adhesive on one side thereof for securing the labels to the containers.

The principal object of the invention is to provide a labeling machine of this character which is simple in construction and efficient in operation.

The several features of the invention, whereby this and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a front view of a machine embodying the features of the invention in their preferred form, certain parts of the machine being broken away to save space;

Fig. 2 is a plan view of the same;

Fig. 3 is a front view, on an enlarged scale, of a portion of the machine illustrated in Fig. 1;

Fig. 4 is an end view of the same with certain parts in section; and

Fig. 5 is a detail sectional view, partly in elevation, taken substantially on the line 5—5 of Fig. 1.

The machine illustrated in the drawings is particularly adapted for applying labels 2 having a heat-sensitive or thermoplastic adhesive coating on one side which becomes tacky upon the application of heat, to cylindrical containers 4 such as glass jars and tin cans, the labels being applied about the cylindrical surfaces of the containers.

The labels may be stacked in a box or magazine 6 mounted on a bracket 8 that is secured to an upright frame member 10 of the machine. The forward end of the stack of labels is supported in the magazine by means of a rubber roller 12, having eccentric portions 14. The rear end of the stack of labels is supported upon a needlepoint 16 on a block 18 that is secured by a screw 20 to the magazine wall.

During each revolution of the eccentric roller 14, the bottom label 2 is torn from the needlepoint 16 and fed beneath a guide 22 to the peripheral surface of a drum 24. This drum is provided with suction means, hereinafter described, which retains the labels in position on the drum so that during the rotation of the drum and the feed roller 14, the labels are positioned on the drum end-to-end and spaced apart.

The containers 4 may be fed into the machine at regularly spaced intervals by any suitable indexing device, such as a conveyor 26 which may be the conveyor of a jar drier. As shown, this

2

conveyor passes over and is driven by a sprocket wheel 28 on a shaft 30 mounted in bearings 32 in brackets on the machine frame. The conveyor 26 is provided with lifts 34 which feed the containers 4 over an upwardly and forwardly inclined table or platform 36.

The shaft 30 also carries a pair of pulleys 38 over which V belts 40 pass, and also these belts pass over driving pulleys 42 that are carried by a shaft 44 mounted in beams on the machine frame. The shaft 44 drives the drum 24 through a sprocket chain 46 which passes over a sprocket wheel on said shaft and over a sprocket wheel on a shaft 48 which carries said drum. The V belts 40 and the lift conveyor 26 both travel at the same linear speed as the peripheral surface of the drum 24.

As the containers 4 reach the upper end of the platform 36 they pass from the lifts of the conveyor 26 on to a table 50 and are rolled over this table toward the drum 24 through contact therewith of the V belts 40, the containers being maintained in the same spaced relationship as when they leave the conveyor 26.

The containers are thus successively presented to the peripheral surface of the rotating drum 24, and as they engage the drum they leave the belts 40 and through frictional contact with the drum are rolled over a resilient pad 52. This pad may be made of rubber, is mounted in a depression in the table 50, and is arranged concentrically of the drum.

The labels on the drum are so spaced with relation to the spacing of the containers, that after a container comes in firm contact with the drum, the continued rotation of the container causes it to engage a label, and as the adhesive on the label has previously been made tacky by heat as hereinafter described, the label is then transferred to the container. The resiliency of the pad 52 ensures firm and uniform adhesion of the labels to the containers as the containers pass over the pad.

As the containers leave the pad 52 they again come in contact with the belts 40 and are rolled thereby over the table 50 and from the machine.

The means for applying heat to the thermoplastic adhesive on the labels may comprise a gas burner 54. This burner is arranged above the drum and directs its flame down over the adhesive coating of the labels as they pass therebeneath. The burner 54 may be of the ribbon type with a pilot light, and any suitable means (not shown) may be provided for turning on and turning off the burner upon starting and stopping the machine.

As shown, this suction drum 24 is made up of

¼" disks 56 of steel, and ⅛" annular disks 58 of aluminum arranged between the disks 56. The disks 56 and 58 are spaced apart by means of annular spacers 60 which surround bolts 62 that extend through apertures in the disks and hold them assembled.

The shaft 48 which drives the suction drum extends through the aluminum disks 58 and is flanged to the front steel disk 56 with its front end journaled in a bearing in a bracket 64 on the machine frame. The other end of the shaft extends through an enlarged aperture in the rear steel disk 56 and through a bearing 66 in a frame 10. This end of the shaft carries the sprocket wheel that is driven by said chain 46. Suction is applied to the drum through a rotary union 68 surrounding the shaft 48 and connected with a suction pipe 70.

With this construction of suction drum, a large volume of air at low vacuum may be drawn between the aluminum disks. This air creates sufficient suction to firmly maintain the labels on the drum and, also, because of the large volume at low vacuum, adequate cooling of the drum is effected. Such cooling is of considerable practical importance, as unless the drum is maintained sufficiently cool, when the machine is stopped the adhesive of the labels on the drum would be activated by conduction through the paper, and also the labels in the label box might tend to be activated if the machine stood still with a hot drum so near to them for any length of time.

The label feed roller 12 is secured on the forward portion of a shaft 72 which extends through a bearing in the upright frame member 10. This shaft is driven by a sprocket wheel 74 driven through a sprocket chain 76 from the shaft 44. The sprocket wheel carries the driving member 78 of a one revolution clutch, and the shaft carries the driven member 79 thereof, the clutch member being adapted to be connected and disconnected by means of a spring pressed detent 80 on the driving member which is adapted to engage and disengage in a slot in the driven member.

Normally the clutch 78—79 is closed so the label feed roller 12 is driven continuously from the shaft 44. In case, however, one of the lifts of the conveyor 26 fails to deliver a container so the feeding of the containers to the suction drum is interrupted, the clutch is opened for one revolution, so as to correspondingly interrupt the feeding of the label that would otherwise be applied to the container omitted from the conveyor. This ensures that all labels fed to the suction drum are properly applied to containers.

To provide for this, a microswitch 82 is mounted in a recess in the inclined table 36, and an operating lever 84 slightly longer than the pitch distance between the containers on the conveyor 26, is held down when there is a continual line of containers. Should there be one or more containers missing, the switch lever 84 rises making an electric contact so as to activate a solenoid 86 mounted on the back of the frame member 10. The core 88 of the solenoid has a clutch release member 90 secured on its lower end which, when the solenoid is energized, is projected to retract the clutch detent 80 and thus disconnect the clutch member 78 and 79. When the clutch is thus released, the label feed roller 12 is immediately stopped due to a leaf-spring 92 that bears at all times on the driven clutch member 79 and serves as a brake. When the solenoid is de-energized by the switch lever 84, a spring 94 having one end connected to the upper end of the core 88 serves to retract the clutch release member 90. The shaft 44 may be driven from a motor (not shown) on the machine through a sprocket chain 98 that passes over a sprocket wheel 100 thereon. A brush or comb 102 may be positioned ahead of the label feed for brushing off any label which might accidently miss being applied on a container.

It will be apparent that my improved machine is simple in construction and capable of operating at high speed. Since the label itself carries the adhesive, there is no problem of synchronizing the label with a spot of applied glue, and instead of it being necessary to use a wrap-around label, the label may be only large enough to carry the identifying message, which is desirable especially in the case of glass jars so that as much of the product may show through the glass as possible.

What I claim is:

1. A machine for applying labels to cylindrical containers of the class described, the labels having heat-sensitive adhesive on one side thereof, having, in combination, a rotatable drum adapted to receive the labels on the peripheral surface thereof with the labels arranged end-to-end and spaced apart and with the adhesive side of the labels outermost during the rotation of the drum in one direction, said drum comprising a plurality of annular disks arranged side by side and spaced apart, suction means for drawing air inwardly from between said disks so as to cause the labels to be retained on said surface of the drum during the rotation of the drum in said direction, means operated in timed relation to said label feeding means for feeding containers one behind the other and spaced apart to present their cylindrical surfaces to the peripheral surface of the drum, a support for receiving the containers as they engage the drum and over which they are rolled through frictional contact between them and the drum, and means for applying heat to the adhesive on the labels previously to the labels reaching the point of contact between the containers and the drum to cause the labels to be adhesively secured about the cylindrical surfaces of the containers.

2. A machine for applying labels to cylindrical containers of the class described, the labels having heat-sensitive adhesive on one side thereof, having, in combination, a horizontally rotatable drum adapted to receive the labels on the peripheral surface thereof with the labels arranged end to end and spaced apart and with the adhesive sides of the labels outermost, means for thus feeding the labels to the drum, suction means for causing the labels to be retained on said surface of the drum during the rotation of the drum in one direction, a support positioned below the peripheral surface of the drum over which the cylindrical containers are adapted to be rolled one behind the other and spaced apart successively into contact with the peripheral surface of the drum whereby upon such engagement of the containers with the drum they are rolled through frictional contact between them and said support and said drum until they pass the peripheral surface of the drum, the ends of said cylindrical containers projecting a distance beyond the ends of the drum, two endless belts arranged at opposite sides of said drum with the lower stretches thereof engaging the ends of the cylindrical surfaces of the containers so as thus to

feed the containers to the drum and as each container leaves the drum to feed the container away from the drum by frictional contact between them and the containers, means for driving the drum and said belts so as to cause the outer surfaces of the lower stretches of the belts and the peripheral surface of said drum to travel at substantially the same speed, and means for applying heat to the adhesive on the labels successively previously to the labels reaching the point of contact between the containers and the drum to cause the labels to be adhesively secured about the cylindrical surfaces of the containers.

3. A machine for applying labels to cylindrical containers of the class described, the labels having heat-sensitive adhesive on one side thereof, having, in combination, a horizontally rotatable drum adapted to receive the labels on the peripheral surface thereof with the labels arranged end to end and spaced apart and with the adhesive sides of the labels outermost, means for rotating the drum in one direction, means for thus feeding the labels to the drum, suction means for causing the labels to be retained on said surface of the drum during the rotation of the drum in said direction, a support over which the cylindrical containers are adapted to be rolled one behind the other and spaced apart successively into engagement with the peripheral surface of the drum whereby upon such engagement of the containers with the drum they are rolled through frictional contact between them and said support and said drum until they pass the peripheral surface of the drum, means for thus rolling the containers on said support until they engage said surface of the drum, and means for applying heat to the adhesive on the labels successively previously to the labels reaching the point of engagement between the containers and the drum so as to cause the labels to be adhesively secured about the cylindrical surfaces of the containers as the containers are rolled through frictional contact with the drum.

4. A structure according to claim 3 in which said means for rolling the containers into engagement with the peripheral surface of the drum causes the containers to be rolled at substantially the same peripheral speed as the peripheral surface of the drum.

RICHARD F. ZIMPEL.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
Re. 23,512	Von Hofe	June 10, 1952
781,333	Edson	Jan. 31, 1905
1,078,723	Dodge	Nov. 18, 1913
1,328,733	Harriss	Jan. 20, 1920
1,660,467	Anderson	Feb. 28, 1928
1,672,412	Hitchcock	June 5, 1928
1,719,406	Townsend	July 2, 1929
1,998,615	Groven	Apr. 23, 1935
2,050,455	Ohlsen et al.	Aug. 11, 1936
2,129,686	Gray	Sept. 13, 1938
2,247,623	Von Hofe	July 1, 1941
2,525,741	Von Hofe	Oct. 10, 1950