July 19, 1966 M. J. WILCOX 3,261,142

DEVICE FOR MOUNTING LIDS ON CONTAINERS

Filed April 8, 1963 2 Sheets-Sheet 1

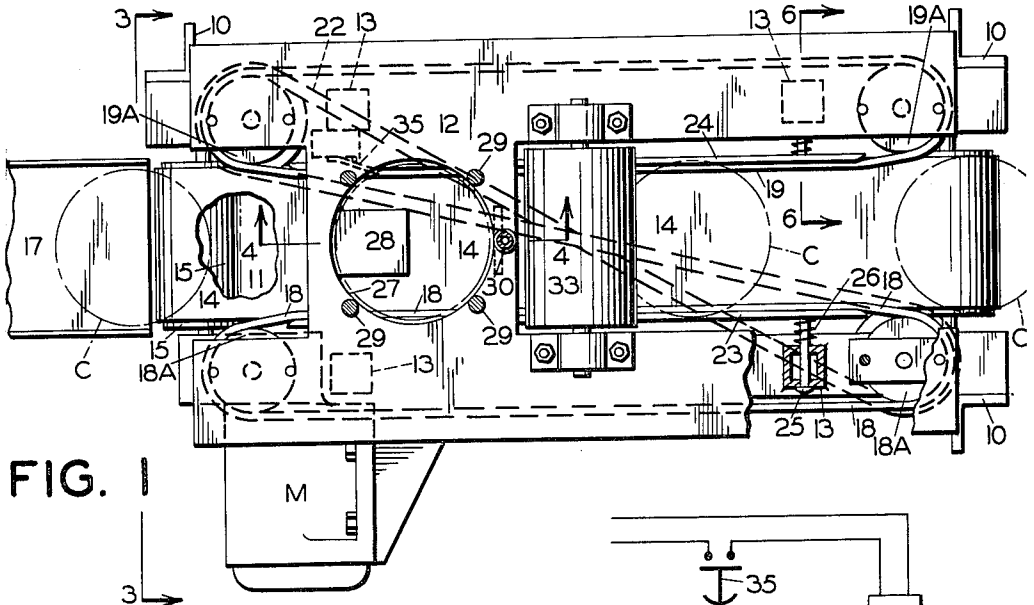


FIG. 1

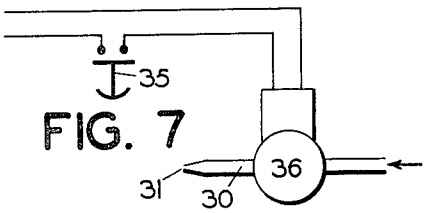


FIG. 7

FIG. 2

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DEVICE FOR MOUNTING LIDS ON CONTAINERS

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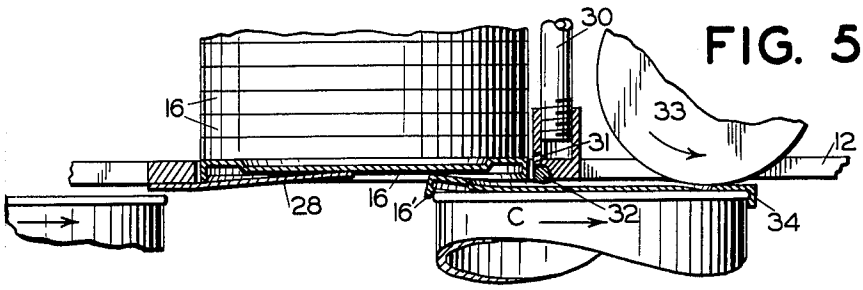


FIG. 5

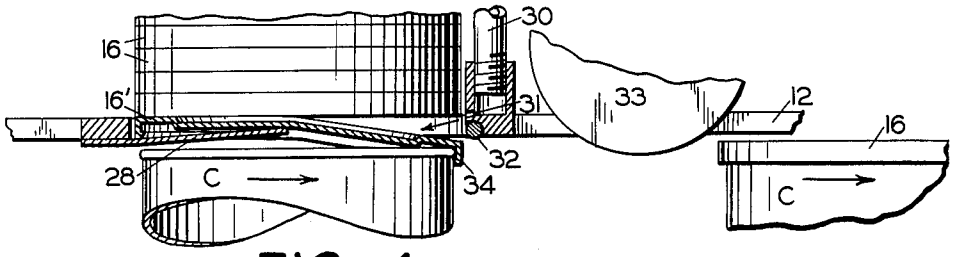


FIG. 4

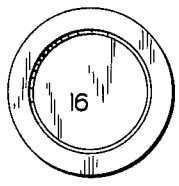
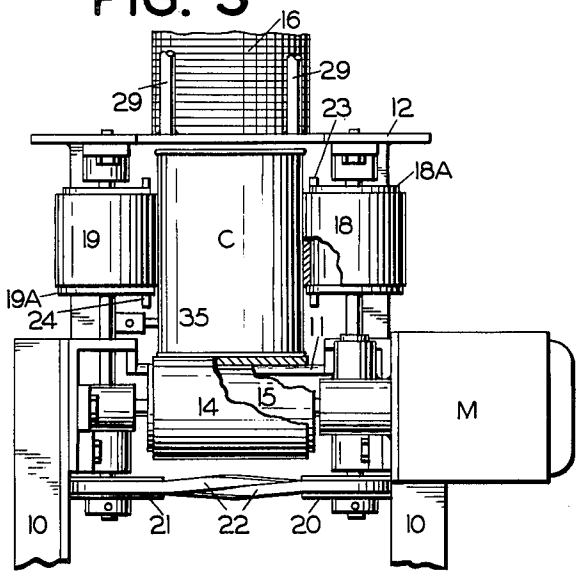


FIG. 8

FIG. 3



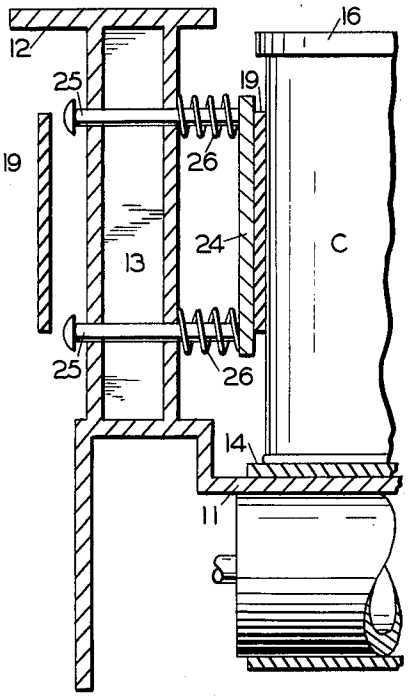


FIG. 6

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DEVICE FOR MOUNTING LIDS ON CONTAINERS

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4 Claims. (Cl. 53—128)

This invention relates in general to the placing of removable covers or lids on the top of a container, and, more especially, relates to the practice which has developed recently of providing an auxiliary replacement cover for a sealed can to be used on the can after the original top of the can is removed with the opening of the can.

In the past it has long been customary when certain commodities, such as food products, and especially ground coffee, are packed in sealed cans, to have the lid of the can originally secured to the side wall of the can by an extra strip of tin mounted partly on the peripheral wall of the lid and partly on the outside wall of the can, which strip is removed by means of a simple key, provided with the can, which enables the strip to be pulled loose by being wound up on the key. A recently developed change which is being followed in the marketing of coffee, for example, in sealed cans, is to seal the top of the can in the same manner as in the case of cans which are not to be used for any appreciable length of time after the can is opened, and thus with the top of the can adapted to be cut out by a conventional can opener, and to supply an auxiliary, tightly fitting but easily removable plastic lid for keeping the can covered after it has been opened and until the contents of the can have been used up and the can be wasted. Reportedly the saving in the container total cost, when an ordinary can with the top to be cut open by a can opener is used in place of the can with the lid attached by the extra strip as previously mentioned, amounts to more than the cost of providing the auxiliary plastic lid for the can. However, so far in the carrying out of this modified marketing method, the auxiliary plastic lids have had to be manually placed on the sealed cans.

The object of the present invention is to provide a labor saving machine by means of which lids, and particularly such auxiliary lids, can be set on the containers or cans automatically.

A further object of the invention is to provide a device adapted especially for setting auxiliary lids in place on sealed cans which device will be simple in construction, moderate in cost, and which will not involve any appreciable operating or maintenance problems.

The manner in which the device of the present invention is constructed and operated will be readily understood from the following brief description and explanation in which reference is made to the accompanying drawings.

In the drawings:

FIG. 1 is a top plan view of the device but with the stack of lids on the top of the device and the holding means for the stack omitted and with a portion of the top cover plate broken away for clarity;

FIG. 2 is a side elevation of the device showing the stack of lids in place on the device;

FIG. 3 is a rear end elevation taken on the line 3—3 of FIGS. 1 and 2;

FIG. 4 is a fragmentary section taken on line 4—4 of FIG. 1 drawn to a larger scale, illustrating the first stage in the placing of an auxiliary lid on a sealed can;

FIG. 5 is a fragmentary section similar to FIG. 4 and showing a further stage in the securing of such auxiliary lid in place on the can;

FIG. 6 is a fragmentary section on line 6—6 of FIG. 1 drawn to a larger scale;

FIG. 7 is a simple diagram of the automatic control constituting part of the device; and

FIG. 8 is a view showing one of the auxiliary lids by itself.

Referring first to FIGS. 2 and 3, the device includes a rigid frame structure having supporting legs **10**, a lower deck **11** and a top deck **12**, the top deck being supported above the lower deck by means of posts **13**. Portions of the top deck **12** are cut away as shown in FIG. 1.

An endless conveyor belt **14** moves over the lower deck **11** (from left to right as viewed in FIGS. 1 and 2), passing around a driven roller **15** at the intake end of the device and around an idler roller at the opposite end of its course. The shaft for the roller **15** is driven through suitable gear connection from a motor M. The containers or sealed cans C, on each of which a lid **16** is to be placed, are delivered in succession to the receiving end of the conveyor belt **14**, preferably being delivered from a suitable trough or chute or other conveyor indicated at **17** in FIG. 1.

A pair of endless belts are mounted above the main conveyor belt **14** on opposite sides respectively and are so positioned as to engage the containers or cans at opposite sides and to combine with the conveyor belt **14** in holding them firmly while moving them through the device. These side belts **18** and **19** are driven in unison with the conveyor belt **14**.

The side belt **18** passes around a roller **18A** (FIGS. 2 and 3), the vertical shaft of which is driven by suitable gear connection with the shaft of the motor M. At the other end of its course this side belt **18** passes around an idler roller, and the shaft of this idler roller is extended downwardly below the plane of the bottom course of the conveyor belt **14** and carries a belt pulley **20**.

The side belt **19** similarly passes around a driven roller **19A**, located opposite the roller **18A**, and has an idler roller at the other end of its course. The shaft for the driven roller **19A** is extended downwardly and carries a drive pulley **21** located in the same lower horizontal plane as the pulley **20**, and the pulleys **20** and **21** are connected by the cross belt **22**, the belt **22** passing over suitable guides (not shown). In this way the belt **19** and the belt **18** are driven at the same speed and at the same speed as the conveyor belt **14**.

Along their inner courses the side belts **18** and **19** move on spring-mounted guide plates **23** and **24** respectively. Each of these guide plates is supported on two pairs of horizontal guide pins **25** (shown best in FIG. 6), which pins are slidably mounted in the adjacent posts **13** respectively, the guide plates being urged inwardly against the moving containers or cans by interposed coil springs **26**. The purpose of this arrangement, as obvious, is to keep the side belts in firm contact with the sides of the containers or cans as they are moved along through the device.

The top deck **12** is provided with a circular opening **27** in the location shown in FIG. 1, and the diameter of this opening is slightly greater than the outside diameter of the auxiliary lids **16** which are to be mounted on the cans. This opening **27** is partially closed by a spring plate **28** (FIGS. 1, 4 and 5) which spring plate is secured to the underside of the top deck **12** and which spring plate extends into the opening in the direction of travel of the cans. The spring plate terminates approximately at the center of the opening **27**.

The lids **16** are placed in a stack on the plate **28** and are held in stacked position and in registration with the opening **27** in the deck **12** by marginal guide posts **29**.

A pipe **30** (FIGS. 1, 2, 4 and 5), connected to a suitable source of air under pressure (not shown), has a discharging jet orifice **31** (see FIGS. 4 and 5), which is so positioned and arranged as to cause the jet of air from

the orifice or nozzle **31** of the pipe to be discharged inwardly and downwardly on the top of the edge of the bottom lid in the stack of lids **16** whenever air under pressure is delivered through the pipe. The bottom of this pipe **30** and the jet orifice **31** are positioned along the center line of the lids in the direction of travel of the cans and at the edge of the opening **27**, as indicated in FIG. 1, and thus on the side opposite the end of the spring plate **28** on which the lids are supported.

Due to the fact that the lids **16** are made of flexible material, being preferably of plastic, and due to the fact that the bottom lid is supported on the bottom plate **28** for not more than half its width, leaving the remaining half on the side of the jet orifice **31** unsupported, the sudden discharge of a strong jet of air through the orifice **31** against the unsupported edge of the bottom lid will cause the adjacent edge of the bottom lid to be pushed downwardly a short distance, as illustrated by the lid **16'** in FIG. 4. The discharge of air from the jet orifice is so controlled that the air jet is delivered against the bottom lid just as the can is reaching the position of the can C shown in FIG. 4. As a result, the top edge of the can contacts the forward portion of the rim of the depressed bottom lid **16'** and pulls this lid along with the moving can, the lid passing first under a small, freely rotating roller **32** and thence under a spring-mounted pressure roll **33** which bears down on the lid **16**, as shown in FIG. 5, thereby completing the mounting of the lid on the can and causing it to be firmly secured in place.

As shown in FIGS. 4 and 5, and as is well-known, plastic lids or covers of this type are formed with a snap-over rim flange **34**, adapted to be pressed down over the top rim of a can, causing the auxiliary lid when set in place on the top of the can to remain in place until the lid is manually removed. FIG. 8 shows a top view of a well-known type of plastic lid or cover for cans and other containers.

A spring-operated, switch contact element **35** (FIGS. 1, 2 and 3, and also shown diagrammatically in FIG. 7) is positioned in the path of the moving cans in the location indicated in FIG. 1 so as to cause a switch with which it is connected to be actuated whenever a can is moving into position beneath the stack of lids and thus beneath the opening **27** in the top deck **12** of the device. The engaging of the switch element **35** and the resulting actuation of the switch operates a solenoid valve **36** (FIG. 7) causing air to be discharged through the jet orifice **31** and an air jet momentarily to be impinged against the bottom lid in the stack, with the result that the adjacent edge of the bottom lid is pushed down so as to be contacted by the can, as illustrated in FIG. 4.

As previously indicated, when sealed cans containing coffee or other products are marketed with such an auxiliary lid in place on the top of the can, the purchaser, when the can is to be opened, first manually removes the auxiliary lid and then cuts out the top of the can with an ordinary can-opener. Thereafter the auxiliary lid is used to keep the can closed when not in use until such time as the can has been emptied.

With the employment of the device of this invention the placing of the auxiliary lid on each can as it passes through the device occurs quickly and easily, resulting in a considerable saving in time and labor, since only a minimum of effort and attention is required on the part of the single operator, while the simplicity of the device enables it to be manufacturing and maintained at very low cost.

While this device has been described for use primarily in placing auxiliary lids or covers on sealed cans, it may also be used for placing lids or covers on other containers including open containers adapted to accommodate removable semi-flexible covers. Minor modifications in the device described would be possible without departing from the principle of the invention and it is not intended to limit the invention otherwise than as stated in the claims.

I claim:

1. In a device for mounting covers on containers, conveying means for moving the containers through the device, holding elements for a vertical stack of covers above the path of said containers, said holding elements including a supporting bottom plate and a guideway for said stack, said supporting plate positioned a slight distance above the top line of said containers while passing under said stack and extending beneath the underside of the bottom cover in said stack in the direction of travel of said containers for not more than approximately halfway across the underside of said bottom cover and leaving the remaining unsupported portion of said bottom cover capable of being pushed slightly downwardly, air jet discharging means located slightly beyond the top edge of the rim of said bottom cover in the direction of travel of said containers for directing an air jet inwardly and downwardly on said top edge, whereby to cause the unsupported portion of said bottom cover to be pushed slightly downwardly, and a roller positioned beyond said air jet discharging means in the line of travel of said containers for bearing down on the cover carried along by a container and completing the pressing of the cover firmly down in place on the container.

2. In a device of the character described for mounting lids on containers, a lower conveyor belt and a pair of endless side-engaging belts for moving the containers through the device, holding elements for a vertical stack of lids above the path of said containers, said holding elements including a supporting bottom plate and a guideway for said stack, said supporting plate positioned a slight distance above the top line of said containers while passing under said stack and extending beneath the underside of the bottom lid in said stack in the direction of travel of said containers for not more than approximately halfway across the underside of said bottom lid and leaving the remaining unsupported portion of said bottom lid capable of being pushed slightly downwardly, air jet discharging means located slightly beyond the top edge of the rim of said bottom lid in the direction of travel of said containers for directing an air jet inwardly and downwardly on said top edge, whereby to cause the unsupported portion of said bottom lid to be pushed slightly downwardly, an automatic control assembly for said air jet discharging means actuated by said containers, and a roller positioned beyond said air jet discharging means in the line of travel of said containers for bearing down on the lid carried along by a container and completing the pressing of the lid firmly down in place on the container.

3. In a device for mounting semi-flexible lids on containers, a lower conveyor belt and a pair of endless side-engaging belts for moving the containers through the device, spring mounted guideways for said side belts holding said side belts in engagement with said containers while travelling through the device, holding elements for a vertical stack of semi-flexible lids above the path of said containers, said holding elements including a supporting bottom plate and a guideway for said stack, said supporting plate positioned a slight distance above the top line of said containers while passing under said stack and extending beneath the underside of the bottom lid in said stack in the direction of travel of said containers for not more than approximately halfway across the underside of said bottom lid and leaving the remaining unsupported portion of said bottom lid capable of being pushed slightly downwardly, air jet discharging means located slightly beyond the top edge of the rim of said bottom lid in the direction of travel of said containers for directing an air jet inwardly and downwardly on said top edge, whereby to cause the unsupported portion of said bottom lid to be pushed slightly downwardly, an automatic control assembly for said air jet discharging means, and a pressure roller positioned beyond said air jet discharging means in the line of travel of said containers for bearing down on the lid carried along by a container and com-

pleting the pressing of the lid firmly down in place on the container.

4. A device for mounting auxiliary plastic lids on sealed cans, including a lower conveyor belt and a pair of endless side-engaging belts for moving the sealed cans through the device, pressure guide plates for said side belts holding said side belts in engagement with said sealed cans while traveling through the device, holding elements for a vertical stack of auxiliary plastic lids above the path of said sealed cans, said holding elements including a supporting bottom spring plate and a guideway for said stack, said supporting plate positioned a slight distance above the top line of said sealed cans while passing under said stack and extending underneath the underside of the bottom lid in said stack in the direction of travel of said sealed cans for not more than approximately halfway across the underside of said bottom lid and leaving the remaining unsupported portion of said bottom lid capable of being pushed slightly downwardly, intermittently operating air jet discharging means located slightly beyond the top edge of the rim of said bottom lid in the direction of travel of said sealed cans for directing an air jet inwardly and downwardly on said top edge, whereby to cause the unsupported portion of said bottom lid to be pushed slightly downwardly, an automatic control assembly for said air jet discharging means, a switch element in said control assembly actuated by engagement with a can moving into position beneath said bottom plate and stack, and a spring mounted pressure roller positioned beyond said air jet discharging means in the line of travel of said cans for bearing down on the lid carried along by a can and completing the pressing of the lid firmly down in place on the can.

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