March 5, 1929. R. STROPPEL 1,704,227

CAN CAPPER

Filed June 25, 1925 2 Sheets-Sheet 1

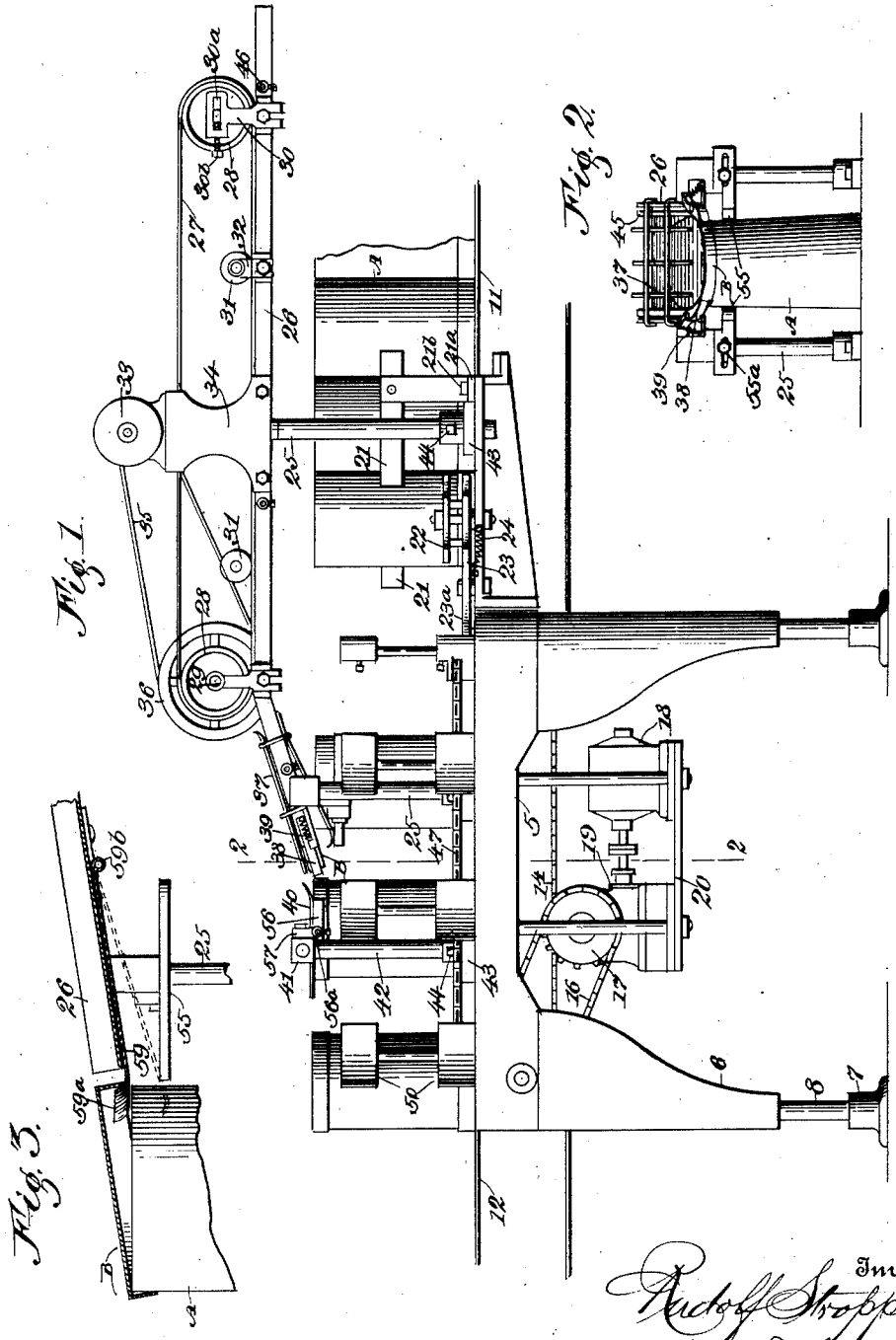


Fig. 1.

Fig. 2.

Fig. 3.

Inventor
Rudolf Stroppel
By J. M. St. John
Attorney

March 5, 1929. R. STROPPEL 1,704,227

CAN CAPPER

Filed June 25, 1925 2 Sheets-Sheet 2

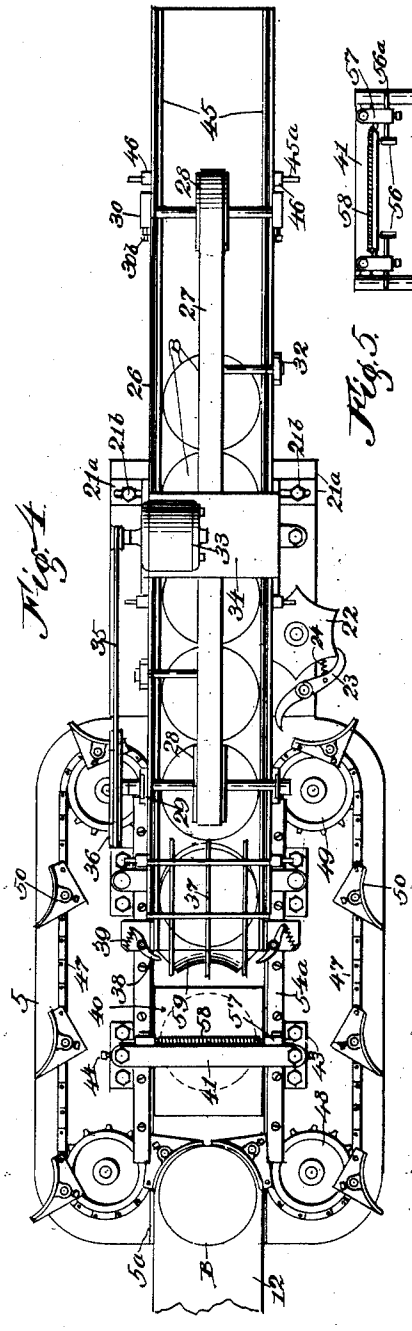


Fig. 4.

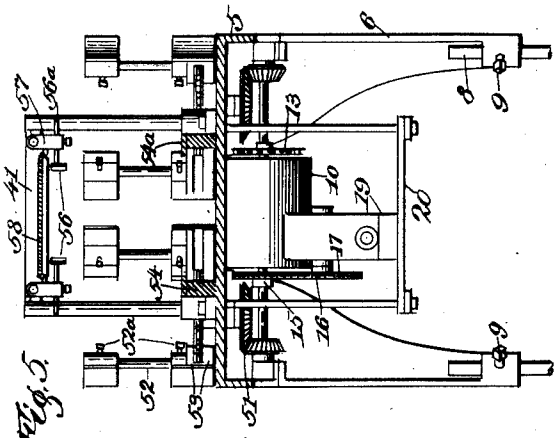


Fig. 5.

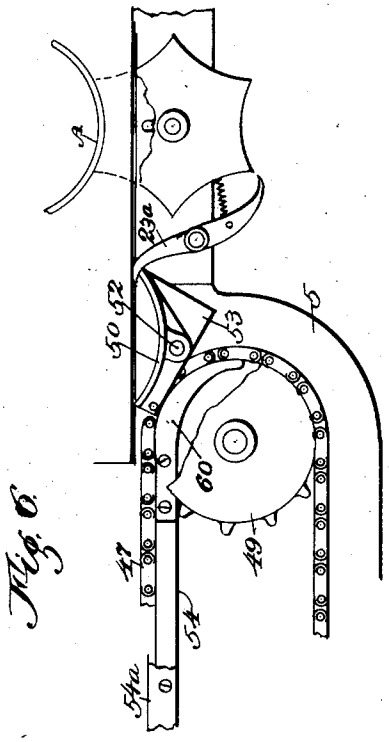


Fig. 6.

Inventor
Rudolf Stroppel.
By J. M. St. John
Attorney

Patented Mar. 5, 1929. 1,704,227

UNITED STATES PATENT OFFICE.

RUDOLF STROPPEL, OF CEDAR RAPIDS, IOWA; GEORGE STROPPEL ADMINISTRATOR OF SAID RUDOLF STROPPEL, DECEASED.

CAN CAPPER.

Application filed June 25, 1925. Serial No. 39,554.

This invention relates to can capping machines in which the method of applying the cap corresponds to that shown and described in Letters Patent No. 1,435,415, issued to Nemecek and Stroppel November 14, 1922, and Patent No. 1,502,869, issued to the same inventors July 29, 1924, to which reference may be had. The object of this invention is to improve capping machines applying the cap in a similar manner so as to secure certain advantageous results in both manufacture and use, as will hereinafter appear.

In the accompanying drawings, forming a part of this specification, Fig. 1 is a side elevation of a machine embodying my improvements. Fig. 2 is a fragmentary elevation showing the capping parts as seen in looking toward the right past the section line 2—2 of Fig. 1. Fig. 3 is a fragmentary side elevation showing the manner of applying the cap, and details of a device for dragging the rear edge of the cap flange over the top of the can. Fig. 4 is a plan view of the machine. Fig. 5 is a cross section of the same at the line 2—2, looking toward the left. Fig. 6 is a fragmentary plan view, showing mechanism for detaining the row of advanced cans, and for releasing them one at a time.

In the drawing, the numeral 5 denotes a table mounted on supporting legs 6, which at their lower ends are provided with feet 7 adjustable by their shanks 8 in the main legs, by means of set-screws 9. The machine may thus be raised or depressed bodily so as to level up with other machinery with which it may be connected in the factory where used. In a gap 5^a at each end of the table is mounted a roller 10, each carrying a conveyor belt. The belt 11 at the right delivers the uncapped cans A to the machine, and the belt 12 at the left carries them away when capped. The rollers are driven concurrently by connecting sprockets and chain 13, 14, and by a sprocket 15 and chain 16 connecting with a motor-driven sprocket 17, the motor 18 and connected driving apparatus 19 being hung by a hanger 20 from the under side of the table.

The train of cans, to which the bottoms have been applied in the same manner by another machine of the same type, as advanced from the filling machine (not shown) to the capper, are guided in proper alinement by laterally disposed rails 21, which may be adjusted laterally to suit different sizes of cans by slotted supports 21^a and fastening screws 21^b. The cans are delivered one at a time as required by the capping apparatus to be described presently. For this purpose the machine is provided with a detent 22 of the star-wheel type, engaging the forward can of the train by one of its fluted sides, and thus holding the whole train slidably on the conveyor belt until released. The star-wheel is held in this detaining position by a latch-lever 23 drawn to engaging position by a spring 24. It is disengaged by the mechanism that carries the can forward during the capping operation, in a manner to be described presently.

Supported by posts 25 a chute 26 for can covers B is mounted over the can conveyor, and preferably parallel therewith. The chute is a simple, flat-bottomed trough with upstanding sides, horizontal mainly, but near its forward end pitched downwardly, as shown. Over the horizontal portion a belt 27 is carried by terminal drums or pulleys 28 mounted in bearings 29 and 30 attached to the sides of the chute. Both pairs of bearings are adjustable vertically, and one pair is slotted at 30^a and provided with adjusting screws 30^b for the proper stretching of the belt. The lower member of the belt runs at the depth of the cover flanges above the bottom of the chute, and by frictional contact with the tops of the covers slides them forward in the chute. Intermediate rollers 31 are mounted by brackets 32 adjustably at the sides of the chute, and are adapted to press down on the upper side of this lower member of the belt, and thus provide the necessary frictional contact throughout the whole length of the belt. The belt is driven by a small electric motor 33 mounted on a bridge 34, and connecting by a belt 35 with a pulley 36 attached to the shaft carrying the pulley 28 at the forward part of the chute. Over the inclined portion of the chute is mounted a wire cage 37 to prevent the covers from springing or flying out of place as pressed forward by the train of them following. At the end of the incline the leading cover is caught and detained by a pair of fingers 38 held to such detaining position by springs 39. As shown

in Fig. 1 this cover now lies at an incline, and at such a level that a can slid forward in line with it will enter the cover, catch this depressed part of the flange, and drag it along as it moves forward. In this forward movement the cover passes under a pressure plate 40 which forces the entire cover down over the top of the can. The plate is attached to a bridge-bar 41 mounted on posts 42 set adjustably in bases 43, by means of set-screws 44. A similar adjustment is provided for the chute-supporting posts 25, and all are supposed to be movable up or down through the table top, or its extensions, as indicated by the chute-post at the right in Fig. 1. By this means the operative height of the machine is adapted to cans of varying depths.

Referring to Figs. 2 and 3 it will be seen that the detent fingers above referred to are attached to supporting plates fixed to the ends of a pair of parallel guide-rails 45 mounted near each side of the chute, and serving as side-guides for the covers. These rails are provided with lateral studs 45^a, which pass through bosses 46 at the sides of the chute, and are held in place by set-screws as shown. By this lateral adjustment of the guide-rails covers of various sizes may be accurately centered and guided so as to engage the under-moving can of a corresponding size.

The cans are caught and fed forward singly by flanking conveyors, as best shown in Figs. 1 and 4. These conveyors comprise sprocket chains 47 carried by sprockets 48 and 49 a little above the top of the table, and flights 50 pivotally connecting with the chains. The vertical shafts of the forward pair of sprockets are driven by bevel gears 51 connecting operatively with the front drum-shaft. Each flight is composed of a lower and upper member adjustable with respect to each other, by means of a connecting post 52 and set-screw 52^a. The lower flight is provided with angular wings 53 straddling the chain. These wings serve to hold the curved wings of the flights in position to partially embrace the can, as shown at the left in Fig. 4, and thus force the can forwardly (to the left) in the operation of the machine. During the positive action of the flights they are held to this position by the contact of the angular flanges adjacent to the chains with adjacent guide-bars 54 secured to the bed of the machine. An overlapping top-plate 54^a serves to hold the flights to a true vertical position and prevent their tipping. The conveyors need no lateral adjustment for any size of can within the range of the machine, and the operative position of the flights is such that the can is always accurately centered, and can be depended upon to register exactly with the cover as it moves forwardly. To prevent any possibility of deflection, however, the upper part of the can is made to pass between a pair of guides 55, laterally adjustable by slots and screws 55^a (Fig. 2), and attached to the forward pair of posts 25. These guides may serve, as indicated in said figure to compress the upper part of the can more or less, and thus insure its proper entrance inside the cover, even though the latter, by warping, may be distorted and narrowed in this direction.

As the can and cover pass under the pressure-plate in the final act of capping the sides of the cover are pressed closely against the can by lateral fingers 56. These have stems 56^a for side adjustment in hangers 57 attached pivotally to the cross-bar 41, and are drawn inwardly by a tension spring 58. This forces the sides of the cover flange to hug the can, and insures the entrance of the sides of the can within the sides of the cover flange. The entrance of the rearmost portion of the can-top into the cover is insured by the use of a shoe 59 hinged at 59^b, and provided with a curved, upturned lip 59^a. This lip is thrown up inside the cover as the can passes under the shoe, and in the forward movement of the can and cover toward the pressure-plate the curved lip serves to drag the rearmost portion of the cover flange over the corresponding portion of the can top. No specific claim is made to various of these devices, as they are found, in somewhat different form, in one or both of the patents above referred to.

In Fig. 6 is shown the device for tripping the can detent. It will be seen that the star-wheel latch-lever has a tail 23^a, which is caught at the proper time by the curved wing of the conveyor flight, and pushed to releasing position, as shown. The flight is carried to position for engagement with the trip-lever by a cam 60 set below the sprocket wheel of the conveyor, and adapted to force the flight to tripping position by the engagement of its outer face with the angled flange of the flight.

Thus constructed, the machine possesses a number of practical advantages over the type of machine described in the patents referred to. The movement of the cans and covers is in a straight line through the machine and beyond. By reason of this it is found to be easier to place the parts, can and cover, with perfect accuracy, so that the covers slip over the cans without missing or mutilation. As above noted no lateral adjustment of the can conveyors is necessary, as the flights converging backwardly and inwardly hold them accurately to a central line, regardless of the size of the cans. This is a matter of great convenience both to the manufacturer and the user of the machine. The machine, as indicated, is universally adjustable to varying sizes and heights of

cans, thus allowing for a standardization of the machine by the manufacturer, and giving it a wide range of usefulness to the user. It is to be noted also that the adjustments are all simple and easily made, even the lateral shifts, as the parts are duplicates, rights and lefts, and have the same movements on both sides. In practice it is found that an expert operator of one of the machines can make all the changes from one extreme size of can to the opposite in three minutes.

Having thus described my invention, I claim:

1. In a can capper, a table, a pair of oppositely disposed parallel conveyors thereon provided with lateral flights which in can-advancing position flare forwardly and converge rearwardly to admit the largest can and hold the smallest can admissible between the conveyors and advance them along a central line, an overhead cap-chute adapted to deliver covers at an incline and in position to be intercepted by the can, and a pressure-plate to close the cover down over the top of the can as the same moves forward.

2. In a can-capper, a table, a pair of parallel, oppositely disposed and concurrently moving conveyors thereon provided with lateral flights converging rearwardly to near a central line between the conveyors, to hold and guide along such central line any can admissible between the conveyors, means for imparting continuous movement to the conveyors and for delivering cans singly thereto, an overhead cap-chute adapted to deliver covers inclined downwardly and forwardly in the path of the cans, and an overhead pressure-plate forward of the point of interception of the can with the cover, to force the cover on the can as they move forwardly.

3. In a can-capper, a table, a pair of oppositely disposed, concurrently moving conveyors thereon, provided with vertically adjustable, can-engaging flights, a vertically adjustable cap-chute adapted to deliver covers to the can-intercepting point, and inclined downwardly and forwardly, and a vertically adjustable pressure-plate in the path of the can and cover, to press the cover down over the top of the can.

4. In a can-capper, a pair of oppositely disposed, concurrently-moving conveyors, provided with can-engaging flights, a cap-chute adapted to deliver covers at a downwardly and forwardly inclined angle in the path of the can, and a pair of laterally adjustable guides for the covers, whereby covers varying in size may be aligned accurately with corresponding cans.

5. In a can-capper, a pair of oppositely disposed conveyors provided with vertically adjustable, can-engaging flights, a vertically adjustable cap-chute adapted to deliver covers in the path of the top of the can and at a downwardly and forwardly inclined angle, adjustable lateral guides for the covers, and means for advancing a train of covers in the chute, and advancing the intercepting cans and covers.

6. In a can-capper, a can-conveyor adapted to advance cans on end, and provided with vertically adjustable can-engaging flights, a vertically adjustable cover chute provided with a laterally adjustable cover guide, and adapted to deliver covers at a downward and forward incline to be intercepted by the cans, and a vertically adjustable pressure-plate to force the cover on the can as can and cover advance.

7. In a can-capper having can-advancing mechanism, a cover-chute mainly horizontal, and terminating in a downward incline to position the cover so as to intercept the advancing can, a moving belt in frictional contact with the tops of the covers, and a cage over the inclined portion of the chute to prevent their displacement.

8. In a can-capper having can-advancing mechanism, an overhead cover chute mainly horizontal and terminating in a downward incline to bring the covers to can-intercepting position, a moving belt in frictional contact with the tops of the covers, and vertically adjustable rollers disposed above the cover-contacting portion of the belt, whereby the friction of the belt may be controlled.

In testimony whereof I affix my signature.

RUDOLF STROPPEL.