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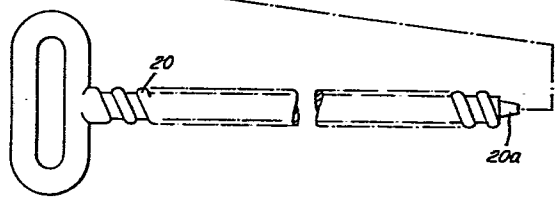
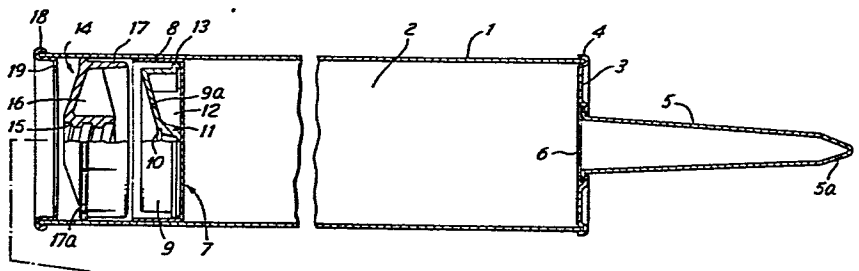
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**Cartridge for dispensing a fluent substance.**

A cartridge for dispensing a fluent substance such as a mastic or an adhesive and which can be used either with a conventional gun or as a self-contained cartridge comprises an elongate container (1), a piston (7) movable longitudinally within the container for expelling substance through an outlet (5) at one end thereof, and a nut member (14) within the container between the piston and the other end of the container. A separate screw (20) cooperating between the nut member (14) and the piston (7) enables the cartridge to be used as a self-contained dispenser. To prevent the nut member (14) from being forced out of the other end of the cartridge, abutment means (19) are provided projecting inwardly of the container wall (1) at said other end. The abutment means (19) however project only as far as necessary to act as a stop for the nut member (14), and leave the other end of the container (1) substantially open and unobstructed so that the cartridge may be used in a conventional gun. In this latter mode the nut member (14) and the piston (7) move together as a unit longitudinally in the container (1) when dispensing substance.

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CARTRIDGE FOR DISPENSING A FLUENT SUBSTANCE

This invention relates to a cartridge for dispensing a fluent substance, for example a mastic, an adhesive etc.

Such cartridges are well known and comprise an  
5 elongate container having an outlet at one end (the front) and a piston at the other end (the rear). The fluent substance is contained between the outlet and the piston. The outlet may comprise a dispensing nozzle, which may be integral with or detachable from the  
10 container. In order to expel the fluent substance from the cartridge the piston is moved towards the front of the cartridge.

One well known type of cartridge is used with a gun which comprises a frame for receiving the cartridge  
15 and providing an abutment for engaging the front end thereof, and a longitudinally extending rod with a pressure-distributing plate mounted on it to engage the piston from the other end of the cartridge. When a trigger is actuated, the rod is caused to move long-  
20 itudinally to push the piston towards the front of the cartridge.

A second type of cartridge provided for use without a gun comprises a rotatable end cap closing the rear end of the cartridge and to which a screw is  
.25 fitted to extend longitudinally through the cartridge and engage within a screw threaded aperture in the piston.

When the end cap is rotated in the appropriate direction, the piston is caused to travel along the  
30 screw towards the front of the cartridge to expel the fluent substance.



A third type of cartridge provided for use without a gun comprises a nut within the cartridge at the rear of the piston, and a closure cap sealing the rear end of the cartridge. A separate screw engageable with the nut is provided. The cartridge is used by perforating the end cap to allow the screw to be inserted through the perforation to engage the nut. By threading the screw through the nut so that the end of the screw engages the piston the latter can be moved towards the front of the cartridge to expel the fluent substance.

A fourth type of cartridge is similar to the third type but has the nut fixed to the rear end of the cartridge.

Cartridges of the second to fourth types above are referred to herein as "self-contained" cartridges.

The materials commonly used in the manufacture of cartridges include board, composite fibre material, metal and plastics. A typical container comprises a spiral wound board tube, which may contain either a metal or a plastics piston. The nut and screw (when provided) are commonly plastics or a plastics/metal combination.

Deep drawn aluminium containers are also known but are expensive to manufacture and in material cost. Tubular plastics containers, usually polyethylene or polypropylene are in use, but do not successfully retain fluent substances which have a high solvent content, such as wall board adhesives. Polyamide plastics can be used, but this material is very expensive. An alternative is to use a board container which is lined internally, and may also be lined externally, with metal foil such as aluminium foil, to resist the action of solvents and/or other chemical constituents of the fluent substance. However, self-

contained cartridges using spiral wound board  
containers have been found prone to failure at the  
container ends particularly when filled with viscous  
substances in that the forces it is necessary to  
5 apply to expel such substances have caused failure of  
the container ends which are usually secured to the  
wall of the board container by conventional crimping  
techniques. It is believed the failure occurs by  
deformation and bowing of the tube ends under the  
10 forces applied, causing the ends to tear away from  
the container wall.

Also hitherto a distinction has been drawn  
between cartridges intended for use with a gun and  
cartridges of the self-contained type. No cartridge  
15 available has been capable of use without modification  
both with a gun and as a self-contained cartridge  
dispenser (i.e. of multi-purpose use).

It is an object of the present invention to  
provide an improved cartridge capable of multi-  
20 purpose use and which is reliable in operation.

The present invention provides a cartridge  
for dispensing a fluent substance which comprises an  
elongate container for holding the fluent substance  
to be dispensed, means at one end of the container  
25 defining an outlet for the fluent substance, a piston  
movable longitudinally within the container for  
expelling fluent substance through the outlet, a nut  
member slidable within the container between the piston  
and the other end of the container, and abutment means  
30 at the other end of the container for contacting the  
periphery of the nut member whilst leaving the other end  
substantially open and unobstructed whereby the  
cartridge may be used in a gun or in conjunction with  
a separate screw as a cartridge of the self-contained  
35 type.

Preferably the abutment means is constituted by at least one projection which extends inwardly of the wall of the container adjacent the other end. The container body may be formed of board, metal or plastics.

5 A spiral wound board container which may be lined internally or internally and externally with foil may have the abutment means constituted by a metal ring for example of aluminium or tin plate, which is seamed and/or crimped onto the wall of the container at the  
10 other end and provides a flange which surrounds and projects inwardly of the container end to engage the periphery of the nut. The force exerted by the nut (when the cartridge is used in conjunction with a separate screw) is transmitted by the abutment means  
15 to the container wall mainly in shear and a reliable connection is ensured.

In the case of a metal container a similar metal ring may be employed or dimples formed in the container wall adjacent the other end may act as abutments for  
20 the nut.

In the case of a plastics container an abutment flange ring may be a plastics ring which can be heat sealed, welded or moulded integrally with the container body. Alternatively a metal abutment ring as described  
25 above may be seamed and/or crimped onto the wall of the plastics container.

The abutment means must leave the other end of the container substantially open and unobstructed to allow a pressure-distributing plate mounted on the rod of  
30 a gun to be inserted into the container without requiring any modification thereof. When the cartridge is used with a gun, the nut member acts as a back-up and further pressure-distributing member behind the piston.

Conveniently the cartridge is dimensioned to  
35 allow it to be used with standard commercial forms of gun, whether manually operated as mentioned above or

by a pressurising assembly employing liquefied or  
pressurised gas.

The materials of which the cartridge can be  
made are not limited to those mentioned but include  
5 all other materials which can be fabricated as  
necessary and provide the desired resistance to attack  
by the fluent substance to be dispensed.

An embodiment of a cartridge according to the  
present invention is shown by way of example in the  
10 accompanying diagrammatic drawing which shows the  
cartridge in sectional side view. The drawing shows  
a cartridge according to the present invention which  
comprises a tubular spiral wound board container 1 of  
circular cross-section lined internally and externally  
15 with aluminium foil. The container defines an elongate  
chamber 2 containing a viscous fluent substance to be  
dispensed, for example a mastic. The front end of the  
container is closed by an end cap 3 of tin plate,  
seamed and crimped to the container wall at 4. The  
20 end cap 3 mounts a dispensing nozzle 5, and the inner  
face of the end cap is covered by a disc of foil 6.

At the other or rear end of the cartridge a  
piston 7 is slidably mounted within the container 1.  
The piston 7 comprises a thin-walled metal cup 8 which  
25 is a sliding sealing fit within the container. A  
plastics washer 9 is an interference fit within the  
cup 8 and operates to distribute over the base wall of  
the cup the force applied to the piston to eject the  
fluent substance. The washer 9 comprises a smooth  
30 concave rear face 9a which leads into a central



annular seating 10 which surrounds a hollow boss 11. On its opposite face, the washer 9 has stiffening ribs 12 which extend radially outward from the central boss 11 and abut the base wall of the cup 8. A perimetral rim 13 of the washer 9 provides the interference fit within the cup 8 of the piston 7.

A nut member 14 is slidably mounted in the container 1 between the piston 7 and the rear end proper. The nut member 14 has a central internally screw-threaded boss 15 which is in coaxial alignment with the boss 11 of the washer 9 mounted in the piston 7, and preferably includes stiffening ribs 16 as shown connecting the boss 15 to an outer cylindrical wall 17, and a rim 17a frictionally engaged with the wall of the container 1. Although for purposes of illustration the nut member 14 is shown longitudinally spaced within the container 1 from the washer 9 and piston 7, it will be noted that the cylindrical wall 17 is dimensioned to fit within the cup 8 of the piston 7 between the side wall of the piston and the washer 9 so as to reduce the space required to accommodate these components within the container 1 and thus maximise the volume of chamber 2 available to contain fluent substance to be dispensed, for a given length of the container 1. The cartridge will normally be packed with the nut member 14, washer 9 and piston 7 telescoped in this fashion.

An abutment means 18 is mounted on the rear end of the container 1 and comprises a metal ring seamed and crimped to the container wall 1 to define an annular flange 19 which projects inwardly into the container 1 for a distance sufficient to restrain the



nut member and leave the end of the container itself substantially open and unobstructed. To dispense fluent substance from within the cartridge, the cartridge may either be used with a conventional gun or as a self-contained cartridge in conjunction with a screw 20. Initially in either case, the end 5a of the nozzle is opened by severing it, and a spike is inserted through the nozzle to pierce the foil 6. Then, if the cartridge is to be used with a gun, it is placed in the gun and the gun trigger is operated to advance the rod of the gun and any pressure-distributing plate located thereon into engagement with the nut member 14. Thereafter, operation of the trigger first moves the nut member 14 into abutment with the washer 9 and piston 7 (if these components have become separated), and then moves the nut member 14, washer 9 and piston 7 together as a unit longitudinally of the container 1 to expel fluent substance through the nozzle 5.

To use the cartridge as a self-contained dispenser, the screw 20 is threaded into the boss 15 of the nut member 14 until the end 20a of the screw engages in the central seating 10 in the washer 9. The concave rear face 9a of the washer 9 ensures that even if the screw 20 is incorrectly aligned the end 20a upon striking the washer will slide down the face 9a until it correctly engages in the seating 10. Thereafter further rotation of the screw 20 draws the nut member 14 rearwardly until the peripheral portion of the rear face thereof engages the flange 19 of the abutment. After this position is reached, continued rotation of the screw 20 causes the washer 9 and piston 7 to advance



as a unit longitudinally of the container 1 to expel  
fluent substance through the nozzle 5. Friction  
between the wall of the container 1 and the rim of  
the nut member, as well as between the rear face of  
5 the nut member and the abutment means is sufficient  
to prevent the nut member from rotating with the screw  
as the latter is turned to advance the piston.

The inner edge of the flange 19 may be rolled  
or otherwise made safe if desired to avoid the danger  
10 of a sharp edge which could result in a user of the  
cartridge cutting his fingers.

A cartridge comprising a metal or a plastics  
container 1 may be constructed in the same manner as  
the cartridge described above comprising a tubular  
15 spiral wound board container, namely with a metal  
abutments means 18 having an annular flange 19 seamed  
and/or crimped to the wall of the metal or plastics  
container. Other forms of abutment means and  
specifically of the abutment flange 19 are however  
20 available with a metal or plastics container 1. Such  
a container 1 may be provided with an inwardly  
projecting flange 19 at the rear end, or a non-  
continuous flange 19 may be obtained by forming a  
plurality of inwardly extending projections  
25 or dimples in the wall of the container adjacent the  
rear end. With a plastics container 1, the abutment  
means 18 and flange 19 may also be of plastics and  
can be heat sealed or welded to the container wall,  
or a flange 19 may be moulded integrally with the  
30 rear end of the container 1.

The piston 7 and the washer 9 may if desired  
be combined and manufactured as a single member or  
element.

It will be seen that there has thus been described an improved cartridge for dispensing of fluent substance, capable of multi-purpose use and which is relatively cheap and convenient to manufacture.

5 The abutment means and specifically the flange 19 need project into the container only for a distance sufficient to restrain the nut member, for example such as about 0.5 to 2 millimetres radially inwardly from the container wall, whereby substantially open  
10 and unobstructed access to the interior of the container at the rear end is ensured to permit use of the cartridge with a conventional gun, and the additional provision of the screw 20 enables the cartridge to be used as a self-contained dispenser  
15 as and if desired.

CLAIMS:

1. A cartridge for dispensing a fluent substance which comprises an elongate container (1) for holding the fluent substance to be dispensed, means (5) at one end of the container defining an outlet for the  
5 fluent substance, a piston (7) movable longitudinally within the container for expelling fluent substance through the outlet, a nut member (14) slidable within the container (1) between the piston (7) and the other end of the container, and abutment means (18) at the  
10 other end of the container for retaining the nut member, characterised in that the abutment means (18) comprise means (19) engageable with the periphery only of the nut member (14) whilst leaving the other end of the container (1) substantially open and unobstructed  
15 whereby the cartridge may be used in a gun or in conjunction with a separate screw (20) as a cartridge of the self-contained type.
2. A cartridge as claimed in Claim 1, wherein the abutment means (18) comprises at least one  
20 projection (19) which extends inwardly of the wall of the container adjacent the said other end.
3. A cartridge as claimed in Claim 1, wherein the container (1) comprises a lined or unlined spiral wound board container and said abutment means (18)  
25 is a metal ring secured to the wall of the container at the said other end, said ring including a flange (19) which surrounds and projects inwardly of

the said other container end for engaging the periphery of the nut member (14).

4. A cartridge as claimed in Claim 1, wherein the container (1) is a metal container and the  
5 abutment means (18) comprises an inwardly directed flange (19) at said other end of the container for engaging the periphery of the nut member (14).

5. A cartridge as claimed in Claim 1, wherein the container (1) is a metal or plastics container  
10 and said abutment means (18) comprises inwardly extending projections formed in the wall of the container adjacent the said other end thereof.

6. A cartridge according to Claim 1, wherein the container (1) is a plastics container and the  
15 said abutment means (18) comprises a flange (19) of plastics material which surrounds and projects inwardly of the said other end of the container for engaging the periphery of said nut member (14).

20 7. A cartridge as claimed in Claim 1, wherein the container (1) is a plastics container and said abutment means (18) comprises a metal ring secured to the container at the said other end and including a flange (19) which surrounds and projects  
25 inwardly of the said other end for engaging the periphery of the nut member (14).

8. A cartridge as claimed in Claim 1, wherein the piston (7) comprises a thin walled cup (8) which is a sliding sealing fit within the container (1), and

a washer (9) is interposed between the said piston (7) and said nut member (14).

9. A cartridge as claimed in Claim 8, wherein said washer (9) comprises a smooth concave face (9a) 5 opposed to said nut member (14), said face having a central annular seating (10) which surrounds a hollow boss (11), said washer (9) further comprising a perimetral rim (13) providing an interference fit within said cup (8) of said piston (7).

10 10. A cartridge as claimed in Claim 9, wherein the washer (9) further comprises stiffening ribs (12) on the opposite face thereof, said stiffening ribs (12) extending outwardly from said central boss (11) and abutting the base wall of said cup (8).

15 11. A cartridge as claimed in Claim 9, wherein the piston (7) and the washer (9) are combined as a single element.

12. A cartridge as claimed in Claim 8, wherein said nut member (14) comprises a central internally 20 screw-threaded boss (15), an outer cylindrical wall (17), and a rim (17a) frictionally engaged with the wall of said container (1), said outer cylindrical wall (17) of said nut member (14) being dimensioned so as to telescope within the said cup (8) of said piston (7).

25 13. A cartridge as claimed in Claim 12, wherein the nut member (14) further comprises stiffening ribs (16) connecting said boss (15) to said outer cylindrical wall (17) of said nut member (14).

