

March 20, 1951

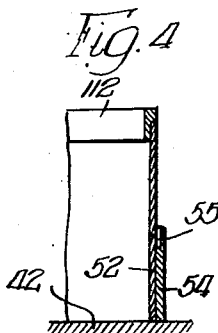
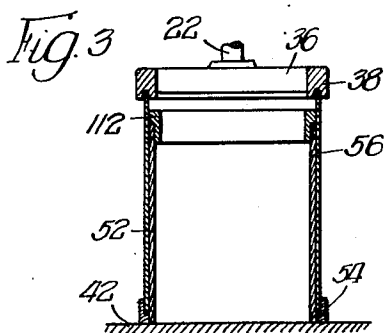
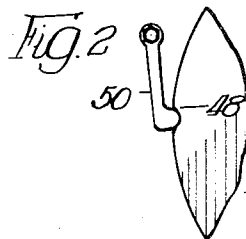
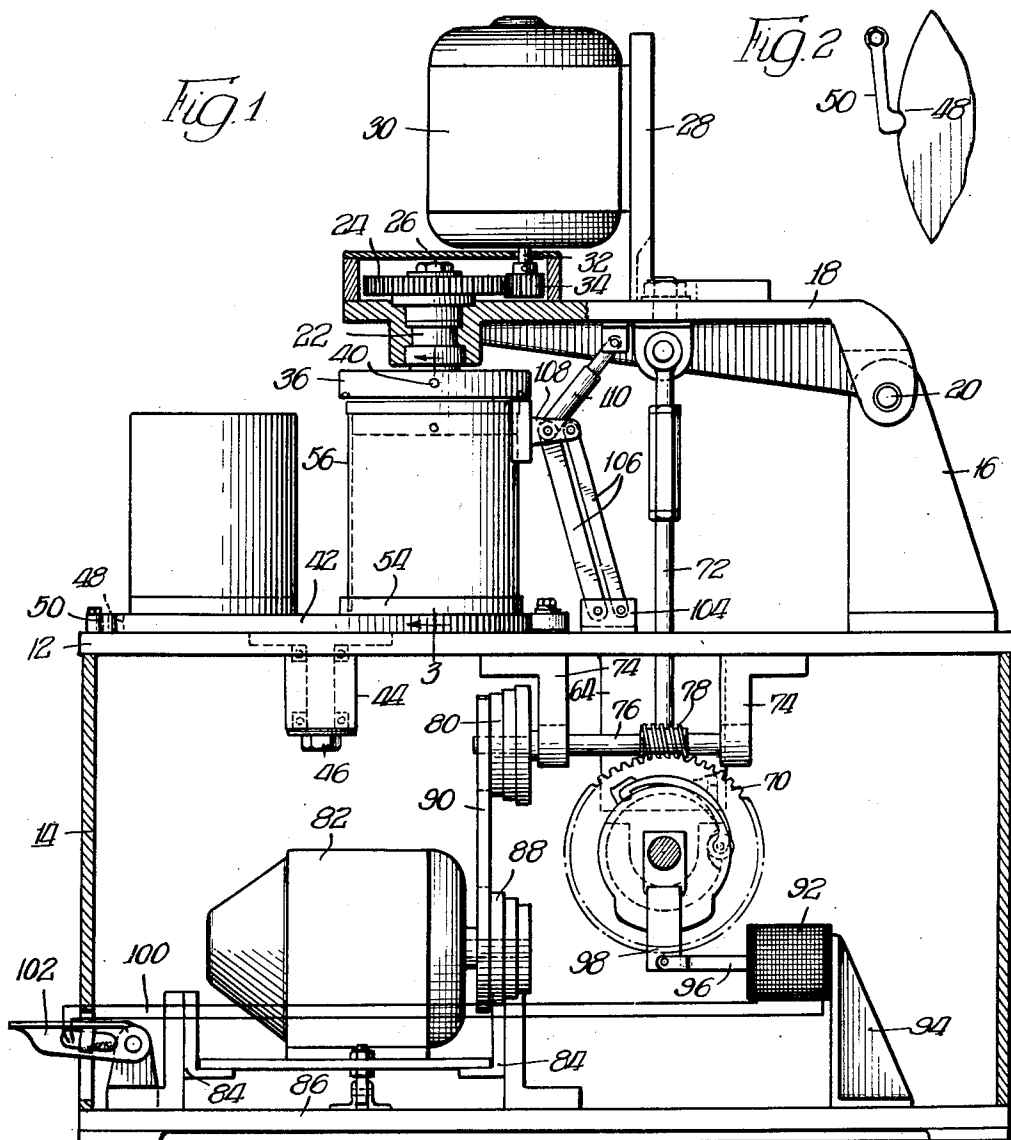
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2,545,912

CONTAINER SPINNING MACHINE

Filed June 4, 1949

3 Sheets-Sheet 1



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Fig. 5.

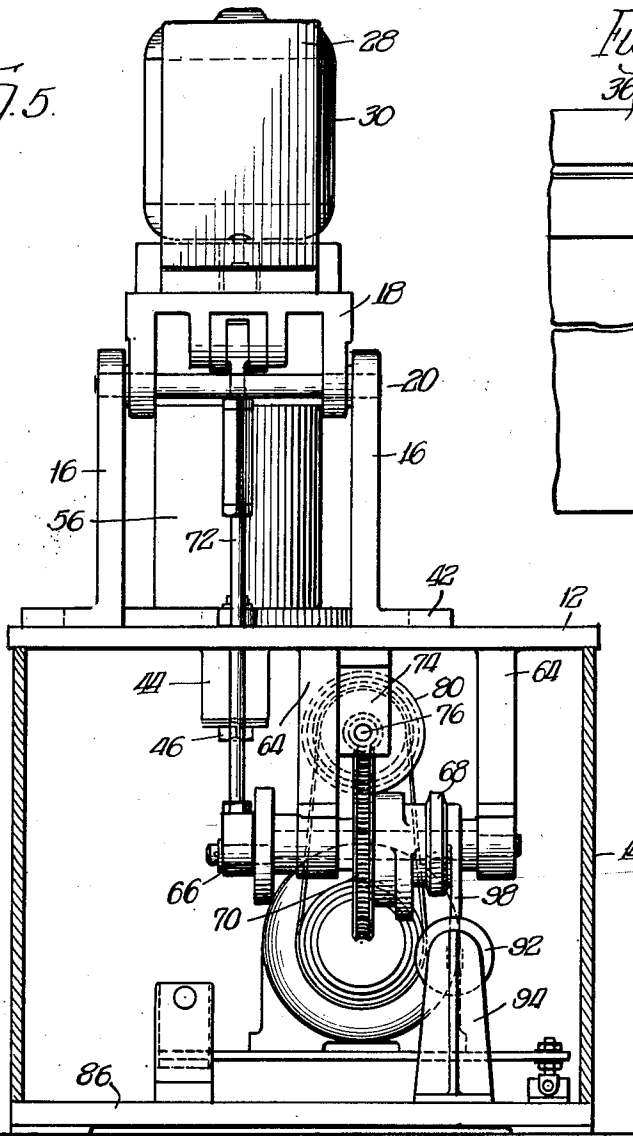


Fig. 6

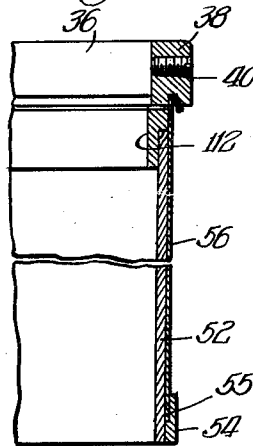


Fig. 7

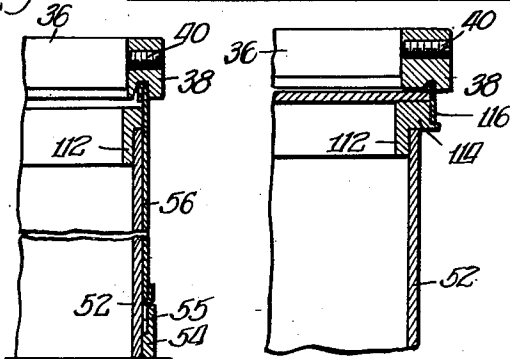


Fig. 8.

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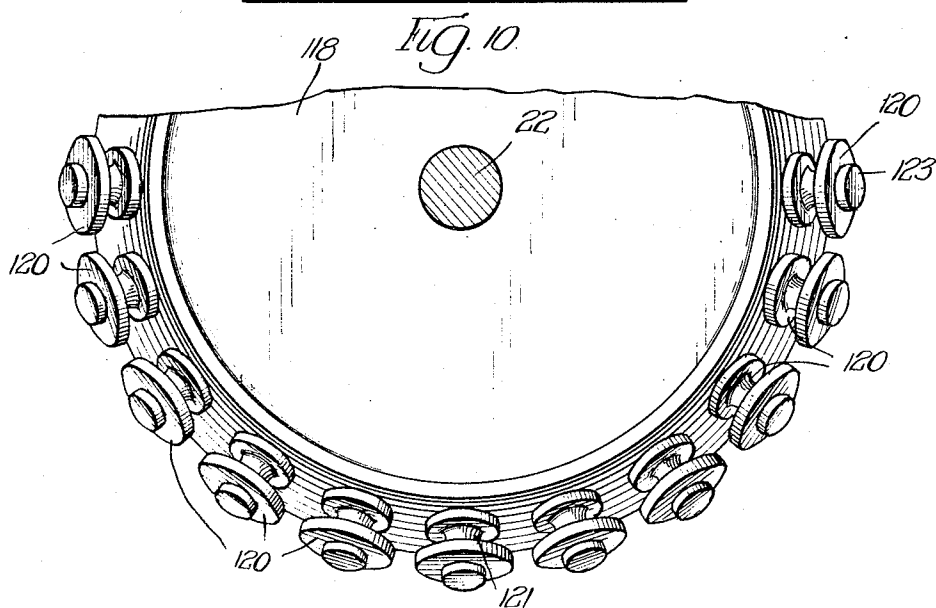
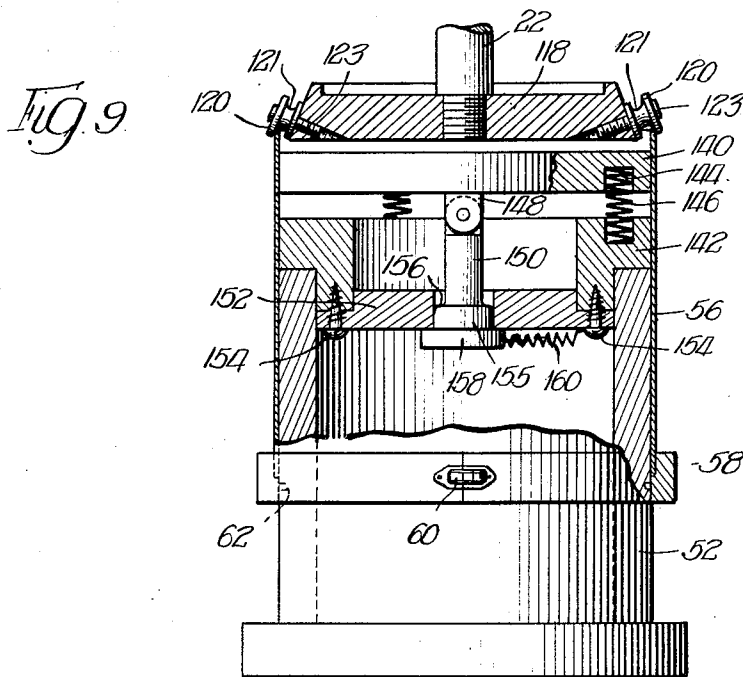
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CONTAINER SPINNING MACHINE

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2 Claims. (Cl. 93—36.5)

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The present invention relates to carton forming machines and more particularly to a machine for forming beaded or rolled edges on cylindrical containers.

In manufacturing cartons such as containers for ice cream or other semi-liquid products, it has been found desirable to have either double or single side walls formed from a single strip of relatively light paper. The upper, lower, or both margins may be rolled; one of them may be rolled inwardly and the other outwardly. The covers of these containers are sometimes formed from a single strip of paper and have the upper margin rolled.

When the side wall of the container and the rim of the cover are made from lightweight paper, it is somewhat of a problem to spin the roll on the margins without collapsing or damaging the side walls, particularly where there is some weakness in the paper. This is particularly true where the spin is inwardly rather than outwardly.

It is, therefore, an object of the present invention to provide a machine which may be readily adapted to spin either an inward or outward roll on containers and covers.

Another object is to provide a machine which is readily adaptable to spin the rims of containers of varying heights.

A further object is to provide a machine which will spin an inward roll on relatively light paper stock without damaging it.

Another object is to provide a machine which will spin a uniform inward or outward roll on containers and covers.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, in which like reference characters are used to designate like parts,

Fig. 1 is a side elevational view of a machine embodying the invention, the side wall of the lower cabinet being removed to more clearly show the interior thereof;

Fig. 2 is a fragmentary plan view of the indexing latch;

Fig. 3 is an elevation in cross section taken on the line 3—3 of Fig. 1;

Fig. 4 is a fragmentary elevation in cross section showing the retaining cylinder and arbor and a can clamp for holding the side wall of a container of less height than shown in Fig. 3;

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Fig. 5 is an end elevational view angularly displaced ninety degrees from Fig. 1;

Fig. 6 is an enlarged fragmentary cross section showing the spinner head in engagement with the upper portion of a container side wall on which an outward roll has been formed;

Fig. 7 is an enlarged fragmentary cross section similar to Fig. 6, but showing an inward roll on the upper portion of the container wall and an outward roll on the lower portion;

Fig. 8 is an enlarged fragmentary cross section showing a spinner head forming an inward roll on the upper edge of a container cover;

Fig. 9 is an enlarged fragmentary cross section showing a floating arbor in its uppermost position within a container wall and an improved spinner head for forming an inward roll; and

Fig. 10 is an enlarged fragmentary top plan view of the spinner head shown in Fig. 9.

In the drawings, particularly Figs. 1 and 5, the invention is shown as embodied in a table or supporting surface 12 which has side walls or panels 14 for enclosing the under portion. Brackets 16 are secured to the upper surface of the table 12. The spinning arm 18 is pivotally mounted at one end on the shaft 20, which is journaled in the brackets 16.

The outer end of the spinning arm 18 is provided with a suitable bearing in which the spinning shaft 22 is mounted. A gear 24 is secured to the upper end of the shaft 22 by the nut 26. A vertically extending bracket 28 is provided on the upper surface of the spinning arm 18 to which the electric motor 30 is secured, with the axis of rotation of its shaft 32 in a plane substantially normal to that of the arm 18. A reduction gear 34 is secured to the shaft 32 of the motor and is in mesh with the gear 24 on the spinning shaft 22 so that the speed of rotation of the spinning shaft is considerably less than that of the motor.

The spinner head 36 is threaded to the shaft 22. Spinner heads of the type shown in Figs. 1, 3, 6, 7 and 8 may have the spinning grooves formed in detachable flanges 38 which are secured to the spinner heads by set screws 40. The spinner heads or flanges may be quickly changed for various spinning operations.

A circular positioning device or turntable 42 is rotatably mounted on the table 12 which is provided with a journal 44 for supporting the shaft 46. The turntable 42 is provided with two diametrically opposed stations, each of which is adapted to be concentrically aligned with the spinner head when the latter is in a substantially horizontal position and when the turntable is in

each of two predetermined positions. These positions are determined by the indexing mechanism consisting of notches 48 in the turntable and a spring pressed latch 50 on the table 12 adjacent the perimeter of the turntable, as shown in detail in Fig. 2. The turntable is manually rotatable so that when the latch 50 is in engagement with one of the notches 48, one of the stations is in alignment with the spinner head and when the turntable is rotated 180°, the other station is so aligned. It is obvious that more than two stations may be provided.

Mounted on the turntable 42 at each of the stations is a retaining cylinder 52 having a circumference substantially that of the interior of the container wall and having a height approximately that of the tallest container that is contemplated. As shown more clearly in Figs. 3, 4 and 7, a flange or ring 54 encircles the base of the retaining wall 52 and is provided with an interior annular offset portion 55 adjacent its upper margin in which the side wall of the container 56 is supported. As shown in Figs. 3 and 7, the ring is of such a height as to support a container wall of considerably greater height than that shown in Fig. 4. In Fig. 7, the container wall has an outward roll on its bottom edge and this will not enter the offset portion 55 in the ring, with the result that the upper margin is presented at the proper altitude for spinning.

The upper margin would otherwise be too low if the bottom margin were already rolled. When the ring is in position, the space between the annular offset portion and the side of the retaining cylinder is such as to accommodate the side wall of the container prior to being rolled.

The same is true of the ring 58 shown in Fig. 9, which is a modified embodiment. The ring 58 is similar to the ring 54, but consists of two segments which are hinged together and have a snap clamp 60 at their free ends. The interior faces of the segments of the ring are provided with a plurality of studs 62 which engage in openings or depressions in the exterior surface of the retaining cylinder 52. These depressions are at predetermined levels, and the ring may be raised or lowered, depending on the desired height of the container, by merely unsnapping the clamp 60 and moving it so that the studs 62 engage the depressions in the retaining cylinder 52 at the desired level.

A pair of brackets 64 secured to the underside of the table 12 supports a self-contained gear box having an eccentric 66 at one end and a clutch 68 at the other, with the gear 70 intermediate. A connecting rod 72 is pivotally connected at one end to the eccentric 66 and passes through the table 12, having the other end pivotally connected to the under part of the spinner arm 18.

A pair of brackets 74 are secured to the under surface of the table and provide journals for the shaft 76 on which the worm gear 78 is non-rotatably mounted. The gear 78 is positioned to mesh with and drive the gear 70. A pulley 80 is non-rotatably mounted on one end of the shaft 76.

A motor 82 is mounted below the table 12 on brackets 84, which are secured to the platform 86, and is provided with a pulley 88 which is in alignment with the pulley 80. A belt 90 operatively connects pulleys 80 and 88.

A solenoid 92 is mounted on the bracket 94 secured to the platform 86. The solenoid plunger 96 is connected to the clutch actuating arm 98. The solenoid 92 is electrically connected by suitable wiring 100 to the pedal switch 102. The

clutch indicated generally at 68 may be of any type that will interrupt the drive from the worm gear 78 to the eccentric 66.

A bracket 104 is secured to the upper surface of the table 12 between the rod 72 and the turntable 42. A pair of levers 106 each has one end pivotally connected to the bracket 104 and positioned one in front of the other with their pivots in substantially the same horizontal plane. The opposite ends of the levers are pivotally connected to the can clamp 108. A lever 110 has its lower end pivotally connected to the can clamp 108 at approximately the same point as the forward of the two levers 106. The upper end of the lever 110 is pivotally connected to the spinner arm 18 at a point in substantially vertical alignment with the lower pivot of the rear of the two levers 106 when the spinner arm 18 is in a horizontal position. The lever 110 may be provided with a telescoping joint to impart a piston action and which may have a compression spring therein so that the can clamp 108 may engage the side wall of the container before the spinner arm has been completely lowered to a horizontal position. The compression of the spring within the joint urges the clamp against the container under pressure.

Figs. 3, 4, 6, 7 and 8 show more clearly the stationary arbor 112 which consists of a ring having an outside circumference corresponding to the inside circumference of the retainer wall 52 and adapted to fit within it. It is also provided with an outwardly projecting annular flange which overlays the upper margin of the retaining cylinder 52 but does not project beyond the side of the retaining cylinder as the side wall of the container, after it has been placed around the retaining wall 52 and seated on the ring 54, projects above the arbor, as shown in Fig. 3, a sufficient amount for the top margin to be rolled down against the top surface of the arbor as shown in Fig. 7.

In Fig. 8 the flange of the arbor 114 projects beyond the retaining cylinder and is provided with an offset portion for seating the rim of a container cover 116. The cover necessarily has a greater diameter than the container as it fits over it in the present instance, and this arbor may be placed in the same retaining cylinder when spinning a roll on the cover.

It will be noted that in Fig. 6 the container wall has been inserted in the offset portion 55 of the ring 54 and the spinning flange 38 is forming an outward roll on the container, while in Fig. 7 the container wall has been inverted and the outward roll rests on top of the offset portion 55 and the spinner head is forming an inward roll, the same size arbor being used in both instances. In Figs. 6, 7 and 8 the flanges 38 attached to the spinning head 36 have different spinning grooves, depending on whether it is an outward roll as shown in Fig. 6, an inward roll as in Fig. 7 or an inward roll on a cover as in Fig. 8.

The spinner head 118 shown in Figs. 9 and 10 is provided with peripheral rollers 120 rather than detachable flanges as shown in Figs. 6, 7 and 8. The spinner head shown in Figs. 9 and 10 is particularly adapted for spinning an inward roll. The rollers 120 are provided with grooves 121 for engaging the rim of the container and are rotatably mounted on the spindles 123 which are at an upward angle from the plane of the spinner head 118. The rollers freely rotate in contact with the container rim when the spinner head is lowered and rotated.

A floating arbor is shown in Fig. 9 and consists of a floating member 140 and a stationary mem-

ber 142. The stationary member 142 is similar to the arbor 112 shown in Figs. 6 and 7 and consists of a ring adapted to fit within the retaining cylinder 52 and having an annular flange overlying the top of the retaining cylinder and supported by it. The floating member 140 consists of a disk having a circumference corresponding to that of the retaining cylinder 52. The under face of the member 140 and the upper face of member 142 are provided with a plurality of oppositely disposed recesses 144 for seating the compression springs 146. The under surface of the member 140 is provided with a boss 148 to which the depending latch 150 is pivotally secured. The under surface of the fixed member 142 has a crosspiece 152 secured to it by screws 154.

The latch 150 has an enlarged base portion 155 having shoulders 156. The crosspiece 152 has a circular opening in alignment with the latch 150 of sufficient size to permit passage of the base 155 of the latch therethrough. The base has a stop 158 at its lower end which limits the upward movement of the latch by engaging the crosspiece 152. A tension spring 160 is secured at one end to the stop 158 and at the other to a screw 154. The stop 158 may be threaded to the base 155 of the latch so that the upward movement of the arbor may be limited to a predetermined height by screwing or unscrewing the stop. When the spinner head 118 is lowered and the rollers 120 engage the upper margin of the container, it engages the upper surface of the arbor 140 and moves it downward against the compression of the springs 146. The latch member 150 moves downwardly through the opening in the crosspiece 152 and as the base 155 moves beyond the opening in the crosspiece 152, the spring 160 moves the latch member sideways so that the shoulder 156 is against the under surface of the crosspiece. As the spinner head is raised after spinning an inward roll on the container side wall, the arbor 140 is held in its depressed condition by the latch 150.

In operation, the desired spinning flange is placed on the spinner head 36 and secured by screws 40. The flange may be such as shown in Fig. 6 for an outward roll, Fig. 7 for an inward roll or Fig. 8 for a cover. If a spinner head such as is shown in Figs. 9 and 10 is used, it is screwed directly to the shaft 22.

A container side wall blank is placed around each of the retaining cylinders 52 with the lower edge resting on the ring 54. The turntable 42 is in a position so that one of the containers 56 is centered under the spinner head and the latch 50 is in engagement with one of the notches 48. The motors 30 and 82 are then turned on separately or together by any suitable switch and continue running while the machine is in use. The motor 30 through shaft 32, gears 34 and 24 and shaft 22 rotates the spinner head 36.

The motor 82 through pulleys 88 and 80 and belt 90 rotates the shaft 76 and worm gear 78 which rotates gear 70. When the clutch 68 is in disengaged position, the motion is not transferred to the eccentric 66. Downward pressure on the pedal switch 102 energizes the solenoid 92 which causes the plunger 96 to move and with it the clutch actuating arm 98 which moves the clutch to engaged position and the rotary motion of the gear 70 is imparted to the eccentric 66 which, at the start, is in its uppermost position. In this position, the connecting rod 72 is at the top of its stroke and the spinning arm 18 is in a raised position. The lever 110

holds the can clamp 108 away from the container wall 56.

As the eccentric 66 rotates, the connecting rod 72 lowers the spinning arm 18 and the lever 110 moves the clamp 108 into engagement with the container wall 56. The rotating spinner head is lowered and spins a roll on the upper margin of the container wall. As the eccentric moves upwardly, the spinner head is raised and the clamp 108 moves away from the container wall. The pedal switch 102 may then be released and the solenoid then disengages the clutch 68. The latch 50 is then moved outwardly from the notch 48 while the turntable 42 is rotated 180° so that the other container wall is centered under the spinner head. The pedal switch may then be operated and the cycle repeated. During the next cycle, the completed container wall may be removed and a new one placed around the retaining cylinder.

When a floating arbor such as is shown in Fig. 9 is used and an inward roll has been formed on the container, the arbor 140 does not move upwardly under pressure of the springs 146 as the spinner head 118 is raised since it is held in a depressed position by the latch 150. Otherwise, the upper surface of the arbor 140 would engage the headed roll and lift the container wall 56 upwardly with it, or if the clamp 108 is not in a released position as the spinner head moves upwardly the arbor would tend to unroll the inwardly rolled edge of the container which is still held by the clamp.

When a floating arbor such as shown in Fig. 9 is used, it is immaterial that clamp 108 is not released before the spinner head moves upwardly, since the arbor remains in a depressed position by the latch 150 and spring 160 until manually released. This type of arbor has the further advantage of adapting its position to that of the spinner head as it is engaged by it; the spinner head, when it first engages the edge of the container, may not be in a horizontal position so that it contacts the edge of the carton gradually as it is lowered. As a result, the arbor will be tilted accordingly by the spinner head.

While certain preferred embodiments of the invention have been shown and described, it is to be understood that these are illustrative only, as it is capable of variation to meet differing conditions and requirements, and such modifications are contemplated as come within the spirit and scope of the appended claims.

We claim:

1. In a device for forming rolled edges on containers, a spinner head, a motor for rotating said spinner head, a vertically pivotal arm for rotatably holding said spinner head and supporting said motor, a rotary bed having a plurality of stations for mounting said containers, said stations being selectively alignable axially of said spinner head when said arm is in a substantially horizontal position, a clamp operatively connected to said arm for engaging a container when said arm is in a substantially horizontal position and said container is in axial alignment with said spinner head, an eccentric for raising and lowering said arm and a motor for driving said eccentric.

2. In a device for forming rolled edges on containers, a spinner head, means for rotating said spinner head, a table, a bracket supported on said table, a supporting member for raising and lowering said head pivotally connected to said bracket adjacent one end, a retaining cyl-

inder adapted to be positioned in axial alignment with said spinner head and to be encircled by a container blank, a clamp for engaging said container, a lever pivotally connected at one end to said supporting member and at the other to said clamp, a second lever pivotally connected at one end to said clamp and at the other to said table whereby lowering and raising said spinner head will move said clamp into and out of engagement with said container blank and means for pivoting said supporting member on said bracket.

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