

Sept. 1, 1959

H. C. GRAY

2,902,075

MACHINE HAVING SEAMING ROLLS FOR SECURING PREASSEMBLED
RINGS TO ENDS OF CONTAINER SIDE WALL

Filed Feb. 16, 1955

3 Sheets-Sheet 1

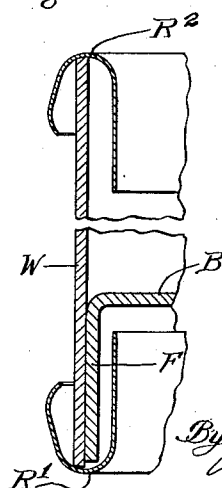
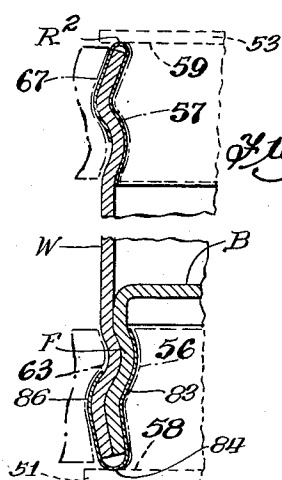
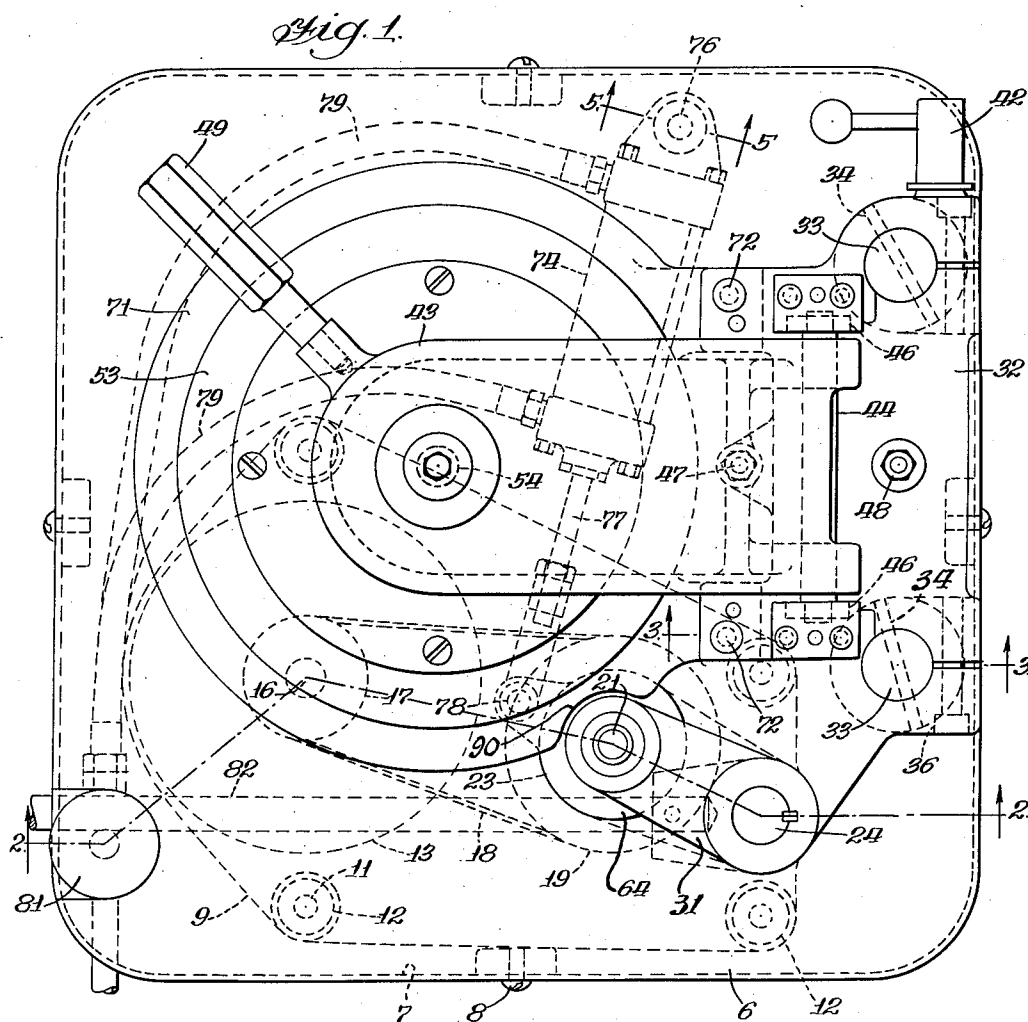


Fig. 6

Fig. 7

Inventor:
Harry C. Gray
By Charles H. Bassett Att'y.

Sept. 1, 1959

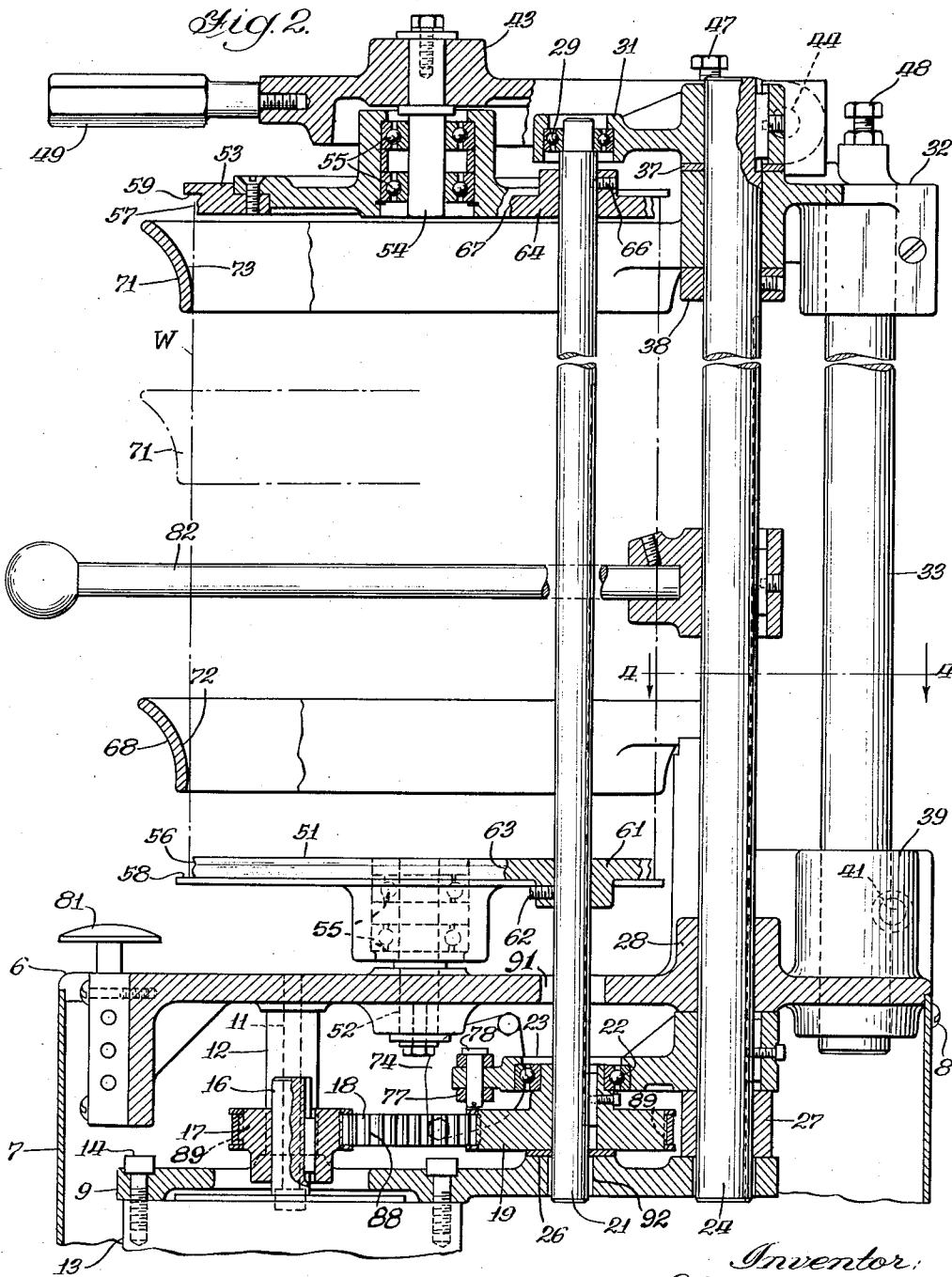
H. C. GRAY

2,902,075

MACHINE HAVING SEAMING ROLLS FOR SECURING PREASSEMBLED
RINGS TO ENDS OF CONTAINER SIDE WALL

Filed Feb. 16, 1955

3 Sheets-Sheet 2



Inventor:
Harry C. Gray

By *Wm. H. Carson* Att.

Sept. 1, 1959

H. C. GRAY

2,902,075

MACHINE HAVING SEAMING ROLLS FOR SECURING PREASSEMBLED
RINGS TO ENDS OF CONTAINER SIDE WALL

Filed Feb. 16, 1955

3 Sheets-Sheet 3

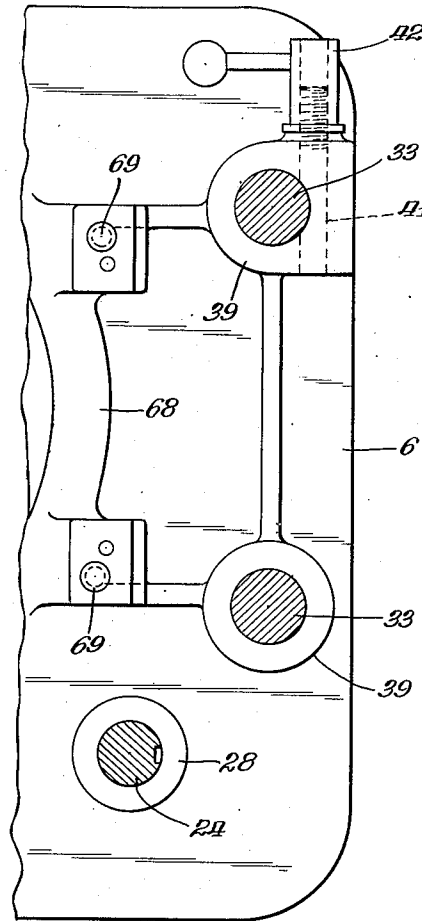
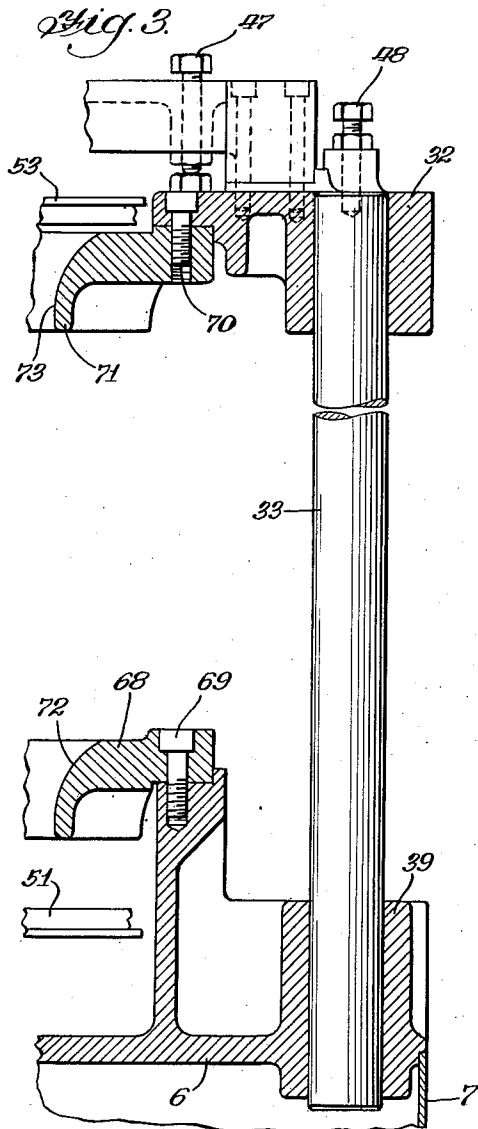
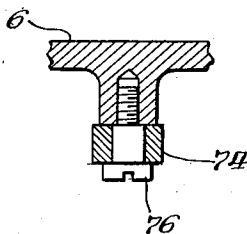


Fig. 4.



Inventor:
Harry C. Gray

By Charles H. Bassett Att'y

1

2,902,075

MACHINE HAVING SEAMING ROLLS FOR SECURING PREASSEMBLED RINGS TO ENDS OF CONTAINER SIDE WALL

Harry C. Gray, Chicago, Ill., assignor to Summit Container Company, Chicago, Ill., a corporation of Illinois

Application February 16, 1955, Serial No. 488,621

10 Claims. (Cl. 153—1)

This invention relates to machines for assembling containers of the type now commonly used in packaging ice cream.

It is now common practice for ice cream manufacturers to sell their products in 2½ and 5 gallon containers or cans comprising cylindrical side walls and flanged disc-shape bottoms formed of fiberboard and secured in assembled relationship by means of metallic rings. After assembly and filling of the containers, a suitable cover is detachably mounted over the open end thereof and the filled containers are then placed in a refrigerator.

As these containers cannot economically be shipped or stored in their assembled condition, they are delivered to ice cream manufacturers in disassembled condition for assembly immediately prior to being filled with ice cream. It is an object of the present invention to provide a machine adapted for use in rapidly assembling cylindrical fiberboard containers of different sizes.

Another object of the invention resides in the provision of a machine adapted to be operated by unskilled operators to produce uniform, leakproof containers.

A further object of the invention resides in the provision of a machine adapted to apply metallic rings simultaneously to both ends of the side wall, one ring being provided to reinforce the upper open end of the side wall, and the other ring being operative to secure the bottom in fixed position on the side wall.

Another object of the invention resides in the provision of a machine which is relatively simple and inexpensive in construction and reliable in operation.

The invention embodies other novel features, details of construction and arrangement of parts which are hereinafter set forth in the specification and claims and illustrated in the accompanying drawings, wherein:

Fig. 1 is a top plan view showing a machine embodying features of the invention.

Fig. 2 is a vertical sectional view taken generally along the line 2—2 of Fig. 1, parts being broken away to more clearly illustrate the invention.

Fig. 3 is a fragmentary vertical sectional view taken along the line 3—3 of Fig. 1.

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

Fig. 5 is a detail sectional view taken along the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary detail sectional view illustrating parts of a fiberboard container as positioned for assembly by the machine.

Fig. 7 is a fragmentary sectional view showing container after assembly.

Referring now to the drawings for a better understanding of the invention, the machine is shown as comprising a horizontal base 6 adapted to be supported above a floor by means of a sheet metal frame 7, the base being secured to the frame by means of screws 8.

A motor support bracket 9 depends from the base 6 and is secured thereto by screws 11 and spacing collars 12. An electric motor 13 is secured to the underside of

2

the bracket 9 by means of cap screws 14, the drive shaft 16 of the motor projecting upwardly through the bracket and having a drive pulley 17 keyed thereon to drive a Gilmer timing belt 18 which, in turn drives a driven pulley 19 keyed to a seaming roll shaft 21. The Gilmer timing belt 18 is manufactured and sold by New York Belting & Packing Co., Passaic, New Jersey, and is provided with teeth 88 which mesh with grooves 89 in the pulleys 17 and 19, whereby limited arcuate movement of the shaft 21 is permitted without causing slippage of the belt relative to the pulleys. The base 6 and bracket 9 are formed with slots 91 and 92, respectively, to permit arcuate movement of the shaft 21. Recesses 90 are formed in the centering rings 68 and 71.

The driven pulley 19 and the lower end of the seaming roll shaft 21 are journaled for common rotational movement by means of an anti-friction bearing 22 mounted between the pulley and a lower roll actuating lever 23 keyed to a pivot shaft 24. A thrust bearing 26 is mounted on the shaft 21 between the motor support bracket 9 and the driven pulley 19; and a thrust collar 27 is provided on the pivot shaft 24 between the motor support bracket 9 and the roll actuating lever 23. The lower end of the pivot shaft 24 is journaled in a suitable bearing 28 provided on the base 6.

The upper end of the seaming roll shaft 21 is journaled in an anti-friction bearing 29 mounted on the outer end of an upper roll actuating lever 31 which is keyed on the upper end of the pivot shaft 24. The upper end of the pivot shaft 24 is journaled in a seamer head support bracket 32 secured to the upper ends of posts 33—33 by means of dowels 34 and cap screws 36.

A suitable thrust bearing 37 is provided on the pivot shaft 24 between the support bracket 32 and the upper roll actuating lever 31; and a collar 38 is secured on the pivot shaft to engage the underside of the support bracket.

The lower ends of the posts 33—33 are slidably adjustable in bearings 39—39 formed on the base 6 to vary the spacing between the seamer head support bracket 32 and the base, whereby the machine is adapted for use in assembling containers of different heights. After the posts have been raised or lowered to adjust the position of the bracket 32, they are locked in fixed position by means of a locking stud 41 slidably mounted in an aperture formed in one of the bearings 39 and movable into wedge engagement with its related post 33 by means of a nut 42 threaded onto one end of the stud.

A seamer head 43 is keyed to a shaft 44 journaled at its ends in anti-friction bearings 46—46 mounted on the seamer head support bracket 32, whereby the head may be pivoted from its operative position, shown in Fig. 2 to an inoperative position in which an adjustment screw 47 on the head engages a stop screw 48 on the bracket. The seamer head is provided with a suitable handle 49 to be engaged by the operator to pivot the head.

A lower seaming chuck 51 is journaled on a stud shaft 52 mounted on and projecting upwardly from the base 6; and an upper seaming chuck 53 is journaled on a stud shaft 54 mounted on and projecting downwardly from the seamer head 43. Anti-friction bearings 55 are preferably provided on the stud shafts 52 and 54 to rotatably support their respective seaming chucks in accurate coaxial alignment and with minimum frictional resistance during operation of the machine. The seaming chucks 51 and 53 are formed with coaxial peripheral seaming surfaces 56 and 57, respectively, for telescopic engagement into their respective metallic rings R employed in assembling containers, as hereinafter described.

The lower seaming chuck 51 is formed with the annular abutment surface 58 merging with and extending outwardly radially from the lower end of the seaming

surface 56; and the upper seaming chuck 53 is provided with an annular abutment surface 59 merging with and extending outwardly radially from the upper end of the seaming surface 57. The abutment surfaces 58 and 59 are adapted to coact to maintain the metallic container ring R in snug engagement against opposite ends of a container side wall W during the seaming operation.

A lower seaming roll 61 is secured in fixed adjusted position to the lower end of the seaming roll shaft 21 by means of a set screw 62, the periphery of the roll being formed with an annular seaming surface 63 to coact with the chuck seaming surface 56 in applying a metallic ring R to the lower end of a container.

An upper seaming roll 64 is secured in fixed position to the upper end of the seaming roll shaft 21 by means of a set screw 66, the periphery of the roll being formed with an annular seaming surface 67 to coact with the chuck seaming surface 57 in applying a metallic ring R to the upper end of a container.

A lower centering ring 68 is secured to the base 6 by means of cap screws 69; and an upper centering ring 71 is secured to the seamer head support bracket 32 by means of cap screws 70. The centering rings 68 and 71 are formed with identical annular downwardly converging inner surfaces 72 and 73, respectively, to snugly slidably engage the outer surfaces of container side walls W, said surfaces being coaxial with the seaming chucks 51 and 53.

An air cylinder 74 is pivotably mounted at one end thereof on a shoulder screw 76 threaded into the base 6, the cylinder housing a conventional piston (not shown) having approximately a two inch stroke. A piston rod 77 is secured at one end thereof to the piston and is pivotably connected at its other end to the free end of the roll actuating lever 23 by means of a pin 78. The piston is adapted to be actuated by compressed air traveling from a suitable source of supply through flexible air conduits 79 leading to opposite ends of the cylinder, the flow of air being controlled by a suitable manually operative 4-way control valve 81 mounted on the base.

In the event a supply of compressed air is not available for use to actuate the piston in the cylinder 74, an operating handle 82 may be keyed to the pivot shaft 24 for manual operation in rotating the latter to move the seaming rolls 61 and 64 toward or away from their respective seaming chucks 51 and 53.

The machine thus shown and described is particularly adapted for use in assembling containers of the type illustrated in Figs. 6 and 7, in which a fiberboard bottom B having a peripheral flange F is secured within one end of a tubular fiberboard side wall W by means of an annular metallic retaining ring R1, the other end of the side wall having a similar annular metallic reinforcing ring R2 thereon. The rings are generally J-shape in section to provide a substantially cylindrical inner web 83 joined at 84 to a relatively short annular outer web 86 of arcuate section to provide a free edge disposed to bite into the side wall during assembly.

In the operation of the machine, a retainer ring R1 and bottom B are first mounted on the lower seaming chuck 51 with the bottom flange F disposed between the webs 83 and 86 of the ring. To facilitate assembly, the inner surface of the flange F may first be adhesively united to the outer surface of the inner web 83 to provide a united structure for mounting on the lower seaming chuck.

The flattened side walls W are then opened to generally cylindrical form and threaded downwardly through the centering rings 68 and 71 to dispose the lower edge of the wall between the bottom flange F and the outer web 86 of the retainer ring. It will be noted that the centering rings are formed to snugly slidably engage the side wall to cause the latter to assume a substantially

perfect cylindrical form to insure ready telescopic engagement of the side wall over the bottom B.

The reinforcing ring R2 is then mounted on the upper end of the side wall, with the ring webs embracing the edge of the side wall. The seamer head 43 is then pivoted into operative position to dispose the upper chuck seaming surface 57 within the upper end of the side wall and retainer ring. The seaming rolls 61 and 64, while being rotated by the motor 13, are moved toward their respective seaming chucks by means of either the air operated piston-cylinder assembly or the manually operable handle 82. When the container rings R1 and R2 are thus simultaneously engaged between the seaming surfaces on the rolls and chucks, their webs are gradually forced together during rotation of the chucks and the container parts to form a relatively strong leakproof container suitable for use in vending bulk ice cream and other products.

The machine may readily be adjusted to assemble containers of different heights by merely loosening the adjustment nut 42 to permit vertical movement of the posts 33 and parts supported thereon, and by loosening the set screw 62 to move the lower seaming roll 61 to its adjusted position on the roll shaft 21.

I claim:

1. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to telescopically engage said side wall, rotatable seaming rolls coacting with said surfaces and shoulders or their respective chucks to simultaneously secure the container rings to the container side wall, and means to rotate said seaming rolls.

2. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical fiberboard container side wall disposed within said rings, a centering ring of greater diameter than length disposed between and coaxial with said chucks to telescopically engage said side wall, said centering ring having an inner annular surface converging toward one of said chucks to facilitate loading of the side wall into the machine, rotatable seaming rolls coacting with said surfaces and shoulders on their respective chucks to simultaneously secure the container rings to the container side wall, means to drive the seaming rolls.

3. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to telescopically engage said side wall, said centering ring having an inner annular surface converging toward one of said chucks to facilitate loading of the side wall into the machine, seaming rolls coacting with said surfaces and shoulders on their respective chucks to simultaneously secure the container rings to the container side wall, means to vary the spacing between said chucks to accommodate container side walls of different lengths, and means to drive the seaming rolls.

4. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at

5

radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to engage said side wall, seaming rolls co-

5 acting with their respective chucks to simultaneously secure the container rings to the container side wall, means to drive said seaming rolls, a seamer head supporting one of said chucks, and means pivotably supporting said head.

5. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed adjacent and coaxial with each of said chucks to telescopically engage its respective end of said side wall, seaming rolls coacting with their respective chucks to simultaneously secure the container rings to the container side wall, said rolls being keyed to a common roll shaft, and means to drive said seaming rolls.

6. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, two centering rings disposed between and coaxial with said chucks to telescopically engage opposite ends of said side wall, seaming rolls coacting with their respective chucks to simultaneously secure the container rings to the container side wall, a roll shaft extending parallel to the axis of said chucks and keyed to said seaming rolls, means supporting the roll shaft for rotational movement and also for arcuate movement relative to said seaming chucks, and means to drive said roll shaft.

7. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks, journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to telescopically engage said side wall, seaming rolls coacting with their respective chucks to simultaneously secure the container rings to the container side wall, a roll shaft extending parallel to the axis of said chucks and keyed to said seaming rolls, means supporting the roll shaft for rotational movement and also for arcuate movement relative to said seaming chucks, said last means including a pivot shaft journaled for rotational movement, means to drive said roll shaft, and means to rotate said pivot shaft.

8. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks journaled for free rotational movement, said chucks having

6

axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to telescopically engage said side wall, seaming rolls coacting with their respective chucks to simultaneously secure the container rings to the container side wall, means to vary the spacing between said chucks to accommodate container side walls of different lengths, said means including a seamer head to support one of said chucks, a base to support the other chuck, a post interconnecting said head and base, and means to drive said seaming rolls.

9. In a machine for assembling a container of the type described, two spaced coaxial seaming chucks, journaled for free rotational movement, said chucks having axially extending peripheral seaming surfaces terminating at radial shoulders to telescopically engage metallic container rings of generally J-section and opposite ends of a cylindrical container side wall disposed within said rings, a centering ring disposed between and coaxial with said chucks to engage said side wall, seaming rolls coacting with their respective chucks to simultaneously secure the container rings to the container side wall, means to vary the spacing between said chucks to accommodate container side walls of different lengths, said means including a seamer head to support one of said chucks, a base to support the other chuck, a post interconnecting said head and base, said head being pivotably supported at one end of said post, and the other end of said post being slidably adjustable on said base, and means to drive said seaming rolls.

10. A machine for securing a flanged fiberboard bottom and metallic reinforcing and retainer rings of channel section to a tubular fiberboard side wall, comprising two chucks journaled for free rotational movement about a common axis, each chuck having a peripheral seaming surface and a radial abutment surface engageable with its respective ring, a centering ring disposed between and coaxial with said chucks to telescopically engage a side wall mounted at its ends within said reinforcing and retaining rings, rotatable seaming rolls coacting with the seaming surfaces and abutment surfaces on their respective chucks to simultaneously secure said reinforcing and retaining rings to said side wall, means to move said seaming rolls into operative engagement with their respective chucks, and means to rotate said seaming rolls.

References Cited in the file of this patent

UNITED STATES PATENTS

274,863	Vincent	Mar. 27, 1883
832,075	Moxham	Oct. 2, 1906
2,019,412	Heyndrickx	Oct. 29, 1935
2,113,699	Lowry	Apr. 12, 1938
2,671,490	Jansen	Mar. 9, 1954
2,686,551	Laxo	Aug. 17, 1954
2,774,247	Knost	Dec. 18, 1956