R. MAGRANE.

SEALING MACHINE.

APPLICATION FILED OCT. 10, 1914.

1,235,146.

Patented July 31, 1917.

2 SHEETS—SHEET 1.

Fig. 1

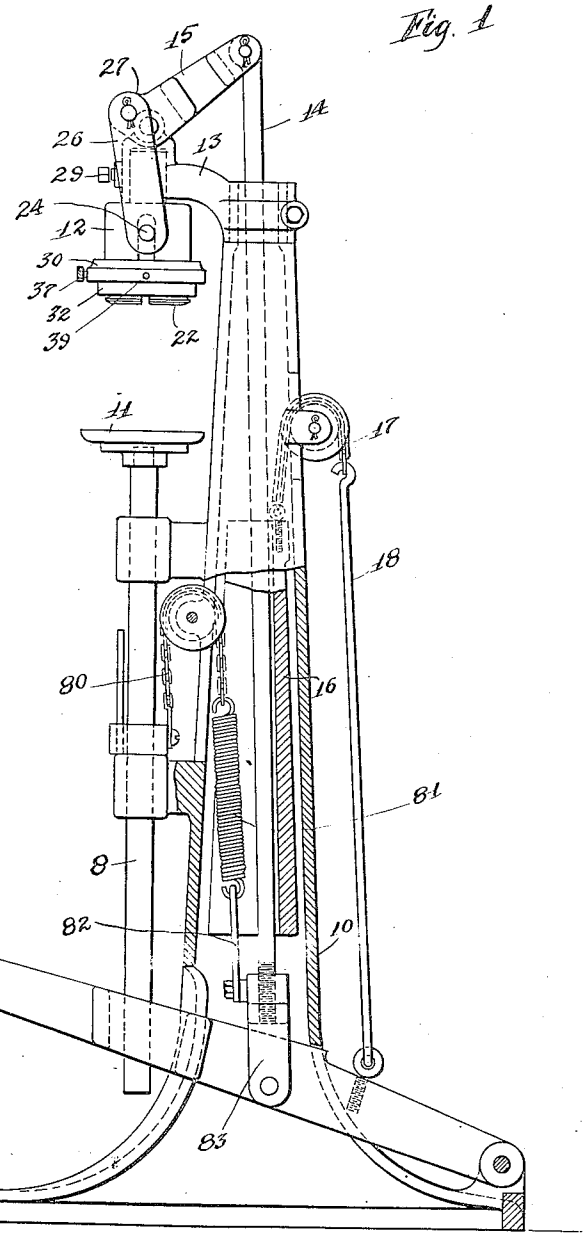


Fig. 5

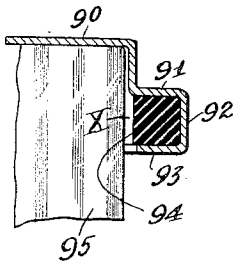
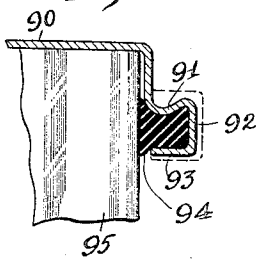


Fig. 6



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2 SHEETS—SHEET 2.

Fig. 3

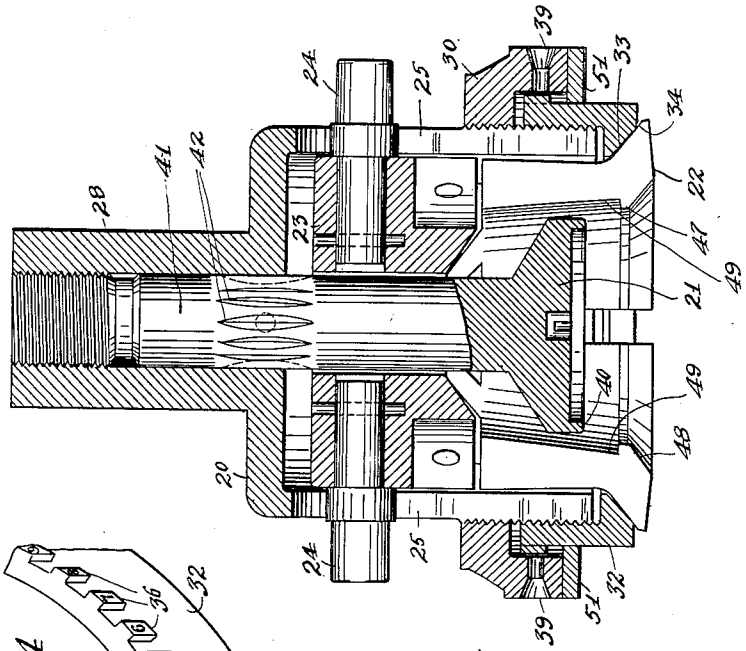
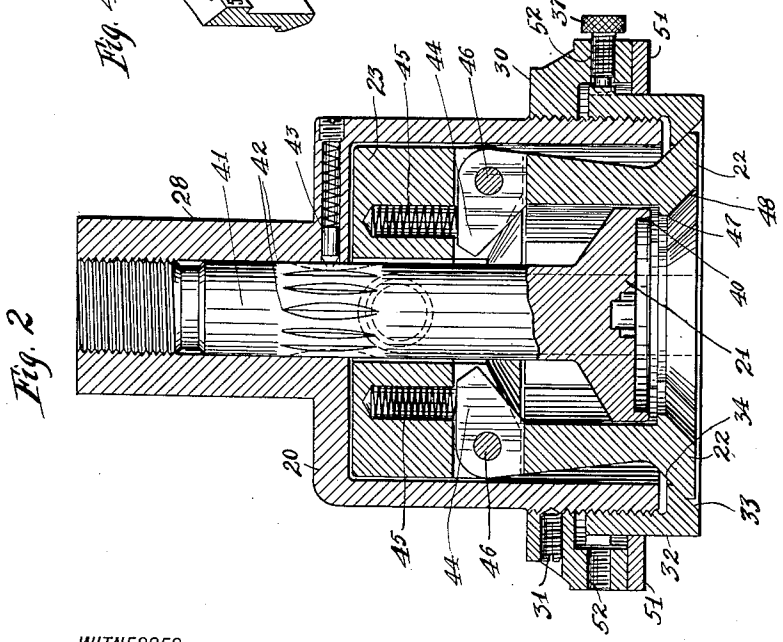


Fig. 4

Fig. 2



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SEALING-MACHINE.

1,235,146. Specification of Letters Patent. Patented July 31, 1917.

Application filed October 10, 1914. Serial No. 865,980.

To all whom it may concern:

Be it known that I, ROBERT MAGRANE, a citizen of the United States, residing at New York, in the county of Queens and State of New York, have invented new and useful Improvements in Sealing-Machines, of which the following is a specification.

My invention relates to mechanism for sealing metallic closures and the like to glass containers and is an improvement on the sealing mechanism heretofore in use.

The objects of invention are to increase the efficiency of the sealing mechanism, particularly when the closure is applied to smooth wall cylindrical containers, which have no sealing shoulder; to increase the efficiency of the seal; to reduce the breakage of glass during the capping operation; to reduce the cost of the package; and to permit a greater variation in the allowable sizes of glass containers.

Referring to the drawings:

Figure 1 is a side elevation, partly broken away, showing a sealing mechanism equipped in accordance with the invention;

Figs. 2 and 3 are diametrical sectional views of the sealing mechanism, the sections being at right angles with each other;

Fig. 4 is a detail in perspective of a measuring device;

Fig. 5 is an elevation partly in section of part of a glass container and closure before sealing; and

Fig. 6 is a similar view showing the same parts after sealing.

In the drawings 10 represents the frame of the machine, 11 a vertically movable table controlled by a pedal 9, the table pressing upwardly the container to be sealed; 12 the chuck as a whole; 13 a rigid arm supporting the chuck; 14 a rod pivotally connected at its upper end with a lever 15 which is fulcrumed on said arm, and connected at its lower end to the pedal 9 by means of a yoke 83; 16 is a weight guided on the rod 14 and connected by a chain 17 and rod 18 with the pedal 9 for normally keeping the latter in its upper position ready to be depressed by the foot of the operator. The table 11 is secured upon the upper end of a slidable rod 8 which by means of a chain 80, spring 81, and link 82 is connected with the yoke 83 pivotally secured to the pedal 9. When the pedal is depressed the downward pull upon spring 81 and chain 80 causes an upward movement of the table 11.

The chuck 12 comprises an inverted cup-shaped casing 20 containing a centering head 21 and a series of jaws 22, 22, the latter in the illustrated embodiment of the invention being pivotally secured to and carried by a frame 23 located within the upper portion of the casing 20 and carrying trunnions 24, 24 which project outwardly through vertical slots 25, 25 formed in said casing and are engaged by the lower ends of links 26 pivotally secured to the crank end 27 of the lever 15. The casing 20 and centering head 21 have no movement during the operation of the machine, but the frame 23 and jaws 22 are drawn upwardly, in such operation, from the position shown in Fig. 3 to that shown in Fig. 2 by the depression of rod 14 and the upward movement imparted by the lever 15 at such time to the links 26.

While in the present instance, provision is made for holding the head 21 in a fixed position and for moving the jaws 22 toward the head, it is obvious that this arrangement might be modified by holding the jaws fixed and moving the head toward the jaws, or by simultaneously causing the head and jaws to approach each other. In any case the motion is a relative one and the preferred embodiment of my invention is the one shown and described.

The casing 20 is a casting and has an upwardly extending tubular shank 28 which fits within a vertical socket in the arm 13 and is held by a screw 29. The lower part of the casing is threaded and is circled by a ring 30 screwed into position and fastened by a suitable set screw, as at 31 in Fig. 2. This ring prevents any spreading of the walls of the casing and has other functions subsequently described. A second annular member 32 is adapted to screw upon the lower part of the casing 20, as shown in Figs. 2 and 3, and the lower and inner part of the member 32 is beveled as indicated at 33 to correspond with the bevel 34 on the outer lower part of the jaws 22, 22. The member 32 is further provided with a series of lugs 36 Fig. 4, which enables it to be locked in any angular position upon the casing 20 by a screw 37 tapped in the ring 30 and adapted to be moved inward between any two of the lugs 36. These lugs are

preferably provided with figures as shown in Fig. 4 and suitable sight holes 39, 39 are provided in ring 30 through which the figures upon the lugs may be seen.

The centering head 21 has in its lower face a recess surrounded by an annular jaw 40 equipped with a beading. The body of the cap is received in this recess and the annular sealing flange of the cap is positioned directly below the annular jaw 40, which operates as an anvil or abutment when the cap flange is pressed upward by the jaws 22 as subsequently described.

The centering head 21 has an upwardly extending stem 41 which is located within the shank 28 of the casing 20 and is threaded at its upper end to engage a thread formed in the interior of the shank. The centering head 21 may thus be adjusted vertically within the casing 20. In order to lock the head 21 against accidental rotation, I provide the stem 41 with a series of elongated tapered recesses 42 which are engaged by a spring pressed stud 43, this stud permitting the rotation of the head 21 under the force of a tool applied to it for that purpose, but preventing accidental movement of the head.

The jaws 22 are of segmental outline, and at their upper parts are formed with inwardly extending arms 44 whose inner ends are disposed below coiled springs 45 housed within the frame 23 and exerting a downward pressure upon the inner ends of said arms 44, whereby the lower portions of the jaws 22 have a normal tendency to spring outward from around the head 21. The arms 44 of the jaws are pivotally hung by means of pins 46 in slots formed in the lower part of frame 23, and the lower inner edges of said jaws are provided with a shoulder 47 and a centering bevel 48. Above the shoulder 47 each jaw has a substantially vertical surface 49.

When the jaws are in their lower position, shown in Fig. 3, the jaws are radially distended as shown. When the pedal 9 and rod 14 are depressed and the lever 15 is caused to pull upwardly through the links 26 and trunnions 24 upon the frame 23 and jaws 22, the tapered skirt 34 on the jaws, bearing against the taper 33 of member 32, causes the jaws to move radially inward and at the same time the shoulder 47 is carried upward. This radial inward movement of the jaws brings their inner walls 49 into contact with the outer wall of the flange of the closure and compresses the closure flange radially inward. At the same time the shoulders 47 move upward and coact with the annular jaw beading 40 to apply vertical pressure to the closure gasket.

The operation on the closure is indicated in Figs. 5 and 6.

The closure comprises a metallic cap 90 having an annular flange formed by the walls 91, 92 and 93 of the cap, and within this flange is a circular gasket 94 which in the present instance is shown as rectangular in cross section, though this is not essential. The glass container upon which the closure is sealed is indicated at 95.

As indicated in Fig. 5, in which the closure is shown upon the container and before it is sealed thereto, a clearance X between the gasket 94 and the container 95 is provided so that the closure may be readily placed upon the container. At this time the sealing mechanism is in the position shown in Fig. 3.

When the machine is operated as described above, the jaws are first cammed inward, their inner surfaces 49 contacting with the wall 92 of the cap flange, the latter is reduced in diameter and the clearance between the container 95 and the gasket 94 is lessened if not wholly taken up. Simultaneously with this movement the shoulders 47 upon the rising jaws create a direct pressure in a vertical line between those shoulders and the jaw beading 40, so that the cap flange is also compressed vertically. The final form the closure assumes under these united pressures is shown in full lines in Fig. 6 while the dotted line in the same figure represents the original form and position of the closure.

In machines heretofore in use in which this type of closure is used for sealing, the variable limits of the glass containers from the standard size of the cap and gasket has a maximum of about $\frac{3}{4}$ mm., that is to say, if the glass container is more than $\frac{3}{4}$ mm. under or over size in diameter, the seal will be either imperfect in the first case, or the glass will be crushed in the second case. This limitation requires the glass to be selected with test gages and great quantities of glass are frequently discarded because the difficulty of manufacturing it within such close limits is so great. Oftentimes, a factory will have a large run of glass which will be a little over or under the allowable limit and which cannot be used.

By the improved sealing mechanism described above, these limitations are avoided and it is possible to seal glass containers that are far beyond the present variable limits; and the invention further renders unnecessary the close system of inspection of glass as manufactured that has heretofore been required.

These results are accomplished by providing suitable adjustments in the sealing machine itself to take care of the wide variations in the size of the glass containers. As shown in Figs. 2 and 3, the member 32 is adjustable in a vertical direction by rotating it about the casing 20. The inward radial movement of the jaws 22 is deter-

mined in amount by this vertical adjustment of member 32, so that the amount of radial pressure brought to bear upon the closure depends upon the angular adjustment of the member 32. In case the glass comes undersized, the member 32 is lowered and the radial compressing movement against the closure is increased; if the glass is oversize, the member 32 is raised and the radial compressing movement is diminished.

In order to facilitate adjustments of the machine to an exact degree, and to return the machine to any given adjustment that has been used before, the lugs 36 of the member 32 are provided with numbers as shown, these numbers appearing in turn before the sight holes 39 in the ring 30, so that a given angular adjustment may be easily made.

If the member 32 were lowered to too great an extent, the jaws 22 would be forced into contact with the centering head 21 and the machine might be broken. To prevent this, the ring 30 has an annular cap 51 attached to its lower surface which is adapted to engage the lugs 36 when the member 32 is screwed downward, and in this way the range of that member is positively limited.

The general adjustment of the parts together with the lower limit of movement of member 32 is determined by the position of the ring 30 upon the casing 20, and after this adjustment is made, the ring is permanently secured to the casing by means of a set screw 31. As this adjustment of the ring 30 may bring it to any angular position relative to the machine, a plurality of tapped holes 52, 52 are provided for the insertion of the lock screw 37 and a plurality of sight holes 39 are also provided so that whatever may be the angular position in which the ring 30 is permanently adjusted, there will be a sight hole 39 convenient for the operator and the locking screw 37 may also be located in a convenient position.

It will be understood that the fundamental principles underlying the organization of elements above described may be embodied in the apparatus of different form from that disclosed herein without departing from the broad scope of my invention. I do not limit myself, therefore, to the particular structure, or to the precise form of the elements herein described.

I claim:

1. In a machine for sealing a closure to the side wall of a container, adjustable means for compressing the flange of the closure radially inward, and for applying pressure to the flange in a direction at right angles to the said radial pressure, in combination with means operating as an abutment to resist said right angle pressure.

2. In a machine for sealing a closure to the side wall of a container, adjustable means for reducing the diameter of the flange of the closure, and for reducing the thickness of the flange, in combination with an abutment contacting with said flange.

3. In a machine for sealing a closure to the side wall of a container, means for reducing the diameter of the flange of the closure and for reducing the thickness of the flange, the said means including adjusting devices adapted respectively to determine the amount of reduction of diameter and of reduction of thickness of the flange.

4. In a sealing machine adapted to apply closures having a flange and inclosed gasket, an abutment, adjustable means to apply pressure horizontally to the flange to reduce its diameter, and to apply pressure vertically to the flange between said means and abutment to cause a radial inward flow of the gasket material upon the wall of the container whereby the seal is effetced.

5. In a sealing mechanism, a chuck comprising a head having a depending annular jaw adapted to contact with the upper surface of the closure flange, a series of radially movable sectional jaws adapted to contact with the outer and under walls of the closure flange, a support for the jaws, means for adjusting the radial movements of said sectional jaws, and means to cause a relative movement of the head and the sectional jaws whereby the flange is compressed in a horizontal and in a vertical direction.

6. In a sealing mechanism, a chuck comprising a head having an annular jaw against which the flange of the closure may be positioned, a series of segmental jaws surrounding the head and radially movable, the said jaws being adapted to engage and compress the outer wall of the closure flange and also having shoulders adapted to engage and compress the lower surface of the flange, a frame to support the jaws, means for adjusting the radial movements of said sectional jaws, and means to cause a relative movement between the head and the jaws to compress the closure flange.

7. A sealing chuck comprising a head having an annular jaw adapted to contact with the upper wall of the cap flange, a support, a series of sectional jaws carried by the support and adapted to contact with the outer and under walls of the flange, the said sectional jaws being radially movable to and from the cap flange, means to adjust the said radial movement and means to cause a relative movement of the head and the sectional jaws whereby the cap flange is compressed radially inward and also in a vertical direction.

8. A sealing chuck comprising a head having an annular jaw adapted to contact with the upper wall of the cap flange, the said jaw having a beading adapted to impress an annular groove in the upper wall of the

cap flange, a support, a series of sectional jaws carried by the support and adapted to contact with the outer and under walls of the flange, the said sectional jaws being radially movable to and from the cap flange, means to adjust the said radial movement, and means to cause a relative movement of the head and the sectional jaws whereby the cap flange is compressed radially inward and also in a vertical direction.

9. A sealing chuck comprising a head having an annular jaw adapted to contact with the upper part of the cap flange, a support, a series of jaws pivoted to the support and adapted to contact with the outer and under walls of the flange, the said pivoted jaws being radially movable to and from the cap flange, means to adjust the said radial movement, and means to cause a relative movement of the head and the jaws whereby the cap flange is compressed radially inward and also in a vertical direction.

10. A sealing chuck comprising a head having an annular jaw adapted to contact with the upper part of the cap flange, a support, a series of jaws pivoted to the support and adapted to contact with the outer and under walls of the flange, the said pivoted jaws being radially movable to and from the cap flange, means to adjust the said radial movement, and means to move the said support and jaws toward the said head, whereby the cap flange is compressed radially inward and also in a vertical direction.

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