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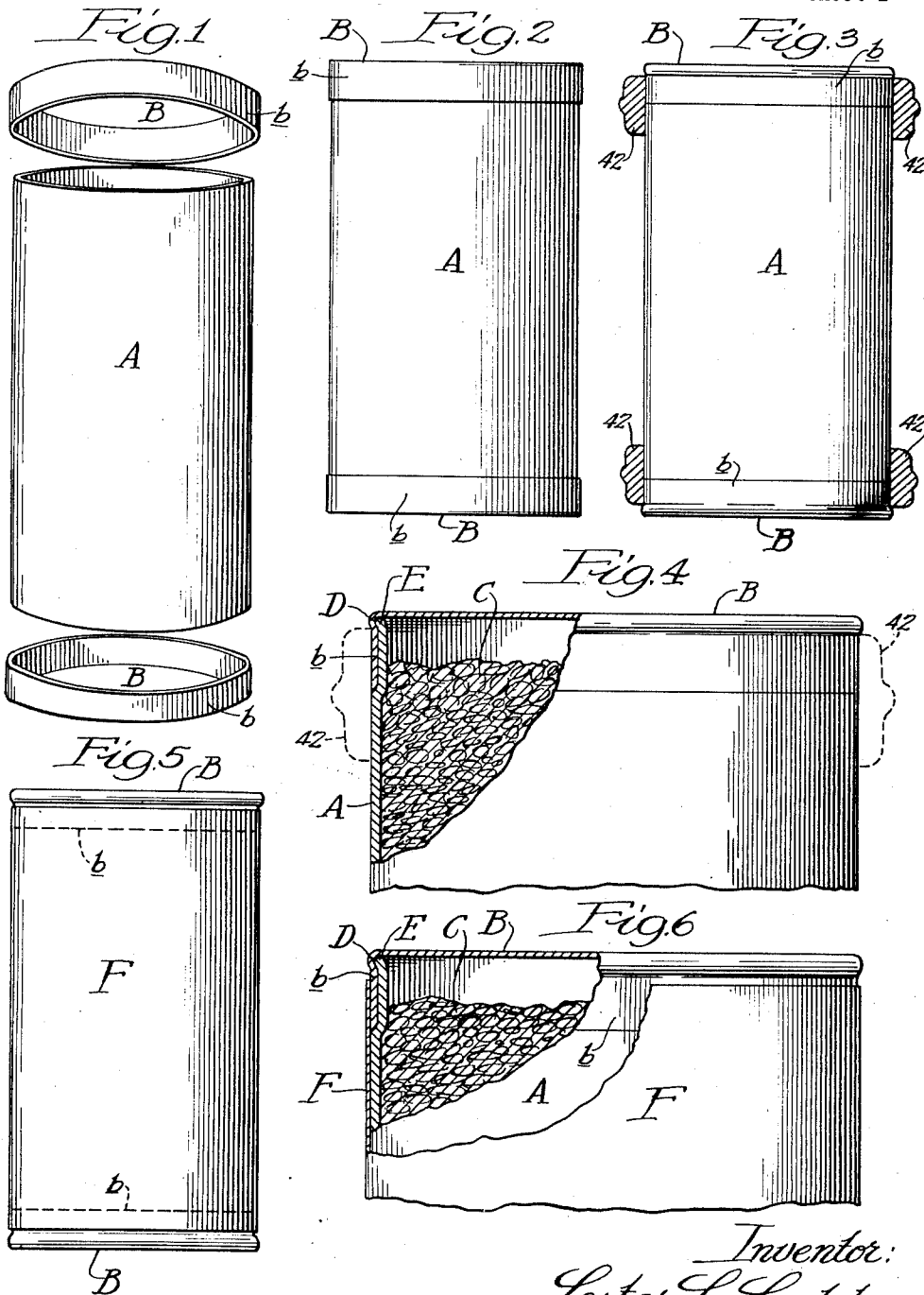
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2,262,292

METHOD OF AND APPARATUS FOR SEALING PASTEBOARD CANS

Filed Sept. 18, 1939

5 Sheets-Sheet 1



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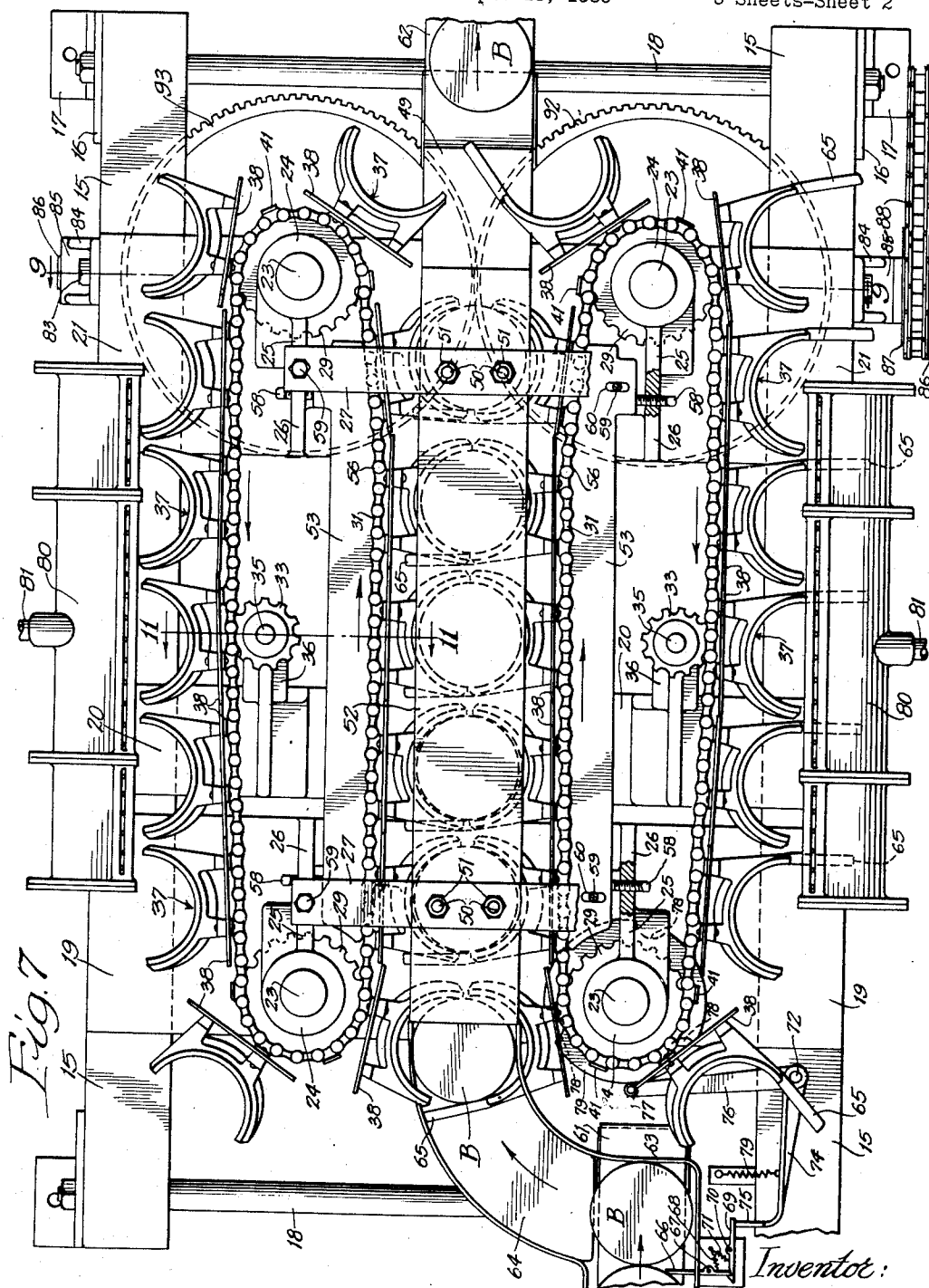
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5 Sheets-Sheet 2



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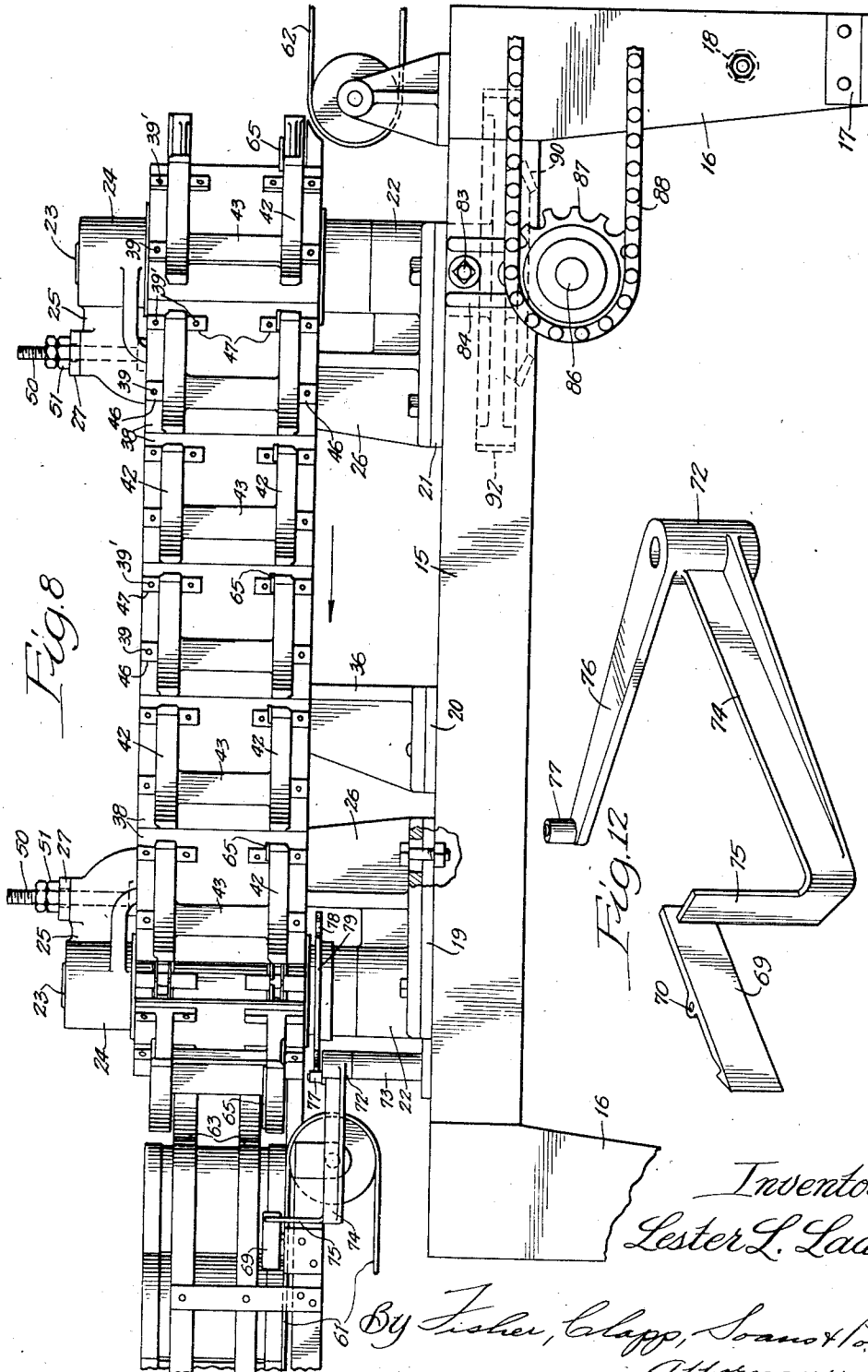
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5 Sheets-Sheet 3



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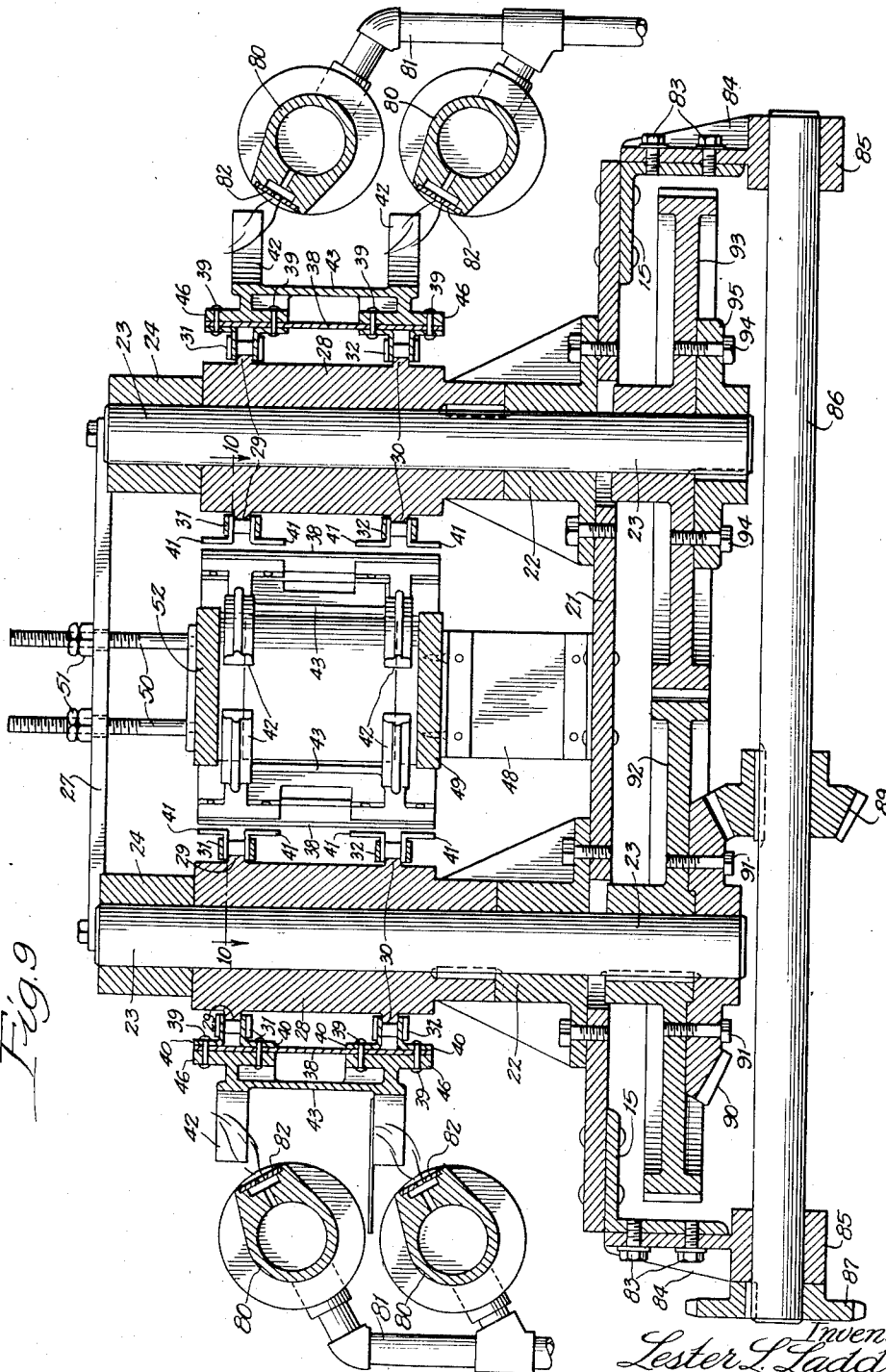


Fig. 9

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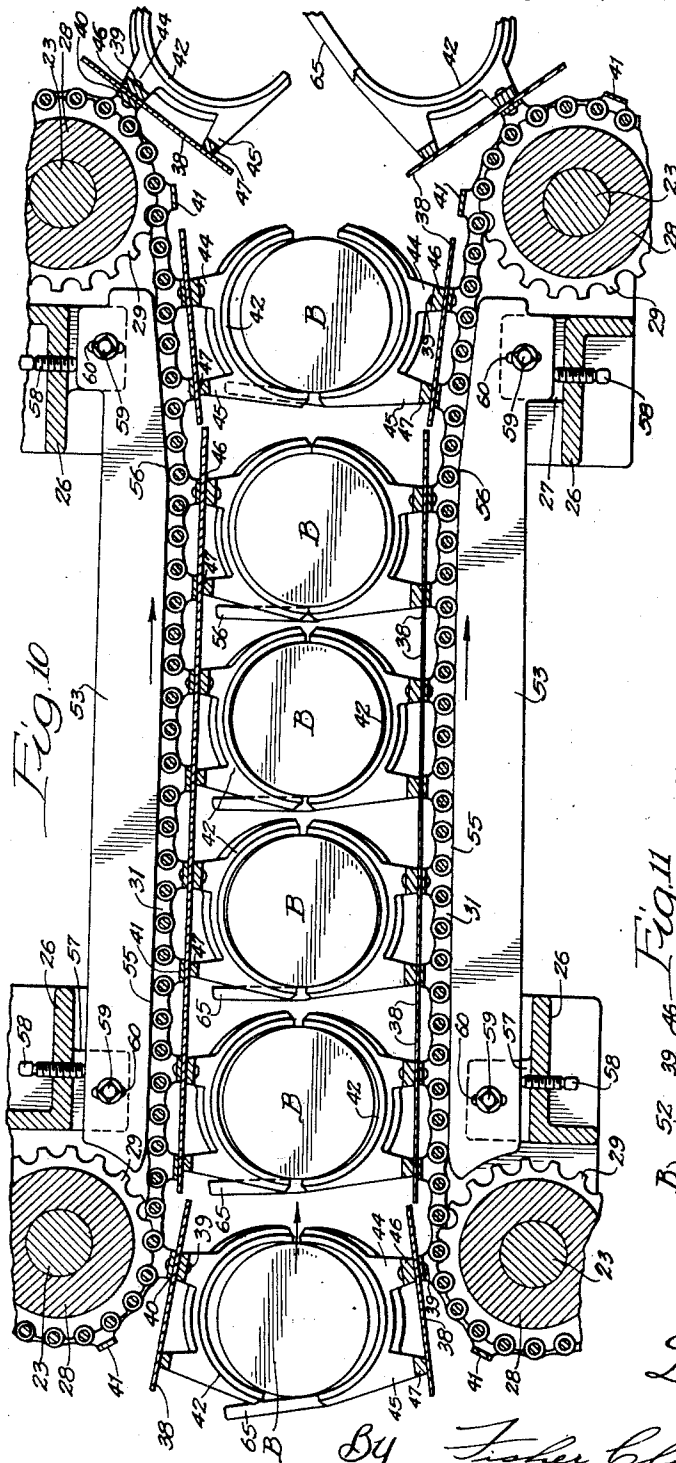
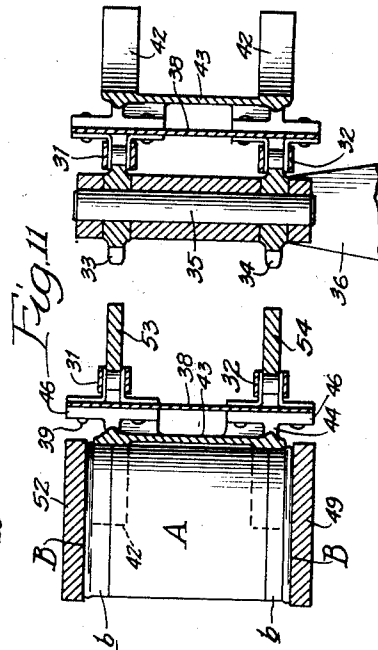
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METHOD OF AND APPARATUS FOR SEALING PASTEBOARD CANS

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR SEALING
PASTEBOARD CANS

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Application September 18, 1939, Serial No. 295,351

15 Claims. (Cl. 93—55.1)

This invention relates to round pasteboard cartons or cans, such as are extensively used for packaging oatmeal and other cereals for the market. These cans commonly consist of a round body and flat end caps or covers formed with flanges that telescope snugly over the ends of the body to seal and protect the contents of the can. To lock the caps to the body a paper label, bearing the name of the goods and the name and address of the manufacturer, is rolled around and adhered to the can, this label being wide enough to cover not only the body of the can but also the major portion of the flanges of the caps.

Now, since the cap flanges encircle the end portions of the can body, the external diameter of the cap flanges is greater by twice the thickness of the cardboard stock than the external diameter of the ends of the body. As a consequence of this, when the label is applied to side portions thereof which encircle the cap flanges are required to cover an area of greater circular extent than the main portion thereof which covers the can body, and this creates an oblique stretching strain on the parts of the label which overlies the joints at the inner edges of the cap flanges, which often results in breaking the label, moistened and weakened by the wet paste, lessening the efficiency of the label as a cap locking or bonding means. Furthermore, it destroys the straight line effect of the exposed edge of the label extending from end to end of the can.

The main object of this invention has been to provide an improved method and apparatus for sealing filled pasteboard cans or cartons having flanged end closures or caps that will effectively obviate the above noted objections.

Still other objects and attendant advantages of the invention will be apparent to persons skilled in the art from the following detailed description, taken in connection with the accompanying drawings in which I have illustrated one practical and preferred embodiment of both the can itself and the method of and apparatus for making the same, and in which—

Fig. 1 is a perspective view of the can in its initial stage, with the caps about to be applied to the can body.

Fig. 2 is an elevation of the can with the caps moistened and applied.

Fig. 3 is an elevation of the can with the caps applied and compressed on the ends of the body, and showing in section the cap clamps.

Fig. 4 is a fragmentary view enlarged of the upper portion of a filled can, showing in section

the inwardly offset joint between the can and cap.

Fig. 5 is an elevation of a sealed can with the label applied.

Fig. 6 is a view similar to Fig. 4 of an end portion of a filled, sealed and labeled can.

Fig. 7 is a top plan view of the cap compressing and locking mechanism, including the can feeding and discharging devices.

Fig. 8 is a side elevation of the mechanism shown in Fig. 7, viewed from the bottom of Fig. 7, with the heater omitted for the sake of clearness.

Fig. 9 is a vertical transverse section on the line 9—9 of Fig. 7.

Fig. 10 is an enlarged plan section, taken on the line 10—10 of Fig. 9.

Fig. 11 is a detail vertical section, taken on the line 11—11 of Fig. 7.

Fig. 12 is a perspective view of part of an automatic trip mechanism that controls the feeding of the cans into the compressing and squeezing mechanism.

Describing first the apparatus, the working parts are supported on a rectangular frame comprising parallel longitudinal angle bars 15 supported at their ends on legs 16, to the lower ends of which are attached feet 17. The two legs at each end are connected and spaced by a tie rod 18, and the tops of the angle bars 15 are rigidly connected and spaced by transverse plates 19, 20 and 21. On the plates 19 and 21 are mounted bearings 22 (Figs. 8 and 9) for vertical shafts 23, and the upper ends of said shafts are also journaled in bearings 24 formed on the ends of lateral arms 25 on the upper ends of posts 26 rising from the base plate of the lower bearings 22. Flat transverse bars 27 rigidly connect and space the arms 25 at each end of the machine.

Keyed on the shafts 23 between the shaft bearings 22 and 24 are hubs 28, integral with the upper and lower end portions of which are sprocket wheels 29 and 30. Trained around these sprocket wheels are two endless belts extending in substantial parallelism lengthwise of the machine, each belt consisting of upper and lower chains 31 and 32 the former engaged with the upper sprocket wheels 29 and the latter with the lower sprocket wheels 30. Intermediate idler sprocket wheels 33 and 34 (Fig. 11) journaled on a vertical spindle 35 in turn mounted on a fixed bracket 36 stepped on the plate 20, support the outer laps of the belts from sagging.

A plurality of uniformly spaced can clamps or squeezers, each designated as a whole by 37, is attached to the outer sides of the two chains of

each belt. Each clamp includes a flat rectangular base plate 38 that is attached at one side of its vertical median line, as by rivets 39 (Fig. 9) to vertical extensions 40 of spaced links of the chains 31 and 32. As best shown in Figs. 7 and 9, the third link in rear (in the direction of travel) of the link to which the plate 38 is attached is formed with similar vertical extensions 41 which contact with the plate 38 on the other side of the vertical median line of the latter except when the clamps are rounding the sprocket wheels, thus affording two horizontally spaced points of push on the base plate under the action of cams, later described. A pair (upper and lower) of substantially semicircular horizontal grips 42 rigidly connected and spaced by an integral vertical bar 43 (Fig. 8) and having concave can-engaging faces, are formed on their rear sides with legs 44 and 45 terminating in feet 46 and 47. The feet 46 are secured to the plate 38 by the rivets 39, and the feet 47 are secured to the plate by rivets 39' (Fig. 8).

Attached to and supported on vertical brackets 48 (Fig. 9) stepped on the cross plates 19 and 21 is a platform 49 located parallel with and midway between the adjacent laps of the belts; and adjustably suspended by threaded rods 50 and nuts 51 from the bars 27 above and parallel with the platform 49 is a board 52. The platform 49 and board 52 are spaced the height of the cans that travel between them.

Flanking the adjacent laps of the chains 31 and 32 are upper and lower bars 53 and 54 (Figs. 10 and 11), the inner edges of which are formed as low cams 55 having their peaks at the points 56. These bars 53 and 54 are supported at their ends on horizontal lugs 57 projecting from the legs 26, and the bars are adjustable toward and from the chains which slidably engage their cam edges by screws 58 threaded through the legs 26 and engaged with the outer edges of the bars; and the latter are secured in adjusted position by clamp screws 59 extending through transverse slots 60 in the bars and entering tapped holes in the lugs 57.

Referring to Fig. 7, at 61 is shown the inner end of a belt conveyor that carries the cans into the machine, and at 62 is shown a discharge conveyor. A stop 63 constituting a continuation of the inner wall of a curved passageway 64 leading from the conveyor 61 to the entrance end of the platform 49 arrests the foremost can in position to be deflected into and through the passageway 64. The can deflecting means consists of a thin arm 65 on the trailing end of the clamp that projects far enough laterally to engage the foremost can on the conveyor 61 and push it into the passageway 64, through the latter, and through the zone of the can clamping and squeezing mechanism and thence onto the discharge conveyor 62.

In association with the delivery end of the feed conveyor 61, I show an automatic trip mechanism which holds back the next to the foremost can until the foremost can has been switched into the passageway 64. This consists of a stop finger 66 pivoted at 67, urged into stop position by a spring 68, and held in stop position by a latch 69 pivoted at 70 and retained in latching position with the outer end of the finger 66 by a spring 71. Stop finger 66 is unlatched as soon as the foremost can has passed off the conveyor 61 and into the passageway 64 by an elbow lever, best shown in the perspective view, Fig. 12, that is pivoted at 72 on a post 73 supported on the frame (Fig. 8). 75

One arm 74 of this elbow lever has an upturned free end 75 that normally abuts against the latch 69 in position to release the latch from the finger 66. The other arm 76 of the elbow lever carries on its free end a roller 77 that cooperates with notches or cams 78 in the periphery of a disc 79 that is fast on the lower end of one of the sprocket hubs 28, and, of course, is driven by one of the shafts 23. When the roller 77 drops into one of the cams 78, a spring 79' (Fig. 7) swings the lever arm 74 inwardly sufficiently to cause its tip 75 to rock the latch 69 sufficiently to disengage the stop finger 66 and thus permit the next can to advance to discharge position. When this has happened, the roller 77 is forced outwardly into engagement with the periphery of the cam disc 79, and this reseats the parts of the trip to the position shown in Fig. 7.

When the apparatus is operating upon pasteboard or other fibrous cans, preferably the entire cap is stamped from pasteboard or paper that has previously been dampened; or the flange of a preformed can cap or cover may be dampened or moistened before it is applied; and the efficiency of the clamps or squeezers to effect the inward offsetting of the flange and the portion of the can body encircled thereby is enhanced by heating the clamps or squeezers just before they engage with the cap flanges. For this purpose I provide opposite the outer laps of the chain belts, gas heaters 80 supplied by a manifold 81, and equipped with burners 82 (Fig. 9) by which flames are directed onto the flange grips 42, heating the latter sufficiently to cause them to convert the residual moisture in the damp flanges of the caps into steam, which penetrates and softens the portion of the can body encircled thereby, thus enabling such portions to be offset inwardly without cracking or breaking.

The drive mechanism for the chain belts is best shown in Figs. 8 and 9. Attached to the outer sides of the frame angle bars 15, as by machine screws 83, are brackets 84, the lower portions of which are formed to constitute bearings 85 for a transverse drive shaft 86, on one end of which is keyed a sprocket wheel 87 driven by a sprocket chain 88 from any suitable source of power. Keyed on the shaft 86 is a miter gear 89 meshing with and driving a miter gear 90 secured by machine screws 91 to the lower side of a large horizontal gear wheel 92 that is keyed on one of the shafts 23. Gear wheel 92 meshes with and drives a similar gear wheel 93, the hub of which encircles the companion shaft 23, and to the lower side of gear 93 is attached by machine screws 94 a disc 95 that is keyed to the lower end of the companion shaft 23.

In describing the operation of the apparatus I shall refer to Figs. 1 to 6, inclusive, which illustrate various stages in the formation, loading and treatment of the pasteboard cans. A designates the cylindrical body of a pasteboard can, and B designates each of the upper and lower covers or caps, each of which is formed with an annular flange or rim b that is first dipped in water or otherwise moistened, the can caps being then applied to the body as shown in Fig. 2. Prior to applying the upper cap, the can is charged with oatmeal or other cereal indicated at C in Figs. 4 and 6, and the upper cap is then applied. The loaded cans are then placed in succession on the feed conveyor 61 and, as they pass between the adjacent laps of the belt conveyors, the grips 42 are brought into embracing relation to the cap flanges and are gradually

forced inwardly in a direction at right angles to the axes of the caps, as shown in Fig. 3. The grips 42 are somewhat wider than the flanges b, as shown in Fig. 3, and they engage with the flanges slightly below the joints of the flanges with the discs of the caps. This squeezing action on each can is continued during the travel of the clamps over the cams 55 until the peaks 56 are reached, this action being most clearly shown in the plan view Fig. 10. During this travel both the flanges and the portions of the body encircled thereby are inwardly offset, as shown in Figs. 4 and 6, and furthermore, a shallow internal annular groove D is formed at the junction of the flange with the disc, and an outwardly offset annular bead E is formed on the upper edge of the can body, which yieldably interlocks with the groove D in the manner clearly shown in Figs. 4 and 6. When the chain belts have passed off the peaks 56 of the cams, the grips begin to retreat from the can and this continues until the can is fully released and delivered onto the discharge conveyor 62. The groove D and bead E do not permanently lock the cap on the body, but they do yieldably lock it against accidental displacement in handling. This yieldable lock forms the subject matter of a divisional application filed by me December 16, 1940, Serial No. 370,361.

As will be seen by Figs. 4, 5 and 6, this treatment brings the outer surfaces of the flanges b flush with the outer surface of the can body between the flanges, so that when a paper label, such as F is rolled on the can with its side edge portions overlapping the flanges b, there is no warping or stretching between the parts of the label that cover the flanges and the part that covers the intermediate body portion of the can, thus leaving the surface of the label perfectly smooth and straight from end to end of the can.

I have herein shown and described one practical and preferred embodiment of this invention, but it is manifest that, so far as the method and apparatus are concerned, changes in the details of structure and arrangement may be resorted to without departing from the operative principle or sacrificing any of the advantages of the invention. Hence, I reserve all such variations, modifications and mechanical equivalents as fall within the spirit and purview of the appended claims.

I claim:

1. In an apparatus of the class described, the combination with means for supporting a cylindrical pasteboard can having a pasteboard cap with a flange encircling an end portion of the can body, of a pair of clamps formed with opposed substantially semi-circular flange fitting surfaces, and means for effecting simultaneous inward movements of said clamps at right angles to the axis of the cap into squeezing engagement with said flange sufficient to inwardly offset the portion of the body encircled by the flange and bring the outer surface of the flange flush with the outer surface of the can body.

2. In an apparatus of the class described, the combination with means for supporting a cylindrical pasteboard can having a pasteboard cap with a molstened flange encircling an end portion of the can body, of a pair of clamps formed with opposed substantially semi-circular flange fitting surfaces, means for heating said clamps, and means for effecting simultaneous inward movements of the heated clamps at right angles to the axis of the cap into squeezing engagement

with said flange sufficient to inwardly offset the portion of the body encircled by the flange and bring the outer surface of the flange flush with the outer surface of the can body.

3. In an apparatus of the class described, the combination of a platform, means for successively feeding onto one end of said platform cylindrical pasteboard cans having caps with flanges encircling the ends of the can bodies, endless belts mounted on opposite sides respectively of, and substantially parallel with, said platform, clamps formed with substantially semi-circular flange fitting surfaces carried by said belts, and means for gradually moving said clamps at right angles to the axes of the caps into squeezing engagement with the cap flanges during the passage of the cans over said platform between adjacent laps of said belts.

4. In an apparatus of the class described, the combination of a platform, means for successively feeding onto one end of said platform cylindrical pasteboard cans having caps with flanges encircling the ends of the can bodies, endless belts mounted on opposite sides respectively of, and substantially parallel with, said platform, clamps formed with substantially semi-circular flange fitting surfaces carried by said belts, means for heating said clamps prior to their engagement with the cans, and means for gradually moving said clamps at right angles to the axes of the caps into squeezing engagement with the cap flanges during the passage of the cans over said platform between adjacent laps of said belt.

5. In an apparatus of the class described, the combination of a platform, means for successively feeding onto one end of said platform cylindrical pasteboard cans having caps with flanges encircling the ends of the can bodies, endless belts mounted on opposite sides respectively of, and substantially parallel with, said platform, clamps formed with substantially semi-circular flange fitting surfaces carried by said belts, and stationary cams located respectively on opposite sides of said platform and engaged by said clamps for gradually moving the latter into squeezing engagement with the cap flanges during the passage of the cans over said platform between adjacent laps of said belts.

6. In an apparatus of the class described, the combination of a platform, means for successively feeding onto one end of said platform cylindrical pasteboard cans having caps with flanges encircling the ends of the can bodies, endless belts mounted on opposite sides respectively of, and substantially parallel with, said platform, clamps formed with substantially semi-circular flange fitting surfaces carried by said belts, gas burners located opposite the outer laps of said belts adapted to direct flames on said clamps to heat the same, and stationary cams located respectively on opposite sides of said platform and engaged by said clamps for gradually moving the latter into squeezing engagement with the cap flanges during the passage of the cans over said platform between adjacent laps of said belts.

7. In combination with the subject-matter defined in claim 3, a plank overlying the platform parallel therewith and spaced therefrom the height of the cans.

8. A specific embodiment of the combination defined in claim 3, wherein the means for successively feeding the cans onto one end of the platform comprises a belt conveyor, a lateral passageway leading from the delivery end of said conveyor to the receiving end of the platform,

and arms carried by the clamps each of sufficient length to push the foremost can through said passageway and onto the platform.

9. A specific embodiment of the combination defined in claim 3, wherein the means for successively feeding the cans onto one end of the platform comprises a belt conveyor, a can stop at the delivery end of said conveyor, a lateral passageway leading from the delivery end of said conveyor to the receiving end of the platform, arms carried by the clamps each of sufficient length to push the foremost can through said passageway and onto the platform, and means for arresting the travel of the next to the foremost can until the foremost can has been shunted off the belt conveyor and into said lateral passageway.

10. A specific embodiment of the combination defined in claim 3, wherein the means for successively feeding the cans onto one end of the platform comprises a belt conveyor, a can stop at the delivery end of said conveyor, a lateral passageway leading from the delivery end of said conveyor to the receiving end of the platform, arms carried by the clamps each of sufficient length to push the foremost can through said passageway and onto the platform, a pivoted finger for arresting the travel of the next to the foremost can until the foremost can has been shunted off the belt conveyor and into said lateral passageway, a latch normally locking said finger in operative position, a spring-actuated cam-controlled lever for releasing said latch as soon as the foremost can has passed into said lateral passageway, and springs for returning said finger and latch to normal interlocked position.

11. A method of applying a flanged pasteboard cap to a pasteboard can body to produce a can of uniform external diameter, which consists in stamping the cap from a previously dampened pasteboard sheet, telescoping the cap flange over an open end of the can body, and then heating and squeezing the dampened flange at right angles to the axis of the cap, to compress and inwardly offset the portion of the body covered

by the flange, said heating and squeezing action being continued until the outer surface of the flange is flush with the outer surface of the body.

12. The herein described method of transforming an over-size cap can into a flush type can after the can has been filled with product, which consists in squeezing the flanges of the caps on the ends of the body at right angles to the axis of the cap under moisture and heat until the outer surfaces of the caps are substantially flush with the outer surface of the body.

13. A method of applying a flanged pasteboard cap to a pasteboard can body, which consists in moistening the cap flange, then telescoping the cap onto an open end of the body, and then gradually applying external squeezing pressure to the moist flange at right angles to the axis of the cap sufficient to compress and inwardly offset the portion of the body covered by the flange, said pressure applying action being continued until the outer surface of the flange is flush with the outer surface of the body.

14. A method of applying a flanged pasteboard cap to a pasteboard can body, which consists in moistening the cap flange, then telescoping the cap onto an open end of the body, and then heating and gradually applying external squeezing pressure to the moist flange at right angles to the axis of the cap sufficiently to compress and inwardly offset the portion of the body covered by the flange, said heating and pressure applying action being continued until the outer surface of the flange is flush with the outer surface of the body.

15. A method of applying a moist, flanged pasteboard cap to a pasteboard can body, which consists in telescoping the cap onto an open end of the body, and then gradually applying external squeezing pressure to the moist flange at right angles to the axis of the cap sufficient to compress and inwardly offset the portion of the body covered by the flange, said pressure applying action being continued until the outer surface of the flange is flush with the outer surface of the body.

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