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2,755,003

DISPENSING DEVICE FOR PLASTIC MATERIALS AND THE LIKE

Filed Nov. 26, 1954

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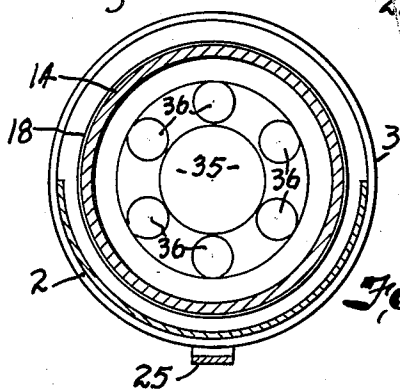
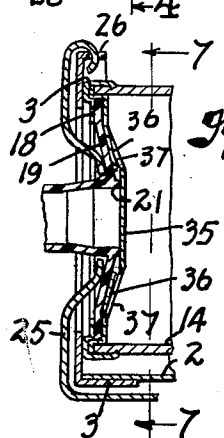
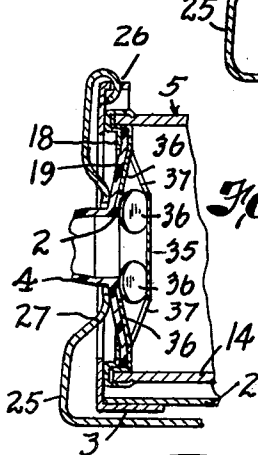
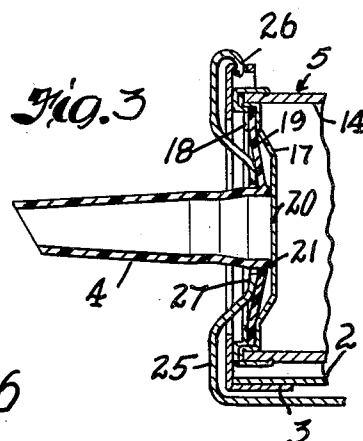
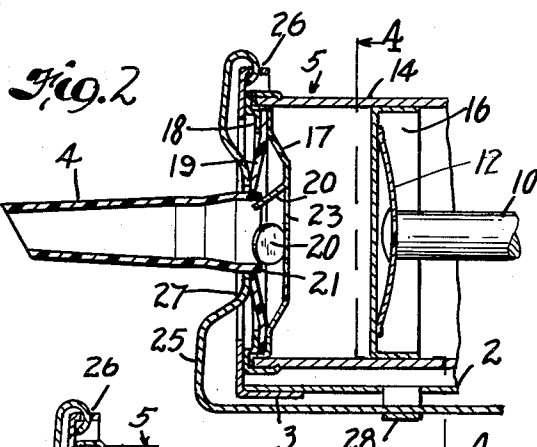
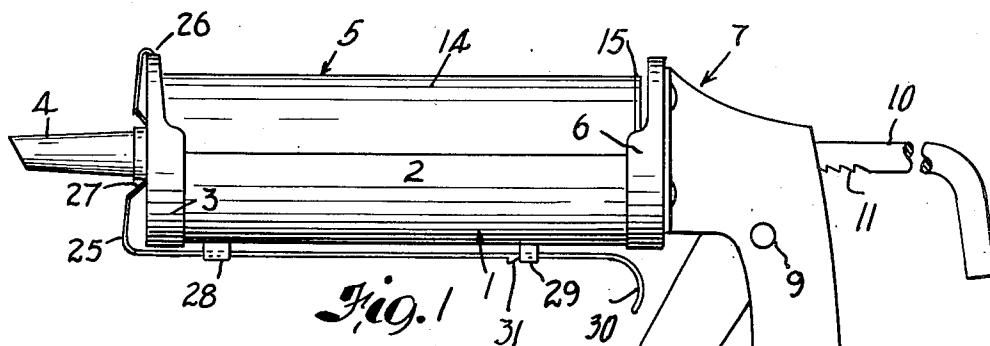
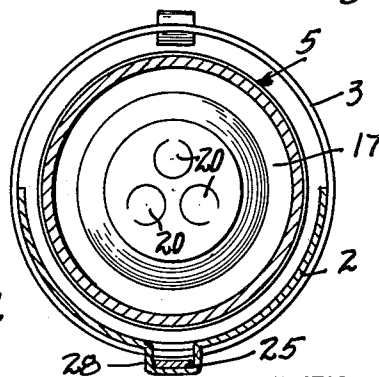


Fig. 4



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2 Sheets-Sheet 2

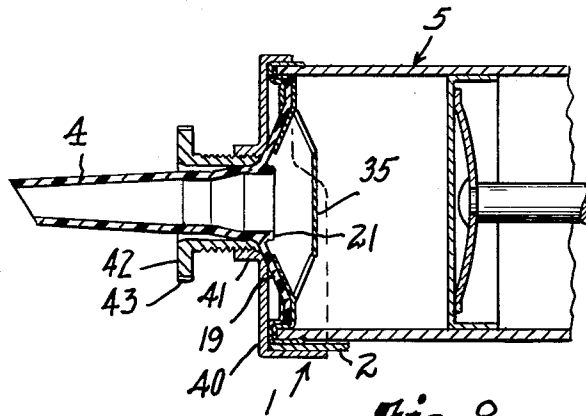


Fig. 8

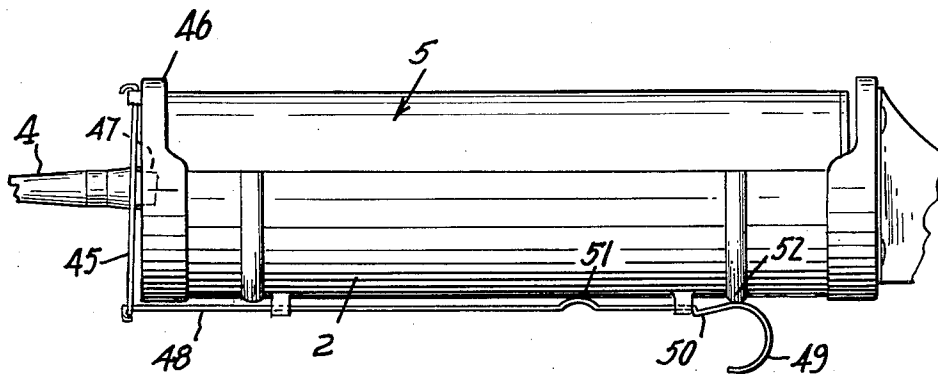


Fig. 9

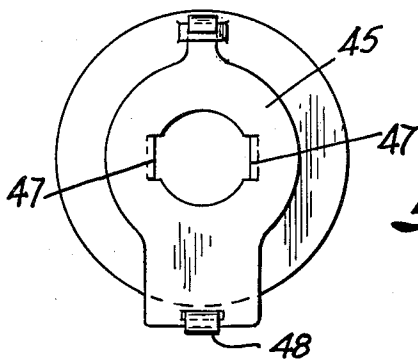


Fig. 10

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DISPENSING DEVICE FOR PLASTIC MATERIALS AND THE LIKE

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12 Claims. (Cl. 222—327)

The present invention relates generally as indicated to a dispensing device for plastic materials such as, for example, calking compound and like semi-solid or viscous substances.

More particularly, the present invention is concerned with, but not limited to, improvements in a plastic material-containing cartridge which is adapted to be installed in a holder or calking gun, said gun being operative to dispense the contents of the cartridge through a discharge spout at one end of the latter or of the gun.

Heretofore, it has been the practice to provide calking gun cartridges in the form of mailing tubes filled with calking compound and closed by plungers and frangible seals at their respective ends, the frangible seals being effective to prevent leakage of the calking compound and to seal the calking compound from atmospheric exposure. The spout for dispensing the calking material may be a part of the cartridge itself or it may be a part of the calking gun or holder proper. In either event, once the frangible seal has been broken and the cartridge put to use, there has arisen the annoying problem that each time that the calking gun is set aside, the calking compound slowly oozes from the spout, owing to gradual release of the pressure exerted thereon when the gun is in use. Thus, the workman has found it necessary to be very careful as to where he sets the gun down, and in any event he is bothered with the cleaning up of the inch or more of calking compound which may ooze from the end of the spout owing to such release of pressure.

With the foregoing and other problems in mind, it is one principal object of this invention to provide a valved calking gun and cartridge having a valve which may be operated to close the discharge passage of the cartridge so that such oozing of the calking compound is avoided during periods of non-use of the gun.

Another object of this invention is to provide a unique valve mechanism which is simple and foolproof in operation and which does not interfere with the normal dispensing of the contents of the cartridge.

Another object of this invention is to provide a cartridge valve mechanism which does not add to the cost of the cartridge, whereby, as before, the cartridge may be discarded when empty and a new one inserted into the gun or holder.

Another object of this invention is to provide a simple form of valve actuator carried by the gun, which actuator either permits or prevents flow of calking material through the dispensing spout.

Another object of this invention is to provide a valve-actuating mechanism which is mounted on the gun proper and which has a trigger which is latched in valve-closing position, as with the forefinger of the same hand in which the handle of the gun is held. Thus, the valve closing is a simple, one-hand operation so that the workman standing on a ladder, for example, can hold the gun in one hand and operate the valve trigger with a finger of the same hand, whereby his other hand is free to hold the ladder.

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Other objects and advantages of the present invention will become apparent as the following description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described and particularly pointed out in the claims, the following description and the annexed drawings setting forth in detail certain illustrative embodiments of the invention, these being indicative, however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:

Fig. 1 is a side elevation view of a preferred embodiment of this invention, showing the combination cartridge and gun;

Fig. 2 is a longitudinal section view, on enlarged scale, of the dispensing end of the Fig. 1 assembly;

Fig. 3 is a central cross-section view showing the cartridge valve mechanism in its closed position to prevent the escape of plastic material from within the cartridge tube;

Fig. 4 is a transverse cross-section view taken substantially along the line 4—4, Fig. 2;

Fig. 5 is a fragmentary longitudinal section view similar to Fig. 2 except illustrating a modification;

Fig. 6 is a longitudinal section view of the Fig. 5 modification in closed position;

Fig. 7 is a transverse cross-section view taken substantially along the line 7—7, Fig. 6;

Fig. 8 is a cross-section view of a preferred form of the present invention; and

Figs. 9 and 10 are side and front elevation views of a modification.

Referring now in detail to the drawings, and first to Fig. 1 thereof, the calking gun or cartridge holder 1 is exemplarily shown as comprising a semi-circular body or cradle 2 having a ring 3 welded thereto at one end through the opening of which ring the spout 4 of the cartridge 5 is adapted to be inserted, said cartridge being supported on cradle 2.

Welded at the other end of said cradle 2 is a ring 6 to which the handle assembly 7 is riveted or otherwise secured. The handle assembly 7 has a trigger 8 pivoted thereto at the pivot 9 and within the handle, and actuated by the trigger is a ratchet mechanism, not shown, which is operative in well known manner to axially advance the rod 10 each time that the trigger is squeezed.

The rod 10 has formed on its under surface a series of teeth 11 engaged by the ratchet mechanism, and when said rod is rotated about its longitudinal axis to position the teeth at the side or top, said rod may be withdrawn axially toward the right to position its plunger head 12 adjacent the end ring 6 so that the cartridge 5 may be inserted as above described and removed when empty.

The cartridge 5 may comprise, for example, a cylinder body 14, usually a piece of paper mailing tube having a metal reinforced edge 15 at one end, if desired or necessary, and a dispensing spout 4 at the other end. Fitted into the handle end of the cartridge 5 is a plunger 16 in the form of a thin sheet metal stamping upon which the plunger head 12 of the rod 10 is adapted to press to thus move said plunger 16 toward the left in the tube 14 for discharging the plastic substance from therewithin.

The dispensing end of the cartridge 5 is here exemplarily shown as comprising an inner disc part 17 which has a cylindrical flange portion fitting closely the inner surface of the tube 14 and a radial flange which abuts the end of said tube so as to properly position said part in the end of said tube. An outer ring part 18 includes a cylindrical flange portion which fits snugly in the cylindrical flange of said inner part 17, and the radially outwardly extending flange of said outer part is spun or crimped over

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the outside of the tube 14 to thus firmly secure the two parts 17 and 18 in place at the dispensing end of the cartridge.

Gripped between the spaced apart, radially inwardly extending portions of said parts 17 and 18 is the peripheral portion of the laterally flexible flange 19 of the spout 4, said spout being made of flexible plastic or like material. The inner part 17, as best shown in Figs. 2, 3, and 4, is provided with flap valves 20 hinged thereto. Said flap valves 20 are preferably formed integrally with said inner part 18 by shearing through the metal thickness except at the portions thereof which constitute the hinges.

The inner portion of the spout flange 19 is formed with an axially projecting annular bead 21, which is normally spaced away from the inner part 17 as is shown in Fig. 2. Initially, when a new cartridge 5 is inserted in the holder 1, the flap valves 20 will be flush with the central portion of the inner part 17 and a suitable sealing substance such as plastic cement or the like on the shear lines of said flap valves 20 will be effective to prevent leakage of the plastic material from within the cartridge 5 and also to prevent exposure thereof to the air.

After the cartridge 5 has been inserted into the holder 1, all that the operator has to do is to squeeze the trigger 8, thus advancing the rod 10 toward the left and creating a high pressure on the plastic material in the cartridge 5. This high pressure forces the flap valves 20 to swing outward about their hinges to the position shown in Fig. 2, whereupon the plastic material is then freely discharged from within the tube 14 through the passages 23 and out through the spout 4.

Now, when it is desired to set the calking gun aside, all that it is necessary to do is to axially retract the spout 4 toward the right from the Fig. 2 to the Fig. 3 position, such retraction being through bead 21 effective to swing the flap valves 20 to the flush position and thereby prevent oozing of the calking compound from within the cartridge.

The mechanism for so axially retracting the spout is here shown as comprising an L-shaped member 25 hingedly connected at 26 to the top of ring 3 of the holder and having an offset portion 27 which bears on the base of the spout flange 19. The rest of said valve actuator 25 extends rearwardly along the bottom of saddle 2 toward the handle 7 of the gun and passes through guide openings 23 and 29 formed in said saddle 2. The rear end of said actuator 25 is bent to form a trigger or finger piece 30 which is adapted to be drawn rearwardly as with the forefinger of the hand in which the calking gun is held.

Said rearwardly extending portion of said actuator 25 is formed with a hook 31 or the like which, when the trigger 30 is pulled to the right, engages the right hand edge of the guide 29, and thus serves as a latch to hold the actuator 25 in the Fig. 3 position until such time as said hook 31 is pressed laterally toward the saddle 2, whereupon the resilience of the spout flange 19 will cause the same to move toward the left. Then, by squeezing the trigger 8, the flap valves 20 will again be swung outward to the Fig. 2 position.

In Figs. 5-7, there is shown a modification of the present invention in which the annular bead 21 of the spout 4 engages an unapertured portion of the inner part 35, and thus serves to prevent oozing of the material from within the cartridge 5, and in this case the valve flaps 36 are circularly arranged outward of the bead 21. As shown in Fig. 6, when the valve mechanism is in the closed position, the valve flaps 36 are not swung all the way back to their initial flush position; and, therefore, this form of the invention will have a somewhat longer life than the Figs. 2-4 form before the valve flaps break off at the hinges. However, even in the Figs. 2-4 form of the invention, the valve flaps 20 can be opened and closed more than the usual number of times that a calking gun is set aside and closed. Also, the

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form of the invention in Figs. 5-7 provides a greater number of flow openings 37 to reduce the pressure drop or pressure required on the material to dispense the same through the spout 4.

5 The valve actuator 25 is in this case of the same construction as illustrated and described with reference to Figs. 1-4; and, therefore, repetition thereof is not deemed necessary.

Although the present invention has been illustrated and described in connection with a cartridge-type calking gun wherein the spout 4 and valve mechanism is a part of the cartridge itself, it is to be understood that the spout could be secured to the end of the gun or holder or that a similar valve mechanism may be incorporated at the end of the holder rather than at the end of the cartridge 5 without departing from the spirit of the present invention.

10 In such latter case, the end of the cartridge 5 could be provided with the usual type of frangible seal and, when installed, the cartridge end would sealingly engage that part of the holder which constitutes the flap valve mechanism, and here again the retraction of the spout or a flanged member will effect a closing of the dispensing passage so that the contents of the cartridge would be retained therein. Furthermore, when the valve mechanism is in the end cap of the holder, bulk compound may be loaded into the holder barrel, and when the valve mechanism is closed the bulk compound is prevented from oozing from the holder spout during periods of non-use of the gun.

Referring now to the preferred form of my invention as illustrated in Fig. 8, the cartridge 5 and holder 1 are of the same general construction as Figs. 5 to 7 except that the end ring 40, substituted for end ring 3 and actuator 25, has a central, internally threaded extrusion 41 in which a tubular screw 42 is threadedly engaged, said screw having a knurled flange 43 by which said screw may be rotated.

As evident, when said screw 42 is rotated so as to retract it toward the right, its righthand annular end bears on the base of flange 19 of the spout 4 to thus urge the bead 21 into engagement with the central imperforate portion of the inner stamping 35 so as to close the cartridge 5 in the manner already explained in detail with respect to the Figs. 5 to 7. Obviously, if desired, a cartridge 5 of the Figs. 2 to 4 construction may be used instead of the Figs. 5 to 7 cartridge.

The Fig. 8 improvement is not only simple in construction, but is economical to manufacture and is positive in its cartridge-closing action.

Referring now to Figs. 9 and 10, the valve actuator linkage comprises two pieces, viz. a front plate 45 hinged to end ring 46 and having an opening through which spout 4 extends and integral lugs 47 adapted to bear on the flange 19 of said spout 4 in the manner illustrated in Figs. 3 or 6; and a bottom rod 48 hooked to the lower edge of said plate 45 and provided with a finger ring 49 and a latch 50.

As a further feature, said rod 48 engages the saddle 2 at two spaced apart points 51 and 52, whereby when it is desired to release the latch 50, all that the operator has to do is to press the rod 48 toward the gun saddle 2 at some point between the points 51 and 52.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a plastic material-containing cartridge, the combination of a tubular body, a spout having a dispensing passage therethrough and a laterally flexible flange peripherally secured at one end of said body, an end wall member secured within such one end of said body with its central portion axially spaced from the central portion

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of said flange whereby the latter may be laterally flexed to engage said wall member, said end wall member having a passage therethrough which is initially closed to seal the contents from atmospheric exposure but which is open-able to permit egress of plastic material therethrough, through the aforesaid space, and through such spout pas-
 sage and which is closable by engagement of the central portions of said flange and wall member to preclude oo-
 zing of plastic material from said spout during periods of non-use of said cartridge.

2. The cartridge of claim 1 wherein the passage through said end wall member is initially closed by a flap valve hingedly connected to said end wall member for swinging to passage-opening position under the influence of pres-
 sure adapted to be exerted on the plastic material in said cartridge.

3. The cartridge of claim 2 wherein the central portion of said flange when laterally flexed engages said flap valve to move the latter to passage-closing position.

4. The cartridge of claim 2 wherein the central portion of said flange when laterally flexed engages an imperforate portion of said end wall member which is radially offset from said flap valve.

5. A valve assembly and end wall structure for plastic material containing cartridges comprising inner and outer parts adapted respectively to be fitted into and rolled over the end of a tubular cartridge body, a laterally flex-
 ible flange member peripherally clamped between said parts and having a central apertured portion which is spaced from a central transverse wall portion of said inner part and which is adapted to be flexed laterally to engage
 such wall portion, said inner part being formed with a passage therethrough, and a flap valve hingedly connected to said inner part and effective to normally close such
 passage, said flange when flexed into engagement with said wall portion serving to prevent egress of plastic ma-
 terial through such passage from the cartridge to which said assembly and end wall structure is adapted to be
 secured.

6. The valve assembly and end wall structure of claim 5 wherein such central portion of said flange when flexed as aforesaid is effective to engage said flap valve to urge the latter to a position closing such passage.

7. The valve assembly and end wall structure of claim 5 wherein such passage is radially offset from the flange aperture and wherein such central wall portion of said inner part is imperforate whereby flexing of said flange prevents egress of plastic material through such passage.

8. In a calking gun and the like, the combination of a tubular body adapted to contain calking compound, a

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plunger in one end of said body, a handle at such one end having means for moving said plunger toward the other end of said body, a dispensing spout at such other end, a valve mechanism at such other end including a wall member across such other end of said body having a passage for flow of compound from within said body through said spout and a laterally flexible apertured member adapted to be flexed to engage said wall member to stop flow of compound through such passage, and an actuator at such other end of said body to so flex said laterally flexible member, said actuator extending toward said handle for actuation by the same hand as the gun is held in.

9. The calking gun of claim 8 wherein said gun and actuator are provided with cooperating latch means effective to hold said laterally flexible member in its wall member engaging position to preclude oozing of the compound from said spout during periods of non-use of the gun.

10. The calking gun of claim 8 wherein said wall member is intergally formed with a hinged flap valve which initially closes such passage and thus seals the compound in said body from leakage and air exposure, and which is swingable to open such passage under the influence of pressure exerted on the compound in said body.

11. In a calking gun and the like, the combination of a tubular body adapted to contain calking compound, a plunger in one end of said body, a handle at such one end having means for moving said plunger toward the other end of said body, a dispensing spout at such other end, a valve mechanism at such other end including a wall member across such other end of said body having a passage for flow of compound from within said body through said spout and a laterally flexible apertured member adapted to be flexed to engage said wall member to stop flow of compound through such passage, and an actuator at such other end of said body to so flex said laterally flexible member, said actuator being in the form of a screw having threaded engagement with said body and disposed to engage and thus flex said laterally flexible member as aforesaid.

12. The calking gun of claim 11 wherein said screw is tubular, and said dispensing spout extends through said screw.

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