To all whom it may concern:

Be it known that I, HORATIO N. NORTON, a citizen of the United States, and a resident of Mount Vernon, in the county of Westche ster and State of New York, have invented certain new and useful Improvements in Vacuum Sealing-Machines for Containers, of which the following is a specification.

This invention relates to so-called vacuum sealing machines.

In packing certain products of more or less perishable character, such as food stuffs, it is desirable to exclude the air from the package or container in order to better preserve the contents thereof. It is therefore customary, in packing such products, to exhaust the air from the container prior to hermetically sealing the same, an operation which has been found to present certain difficulties, more particularly on account of the fact that the seal must be applied without breaking the partial vacuum within the container.

The principal object of the present invention is the provision of a machine which is comparatively simple in construction and dependable in operation.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation, partly in section, of a machine embodying my invention; Fig. 2 is a front elevation thereof; Fig. 3 is a central transverse section of the lower part of the machine; Fig. 4 is a detail view hereinafter described.

Referring now to the drawings in detail, numeral 11 designates the frame of the machine, the base 12 of which preferably provides an air chamber 13. Journalled in bearings in said frame and in the arm 14 thereof is the power-shaft 15, carrying the usual fast-and-loose pulleys 16 and 17, whereby said shaft may be rotated from any suitable source of power. Mounted upon this shaft 15 is the worm 18, in mesh with the gear 19 on the vertical shaft 20, which is journalled in suitable bearings in said frame 55 and in the standard 24 thereof.

Slidably mounted in bearings in arms 25 and 26 which project from the frame 11, is the reciprocating shaft or rod 27. At the upper end of this shaft 27 is provided a plate or platform 28, and at the lower end thereof is adjustably mounted a collar 29 carrying a roller 30, which projects into the cam groove 31 in the disk-wheel 32 at the end of the shaft 23. This cam groove is of such contour, as shown in Fig. 2, that upon rotation of the shaft 23, the rod 27 is rapidly raised to its elevated position, where it is retained for a definite period of time, and then quickly lowered to its most depressed position.

The upper end of the frame 11 is bent forward to provide the arm 33, in the end of which is adjustably mounted the tube 34. The upper end of this tube is closed, it being provided, however, with a close fitting aperture, within which the plunger 35 is slidable. Telescoped into the lower end of this tube is the tube 36, which forms a part of the member 37. The tube 34 is provided with slots 38 for the pins 39 projecting from the tube 36, whereby the latter is slidable for a limited distance within the tube 34. This member 37 is provided with a duct 40, communicating at one end with the interior of the tube 38 and at the other end through the coupling 41 with the flexible tube 42, which is coupled to the pipe 43 leading to the chamber 13. This member 37 has a vertical reciprocating movement which is limited by the length of the slots 38, the tube 36 sliding within the tube 34.

Secured to the under side of the arm 33, is the plate 44, which passes through a closely-fitting slot in the head 45 on the member 37. This plate is provided with an aperture 46, which, when said member 37 is in its most elevated position, registers with the duct 40, operating as a valve to close said duct when said member 37 is lowered from its elevated position. A coil spring 47 surrounds the tube 34 and is in compression between the arm 33 and the member 37 to retain the latter yieldingly in its lowermost position.

The chamber 13 is a vacuum chamber, or what is known as an equalizing chamber, from which the air has been largely ex-
hausted. This may be accomplished by any desired form of air pump, although I prefer to employ a pump 48, this pump 48 being driven from the shaft 15 by means of pulleys 49 and 50 and the belt 51.

Through the aperture in the top of the tube 34 projects the plunger 35, pivoted to lever 53, which is pivotally connected to the arm 54 mounted on the frame 11. This lever is raised and lowered by means of a rod 55, having slide bearings in the arms 56 and 57, and carries at its end a roller 58 in the cam groove 59 in the disk-wheel 60 (see Fig. 4).

In the pipe 43 I provide a two-way valve 61, the same comprising a bar 62 at the end of which is provided the pin 63 projecting into the cam groove 64 in the drum 65 on the shaft 23, whereby said bar 62 is longitudinally reciprocated. This bar 62 is provided with a dent 66, which, in one position of said bar, opens the upper portion of the pipe 43 to the atmosphere, at the same time closing the lower portion of said pipe which leads to the chamber 13 (as shown in Fig. 1), and with a dent 67 which, at the other end of the stroke of reciprocation of said bar, opens the upper portion of said pipe 43 to the chamber 13. This closure is adapted to either glass or earthenware containers and to sheet metal containers of certain types. The closure is of the character known as a friction cap or disk, the cap being loosely placed over the mouth of the container and then subjected to pressure which firmly seats the same and provides a hermetic seal. For the purpose of this description, I have shown a glass container 69, which is placed upon the platform 28 when the same is in its most depressed position. As has been explained, the rotation of the shaft 23 has the effect of raising said platform, and therewith the container 69, until the mouth thereof has been pressed firmly against the annular pad 65 of rubber or the like carried by the member 37. The cap or closure 70 is first placed loosely in said mouth, and during the period of time in which the roller 30 is traveling in that portion of the cam groove 31 which retains the platform 28 in its most elevated position, the rod or bar 55 is depressed to force downwardly the plunger 35. When the platform 28 has been raised to press the mouth of the container 69 firmly against the yielding pad 68, the member 37 is raised to its uppermost position, and the duct 40 brought into registration with the aperture 46 in the plate 44, thereby opening the chamber within the tube 36 to the pipe 43. As this member 37 is being raised, the cam groove 64 in the cylinder or drum 65 operates to reciprocate the bar 62 and bring the duct 67 into registration with the interior of the pipe 43, thereby opening a continuous passage from the vacuum chamber 13 to the chamber within the tube 36. The cap or closure 70 having been loosely placed within the mouth of the container 69, the air within said container will be to a large extent withdrawn, and immediately following this operation the cam groove 59 and the disk wheel 60 operate to depress the rod 55 and therewith the plunger 35 to seat the cap 70 firmly within the mouth of the container and hermetically seal the same. It will be apparent that the partial vacuum in the tube 36 would tend to hold the mouth of the container firmly against the pad 68. Immediately following the depression of the plunger 35, therefore, the cam groove 64 in the cylinder or drum 65 operates to return the bar 62 to its initial position, closing the lower portion of the pipe 43 which leads to the vacuum chamber and opening the upper portion thereof to the atmosphere. Thus the partial vacuum in the chamber above the container is broken, and upon lowering the platform 28 the container 69 will be lowered therewith and may readily be removed and another container placed on said platform for the repetition of the sealing operation.

When the mouth of the container is withdrawn from the pad 68, the spring 47 operates to depress the member 37 to its normal or lowered position, thereby closing the valve 46, wherefore it will be seen that continued operation of the machine, even without placing a container therein, will have no possible effect upon the vacuum in the chamber 13. In other words, this chamber 13 is never opened to the tube 36 above the container unless a container has been placed on the platform 28 and serves to raise the member 37 in the manner described.

Many modifications of minor details of my improved vacuum sealing machine for containers will doubtless readily suggest themselves to those skilled in the art to which it appertains, and I therefore do not desire to limit my invention to the specific construction herein shown and described.

I claim as new and desire to secure by Letters Patent:

1. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; and means for alternately raising and lowering said member.

2. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port...
and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; and means, operative through the medium of a container on said support, for alternately raising and lowering said member.

3. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; means for alternately raising and lowering said member; a vacuum chamber in communication with said port, and means, including a plunger reciprocating through said member, for securing a cap or cover upon said container while a condition of vacuum exists therein.

4. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; means for alternately raising and lowering said member; a vacuum chamber in communication with said port, and cam-actuated means for securing a cap or cover upon a container while a condition of vacuum exists therein.

5. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; means for alternately raising and lowering said member; a vacuum chamber in communication with said port, and means for securing a cap or cover upon said container while a condition of vacuum exists therein.

6. In a machine for hermetically sealing containers, a support for the containers; a vertically-movable member disposed above said support and having a port there-through; a stationary, apertured valve controlling passage of air through said port and supported independently of said member, said port being brought into and out of registry with said valve-aperture by the raising and lowering of said member; means for alternately raising and lowering said member; a vacuum chamber in communication with said port, and means for securing a cap or cover upon said container while a condition of vacuum exists therein.

Witnesses:

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