United States Patent

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[54] **IN-LINE SEALANT DISPENSER**
13 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **222/389,** 222/397, 222/469
[51] **Int. Cl.** **B65d 83/00**
[50] **Field of Search** 222/394, 396, 397, 389, 325, 326, 327, 465, 469, 470, 471, 472, 473, 474

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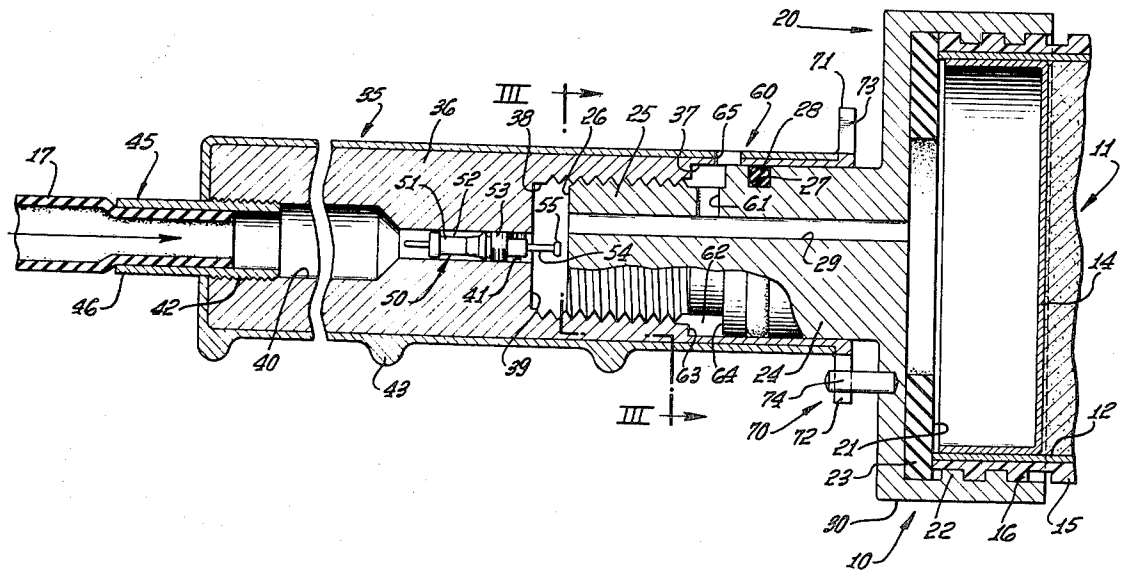
ABSTRACT: An in-line sealant dispenser has a socket member receiving the rear end of a cartridge assembly containing sealant to be selectively dispensed therefrom by air pressure, and a rearwardly extending manually rotatable control handle member threaded onto a coaxial boss on the socket member, axially in line with said cartridge, for axial movement relative to said socket upon rotation relative thereto to open and close a valve in the control handle member to regulate the flow of air from an airhose through said handle and socket member air passages to the rear end of the cartridge assembly to selectively dispense the sealant from the dispenser.



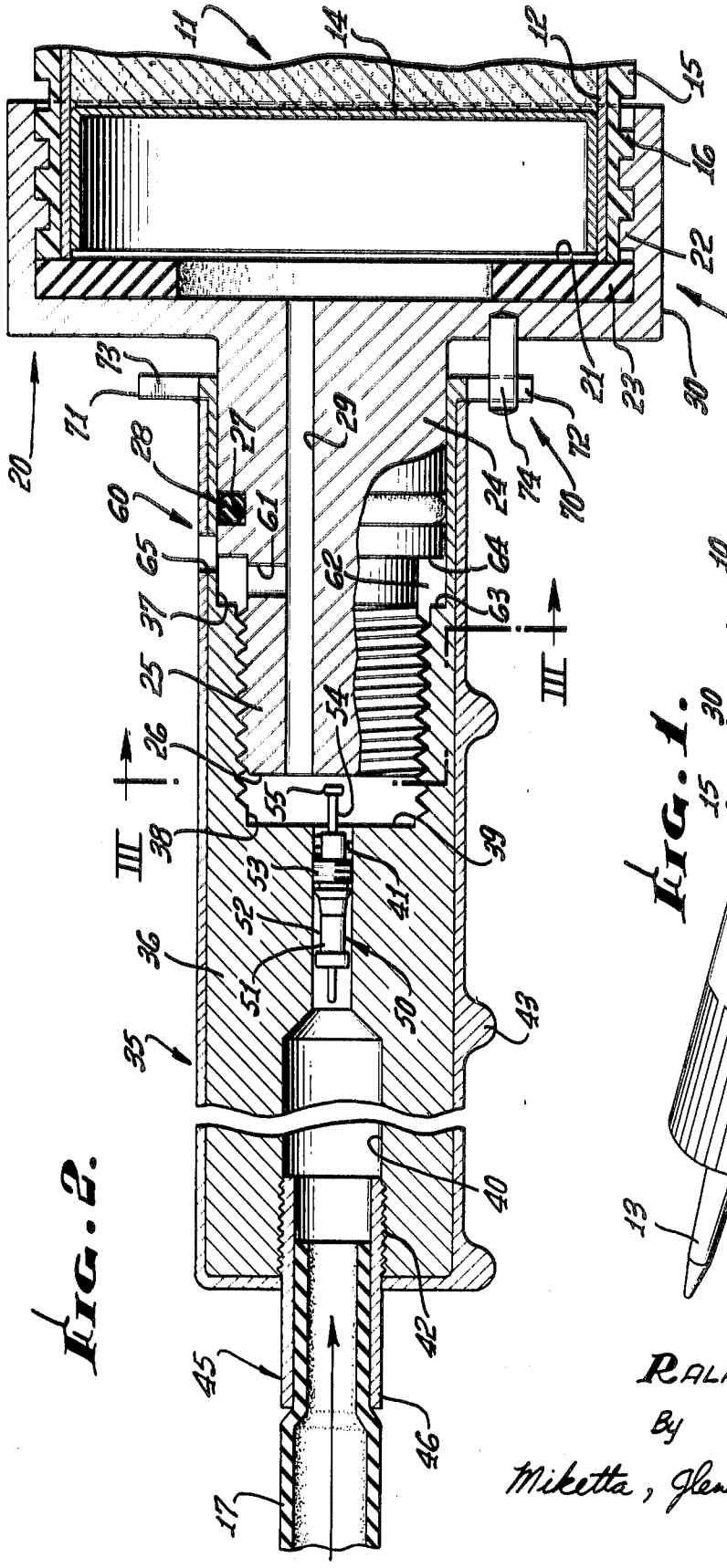


FIG. 2.

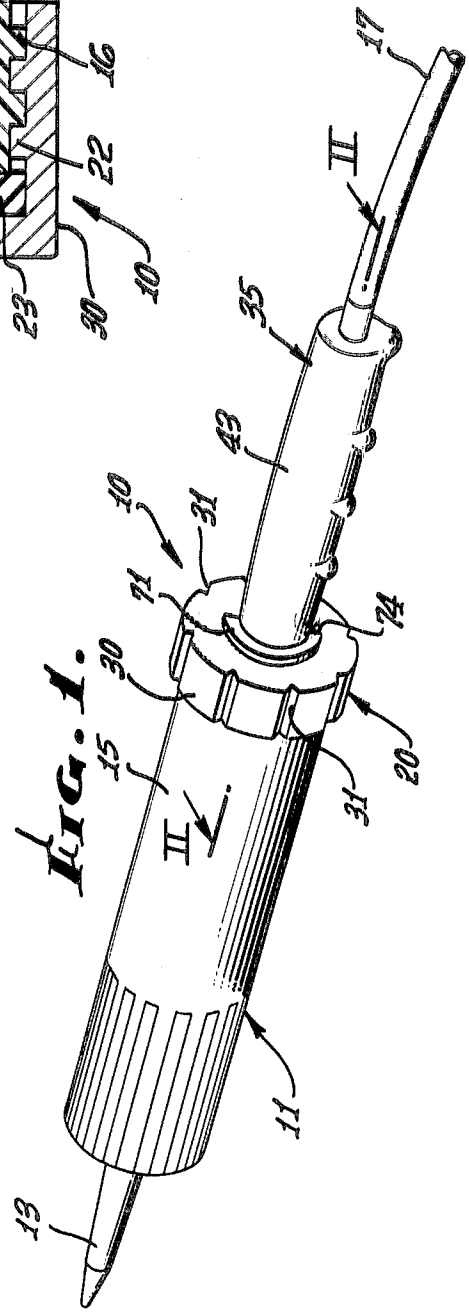


FIG. 1.

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FIG. 3.

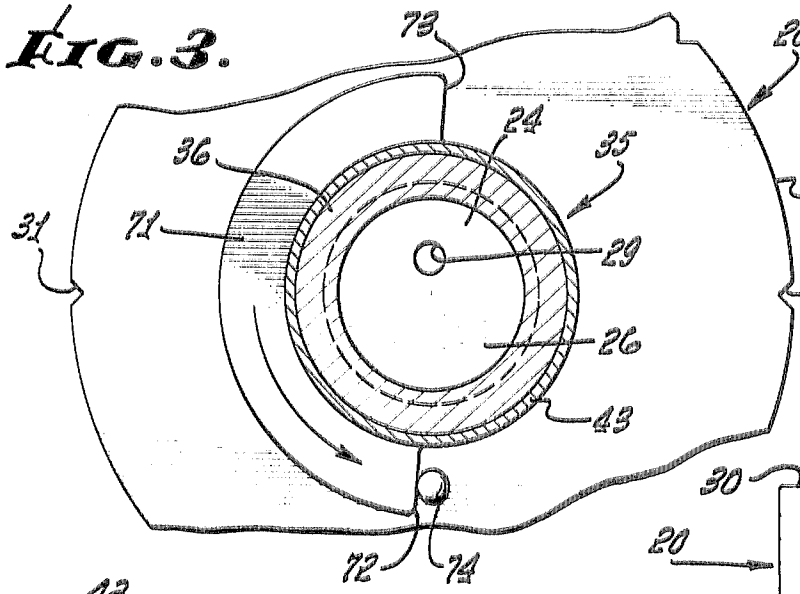


FIG. 4.

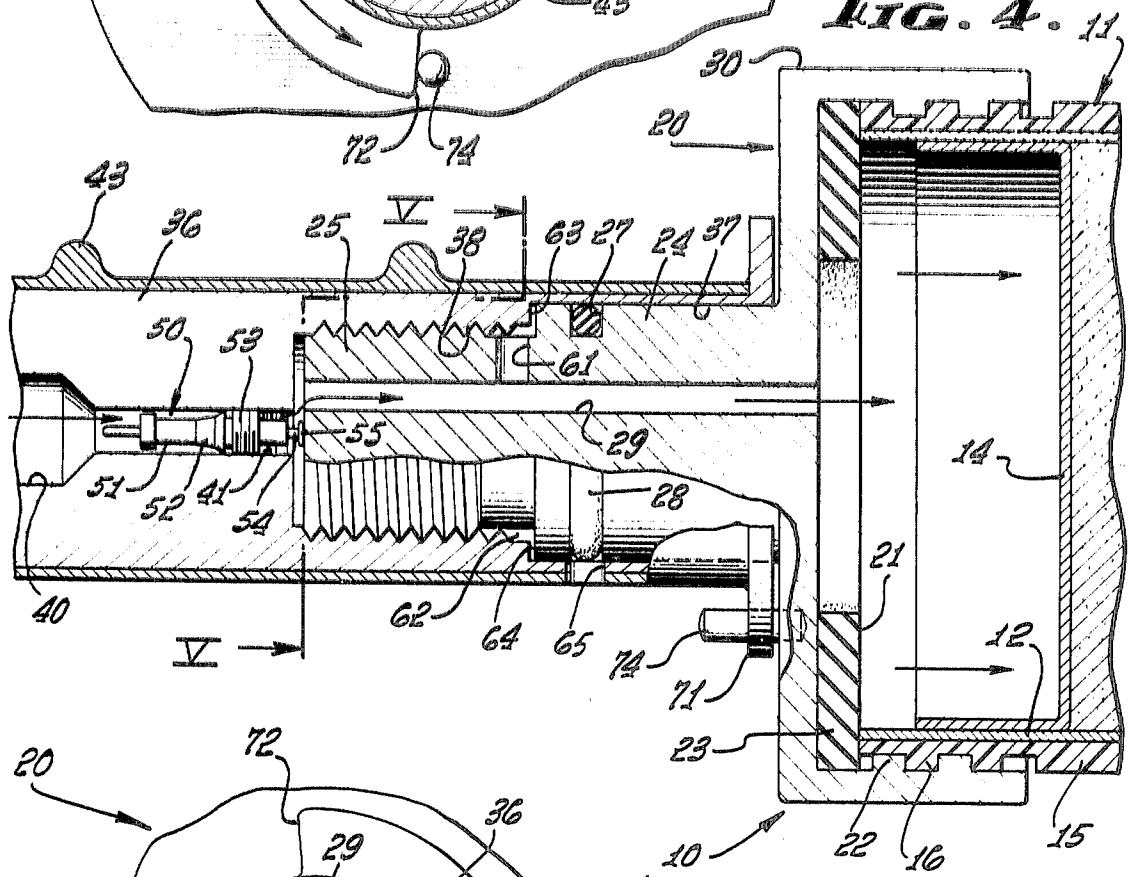
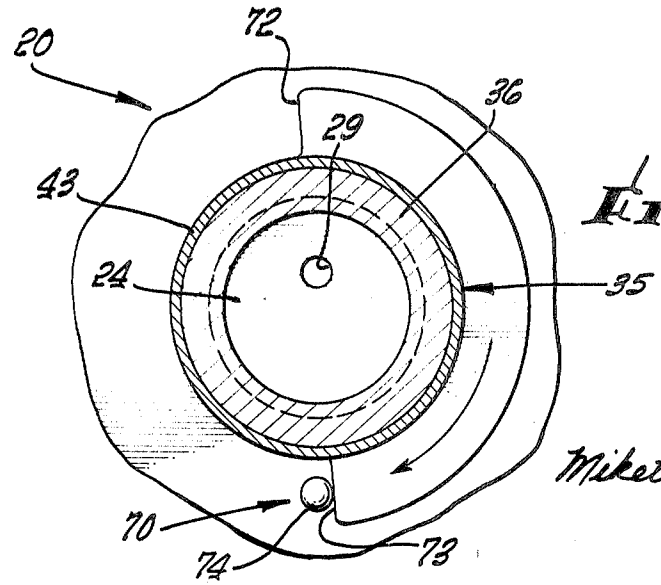


FIG. 5.



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IN-LINE SEALANT DISPENSER

BACKGROUND OF THE INVENTION

This invention relates to sealant dispensers for use with a disposable cartridge and more particularly to such a sealant dispenser with an axially in-line rotatable control handle and air valve assembly for controlling the dispensing of sealant from said cartridge by rotation of said handle.

Sealant-dispensing devices are generally shown by U.S. Patents to Detrie et al. No. 2,838,210 and Schumann et al. No. 3,439,839. These sealant-dispensing devices use a cartridge assembly including a disposable cartridge usually with a plastic or cardboard shell having a dispensing nozzle on the front end thereof and a pistonlike backwall at the rear end thereof. The disposable cartridge is surrounded by a support barrel which mounts in a receiving socket of the sealant-dispensing gun. The sealant-dispensing gun generally has air passages therein receiving air under pressure from a hose and a downwardly extending handle or pistol grip usually containing a trigger assembly for operating a valve in the air passages to regulate the flow of pressurized air to the backwall of the disposable cartridge.

The pistol grip or gun type of sealant dispenser works well for most sealant-laying applications, however in some applications the downwardly extending pistol grip gets in the way. In such applications, heretofore the sealant has been applied by primitive hand methods. Additionally, the use of a downwardly extending pistol grip tempts the user to only use one hand to both control the flow of sealant and position the tip of the gun causing sloppy work and wasting of sealant. The pistol grip type of sealant dispenser is hard to store or ship, expensive to produce and relatively complex to build and repair.

Therefore, it is a primary object of this invention to provide a novel sealant-dispensing device with all of its components in an in-line construction wherein no part of the device interferes with the maneuverability of the nozzle in use or its care or storage when not in use.

It is another object of this invention to provide such an in-line design sealant dispenser with a rearwardly extending control handle and valve assembly axially coaligned with the axis of the associated cartridge and which is rotatable to control dispensing of sealant from said cartridge.

Other objects of this invention are to provide a straight through or in-line pressure airflow passage through a sealant dispenser; which is easily stored; which is able to closely approach a flat surface, and fit into tight places; which will be held with both hands for accuracy in placement of the sealant; which uses standardized parts to provide a low cost; and which has few moving parts to provide low cost and dependability.

SUMMARY OF THE INVENTION

The in-line sealant dispenser of the present invention is generally used with a sealant dispenser cartridge assembly, including a support barrel and a disposable cartridge containing sealant to be dispensed therefrom by air pressure acting at the rear end of the cartridge, and includes: a socket member for receiving the rear end of the cartridge assembly in airtight relationship thereto, said socket member having a straight through air passage therein; a handle member rotatably and axially movably mounted to the socket member to extend straight rearwardly therefrom within a projection of the cartridge outer surface with the handle containing a straight through air passage between the airhose and the air passage in the socket member, and airflow-regulating means located in one of said members for regulating the airflow therethrough in response to movement of the handle member relative to the socket member to selectively regulate the dispensing of sealant from the cartridge. The in-line sealant dispenser may also include vent means to exhaust unneeded pressurized air and stop means limiting the movement of the handle member relative to the socket member between the open and closed positions of the air-regulating means.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the in-line sealant dispenser according to this invention;

FIG. 2 is a cross-sectional view of the in-line sealant dispenser of FIG. 1 showing the sealant dispenser in the closed, nondispensing position;

FIG. 3 is a fragmentary cross-sectional view taken along the stepped plane III—III of FIG. 2 showing the handle and associated stop means of the sealant dispenser in the closed nondispensing position thereof;

FIG. 4 is a cross-sectional view similar to FIG. 2 showing the in-line construction sealant dispenser in the open sealant-dispensing position; and

FIG. 5 is a fragmentary cross-sectional view taken along the stepped plane V—V of FIG. 4 showing the handle and associated stop means of the sealant dispenser in the open sealant-dispensing position.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to the drawings and particularly to FIG. 1, preferred exemplary embodiment of the in-line sealant dispenser, according to this invention, is indicated generally by the numeral 10. Dispenser 10 is adapted to receive a cartridge assembly 11 including a disposable cartridge 12 which may have a plastic or cardboard shell with a dispensing nozzle 13 extending out the front end thereof, and a pistonlike endwall 14 at the rear thereof. The cartridge assembly 11 additionally includes a support barrel 15, surrounding the cartridge 12 to provide support thereto. The barrel 15 has external screw threads 16 adjacent the rear end thereof.

Compressed air from a suitable source is supplied to the sealant dispenser 10 by a flexible hose 17 to move the pistonlike endwall 14 and force the sealant in the disposable cartridge 12 out of the dispensing nozzle 13.

The in-line sealant dispenser 10 according to the preferred embodiment of this invention includes generally: a socket member 20; a rearwardly extending control handle member 35 mounted thereto; and airflow-regulating means 50 to regulate the flow of air in passages in both members 20 and 35. Vent means 60 may be provided to exhaust unneeded air from the passages and stop means 70 may be provided to limit the movement of the control handle member 35 relative the socket member 20 between first and second positions.

The socket member 20, as best seen in FIG. 1 and 2, is generally cylindrical in shape and includes a forwardly facing barrel-receiving opening 21 with an internal screw thread 22. The internal screw thread 22 mates with the external screw thread 16 enabling the barrel 25 to be screwed into the socket member 20, securing the two together. The barrel-receiving opening 21 of the socket member 20 has a washer-shaped seal ring 23 therein which is engaged by the rear end of the disposable cartridge 12 as the barrel 15 is screwed into the socket member 20 to form an airtight seal therebetween.

As seen in FIG. 2, the rearwardly facing surface of the socket member 20 has a rearwardly extending coaxial boss 24 with a smaller diameter threaded end 25, terminating in a rearwardly facing surface 26. The boss 24 has formed therearound a circumferential O-ring-receiving groove 27 which receives an O-ring seal 28. The socket member 20 also contains an axially offset straight-through air passage 29 extending from the rearwardly facing surface 26 forwardly to the barrel-receiving opening 21, centrally of the seal ring 23. The peripheral cylindrical surface 30 of the socket member 20 contains a series of circumferentially equally spaced grooves 31 to provide for easy grasping and holding of the socket member 20 while the cartridge assembly 11 is being screwed thereto.

The handle member 35 according to the preferred embodiment generally includes a cylindrical inner body 36 with a forwardly facing boss-receiving bore 37. An internally threaded inner bore 38 terminates in a forwardly facing surface 39. The boss-receiving bore 37 is adapted to extend over the boss 24 of the socket member 20 as the threaded end 25 of the socket

member 20 is screwed into the threaded inner bore 38 of the control handle member 35.

The control handle member 35 also contains a centrally located axial air passage 40 having a threaded forward portion 41 and a threaded rear portion 42. A conventional bicycle-type resilient handle grip 43 may be slid over the cylindrical inner handle body 36 to provide a convenient hand grip for the control handle member 35. According to the present invention, the handle and grip extend in line rearwardly of the cartridge within a rearward projection of the outer surface of the cartridge.

Hose-attaching means 45 in the form of a sleeve 46 is screwed into the rear portion 42 of the air passage 40 in the control handle member 35 and has secured thereto the end of the flexible hose 17. The other end of the flexible hose 17 is connected to a suitable source of pressurized or compressed air (not shown).

The in-line sealant dispenser 10 of the present invention also contains airflow-regulating means 50. In the preferred embodiment, the airflow-regulating means 50, includes a valve 51 having a body 52 with external threads 53 which screw into the threaded forward portion 41 of the air passage 40 in the handle member 35. The valve 51 includes a forwardly extending stem 54 with a head 55 which is movable between a closed position as shown in FIG. 2 and an open position as shown in FIG. 4. The stem 54 is biased by a spring (not shown) to the open position shown in FIG. 2.

Vent means may also be included in the sealant dispenser 10 to allow venting of pressure air when a slower rate of sealant dispensing is desired. Such vent means, indicated generally at 60 in the preferred embodiment, includes a radial hole 61 extending from the air passage 29 to the external surface of the boss 24. A chamber 62 is formed between a forwardly facing shoulder 63 of the control handle member 35, and a rearwardly facing shoulder 64 the socket member 20 and between the internal surface boss-receiving opening 37 of the control handle member 35 and the external surface of the boss 24 adjacent the threaded end 25 of the socket member 20. A radial bore 65 through the control handle member 35 opens the chamber 62 to atmosphere only when the control handle member 35 is in the first position, as shown in FIG. 2. The radial bore 65 moves out of fluid communication with the chamber 62 as the control handle member 35 moves forwardly relative the socket member 20 away from the first position to effectively seal the chamber 62 and the vent means 60.

Stop means 70 of the preferred embodiment of the sealant dispenser 10 generally includes a radially outwardly extending flange 71 on the forward end of the cylindrical inner handle body 36 of the control handle member 35. As best seen in FIGS. 3 and 5, the flange 71 is semicircular with shoulders 72 and 73. A pin 74 is mounted in the socket member 20 and extends rearwardly to be engaged by the shoulders 72 and 73 in the first and second positions of the control handle member 35 respectively.

To assemble the preferred embodiment of the sealant dispenser 10, the valve 51 is screwed into the threaded forward portion 41 of the air passage 40 with the head 55 thereof extending forwardly a short distance and the O-ring seal 28 is inserted into the O-ring seal groove 27. Next the cylindrical inner handle 36, with or without the handle grip 43 is screwed onto the threaded end 25 of the boss 24 until tight. The handle 36 is then slightly unscrewed until the pin 74 can be attached to the socket member 25. The balance of the parts may now be conveniently attached in any convenient sequence.

As can been seen by a comparison of FIGS. 3 and 5, the control handle member 35 may be freely rotated approximately 180° relative the socket member 20 between a first position shown in FIG. 3 and a second position shown in FIG. 5. As long as the pin 74 remains in place, the control handle member 35 will only be rotatable between these two positions.

Notice by comparison of FIGS. 2 and 4, that as the control handle member 35 is rotated from the first position to the second position, the control handle member moves from the position shown in FIG. 2 axially toward the socket member 20 to the position shown in FIG. 4. As the control handle member 35 moves axially, the valve 51 is moved from a closed position shown in FIG. 2 to an open position shown in FIG. 4 by the head 55 engaging the rearwardly facing surface 26. The opening and closing of the valve 51 controls the passage of air through the passages 40 and 21 and thereby controls the flow of sealant out of nozzle 13.

In operation, a disposable cartridge 12 is inserted into a support barrel 15 with the dispensing nozzle 13 extending out the front end thereof, to form a cartridge assembly 11 which is screwed into the socket member 20 of the in-line sealant dispenser 10. As the cartridge assembly 11 is screwed into the socket member 20 the rear end of the cartridge engages seal ring 23 to form an airtight seal therebetween.

The in-line sealant dispenser 10 is now ready to be used. The dispenser 10 is manually grasped by the user with one hand around the socket member 20, and the other hand on the control handle member 35. The dispenser 10 is suitably positioned with the dispensing nozzle 13 directed to the point where the sealant is to be applied, and the control handle member 35 is manually rotated while the socket member 20 is held stationary. The rotation of control handle member 35, initially in the first position as is shown in FIGS. 2 and 3, relative the socket member 20 moves the control handle member 35 on the threaded end 25 of the boss 24 forwardly relative the socket member 20 to move the radial hole 65 away from the chamber 62 and thereby close the vent means 60, and to move the airflow-regulating means 50, i.e., valve 51 forward. Forward movement of the valve 51 causes the head 55 of the stem 54 to engage the rearwardly facing surface 26 of the boss 24 and continued rotation of the handle member 35 continues to move the stem 54 from the closed position shown in FIG. 2 to the open position as shown in FIG. 4. The movement of the stem 54 opens the valve 51 allowing air under pressure to flow from the flexible hose 18 to flow down the air passage 40 through the valve 51 and into the axially offset air passage 29 as is shown by the arrows in FIG. 4. The pressurized air passes along the air passage 29 to the rear end of the disposable cartridge 12 to move the pistonlike endwall 14 thereof, forcing the sealant in the disposable cartridge 12 out to the nozzle 13.

The rate at which the sealant is dispensed is dependent upon the air pressure which is in turn dependent on the flow of air through the valve 51 which can be infinitely variable between no flow and full flow by opening or closing the valve 51 by movement of the control handle member 35.

Once a suitable amount of sealant has been dispensed, the control handle member 35 is rotated from the second position as shown in FIG. 5 to the first position as shown in FIG. 3 moving the control handle member 35 rearwardly relative to the socket member 20. The rearward movement of the handle member moves the valve 51 from the open position shown in FIG. 4 to the closed position shown in FIG. 2 enabling biasing spring of the valve 51 to move the stem 54 forwardly from the open position to the closed position. As the control handle member 35 reaches the first position, the radial hole 65 moves into fluid communication with chamber 62 to open the chamber 62 to atmosphere dissipating the pressurized air therein and in the air passage 29 of the socket member 20 ahead of the valve 51. Without the air pressure acting upon the pistonlike endwall 14 a disposable cartridge 12, the sealant therein ceases to flow out of the nozzle 13.

The above cycle can be repeated as often as desired to selectively control the flow of sealant out of the in-line design sealant dispenser 10.

It should be noted that the valve 51 could have alternatively been placed in the rear end of the air passage 29 of the socket member 20 with the stem 54 extending rearwardly, although this construction may produce air leakage past the threads and may wear the head 55 down after extended use.

Thus the exemplary in-line sealant dispenser according to this invention described in detail herein, selectively dispenses sealant from a cartridge assembly having a disposable car-

tridge surrounded by a support barrel in response to rotation of an axially aligned control handle member, which extends rearwardly from the socket member of the sealant dispenser, to accomplish the aforestated objects of this invention.

I claim:

1. An in-line design sealant dispenser for receiving a cartridge assembly including a support barrel and a disposable cartridge containing sealant to be dispensed therefrom by air pressure acting at the rear end of the cartridge and supplied to the dispenser by an airhose from a source of pressurized air, comprising:

a socket member for receiving the rear end of said cartridge assembly with the cartridge thereof in airtight relationship to said socket member, said socket member having an air passage therethrough opening to the rear end of the cartridge,

a handle member mounted to the socket member to extend rearwardly therefrom for movement between first and second positions, said handle containing an air passage in fluid communication with the air passage of said socket member,

hose-attaching means on said handle, said attaching means connecting the airhose to said handle in fluid communication with said air passage in said handle; and

airflow-regulating means in one of said members, said airflow-regulating means movable between closed and open positions in response to movement of said handle between first and second positions to selectively regulate the flow of pressurized air from the hose through the air passages to the rear end of said cartridge, to selectively dispense the sealant therefrom.

2. The in-line sealant dispenser as in claim 1 wherein the handle member is located totally inside the rearward projection of the exterior surface of the cartridge, when received in said socket member.

3. The in-line sealant dispenser as in claim 1 wherein vent means is provided in one of said members in fluid communication with the air passage between said regulating means and said cartridge to vent the passage to atmosphere both in the first position of said handle and the closed position of said regulating means, said vent means being closed as the handle moves from the first position towards the second position to maintain the pressurized air within the air passages.

4. The sealant dispenser as in claim 1 wherein stop means is provided at both the first and second positions of said handle to halt the movement of the handle thereat.

5. The sealant dispenser as in claim 1 wherein said handle member is rotatably mounted on said socket member to be rotated relative thereto between said first and second positions.

6. The sealant dispenser as in claim 5 wherein the socket member contains a rearwardly extending boss having external threads thereon, and the handle member has an internally threaded opening for receiving said boss whereby rotation of the handle between said first and second positions moves the handle member axially relative to the socket member.

7. The sealant dispenser as in claim 5 wherein said handle is mounted to said socket for axial movement relative thereto upon relative rotation therebetween; and the regulating means is a valve with a linearly actuated stem extending outwardly therefrom which is axially movable between open and closed position, said stem engaging the other of said members during axial movement of the handle member relative to the socket member between said first and second positions to be moved between closed and open positions.

8. The in-line sealant dispenser as in claim 7 wherein the passage in the handle member is axial thereof, the passage in the socket member is axially offset, and the valve is mounted in one of said passages with the stem thereof engaging the face of the other member adjacent the passage therein during axial movement between the handle member and the socket member.

9. The sealant dispenser as in claim 5 wherein the socket member has a roughened peripheral surface to facilitate the manual holding thereof.

10. The sealant dispenser as in claim 5 wherein stop means is provided to limit the rotational movement of the handle member at the first and second positions, said stop means also preventing the handle from being unscrewed by limiting the rotational movement to movement between the first and second positions only.

11. The in-line sealant dispenser as in claim 12 wherein the stop means includes a radially outwardly extending flange on the handle member adjacent the socket member, and a rearwardly extending pin on the socket member, said flange having shoulders which engage the pin at the first and second positions.

12. In a sealant dispenser for a cartridge assembly including a support barrel and a disposable cartridge-containing sealant to be dispensed therefrom by pressurized air, supplied by an airhose, acting at the rear end of the cartridge including a socket member having a forwardly facing cartridge-receiving opening for receiving the cartridge assembly with the cartridge in airtight relationship thereto, said socket member having an air passage opening to the rear end of said cartridge, the improvement comprising:

an in-line handle member movably mounted to the socket member to extend rearwardly therefrom in coaxial relationship thereto, said handle member moving axially relative the socket member in response to rotation thereof between first and second positions, said handle member having an air passage therethrough with one end thereof connected to said airhose and the other end in fluid communication with the air passage of the socket member

airflow-regulating means in one of said members movable between closed and open positions in response to movement of said handle between first and second positions to selectively regulate the flow of pressurized air from the hose through the air passages to the rear end of said cartridge to selectively dispense sealant therefrom.

13. The improvement as in claim 12 wherein the air passage in one of the members is coaxial with the socket and handle members.