

[54] **AIR POWERED SEALANT DISPENSER,  
INCLUDING FLEXIBLE TUBULAR  
CONDUITS AS VALVE MEANS**

[75] Inventor: **John E. Laird**, Inglewood, Calif.

[73] Assignee: **Products Research & Chemical  
Corporation**, Burbank, Calif.

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[51] Int. Cl. .... **E04f 21/30**

[58] Field of Search ..... **222/389, 334, 325-327,  
222/386, 1, 556**

[56]

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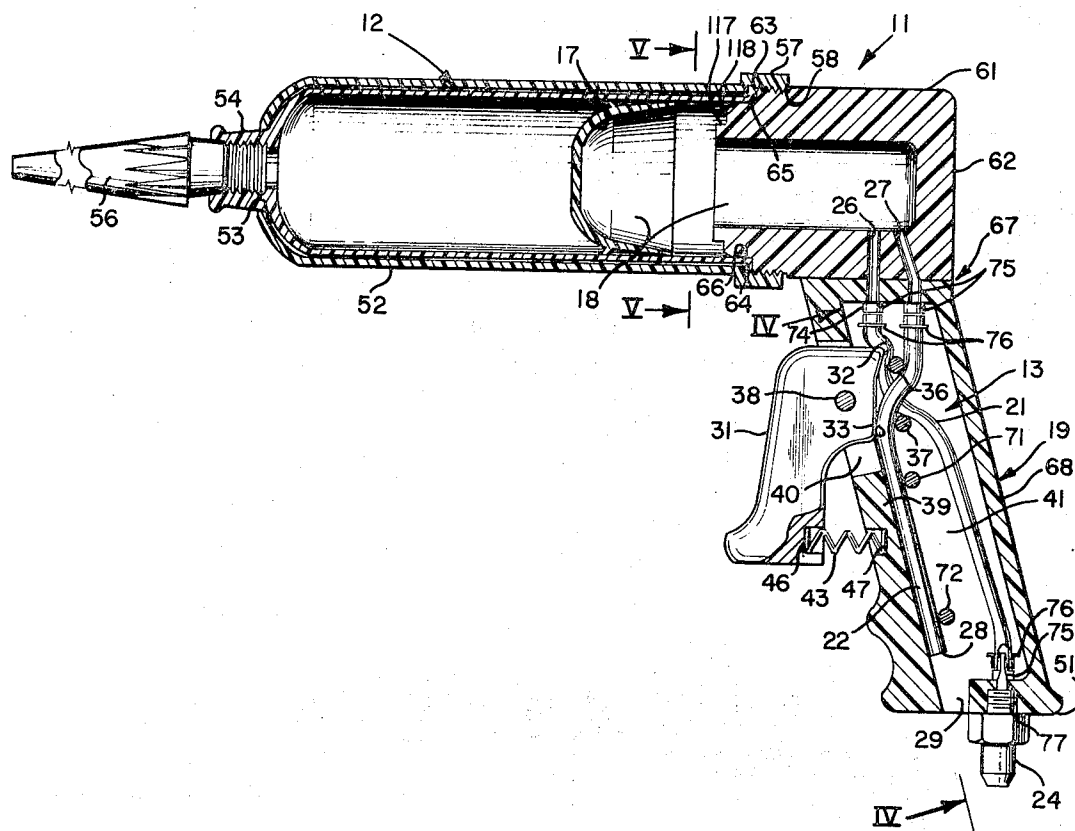
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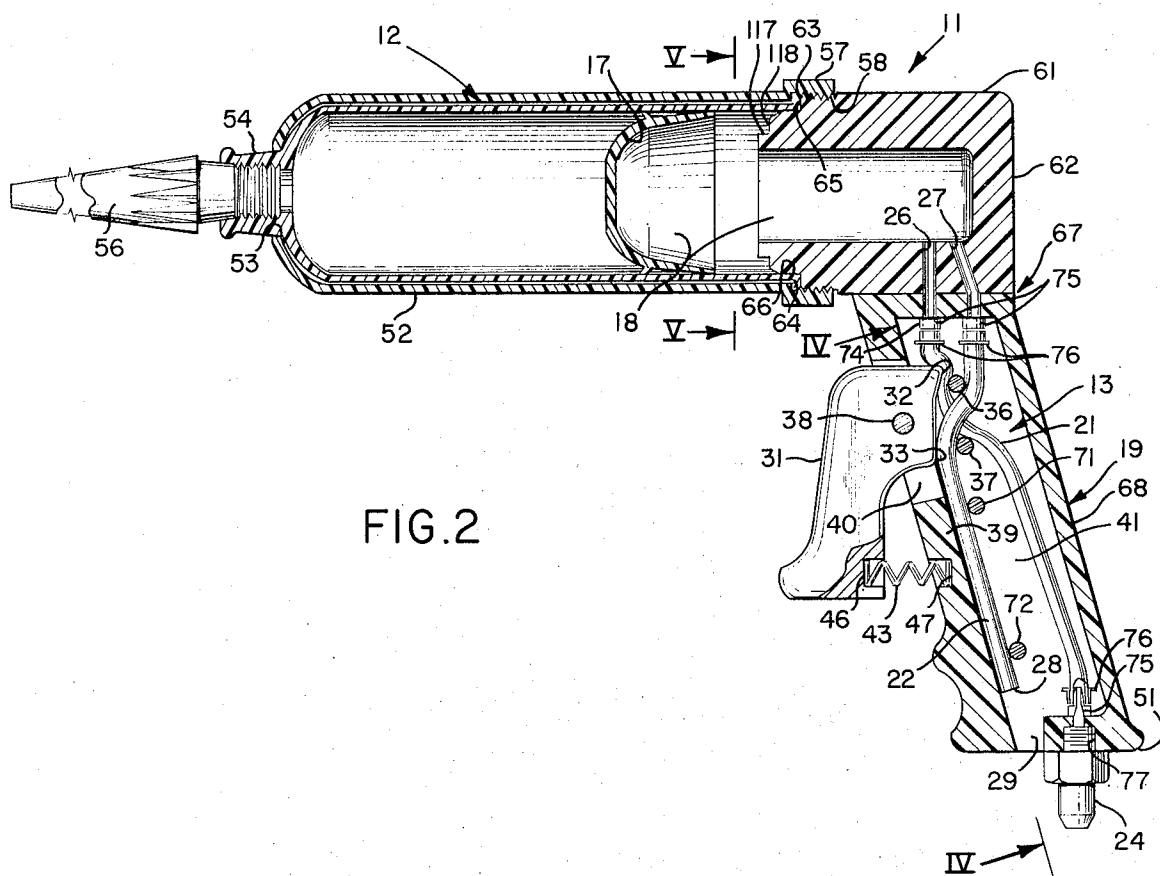
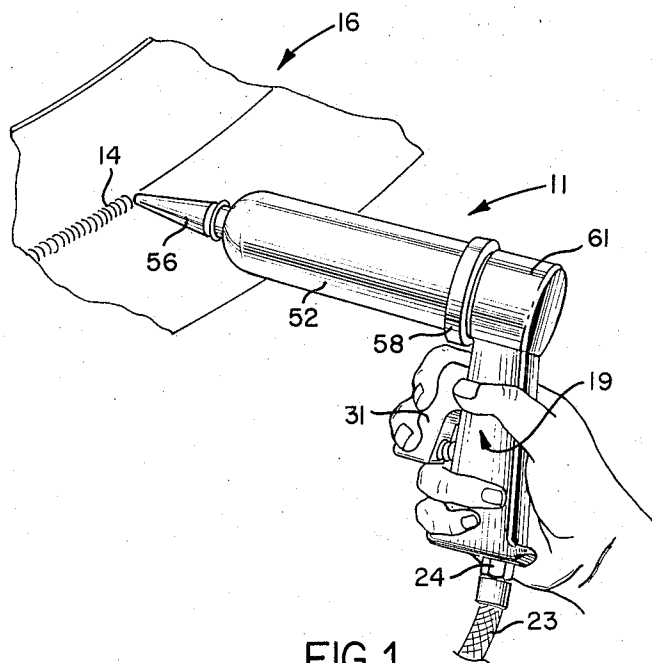
*Primary Examiner*—Stanley H. Tollberg  
*Assistant Examiner*—James M. Slattery  
*Attorney, Agent, or Firm*—Miketta, Glenn, Poms & Smith

#### [57] ABSTRACT

In an air powered gun dispenser for controlled discharge of a flowable sealant material, the dispenser is provided with universal adapters to receive and support various size cylindrical cartridges of the sealant material. These cartridges are of the type having one end formed with a discharge nozzle while the other end is equipped with a dispensing plunger. A supply of pressurized air is received by the dispenser and selectively applied against the cartridge plunger to effect a discharge of the sealant material. To provide manual control over the applied air pressure, a flexible air inlet conduit is arranged to connect the supply of pressurized air to a dispenser chamber communicating with the cartridge plunger. A flexible air exhaust conduit also communicates with such chamber. A manually operable and spring biased trigger actuator provides for selectively discharging or terminating discharge of the sealant material by alternately pinching and thus closing either the inlet or exhaust conduits.

**14 Claims, 8 Drawing Figures**





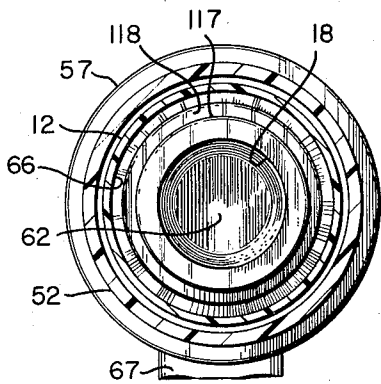


FIG. 5

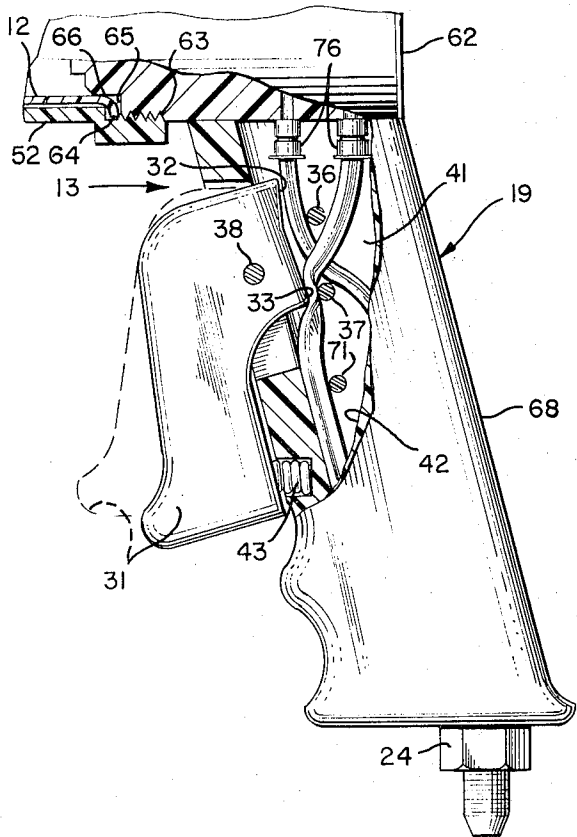


FIG. 3

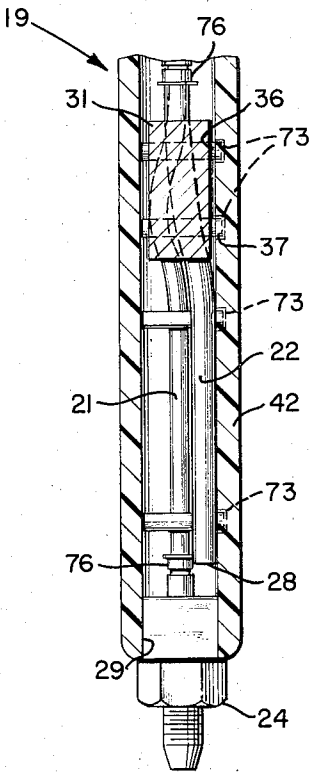


FIG. 4

SHEET 3 OF 3

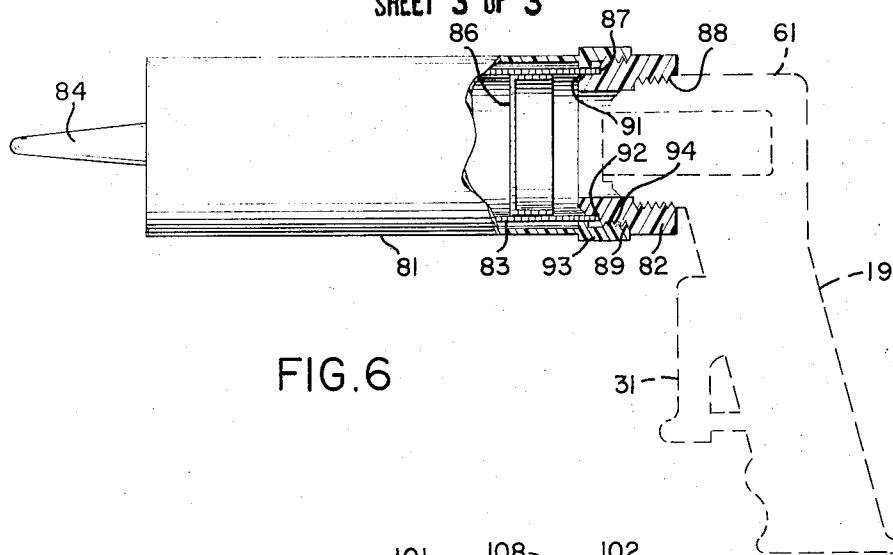


FIG. 6

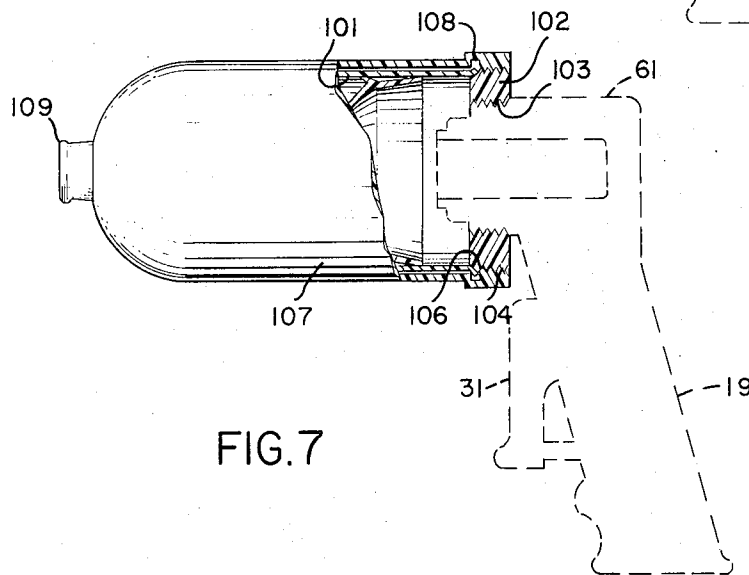


FIG. 7

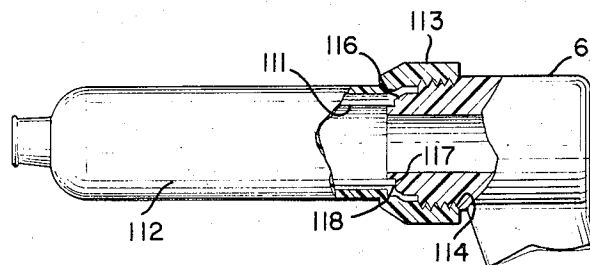


FIG. 8

# AIR POWERED SEALANT DISPENSER, INCLUDING FLEXIBLE TUBULAR CONDUITS AS VALVE MEANS

## BACKGROUND

In general, the present invention relates to material dispensing devices and apparatus and more particularly to an air powered dispenser for controlled discharge of flowable sealant materials such as caulking compounds, glazes, plastics, putty, and other paste-like or semi-solid materials.

The use of sealant cartridges and dispenser guns therefor is a convenient and economical way to store flowable sealant material until needed and to facilitate the dispensing and application thereof. Typically, the cartridges containing the sealant material are formed of a plastic, paper or other low pressure resistant substance. Generally, a cylindrical configuration is employed in which one of the cartridge ends is formed with a discharge nozzle or nozzle receiving opening while the other end is equipped with a piston or dispensing plunger moveable with respect to the inside diameter of the cartridge.

Although some dispensers are provided with a mechanical ratchet drive for displacing the cartridge piston to dispense the material, other dispensers are operated by air pressure. Because the air powered devices are easier to use and control and permit a faster application of the sealant material, they are preferred over the mechanical type for many jobs, especially for large scale construction and industrial projects and projects requiring careful workmanship.

In an air powered dispenser, the cartridges are normally sealed by an end closure engaging a marginal edge or end of the cartridge adjacent its plunger and sealing it with respect to an air drive chamber formed in the dispenser body. Into this chamber high pressure air is introduced for acting against the plunger and forcing the dispensable material out of the discharge or nozzle end. Such dispensers may be provided with a hand or pistol grip structure and equipped with an actuator or trigger for selectively directing the supply of pressurized air to the driving chamber.

An air powered dispensing device and a cartridge suitable for use therein are respectively illustrated in U.S. Pat. Nos. 2,838,210 and 3,367,545. Devices such as these have been found very valuable in reducing the time and improving the quality of workmanship in the application of sealant materials particularly for industrial projects.

Notwithstanding the success of existing dispensers of this type, it is desirable to provide a lower cost air powered dispenser in which the air control mechanism or means is substantially simplified. With this in mind, it is one object of the present invention to provide a dispenser which may be manufactured on a large volume scale at a lower per unit cost and which nevertheless results in a reliable, rugged, long lasting device.

It is a further object of the present invention to provide such a dispenser in which the valving mechanism for applying pressurized air to the drivable plunger of the cartridge is inherently free of the type of fittings, connections and valve mechanisms which have in the past resulted in the leakage of air between the air supply and the cartridge drive piston.

Another shortcoming of existing dispensing devices lies in their inability to accommodate different sizes and types of sealant cartridges. It is typical to have a different dispensing gun for each of several sizes of commercially available cartridges. The size of the cartridge may vary substantially depending upon the type of sealant material carried therein and the quantity required for completing each particular project or job. For industrial applications, the cartridge may be of a relatively expensive plastic variety for containing special and relatively expensive sealant compounds. On the other hand, for general caulking applications, the cartridge may be of the more usual paper container type typically having quantities of 1/10 gallon or one quart. Although some existing dispensers accommodate cartridges of different length, and in this respect of different volume capacity, for the most part available dispenser guns are capable of receiving only a particular size and type of cartridge.

It is accordingly another object of the present invention to provide such a lower cost air powered dispenser in which cartridges varying not only in length but also in diameter and cartridges varying in type, such as the more expensive plastic versus the less costly paper cartridges, may be dispensed by a single universal air powered gun.

## SUMMARY

Briefly, these objects are achieved by a dispenser constructed in accordance with the present invention to provide an improved manually operable fluid control means for selectively applying and exhausting the pressurized air with respect to the drivable piston or plunger of the cartridge. The air control means includes a flexible fluid inlet conduit communicating the pressurized air with an air-drive chamber of the dispenser and a flexible air exhaust conduit communicating between such chamber and ambient air. A manually operable actuator means, which may be in the form of a finger operated trigger member, provides for selectively collapsing either the intake or exhaust conduits depending upon the desired operation of the dispenser. For discharging the flowable material, the actuator means is moved from a position in which the inlet conduit is collapsed and thus closed and in which the exhaust conduit is uncollapsed and thus open to a position in which the inlet conduit is uncollapsed and open and the exhaust conduit is collapsed and thereby closed.

This operation allows the supply air to enter the drive chamber and displace the cartridge piston. The exhaust conduit is blocked to prevent the higher pressure air entering the inlet conduit from escaping to atmosphere. To terminate the discharge of flowable material from the cartridge, the actuator means is moved to a position in which the inlet conduit is collapsed and closed and the exhaust conduit is uncollapsed and open. This permits the pressurized air within the drive chamber to bleed or vent through the exhaust conduit to atmospheric pressure causing an immediate relaxation of the drive pressure against the cartridge piston and the abrupt termination of discharge. The actuator means or trigger member may be biased in the position described immediately above which may be termed the normal or "off" condition of the dispenser.

The air control means may be provided in a handle or pistol grip structure having an upper socket-like

head open at one end and defining the air-drive chamber therein. External threads may be provided adjacent the open end for receiving and securing a threaded end of a hollow barrel-like retainer for the cartridge. Depending upon the size and type of cartridge, adapters are provided for adjusting the threaded end of the head-like socket to accommodate different diameter cartridges and barrel shaped cartridge retainers.

These and further objects and various advantages of the improved air control means for a sealant dispensing gun according to the present invention will become apparent to those skilled in the art from a consideration of the following detailed description of a particular and exemplary embodiment of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Reference will be made to the appended sheets of drawings in which:

FIG. 1 is a perspective view of a dispenser constructed according to the embodiment of the invention herein, for applying a flowable sealant material to a lap-joint of a work piece.

FIG. 2 is a longitudinal, substantially central, sectional view of the dispenser of FIG. 1, with certain components thereof being illustrated in elevation.

FIG. 3 is a partial sectional view similar to FIG. 2 illustrating the actuator means of the present dispenser in a different mode.

FIG. 4 is a partial sectional view of FIG. 2 taken generally along the section lines for IV—IV therein.

FIG. 5 is a transverse sectional view of the dispenser shown in FIG. 2 and taken along the lines of V—V therein.

FIGS. 6, 7 and 8 are longitudinal sectional views similar to FIG. 2 illustrating different size cartridges and barrel retainers therefor connected to a universal dispenser head or socket, shown in phantom, by threaded adapter rings.

#### DISCLOSURE

With reference to FIGS. 1 and 2 of the drawings, the exemplary embodiment of the present invention generally comprises an air powered hand held dispenser 11 for receiving and holding a cylindrical cartridge 12 of flowable sealant material in which an improved manually operable fluid-pressure control means, indicated at 13, provides for selectively discharging the sealant material as at 14 for application to a work piece 16.

The manually operable fluid control means 13 serves to controllably apply a drive fluid, such as air, at a superatmospheric pressure to a drivable portion of cartridge 12. In this instance, the drivable portion of the cartridge is provided by a piston or moveable dispensing plunger 17 communicating with a drive chamber 18 formed in the dispenser.

Control means 13 is in this instance mounted within a pistol or handle grip structure 19 of dispenser 11 and includes a flexible fluid inlet conduit 21 and a similarly flexible fluid exhaust conduit 22. Inlet conduit 21 serves to connect or communicate a supply of pressurized air available via a hose 23, detachably connected to a connector 24, to pressurizable drive chamber 18 of the dispenser. Conduit 21 communicates with chamber 18 at an inlet passageway 26. Also connected to chamber 18 is exhaust conduit 22 which communicates with the chamber at an exhaust outlet 27. The other end of exhaust conduit 22 is vented to atmospheric air

at an open end 28 communicating directly with ambient air through an opening 29 at the butt end of handle grip structure 19.

Control means 13 further includes an actuator means for selectively pinching or collapsing one or the other of the flexible inlet and exhaust conduits 21 and 22. The actuator means is manually operable and may be provided as in the case of the present embodiment by a trigger member 31 having spaced apart clamping portions 32 and 33. Abutment means are provided in association with clamping portions 32 and 33 and the inlet and exhaust conduits are arranged between the abutment means and the clamping portions of trigger member 31 such that the conduits may be alternately collapsed and uncollapsed by movement of member 31.

In this embodiment the abutment means are provided by spaced transverse pins 36 and 37 associated respectively with clamping portions 32 and 33. Inlet conduit 21 is dressed between clamping portion 32 of the trigger member and the abutment means formed by pin 36, while exhaust conduit 22 is dressed between clamping portion 33 and abutment means pin 37.

Moreover, trigger member 31 is pivotally mounted for limited relative rotation between a first position illustrated by FIG. 2 in which inlet conduit 21 is collapsed between the clamping portion 32 and pin 36, and a second position shown in FIG. 3 in which exhaust conduit 22 is collapsed between clamping portion 33 and pin 37. In other words, the actuator means may be provided as in this case by a member 31 having hammer-like portions selectively and mutually exclusively collapsing the respective conduits against anvil-like abutments.

In this embodiment, trigger member 31 forms a manual finger operated trigger of pistol or handle grip structure 19, and is pivotally mounted about a transverse pin 38 carried by a front wall 39 of structure 19. Wall 39 is formed with recesses, such as recess 40, for receiving trigger member 31. Pins 36 and 37 here providing the abutment means extend transversely between side walls 41 and 42 of the pistol grip structure as best shown in FIG. 4.

The air pressure control means may be further provided with means for biasing the actuator means to a normal "off" position in which the inlet conduit is fully collapsed and thus closed and the exhaust conduit is uncollapsed and thus open. This is the first position of trigger member 31 as shown in FIG. 2 and is illustrated therein, the biasing means may be provided by a coiled compression spring 43 having opposite ends nested and secured within opposed recesses 46 and 47 formed in trigger member 31 and wall 39 of structure 19. Spring 43 thus functions to force the lower end of trigger member 31 outwardly from grip structure 19 causing member 31 to pivot to its first position with clamping portion 32 collapsing inlet conduit 21 against the abutment means provided by pin 36.

It has been found that conduits 21 and 22 may be provided by a relatively high pressure resistant plastic tubing, such as a polyurethane tubing capable of handling a pressure in excess of 100 PSI. A normal operating pressure for the dispenser may be in the range of 90 PSI. A suitable tubing for the conduits is available as a reinforced polyurethane high pressure tubing.

The inlet conduit 21 should not only have sufficient strength to resist the applied pressure, but it also should have a sufficient flexibility to permit complete collapse

ing and closing under the pinching force applied by trigger member 31. For this purpose, an inlet conduit of the above material having an inside diameter of 1/16 inch and an outside diameter of 1/8 inch has been found suitable. On the other hand, it has been found preferable to provide a larger inside diameter tubing for exhaust conduit 22 to permit rapid venting of the pressurized chamber. If the drive chamber 18 is exhausted too slowly, the response time between releasing trigger 31 and termination of the discharge may be too slow. For this purpose, an exhaust conduit tubing of a larger size than the inlet tubing may be used, and here a tubing of 1/8 inch inside diameter and 1/4 inch outside diameter is satisfactory.

The pinching force applied by trigger member 31 in collapsing inlet conduit 21 should be sufficient to close conduit 21 and prevent air from leaking therethrough when the gun is in the "off" condition. Here the pinching force may be provided by a spring 43 having approximately a 9 pound force and with a lever advantage of approximately six to one between the point of application of the spring force to member 31 and the clamping point of portion 32. A similar force and lever advantage applies to the closing of exhaust conduit 22, however, the trigger force in this instance is applied by the operator's finger. The foregoing leverage parameters may be provided by a trigger member 31 having a length of approximately 1 1/2 inches between pivot pin 38 and the point of application of force by spring 43, and approximately 1/8 to 3/8 inch spacing between pivot pin 38 and the abutment pins 36 and 37.

In moving trigger member 31 between its biased "off" position shown in FIG. 2 and an actuated "on" position illustrated by FIG. 3, it is possible to create a throttling effect by moving member 31 to an intermediate position of rotation. In particular, by an initial depression of member 31 to an intermediate position of rotation, the inlet conduit 21 is partially opened to allow some higher pressure air to enter chamber 18, while conduit 21 is only partially blocked so as to allow the escape of some of the higher pressure air entering chamber 18. This may be utilized to achieve a gradual application of drive pressure to plunger 17 and a controllable discharge of the flowable material from the dispenser. Once the flow is started, the trigger member can be depressed fully, causing inlet conduit 21 to be completely open and exhaust conduit 22 completely closed. This results in a maximum rate of discharge.

It is an important capability of air operated dispensers that they respond rapidly to the manual control to permit the abrupt termination of material discharge. In the present fluid pressure control means, this is achieved by releasing trigger 31 so as to close off the inlet conduit 21 by permitting trigger member 31 to be returned to its first position by the force of the biasing spring 43. Simultaneously, exhaust conduit 22 is released from its deformed collapsed condition to allow chamber 18 to be exhausted or vented to atmosphere. In the present embodiment, exhaust conduit 22 extends downwardly within grip structure 19 and is held in place by pins 71 and 72 so that its exhaust or venting end 28 is directed outwardly of the butt end of handle structure 19. This directs the blast of exhaust air away from the face of the user.

Alternatively, exhaust conduit 22 may be shortened so as to extend just below abutment pin 37 and trigger portion 33 for venting outwardly through the openings

provided by recesses 40. In such case, retaining pins 71 and 72 may be omitted and the opening 29 at the butt end of grip structure 19 closed.

Also, by positioning conduit 21 so as to extend longitudinally with the elongated pistol grip structure 19, the supply hose 23 may be fastened to a convenient location on the dispenser, namely the butt end 51 of handle grip structure 19. Hose 23 thus extends downwardly from butt end 51 out of the way of the user and below the hand holding the dispenser.

The conduits are crisscrossed between spaced apart pins 36 and 37. This disposes the respective conduits in clamping or pinching position between the clamping portions 32 and 33 of member 31 and the abutment means provided by pins 36 and 37. By this arrangement, it is less likely, if not impossible, for the dispenser to malfunction by accidental pinching of the wrong conduit between the clamping portions and abutments.

For receiving and retaining cartridge 12, dispenser 11 is provided with a cartridge holder means in the form of a cylindrical barrel-like retainer 52 having an inside diameter just slightly larger than the outside diameter of the cartridge. At the forward working end of dispenser 11, retainer 52 has a shape conforming to that of cartridge 12, and is formed with a nozzle receiving opening 53 through which a nozzle fitting 54 of cartridge 12 may protrude. Fitting 54 of cartridge 12 may threadedly receive a discharge nozzle 56 as illustrated. Cartridge 12 and its associated nozzle 56 are generally of the type disclosed in aforementioned U.S. Pat. Nos. 2,838,210 and 3,367,545.

Opposite the forward working end of retainer 52, it is provided with a flanged portion 57 having interior circumferentially extending threads 58. To cooperatively and threadedly receive retainer 52, the dispenser is provided with a hollow cylindrical head or socket portion 61 mounted at an uppermost end of pistol grip structure 19 with the axis of head 61 extending approximately at right angles with the longitudinal axis of structure 19. The hollow interior of head 61 defines chamber 18 which is closed at a rear end by a transverse wall 62. The opposite and forward end of head 61 is open so as to communicate with the interior of cartridge 12 and with dispensing plunger 17.

External circumferentially extending threads 63 are provided at the forward end of head 61 for threadedly receiving the internal threaded end of retainer 52. A seal is automatically formed between an axial end margin 64 of cartridge 12 and a reduced annular margin 66 at a forward end of head 61 upon threadedly securing retainer 52 to head 61 with the cartridge therein. The axial displacement of margin 64 of the cartridge toward head 61 upon threading of retainer 52 forces a radius provided on margin 64 to squeeze against a forwardly facing shoulder 65 adjacent the reduced margin 66 of the head and seal therewith. This completes drive chamber 18 for receiving pressurized fluid such as air and displacing the plunger 17 in the direction of discharge. Thus, retainer 52 and head 61 form a cartridge holder and a drive chamber 18 which is connected at 67 to an uppermost portion of pistol grip structure 19.

In use, retainer 52 is threadedly detached from head 61, and an expended cartridge, if any, is removed therefrom and a new one inserted. Retainer 52 is there-

upon threadedly secured to head 61 and an air hose 23 is attached to fitting 24.

The particular control over the air pressure applied to plunger 17 involves a novel method of dispensing the sealant material. In particular, the method of controlling the air pressure generally comprises conducting the air or other fluid at a relatively high pressure through a flexible conduit, such as conduit 21, into communication with the drivable portion, namely plunger 17, of the cartridge. Also involved is the step of exhausting the pressurized air which is in communication with plunger 17 through another flexible conduit extending to atmosphere. Controlling the flow of air or fluid through these conduits is achieved by the steps of physically collapsing one of the conduits while uncollapsing the other and vice versa to effect alternate modes of discharge and termination of discharge of the flowable material from the cartridge.

The various components and structures of dispenser 11 may be formed of any suitably strong and rugged material. For example, in this embodiment, retainer 52, head 61 and pistol grip structure 19 may all be formed of a rugged molded plastic. Trigger member 31, fitting 24 and, of course, spring 43 may be formed of metal.

With reference to FIG. 4, pistol grip structure 19 may be of a two part molded plastic construction in which a first part includes side wall 41, inner wall 39 and a rear wall 68, while the second part is provided by side wall 42. Abutment pins 36 and 37, together with exhaust conduit guide pins 71 and 72, may be integral with side wall 41 and supported at opposite ends within indentations or recesses 73 formed on the inside surface of side wall 42. This provides adequate support for the plastic pins 36 and 37 which must withstand the transverse shear force applied by clamping portions 32 and 33 of member 31. The two part construction of grip 19 may be secured together by suitable means such as an adhesive, or screw means (not shown).

Head 61 may be formed of a one or two piece molded plastic part and joined to the uppermost end of structure 19 by suitable connecting means, such as a boss or other protrusion (not shown) to which the upper margin of handle structure 19 may be securely clamped and permanently fastened, such as by an adhesive.

For a dispenser in which the pistol grip structure 19 is formed of plastic, integral conduit fittings 74 may be molded as an integral part of the plastic structure. These fittings may be generally of a standard type having a hollow nub 75 formed with one way barbs (not shown) over which the tubular conduits may be forced. Flanged metal ferrules 76 may be provided for slipping over the outside of the tubes into secured coaxial relation with the barbed nubs for providing a reliable air seal and strong mechanical connection of the conduits to the fittings.

Air inlet fitting 24 may be threaded to a bore 77 communicating with the lower inlet conduit fitting 74. Inlet and outlet passageways 26 and 27 are formed in the plastic parts so as to communicate with the respective inlet and exhaust fittings 74 at the upper end of structure 19.

The configuration of barrel-like retainer 52 as illustrated in FIGS. 1 and 2 is suitable for accommodating certain sized cartridges generally of the shape of cartridge 12. However, certain cartridges such as those illustrated in FIGS. 6 through 8 have configurations

which are not compatible with retainer 52; nevertheless, these diversely shaped cartridges are accommodated by specially shaped retainers, each capable of being threadedly connected to the same universal head 61 and pistol grip structure 19 of FIGS. 1 through 5. In particular, FIGS. 6 through 8 illustrate in phantom the principle parts of the dispenser 11 discussed above namely, socket or head 61, pistol grip structure 19 and trigger member 31 in which the air control means is mounted, for receiving the various shaped cartridges and barrel retainers.

For example, FIG. 6 provides a hollow, cylindrical, barrel-like retainer 81 and a threaded adapter ring 82 to modify the gun dispenser for receiving a standard commercial 1/10 gallon paper cartridge 83. Such paper cartridges include a built-in nozzle 84 and a dispensing plunger 86 corresponding to detachable nozzle 56 and plunger 17 of cartridge 12 disclosed and described herein above. These 1/10 gallon cartridges have a diameter slightly larger than that of cartridge 12 for which dispenser 11 is designed. However, by providing adapter ring 82 having internal threads 88 for threadedly mounting ring 82 to the standard external threads of head 61 of the dispensing gun, the dispenser is readily adapted to accommodate the standard 1/10 gallon paper cartridge. Ring 82 in particular is formed with a forwardly extending annular portion defining a reduced circumferentially extending annular margin 91, here tapered, and an adjacent circumferentially extending forwardly facing shoulder 92 for receiving and sealingly engaging margin 87 of the paper cartridge. To cause this sealing engagement, retainer 81 is provided with a circumferentially extending flange 93 having internal threads 94 mated to threads 89 formed on the forward portion of ring 82. Retainer 81 upon threaded attachment to adapter ring 82 causes the paper cartridge to be forced against shoulder 92, deforming margin 87 and causing a seal to form, similar to the forced sealing of cartridge 12 by retainer 52 described above.

In FIG. 7, head 61 of the dispenser gun is adapted to receive a relatively large diameter cartridge 101, and for this purpose a threaded expansion ring 102 is provided. Ring 102 has internal threads 103 mated to the standard external threads of head 61, and is provided with coaxial external threads 104 for receiving an internally threaded flange portion 106 of large diameter retainer 107. Expander ring 102 may be formed similarly to the forward end of head 61 for receiving and sealingly engaging an end margin 108 of cartridge 101. In this instance, cartridge 101 is of the same type as cartridge 12 shown in FIG. 2, although of different diameter, and as such is provided with a threaded nozzle receiving fitting 109 at the forward end.

FIG. 8 illustrates an embodiment of the invention in which a smaller diameter cartridge is accommodated, by providing a retainer formed with an expanded flanged end for threadedly engaging the external threads of standard head 61. Thus, a relatively small cartridge 111, which might be used for small capacity storage of a relatively expensive sealant or other flowable material, is carried within a mated retainer 112 which for the most part is shaped similarly to retainers 52 and 107. However, the nonworking end of cartridge 112 is provided with an enlarged diameter hollow, cylindrical or flange portion 113 having internal threads 114 mated to the external threads of head 61. To provide for the sealing of an end margin 116 of the smaller

diameter cartridge 111, head 61 as shown in FIG. 8, and also as shown in FIGS. 2 and 5, is provided with a circumferentially extending annular margin 117, and an adjacent circumferentially extending and forwardly facing shoulder 118 for receiving and sealing with end margin 116 of the cartridge in a manner similar to the seating and sealing engagement of end margin 64 of the larger diameter cartridge 12 against annular margin 66 and shoulder 65.

While only a particular and preferred embodiment of the present invention has been disclosed herein, it will be readily apparent to persons skilled in the art that numerous changes and modifications may be made thereto without departing from the spirit of the invention. Accordingly, the foregoing disclosure and description thereof are for illustrative purposes only and do not in any way limit the invention which is defined only by the following claims.

I claim:

1. In a dispenser for receiving and holding a cartridge of flowable material and for discharging such material by selectively applying a pressure-fluid to a drivable portion of such cartridge, the improvement comprising: manually operable fluid pressure control means for selectively applying said pressure-fluid having a flexible tubular fluid inlet conduit adapted to receive a supply of relatively high pressure-fluid and a flexible tubular fluid exhaust conduit, said conduits communicating with the drivable portion of said cartridge, and actuator means for selectively collapsing one of said conduits to restrict the flow of fluid therethrough while concurrently uncollapsing the other said conduit to allow flow of fluid therethrough and vice versa, whereby said drivable portion of the cartridge may be selectively pressurized to discharge the flowable material from said cartridge or vented to terminate said discharge.

2. In the dispenser of claim 1, said manually operable fluid pressure control means further comprising spring biasing means for continuously urging said actuator means to a position in which said fluid intake conduit is fully collapsed and said exhaust conduit is uncollapsed to respectively block and pass the flow of fluid therethrough.

3. In the dispenser of claim 1, said actuator means of said manually operable control means comprising: a pivotally mounted member having first and second positions of limited relative rotation, abutment means disposed in proximate relation to said pivotally mounted member, and said flexible conduits arranged between said abutment means and said member such that said inlet conduit is collapsed between said abutment means and said member in its first position and uncollapsed in its second position and said exhaust conduit is collapsed between said abutment means and said member in its second position of rotation and uncollapsed in its first position.

4. In the dispenser of claim 3, said actuator means being further defined by said pivotally mounted member having positions intermediate said first and second positions of rotation in which said inlet and exhaust conduits are partially collapsed so as to afford limited inlet flow of pressure fluid to the drivable portion of said cartridge and limited venting of fluid therefrom.

5. In the dispenser of claim 3, said actuator means further comprising:  
spring biasing means continuously urging said pivotally mounted member to its first position of rota-

tion, such that said actuator means is biased to a normal off condition in which said inlet conduit is closed and said exhaust conduit is open.

6. In the dispenser of claim 1, wherein said cartridge is received within and supported by a cartridge holder and a pistol grip structure is provided connected to said cartridge holder for convenient manipulation of the dispenser, said actuator means comprising:

a finger operated trigger member pivotally mounted on said pistol grip structure for controlled movement between first and second positions of relative rotation, abutment means disposed on said pistol grip structure proximate to said trigger member, and said flexible conduits being arranged between said abutment means and said trigger member such that said inlet conduit is collapsed between said abutment means and said trigger member in its first position of rotation and uncollapsed in its second position, and said exhaust conduit is collapsed between said abutment and said trigger member in its second position of rotation and uncollapsed in its first position.

7. In the dispenser of claim 6, said abutment means comprising an inlet conduit abutment and an exhaust conduit abutment disposed on said grip structure at spaced apart locations, and said inlet and exhaust conduits arranged in crisscrossed relationship with respect to said abutments so that said conduits pass only between their associated abutments respectively and said trigger member.

8. A dispenser for flowable material contained within a cartridge of the type having a fluid drivable portion at one end for forced discharge of the material out of the other end, comprising:

cartridge holder means for receiving and supporting such a cartridge and having a fluid drive chamber adapted for sealed communication with said fluid drivable portion of said cartridge; and

manually operable fluid pressure control means connected to said cartridge holder means and having a flexible tubular fluid inlet conduit and a flexible tubular fluid exhaust conduit communicating with said pressure drive chamber, and actuator means for selectively collapsing one of said conduits while concurrently uncollapsing the other said conduit and vice versa.

9. The dispenser of claim 8, comprising,

a pistol grip structure connected to said cartridge holding means for convenient manipulation of the dispenser, said inlet and exhaust conduits extending upwardly from a butt end of said pistol grip structure into communication with said pressure drive chamber of said holder means, said actuator means comprising a trigger member pivotally mounted to said pistol grip structure and abutment means against which said inlet and exhaust conduits are selectively collapsed by movement of said trigger member between first and second positions of limited relative rotation.

10. The dispenser of claim 8, said manually operable control means comprising spring biasing means continuously urging said actuator means to a disposition in which said inlet conduit is fully collapsed and said exhaust conduit is substantially uncollapsed.

11. In a method of dispensing a flowable sealant material from a cartridge containing such material including the steps of alternately applying a fluid pressure to

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a drivable portion of the cartridge for ejecting the material and exhausting such pressure fluid to atmosphere to terminate said ejection, the improvement in the steps of applying and exhausting the pressure fluid comprising;

conducting pressure fluid at a relatively high pressure through a flexible tubular conduit into communication with the fluid drivable portion of the cartridge,

exhausting the pressure fluid communicating with the drivable portion of the cartridge through a flexible tubular conduit to atmosphere, and

selectively controlling the flow of fluid through said tubular conduits by physically collapsing one of said tubular conduits while uncollapsing the other and vice versa to achieve the alternate modes of discharge and termination of the flowable material from said cartridge.

12. The dispenser of claim 8, wherein said cartridge holder means comprises;

a hollow generally cylindrical head portion having an open end communicating with said cartridge plunger and a closed end, said head portion being formed with external threads adjacent its open end;

a plurality of adapter rings having both internal and external threads for optionally threadedly securing any selected one of said retainers to said external

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threads on said head portion, thereby adapting a single universal head portion of the dispenser for receiving a plurality of different size and types of cartridges and cartridge retainers.

13. The dispenser of claim 12 further comprising; a generally elongated pistol grip structure having one end connected to said head portion with the axis of said head portion generally at right angles to the longitudinal axis of said structure;

said inlet and exhaust conduits extending upwardly and interiorly of said pistol grip structure from a butt end thereof into communication with said pressure drive chamber defined interiorly of said hollow head portion; and

said actuator means comprising a finger operated trigger member pivotally mounted to said pistol grip structure and abutment means carried by said pistol grip structure against which said inlet and exhaust conduits are selectively collapsed by movement of said trigger member between first and second positions of limited relative rotation.

14. The dispenser of claim 12, wherein said head portion is formed with annular coaxial margins circumferentially extending about its open end for receiving and sealingly engaging with end margins of different size cartridges.

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UNITED STATES PATENT OFFICE  
CERTIFICATE OF CORRECTION

Patent No. 3,813,012

Dated May 28, 1974

Inventor John E. Laird

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 4, line 62 change "he" to - - the - -. Column 6, line 66 change "expanded" to - - expended - -. Column 7, line 22 change "fromed" to - - formed - -. Column 9, line 7 change "sealing" to - - sealed - -. Columns 11 and 12, please correct claim 12 to read as follows:

12. The dispenser of claim 8, wherein said cartridge holder means comprises;

a hollow generally cylindrical head portion having an open end communicating with said cartridge plunger and a closed end, said head portion being formed with external threads adjacent its open end;

two or more generally cylindrical hollow barrel-like retainers of different size for receiving different cartridges, said retainers having one end formed with circumferentially extending internal threads with some of said retainers having internal threads not mated to said external threads of said head portion;

a plurality of adapter rings having both internal and external threads for optionally threadedly securing any selected one of said retainers to said external threads on said head portion, thereby adapting a single universal head portion of the dispenser for receiving a plurality of different size and types of cartridges and cartridge retainers.

Signed and sealed this 8th day of October 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.  
Attesting Officer

C. MARSHALL DANN  
Commissioner of Patents