

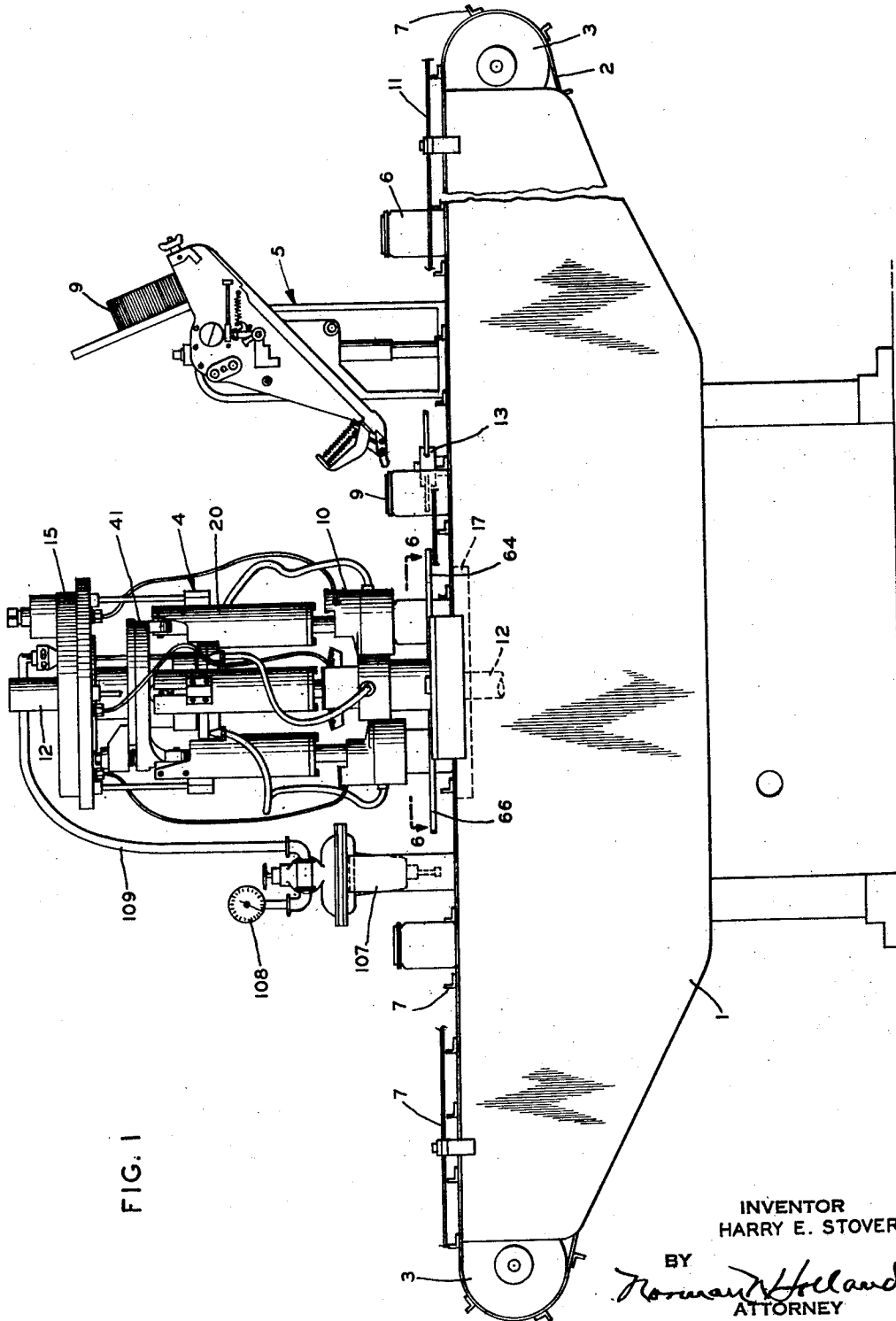
Dec. 8, 1959

H. E. STOVER
CONTAINER SEALING APPARATUS

2,915,862

Filed July 24, 1953

5 Sheets-Sheet 1



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H. E. STOVER

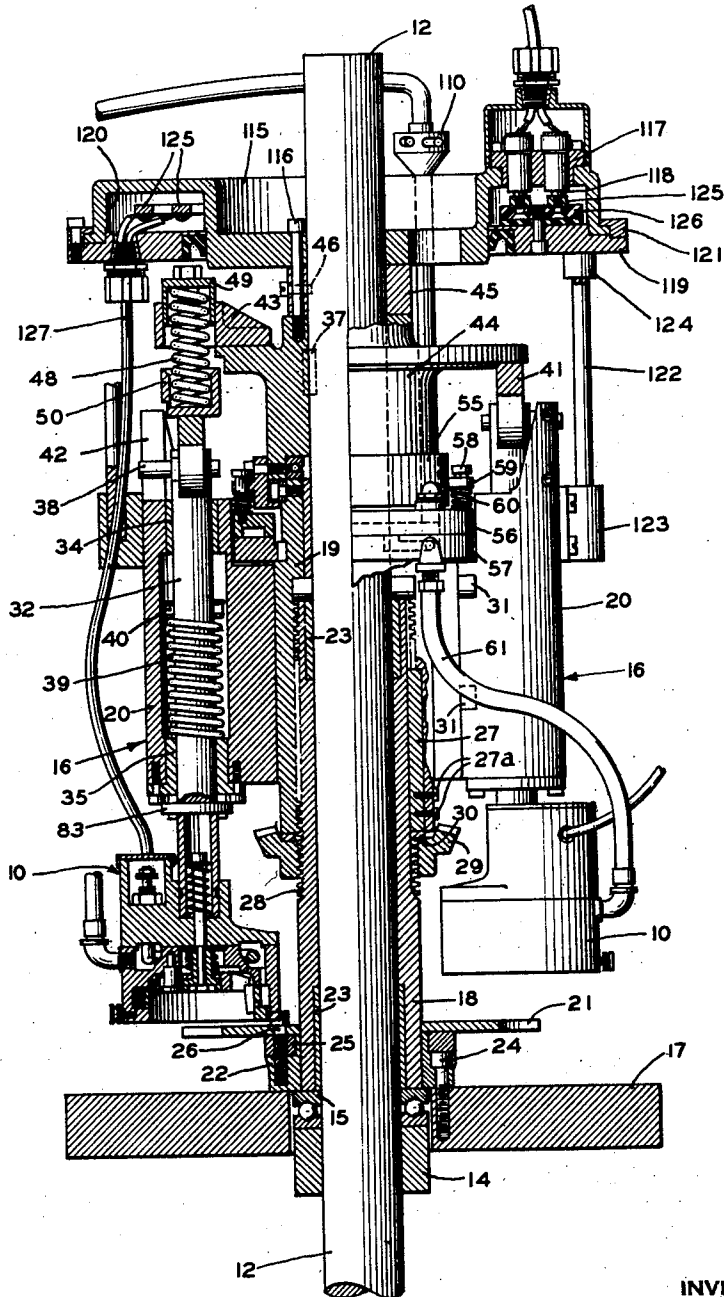
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CONTAINER SEALING APPARATUS

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FIG. 2



INVENTOR
HARRY E. STOVER

BY
Norman D. Heland
ATTORNEY

Dec. 8, 1959

H. E. STOVER

2,915,862

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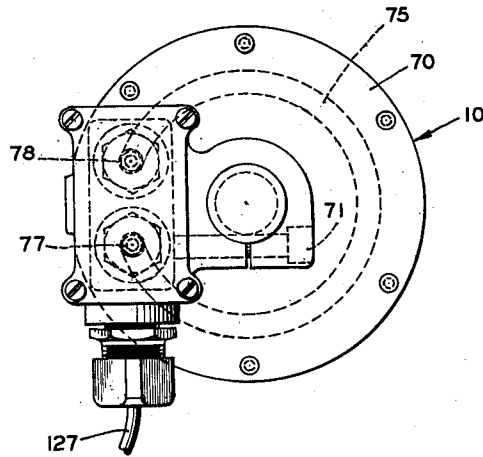


FIG. 5

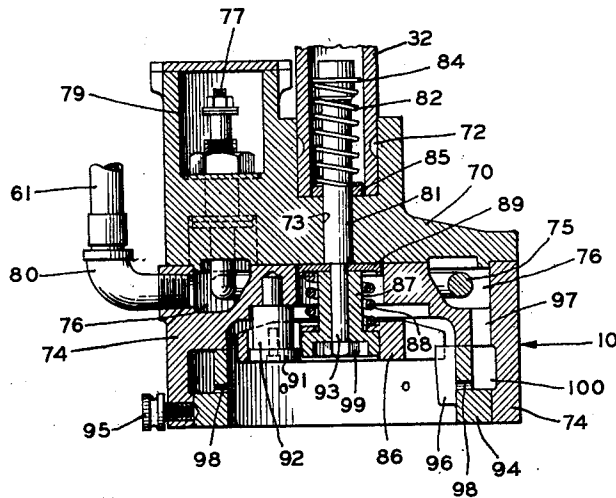


FIG. 4

INVENTOR
HARRY E. STOVER

BY
Norman R. Holland
ATTORNEY

Dec. 8, 1959

H. E. STOVER
CONTAINER SEALING APPARATUS

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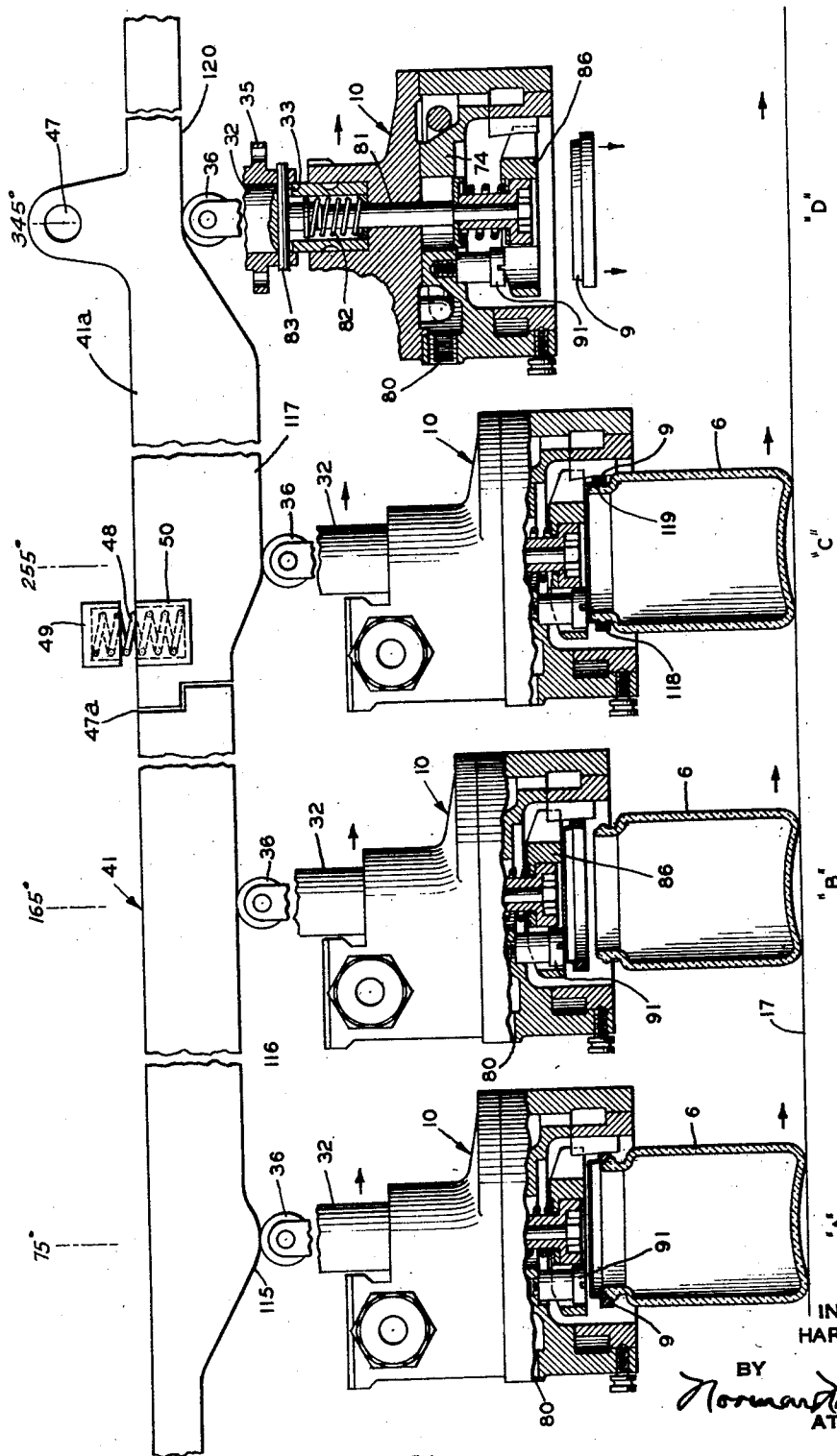


FIG. 7

INVENTOR
HARRY E. STOVER

BY
Norman Holland
ATTORNEY

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2,915,862

CONTAINER SEALING APPARATUS

Harry E. Stover, Lancaster, Ohio, assignor to Anchor Hocking Glass Corporation, Lancaster, Ohio, a corporation of Delaware

Application July 24, 1953, Serial No. 370,135

8 Claims. (Cl. 53—112)

The present invention relates to the sealing art and more particularly to a machine for hermetically sealing closures having gaskets therein on glass containers.

Glass containers are used in large quantities for sealing and preserving various food products; for example, large numbers of containers and closures are used daily for sealing foods for babies, commonly termed "baby foods." Jellies, jams, peanut butter, and other food products are also sealed in large quantities. After sealing, the products may be stored for a period before delivery to the retailer and may be stored or held for a period by the retailer before being sold to the housewife. In turn, the housewife may store the product for a substantial period before consuming.

A number of products require very high vacuum in order to preserve the contents. In other cases, a high vacuum is detrimental as the air within the product expands under the influence of the vacuum in the headspace to produce bubbles in the product. The term "vacuum" used herein connotes the difference between atmospheric pressure and the absolute pressure within the container.

Packers and consumers desire to utilize containers differing in diameter, height, and shape which requires that a sealing machine be adjustable for sealing various types and sizes of containers. Failures in the sealing have to be reduced to an absolute minimum, much less than 1%, because the failure of a seal means that the product will deteriorate and spoil. In most cases the spoilage is not noted until it reaches the housewife, thus impairing the reputation of the packer. The above conditions have to be met with a machine which will seal the containers at a high rate of speed.

The present invention provides a machine which will seal containers in accordance with the above requirements and which is relatively inexpensive. The machine is particularly useful to smaller companies or packers having a limited production and requiring an inexpensive, easily-operated machine suitable for use by unskilled personnel. While various types of closures may be utilized for sealing containers, the type shown in the Stover et al. application Serial No. 217,492, now U.S. Patent No. 2,670,868, owned by the assignee hereof, has been found to produce excellent results. In some cases packers desire a seal formed on the rim of a container or a combined rim and side seal. In such cases, closures and containers shown in application Serial No. 225,494, now U.S. Patent No. 2,772,012, owned by the assignee hereof, and in H. Z. Gora Patent No. 2,492,144 provide excellent results. Reference to the above closures and containers is illustrative, as the machine may be used for sealing other closures also.

An object of the present invention is to provide an improved sealing machine.

Another object is to provide an inexpensive machine which may be utilized by packers having a limited production to obtain perfect packaging at high speed.

Another object of the invention is to provide an inex-

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pensive vapor sealing machine in which the amount of vacuum in the headspace of the sealed package may be controlled to meet the requirements of the product being sealed.

Another object of the invention is to provide an improved machine which will apply closures to glass containers rapidly and which will have a minimum of parts.

Another object of the invention is to provide an improved machine for utilizing superheated steam for forming a vacuum and for sterilizing parts of the closure and container.

Another object of the invention is to provide a readily-adjustable machine for hermetically sealing products under partial vacuum in glass containers.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

Fig. 1 is a side elevational view of the machine illustrating the general construction thereof;

Fig. 2 is a fragmentary side view, partly in section, of the sealing mechanism shown at the center of the machine in Fig. 1;

Fig. 3 is an elevational view of the improved means for supplying vapor to the sealing heads of the machine;

Fig. 3a is a sectional view along the line 3a—3a of Fig. 3;

Fig. 4 is an enlarged sectional view of a sealing head;

Fig. 5 is an enlarged top view of a sealing head;

Fig. 6 is a sectional view along the line 6—6 of Fig. 1, illustrating the path of travel of the containers through the machine; and

Fig. 7 is a schematic representation of the operation of the sealing heads, the cam being shown as a development and the sealing heads being shown moving in a straight line.

General description

Described generally and with particular reference to Figs. 1 and 6 of the drawings, the machine comprises a suitable base 1 having an endless conveyor belt 2 mounted on sprockets 3 at the ends of the machine for receiving containers and delivering them to the sealing mechanism and for removing containers delivered by the sealing mechanism. Suitable cleats 7 on the conveyor space the containers as they enter the machine and keep them spaced along the length of conveyor 2.

A closure feeding device 5 is mounted adjacent the conveyor belt for delivering closures 9 and placing them loosely on the containers as the conveyor moves them under it. This operation may be performed by hand, but in a high speed machine the mechanical operation is highly desirable. The preferred form of closure feeding device for this purpose is illustrated in Stover application Serial No. 118,802 filed in the United States Patent Office on September 30, 1949, and owned by the assignee hereof. A star wheel 13 is located directly beneath the closure feeding device and beside conveyor 2 and is synchronized with cleats 7 to propel the upper portion of container 6 at the speed of the conveyor and to prevent the container from tipping over as the closure cap 9 is placed on container 6. Further description of the cap feed herein is deemed unnecessary.

The conveyor 2 delivers the containers from the closure feeding device 5 to the rotating table 17 of the sealing mechanism 4 by a star wheel 64 which accurately posi-

tions the containers with the closures thereon under the respective sealing heads 10. As will be described in detail hereinafter, the closure caps are raised by the sealing heads and vapor is passed between the closure and the container and is sealed within the container so that a vacuum will be formed when the vapor condenses.

The vapor is supplied to the sealing heads by adjustable devices which will be described in detail hereinafter.

The sealed containers leave the rotary sealing mechanism and are received by the conveyor 2 which delivers them from the machine. Suitable guide rails 11 hold the containers on the conveyor. Sprockets 3 for the conveyor 2, the star wheel 13, the closure feeding device 5, and the sealing mechanism 4 are all driven in timed relation by a suitable drive within the base of the machine. As illustrative of a drive which may be adapted for this purpose, reference may be had to the Harry E. Stover Patent No. 2,529,190, granted November 7, 1950, in which a series of operating mechanisms are driven in timed relation in a sealing machine and include a cap feed, a star wheel somewhat similar to the table 17 herein, and sprockets for a conveyor belt similar to the one shown herein. Reference may also be made to the drive in the F. Z. Fouse Patent No. 2,510,568, granted June 6, 1950.

Sealing mechanism

The sealing mechanism 4 is shown in Fig. 1 mounted on the top of base 1 midway between sprockets 3 and adjacent conveyor 2.

The sealing mechanism is shown in greater detail in Fig. 2 and has a plurality of sealing heads 10 which rotate about the fixed vertical shaft 12 and which perform the operations of sealing the closures 9 upon the containers 6. The containers 6 are transferred from conveyor 2 to a circular table 17 in a manner to be more fully described below. The table 17 rotates at the same speed as the sealing heads 10 so that one sealing head is located directly above each container 6 as the rotating table 17 moves the container about shaft 12. A series of sealing operations are performed by the head 10 upon closure 9 and container 6 while the container is on the rotating table 17. The sealing operations as shown in Fig. 7 are performed by the vertical reciprocation of the sealing heads 10 under the control of cam 41 which is fixedly mounted near the top of shaft 12 and comprise the four following principal operations.

At position A the sealing head 10 has been moved down over the container 6 with the closure 9 on its top by the action of cam 41 through cam follower roller 36 and cam follower rod 32. It has been moved close enough so that magnets 91 mounted in the sealing head 10 are about to raise the closure 9 from the container.

At position B the head 10 has been raised by cam 41 and the closure 9 held against sealing disk 86 by magnet 91 is carried a short distance above container 6. Through the action of the vapor supply and the vapor distribution manifold, steam or steam mixed with air or a suitable gas such as nitrogen or carbon dioxide is now directed into the space between closure 9 and container 6 as the table rotates to position C.

At position C the sealing head is moved down by cam 41 bringing sealing disk 86 (Fig. 4) in sealing head 10 against the closure 9 which forces the closure 9 over the top of container 6, resulting in an airtight seal between closure 9 and container 6.

At position D the cam 41 allows the sealing head 10 to rise clear of the container. If an imperfect seal has been made or if a container was not delivered to the head, closure 9 may be lifted with magnet 91 and a closure ejection mechanism to be described below operates to eject the closure from the sealing head 10 before it begins another rotation to perform the sealing operation on another container 6.

Referring to Fig. 2, showing details of the sealing mechanism, a vertical shaft 12 about which the sealing heads

10 rotate is fixedly mounted on base 1. The principal parts of the rotating turret 16 of the sealing mechanism 4 are the sealing heads 10, the cam follower rods 32 which support the sealing heads 10 and which control their vertical movement, and the cam follower rollers 36 which allow rods 32 to follow the contour of cam 41, the cam follower rod support brackets 20 which are bolted by bolts 31 to an upper rotating sleeve 19, the lower rotating sleeve 18 splined by key 27 to rotate with upper sleeve 19, and container support table 17 which is rigidly fastened to sleeve 18 by collar 22 and bolts 24 and a star wheel 21 fastened to collar 22 by ring 25 and bolt 26.

The parts of the rotating turret 16 above mentioned being fastened together all rotate as a unit at the same speed as the container support table 17.

The vertical load of the rotating turret is taken by a thrust bearing 15 mounted on a collar 14 and the radial thrust is taken by bearings 23.

Upper sleeve 19 and lower sleeve 18 rotate together about shaft 12 on bearing 23 and are movable axially of shaft 12 with respect to each other to allow the height of sealing heads 10 to be adjusted. To provide this height adjustment sleeve 18 has a thread 28 on its outer surface and contains a vertical keyway to accommodate key 27. On this thread 28 a bevel gear 29 is mounted and the gear 29 is internally threaded for cooperation with thread 28. The lower end of sleeve 19 rests upon a bushing 30 supported on gear 29. The gear 29 is adapted to be rotated by means of a pinion not shown. When gear 29 is rotated, it feeds axially of the threaded sleeve 18, the direction of axial movement depending upon the direction of rotation of gear 29. Axial movement of the gear 29 will raise or lower the sleeve 19, which will not rotate with respect to sleeve 18 due to its splined condition.

Cam follower rod 32 as explained above reciprocates vertically under the action of cam follower 36 on cam 41. Cam follower rod 32 is mounted in bushings 34 and 35 and is held against cam 41 by spring 39 compressed between flange 40 and bushing 35. Cam follower roller 36 is mounted on shaft 38, an extension of which rides in slot 42 of bracket 20 to hold the sealing head 10 in radial alignment.

The circular cam 41 is fastened to bracket 44 which is mounted on the upper portion of shaft 12. Bracket 44 is held in position by a collar 45 at its top and a thrust bearing 51 at its bottom. Bearing 51 rests on the top of upper sleeve 19. A key 37 prevents bracket 44 from rotating on shaft 12. Collar 45 is held in position on shaft 12 by set screw 46.

In order to hold the stationary bracket 44 and the rotating sleeve 19 in the proper relationship, a centering ring 52 is bolted to sleeve 19 by bolts 53, and a cooperating ring 55 is bolted to bracket 44 by bolt 54.

As will be more fully explained below, vapor is directed between the closures 9 and the containers 6 during a portion of the sealing operation. A vapor distributing manifold comprising a rotating distributor 57 and a fixed manifold 56 are positioned below cooperating ring 55 to distribute the vapor to the sealing heads 10 through conduits 61 at the proper time. The manifold 56 is attached to cooperating ring 55 by bolts 58 which pass through lugs 59 on ring 55. Compressed springs 60 between lugs 59 and manifold 56 hold manifold 56 firmly against distributor 57 which is keyed to upper sleeve 19 to rotate therewith.

Bracket 115 mounted at the top of shaft 12 supports brushes 118 which supply current to vapor superheaters in the sealing heads 10 as will be described in connection with the vapor supply.

Sealing heads

The details of the sealing heads 10 on the sealing mechanism 4 are shown in Figs. 4 and 7. In the preferred embodiment four sealing heads 10 are used, however the

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invention is not limited to this member, as more or less may be used.

As outlined above and as shown in Fig. 7, the sealing head 10 performs four principal operations in the sealing of the containers.

The sealing head 10 moves vertically as a unit as the cam follower rod 32 reciprocates under the control of cam 41.

The actual sealing operation, which is shown in Fig. 7, position C, is done by sealing disk 86 applying a downward pressure on closure 9 and forcing the skirt of closure 9 over the finish 119 of container 6 so that a gasket 118 forms an airtight seal. Sealing disk 86 is mounted on the end of a plunger 81 which is slidably mounted in an aperture 73 in the top portion 70 of the sealing head. The upper portion of plunger 81 extends into a hollow end of cam follower rod 32. The lower end of plunger 81 has a reduced diameter portion 93. Over this reduced portion 93 a bushing 87 is fastened between nut 99 and a washer 89. The sealing disk 86 fits over bushing 87 and is held firmly against it by a strong spring 88 compressed between the sealing disk 86 and washer 89. Spring 88 will be compressed slightly as disk 86 is forced against closure 9 when there are slight irregularities in the closure 9 and container 6. Preferably the spring 88 is sufficiently strong to force the closure 9 on without moving upwardly sufficiently for substantial pressure to be applied to the closure by the magnets 91. Plunger 81 is held in a normal upward position with washer 89 against top portion 70 by spring 82 compressed between flange 84 on plunger 81 and washer 85.

The downward and upward movements of sealing head 10, shown in positions A and B of Fig. 7, are for the purpose of lifting the closure 9 a slight distance above the container 6 to allow the steam to be injected between the closure 9 and container 6 as described above. Magnets 91 on the ends of mounting posts 92 are fastened to the skirt portion 74 of the sealing head 10. The magnets 91 (preferably three in number) and posts 92 are fitted within holes in disk 86 so that the disk 86 may move freely with respect to the magnets in the closure stripping action to be explained below. The lower surfaces of the magnets 91 are substantially flush with the lower surface of the sealing disk 86 but preferably slightly above; for example, .02 inch to permit some compression of spring 88 without exposing the magnets. If the distance is too great the effect of the magnets will be impaired.

As the sealing head 10 is moved toward the closure 9, as in position A, Fig. 7, the magnets pick up the closure 9. When the sealing head is moved upward a slight distance, as in position B, Fig. 7, the closure 9 is raised above the container 6 allowing a space for steam to be directed between the closure 9 and the container 6 prior to the sealing operation of position C discussed above.

The action at position D is a stripping action which removes closures from magnets 91 which have failed to remain sealed to the container 6 in the sealing operation of position C and have been raised up with sealing head 10.

Mounted on bushing 35 on cam follower bracket 20 is a pin 83. Pin 83 passes through a slot 33 in cam follower rod 32 so that pin 83 normally does not interfere with the vertical reciprocation of cam follower rod 32 in positions A, B, and C of Fig. 7. In position D, however, cam follower rod 32 has risen high enough so that plunger 81 rising with the cam follower rod 32 strikes pin 83. Further upward motion of cam follower rod 32 now forces plunger 81 down, compressing spring 82 and moving sealing disk 86 downward with respect to magnets 91. A closure remaining on sealing disk 86 will be moved far enough away from magnets 91 so that it will be beyond effective force of the magnets and will fall from sealing disk 86 due to its weight.

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A removably-mounted ring 94 having inwardly projecting radial fins 96 is fastened by screw 95 in the bottom of skirt portion 74. The size of ring 94 and projecting fins 96 is chosen to guide the particular closure 9 being used into a proper seal on container 6.

In order to supply the means for the direction of steam between the cap and closure, as will be more fully explained below, a series of passages are provided in sealing head 10. These comprise the steam inlet 80 which connects to an annular steam channel 76 in skirt portion 74. Channel 76 is connected by a series of apertures 97 to channel 100 formed between skirt 74 and ring 94. Apertures or slots 98 annularly arranged in ring 94 admit steam to the space between closure 9 and container 6.

An annular resistance heating element 75 is mounted in channel 76 to superheat the steam as will be described below. The heater element 75 is mounted on terminal posts 77 and 78 in housing portion 79 of top portion 70 of the sealing head 10.

Vapor supply

A vacuum is preferably formed within the sealed containers by directing a quantity of vapor such as steam between the closure and the container at the time of sealing. When the vapor condenses, a partial vacuum is formed. Preferably, vapor is directed between the closure and the container at the time of sealing somewhat as an atmosphere or cloud which displaces the air in the headspace. In many cases, a high vacuum is desired, but with certain products, such as jellies, a relatively low vacuum is desired because the air bubbles in the product tend to expand, and the higher the vacuum in the headspace within container 6, the greater the expansion of the air bubbles. However, with products having a high sugar content, the tendency to spoil is generally less and consequently less vacuum is required.

Where lower vacuums are desired, the present invention provides means for mixing a predetermined proportion of air or of an inert gas with the vapor so that the amount of vacuum may be controlled.

A preferred embodiment of the means for supplying vapor for sealing with a mixture of air or gas, where desired, is shown in Fig. 3. Steam is supplied from an outside source through an inlet pipe 101 to a conventional steam separator 104 which removes the water and moisture and drains it out through trap 102. The steam then passes through line 105 and control valve 106 to a conventional pressure regulator 107. In the preferred embodiment, the pressure of the steam delivered to the sealing head is relatively low so that turbulence within the sealing head is not excessive. A gauge 108 indicates the output pressure of the regulator 107. The steam now passes through line 109, mixer 110, and line 111 to fixed manifold 56 which is shown in assembled relation in Fig. 2. Mixer 110 may be any conventional vapor or gas mixer wherein air is admitted and mixed with the steam illustrated herein by venturi action. The amount of the vacuum in the containers may be controlled by adjusting the mixer air inlet 113.

Fixed manifold 56 has a semi-annular vapor distribution channel 112 connected at one end to line 111. The channel 112 is open at its lower side so that apertures 114 in rotating distributor 57 leading to the vapor lines 61 connect with channel 112. As the rotating distributor 57 turns, vapor will be admitted while holes 114 are in communication with channel 112.

The vapor passes through lines 61 and inlets 80 to the vapor channel 76 in the sealing head 10 as shown in Fig. 4.

The use of superheated steam is desirable to minimize condensation within the headspace and in order to have a high temperature for its sterilizing effect. However, good results can be obtained with many products without superheating the steam.

A superheater coil 75 is mounted in channel 76 of the sealing head. This heater coil raises the temperature of the steam to any desired degree and keeps the temperature of the steam sufficiently high to prevent or minimize condensation in the head 10 and in the container after the sealing operation.

Fig. 2 shows the details of the current supply for heater 75. A fixed bracket 115 is mounted on the upper end of shaft 12 by bolt 116 in ring 45. Mounted upon bracket 115 are brush holders 117 and brushes 118. A rotatable ring 119 is fitted into channel 120 in bracket 115. Flange 121 bolted to ring 119 positions ring 119 on bracket 115 and allows it to rotate about bushing 120. Rod 122, connected by bracket 123 to rod support bracket 20 and by bracket 124 to ring 119, turns ring 119 in synchronism with the rotating portion 16. Slip rings 125 are mounted on suitable insulating blocks 126. Brushes 118, fed from a suitable current source, contact and energize slip rings 125. Conductors 127 are screwed to rings 125 and run to terminal posts 77 and 78 on sealing heads 10, as shown in Fig. 5.

Where superheated steam is not desired, the steam may be delivered directly to channel 100 without passing through the superheater channel 76, or the steam may be passed through the superheater with the current disconnected. Of course, it is preferred that the superheater and the current distributor therefor be included in the machine, but, if desired, these parts could be omitted and the machine used with ordinary steam.

Operation

The containers 6 to be sealed are placed on the right end (Fig. 1) of conveyor 2 by hand or by a loading device and are carried under the closure cap feed device 5 where a closure cap 9 is loosely placed on the top of each container. The containers are then carried to an in-feed star wheel 64 (Fig. 6). Curved guide plate 65 and star wheel 64 move the container from conveyor 2 to rotating table 17 and together with center star wheel 21 position the container on table 17 so that it is correctly located beneath a sealing head 10. Conveyor 2, in-feed star wheel 64, and center star wheel 21 are all driven in timed relation by suitable gearing from a central motor drive (not shown) and are coordinated to place the containers in the proper position on rotating table 17 for the sealing operations of the sealing heads.

In Fig. 7, the cam 41 is shown in developed form with the operation performed by the sealing heads shown in four different positions.

Position A shows the container just after it has been placed on table 17 by the action of the star wheels 21 and 64. Cam surface 115 has moved roller 36 and rod 32 downward, moving sealing head 10 over the top of closure cap 9 and container 6. The sealing head has been lowered so that magnets 91 are close enough to attract closure cap 9 and to start to lift it from container 6.

In position B the roller 36 and rod 32 have moved upward in accordance with the cam surface 116. The closure cap 9, which has been attracted against sealing disk 86 by magnet 91 has been raised away from the top of container 6. Steam is now being admitted to the inside of sealing head 10 from steam inlet 80, for the vacuum forming process discussed in detail above.

In position C, cam surface 117 has now moved roller 36 and rod 32 down so that the sealing disk 86 has forced closure cap 9 to fit over the beaded portion of container 6. Steam has been trapped by the airtight seal of the closure gasket 118 against a bead 119. The condensation of the steam trapped within the container will create a vacuum in the sealed container.

The cam section 41a, a portion of cam 41 corresponding to position C, is hinged against a spring 48 with the pivot of hinge at shaft 47 and open end of hinge at 47a in such a manner that the force applied to the closure

top by disk 86 will not exceed a given amount. Spring 48 is mounted between a cup portion 50 formed integrally with cam section 46 and cup 49 mounted on bracket 44. Spring 48 will compress, allowing the cam portion 41a to rotate upward about shaft 47. This spring action will prevent container damage where slight variations in the container height or the depth of the closure would ordinarily cause an excess force to be exerted on the container, damaging it.

Position D shows the final operation of the sealing head. The cam surface 120 has allowed spring 39 to move roller 36 and cam rod 32 upward and to bring sealing head 10 clear of the sealed container.

Position D provides a stripping action to remove a closure cap from the sealing head 10 in case a container is missing or in case the cap fails to seal on the container and is lifted up by magnet 91 as the sealing head 10 moves away from the container 6. As the rod 32 rises, the plunger 81 strikes pin 83 set in bushing 35. Pin 83 passes through slot 33 in rod 32 so that it does not prevent the vertical reciprocation of cam rod 32. As pin 83 strikes plunger 81, it prevents further upward motion of plunger 81 while allowing rod 32 to rise while spring 82 compresses. Sealing disk 86, which is fastened to the bottom of plunger 81, will be moved away from its normal position adjacent shoulder 74. Magnets 91 being fixedly mounted on top 70 will remain in position and disk 86 will be moved down, thus causing the closure cap 9 to be separated from the magnets 91. As closure cap 9 moves away, the attraction of magnets 91 will decrease so that the weight of the closure cap 9 will cause it to fall clear of the sealing head to the conveyor or other appropriate clearing device.

Out-feed star wheel 66 (Fig. 6) cooperates with guide plate 65 to remove the sealed container from the table 17 and to place it back on the conveyor 2 which carries it to an unloading point.

The speed of the machine may be adjusted by changing the speed of the main drive (not shown) which may be any suitable power source such as an electric motor. Conveyor belt 2, the rotating portion 16 of the sealing mechanism 4 and the star wheels 64 and 66 are connected to the drive motor by suitable gearing and thus, having a positive drive, remain in synchronism at all speeds.

The placing of different size jars on the table 17 in their correct positions may be adjusted by changing the position of the guide plate 65 and the size of the star wheels as necessary.

Removable ring 94 in the sealing head 10 may be chosen to correspond to the cap and container size being used. The fins 96 are suitably shaped to guide the container cap into the correct position for the sealing action.

As described above, the height of the sealing heads above table 17 may be adjusted, using gear 29 for sealing containers of different heights. The upper stationary cam bracket 44 and the bracket 115 (Fig. 2) are loosened to move with the sealing heads by unscrewing bolt 46 on ring 45. Gear 29 is then turned to move on thread 28 in the desired direction. Cam surfaces on cam 41 may be suitably cut to provide the proper vertical reciprocation of the rods 32 for the particular closure cap and container design.

As previously described, the degree of the vacuum may be varied by the amount of air allowed to enter the steam line through mixer 110. The degree of superheating is varied by varying the amount of external voltage supplied to the superheater.

It will be seen that the present machine provides an improved sealing machine for vacuum sealing. The machine is rugged and compact and easily adjusted for a variety of container and closure sizes. The degree of vacuum is readily adjustable. The machine has a built-in vapor superheater to prevent condensation of the va-

por and excessive condensate in the sealed containers. The machine is especially adapted for use in small or medium-size canning operations where a rugged, easily adjusted and relatively simple and inexpensive machine is required.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. In a sealing machine, the combination of a sealing head having a spring mounted floating pressure member, a plurality of apertures extending through said member, a plurality of magnets fixed with respect to the head in said apertures, the lower surfaces of the magnets substantially flush with the lower surface of said pressure member for retaining a closure on said pressure member when said pressure member is in a first position and the lower surfaces of the magnets being substantially above the lower surface of said pressure member to release a closure when said pressure member is moved downwardly to a second position.

2. In a sealing machine, the combination of a plurality of sealing heads, each having a skirt adapted to telescope over the upper end of the container and having a spring mounted pressure member for forcing a closure on the container, a passage through the sealing head for vapor and heating means within said passageway for heating the vapor.

3. In a sealing machine, the combination of a sealing head having a pressure member therein for engaging a closure, means for resiliently mounting said member for limited movement, a plurality of magnets fixedly mounted on said head adjacent to said member for holding a closure thereon, and means for moving said member with respect to said head and said magnets to disengage a closure thereon from said magnets.

4. In a rotary sealing machine for applying closures to glass containers, the combination of a plurality of sealing heads adapted to rotate about an axis, each of said sealing heads having a skirt adapted to telescope over the upper end of the container and a pressure member within the skirt adapted to engage and retain a closure, and means for moving each of said heads consecutively downwardly to engage a closure on a container, upwardly to raise the closure slightly above the container and downwardly to force the closure on the container.

5. A rotary sealing machine as claimed in claim 4 in which a passage in the head permits the supplying of steam between the closure and the container prior to the sealing.

6. A rotary sealing machine as claimed in claim 4 in which a passage within the head is provided for supplying steam between the closure and container at the time of sealing and in which a heating element in said passage superheats the steam passing therethrough.

7. A rotary sealing machine as claimed in claim 4 in which means is provided for ejecting the closure from the head if it is not removed by a container.

8. In a sealing machine, the combination of a rotary sealing mechanism, a conveyor, a mixer to mix a predetermined amount of air with steam, said sealing mechanism comprising a vertical shaft, a plurality of vertically reciprocable sealing heads rotatably mounted on said shaft, a connection between said steam supply system and said heads, an electric heater in each of said heads, a channeled bracket mounted on said shaft, a rotatable ring within said bracket channel, said rotatable ring operatively connected to said sealing heads to rotate therewith, a pair of slip rings on said rotatable rings, said slip rings electrically connected with said heaters, and a pair of brushes mounted on said channeled bracket contacting said slip rings for connection with a source of electric current.

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