Dec. 1, 1953 J. T. LIVACICH 2,660,968

CLOSING MACHINE WITH OVAL CONTAINER AND COVER POSITIONING DEVICE

Filed July 20, 1949 5 Sheets-Sheet 1

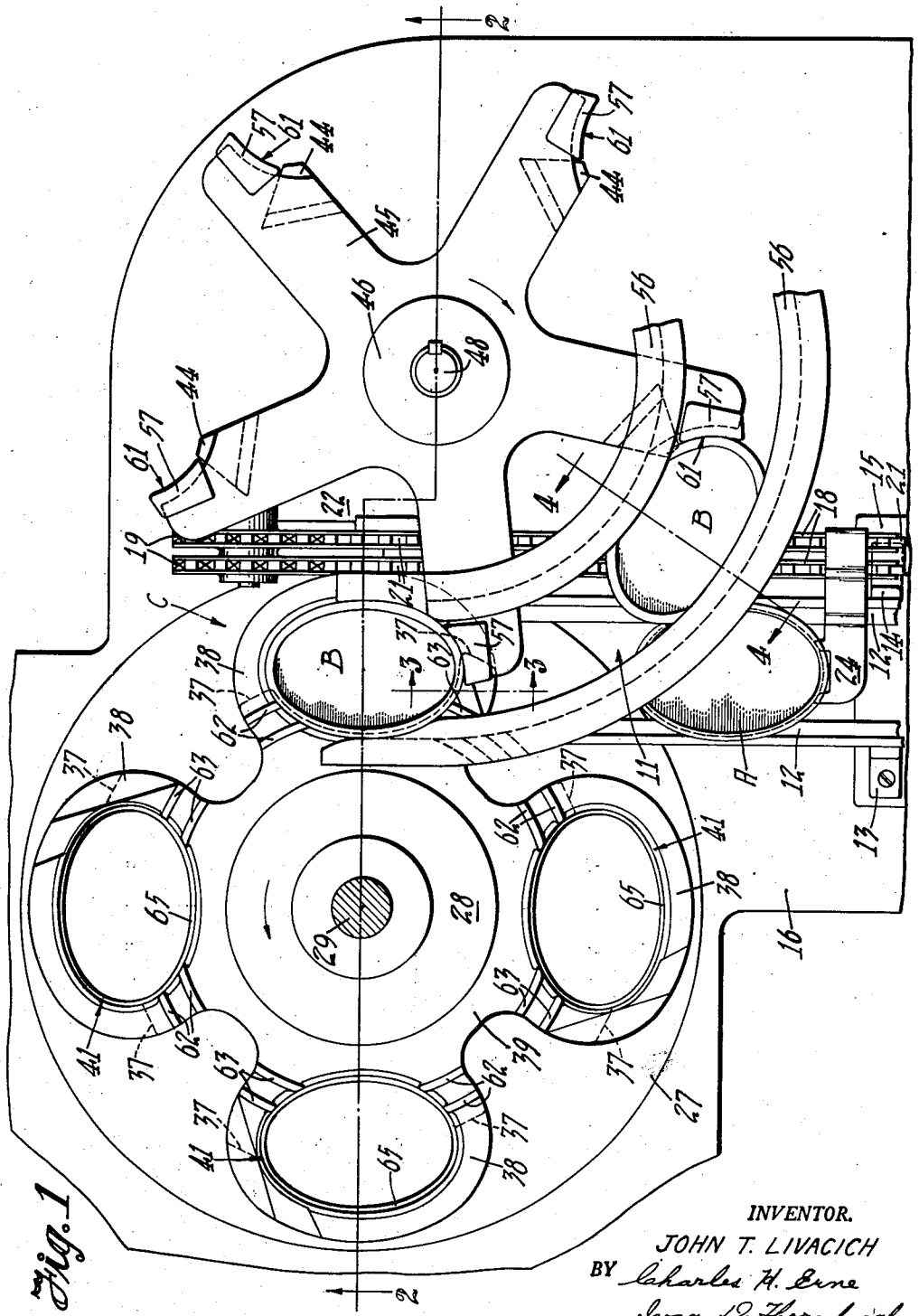


Fig. 1

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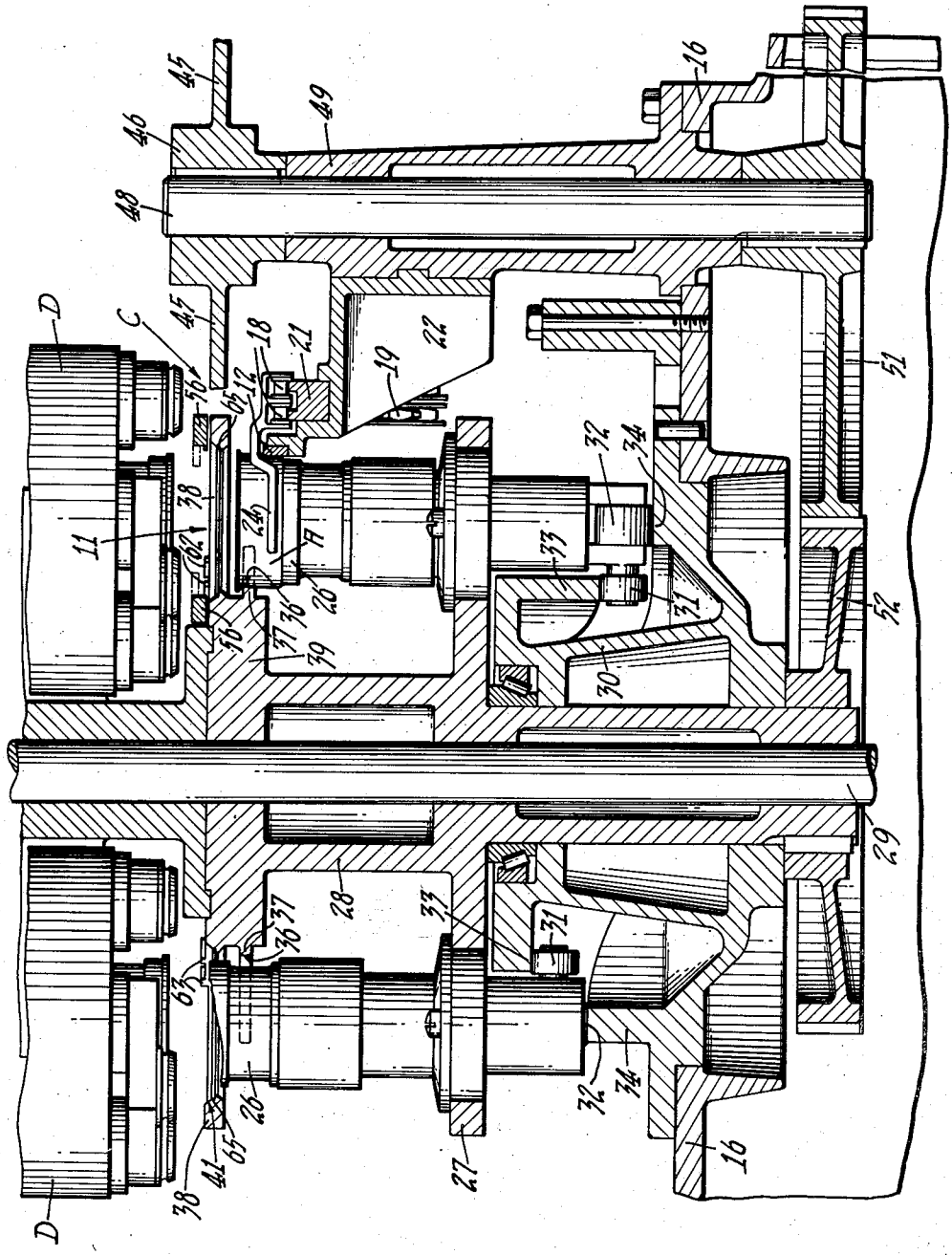


Fig. 2

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CLOSING MACHINE WITH OVAL CONTAINER AND COVER POSITIONING DEVICE

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Fig. 3

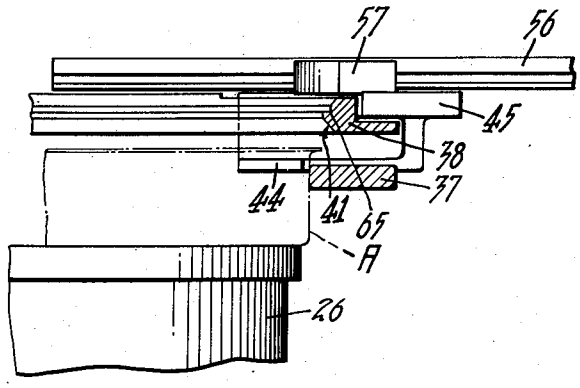
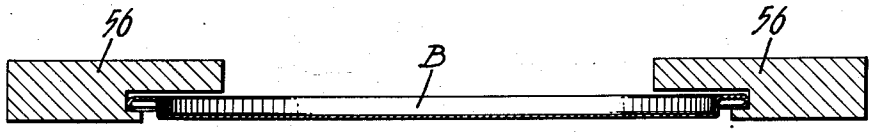


Fig. 4



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Fig. 5

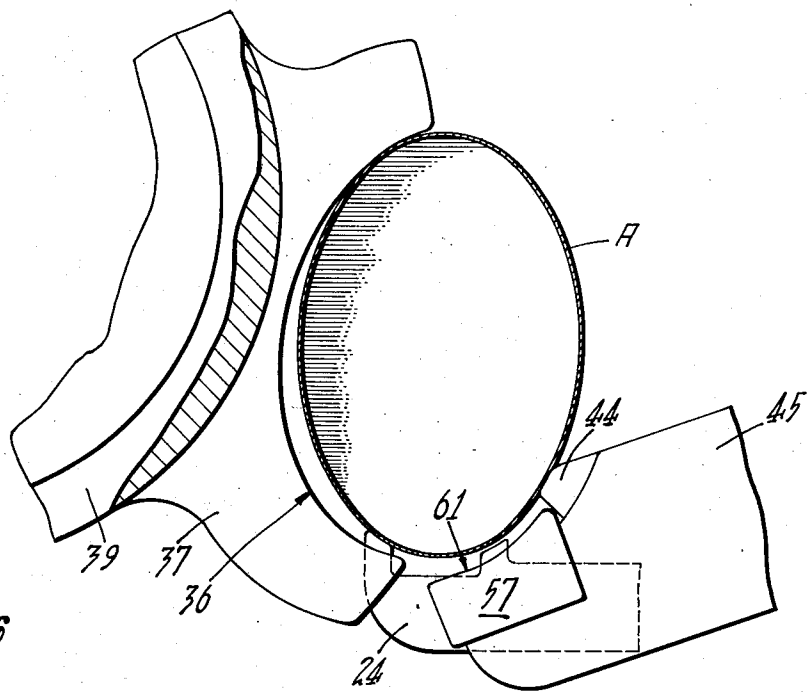
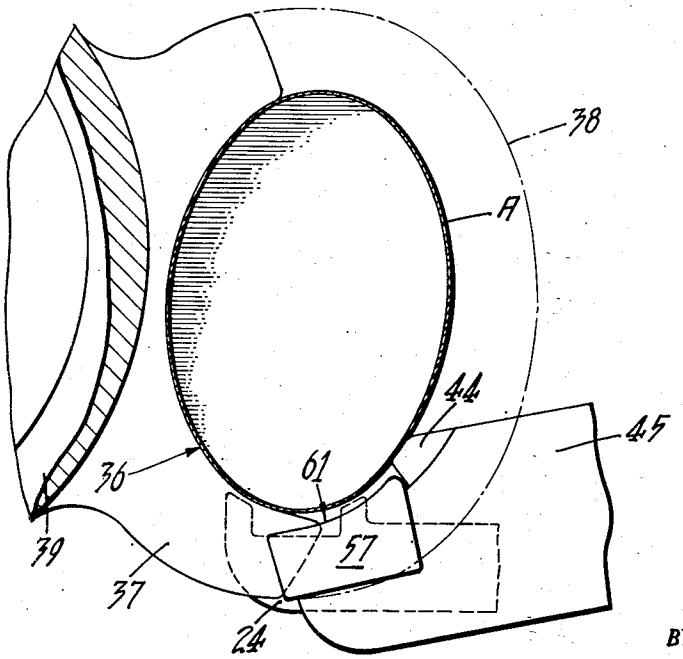


Fig. 6



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Fig. 7

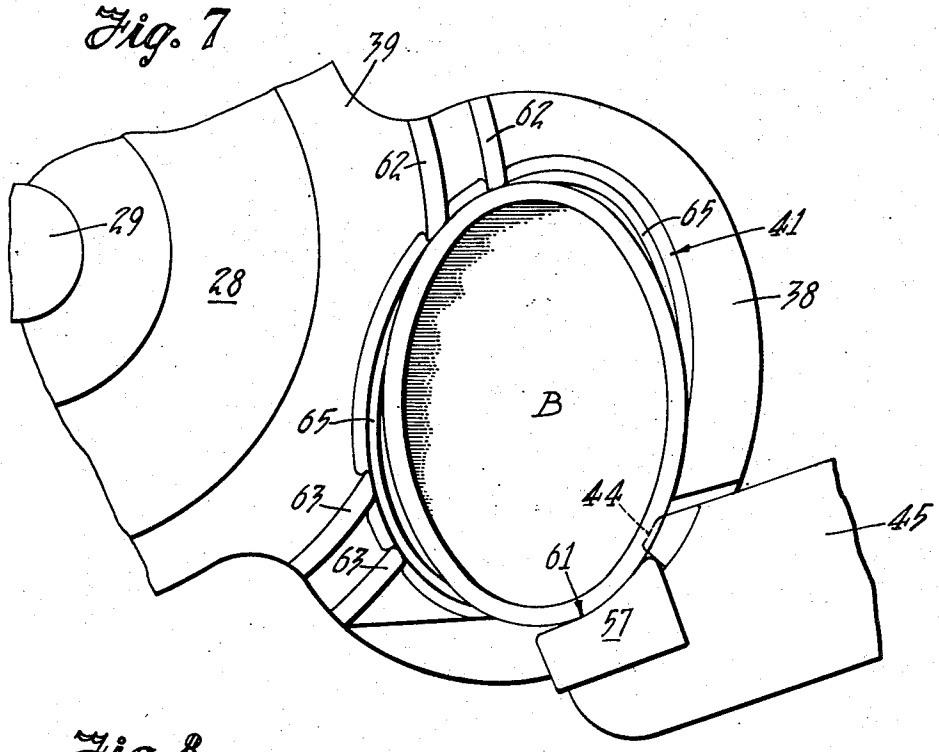
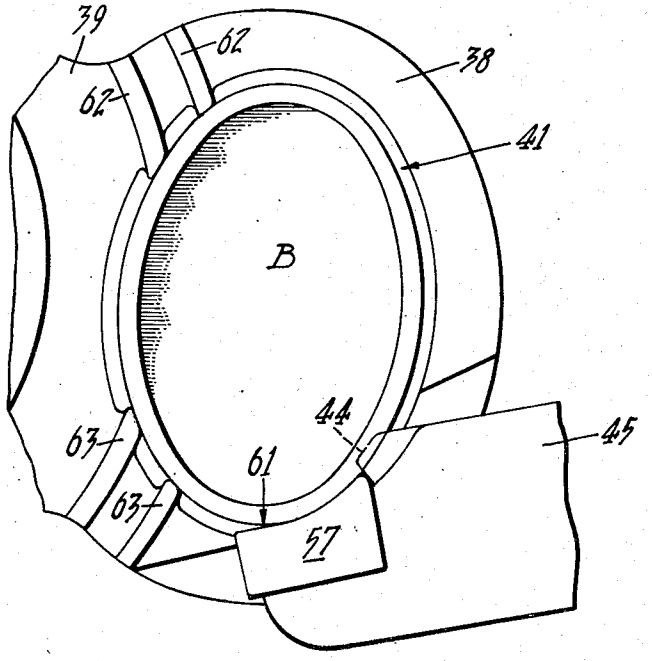


Fig. 8



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UNITED STATES PATENT OFFICE

2,660,968

CLOSING MACHINE WITH OVAL CONTAINER AND COVER POSITIONING DEVICE

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Application July 20, 1949, Serial No. 105,757

5 Claims. (Cl. 113—14)

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The present invention relates to a can or container closing machine and has particular reference to devices for aligning oval or oblong cans and their covers in superposed relation preparatory to sealing the covers on the cans.

In the automatic feeding of oval or obling cans and covers into superposed position for assembly as an incident in attaching the cover to the can, considerable difficulty is experienced in attempts to prevent the cans and covers from skewing or shifting angularly during their advancement toward the assembling station. After one or the other of these can parts shifts into a skewed position so that they are out of axial alignment when they reach the assembling station and hence when they are brought together, they do not properly nest or fit one within the other for the closing or seaming operation. Such misaligned can parts are the cause of many jams in closing machines and are responsible for many machine break downs and may also result in leaking seams or joints.

An object of the invention is the provision in a can closing machine of devices which operate to feed cans or can bodies and their end members, which because of their shape are difficult to handle, and to properly align them in axial relation for the attachment of the cover to the can or can body.

Another object is the provision of such devices which operate to properly align cans or can bodies and their covers at high speed rates of production and while the can parts are fed into the machine in substantially continuous processions.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a top plan view of a can closing machine embodying the instant invention, with parts broken away;

Fig. 2 is a sectional view taken substantially along the broken lines 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a sectional view taken substantially along the line 3—3 in Fig. 1, with parts broken away;

Fig. 4 is an enlarged sectional view taken substantially along the line 4—4 in Fig. 1,

Figs. 5 and 6 are enlarged schematic views showing a can and certain fragmentary parts of the machine in different positions as an incident

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to properly positioning the can for the reception of a cover; and

Figs. 7 and 8 are enlarged schematic views showing a cover and certain fragmentary parts of the machine in different positions as an incident to properly positioning the cover relative to a can to which it is to be attached.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate principal parts of a can closing machine such as that disclosed in United States Patent 2,447,525 issued August 24, 1948 to R. E. J. Nordquist on Can Closing Machine.

In such a machine filled cans A (Fig. 1) and covers B are fed into the machine along different paths of travel and are brought together into vertical or axial alignment at an assembling station C where the cans are lifted vertically to meet and receive the covers and to position the covers and the upper ends of the cans into closing or seaming heads D (Fig. 2) which permanently unite the covers and the cans in suitable end seams by an interfolding of flange parts on the cans and on the covers.

The instant machine is particularly adapted to feed and secure oval or oblong shaped sheet metal covers to correspondingly shaped sheet metal cans, although the invention is equally well adapted to cans and covers of other shapes and materials.

The cans A to be assembled with the covers B are fed into the machine toward the assembling station C from any suitable source of supply in a substantially endless straight line procession, arranged in spaced and timed order and in a vertical or upright position. The cans shown in the drawings are one piece drawn cans but the invention is equally well adapted to cans having bodies with bottoms seamed thereto or to merely the bodies alone.

The entering cans A move along a straight line runway 11 (Figs. 1 and 2) having a pair of spaced and parallel L-shaped supporting and guiding rails 12. These rails extend toward and terminate at the assembling station C. They are held in place by brackets 13, 14 secured to a horizontal table 15 which is part of a frame 16 which constitutes the main frame of the machine.

Advancement of the cans A along the runway 11 in spaced and timed order is effected by an endless double chain conveyor 18 which is disposed adjacent the can runway 11 in spaced and parallel relation thereto and which operates over suitable vertically disposed sprockets 19. The upper or feeding run of the conveyor is supported

and guided on a horizontal support rail 21 which is carried in the table 16 and in a bracket 22 located at the assembling station C. Feed dogs 24 secured to the conveyor 18 at spaced intervals therealong engage behind the cans A and feed them toward the assembling station. These feed dogs are disposed in a horizontal position and extend laterally from the conveyor into the can runway 11.

As a can A approaches the assembling station C it transfers from the can runway support rails 12 to a vertically movable lifter pad 26 which is moved into position under the advancing can. There are a plurality of these lifter pads 26 disposed adjacent the outer periphery of a horizontal flange 27 of a rotatable sleeve 28 surrounding a normally stationary shaft 29. The sleeve 28 is supported in and journaled in a bearing bracket 30 bolted to the man frame 16. The sleeve is rotated continuously in time with the advancement of the cans A along the can runway 11, in any suitable manner such as that shown in United States Patent 1,601,910 issued October 5, 1926 to P. W. Fleischer et al. on Multi-spindle Double Seamer.

Vertical movement of the lifter pads 26 as will be hereinafter explained is effected by a pair of cam rollers 31, 32 which are carried on depending stems of the lifter pads and which operate against a pair of conventional cam tracks 33, 34 formed on the bearing bracket 30. These lifter pads 26 are disposed below and in vertical alignment with the can closing or seaming heads D hereinbefore mentioned, the heads being supported on the rotatable sleeve 28 so that they travel with the pads and are actuated in the conventional manner as disclosed in the above mentioned Fleischer patent.

As a can A transfers to a lifter pad 26 adjacent the assembling station C, it also enters an aligning pocket 36 (Figs. 1, 5 and 6) in a half mold 37 located on a level with the can and disposed in axial alignment with a seaming head D and a centering ring 38 (see also Fig. 2) located between the head and the mold at a level just above the advancing can. There are a plurality of these molds 37 and centering rings 38, one for each lifter pad 26 and they are formed on a turret 39 which extends out from the rotatable sleeve 28.

Each of the pockets 36 in the molds 37 are precisely shaped to fit and properly locate or align a can A received therein in axial alignment with a correspondingly shaped tapered throat 41 (see also Fig. 3) in the centering rings 38.

Hence as the turret 39 rotates, it swings a mold 37 in a circular path substantially tangent at station C to the straight path of the cans A and into position adjacent and partially surrounding a can A as it approaches the assembling station C on a lifter pad 26 and both mold and can move forward together at substantially the same speed. During this travel of the mold and the can, the can is pushed into the mold in a fully seated position properly aligned with the centering ring located immediately above it.

Positioning of a can A into a mold 37 is effected by a can locating finger 44 (Figs. 1, 3, 5 and 6) which is rotatable in time with the advancement of the can and engageable with the can as it approaches the assembling station C. There are a plurality of these locating fingers 44 and they are attached to the outer ends of spider arms 45 of a spider wheel 46 disposed adjacent

the path of travel of the cans entering the machine. The spider wheel 46 (see also Fig. 2) is mounted on the upper end of a vertical shaft 48 journaled in a bearing bracket 49 bolted to the main frame 16. The shaft is rotated continuously in time with the turret 39 by a gear 51 which is secured to the lower end of the shaft and which meshes with and is driven by a gear 52 secured to the lower end of the sleeve 28.

Through the rotation of the spider wheel 46 a locating finger 44 moves into position along side of and toward the rear of a can A as the can approaches the assembling station C as best shown in Fig. 5 and forces the can laterally into its mold 37 while slightly rotating the can on its axis, if required, within the mold to fully seat the can and to properly locate it relative to the above disposed centering ring 38 as shown in Fig. 6.

Simultaneously with the seating and locating of a can A in its mold 37 relative to its centering ring 38, a cover B is advanced from any suitable source of supply and is seated in the centering ring in axial alignment with the can. The covers B are fed in a horizontal position along a curved path of travel adjacent the outer ends of the arms 45 of the spider wheel 46. The covers are supported and guided by a pair of spaced and parallel curved tracks 56 (Figs. 1, 2 and 4) which terminate at the assembling station C. The tracks are elevated sufficiently to permit the rotating centering rings 38 to pass under them. At the assembling station the cover supporting ledges of the tracks are cut away so as to permit an advanced cover to fall from the tracks into the ring. Advancement of the covers along the curved tracks 56 is effected by feed fingers 57 which are attached to the outer ends of the arms 45 of the spider wheel 46.

In order to correct any skewing of the covers B as they advance along the curved tracks 56 so as to bring the covers into proper position before dropping them into the centering ring 38, the feed fingers 57 are formed with a curved face 61 (see Figs. 7 and 8) which engages against the back edge of the cover within its outer trailing quadrant. These feed fingers co-operate with two pairs of spaced locating lugs 62, 63 formed on top of each centering ring 38. The pair of spaced lugs 62 project up from the ring within its leading inner quadrant and the pair of lugs 63 project up within its trailing inner quadrant. The outer curved track 56 is cut away to provide clearance for these lugs. The inner faces of the lugs are flush with the inner face of the centering ring throat 41.

Hence as a cover B propelled by a feeding finger 57 approaches the assembling station C, it moves into position over an advancing centering ring 38 while the mold 37 below the ring is simultaneously receiving a can A, and the feeding finger pushes the cover forward so that the leading edge of the cover engages against the leading pair of locating lugs 62 on the centering ring, as best shown in Fig. 7. As the ring and the feed finger continue to advance the finger presses against the trailing edge of the cover and forces it inwardly while simultaneously rotating it into position until the cover edge engages both of the pairs of locating lugs 62, 63 as shown in Fig. 8.

When the cover B is in this position against the locating lugs 62, 63 it is in axial and peripheral alignment with the throat 41 of the centering ring 38 and the cover thereupon rides off the

supporting tracks **56** and falls into the throat of the ring. The falling cover is received on a horizontal ledge **65** (Figs. 1, 2, 3 and 7) formed on the centering ring within its throat. This ledge projects just sufficient to engage the usual curled edge on the flange of the cover so as not to interfere with the flange and thus locates the cover in superposed relation with the can A fully seated in its mold **37**.

To facilitate this proper centering of the covers B in the centering rings **38**, the covers move along a straight line path of travel for a short distance during the approach of the covers to the assembling station C. This is effected by the assembling station being located on the center line of the turret **39** taken perpendicular to the straight line runway **12** slightly in advance of a parallel center line of the spider wheel **46** also perpendicular to the runway. This short straight line approach thus extends between points of tangency of the cover path and turret mold path with the straight path of cans A.

With a can A and a cover B, thus properly located relative to each other, the lifter pad **26** lifts the can up into and through the centering ring **38** and thus raises the can into engagement with the cover and further raises the can and its now superimposed cover up into the seaming head D where the cover is united with the can. Following the seaming operation the lifter pad lowers the sealed can through the centering ring and the can is thereupon discharged from the machine in the usual manner.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for attaching covers to oval bodies, the combination of a continuously rotating turret, a cover centering ring on said turret and having an oval opening therein surrounded by a horizontal cover supporting ledge and a tapered throat extending upwardly and outwardly from said ledge for guiding a cover downwardly onto said ledge, said centering ring also having raised locating lugs adjacent the top of said tapered throat for locating said cover above said tapered throat, a mold on said turret in axial alignment with said oval opening in the centering ring and for receiving an oval body therein, continuously moving body feeding means adjacent said turret for feeding a body to said mold in a path substantially tangent with the path of the mold at the point of transfer, parallel tracks over said body feeding means for conducting a cover to said cover centering ring in a path substantially tangent with the path of the ring at the point of transfer, a cover feed finger continuously advancing said cover along said tracks to said centering ring and cooperating with said raised locating lugs to locate said cover above said tapered throat, and a body locating finger cooperating with said mold to align said body with said centering ring and the cover therein, a seaming head above said centering ring for uniting said cover and body in an end seam, and a lifter below and in axial alignment with said mold and centering ring for raising said body through said ring into loose assembly with said cover and into seaming position in said seaming head.

2. In a machine for attaching covers to oval bodies, the combination of a continuously rotating turret, a cover centering ring on said turret and having an oval opening therein surrounded by a horizontal cover supporting ledge and a tapered throat extending upwardly and outwardly from said ledge for guiding a cover downwardly onto said ledge, said centering ring also having raised locating lugs adjacent the top of said tapered throat for locating said cover above said tapered throat, a mold on said turret in axial alignment with said oval opening in the centering ring and for receiving an oval body therein, continuously moving body feeding means adjacent said turret for feeding a body to said mold in a path substantially tangent with the path of the mold at the point of transfer, parallel tracks over said body feeding means for conducting a cover to the top of said tapered throat in a path substantially tangent with the path of the throat at the point of transfer, a continuously rotating arm adjacent said tracks and having a cover feed finger and a body locating finger thereon, said cover feed finger advancing said cover along said tracks to said centering ring and cooperating with said raised locating lugs to locate said cover above said tapered throat, and said body locating finger cooperating with said mold to align said body with said centering ring and the cover therein, a seaming head above said centering ring for uniting said cover and body in an end seam, and a lifter below and in axial alignment with said mold and centering ring for raising said body through said ring into loose assembly with said cover and into seaming position in said seaming head.

3. In a machine for attaching covers to oval bodies, the combination of a continuously rotating turret, a cover centering ring on said turret and having an oval opening therein surrounded by a horizontal cover supporting ledge and a tapered throat extending upwardly and outwardly from said ledge for guiding a cover downwardly onto said ledge, said centering ring also having raised locating lugs adjacent the top of said tapered throat for locating said cover above said tapered throat, a mold on said turret in axial alignment with said oval opening in the centering ring and for receiving an oval body therein, continuously moving body feeding means adjacent said turret for feeding a body to said mold along a straight line path of travel tangent to the path of said centering ring, parallel curved tracks over said body feeding means for conducting a cover to said cover centering ring along a curved path tangent to said straight line path of the body, the point of tangency between these paths being spaced from the point of tangency between said mold and body paths, a continuously rotating arm adjacent said curved tracks and having a cover feed finger and a body locating finger thereon, said cover feed finger advancing said cover along said tracks to said centering ring and cooperating with said raised locating lugs to locate said cover above said tapered throat, and said body locating finger cooperating with said mold to align said body with said centering ring and the cover therein, a seaming head above said centering ring for uniting said cover and body in an end seam, and a lifter below and in axial alignment with said mold and centering ring for raising said body through said ring into loose assembly with said

cover and into seaming position in said seaming head.

4. In a machine for attaching covers to oval can bodies, the combination of a mold moving continuously in a predetermined path for receiving an oval can body, a continuously moving body feeding device for feeding said can body into said mold in a path substantially tangent to the path of the mold, a cover centering ring having an oval opening and a surrounding support ledge therein disposed adjacent said mold in axial and peripheral alignment therewith, said ring having raised locating lugs disposed adjacent one side of said oval opening, a cover runway leading toward and terminating adjacent and substantially tangent to the path of the top of said centering ring, a cover feed finger disposed in said runway and located off-center relative to the axis of the oval opening in said centering ring on the side opposite said locating lugs, a movable support for said feed finger, and means for continuously moving said support and its finger for feeding an oval cover along said runway and into said centering ring and for pressing the cover against said locating lugs to rotate the cover on its axis so that it will axially and peripherally align with and fall into said oval opening in spaced relation to said body for subsequent attachment thereto.

5. In a machine for attaching covers to oval can bodies, the combination of a mold moving contiuously in a predetermined path for receiving an oval can body, a continuously moving body feeding device for feeding said can body into said mold in a path substantially tangent to the path of the mold, a cover centering ring having an oval opening and a surrounding support ledge therein disposed adjacent said mold in axial and peripheral alignment therewith, said ring having raised locating lugs disposed adjacent one side of

said oval opening, a cover runway leading toward and terminating adjacent and substantially tangent to the path of the top of said centering ring, a cover feed finger disposed in said runway and located off-center relative to the axis of the oval opening in said centering ring on the side opposite said locating lugs, a movable support for said feed finger, means for continuously moving said support and its finger for feeding an oval cover along said runway and into said centering ring and for pressing the cover against said locating lugs to rotate the cover on its axis so that it will axially and peripherally align with and fall into said oval opening in spaced relation to said body, and a body locating finger carried on said support adjacent said cover feed finger and in a different plane and off-center relative to the axis of the oval opening on the same side as said cover feed finger for engaging the body in the mold and for turning the body on its axis to locate said body in peripheral alignment with said cover for a subsequent uniting of the cover with the body.

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