

[54] APPARATUS FOR APPLYING A SEALING GASKET TO A SURFACE

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 [22] Filed: **June 28, 1973**
 [21] Appl. No.: **374,734**

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Related U.S. Application Data

[62] Division of Ser. No. 177,245, Sept. 2, 1971, abandoned.

[52] U.S. Cl. 425/113, 118/408, 118/410, 425/DIG. 809, 425/DIG. 812
 [51] Int. Cl. B29c 13/02
 [58] Field of Search 425/809, 812, 113; 118/3, 118/317, 408, 410, 411

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ABSTRACT

[57] Apparatus and method for applying a fluid sealing composition en masse to a closure in the desired final configuration, the apparatus comprising a nozzle having an annular orifice and a mechanically movable plunger for opening and closing the orifice to control the flow of fluid sealing composition onto the closure.

2 Claims, 3 Drawing Figures

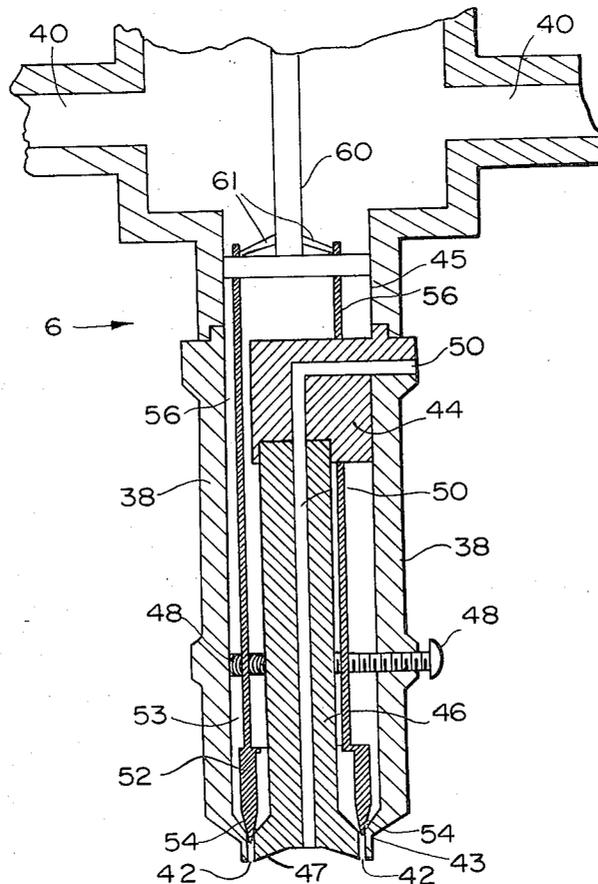


Fig. 3

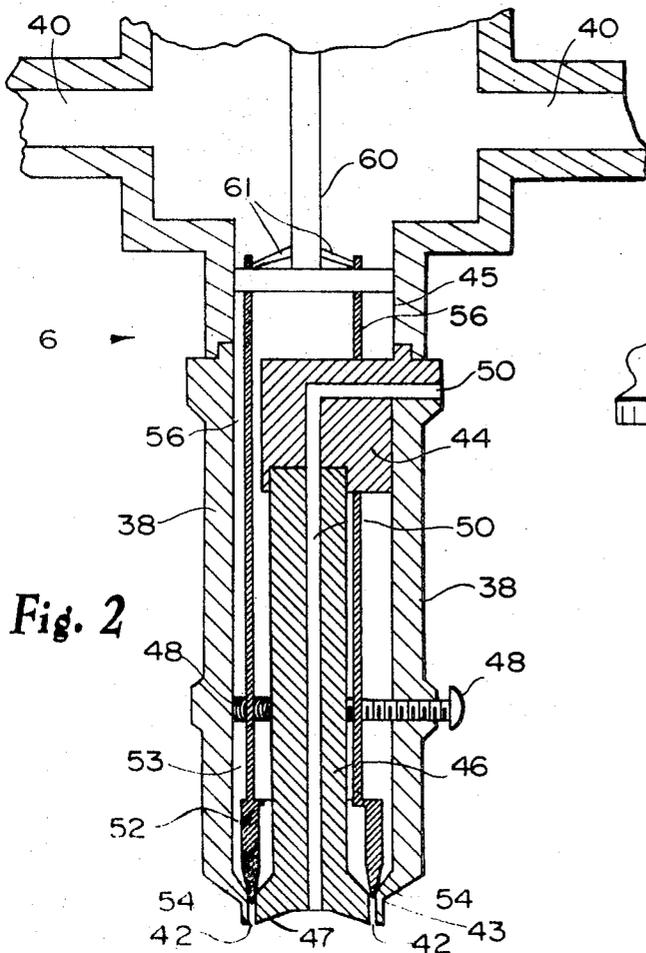
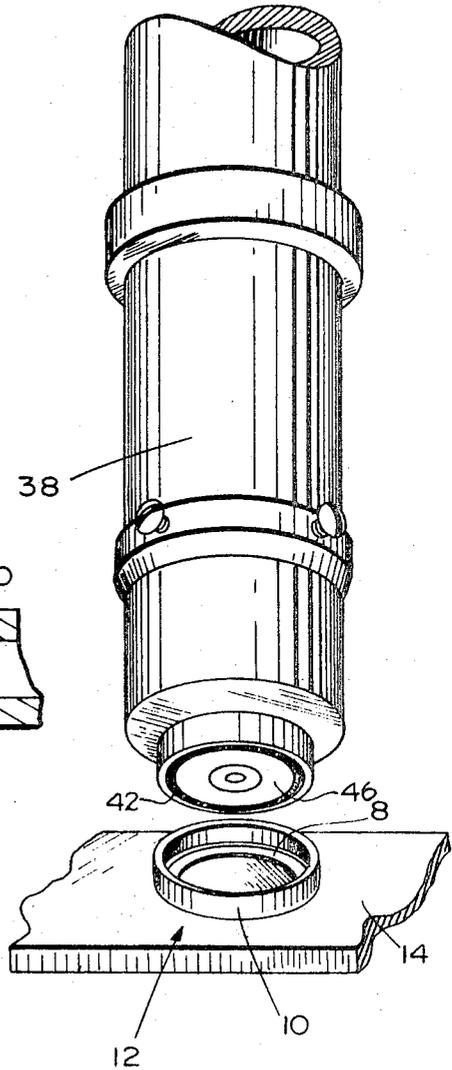


Fig. 2

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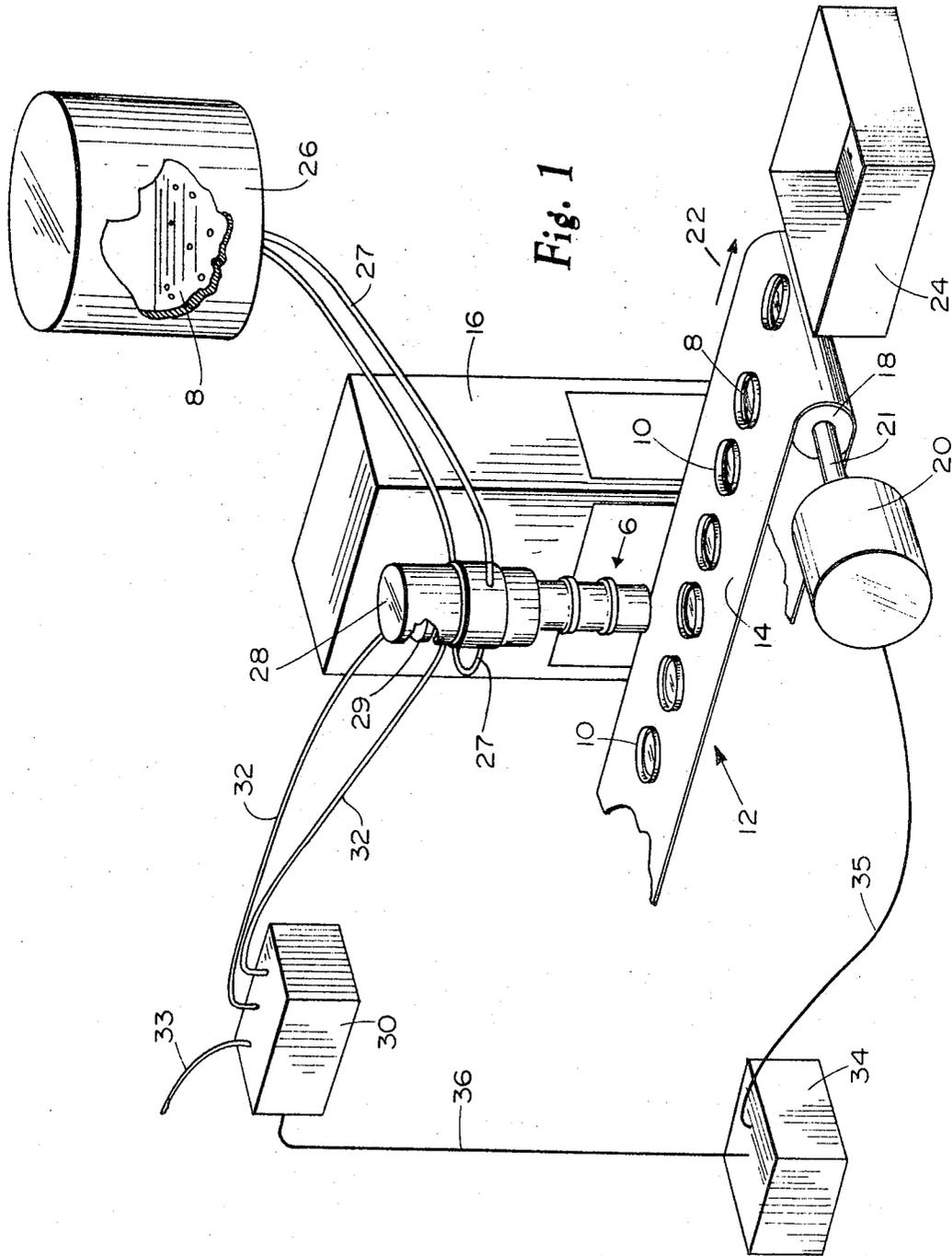


Fig. 1

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APPARATUS FOR APPLYING A SEALING GASKET TO A SURFACE

This is a division of application Ser. No. 177,245 filed Sept. 2, 1971, now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to apparatus and method for applying fluid sealing compositions to a closure and, more particularly, to applying fluid gasket compositions en masse to closures in the desired final configuration.

2. Discussion of the Prior Art

In the food processing and packing industry, it is essential to provide containers with excellent seals in the closure portion to prevent food leakage or spoilage. With the increasing use of container packaging, more convenient and easier access containers came into demand. This increased need in container use and convenience required the development of better sealing compositions for forming gaskets in closures to be used to close or seal the containers. In addition, more rapid placement of gasket-forming compositions in closures became necessary to more effectively meet the demand for containers with excellent sealability.

Several apparatus and methods have been developed to meet the demand for containers with excellent sealability. For example, sealing compositions have been poured into closures and thereafter shaped to form a gasket by use of a hot or cold punch; sealing compositions have been poured into closures while the closures are being rotated under the pouring nozzle to create a circular gasket; and sealing compositions have been poured in the center of a closure being rotated at high speed to form the gasket on the outer perimeters of the closure. Inherent in the use of the above methods and apparatus are certain variables that can lend themselves to create deficiencies in the gasket so formed, e.g., gaskets can be of nonuniform size, shape or thickness, gaskets can be situated inappropriately in the closure, and the application of the sealing composition can be slower with the increased number of steps previously necessary in the gasket formation.

In high-line speed operations, it becomes increasingly important to reduce as much as possible the variables that can affect line-speed operations as well as the resulting gaskets' efficiency. It is essential to excellent gasket formation to provide uniformity of thickness, size and shape as well as placing the gaskets appropriately within the closure.

SUMMARY OF THE INVENTION

This invention provides apparatus and methods for highspeed application of a sealing composition en masse to a closure in the desired final configuration. In so doing, the sealing composition is placed within the closure in controlled amounts providing uniformity of shape, size and thickness as well as providing accurate positioning of the gasket in the closure.

It is therefore an object of this invention to provide an improved apparatus for applying a fluid sealing composition to a closure.

It is another object of this invention to provide an improved apparatus for applying a fluid sealing composition en masse to a closure in the desired final configuration.

It is a further object of this invention to provide a method for applying a sealing composition en masse to a closure in the desired final configuration.

These and other objects will become apparent upon consideration of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate a complete embodiment of the invention according to the best mode thus far devised for the practical application of the principles thereof in which:

FIG. 1 is a perspective view of the apparatus for applying a fluid sealing composition en masse to a closure;

FIG. 2 is a partial cross-sectional view of the nozzle portion of the apparatus of FIG. 1; and

FIG. 3 is a partial perspective view of the nozzle portion shown in FIG. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in which like numerals are used for like components, nozzle 6 deposits a gasket-forming composition 8 in closures 10, which closures 10 are delivered to a depositing area 12 by a conveyor 14 which can be a conventional endless conveyor and thereafter removed by the same conveyor 14 (or other means as may be desired), the placement of said gasket-forming composition 8 in closures 10 being in timed sequence to the delivery and removal of said closures to the depositing area 12 by the conveyor 14.

As shown in FIG. 1, a conveyor 14 is situated adjacent nozzle support 16 and underneath nozzle 6. The conveyor 14 is connectable at gear 18 with a conventional motor 20 by a connecting shaft 21, the motor 20 providing the power for movement of conveyor 14 in the direction of the arrow 22. As shown, closures 10 are continuously and rapidly sequentially delivered to the depositing area 12 whereupon gasket-forming composition 8 is deposited therein. Once the gasket-forming composition 8 is deposited, closures 10 are sequentially moved along conveyor 14 for further processing, for example, curing (not shown) and handling, for example, by eventual packaging in box 24 as shown.

Nozzle 6 is fastened to nozzle support 16 and extends over conveyor 14, the nozzle 6 and conveyor 14 being used in combination to form depositing area 12 directly under nozzle 6 and on conveyor 14. A gasket-forming composition 8 is supplied under pressure to nozzle 6 from a reservoir 26 through supply lines 27 in conventional manner. The nozzle 6 is activated by fluid pressure for causing movement of piston 29 in the upper portion 28 of nozzle 6 (as shown in FIG. 1 with the housing partially cut away) to control the flow of gasket-forming composition 8 through said nozzle 6 as will hereinafter be explained.

Fluid pressure is controlled by a conventional fluid pressure regulator shown as block 30 which adjusts fluid pressure at said piston 29 through fluid pressure lines 32 connected at opposite sides of the piston for imparting selective motion to the piston, the fluid pressure being supplied through supply line 33.

The delivery and removal of closures 10 along conveyor 14 is in a timed relationship to the depositing of gasket-forming composition 8 in the closures 10 at depositing area 12. The timing can be effected, for example, by a conventional timing device represented as

block 34 which is connected by line 35 to motor 20 for controlling the movement of conveyor 14 and by line 36 to the fluid pressure regulator 30 for controlling the flow of the gasket-forming composition 8 from nozzle 6.

Turning now to FIGS. 2 and 3, it is illustrated that nozzle 6 has an outer housing 38 defining the outer dimensions of nozzle 6. The nozzle at one end has infeed portions 40 (as shown in FIG. 2) to which infeed portions supply lines 27 are connected for supplying the gasket-forming composition 8 to nozzle 6. At the other end of nozzle 6 is an annular orifice 42 through which gasket-forming composition 8 flows to be deposited en masse on closures 10. To form this orifice, housing 38 has an inwardly tapered portion 43 at the discharge end. A base 44 of smaller dimension than the diameter of housing 38 is fixedly attached to one portion of inner wall 45 of housing 38 so that sealing composition may pass thereby from infeed portion 40 to orifice 42. A central cone 46 of small diameter relative to housing 38 is held at one end in base 44 and extends lengthwise within the nozzle 6 to the end of nozzle 6 having orifice 42 and has an outwardly flared portion 47 to combine with inwardly flared portion 43 of housing 38 to define the annular orifice 42. Threaded set screws 48 extend through housing 38 normal to cone 46 and tighten against central cone 46 for adjusting the positioning of central cone 46 within nozzle 6 to provide a dimensionally uniform annular orifice 42. The central cone 46 is provided with an air passage 50 extending from the orifice end of the central cone 46 to and through base 44 and out through housing 38 for preventing air pressure buildup during depositing of the gasket-forming composition 8 to the closures 14.

A plunger 52 is positioned in the sealing composition passage 53 which extends between central cone 46 and housing 38. Plunger 52 has a substantially annular tapering portion 54 the end of which is received within annular orifice 42 so that when the plunger 52 is moved, the annular portion 54 moves into and out of orifice 42 for closing and opening the orifice 42 to control the flow of the gasket-forming composition 8 to the

closures 10. For movement, the plunger 52 is connected by rods 56 to a circular support 58 riding within nozzle 6. The support 58 is connected to rod 60 as by arms 61 so as not to impede the flow of gasket-forming composition 8 in passage 53, and rod 60 is connected to a piston 29 which is activated by fluid pressure to cause the movement of the plunger into and out of the orifice 42.

In operation, closures 10 are continuously delivered to depositing area 12. Also, gasket-forming composition 8 is continuously supplied to nozzle 6. As a closure 10 is delivered to depositing area 12, plunger 52 is moved by fluid pressure applied to the piston 29 causing the piston to pull the plunger out of orifice 42 causing gasket-forming composition 8 to be deposited all at once in the desired final configuration on the closure 10 (shown in FIG. 1 to be a ring-shaped gasket at the periphery of the closure), after which the orifice 42 is closed by movement of plunger 52 into the orifice 42. Thereafter, closure 10 is moved away from depositing area 12 for further handling.

Modifications and variations of the above described invention will become apparent to those skilled in the art but this invention is inclusive of the modifications and variations and is not further limited except as may be required by the claims.

What is claimed is:

1. An apparatus for applying a fluid gasket composition to a closure, comprising: a housing, a central cone situated within said housing, said central cone having an air passage therethrough, said housing and said central cone defining an annular orifice at the lower portion of said cone, a plunger interposed between said housing and said central cone, means connected to said housing for actuating the plunger within said housing, said plunger having an annular tapering portion to accommodate and close off said annular orifice.

2. An apparatus as recited in claim 1 wherein the housing is provided with screw means extending through said housing normal to said cone for adjusting the central cone within said housing.

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