

Aug. 5, 1924.

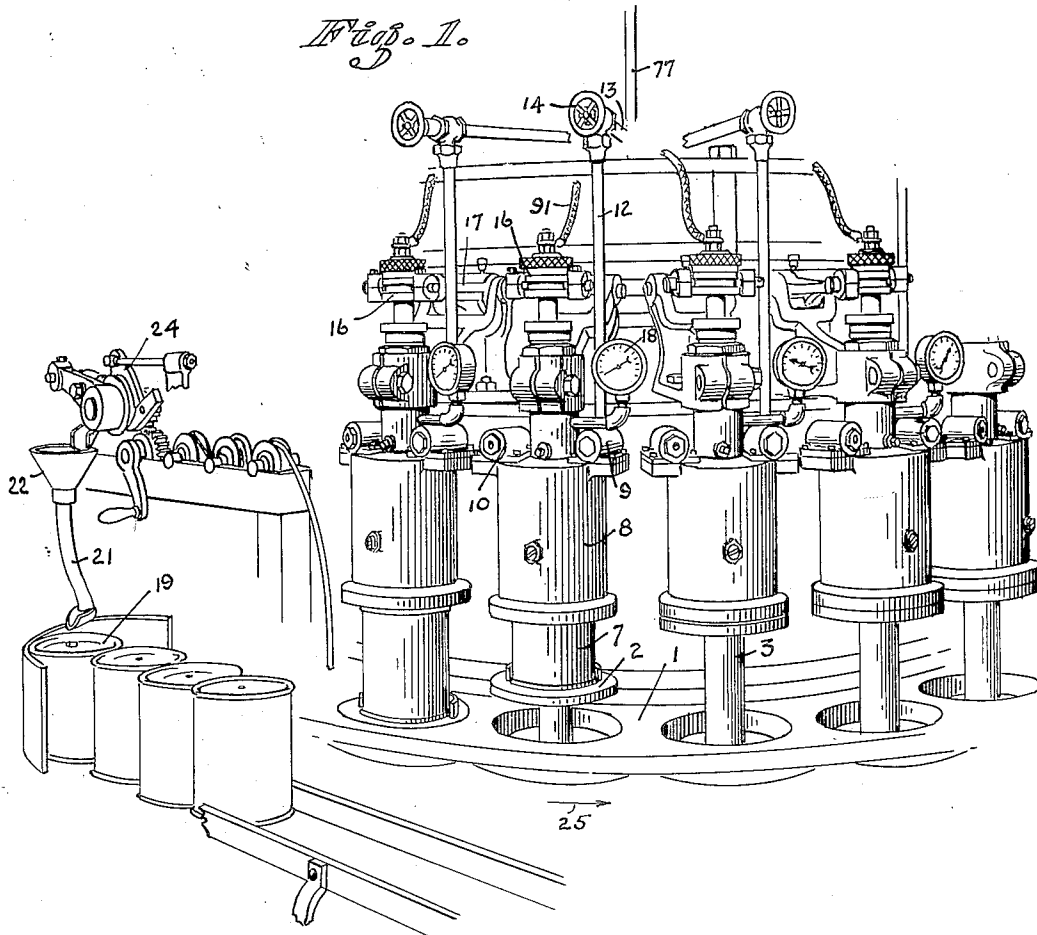
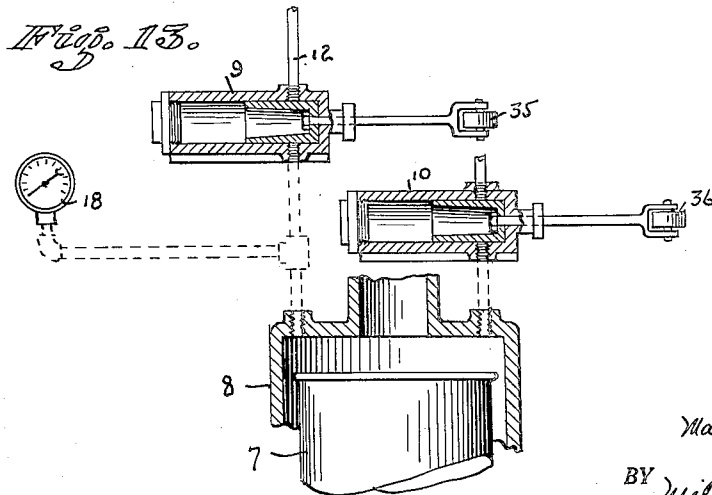
1,504,088

M. BRANSTEN

PROCESS FOR SEALING CONTAINERS IN VACUUM

Filed May 31, 1923

5 Sheets-Sheet 1



INVENTOR.
Maurice Bransten
BY Miller Henry Boykett
ATTORNEYS.

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M. BRANSTEN

PROCESS FOR SEALING CONTAINERS IN VACUUM

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5 Sheets-Sheet 2

Fig. 2.

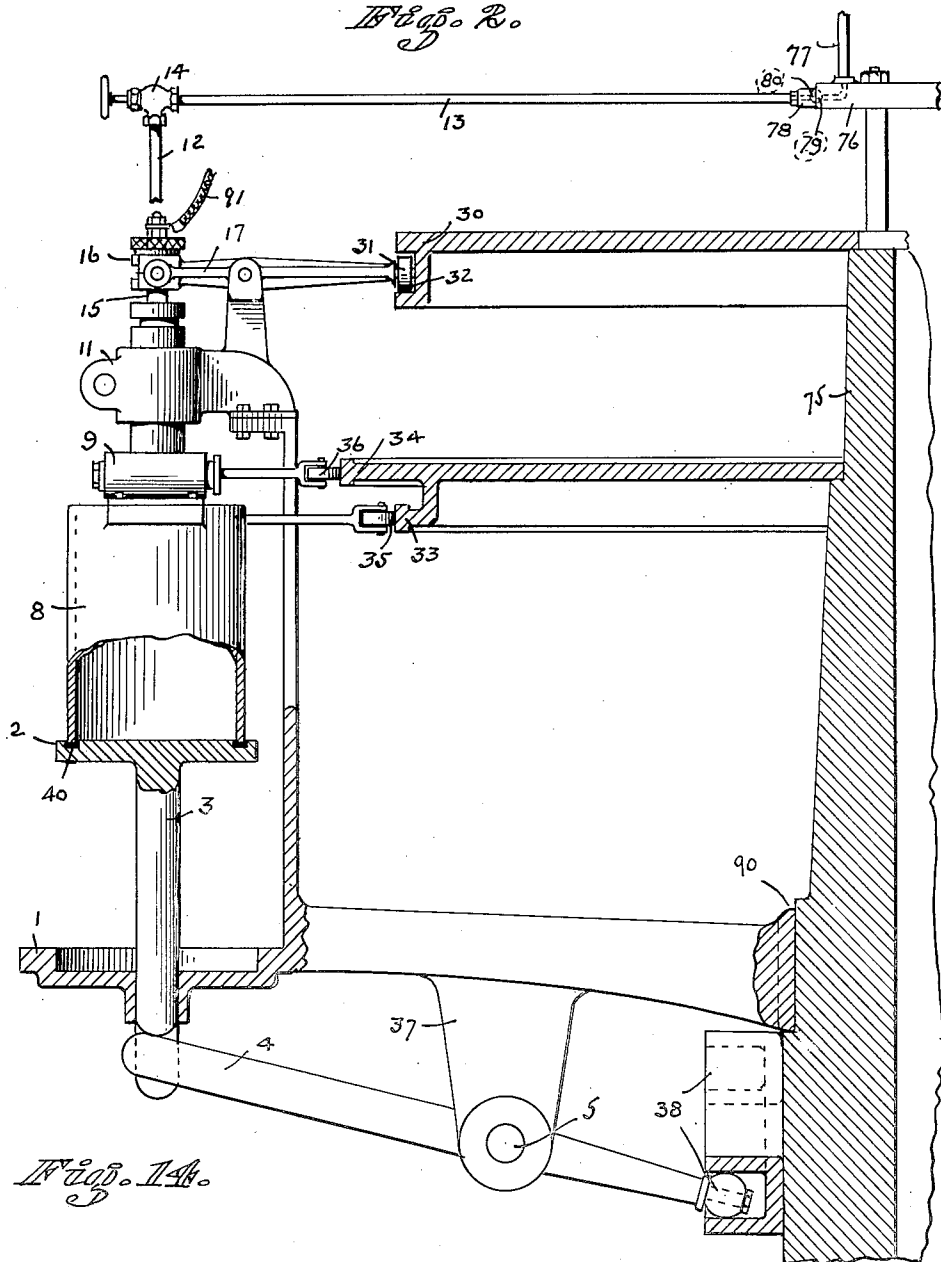
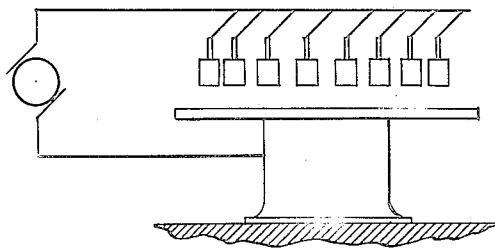


Fig. 14.



INVENTOR.

INVENTOR
Wm. J. Brauer

BY *William Henry Baylee*
ATTORNEYS.

Aug. 5, 1924.

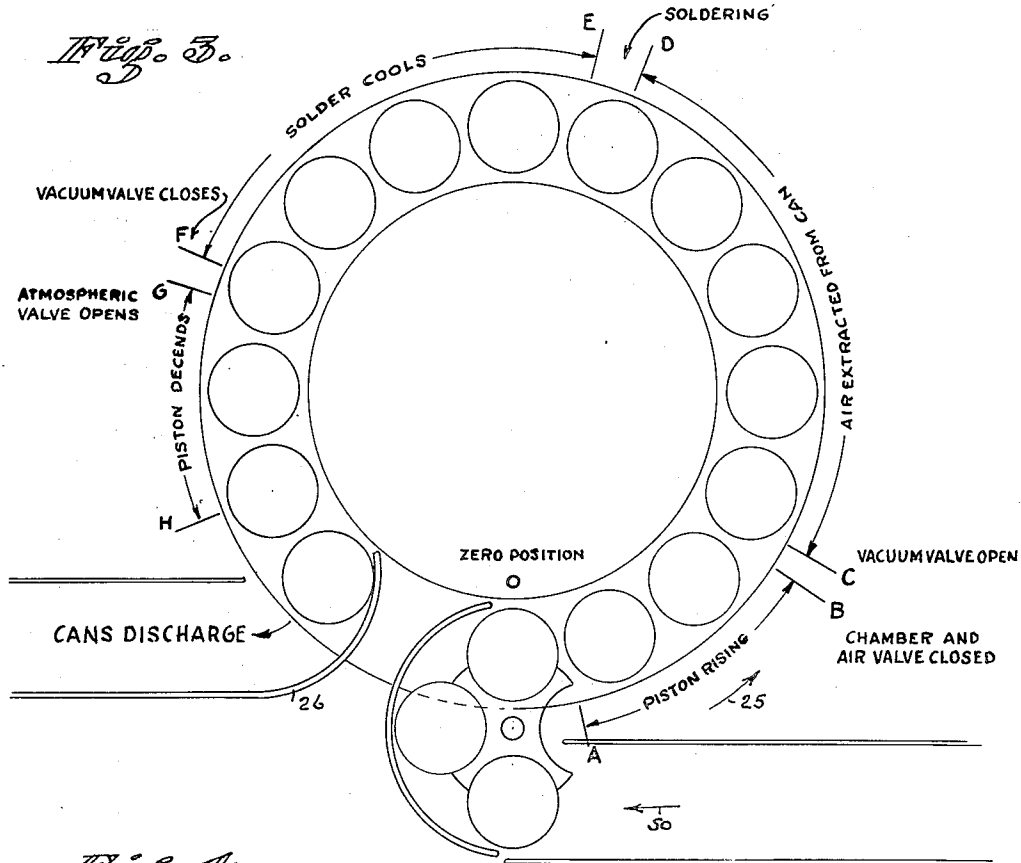
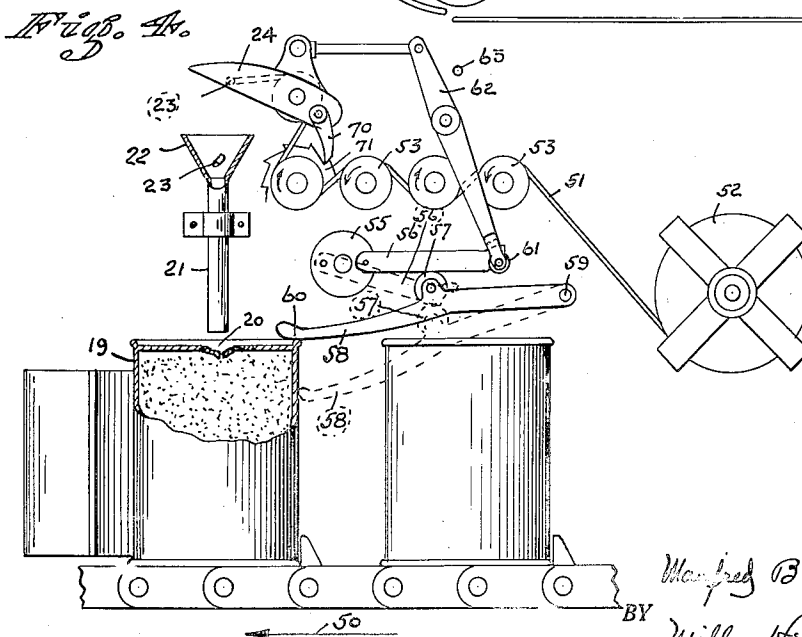
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M. BRANSTEN

PROCESS FOR SEALING CONTAINERS IN VACUUM

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5 Sheets-Sheet 3



INVENTOR.
M. Bransten
BY
Walter Henry Barker
ATTORNEYS.

Aug. 5, 1924.

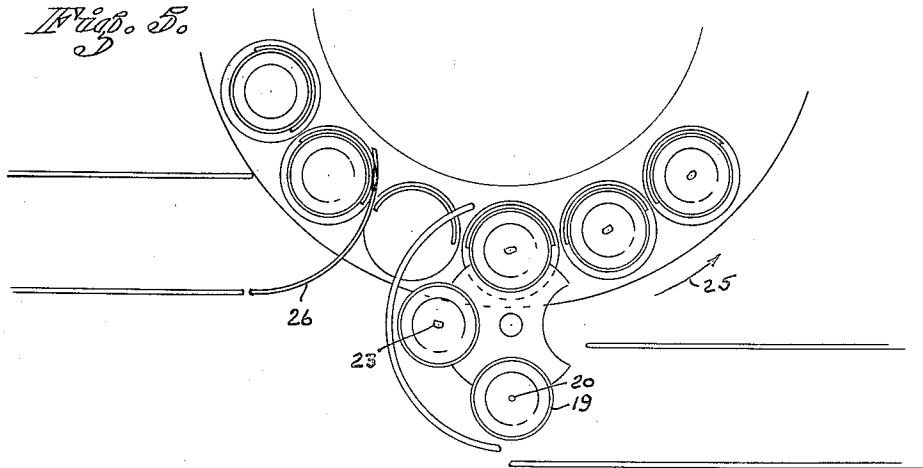
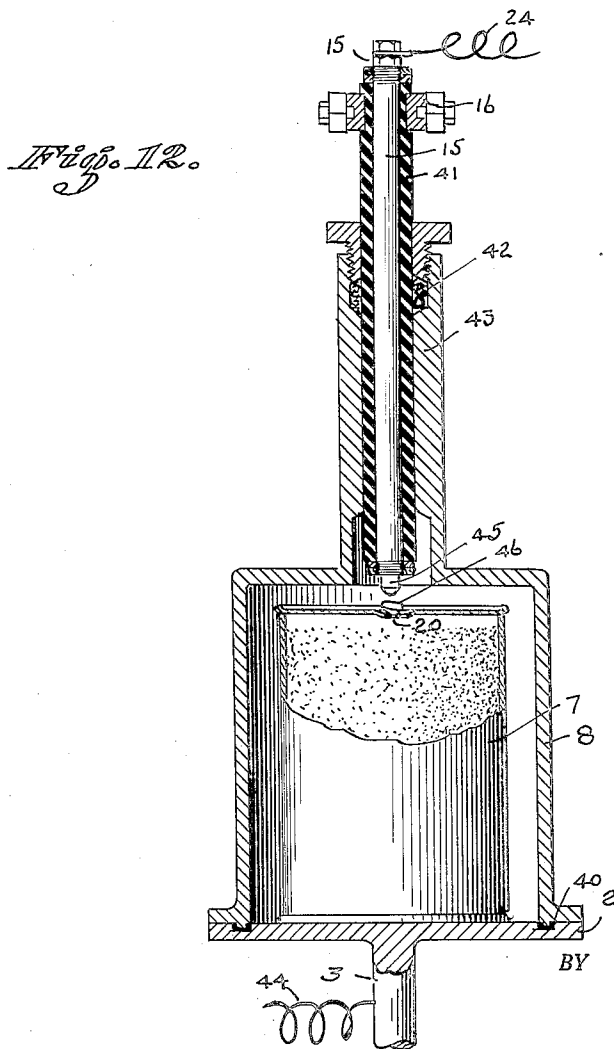
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M. BRANSTEN

PROCESS FOR SEALING CONTAINERS IN VACUUM

Filed May 31, 1923

5 Sheets-Sheet 4



INVENTOR.

Maufred Bransten

BY

Miller Henry & Boyden
ATTORNEYS.

Aug. 5, 1924.

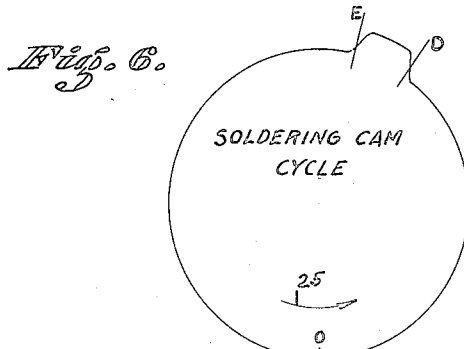
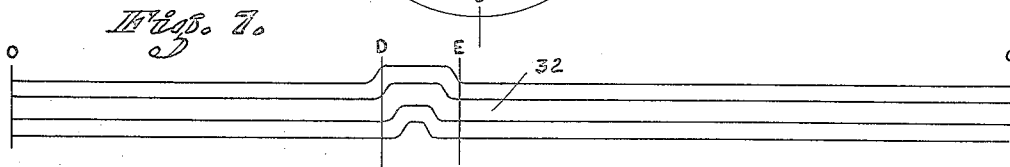
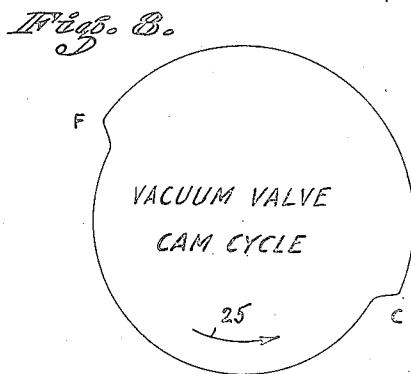
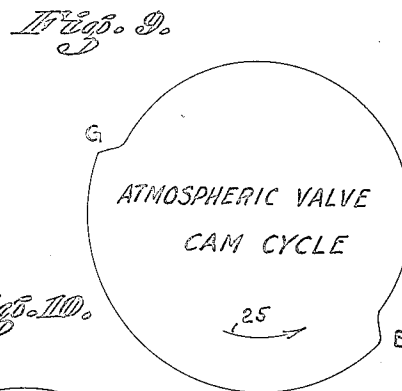
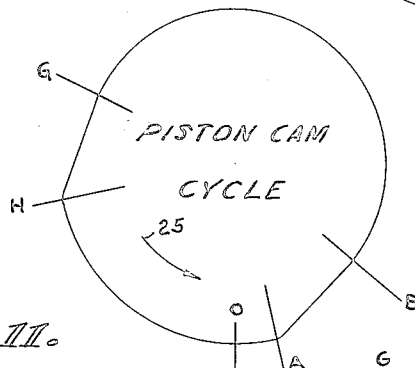
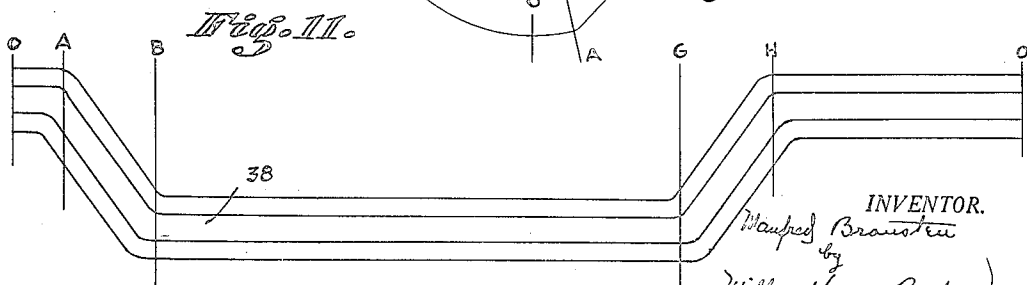
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M. BRANSTEN

PROCESS FOR SEALING CONTAINERS IN VACUUM

Filed May 31, 1923

5 Sheets-Sheet 5



INVENTOR.
Maurice Bransten
by
Miller Henry & Bayless
ATTORNEYS.

UNITED STATES PATENT OFFICE.

MANFRED BRANSTEN, OF SAN FRANCISCO, CALIFORNIA; H. V. BRANDENSTEIN
ADMINISTRATOR OF THE SAID MANFRED BRANSTEN, DECEASED.

PROCESS FOR SEALING CONTAINERS IN VACUUM.

Application filed May 31, 1923. Serial No. 642,466.

To all whom it may concern:

Be it known that I, MANFRED BRANSTEN, a citizen of the United States, and resident of the city and county of San Francisco, State of California, have invented new and useful Improvements in Processes for Sealing Containers in Vacuum, of which the following is a specification.

The principal object of my invention is to secure a perfectly sealed container from which air and any contained gases are previously removed, and is particularly adapted to the packing of food products in tin cans.

My said invention has been developed with particular reference to the sealing of ground coffee and the like in cans, whereby the contents are maintained pure and inert without the deleterious influence of oxygen or moisture, and the original flavor and condition at the time of initial preparation fully maintained.

Other objects will appear from the drawings and specifications as follows:

These objects I attain by packing in a container or can any desired substance immediately after its roasting, cooking or other preparation, which container is entirely closed as by the well known double sealing process, except for a small opening or puncture. The cans are then continuously fed into a machine where each individual can is placed in a chamber which is then closed against air ingress and a vacuum valve opened and the air withdrawn from the said chamber, and therefore through the said opening or puncture it is also withdrawn from the can. When the desired degree of vacuum is attained a drop of solder is employed to close the puncture. The solder seal is then allowed to cool, while still in vacuum, and an air valve is then opened admitting atmospheric pressure in the chamber. The chamber is then opened and the can removed.

The process is continuous in that a series of cans are fed consecutively as above described on to a rotating table, each can being positioned as it arrives on the table on top of a piston. The pistons are thereafter advanced as the table rotates, raising the can into a chamber and which is sealed by the piston. The air and vacuum valves above described are then actuated by

suitable cams, and the movement of the soldering mechanism also is actuated by a suitable cam as the table rotates.

Before the table has made a complete revolution the complete cycle of operations has been performed on the can. The piston descends and the can is removed, thus clearing the piston and chamber, which, upon completion of a revolution, is ready to receive another can.

By referring to the accompanying drawings and specifications wherein is set forth mechanism for performing the process of my invention, particularly adapted to the packing in cans of roasted and ground coffee, my invention will be made clear.

Figure 1 is a fragmentary perspective view showing a portion of a machine for practicing my process.

Fig. 2 is a cross section through one of the chamber elements with the piston raised to close the chamber and certain of the parts broken away to better indicate the operation, and with the air and vacuum valves shown displaced to illustrate the cans.

Fig. 3 is a diagrammatic plan view of the rotating table showing the cycle of piston movements, valve movements and soldering steps.

Fig. 4 is a part side view and part section showing the placing of the cold solder on the can before it enters the vacuum chamber.

Fig. 5 is a plan view of a portion of the table and feeding mechanism illustrating the can movements and positions corresponding with Fig. 4.

Fig. 6 is a cycle diagram of the soldering operation.

Fig. 7 is a development of the periphery of the can diagram of Fig. 6.

Fig. 8 is a diagram of the vacuum valve cam cycle.

Fig. 9 is a diagram of the atmosphere valve cam cycle.

Fig. 10 is a piston cam cycle and is diagrammatic only.

Fig. 11 is a development of the piston moving cam.

Fig. 12 is a cross section through one of the vacuum chambers showing a can in place during the soldering operation.

Fig. 13 is a showing in section of the air

and vacuum valves and chamber, the connections therebetween being shown diagrammatically.

Fig. 14 is a diagram of the electric service connections for the soldering operation.

Throughout the figures similar numerals refer to identical parts.

Referring particularly to Fig. 1 showing an example of mechanism employed in my process, a rotatable table is shown by the numeral 1 in which are mounted a plurality of pistons 2 and piston rods 3, by which the pistons are reciprocated up and down through the action of the lever 4, fulcrumed at 5 and controlled by the cam slot 38. The pistons are adapted to raise the can or other container 7 and to enclose the same therein by serving as a closed bottom to the chamber 8. This chamber is provided with ports and a vacuum valve 9 and an air valve 10 and is separated in spaced relation and rigidly held with the table 1 by the arm or other suitable structure 11.

A vacuum pipe 12 connects the chamber 8 through the valve 9 and is in turn connected through the pipe 13 and valve 14, with a vacuum or negative supply pressure communicated through pipe 77 and more specifically described below. At 15 is an electrode which is reciprocated within the chamber by the head 16 and cam actuated arm 17. At 18 is a gauge to indicate the pressure, relative to the atmosphere, within the chamber 8.

A row of cans about to be transferred to the table 1 is shown at 19 and these are fully packed with the contents enclosed therein, preferably by the well known double seamed top and bottom, with a punctured hole, however, in the center of the end of the can so that the air and gas therein may be exhausted through the said puncture 20 (see Figs. 4 and 5) when the cans are vacuumized in the chambers 8. A chute 21 and funnel 22 (see also Fig. 4) transfers a small piece of cold solder 23 from the cutting mechanism at 24 to the center of the can immediately at or over the puncture 20. The cans are then consecutively transferred by conventional mechanism from the position 19 to a central position on the pistons 2, each can having a punctured top and a drop of cold solder positioned thereat.

The cans now rotate with the table 1 in the direction of arrow 25 and due to the action of the cam slot 38 and lever 4, rods 3, and pistons 2 the cans 7 are raised and closed within the chamber 8.

After complete closure within the chamber, the air valve 10 is closed and the vacuum valve 9 opened through the action of a pair of cams more fully described below. The air is now exhausted through the puncture 20, and after a suitable period of exhaustion the electrode 15 descends through

the operation of the cam actuated arm 17 and an electric arc is formed in the vacuum between the electrode 15 and the can at or near the puncture point.

A low voltage electric connection is shown at 91, the can being grounded through the machine to the other side of the circuit. See Fig. 14. This arc melts the solder, and there being no oxygen present due to the vacuum, a perfect solder seal is effected in vacuum, closing the puncture 20. The arc is now broken by the electrode 5 being raised through the cam actuated arm 17 (see Figs. 6, 7, and 12) and the table continues to rotate for a period sufficient to allow the solder to fully cool, after which the vacuum valve 9 is closed and the air valve 10 opened. See Figs. 3, 8, 9, 13.

A further rotation of the table brings the piston under the action of that portion of the cam slot between G and H of Fig. 11 thus allowing the piston to be withdrawn into the table and the can descends clear of the chamber 8 and is now removed from the rotating table by the conventional wing member 26, Fig. 5, the can having been fully sealed in vacuum.

A cycle of movement of the table 1 is shown, the can being fully positioned on top of the piston 2 while the table has moved from O to the position A. It is fully enclosed within the chamber 8; when it arrives at the position B, the vacuum valve is opened at C and the air and gas are therefore extracted from the can from the position C to the position D. At this point the soldering arc is established and continues to the position E when the arc is broken and the solder cools thereafter and is practically cold by the time it reaches the position F at which point the vacuum valve closes. The atmospheric valve 10 opens at the position G breaking the vacuum within the chamber and the piston descends from G to H arriving back at its initial position with its top flush with the top of the table 1 when the can is removed from the table by the wing 26.

The position of the several cam elements are best shown in Fig. 2, this figure being partly diagrammatic and certain of the parts removed to better show the operation of the mechanism. The cam which controls the electrode 15 and therefore the soldering arc is indicated at 30 and is preferably cylindrically formed. The roller 31 travels within the cam slot maintaining the position of the electrode 15 raised to its highest position during the time the table is traveling from the zero position O to D, see Figs. 3, 6, 7. From positions D to E the cam slot has actuated the roller 31 and lever 17 to depress the electrode 15 and effect the soldering of the vacuumized can 7. From E back to zero completes the revolution of the table.

In the apparatus here shown the cam 30 is stationary and the roller 31 travels around the cam slot 32 as the table 1 rotates in the direction of the arrow 25. The air and vacuum valves are controlled respectively by the cams 34 and 33. The cams are stationary and the roller and piston 35 actuating the air valve 10 and 36, actuating the vacuum valve 9, are shifted laterally by the cam surfaces. These cam surfaces are shown in Figs. 9 and 8, respectively, and the vacuum valve opens in the position C and closes in the position F and the atmospheric valve opens in the position G and closes in the position B, there being a slight lap B to C and F to G to insure closure and prevent "wire drawing." See also Fig. 3.

The piston 2 is raised through the operation of the lever 4, fulcrumed at 5, on the arm 37 projecting from the rotating table 1, through the action of the cam slot 38 formed in a stationary member and within which slot the spherical headed roller 39 travels.

The piston cam cycle is shown diagrammatically in Fig. 10 and with the circumferential slot 38 developed in plan in Fig. 11, the piston being in its lowest position at O starting to ascend at A, being in its uppermost position from B to G after which it starts to descend and arrives again at its lowest position at H.

Referring now to Fig. 2 it will be seen that when the piston is in its uppermost position contacting with the lower edge of the chamber 8 there is preferably interposed a soft gasket 40 which completely seals the chamber 8 against air entering during the vacuumizing period.

The soldering in vacuum is effected by the electrode 15 which has an insulated sheath 41 and passes through the conventional packing gland 42 in the neck 43 of the chamber 8. See Fig. 12.

Electric service connections are shown at 24, 44, the latter being in effect grounded with the machine so that the can 7 forms one pole and the soldering head 45 forms the other pole, and when the electrode is depressed the head 45 establishes an arc 46 melting the small piece of solder 23 previously placed upon the can, and this immediately flows into and closes the puncture 20. The head 45 then being withdrawn the arc breaks and the solder thereafter cools as previously described.

The solder feeding mechanism is shown diagrammatically in Fig. 4. As the can travels in the direction of the arrow 50 it arrives in the position 19 and a piece of solder just cut from the dotted position 23 falls into the funnel 22 and through the chute 21 immediately upon the can puncture at 20 and there remains throughout the

balance of the operation until the soldering is effected as previously described. If there is any interruption in the supply of cans the mechanism feeds no solder through the chute 21. This no-can-no-solder function may be accomplished in a variety of ways, one of which is shown diagrammatically in the parts set forth in the upper portion of Fig. 4. The solder in wire form 51 is fed from the reel 52 by the action of the plurality of drive rollers 53, 53, and by 75 suitable guides not shown but well known, arrives into the dotted position 23. Cutter 24 being reciprocated cuts off measured lengths which drop into the funnel 22 and onto the tops of the cans whenever a can is present and not otherwise.

A crank wheel 55 reciprocates the lever 56, the latter resting upon the roller 57. This latter is carried upon the arm 58 pivoted to a stationary member at 59 and rides 85 against the can 19 as shown at 60. The lever 56 therefore reciprocates the roller 61 and arm 62 and cutter 24 whenever a can is in the position 19. If there be no can in the position 19 the arm 58 and roller 57 descends to the dotted positions, the lever 56 falls below the range of the roller 61 during the period of retraction by the crank wheel 55, until the arm 62 comes against the stop 63. The further retraction of the lever 56 clears the lever from the roller 61 and 56 falls into its dotted position, thereafter reciprocating clear of the roller 61 until a can is again in the position 19, when the arm 58 and roller 57 raise the lever 56 into the full line position, at which time the knife 24 and feeding rolls 53 are brought into action and a piece of solder is cut and falls on the can. The wire solder 51 is advanced a predetermined amount for each reciprocation of the cutter 24 as by the pawl 70 actuating the ratchet 71 in the solder feed train.

Referring to Fig. 2, at 75 is shown a stationary spindle on which the table 1 rotates at the bearing 90 arranged vertically having a stationary valve head 76 and a pipe 77 through which air is continuously removed and in which a vacuum is therefore maintained by any well known vacuum pump not shown. The stationary head 76 has a finished and ground surface on which the ring member 78 is adapted to rotate with the table 1, there being an annular groove 79 in the head and a corresponding groove 80 in the ring member which latter groove connects with the pipes 13 and 12 connecting the vacuum to the chamber 8. It is to be understood that there are corresponding vacuum pipes 12 and 13 for each, and also a plurality of chambers and that each of said chambers is suitable for handling one can during one revolution and has its own vacuum and air valves, its vacuum gauge,

and the soldering and piston actuating mechanism previously described.

While I have described an arc as melting the solder, it is to be understood that this is only one means of accomplishing the heating step to melt the solder and that this may be also done by a high electric resistance at the contact between the electrode and the solder and the solder and the can. The said resistance results in quickly melting the solder and effecting the sealing and I desire to be understood as having disclosed both forms of electric heating means to accomplish my soldering or closing step.

I claim:

1. The process of sealing in vacuum double seamed cans having a puncture in one end, which consists of the following series of automatic steps first placing a portion of solder adjacent said puncture, then and while traveling in a cylindrical path, removing the can to a platform, then advancing the can within a chamber and closing

the chamber with the platform, then exhausting the chamber and therefore the can, then heating the solder and causing it to flow to close the puncture, then allowing the solder to cool and then admitting air to the chamber.

2. The process of sealing in vacuum double seamed cans having a puncture in one end and while traveling in series, which consists of the following series of automatic steps first placing a portion of solder adjacent said puncture, then and while traveling in a cylindrical path, removing the can to a platform, then advancing the can within a chamber and closing the chamber with the platform, then exhausting the chamber and therefore the can, then heating the solder and causing it to flow to close the puncture, then allowing the solder to cool and then admitting air to the chamber, then withdrawing the platform and the can from the chamber.

MANFRED BRANSTEN.