Dec. 3, 1940. F. L. DARLING 2,223,481

CONTAINER SEALING MACHINE

Filed Dec. 16, 1936 3 Sheets-Sheet 1

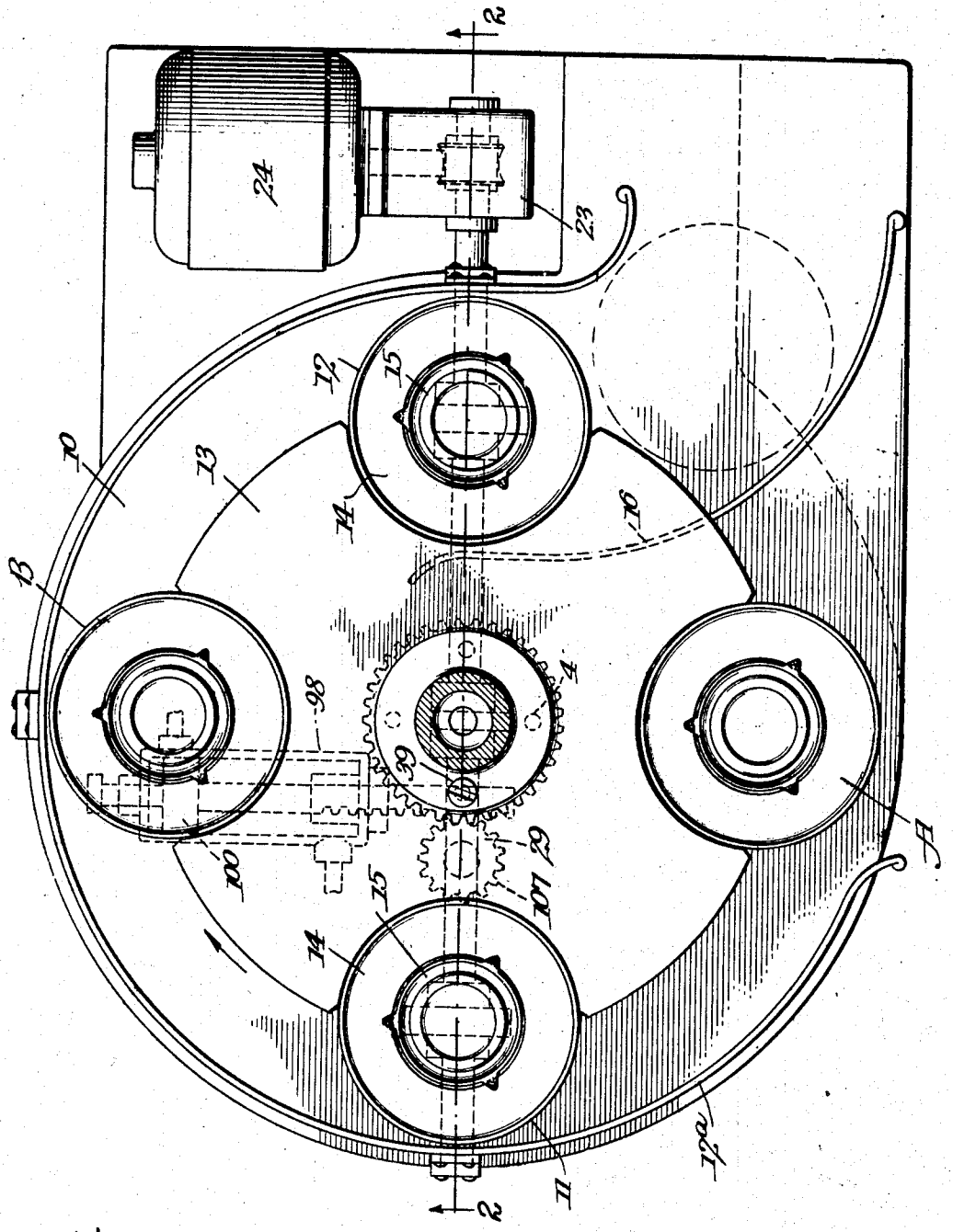


Fig. 1.

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CONTAINER SEALING MACHINE

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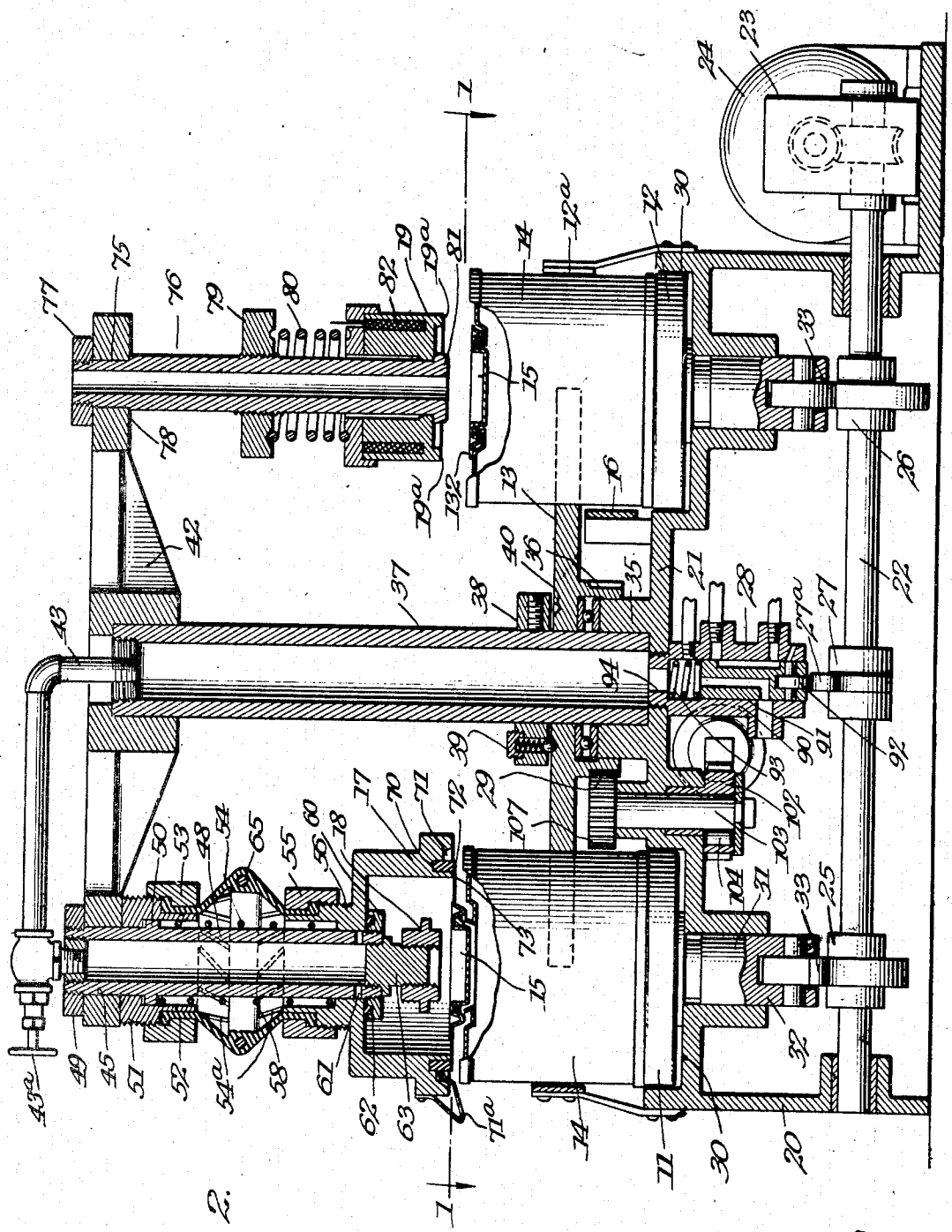


Fig. 2.

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CONTAINER SEALING MACHINE

Filed Dec. 16, 1936 3 Sheets-Sheet 3

Fig. 5.

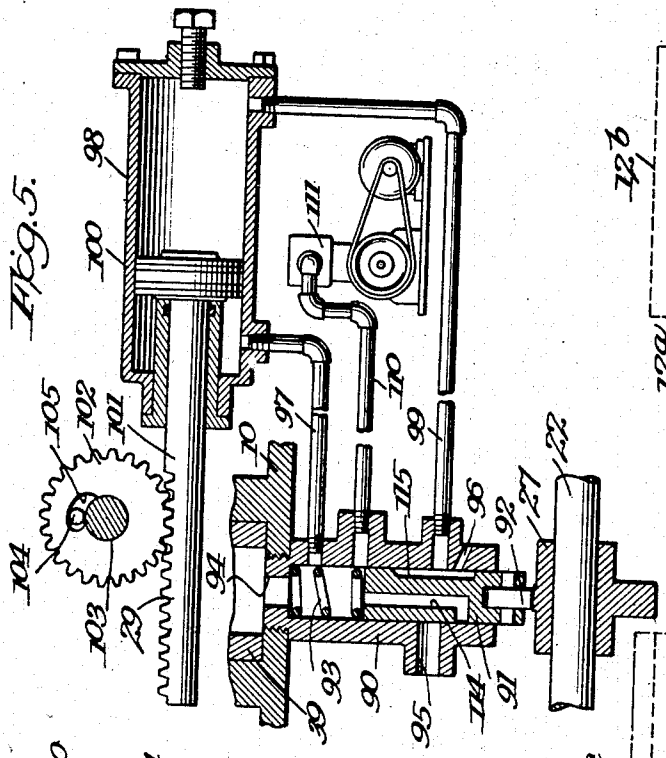


Fig. 6.

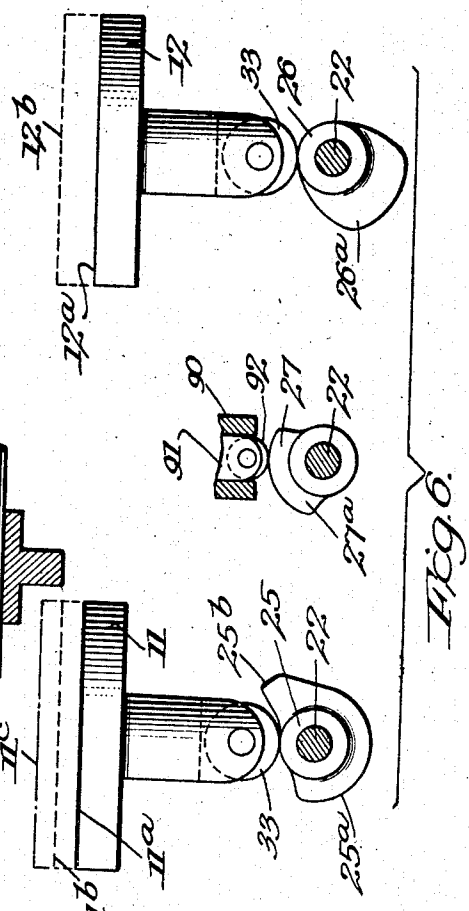


Fig. 3.

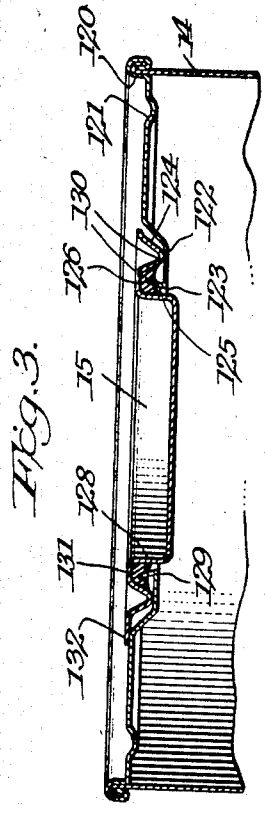
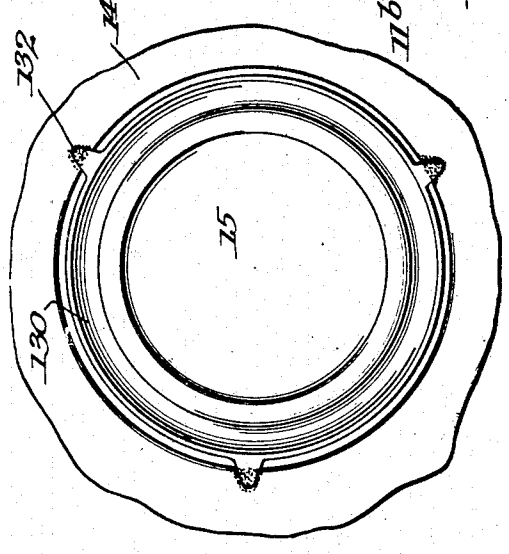


Fig. 4.



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2,223,481

UNITED STATES PATENT OFFICE

2,223,481

CONTAINER SEALING MACHINE

Frank L. Darling, Teaneck, N. J., assignor, by mesne assignments, to Crown Can Company, Philadelphia, Pa., a corporation of Pennsylvania

Application December 16, 1936, Serial No. 116,208

7 Claims. (Cl. 113—82)

The present invention relates to a container sealing machine.

The machine comprising the embodiment of the invention disclosed herein is particularly adapted to operate upon cams of the type shown in my patent for Vacuum sealing can, No. 2,024,511, December 17, 1935, but it will be understood that the machine is applicable to other containers.

The principal object of the invention is to provide a sealing machine for cans and other containers and which is extremely simple in design, and which may be provided at very reasonable cost.

Another object of the invention is to provide a machine for vacuumizing or otherwise varying pressure conditions within cans or other containers and which is of extreme simplicity, but has a degree of efficiency equal to that of more involved and expensive machines.

In present vacuum canning practice the cans used are generally of two types, one type being that in which the can is finally and completely sealed by a seaming operation and must be opened with a can opener, and the other type, generally used for vacuum packed coffee, being that wherein the side wall of the can is provided with a circumferentially extending rim opening seal so that the top may be removed and replaced. The second type of can is also completely or finally closed by a seaming operation.

Since both of these types of vacuum-packed cans must be finally closed by a vacuumizing and seaming machine, they are not practicable for use by the numerous small plants located throughout the country and having sales confined almost entirely to local markets. The principal reason contributing to this impracticability is the fact that vacuumizing seaming machines are extremely expensive and the relatively small sales of a locally operating plant will not warrant the installation of such a machine. Another factor is the great size and weight of such a seaming machine, necessitating a fairly large plant constructed with a particular view of supporting the load of the machine.

The above problems are of particular importance with reference to the handling of coffee. It is now generally conceded that coffee is maintained in best condition when packed under vacuum, but at the present time, vacuum packing in cans may only be accomplished with vacuumizing seaming machines, and since these machines are too expensive for the numerous small packers throughout the country, this type of packing has not heretofore been adopted by them, and their only opportunity for competition with the larger packers has been by selling coffee packed in paper containers and by relying upon rapid sales of small shelf stocks by retailers; an arrangement of doubtful efficacy with regard to the freshness of the coffee, and altogether unsatisfactory from an operating standpoint.

The machine of the present invention, operating upon a can of the type disclosed in my above mentioned patent, will produce a packed product having a seal of an efficiency equal to that of a can which is finally closed by seaming, but the cans may, nevertheless, be readily opened by a removable closure which is reinsertable to keep the contents in proper condition.

It is the present practice of can manufacturers to supply to packers can bodies seamed and closed at one end, it, of course, being necessary for the packer to have a seaming machine with which to finally close the other end of the can after it has been filled. By the machine of the present invention, used with the can of my above mentioned patent, can bodies having both ends seamed thereto at the can manufacturing establishment may be supplied to the packers and the latter may apply the closure of the can of my patent to one end of the can and with the machine of the present invention. By this procedure, the packer does not require a seaming machine, but he is able to market his product in a can which has a seal of an efficiency equal to that of a can which is finally closed by a seaming machine.

Since the machine of the present invention includes means to vacuumize the can, it will enable small packers to pack products such as coffee in a vacuumized can and thereby fully compete with larger packers who at the present time are the only concerns which can afford to vacuum-pack coffee or other products.

Another important object of the invention is to provide a vacuum sealing machine by means of which an efficient vacuum will be produced in such a manner that the contents of the can will not be disturbed.

In numerous vacuumizing machines, difficulty is encountered in gradually producing a vacuum in the container, the vacuum occasionally being so rapidly produced that the products are entirely withdrawn from the cans.

The flow line of the present machine includes valves which will permit the creation of the vacuum to be regulated according to the nature of the product being handled.

Another important object of the invention is to

provide a vacuumizing machine wherein the valve mechanism for controlling the vacuum is extremely simple in construction and may be readily repaired and regulated.

A still further object of the invention is the provision of a sealing head which will cooperate with the can of my above-mentioned patent to form an air-tight seal between the two.

Still another object of the invention is the provision in a container sealing machine of a means to secure the caps to the containers by soldering.

Machines have heretofore been developed in which soldering operations were performed under the sealing head but such machines are extremely complicated in construction. By the machine of the present invention, acting upon a can of the type disclosed in my above mentioned patent, the containers may be closed and entirely sealed beneath the sealing head and then moved to a soldering mechanism which operates in timed relation to the sealing head to secure the caps to the containers.

Another object of the invention is to provide a machine which will efficiently vacuumize and seal a container having a slip opening closure of the type disclosed in my patent for Vacuum sealing can, No. 2,024,511, December 17, 1935.

Another object of the invention is the provision of means whereby containers will be moved through the machine by mechanism controlled by vacuum effect, this vacuum action being inherently synchronized with the pressure control of the interior of the containers, thereby eliminating all possibility of the machine operating with its various mechanisms out of synchronization.

A still further object of the invention is to provide a sealing machine which is so designed that containers to be sealed may be fed thereto by hand.

A machine of the above type is particularly useful to small packers, since it will adequately seal their required output, and without the necessity of any other apparatus such as conveyors or any other feeding means.

Other objects and advantages of the invention will be apparent from the following specification and drawings wherein,

Figure 1 is a horizontal sectional view on the line 1—1 of Figure 2;

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1 showing cans in position for operating thereon;

Figure 3 is a vertical sectional view through the upper portion of a can of the type disclosed in my Patent No. 2,024,511, referred to above, and which the present machine is particularly adapted to operate upon;

Figure 4 is a plan view of the cap element used in the can of Figure 3;

Figure 5 is a diagrammatic showing of the valve and driving structures of the machine, the view showing the valve mechanism in vertical section and the rack drive mechanism in horizontal section; and

Figure 6 is a diagrammatic showing of the cans used in the present machine.

The machine of the present invention may be generally described as comprising a table 10 provided with a pair of diametrically opposite reciprocable container supporting platforms designated in the drawings by the numerals 11 and 12, respectively. A dial 13 is provided above the upper surface of the base 10, dial 13 being rotatable to shift a container comprising a body portion 14 and a closure or cap 15 from infeed position A in a clockwise direction (Figure 1), and by a step by step movement, until the container is removed from the dial by a stationary outfeed guide element 16. When a container has been positioned upon first platform 11, it will be raised by upward movement of the platform 11 and into contact with a vacuumizing bell 17, and the platform will then raise further to cause the cap 15 of the container to be firmly seated in the container opening by a stationary presser foot 18. Platform 11 will then descend and the dial 13 will rotate to move the container to the position indicated at B. On the next movement of the dial 13, the container will be moved from position B to the platform 12 which will raise to bring the top of the can into contact with a heating element 19 which will melt or sweat the solder on the points of the can cap 15 so that the cap will be firmly secured to the top of the can. Platform 12 will then lower and the dial 13 will move again to bring the container into contact with the outfeed guide 16 which will remove the container from the dial.

The base 10 of the machine includes a generally circular wall 20 on which the table is supported and which encloses the gearing of the machine. A horizontal shaft 22 is journaled in the wall 20 as indicated in Figure 2, shaft 22 extending diametrically through the base beneath the platforms 11 and 12, with one end extending outside the wall 20 to a speed reducing mechanism 23 which receives power from a motor 24. The shaft 22 is provided with three cams, a cam 25 for reciprocating the platform 11 beneath the head including the bell 17, a cam 26 for reciprocating the platform 12 beneath the heating element 19, and a cam 27 for operating the valve mechanism generally indicated by the numeral 28. The movement of the dial 13 is controlled by a gear and rack mechanism generally indicated by the numeral 29 and actuated by the valve mechanism 28 in a manner hereinafter described.

The table 10 is recessed as indicated in Figure 2 to receive the platforms 11 and 12, these recesses being indicated by the numeral 30 and having such depth that when the platforms are in lowered position, their upper surfaces will be flush with the upper surface of the table. Each recess 30 is provided with a downwardly extending boss 31 through which extends a hub 32 having a roller 33 journaled in its lower end, the roller 33 on platform 11 engaging cam 25 and the roller 33 on platform 12 engaging cam 26.

A boss 35 extends upwardly from the central portion of the table, the dial 13 being rotatable on boss 35 and having a depending sleeve 36 which surrounds this boss. A hollow post 37 extends upwardly from the table within the boss 35, post 37 having a collar 38 fixed thereto immediately above the dial 13, the collar 38 having a spring-pressed ball 39 provided on its lower surface to engage pockets 40 spaced about the upper surface of the dial 13, the purpose of the ball 39 being to insure that the dial will be stopped in exact registry with the platforms 11 and 12.

The post 37 carries a cross arm 42 at its upper end from one end of which the head including the bell 17 and presser foot 18 is supported, the opposite end of the cross arm carrying the heating element 19. The upper end of the post 37 has a pipe 43 connected thereto through which the fluid flow from the valve mechanism 28 may move to the vacuumizing bell 17.

The end of the cross arm 42 which carries the vacuumizing bell 17 and the presser foot 18 is provided with an aperture 45 through which ex-

tends a tube 48, tube 48 being secured in the aperture by a nut 49 and also being connected with the pipe 43. Tube 48 is provided with an annular flange 50 adjacent its upper end on which bears a nut 51 which has a portion of reduced diameter indicated at 52 extending downwardly along and spaced from the tube 48, and a gland nut 53 is threaded upon the nut 51 to secure the upper end of a resilient sleeve 54. The lower end of the sleeve 54 is secured beneath a gland nut 55 threaded to an upper extension 56 of the vacuumizing or sealing head 17. A coil spring 58 is provided within the resilient sleeve 54 as shown at Figure 2, with its upper end bearing on the flange 50 of tube 48 and its lower end bearing upon the bell 17 within the extension 56, the purpose of the spring 58 being to hold the bell downwardly upon a collar 60 threaded upon the extreme lower end of the tube 48 and just beneath a series of ports 61 provided in the tube. The upper surface of the collar 60 is provided with a sealing ring 62 and when the bell 17 is in contact with the latter, the ports 61 will be closed from the interior of the bell. The lower end of the tube 48 has a threaded stud 63 secured therein, which stud has the presser foot 18 threaded thereto for adjustment of its position.

Because of the small area of the bell which is in contact with the tube 48, the bell may tilt slightly with respect to the tube. The resilient sleeve 54 will permit this movement while maintaining an air-tight seal or passage between the cross head 42 and the bell. The resilient sleeve 54 is preferably provided with a metal ring 65 mid-way of its length, which serves to hold the sleeve from collapsing from bowed position. Also, the sleeve 54 is provided with means such as the interior slots 54a to prevent it from tending to remain in folded position, all as described in my application Serial No. 116,207, filed December 16, 1936, for Container sealing machines and methods.

The bell 17 is of the same construction as that disclosed in my above-mentioned application, the lower edge of the bell 17 being provided with a stepped groove comprising a deeper and inner groove 70 and a shallower groove 71, a resilient packing ring 72 being positioned in the inner groove and extending downwardly past the outer edge of the bell, though the inner edge 73 of the lower end of the bell extends downwardly to a point substantially opposite the lower end of the packing ring. The lower edge of the bell is provided with spaced springs 71a as described in my said application and which will prevent cans from adhering to the bell when the vacuum is released.

The arm of the cross head 42 which carries the heating element 19 has an aperture 75 therein in which is positioned the upper end of a tube 76, the tube being secured in the aperture 75 by means of a nut 77 and having a shoulder 78 which bears against the underside of the cross head arm. The intermediate portion of the tube 76 is threaded to receive a nut 79 and a coil spring 80 bears against the underside of nut 79, the lower end of the coil spring bearing upon the heating element 19 which is in the form of a ring slidable on the tube 76, the lower end of the heating element bearing on a flange 81 at the lower end of the tube. As will be observed from Figure 2, the bore of the heating element 19 is slightly greater than the diameter of the tube 76 and nubs 82 are provided in the bore of element 19 adjacent its lower end to guide and center it along the tube. The lack of contact between the heating element 19 and the tube 76 over any large area, as well as the fact that the bore of the tube 76 extends from end to end thereof will prevent the cross arm 42 or any other part of the machine from being unduly heated by the heating element 19.

The valve mechanism 28 comprises a valve chamber 90 in which moves a slide valve 91 provided with a roller 92 at its lower end to engage the circular cam 27 on the shaft 22. A spring 93 is positioned in the upper end of the valve chamber 90 to normally tend the side valve 91 and the roller 92 to downward position. The upper end of the valve chamber 90 communicates with the lower end of the post 37 through an aperture 94.

As shown in Figure 5, the valve chamber 90 is provided on one side thereof and intermediate its length with a port 95 opening to atmosphere and on the opposite side of the chamber adjacent the lower end is a second port to atmosphere designated by the numeral 96. A pipe line 97 extends from the upper end of the valve chamber to one end of a dial operating cylinder 98, and a second pipe line 99 extends from a lower point of the valve chamber to the opposite end of the cylinder 98. The cylinder 98 has a packed piston 100 fitted therein and a piston rod 101, in the form of a rack, extends from one side of the piston and through the adjacent end wall of the cylinder. Rack 101 engages a pinion 102 of the dial operating mechanism 29, pinion 102 being mounted upon a stub shaft 103, as also shown in Figure 2, the connection between pinion and the stub shaft being through a ball clutch comprising roller 104 positioned in a groove 105 in the pinion. As is usual in such a clutch, the groove is of sufficient size at one end to permit the roller to turn freely therein and the groove tapers to a smaller size at its other end so that the pinion will turn freely upon the shaft 103 when rotated in one direction, the clockwise direction in Figure 5, but will be locked to the stub shaft 103 when the pinion is rotating in the opposite direction, the counter-clockwise direction of Figure 5. By this arrangement, the outward or leftward movement of the piston rod or rack 101 in Figure 5 will occur without causing the stub shaft 103 to be rotated, while inward movement of the piston rod (to the right in Figure 5) will cause the pinion 102 to be locked to the stub shaft to rotate the same. A second pinion 107 is fixed to the upper end of the stub shaft 103, this pinion engaging gear teeth upon the depending flange 36 of the dial 13.

A pipe line 110 extends from a point in the valve chamber 90 substantially intermediate its length to a vacuum pump 111 operated by a suitable motor. The slide valve 91 is provided with a right-angled passage 114 extending from its upper end to its side wall on the side adjacent the atmosphere port 95 and also with a groove 115 in the side surface thereof adjacent the side of the chamber 90 to which the lines 97, 99 and 110 open and in which atmosphere port 96 is provided.

The slide valve 91 is shown in its lowermost position in Figure 5, cam 27 having its low point opposite the roller 92. In this position of the slide valve 91, the pump 111 is in communication with the left hand side of dial operation, cylinder 98 through pipe line 110, the valve chamber, and pipe line 97, so that the piston 100 will be drawn to the left, rotating the pinion 102 in a

clockwise direction. The shaft 103 will not be rotated by this rotation of the pinion 102 because the ball 104 will move to the large end of the groove 105. Also, in the lower portion of the slide valve 91, the groove 115 of the valve will place the atmosphere port 96 in communication with the pipe line 99 which extends to the right hand end of the dial operating cylinder 98, thereby permitting atmospheric pressure to flow to this end of the cylinder so that the piston 100 will be free to move to the left. Passage 114 of the slide valve will have its lower end opposite a blank portion of the valve chamber 90 so that the vacuum present in the upper portion of the valve chamber will not escape through this passage.

The vacuum condition now existing in the upper portion of the valve chamber 90 will extend to the tube 37 and the pipe line in communication therewith and during this time the vacuum will be acting upon a container positioned beneath the bell 17 as hereinafter described. During the continued rotation of the shaft 22, the high portion 27a of cam 27 will move beneath the roller 92 with the result that the slide valve 91 will be moved upwardly in the valve chamber 90 past the opening of the pipe 110 into the valve chamber, thereby closing off the valve chamber from the source of vacuum. Also, the lower end of the passage 114 will be brought opposite the atmosphere port 95 so that the vacuum condition existing in the post 37 will be replaced by atmospheric pressure and the vacuum in the left hand end of cylinder 98 eliminated through line 97, leaving the piston 100 free for movement to the right as will occur by the immediately subsequent positioning of the groove 115 to bridge the vacuum pipe line 110 and the pipe line 99 leading to the right hand end of cylinder 98. The resultant movement of the piston 100 to the right will cause the pinion 102 to be rotated in a counter-clockwise direction, and during this movement it will be locked to the stub shaft 103 by reason of the fact that the roller 104 will be moved to the smaller end of the groove 105. Rotation of stub shaft 103 will cause the dial 13 to be rotated a quarter turn in a clockwise direction (Figure 1), and the action of the spring-pressed ball 39 will insure that the dial will stop in such position that two of its pockets will be in alignment with the container supporting platforms 11 and 12.

The container with which the operating heads of the present machine are adapted to cooperate is similar to that disclosed in my above mentioned patent for a Vacuum sealing can, No. 2,024,511. The upper portion of such a can 14 is illustrated in vertical cross-section in Figure 3 and, as will be noted from that figure, the top of the can 14 includes an upstanding flange 120 at its edge formed by the seam by which it is secured to the upper end of the side wall of the can. Spaced slightly inwardly from the flange 120 is an annular groove 121 and a second groove 122 is provided adjacent the aperture 123 in the can top, groove 112 having a flat bottom and an outwardly inclined side wall 124. The aperture 123 of the top is defined by an outwardly and upwardly inclined lip 125 which forms the inner wall of the groove 122. The upper edge 126 of the lip 125 is relatively sharp so that no wide surface will be provided at this point. The closure or cap 15 used with the can 10 includes a central recessed portion including a side wall 128, closure 15 also being provided with an annular groove 130. In the downwardly facing recess formed between the groove 130 and the side wall 128 of the cap, a layer of a sealing composition 131 is placed prior to the application of the cap 15 to the can. A plurality of points 132 are spaced about the edge of the cap 15, three such points preferably being provided as shown in Figure 4. Each of these points has solder and flux applied preferably before the cap is applied to the can. When the cap 15 is tightly pressed into the aperture 123, the points 132 will bear upon the top of the can adjacent the outer edge of the inner groove 122. The distance which the cap 15 may be forced into the aperture 123 is limited by the underside of the groove 130 of the can top, this groove being of such depth that it will come into contact with the bottom of the groove 122 of the can top before the upper edge 126 of the lip 125 has passed entirely through the sealing material 131.

The sealing ring 72 of the sealing bell 17 is adapted to contact with the can top at a point immediately adjacent the outer edge of the can top outer groove 121 and the inner edge 73 of the bell will fit into this groove, so that vacuum action will tend to draw the sealing ring 72 down into the groove to form a tight seal. The shallower portion 70 of the groove in the lower end of the sealing bell 17 will lie over the upstanding flange 120 on the outer edge of the can top. However, movement of the can with respect to the bell will be limited by the edge 73 of the bell so that the sealing ring will not be eventually deformed as would be the case if movement of the bell and can toward each other should only be limited by the sealing ring itself. The presser foot 18 is provided with a downwardly extending central portion 17a which is adapted to fit into the recess of the can top 15 so that pressure will be exerted both on the central portion of the top and also upon the upper edges of its flange.

The operation of the machine is as follows:

The operator standing at the front of the machine will place a filled can such as 14 in the notch of the dial 13 which is then in alignment with position A, the dial being momentarily stationary. The cap 15 will have been loosely positioned in the can aperture.

The continuously rotating shaft 22 will turn the dial operating cam 27 to bring its high portion 27a beneath the slide valve 91 (Figure 5), moving the slide valve upwardly to cause the groove 115 of the slide valve to bridge the vacuum line 110 and the line 99 leading to the right hand end of cylinder 98 so that the piston 100 and rack 101 will be moved to the right (Figure 5) to rotate pinion 102 in a counter-clockwise direction, and since the roller 104 will grip stub shaft 103 when rotated in this direction, the dial 13 will be rotated a one-quarter turn in a clockwise direction, thereby moving the newly inserted can to a position in alignment with the platform 11.

When dial 13 has completed the partial rotation described above, the high point 27a of valve operating cam 27 will move from beneath the slide valve 91 so that the valve will move downwardly to the position shown in Figure 5, causing the groove 115 to bridge line 99 and atmosphere port 96 so that atmospheric pressure will be present in the right hand end of the cylinder 98. This movement of the valve will also place the cylinder line 97 in communication with the vacuum line 110 so that a vacuum will be exerted in the left hand end of the cylinder 98, thereby moving the piston 100 and the rack bar 101 to the left as shown in Figure 5. This movement of the rack bar will rotate the pinion 102 in a

clockwise direction, but since the roller 104 will move to the large end of the groove 105 during this rotation of the pinion 102, the stub shaft 103 will not be rotated and the position of the dial will remain unchanged.

Simultaneously with the movement of valve operating cam 27 referred to in the preceding paragraph, the cam 25 will rotate with shaft 22 to bring its intermediate high point 25a beneath the roller 33 of platform 11, thereby raising the platform to the plane indicated at 11b in Figure 6 and bringing the top of the can carried thereby into contact with the sealing ring 72 in the lower end of the vacuumizing bell 17. The intermediate high portion 25a of cam 25 is of such height that it will raise the can to the extent that bell 17 will be raised on the tube 48 against the action of spring 58 and lifted from the packing ring 62 so that the ports 61 in tube 48 will be opened to the interior of the vacuumizing bell. Since the slide valve 91 is still in the position indicated in Figure 5, the vacuum line 110 will be opened to the upper portion of the slide valve chamber 90, and thus, through the post 37, will be in communication with the pipe line 43 and tube 48. As a result, vacuum will also be exerted through the port 61 of tube 48 and in the vacuumizing bell 17.

The degree of vacuum in the bell may be regulated by the manual valve 43a so that a sudden vacuum will not be exerted in the bell to withdraw the contents from the can. The vacuum in the bell will create a vacuum condition in the can because of the fact that the cap or closure 15 is only loosely applied to the can. Also, the vacuum in the bell will draw the lower portion of the sealing ring 72 toward and slightly into the outer groove 121 in the can top to perfect the seal between the bell and the can top. It will be understood that the presence of the depending flange at 73 on the bell will prevent the can top from bearing against the sealing ring 72 with such force as to deform the same.

The continued rotation of cam 25 beneath the platform 13 with intermediately high portion 25a beneath this platform will cause the platform to remain in the plane indicated by the dotted line 11a in Figure 6 for an interval, and during this time the low portion of valve operating cam 27 will also remain beneath the slide valve 91. Still further rotation of the cam 25 will bring the high portion 25b of cam 25 beneath the roller 33 of platform 13 so that the platform will be raised to the plane indicated at 11c in Figure 6 in which position, referring to Figure 2, the bell 16 will be further raised on the tube 48 and the can cap 15 will come in contact with the presser foot 18, causing the cap to be forced downwardly into the can aperture 123. However, as has been heretofore explained, and as is described in my above mentioned Patent No. 2,024,511, the movement of the cap 15 into the aperture 123 will be limited by the downwardly facing shoulder formed by the underside of the groove 130 in the cap, because this shoulder will contact with the bottom of can groove 122 before the edge 126 of the can top lip can pass entirely through the sealing substance 131. The movement of the cap 15 into the aperture will also place the points 132 in contact with the upper surface of the can top.

After the cap 15 has thus been firmly forced into the aperture of can 14, the high point 25b of cam 25 will move from beneath the platform roller 33, permitting the platform to drop by its own weight to a position flush with the table as indicated at 11a in Figure 6. Immediately after the last described movement of cam 25, the high portion 27a of valve operating cam 27 will move beneath the slide valve 91 so that this valve will be raised from the position shown in Figure 5 to bring the lower end of the right angled passage 114 of the valve opposite the atmosphere port 95 and after closing the vacuum line 110 to the upper portion of the valve chamber 90. This will create atmospheric pressure in the upper portion of the valve chamber and through the post 37, pipe line 43 and tube 48, also creating atmospheric pressure in bell 17 so that the can 14 will be free to move downwardly with the platform 11 and will not tend to adhere to the bell 17, as might be the case if a vacuum condition still existed in the bell.

The above described upward movement of slide valve 91 will also shut off the vacuum line 110 from cylinder line 97, and the atmospheric pressure now present in the upper portion of the valve chamber 90 will also exist in the left hand end of dial operating cylinder 98. On the other hand, the vacuum line 110 will be placed in communication, through groove 115, with the line 99 extending to the right hand end of cylinder 98, creating a vacuum condition in that cylinder and thereby drawing the piston rod or rack bar 101 to the right and rotating pinion 102 in a counterclockwise direction. Such rotation of pinion 102 will cause the clutch roller 104 to engage the stub shaft 103, with the result that this shaft and dial 13 will be rotated, the latter in a clockwise direction, to remove the can from platform 11 to position B of Figure 1.

While the succeeding can is vacuumized under the bell 17 in the same manner as has been described above, the dial operating piston 100 returns to left hand position and after the can now on platform 11 has been vacuumized and firmly closed, the dial 13 will make another quarter rotation in a clockwise direction to move the can at position B onto the platform 12 which is at that moment in lowered position as indicated at 12a in Figure 6, the low portion of cam 26 being beneath the roller 33 of the platform.

As soon as the can has been placed upon the platform 12, the high portion 26a of cam 26 will move beneath the roller 33, raising platform 12 to position 12b (Figure 6) to bring the points 132 on the can cap in contact with the depending annular portion 19a of the heating element 19 and pressing the upper surface of the cap 15 into contact with the lower end of the fixed tube 81. The spring 80 will hold the heating element 19 firmly in contact with the points 132 so that the solder on these points will be melted or sweated to flow upon the top surface of the can top. After an interval, the high portion 26a of cam 26 will move from beneath the platform 12 so that the platform will descend. Obviously, as soon as the points 132 of the can cap are out of contact with the heating element 19, the solder will begin to harden to form a firm bond between the points 132 of the can top.

After the platform 12 has been lowered to position 12a (Figure 6), the slide valve 91 will drop to lowered position resulting in the movement of piston 100 to the right and another quarter rotation of dial 13 in a clockwise direction, so that the can will contact with guide 16 and be directed from the dial.

It will be observed that a sufficient time interval will elapse between the movements of the dial to enable an operator to place a fresh can in the

dial pocket at A between each movement of the dial.

It will be understood that the invention is not limited to the details of construction shown in the drawings, and that the example of the use of the machine and mechanisms which has been given does not include all of the uses of which they are capable; and that the phraseology employed in the specification is for the purpose of description and not of limitation.

I claim:

1. The combination in a container sealing apparatus, of a base, closure positioning means rigid with respect to said base, a container vacuumizing means coaxial with said last-named means and reciprocable with respect to said base, a valve mechanism to control flow to said vacuumizing means, means to present containers to said closure positioning means and said vacuumizing means, and cam means carried on a common shaft to control said container presenting means and said valve mechanism.

2. The combination in a container sealing apparatus, of a support, vacuumizing means and container closure securing means spaced from each other and reciprocable on said support, a valve mechanism to control fluid flow to said vacuumizing means, and means controlled by said valve mechanism to move containers from alignment with said vacuumizing means to alignment with said closure securing means.

3. The combination in a container sealing apparatus, of a table, a support spaced above said table, means to vacuumize a container and means to position a closure in sealed relation on the container, said means being arranged coaxially on said support, closure securing means on said support and spaced from said two coaxially arranged means, a plurality of reciprocable container platforms to move containers into contact with said coaxially arranged means and said securing means, and means to position containers seriatim on said platforms.

4. The combination in a container sealing machine, of means to create a desired pressure condition in a container, valve means to control flow to said means, and pressure operated means controlled by said valve means to move containers in alignment with said first-named means.

5. The combination in a container sealing apparatus, of a base member, a container engaging member rotatable on said base member, means to vacuumize a container and to position a removable closure in sealed relation with respect to the container, means to secure the closure to the container, said means being spaced from each other along the path of movement of said rotatable member, means in alignment with each of said means to move a container into engagement therewith, and means to intermittently move said rotatable member to position a container successively in alignment with each of said two first-named means.

6. The combination in a container sealing apparatus, of a base member, a rotatable dial member, means to vacuumize a container and to position a removable closure in sealed relation with respect to the container, means to secure the closure to the container, said means being spaced from each other along the path of movement of said dial member, means in alignment with each of said two first named means to move a container into engagement therewith, and means to intermittently move said dial member to position a container successively in alignment with each of said two first-named means.

7. The combination in a container sealing apparatus, of a base member, a container engaging member, means to vacuumize a container and to position a removable closure in sealed relation with respect to the container, means to secure the closure to the container, said means being spaced from each other along the path of movement of said container engaging member, means in alignment with each of said means to move a container into engagement therewith, a valve mechanism to control fluid flow to said vacuumizing means, and means controlled by said valve mechanism to operate said container engaging member to position a container successively in alignment with each of said two first-named means.

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