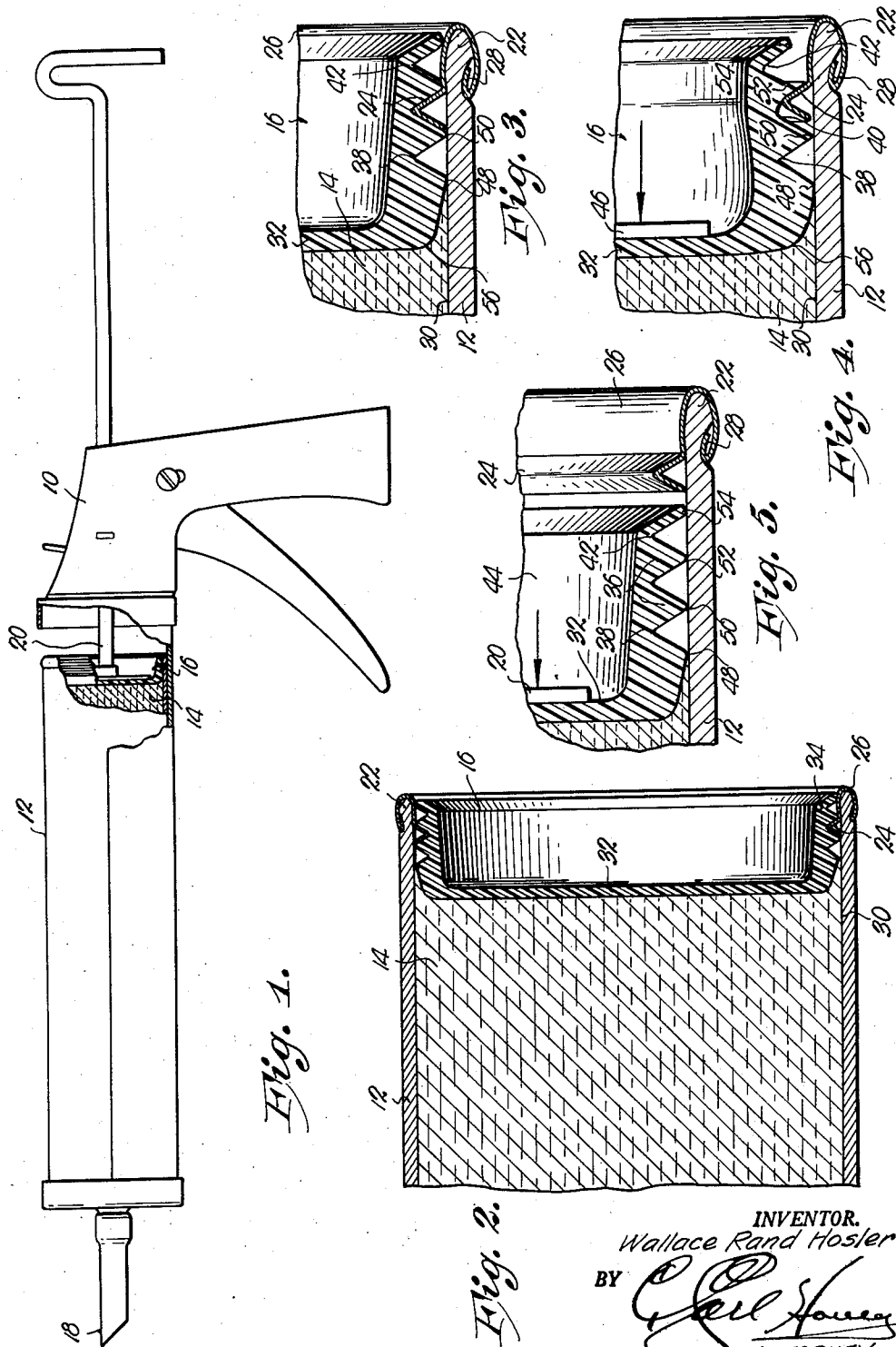


Sept. 1, 1959

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COMBINATION CLOSURE ASSEMBLY AND PLUNGER FOR
CAULKING COMPOUND CARTRIDGE
Filed April 15, 1957

2,902,190



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COMBINATION CLOSURE ASSEMBLY AND PLUNGER FOR CAULKING COMPOUND CARTRIDGE

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Application April 15, 1957, Serial No. 653,009

2 Claims. (Cl. 222—386.5)

This invention relates to an assembly for use in connection with a container and more particularly to a combination closure assembly and plunger that is carried by the container and capable of attaining a number of novel, advantageous results.

The primary object of this invention is to provide a composite assembly capable of initially serving as a closure means for a standard caulking compound cartridge and which, while so serving, will be releasably maintained in a sealing position, but after being pressurably disengaged from its initial locked position, will serve as a plunger by means of which the caulking compound may be forced from the tube.

Another important object of the instant invention is to provide a combination closure cap assembly and plunger having a series of ribs on its outer surface for initially holding the cap in place and also for wiping the inner surface of the tube as the plunger progresses along the length thereof.

Still another object of the present invention is to provide a combination closure assembly and plunger that is resilient whereby the same may be disengaged from its holding means without allowing escape of the compound, and that also, by reason of such resiliency, may be constantly maintained in frictional engagement with the inner surface of the cartridge.

Yet another object of the present invention is to provide a device as above described that, while serving as a plunger, is relatively free floating whereby upon release of ram pressure the device will recede as a result of the expansion of the compound within the tube, and thus by compensating for the expansion pressure so created, prevent the wasteful flow of excess compound from the nozzle of the caulking gun.

Other objects will become apparent in the specification which follows, and from a study of the appended drawing, wherein:

Figure 1 is a side-elevational view of a caulking gun and cartridge having a combination closure assembly and plunger embodying the present invention, parts being broken away for clarity.

Fig. 2 is an enlarged, fragmentary, cross-sectional view of the combination closure assembly and plunger mounted within the cartridge.

Fig. 3 is an enlarged, fragmentary, cross-sectional view similar to Fig. 2.

Fig. 4 is a fragmentary cross-sectional view showing the combination closure assembly and plunger as it is being pressurably released from the engaging means.

Fig. 5 is a fragmentary, cross-sectional view showing the combination closure assembly and plunger fully released from the engaging means and as it is being pushed along the caulking compound cartridge.

As illustrated by the drawing, a standard caulking gun 10 is designed to receive a cartridge or tube 12 which is filled with caulking compound 14. Such a cartridge is usually sold and shipped as a separate unit and since

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the compound is placed therein under pressure it must be kept tightly sealed until placed in use.

The present invention provides device 16 which serves as a closure cap to seal cartridge 12 until it is placed in use, as well as serving as a plunger for forcing the compound 14 from the tube 12 when in use in connection with gun 10. One end of tube 12 (not shown) is sealed by an element designed to be partially broken away when the cartridge 12 is put in use and thus allow the compound 14 to be forced through nozzle 18 of gun 10 through the application of pressure by means of a ram 20.

As best shown by Fig. 2, the combination plunger and closure cap assembly or device 16 is telescoped within tube 12 at one open end 22 thereof and while serving as a closure cap is maintained in a fixed position therein by a projection 24 formed on band 26.

Annular band 26 is looped over end or edge 22 of tube 12 and has a gripping relationship therewith as a result of being rebent upon itself at its outer margin 28 and pressed into the fiber cartridge 12. The looped band 26, from its rebent outer margin 28 bears against edge 22, the inner surface 30 of tube 12, and has formed along its inner margin transversely triangular projection 24.

Tube 12, having band 26 thereon, is adapted to receive and hold in a fixed position device 16 when the same is inserted therewithin. Said device 16 is cup-shaped, has a bottom wall 32, a continuous peripheral side wall 34, a plurality of ribs 36 circumscribing wall 34 and grooves 38, 40 and 42 forming the ribs 36. A cavity 44 is formed by bottom 32 and side wall 34 which cavity 44 is adapted to receive ram 20 when cartridge 12 is placed in operating position in gun 10.

As best illustrated by Fig. 3, when device 16 is initially positioned within tube 12, and while serving as a closure cap, it is releasably maintained in a fixed position by means of projection 24 tightly seated within triangular groove 40. In addition to maintaining device 16 in a fixed position, groove 40 and projection 24 cooperate to form a seal whereby any leakage of compound 14 from tube 12 is effectively prevented.

When cartridge 12 is placed in gun 10 and in a position ready for operation, ram 20 is received by cavity 44 and plate 46 of ram 20 is brought in direct engagement with bottom wall 32. Gun 10 is then actuated and device 16 forced from its position locked in place by projection 24.

Since combination plunger and closure cap 16 is made of a resilient material, such as a suitable plastic, the relatively sharp apex edges 48, 50, 52 and 54 of ribs 36 tend to move outwardly as pressure is applied to bottom wall 32. Thus, the resiliency of side wall 34 and the fact that grooves 38, 40 and 42 are transversely triangular, as is projection 24, enables forward apex edges 48 and 50 to be maintained against inner surface 30 as apex edge 52 passes over projection 24. Similarly, the resilient nature of device 16, permits edges 48, 50 and 52 to be held in contact with inner surface 30 as the last of such edges 54, passes over projection 24 during movement of device 16 into tube 12, such movement being facilitated by the complementary, triangular shape of grooves 38, 40 and 42 and projection 24. The constant contact of said edges with the inner surface 32, during such movement, prevents any appreciable amount of compound 14 from by-passing device 16 and leaking from tube 12.

When device 16 has fully cleared projection 24, and is serving as a plunger, apex edges 48, 50, 52 and 54 of ribs 36, circumscribing resilient side wall 34, are, as a result of the force exerted on bottom 32, maintained in constant frictional engagement with inner surface 30 of

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tube 12, while device 16 is traveling the length thereof. Due to the continuous contact resulting from such resiliency, edges 48—54 serve to wipe the inner surface 30 of tube 12 as plunger 16 progresses therealong.

In order to additionally facilitate the passage of edges 48—54 over projection 24, and the movement of device 16 along tube 12 the outer diameter of side wall 34 decreases progressively from apex edge 48 toward bottom 32. As a result of such decrease in diameter, and the clearance with tube 12 that is created thereby, and since the leading edge 56 of bottom 32 is arcuate, said edge 56 will not cut into or catch on inner surface 30 and impede the movement of device 18 into or along tube 12.

While serving as a plunger device 16 is relatively free-floating in that it is in no way connected with ram 20 but is merely held against compound 14 by the pressure exerted upon it through plate 46. When this pressure is released, ram 22 and plate 46 retract slightly and in so doing release the pressure on device 16. Additionally, upon such release of pressure, compound 14 will expand and device 16, being slidable within tube 12, will move rearwardly against plate 46 and thus compensate for the expansion of compound 14, thereby preventing such expansion from forcing excess compound through nozzle 18. Also, due to the nature of its construction and the fact that apex edges 48—54 of ribs 36 are in constant contact with surface 30, when device 16 is forced rearwardly by the expansion of compound 14 due to the release of pressure thereon, no compound is allowed to pass said combination plunger and closure cap 16.

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Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a cartridge, a tube; and a combination plunger and closure cap telescoped within the tube and having a plurality of ribs circumscribing the same in wiping engagement with the inner face of the tube, said cap being cup-shaped presenting a bottom wall and a side wall, the bottom wall being resilient, the ribs being on the side wall, and the side wall being resilient whereby the ribs are forced against the tube as pressure is applied to the bottom wall, said side wall being cylindrical and progressively decreasing in diameter from one of the ribs toward said bottom wall, said ribs being transversely triangular, presenting an apex edge in line contact with the tube.

2. The invention as set forth in claim 1, wherein said cap is provided with grooves forming the ribs, said tube having a projection therewithin seated within one of the grooves for holding the cap in place, said tube being provided with a band looped over one end thereof, said projection being on the band.

References Cited in the file of this patent

UNITED STATES PATENTS

1,299,078	Weiss	Apr. 1, 1919
1,318,928	Shields	Oct. 14, 1919
2,055,602	Dodge	Sept. 29, 1936
2,067,294	Tear	Jan. 12, 1937
2,126,424	Tear	Aug. 9, 1938
2,196,337	Loweke	Apr. 9, 1940