Feb. 9, 1926. 1,572,219

G. W. MUDD

MACHINE FOR TURNING AND STACKING THE ENDS OF CANS

Filed August 30, 1924 2 Sheets-Sheet 1

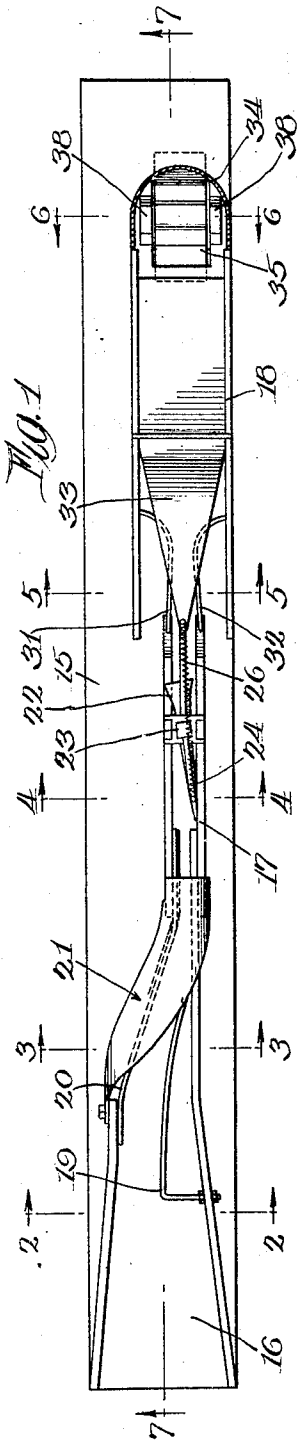


Fig. 1

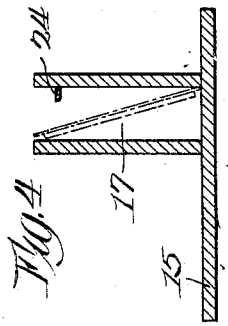


Fig. 4

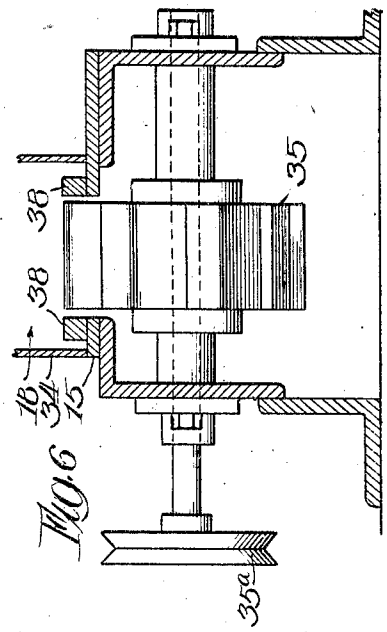


Fig. 6

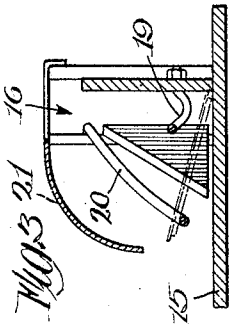


Fig. 3

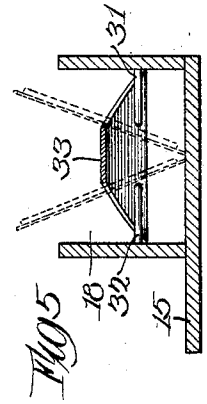


Fig. 5

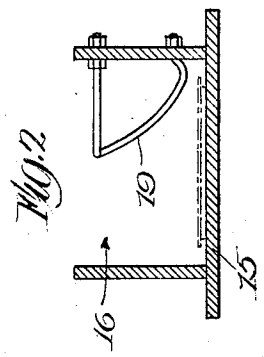


Fig. 2

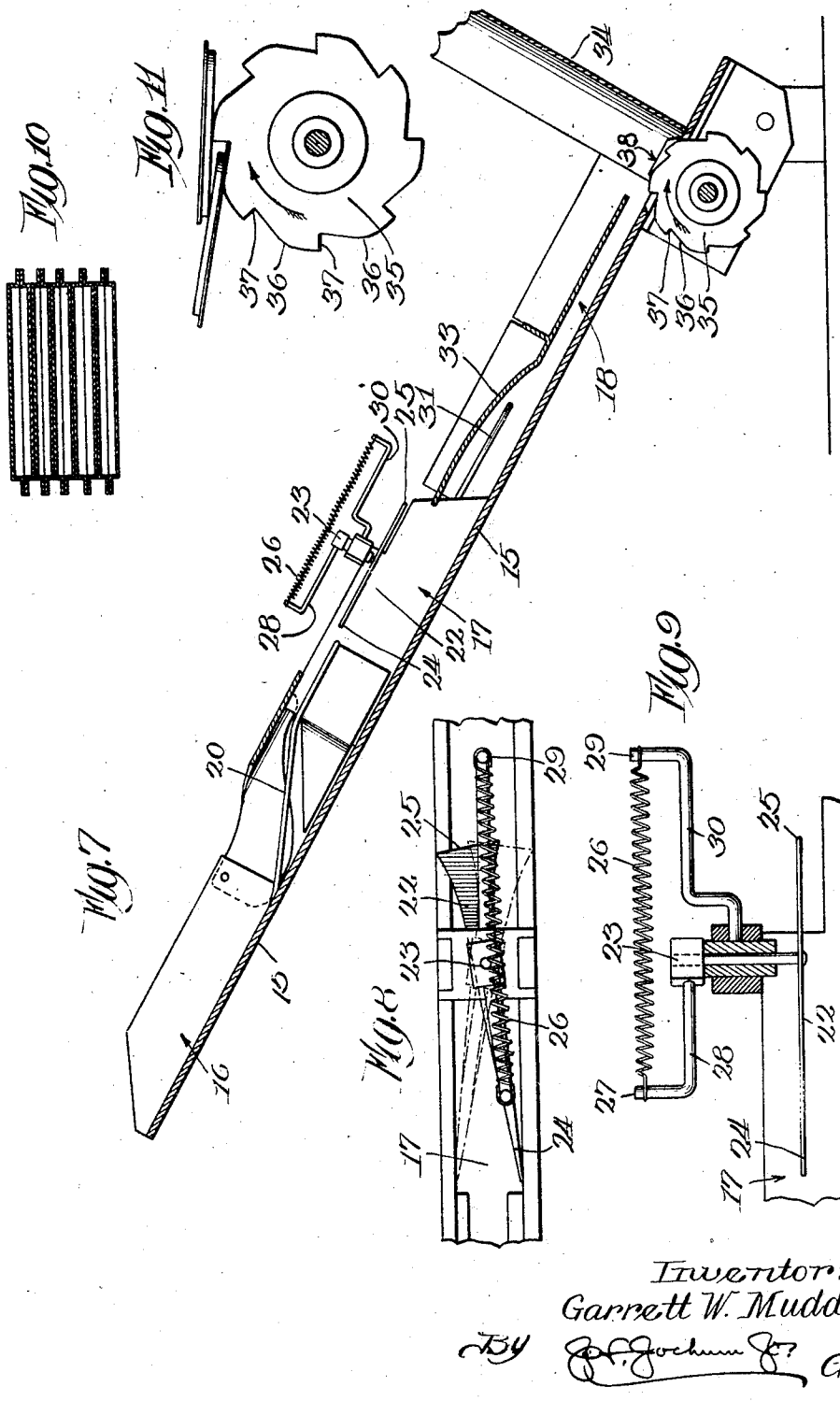
Inventor:
Garrett W. Mudd
by J. F. Jackman Jr. Atty.

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G. W. MUDD

MACHINE FOR TURNING AND STACKING THE ENDS OF CANS

Filed August 30, 1924 2 Sheets-Sheet 2



Inventor:
Garrett W. Mudd
By J. F. Jochum Jr. Atty.

Patented Feb. 9, 1926. 1,572,219

UNITED STATES PATENT OFFICE.

GARRETT W. MUDD, OF CHICAGO, ILLINOIS.

MACHINE FOR TURNING AND STACKING THE ENDS OF CANS.

Application filed August 30, 1924. Serial No. 735,091.

To all whom it may concern:

Be it known that I, GARRETT W. MUDD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Turning and Stacking the Ends of Cans, of which the following is a specification.

This invention is particularly adapted, though not necessarily limited in its use for turning and stacking the metallic ends used in connection with cans of a fibrous body and which ends are provided with a flange edge or rim that is adapted to be flanged over the ends of the body of the can and crimped about or embedded into the can body.

These ends are of a more or less cup formation, the laterally projecting flange being spaced above the body portion of the can end, with the result that when a plurality of ends have been stacked, they will become "nested" thereby rendering it difficult to feed the ends to a machine or to the can body by the feeding mechanism usually employed in machines commonly known as capping machines.

It has been found that by reversing the ends or covers and then stacking them so that they will be arranged in pairs with the faces of each pair of ends adjacent each other, they may be readily fed from the stack to a capping machine.

It is therefore one of the objects of the present invention to provide improved means for turning and for stacking the ends of the can.

A further object is to provide an improved machine of this character which will be of a simple, durable, light and compact construction, and which will be effective and efficient and automatic in its operation.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and as shown in the accompanying drawings illustrating this invention and in which drawings,

Figure 1, is a plan view of a machine of this character constructed in accordance with the principles of this invention.

Figure 2, is a sectional view on line 2—2 Figure 1.

Figure 3, is a sectional view on line 3—3 Figure 1, showing a can end partially turned.

Figure 4, is a sectional view on line 4—4 Figure 1, showing a can end in another partially turned position.

Figure 5, is a sectional view on line 5—5 Figure 1, showing two ends in partially turned positions.

Figure 6, is a detail right hand end elevation of Figure 1.

Figure 7, is a longitudinal sectional view taken on line 7—7 Figure 1.

Figure 8, is a detail top plan view of the switching device for directing the ends that are being fed.

Figure 9, is a side view of the switching device partly in elevation and partly in vertical section.

Figure 10, is a view of a number of stacked can ends.

Figure 11, is a vertical sectional view of the stacking roller showing the manner in which the can ends are fed and stacked thereby.

Throughout the specification and claims the mechanism will be described in connection with a can cap, and the articles handled thereby will be designated as can caps or cap, but it is to be understood that this term is not to be considered as a term of limitation, as the bottoms of the cans may be as readily and efficiently handled and stacked.

Referring more particularly to the drawings the numeral 15, designates a supporting base constituting the bottom of a trough shaped superstructure. This superstructure consists of a plurality of sections 16, 17, and 18, each having co-operating side walls, and the se tions are preferably of varying widths and shapes.

The section 16, constitutes the inlet section for the caps, the side walls of which converge from the inlet end towards the section 17. The said inlet end of the section 16, is of a width somewhat greater than the diameter of the cap to be fed.

The side walls of the section 17, are substantially parallel and are arranged com-

paratively close together so that the cap passing therethrough from the section 16, will be held on edge, and the cap will roll through the section 17. This section together with the sections 16, and 18, may be of any desired length, but are of respective lengths to permit of and insure a complete lateral turning of the cap during its passage throughout the combined lengths of the sections.

The side walls of the section 18, are spaced from each other for a distance slightly greater than the diameter of the cap, and the ends of the walls of the section 18, preferably overlap and are spaced from the proximate ends of the walls of the section 17.

The structure thus formed is preferably supported in a position inclined to the horizontal with the section 16, uppermost so that a cap fed into the inlet end thereof will move by gravity therethrough and also through the successive sections 17, and 18.

The caps are separately placed in the inlet end of the section 16, so that they will lie flat upon the bottom or support 15, and as they travel through the successive sections of the trough formation they will be tilted or turned so that they will rest upon their peripheral or flanged edges and will then be alternately turned in opposite directions so that opposite faces of alternate caps will be presented to the feeding and stacking roller which latter will be hereinafter described.

Arranged within the trough section 16, are cam shaped members, guides, or deflectors 19, 20, preferably formed of wire arranged preferably on opposite sides of the trough section and they co-operate to gradually raise the can cap by turning the same upon its flanged or peripheral edge. A shield or guard 21, is preferably placed over the trough section to prevent the can caps from leaving the trough section through the top thereof.

As the caps leave the trough section 16, and enter the trough section 17, they contact with a switch member 22, which extends along the top of the section and is pivotally mounted intermediate its ends as at 23, upon a suitable support, the forward end of the switch being preferably disposed adjacent the junction of the section 16, and 17, and the rear end of the switch is disposed adjacent the section 18. The forward end 24, of the switch is tapered and is adapted to move from one side of the trough section 17, to the other side thereof for directing the can caps to one side or the other of the pivot 23.

The switch is automatically moved about its pivot 23, by the can caps, and in order to accomplish this result the rear end 25, of the switch is preferably widened and the edge of such portion is engaged by the can cap as it rolls down the section 17.

When the cap strikes one edge of the end 25, of the switch, the latter will be moved about its pivot to switch the end 24, to the other side of the trough section, thereby causing the next advancing cap to be directed to the other side of the switch until the cap strikes the end 25, of the switch to move the end 24, back again. During this movement of the switch 22, the side of the rear end 25, on one side of the switch will move away from the wall of the trough to permit the can cap to roll past the switch and into the trough section 18, while the other side of the rear end 25, of the switch will move into the path of movement of the cap to be engaged by the cap to again shift the switch. This operation will continue and the switch will be moved back and forth about its pivot by the successive caps.

A spring 26, may be provided for assisting in moving the switch and for holding the same in its adjusted position. One end of the spring is connected as at 27, with the switch 22, preferably through the medium of an arm 28, and the other end of the spring is anchored as at 29, to a stationary arm 30. The spring is so arranged that when the point of connection 27, with the arm 28, moves over the center of the pivot 23, the tension of the spring will cause the switch to swing about its pivot and will hold the switch in its adjusted position until the point of attachment 27, of the spring 26, again moves over the center of the pivot 23, at which time its stress will move the switch in the opposite direction.

As the caps emerge from the end of the trough section 17, they will engage guides or deflectors 31, 32, preferably formed of wire and which extend beyond the section 17, into the section 18.

These guides converge from the section 17, and are preferably disposed at an elevation below the center of the can caps.

As the caps move between the guides 31, 32, they engage a deflector 33, disposed adjacent the top of the trough. The sides of the deflector 33, extend from a point above the guides 31, 32, and diverge for any desired distance so as to form spaces between the sides of the deflector and the respective adjacent walls of the trough section 18. The deflector 33, is so shaped and arranged that the edges thereof will co-operate with the respective guides 31, 32, to tilt the caps (see Figure 5) and turn them down from their peripheral edges so that they will rest flat upon their faces and upon the bottom of the trough section 18.

As the switch 22, is operated by the successive caps, the caps will be alternately directed to one side or the other of the deflector 33, and the successive caps will be alternately turned first in one direction and then in the opposite direction, and the caps will be al-

ternately reversed and adjacent caps will be stacked with their top or outer faces together, as shown more clearly in Figure 10.

The operation of this portion of the mechanism is as follows:

The caps are fed into the trough section 16, so as to rest flat upon the bottom 15, and as the bottom is inclined the caps will travel by gravity through the entire length of the trough.

The caps are fed with the same face uppermost and as they travel through the section 16, they will first contact with the guides 19, and 20, and will be turned thereby from a flat or horizontal position into an upright or vertical position so that they will rest upon the peripheral edge. They will then roll beneath the guard or shield 21, which latter prevents the caps from jumping out of the trough or runway, and into the section 17, on one side or the other of the end 24, of the switch 22, according to the position of the switch. As the cap continues to roll past the switch 22, it will engage the side of the end 25, of the switch and swing the switch from the full line position to the dotted line position as shown in Figure 8.

After the switch has been thus shifted the cap will be directed to one side or the other of the deflector 33. The deflector 33, cooperating respectively with the guides 31, 32, will alternately turn the successive caps in one direction or the other (see Figure 5) according to the side of the deflector on which the caps are travelling, to successively turn them in opposite directions and cause them to rest flat upon the bottom 15, of the section 18, after they have passed the guides 31, 32. This will cause the alternate caps to rest upon their bottoms in the trough section 18, and the remaining alternate caps to rest with their upper faces on the bottom of the trough section 18.

Obviously the caps are fed at such intervals as to permit the switch 22, to be shifted about its pivot by one cap to properly position it to handle the next adjacent advancing cap.

After the caps are thus turned or reversed they may be stacked in a hopper or container 34, arranged at the end of the trough section 18, and preferably having an open face to permit the caps to be fed therefrom the bottom 15, by means of a feeding roller 35, suitably operated such as by means of a pulley 35a.

The periphery of the roller is preferably constructed of rubber or any other suitable material which will frictionally engage the surface of the caps and advance them and at the same time feed them into the hopper or container 34, through the bottom thereof by reason of the fact that the friction between the contacting surfaces of the roller and the cap will be greater than the friction between the caps themselves.

The periphery of the roll is preferably notched as at 36, to form shoulders 37, and which shoulders are engaged by the edges of the caps as they are fed down the trough. The roller rotating in the direction of the arrow will cause the periphery to engage the face of the cap and by means of friction, advance the cap and force it into the hopper 34. The next cap is forced into the hopper beneath the cap or caps therein.

When the roller engages the face of the cap and advances it, a portion of the cap being advanced thereby overhangs the next adjacent shoulder 37, on the roller so that the next cap will pass under the overhanging cap, and the latter will co-operate with the periphery of the roller to grip the cap and assist in advancing it.

If desired and as a means for supporting the weight of the accumulated or stacked caps in the hopper or container 34, a suitable support 38, (see particularly Figure 6) may be provided and upon which support the flange of the cap rests when the cap is fed into the hopper by the roller. The surface of the support is substantially flush with the adjacent portion of the periphery of the roller 35.

While the preferred form of the invention is herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:

1. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent one end of the trough for turning the caps from a substantially flat position on edge, means disposed adjacent another portion of the trough and operable upon all of the caps for turning successive caps in opposite directions, and means for controlling the direction in which the caps are to be turned.

2. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent one portion of the trough for turning the caps on edge, means disposed adjacent another portion of the trough for turning successive caps in opposite directions, and shiftable means controlled by the caps for controlling the direction in which the caps are to be turned.

3. A machine for turning can caps and including a runway or trough through which the caps are fed by gravity, means disposed adjacent one portion of the trough for turning the caps on edge, means dis-

posed adjacent another portion of the trough for turning successive caps in opposite directions, and automatically actuated means controlled in its operation by the advancing movement of the caps for controlling the direction in which the caps are to be turned.

4. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent one portion of the trough for turning the caps on edge, means disposed adjacent another portion of the trough for turning successive caps in opposite directions, and means for controlling the direction in which the cap is to be turned, the last recited means including an automatically operated switch device.

5. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent the path of movement of the caps for turning them on edge, means for laterally turning the caps in two different directions, and mechanism interposed between the first two recited means adapted to be set to determine the direction in which the caps shall be turned by the second recited means.

6. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent the path of movement of the caps for turning them on edge, means for laterally turning the caps in two different directions, and mechanism disposed between the first two recited means for determining the direction in which the caps shall be turned by the second recited means, the said mechanism including a shiftable switch device.

7. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent the path of movement of the caps for turning them on edge, means for laterally turning the caps in two different directions, and mechanism interposed between the first two recited means and automatically set by the caps for determining the direction in which the caps shall be turned by the second recited means.

8. A machine for turning can caps and including a trough or runway through which the caps are propelled by gravity, means disposed adjacent the path of movement of the caps for turning them on edge, means for laterally turning the caps in two different directions, and mechanism disposed between the first two recited means for determining the direction in which the caps shall be turned by the second recited means, the said mechanism including a shiftable switch device automatically actuated by the caps as they advance through the said machine.

9. A machine for turning can caps and including a trough like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their edges on to one of their flat faces, and means adapted to be selectively set for directing the caps to the last recited means.

10. A machine for turning can caps and including a trough-like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their edge on to one of their flat faces, and shiftable means responsive in its operation to the movement of the caps through the trough for controlling the direction in which the caps shall be laterally turned by the second recited means.

11. A machine for turning can caps and including a trough-like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their edge on to one of their flat faces, and means responsive in its operation to the movement of the caps through the trough for controlling the direction in which the caps shall be turned by the second recited means, the third recited means including a shiftable switch like device for changing the course of travel of the can caps.

12. A machine for turning can caps and including a trough like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their edge onto one of their flat faces, and means responsive in its operation to the movement of the caps through the trough for controlling the direction in which the caps shall be turned by the second recited means, the third recited means including a switch device moved by the engagement of the caps therewith.

13. A machine for turning can caps and including a trough like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their edge on to one of their flat faces, and means responsive in its operation to the movement of the caps through the trough for controlling the direction in which the caps shall be turned by the second recited means, the third recited means including a spring controlled switch device movable against the stress of the spring by the engagement of the caps with the switch for changing the course of travel of the caps.

14. A machine for turning can caps and including a trough like runway through which the caps are propelled by gravity, means for turning the caps on edge, means for laterally turning the caps from their

edge on to one of their flat faces, and means responsive in its operation to the movement of the caps through the trough for controlling the direction in which the caps shall be turned by the second recited means, the third recited means including a spring controlled switch device movable against the stress of the spring by the engagement of the caps with the switch for changing the course of travel of the caps, the said spring assisting in maintaining the switch in its adjusted position and being also operable to assist in shifting the switch.

15. A can cap turning machine including a trough like runway through which the caps are propelled by gravity, means for turning the caps from a flat position on to their edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, and mechanism interposed between the two said means and operating automatically to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions.

16. A can cap turning machine including a trough like runway through which the caps are propelled by gravity, means for turning the caps from a flat position on to their edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, and mechanism interposed between the two said means and operating automatically to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, the said mechanism including a switch actuated directly by the engagement of the caps with a portion of the switch.

17. A can cap turning machine including a trough like runway through which the caps are propelled by gravity, means for turning the caps from a substantially horizontal position on to their respective edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, mechanism interposed between the two said means and operating to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, and means for collecting and stacking the caps in pairs with their corresponding faces opposed to each other.

18. A can cap turning machine including a trough like runway through which the caps are propelled by gravity, means for turning the caps from a substantially horizontal position on to their respective edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, mechanism interposed between the two said means and operating to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, and means for collecting and stacking the caps in pairs with their corresponding faces opposed to each other, the last recited means including a roller for engagement with one of the flat faces of the cover and means for actuating the roller.

19. A can cap turning machine including a trough like runway through which the caps are propelled by gravity, means for turning the caps from a substantially horizontal position on to their respective edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, mechanism interposed between the two said means and operating to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, and means for collecting and stacking the caps in pairs with their corresponding faces opposed to each other, the last recited means including a roller for engagement with one of the flat faces of the cover and means for actuating the roller, the surface of the said roller being resilient.

20. A can cap turning machine including a trough like runway through which the caps travel by gravity, means for turning the caps from a substantially horizontal position on to their respective edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, mechanism interposed between the two said means and operating to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, and means for collecting and stacking the caps in pairs with their corresponding faces opposed to each other, the last recited means including a roller rotatable on a horizontal axis for engagement with a flat face of the covers, and shoulders on the periphery of the roller against which the edges of the caps engage as they are fed to the roller.

21. A can cap turning machine including a trough like runway through which the caps travel by gravity, means for turning the caps from a substantially horizontal position on to their respective edges, means including a deflector having two active faces for laterally turning the successive caps in opposite directions, mechanism interposed between the two said means and operating to alternately direct the caps against opposite faces of the said deflector to cause alternate caps to be turned in opposite directions, and means for collecting and stacking the caps in pairs with their corresponding faces opposed to each other, the last recited means including a roller rotatable on a horizontal axis for engagement with a flat face of the covers, and shoulders on the periphery

of the roller against which the edges of the caps engage as they are fed to the roller, one of the caps which is being advanced by the roller co-operating with the roller to clamp the next adjacent cap therebetween.

22. Stacking mechanism for can ends, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, and a support for feeding the can ends to the roller, said roller having a resilient surface operating to engage a flat surface of the can end, the said roller operating to elevate and sustain the weight of the can end while advancing and superposing the said ends in the hopper from a point adjacent the bottom of the hopper.

23. Stacking mechanism for can caps, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, said roller having a resilient surface operating to engage a flat surface of the caps operating to elevate and sustain the weight of the cap while advancing the caps and superposing them in the hopper from a point adjacent the bottom of the hopper, and means within the hopper for receiving the caps and sustaining the weight of the pile of caps from the roller.

24. Stacking mechanism for can caps, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, means for feeding the caps in a substantially flat position to the roller, the said roller having a resilient surface operating to engage a flat face of the caps for delivering them into and superposing them in the hopper the said roller operating to elevate and sustain the weight of the cap, and means for causing one of the caps which is being advanced by the roller to co-operate with the roller to grip the next adjacent cap to assist in advancing the last recited cap.

25. A stacking mechanism for can caps, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, means for feeding the caps in a substantially flat position to the roller, the said roller having a resilient surface operating to engage a flat face of the caps for delivering them into and superposing them in the hopper, the said roller operating to elevate and sustain the weight of the cap, and means for causing one of the caps which is being advanced by the roller to co-operate with the roller to grip the next adjacent cap to assist in advancing the last recited cap, the last recited means including shoulders on the periphery of the roller against which the edge of the caps rest.

26. Stacking mechanism for can caps, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, means for feeding the caps to the roller and in a substantially flat position, the said roller engaging a flat face of the caps for delivering them into and superposing them within the hopper, the said roller operating to elevate and sustain the weight of the cap, and means for causing one of the caps which is being advanced by the roller to co-operate with the roller to grip the next adjacent cap to assist in advancing the last recited cap, the surface of the roller being resilient.

27. Stacking mechanism for can caps, said mechanism including an upright hopper, a roller adjacent the bottom of the hopper and rotating on a horizontal axis, means for actuating the roller, means for feeding the caps to the roller, the periphery of the roller being resilient, spaced shoulders arranged about the periphery of the roller and adapted to be engaged by the edge of the can caps, the periphery of the roller between the shoulders engaging a flat surface of the caps for advancing the caps and feeding them into the hopper, one of the caps overhanging another of the shoulders on the roller, and co-operating with the roller to grip the next adjacent cap to assist in feeding the latter.

In testimony whereof I have signed my name to this specification, on this 25th day of July, A. D. 1924.

GARRETT W. MUDD.