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PRESSURE GUN

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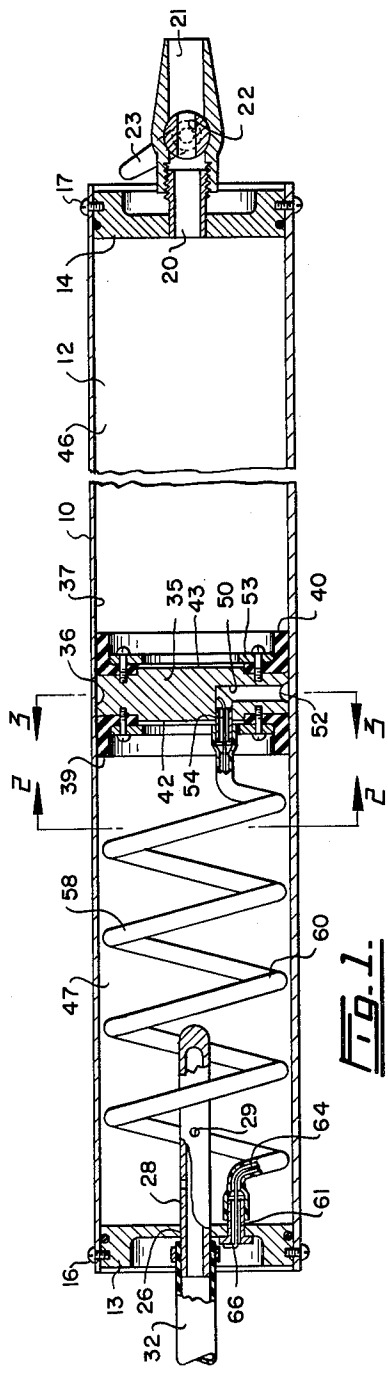

FIG. 1.

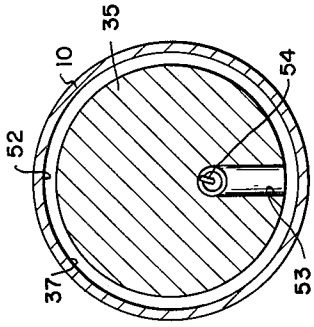

FIG. 3.

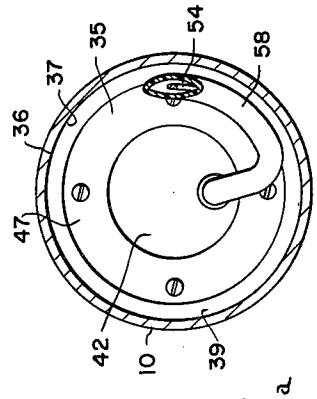

FIG. 2.

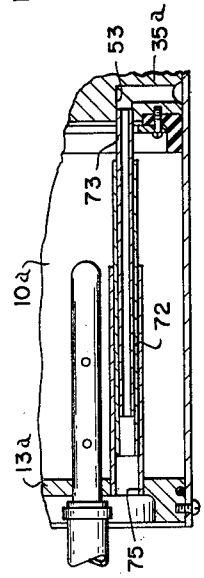

FIG. 4.

INVENTOR

JULIAN CLEON HOVELAND

BY

Featherstonhaugh & Co.

ATTORNEYS

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PRESSURE GUN

Julian Cleon Hoveland, North Surrey, British Columbia, Canada, assignor to M. D. Muttart, Edmonton, Alberta, Canada

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This invention relates to a pressure gun particularly for use in the application of mastic material in corners and cracks, but which may be used for any other desired purpose.

An object of the present invention is the provision of a pressure gun which holds a mastic or similar material to be discharged therefrom by fluid pressure, and which completely prevents the pressure fluid from getting into said material.

In the erection of houses and other buildings, what is known as a dry wall construction is commonly used. Instead of using wet plaster the inside walls are covered by plaster board which comes in large sheets. The cracks and joints between the sheets along the walls and in the corners are filled with a mastic material. Guns for directing the mastic into these joints have been in use for some time. Such guns consist of a cylinder with a free piston therein which is moved by air under pressure against the mastic to force it out through a discharge nozzle. The prior guns were not entirely satisfactory since it was impossible to keep the pressure air from getting past the piston into the mastic with the result that when the air reached the nozzle, the mastic instead of flowing out evenly and under control, spurted out and spattered all over the wall. In other words, the guns were not reliable.

The present invention overcomes this problem by providing means at the piston for trapping any pressure fluid attempting to move past the piston towards the mastic, and means for directing the trapped fluid out of the gun. As a result, the mastic always flows under control evenly from the gun.

A pressure gun according to the present invention comprises a cylinder closed at the ends thereof, and having a discharge outlet at one end and a pressure fluid inlet at the opposite end. The pressure fluid is usually air, but it may be a liquid, such as water. A piston is slidably mounted in the cylinder and is movable towards the outlet by pressure fluid entering the cylinder through said inlet. This piston has a peripheral wall slidable over the cylinder surface, and, usually, sealing means of the type commonly used for such pistons. Passage means is provided in the piston and opens through and around the peripheral wall thereof, and hose means within the cylinder and communicating with the piston passage means opens out through said cylinder near its inlet end to bring the passage means into communication with the atmosphere outside the cylinder. With this arrangement, the pressure in the passage means is the same as the atmospheric pressure outside the gun so that any pressure fluid moving past the piston flows into the comparatively low pressure area, and travels along the hose means to the outside atmosphere.

The hose means is preferably in the form of a flexible hose, and an important feature of this pressure gun is means therein for maintaining the hose in spiral formation so that said hose does not interfere with the return of the piston when it is desired to refill the gun.

Two forms of the invention are illustrated in the accompanying drawings, in which,

FIGURE 1 is a longitudinal section through a preferred form of pressure gun,

FIGURE 2 is a cross section taken on the line 2—2 of FIGURE 1,

FIGURE 3 is a cross section taken on the line 3—3 of FIGURE 1, and

FIGURE 4 is a fragmentary sectional view similar to FIGURE 1, illustrating an alternative form of a pressure gun.

Referring to FIGURES 1 and 3 of the drawings, **10** is a pressure gun including a cylinder **12** of any desired cross sectional shape, usually circular as shown. This cylinder has end walls **13** and **14** removably mounted therein. In this example end walls **13** and **14** fit within the cylinder ends and are removably retained therein respectively by screws **16** and **17**. A discharge outlet in the form of a pipe **20** is provided at end wall **14**, said pipe extending through and being carried by said wall. A nozzle **21** is connected to the outer end of pipe **20**, and has a control valve **22** therein which is operated by means of a handle **23**.

A pressure fluid inlet **26** is provided at the opposite end of cylinder **12**, preferably in end wall **13** centrally thereof. A stiff tube **28** extends through inlet **26** and is carried by wall **13**. This tube extends a short way into the cylinder, and has a plurality of apertures **29** therein. A flexible hose **32** extending from a suitable source of fluid under pressure is removably connected to the outer end of tube **28**. The fluid for guns of this type is usually air, in which case, the hose extends from a compressor, pressure tank or air bottle.

A piston **35** is slidably mounted in cylinder **12** and has a peripheral wall **36** which is slidable over the inner surface **37** of said cylinder. Piston **35** is provided with standard sealing cups **39** and **40** on its opposite ends **41** and **42** slidably to engage cylinder wall **37**. The piston divides the cylinder into a material chamber **46** and a pressure chamber **47**, the respective sizes of which vary during movement of the piston. Material chamber **46** is at the outlet **20** end of the cylinder, while pressure chamber **47** is at the inlet **26** end of said cylinder. Fluid under pressure entering chamber **47** from hose **32** moves piston **35** against material in chamber **46** to force said material through outlet **20** and nozzle **21** when valve **22** is open.

Passage means **50** is provided in piston **35** which opens through and around the peripheral wall **36** thereof. In this example, the passage means includes a groove **52** in wall **36** extending around the piston and opening outwardly therefrom, and at least one passage **53** extending inwardly from said groove towards the centre of the piston and opening out at **54** through the end **42** thereof. Although a groove is preferred, a plurality of holes may be provided instead of groove **52**, said holes opening out from the peripheral wall **36**.

Hose means is provided within cylinder **12** communicating with passage means **50** and opening out through the cylinder near the inlet end **13** thereof. This hose means is preferably in the form of a flexible hose **58** which is connected to the end **54** of passage **53** of piston **35**. This hose is wound in a spiral, indicated at **60**, and opens out through end wall **13** at **61**. Although the hose **58** does not have to be wound in a spiral, it is preferably so wound so that when piston **35** is moved towards end wall **13**, the hose will not interfere with this action or be caught and perhaps damaged. Furthermore, it is highly desirable to provide means for maintaining hose **58** in its spiral formation. This is accomplished in a very simple manner by a stiff flexible wire **64** connected to and extending along the hose in a spiral. The simplest way to attain the desired results is to extend wire **64** through the hose as shown. When hose **58** and wire **64** are wound into spiral **60**, they remain in that formation as a result of the stiffness of the wire. If desired, one end of wire

64 may be anchored to prevent it from being displaced from the hose, as indicated at 66 in FIGURE 1.

Hose 58 keeps groove 52 and passage 53 of the passage means 50 of piston 35 in communication with the atmosphere outside cylinder 12. As fluid under pressure is directed by hose 32 into chamber 47 of the gun, the piston is moved against the material in chamber 46 to keep it under pressure. Thus, when valve 22 is opened, the material flows through nozzle 21. The fluid of chamber 47, usually air, attempts to move past piston 35 into chamber 46. However, groove 52 provides a comparatively low pressure area so that any such fluid, taking the path of least resistance, flows into the groove, along hose 58 and out of the gun. Therefore, the piston passage means and hose 58 prevents any of the pressure fluid from reaching chamber 46.

When chamber 46 is empty, piston 35 is moved back towards end wall 13 to enable the chamber to be filled again. The spiral formation of hose 58 prevents said hose from getting in the way or being damaged during this action. The stiff wire 64 ensures the hose remaining in its spiral configuration without interfering with the operation of the hose or the movement of piston 35.

FIGURE 4 illustrates an alternative pressure gun 10*a* in which the hose means is in the form of a telescopic tube 72 connected at 73 to the outer end of passage 53*a* of piston 35*a*. Telescopic tube 72 opens out at 75 through end wall 13*a* of cylinder 12*a*. Otherwise, gun 10*a* is constructed in the same manner as gun 10.

When gun 10*a* is in operation, it functions in the same way as gun 10, but as piston 35*a* is moved away from and towards cylinder end 13*a*, telescopic tube 72 respectively lengthens and shortens accordingly.

What I claim as my invention is:

In a pressure gun including a cylinder closed at its ends with a discharge outlet at one end and a fluid inlet at its opposite end and a piston having a peripheral wall and mounted slidably in the cylinder to be moved by a pressure fluid forced into the cylinder at the fluid inlet, a low pressure area in the piston opening out therefrom around the peripheral wall of the piston and spirally wound hose means positioned in the cylinder between the fluid inlet and the piston and connected to the low pressure area of the piston at its one end and opening out through the end of the cylinder near the fluid inlet to maintain the low pressure area of the piston in constant communication with the atmosphere outside the cylinder, such low pressure area being adapted to trap any pressure fluid moving past the piston and to direct such trapped fluid to the hose means.

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