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CAN TURNER

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Fig. 1.

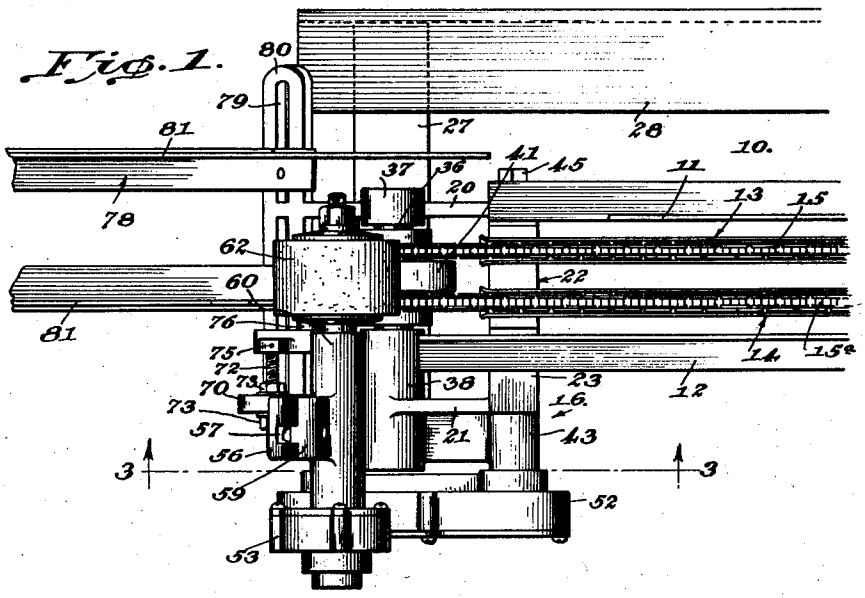
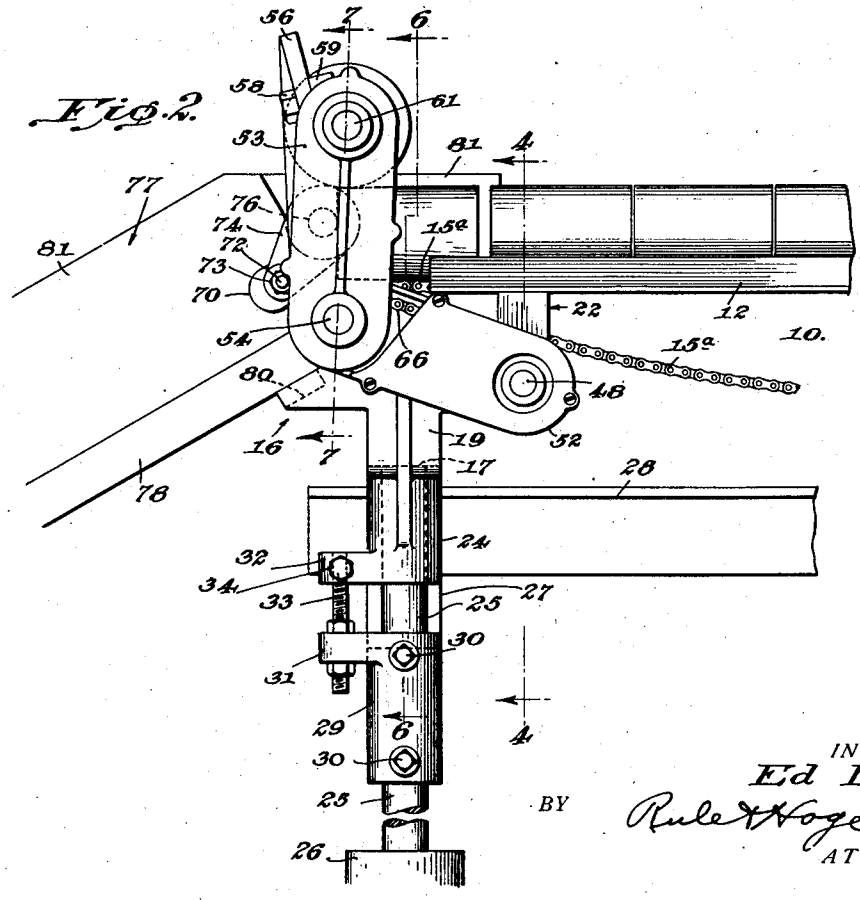


Fig. 2.



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Fig. 3.

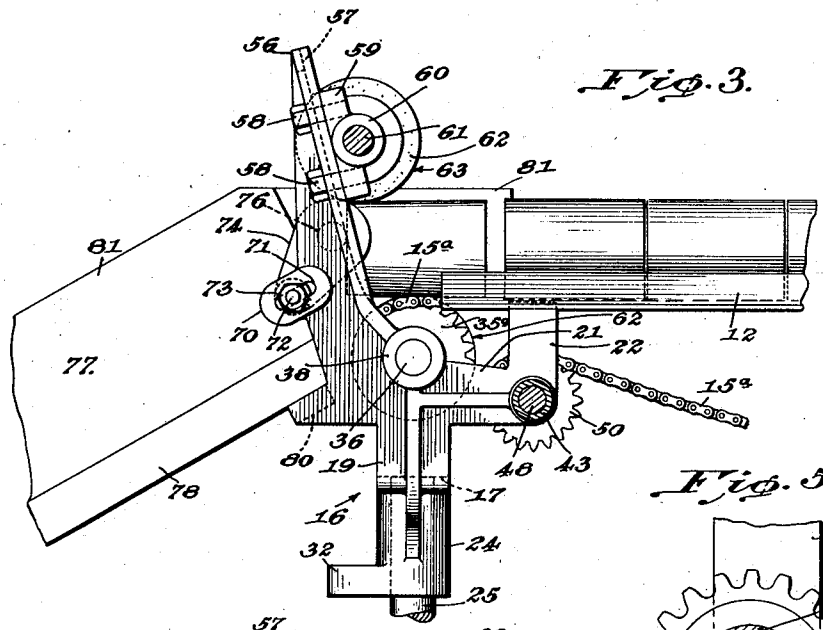
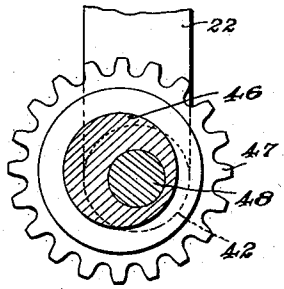


Fig. 5.



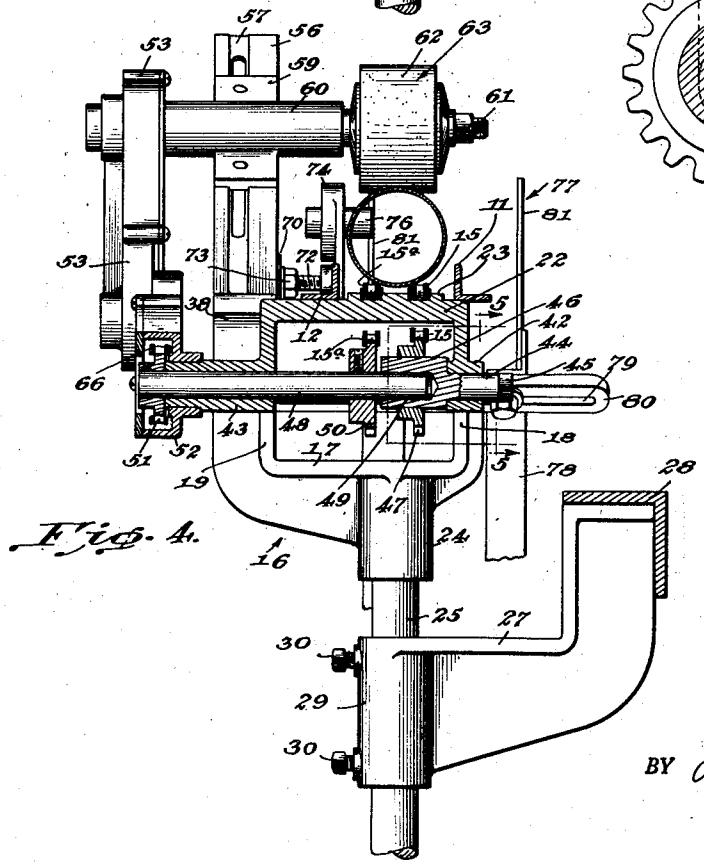


Fig. 4.

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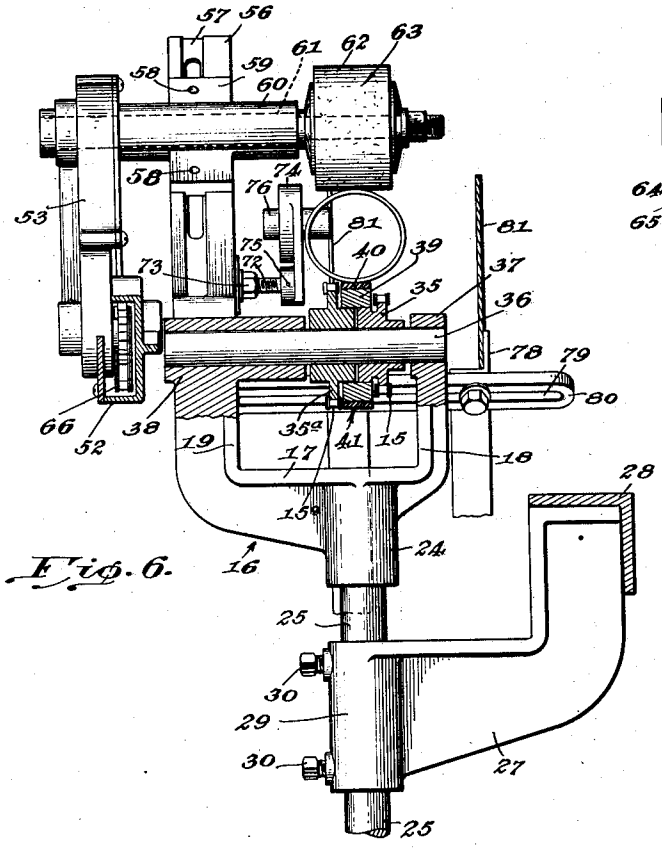


Fig. 6.

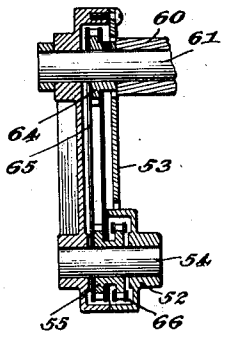


Fig. 7.

Fig. 8.

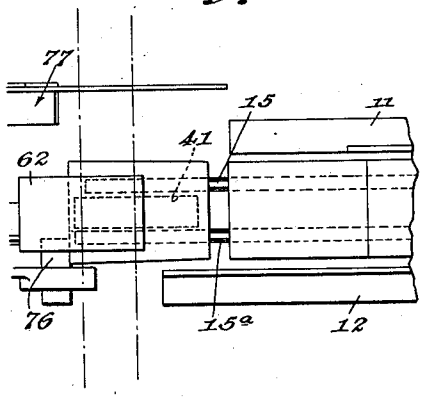
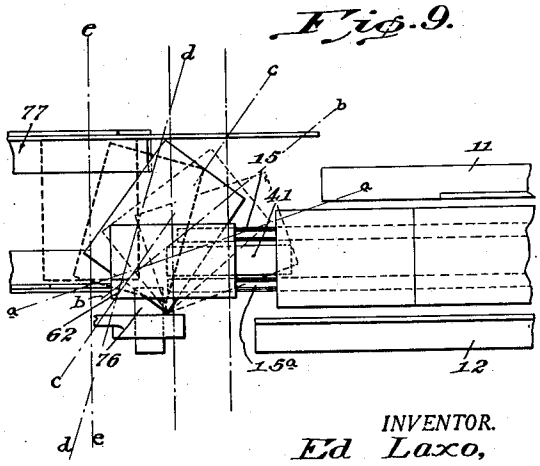


Fig. 9.



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Patented June 13, 1939

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UNITED STATES PATENT OFFICE

2,162,457

CAN TURNER

Ed Laxo, Baltimore, Md., assignor to Owens-Illinois Can Company, a corporation of Delaware

Application June 23, 1937, Serial No. 149,865

8 Claims. (Cl. 198—33)

The present invention relates to a can body-turning device designed for attachment to or incorporation with the discharge end of a cooler chain conveyor leading from a can body-making machine for the purpose of changing the relation of the axis of the can bodies with respect to their line of motion in order that the can bodies may be discharged from the cooler chain conveyor properly oriented for transportation to a machine for applying the can bottoms.

The practice heretofore in turning the can bodies has been to position a bumper or pivot pin in the path of movement of the oncoming axially aligned can bodies in such a manner that the forward rims of the can bodies successively strike the pivot pin, the kinetic energy possessed by the can bodies due to their motion on the cooler chain being relied upon as the sole agent or force in turning the can bodies. Such an arrangement has not been entirely satisfactory in that the can bodies are not always sufficiently spaced on the cooler chain to permit the can body being turned on the pivot pin to clear its immediate successor. Due to the fact that the moment a particular can body strikes the pivot pin its linear travel is immediately terminated, the next succeeding can body is afforded an opportunity to "catch up", so to speak, with the can body undergoing turning so that, upon turning of the latter, there is a collision between the two can bodies, thus destroying proper orientation of both can bodies and resulting in a consequent jamming of the machine.

The principal object of the invention is to provide a can-turning device employing a bumper or pivot pin upon which the can bodies are turned and in which there is incorporated a positive means for engaging the can bodies immediately prior to their coming into contact with the pivot pin to impart thereto an impetus which impels and directs the bodies toward the pivot pin and also impels the bodies in their turning movement on the pivot pin while at the same time the normal movements of the bodies are accelerated so that each successive body undergoing turning will be drawn clear of the succeeding body on the cooler chain.

Other objects of the invention, not at this time enumerated, will become apparent as the description ensues.

In the accompanying drawings:

Fig. 1 is a fragmentary top plan view of the discharge end of a cooler chain construction showing a can body-turning apparatus manufactured in accordance with the principles of the invention associated therewith;

Fig. 2 is a side elevational view of the apparatus shown in Fig. 1;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 2;

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 4;

Fig. 6 is a sectional view taken substantially along the line 6—6 of Fig. 2;

Fig. 7 is a sectional view taken substantially along the line 7—7 of Fig. 2; and

Figs. 8 and 9 are diagrammatic views of the apparatus illustrating the manner in which the can bodies are turned upon a pivot pin forming a part of the present invention.

In the drawings, a portion of a cooler chain assembly 10 adjacent the discharge end thereof is shown. The assembly includes a pair of guide rails 11 and 12 between which there extends in parallelism a pair of conveyor chain guides or channels 13 and 14 through which a pair of endless conveyor chains 15 and 15a extend and in which the upper can body supporting portions of the chains are slidably supported. The cans issuing from the body-making machine (not shown) rest upon the conveyor chains 15 and 15a in close proximity to each other as shown in Fig. 3 with their axes in alignment.

The ends of the guide rails 11 and 12 and of the chain guides or channels 13 and 14 are supported upon a casting which is designated in its entirety at 16 and which includes a yoke portion 17 having upstanding arms 18 and 19 provided with forwardly extending arms 20 and 21 respectively which serve to support therebetween an inverted U-shaped portion 22 (Fig. 4) of the casting. The upper cross piece 23 of the U-shaped portion of the casting provides a table or support upon which the ends of the guides or channels 13 and 14 as well as the ends of the guide rails 11 and 12 are supported.

In order to adjust the elevation of the discharge end of the cooler chain assembly 10 (Fig. 2), means is provided whereby the height of the casting 16 may be adjusted vertically. Toward this end, the lower portion of the casting is in the form of a sleeve 24 which is slidably mounted upon a vertical support 25, the lower end of which is anchored in a boss 26 formed on an anchor plate (not shown) which is secured in any suitable manner to the floor or foundation. A guard rail support 27 (Fig. 2), carrying an elongated guard rail 28, is provided with an integrally formed sleeve 29 which is mounted on

the vertical support 25 and is designed to be secured in any desired adjusted vertical position thereon by means of set screws 30. A lug 31 is integrally formed on the sleeve 29 and extends laterally therefrom. The sleeve 24 of the casting 16 is formed with a similar lug 32 overlying the lug 31 and adjustably connected thereto by means of a threaded spacing bolt 33. A set screw 34 extending through the lug 32 permits the casting 16 to be vertically adjusted on the support 25.

A pair of friction rollers consisting of an upper roller 62 and a lower roller 41 are positioned in the path of movement of the can bodies issuing from the discharge end of the cooler chain 10 and are adapted to frictionally engage the oncoming can bodies successively and project the same against a pivot pin 76 which is struck eccentrically by the bodies and upon which the bodies are pivoted. The rollers 62 and 41 are driven from the cooler chains 15 and 15a at the same rate of surface speed in a manner now to be more fully described.

The discharge end of the can body conveyor chains 15 and 15a pass over respective conveyor sprocket wheels 35 and 35a respectively (Fig. 6). The sprocket wheels 35 and 35a are loosely mounted upon a shaft 36 which extends across the upper end of the yoke portion 17 of the casting and which has its ends secured in a pair of aligned sleeves 37 and 38 formed on the upper ends of the arms 18 and 19 respectively. The diameter of the sprocket wheel 35 is smaller than the diameter of the sprocket wheel 35a and a lesser number of teeth are provided on the former sprocket wheel than on the latter. A ring 39 which is provided with a leather face 40 is shrunk onto the sprocket wheel 35 and the diameter thereof is slightly greater than the diameter of the sprocket wheel 35. The ring 39 and its leather face 40 constitute one roller 41 of a pair of can turning rolls as will appear presently. The leather faced roller 41 occupies a position between the two sprocket wheels 35 and 35a and, by virtue of its diameter, the surface speed thereof is greater than the surface speed of either the chain 15 or the chain 15a. The roller 41 projects upwardly between the chains 15 and 15a above the level thereof and the can bodies which travel on these chains are adapted to move successively onto the leather faced roller 41 and be slightly elevated thereby from the chains 15 and 15a.

Referring now to Fig. 4, the outer ends of the arms 20 and 21 have integrally formed thereon a pair of aligned bearings 42 and 43 respectively. A short transverse shaft 44 having a squared end 45 is journalled in the bearing 42. The shaft 44 is provided with an eccentric head 46 (Figs. 4 and 5) upon which is rotatably mounted an idler sprocket wheel 47 over which the chain 15 passes. The shaft 44 may be turned in the bearing 42 by means of the squared end 45 thereof to shift the position of the eccentric head 46 and vary the tension of the chain 15. A shaft 48 has one end thereof rotatably journalled in the bearing 43 the other end thereof being rotatably received in a socket 49 formed in the enlarged head 46 in alignment with the axis of the supporting shaft 44. The chain 15a passes over a sprocket wheel 50 which is secured to the shaft 48 and thus the shaft 48 is driven directly from the chain 15a. The shaft 48 projects from the bearing 43 and carries at its projecting end a sprocket wheel 51 which is encased within a chain guard 52 (Fig. 2), the lower end of which is pivotally mounted upon the bearing 43. The upper end of the chain guard 52 is pivotally connected to a second chain guard 53, both guards 52 and 53 being pivotally connected to a short floating shaft 54 (Figs. 2 and 7). A dual sprocket wheel 55 rotatably mounted on the shaft 54 is encased commonly by the two chain guards 52 and 53. The casting 16 is provided with an upwardly inclined bracket 56 in the vicinity of the sleeve 38. The bracket 56 is provided with a slot 57 in which there is adjustably secured by means of clamping bolts 58 (Fig. 3) a casting 59 having an elongated bearing 60 formed thereon. A shaft 61 is rotatably journalled in the bearing 60 and one end thereof projects from the bearing 60 and carries a roller 62 having a fabric face 63 preferably though, of course, not necessarily formed of muslin. The roller 62 forms a counterpart of the roller 41 and is positioned thereabove and rearwardly thereof. The other end of the shaft 61 is provided with a sprocket wheel 64 (Fig. 7) thereon, which sprocket wheel is connected to the dual sprocket wheel 55 by means of a chain 65 contained within the upper chain guard 53. The dual sprocket wheel 55 and the sprocket wheel 51 are similarly connected together by a chain 66. From the above description of parts it will be seen that the lower roller 41 is driven directly from the chain 15 while the upper roller 62 is driven from the chain 15a through the sprocket wheel 50, shaft 48, sprocket wheel 51, chain 66, dual sprocket wheel 55, chain 65, sprocket wheel 64 and shaft 61. It will also be noted that by virtue of the floating shaft 54 (Fig. 7) the height of the upper roller 62 may be adjusted with respect to the lower roller 41 simply by adjusting the height of the supporting casting 59 and without disturbing the various chain and sprocket mechanisms which drive the upper roller.

The diameters of the respective rollers 41 and 62, and the number of teeth provided on the respective sprocket wheels 35, 50, 51, 55 and 64 are calculated in accordance with engineering exigencies in order that the surface speed of the two rollers 41 and 62 shall be the same.

Referring now to Figs. 1 and 3, the upwardly inclined bracket 56 is provided with a rearwardly extending lug 70 having a slot 71 formed therein. A bolt 72 extends through the slot and is secured therein in any desired adjusted position by means of a clamping nut 73. A pivot pin bracket 74 is anchored by means of a set screw 75 to the free end of the bolt 72 and a bumper or pivot pin 76 projects laterally therefrom and is designed to be positioned in the path of the can bodies which issue from the cooler chain assembly 10.

The pivot pin 76 is spaced from the dipping end of the cooler conveyor chains 15 and 15a and is positioned with respect to the longitudinal axis of the oncoming can bodies in such a manner that the can bodies which are picked up by the rollers 41 and 62 and which are given an impetus thereby are projected against the pivot pin with the pin engaging the forward rim thereof on one side of and slightly above the longitudinal axis of the can bodies. Engagement between the can bodies and the pivot pin 76 occurs while the bodies are positively engaged by the rollers 41 and 62 and thus, the moment the forward rims of the can bodies engage the pivot pin 76, the direction of the longitudinal axes of the can bodies commences to shift from the position of the can body in Fig. 8 to the successive positions

indicated by the axes *a—a*, *b—b*, *c—c*, and *d—d*, in Fig. 9. It is to be noted that the rims of the can bodies strike the pivot pin **76** well inwardly thereof adjacent the pivot pin bracket **74** and that during progressive turning thereof, the rims travel outwardly on the pin until such time as the can bodies are turned or pivoted throughout an angle of ninety degrees. At such time, the rims of the can bodies clear the pivot pin indicated by the axis *e—e* and the bodies are discharged onto an inclined chute **77** best illustrated in Figs. 1 and 3.

The chute **77** is adjustable to accommodate can bodies of varying size and consists of a pair of angle pieces **78** which are adjustably secured in slots **79** formed in a transverse bracket **80** formed on the casting **16**. Side plates **81** are suitably secured to the angle pieces **78** to limit the turning of the can bodies and to guide the same from the apparatus.

Inasmuch as the number of teeth provided on the sprocket wheel **35a** is in excess of the number of teeth on the sprocket wheel **35**, as has been previously stated, the surface speed of the lower roller will be in excess of the surface speed of the chains **15** and **15a**. Because of the fact that the center line of the lower roller **41** occupies a position ahead of the center line of the upper roller **62**, the can bodies will first come into contact with the lower roller and be impelled forwardly at a rate of speed greater than the rate of speed of the conveyor chains **15** and **15a**. After each can body undergoing turning comes into contact with the pivot pin **76**, it is in engagement with both rollers **41** and **62** which operate upon the rear portion thereof to accelerate turning of the can body on the pivot pin **76**. The lower leather faced roller **41** affords a good frictional contact while the upper muslin faced roller **62** is sufficiently soft that the can bodies are not marred by their engagement therewith. As is illustrated in Fig. 3, the space between each can body about to undergo turning in the apparatus and the next succeeding can body is immediately increased upon engagement of the can body with the lower roller **41**. As shown in Figures 8 and 9, the creation of such increased space together with the fact that the rollers **41** and **62** operate jointly upon the can body to rapidly turn the same on the pivot pin **76** permits the can body to be turned without the danger of collision with the next succeeding oncoming can body on the cooler chains **15** and **15a**.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. The combination with the discharge end of a can body conveyor upon which can bodies are moved progressively at a uniform rate of speed in axial alignment, of a can body-turning device for changing the relation of the axes of the can bodies with respect to their line of motion comprising a pivot pin positioned in the path of movement of said can bodies eccentrically of the common axis of the moving can bodies and against which the forward rims of the can bodies are adapted to successively strike to cause the can bodies to be pivoted thereon, and means positioned between said pivot pin and the discharge end of the conveyor for engaging the can bodies and accelerating the normal rate of speed thereof and projecting the same against said pivot pin.

2. The combination with the discharge end of a can body conveyor upon which can bodies are moved progressively at a uniform rate of speed in axial alignment, of a can body-turning device for changing the relation of the axes of the can bodies with respect to their line of motion comprising a pivot pin positioned in the path of movement of said can bodies and against which the forward rims of the can bodies are adapted to successively strike to cause the can bodies to be pivoted thereon, and means positioned between said pivot pin and the discharge end of the conveyor for frictionally engaging the can bodies and accelerating the normal rate of speed thereof and projecting the same against said pivot pin.

3. The combination with the discharge end of a can body conveyor upon which can bodies are moved progressively at a uniform rate of speed in axial alignment, of a can body-turning device for changing the relation of the axes of the can bodies with respect to their line of motion comprising a pivot pin positioned in the path of movement of said can bodies and against which the forward rims of the can bodies are adapted to successively strike to cause the can bodies to be pivoted thereon, a pair of friction rollers positioned between said pivot pin and the discharge end of said conveyor adapted to engage the can bodies successively therebetween and project the same against said pivot pin, and means for driving said rollers in unison at a greater rate of surface speed than the normal rate of speed of the can bodies on said conveyor.

4. In a device for changing the relation of the axes of cylindrical bodies fed axially thereto in a recumbent position, a pair of friction rollers between which the bodies are received and through which the same pass axially, a pivot pin positioned behind said rollers eccentrically to the longitudinal axes of the bodies issuing from said rollers and against which the forward rims of the bodies are adapted to strike to cause the bodies to be pivoted thereon, the distances between said pivot pin and the vertical planes passing through the axes of the respective rollers of said pair being less than the length of said bodies, and means for driving said rollers at the same rate of surface speed.

5. In a device for changing the relation of the axes of cylindrical bodies fed axially thereto in a recumbent position, a pair of friction rollers between which the bodies are received and through which the same pass axially, a pivot pin positioned behind said rollers eccentrically to the longitudinal axes of the bodies issuing from said rollers and against which the forward rims of the bodies are adapted to strike to cause the bodies to be pivoted thereon, the distances between said pivot pin and the vertical planes passing through the axes of the respective rollers of said pair being less than the length of said bodies, and means for driving one of said rollers.

6. The combination with the discharge end of a can body conveyor upon which can bodies are moved progressively at a uniform rate of speed in axial alignment, of a can body-turning device for changing the relation of the axes of the can bodies with respect to their line of motion comprising a pivot pin positioned in the path of movement of said can bodies and against which the forward rims of the can bodies are adapted to successively strike to cause the can bodies to be pivoted thereon, a friction roller positioned between said pivot pin and the discharge end of said conveyor, the axis of said roller extending transversely to the common axis of the moving

can bodies on said conveyor and the surface thereof extending above the lower surface level of the moving can bodies, said bodies being adapted to be discharged onto said roller and elevated thereby, and means for driving said roller at a greater rate of surface speed than the normal rate of speed of the can bodies on said conveyor.

7. The combination with the discharge end of a can body conveyor upon which can bodies are moved progressively at a uniform rate of speed in axial alignment, of a can body-turning device for changing the relation of the axis of the can bodies with respect to their line of motion comprising a pivot pin positioned in the path of movement of said can bodies eccentrically of the common axis of the moving can bodies and against which the forward rims of the can bodies are adapted to successively strike to cause the can bodies to be pivoted thereon, a pair of rollers positioned between said pivot pin and the discharge end of said conveyor adapted to engage the can bodies successively therebetween and project the same against said pivot pin, and means for driving one of said rollers at a greater rate of surface speed than the normal rate of speed of the can bodies on said conveyor.

8. In a device for changing the relation of the axes of cylindrical bodies fed in axial alignment thereto, a pair of horizontally disposed friction rollers between which the bodies are received and through which the same pass horizontally, one of said rollers being positioned rearwardly and above the level of the other roller, a pivot pin positioned rearwardly of said rollers and eccentrically to the longitudinal axes of the bodies issuing from said rollers and against which the forward rims of the bodies are adapted to strike to cause the bodies to be pivoted thereon, the distance between said pivot pin and the vertical plane passing through said rearwardly disposed roller being less than the length of the individual bodies whereby the bodies will remain in contact with said rearwardly disposed roller during at least a portion of its pivotal movement on said pin, and means for driving said rollers in unison at the same rate of surface speed.

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