

1,023,039.

F. RUDOLPHI.
DOUBLE SEAMING MACHINE.
APPLICATION FILED MAR. 26, 1910.

Patented Apr. 9, 1912.

3 SHEETS—SHEET 1.

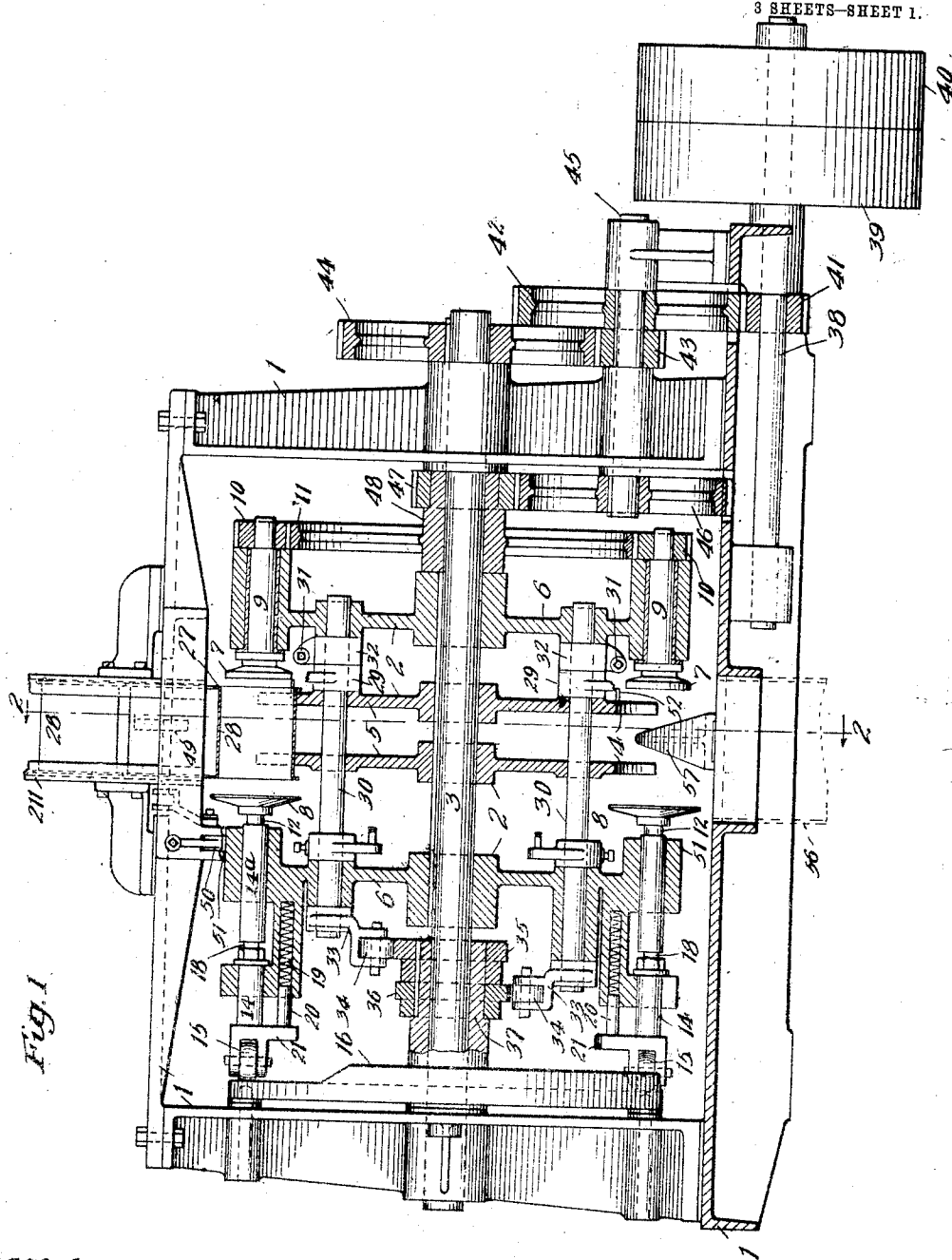


Fig. 1

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3 SHEETS--SHEET 2.

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3 SHEETS-SHEET 3.

Fig. 3

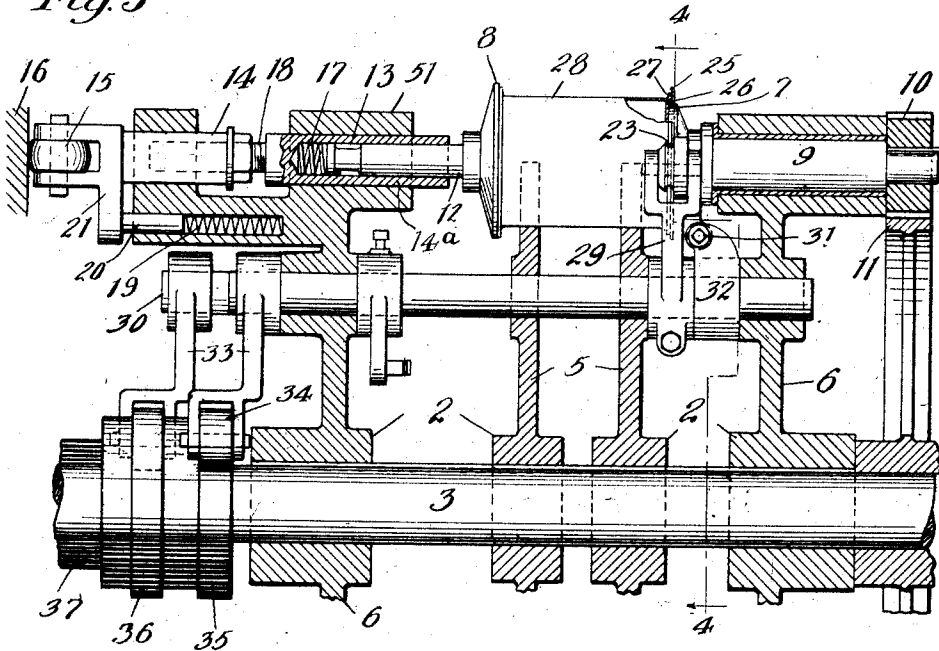


Fig. 4

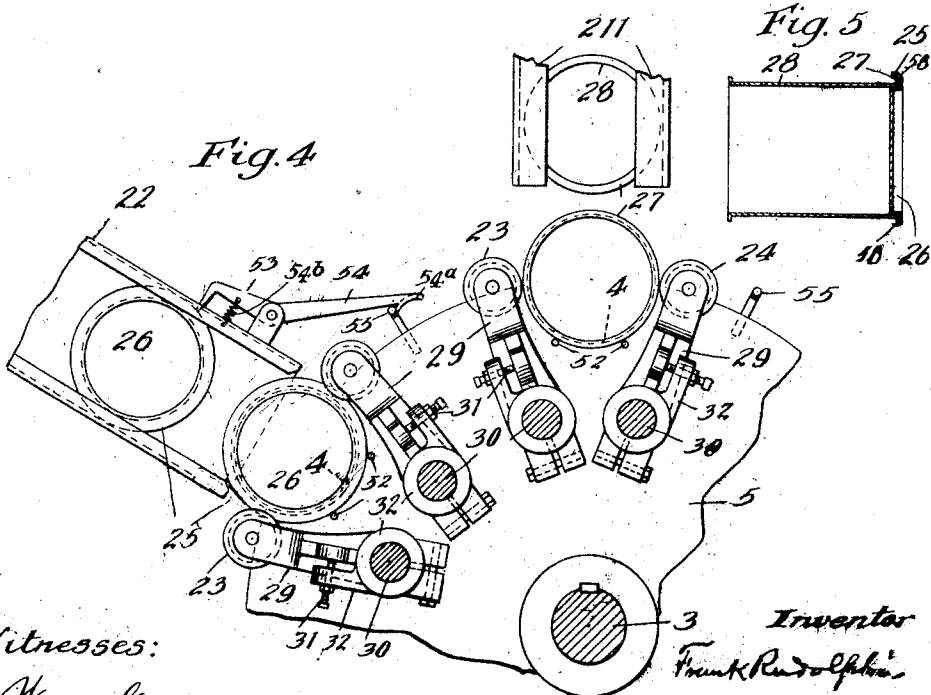
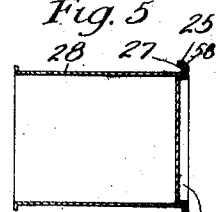


Fig. 5



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UNITED STATES PATENT OFFICE.

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DOUBLE-SEAMING MACHINE.

1,023,039.

Specification of Letters Patent.

Patented Apr. 9, 1912.

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To all whom it may concern:

Be it known that I, FRANK RUDOLPHI, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented a new and useful Improvement in Double-Seaming Machines, of which the following is a specification.

This invention relates to improvements in double seaming machines.

The object of the invention is to provide an automatic, continuous, rotary, double seaming machine of a simple, efficient and durable construction, by means of which can heads may be very rapidly and cheaply double seamed upon can bodies and hermetically tight seams produced.

The invention consists in connection with a continuously rotating carrier turning on a horizontal axis, and having a plurality of horizontally disposed can body receiving pockets into which the can bodies may feed by gravity from a chute into the pockets of the carrier as the carrier rotates continuously, a plurality of pairs of axially rotatable can holder chucks mounted on the carrier, one pair for each pocket of the carrier, a plurality of sets of independently movable double seaming rollers mounted on the carrier, one set for each pocket of the carrier, stationary cams and connections for automatically operating the several sets of double seaming rollers as the carrier rotates continuously, a stationary cam and connections for reciprocating one of the rotatable can holder chucks of each pair as the carrier rotates continuously, and means for axially rotating the rotatable can holder chucks as the carrier revolves.

The invention further consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described and more particularly specified in the claims.

In the accompanying drawing forming a part of this specification, Figure 1 is a central, vertical, longitudinal section of a continuous rotary double seaming machine embodying the invention. Fig. 2 is a vertical cross section on line 2—2 of Fig. 1. Fig. 3 is a detail section on line 3—3 of Fig. 2. Fig. 4 is a detail section on line 4—4 of Fig. 3 and Fig. 5 is a sectional view showing a can and can head assembled to-

gether before being fed to the machine in cases where it is not desired to feed the heads and bodies separately to the machine or to employ or use a can head chute separate from the can body chute.

In the drawing, 1 represents the frame of the machine, the same being of any suitable construction to give support to the other parts.

2 is a continuously rotating carrier, turning on a horizontal axis or shaft 3 and having a plurality of horizontally disposed can body receiving pockets 4, preferably six in number. The carrier 2, for convenience of construction, preferably comprises four separate disks or heads 5, 5 and 6, 6, the two inner ones 5, 5 having formed therein the can body receiving pockets 4, and the two outer ones 6, 6 carrying the can holder chucks and seaming roller mechanism.

A plurality of pairs of axially rotatable can holder chucks 7, 8 are mounted on the carrier 2, one pair for each can body receiving pocket of the carrier. One of the can holder chucks 7 of each pair has a spindle or shaft 9 furnished with a gear 10, which meshes with a main or central gear 11 to axially rotate the can holder chucks and the can clamped between them as the carrier 2 rotates. The shaft or spindle 12 of the other chuck 8 of each pair has a rotatable connection, preferably a ball bearing connection 13 comprising balls and a ball race, with an adjustable member 14 of a reciprocating stem 14 which is furnished with an anti-friction roller 15, engaging a stationary cam 16 on the frame of the machine by which the can holder chuck 8 is reciprocated as the carrier 2 revolves to clamp the can between itself and the opposing chuck 7. A spring 17 is preferably interposed between the can holder chuck 8 and its reciprocating stem 14 of stem 14 to accommodate variations in length of the can bodies and give a yielding clamping action to the can holder chucks 7, 8. An adjusting screw 18 is also preferably interposed between the can holder chuck 8 and its reciprocating stem 14 for adjusting the clamping movement of the reciprocating chuck 8. A spring 19 acting against a pin 20, carried by an arm 21 on the stem 14 is preferably employed to open the chuck 8 as the carrier revolves into position to re-

ceive the can bodies from the can body chute 211 and can heads from the can head chute 22.

The continuously rotating carrier 2 is provided with a plurality of sets of movable double seaming rollers 23, 24, one set for each can body pocket 4 of the carrier 2. One of the double seaming rollers 23 of each set serves to turn or fold the flange 25 of the can head 26 over the flange 27 of the can body 28, and the other seaming roller 24 serves to finish the seaming operation or compress the folds of the seam closely and tightly together.

The movable seaming rollers 23, 24 of each pair are each mounted upon an independently movable tool holder 29, preferably a vibrating arm on a rock shaft 30, and having an adjustable connection 31 with the rock shaft arm 32, the rock shaft being provided with a further arm 33, carrying an anti-friction roller 34 which engages stationary cams 35 and 36, one cam being employed for operating the forming rollers 23 and the other for operating the finishing rollers 24. The stationary cams 35, 36 are preferably on a stationary hub 37, secured to the frame of the machine and springs 37^a are preferably used to retain the rollers 34 in engagement with the cams 35, 36.

The shaft 3 of the carrier 2 is preferably continuously rotated from the main driving shaft 38, having fast and loose pulleys 39, 40, through the intermeshing gears 41, 42, 43 and 44, the gears 42, 43 being on the intermediate shaft 45. The main or central gear 11 by which the can holder chucks are axially rotated as the carrier 2 revolves, is preferably a driven gear instead of a stationary one, and is preferably driven by a gear 46 on the shaft 45, meshing with a gear 47 on the hub 48 of the gear 11.

The can body feed chute 211 is preferably arranged substantially upright so that the can bodies will readily feed down it by gravity, and it is preferably provided with a vibrating feeder or dog 49 to cause the can bodies to feed one by one into the pockets 4 of the carrier 2 as the carrier rotates continuously. The vibrating feeder or dog 49 is preferably intermittently moved to release the lowermost can body in the chute, by means of a lever 50 and a cam or projection 51 on the carrier 2. The can head chute 22 is preferably arranged at an inclination, so that the can heads may feed down the same by gravity against the can head registering pins or stops 52 with which the carrier 2 is provided to cause each can head to properly register with its can body before the can holder chucks 7, 8 close upon the same to clamp the can head on the can body preparatory to the seaming operation. The can head feed chute 22 is preferably furnished with a vibrating can head feeder

or finger 53 having an arm 54 operated by a cam or projection 55 on the carrier 2 as the carrier rotates, and thereby releasing the lowermost can head in the can head chute. The length of the contacting face 54^a of arm 54 is such that the feed finger 53 is only withdrawn long enough from the path of the can heads in the chute 22 to permit the release of but a single can head at a time, a spring 54^b operating to restore the feed finger 53 to normal position as soon as the projection 55 passes the contacting face 54^a of said arm 54.

After the can head has been seamed upon the can body by the operation of the machine, the finished can is ejected or delivered from the machine into the discharge chute 56 by the ejector device 57 which projects into the path of the can bodies on the carrier 2.

In practicing the invention, it is preferred to feed the can bodies and can heads separately to the machine and to employ two chutes for this purpose, one for the can bodies and the other for the can heads. If, however, the heads and bodies are first assembled together and the flange 25 of the can head crimped or clenched at two or more points of its circumference, as at 58, about the flange of the can body, the assembled can heads and can bodies may be together fed to the machine through the can body chute 211, and in such case, the can head chute 22 need not be used or may be entirely omitted from the machine if desired.

What is claimed is:

1. In a continuous, rotary, double seaming machine, the combination with a continuously rotating carrier, having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of pairs of axially rotatable can holder chucks on the carrier, and a plurality of sets of double seaming rollers on the carrier, means for opening and closing the chucks as the carrier rotates, means for axially rotating the chucks as the carrier rotates and means for actuating the double seaming rollers as the carrier rotates, a can body feed chute and-feeder and a can head feed chute and feeder, substantially as specified.

2. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier and a plurality of sets of double seaming rollers mounted on the carrier, substantially as specified.

3. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plural-

ity of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, and stationary cams and connections for independently operating the double seaming rollers of each set as the carrier rotates, substantially as specified.

4. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier and a plurality of sets of double seaming rollers mounted on the carrier, and a stationary cam and connections for reciprocating one of the can holder chucks of each pair as the carrier rotates, substantially as specified.

5. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, and a main gear, one of the can holding chucks of each pair having a spindle furnished with a gear meshing with said main gear for axially rotating the can holder chucks as the carrier revolves, substantially as specified.

6. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, and a feed chute for delivering the can bodies to the pockets of said carrier as it rotates, substantially as specified.

7. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, a feed chute for delivering the can bodies to the pockets of said carrier as it rotates, and a can body feeder in said chute, substantially as specified.

8. In a continuous, rotary, double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder

chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, a feed chute for delivering the can bodies to the pockets of said carrier as it rotates, and a can head feed chute, substantially as specified.

9. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotating about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, a feed chute for delivering the can bodies to the pockets of said carrier as it rotates, and a can head feed chute and a can head feeder in said last mentioned chute, substantially as specified.

10. In a continuous, rotary double seamer, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets therein rotating about a horizontal axis, of a can body chute for delivering can bodies to the pockets of said carrier as it rotates continuously, a plurality of pairs of can holder chucks mounted on said carrier, a stationary cam, and connections for opening and closing said chucks, a main gear and intermeshing gears for axially rotating said chucks, a plurality of sets of seaming rollers mounted on said carrier each set comprising a plurality of independently movable seaming rollers and stationary cams and connections for actuating said seaming rollers as the carrier rotates, substantially as specified.

11. In a continuous rotary double seamer, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets therein rotating about a horizontal axis, of a can body chute for delivering can bodies to the pockets of said carrier as it rotates continuously, a plurality of pairs of can holder chucks mounted on said carrier, a stationary cam, and connections for opening and closing said chucks, a main gear and intermeshing gears for axially rotating said chucks, a plurality of sets of seaming rollers mounted on said carrier each set comprising a plurality of independently movable seaming rollers, stationary cams and connections for actuating said seaming rollers as the carrier rotates, and a can head chute, said carrier having can head seats for registering the can heads with the can bodies, substantially as specified.

12. In a continuous rotary double seamer, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets therein rotating about a horizontal axis, of a can body chute for delivering can bodies to the pockets of said carrier as it rotates con-

tinuously, a plurality of pairs of can holder chucks mounted on said carrier, a stationary cam and connections for opening and closing said chucks, a main gear and intermeshing gears for axially rotating said chucks, a plurality of sets of seaming rollers mounted on said carrier each set comprising a plurality of independently movable seaming rollers, and stationary cams and connections for actuating said seaming rollers as the carrier rotates, a can head chute, said carrier having can head seats for registering the can heads with the can bodies, a discharge chute and ejector for the seamed cans, substantially as specified.

13. In a double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks on the carrier, means for rotating one chuck of each pair as the carrier rotates, and means for reciprocating the other chuck of each pair as the carrier rotates, and a plurality of sets of double seaming rollers mounted on said carrier, one set for each pocket of the carrier, and each set comprising a plurality of independently movable seaming rollers substantially as specified.

14. In a double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks on the carrier, means for rotating one chuck of each pair as the carrier rotates, means for reciprocating the other chuck of each pair as the carrier rotates, a plurality of sets of seaming rollers mounted on the carrier, one set for each pocket of the carrier and each set comprising a plurality of independently movable seaming rollers, and cams and connections for independently operating the separate seaming rollers of each set, substantially as specified.

15. In a double seaming machine, the combination with a continuously rotating carrier having a plurality of horizontally disposed can body receiving pockets rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks on the carrier, means for rotating one chuck of each pair as the carrier rotates, means for reciprocating the other chuck of each pair as the carrier rotates, said chuck reciprocating means comprising a stationary cam, a reciprocating stem and a rotary connection between said stem and the chuck spindle, substantially as specified.

16. The combination of a support rotating continuously about a horizontal axis, a plurality of seaming stations carried thereby, including a chuck, a cooperating rotatable

supporting plate, means for rotating the chuck for rotating the can end and can body, seaming rolls movable with said support and disposed upon opposite sides of said can body, pivoted carriers for the seaming rolls, stationary cams, and rollers mounted on said carriers for the seaming rolls and cooperating with said stationary cams, whereby first one seaming roll and then the other is brought into contact with the can end.

17. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier turning about a horizontal axis and having a plurality of horizontally disposed can body receiving pockets, of a plurality of axially rotatable can holder chucks mounted on said carrier one at each end of each of said pockets, a plurality of sets of double seaming rollers mounted on said carrier, and direct pressure means for actuating said seaming rollers as the carrier rotates, substantially as specified.

18. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier turning about a horizontal axis and having a plurality of horizontally disposed can body receiving pockets, of a plurality of axially rotatable can holder chucks mounted on said carrier one at each end of each of said pockets, a plurality of sets of double seaming rollers mounted on said carrier, and direct pressure means for actuating said seaming rollers as the carrier rotates, and an external annular gear for rotating said carrier, substantially as specified.

19. In a continuous, rotary double seaming machine, the combination with a can body chute, of a can head chute adjacent thereto, a continuously rotating carrier turning about a horizontal axis and having a plurality of horizontally disposed can body receiving pockets and a plurality of can head seats, a plurality of axially rotatable chucks mounted on said carrier one at each end of each of said pockets and a plurality of sets of seaming rollers mounted on said carrier, each set comprising a plurality of independently movable seaming rollers, substantially as specified.

20. In a seaming machine, the combination with a rotary carrier turning about a horizontal axis and having a plurality of horizontally disposed can receiving pockets, of a plurality of axially rotatable chucks on said carrier one at each end of each of said pockets, a plurality of seaming rollers mounted on said carrier, and direct pressure means for actuating said seaming rollers as the carrier rotates, substantially as specified.

21. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier turning about a horizontal axis and having a plurality of

horizontally disposed can pockets thereon, of a can body chute for delivering the can bodies one by one into the pockets of the carrier, a plurality of pairs of axially rotatable chucks mounted on the carrier one at each end of each of said pockets, a plurality of sets of double seaming rollers mounted on the carrier and an external annular gear for rotating the carrier, substantially as specified.

22. In a continuous, rotary double seaming machine, the combination with a can body chute of a can head chute, a continuously rotating carrier turning about a horizontal axis and having a plurality of horizontally disposed can body receiving pockets, and a plurality of can head registering seats, a plurality of pairs of axially rotatable chucks mounted on said carrier one chuck at each end of each of said pockets, a plurality of sets of double seaming rollers mounted on said carrier, said carrier having an external annular gear through which it is rotated, substantially as specified.

23. The combination with a continuously rotating carrier turning about a horizontal axis and having a plurality of horizontally disposed can receiving pockets, a chute for delivering the cans thereto, a plurality of chucks on said carrier, one at each end of each of said pockets, a plurality of sets of double seaming rollers on said carrier, one set for each of said pockets, and an external gear on the carrier through which said carrier is rotated, substantially as specified.

24. The combination of a support rotating continuously about a horizontal axis, a plurality of seaming stations including seaming rolls movable with the support and disposed upon opposite sides of the can body, means for rotating the can body and can end, carriers for said seaming rolls and means for moving said carriers whereby first one seaming roll and then the other is brought into contact with the can end.

25. The combination of a support rotating continuously about a horizontal axis, a

plurality of seaming stations including seaming rolls movable with the support and disposed upon opposite sides of the can body, means for rotating the can body and can end, carriers for said seaming rolls, and stationary cams, and rollers mounted on said carriers and cooperating with said stationary cams for operating the seaming rolls.

26. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, and means for feeding can bodies and can heads to a position between the rotatable can holder chucks, substantially as specified.

27. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, a stationary cam and connections for reciprocating one of the can holder chucks of each pair as the carrier rotates, and means for supporting a can body until clamped by the chucks, substantially as specified.

28. In a continuous, rotary double seaming machine, the combination with a continuously rotating carrier rotatable about a horizontal axis, of a plurality of axially rotatable can holder chucks mounted on the carrier, a plurality of sets of double seaming rollers mounted on the carrier, stationary cams and connections for independently operating the double seaming rollers of each set as the carrier rotates, and means for supporting a can body and head until clamped by the chucks, substantially as specified.

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