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(54) RELIEF VALVE FOR A GREASE GUN

(76) Inventor: **Tien-Chen Tung**, Taipei City (TW)

Correspondence Address:
BRUCE H. TROXELL
SUITE 1404
5205 LEESBURG PIKE
FALLS CHURCH, VA 22041 (US)

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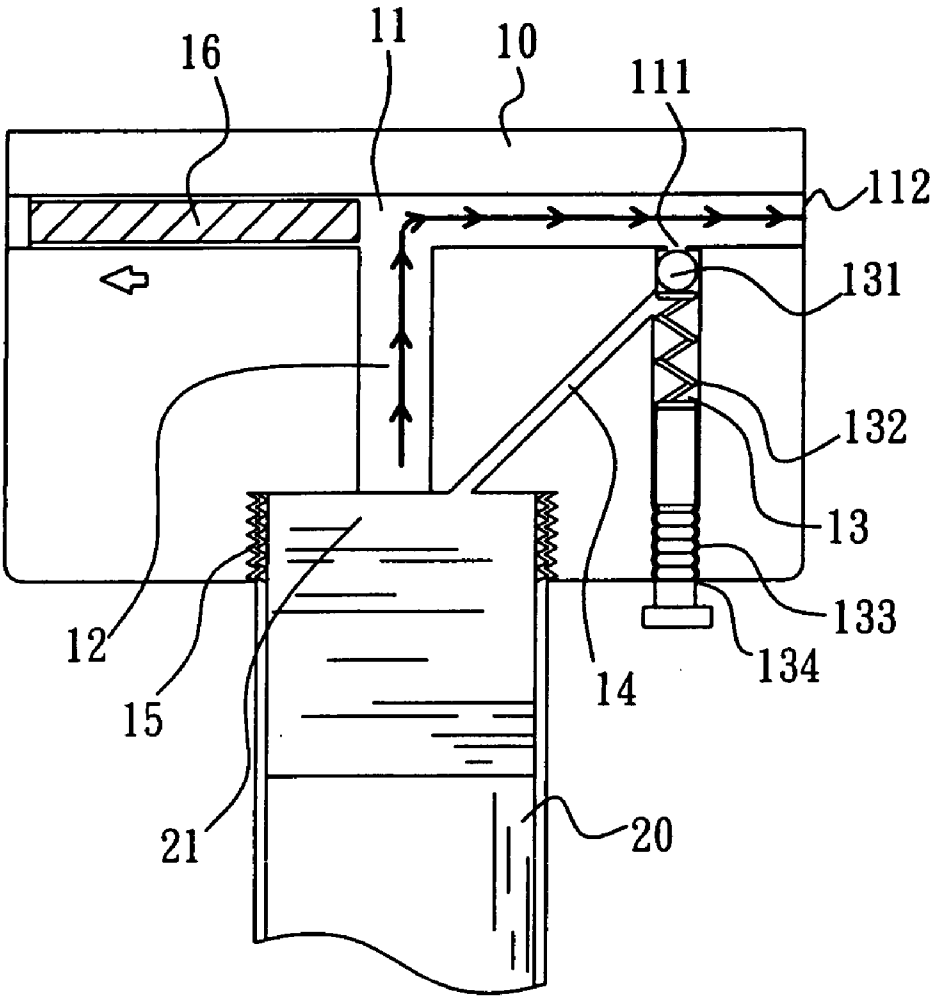
(57) **ABSTRACT**

A grease gun includes a relief valve and a grease barrel. The relief valve has a main member associated with the grease barrel. The main member further includes a compression passage with a relief outlet and a first opening, a first passage communicating the with compression passage at one end thereof and being joined to the barrel opening with the another end thereof, a second passage communicating with the relief outlet at one end thereof and having a second opening communicating with outside of the main member for receiving a ball, an elastic element and a screw rod and a third passage communicating with the second passage at one end thereof and joining the barrel opening at another end thereof. Once the screw rod is adjusted the length thereof in the second passage for regulating compression amount of the elastic element, the force of the ball for blocking the relief outlet is capable of being controlled.



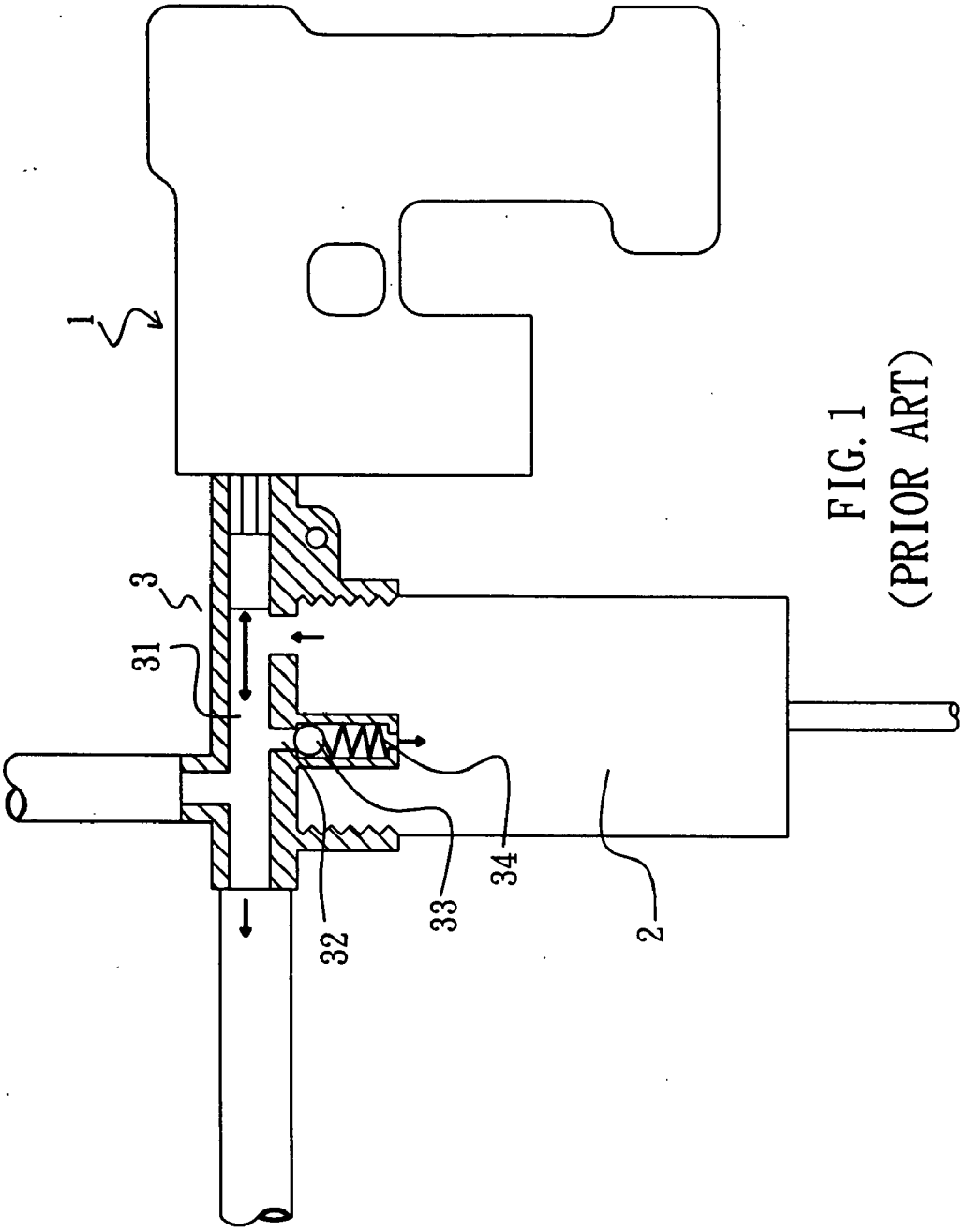


FIG. 1
(PRIOR ART)

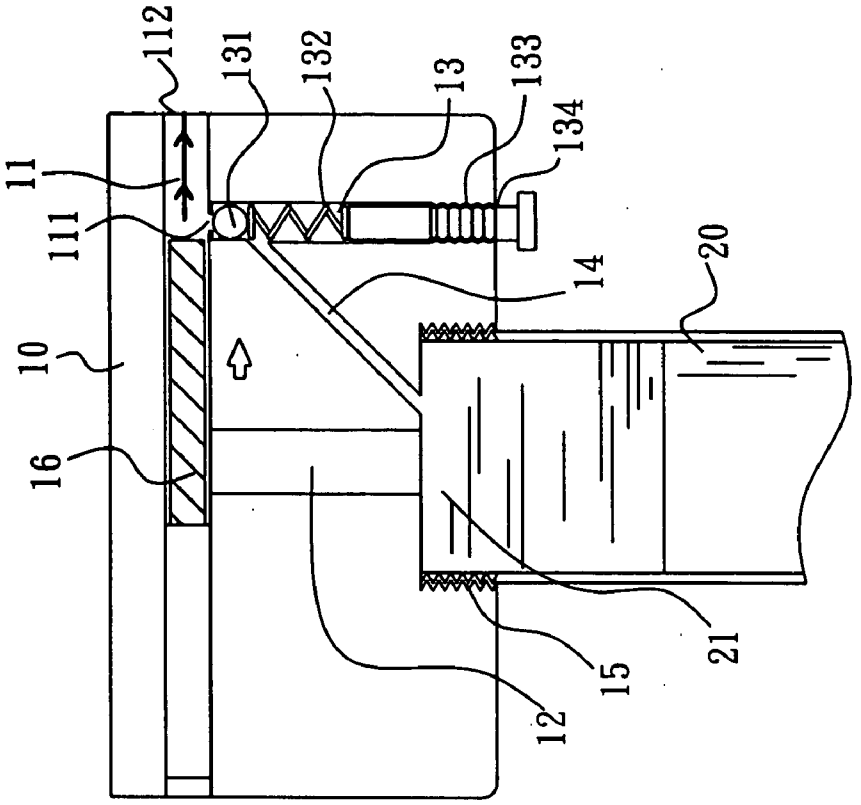

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FIG. 3

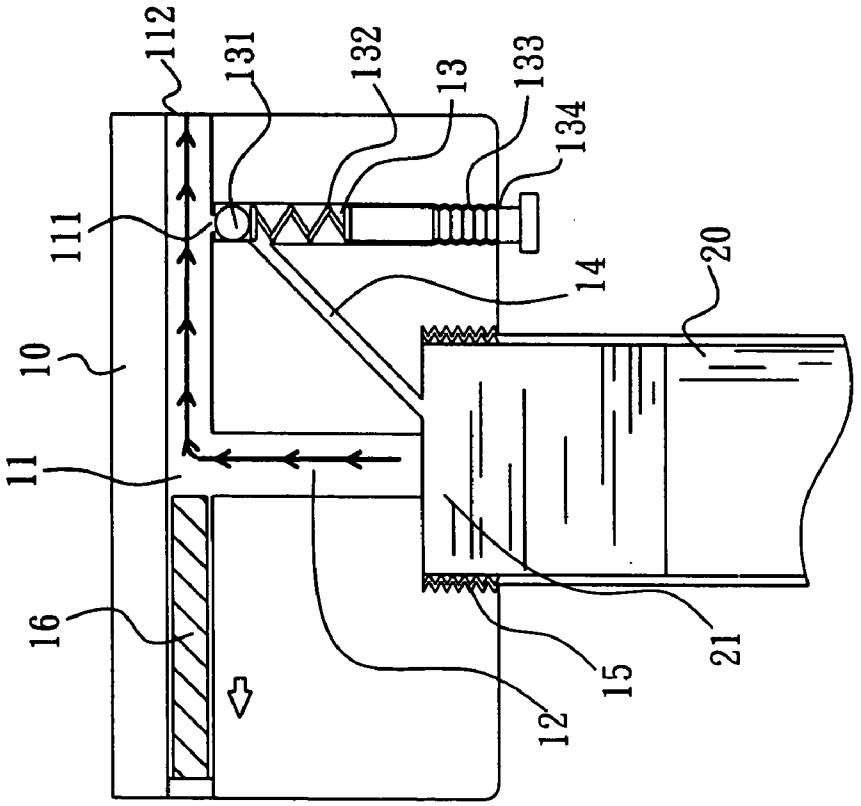
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FIG. 2

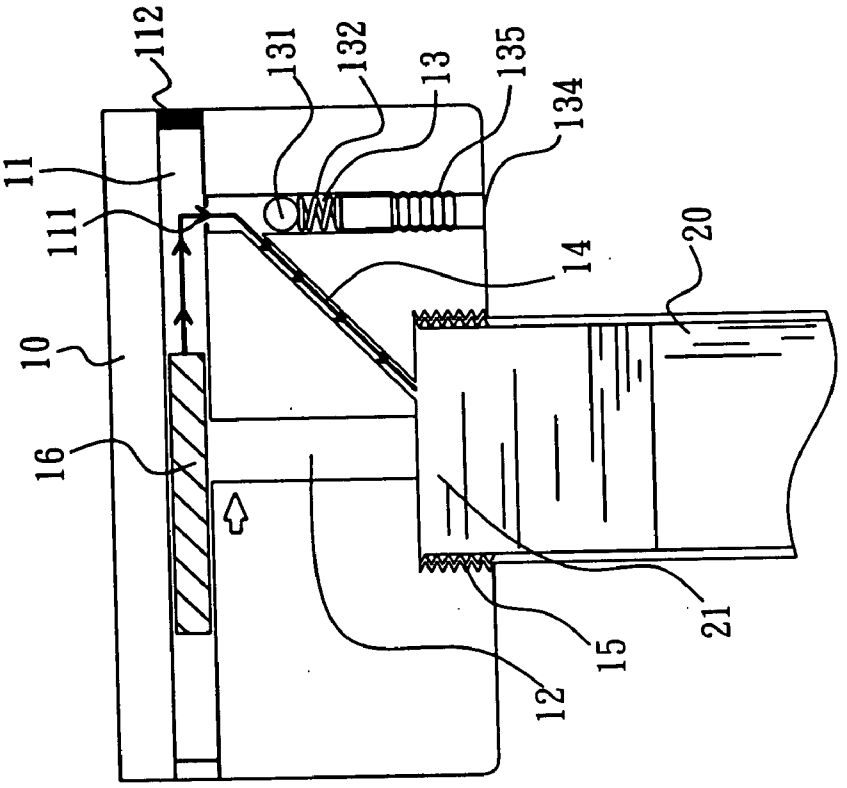
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FIG. 5

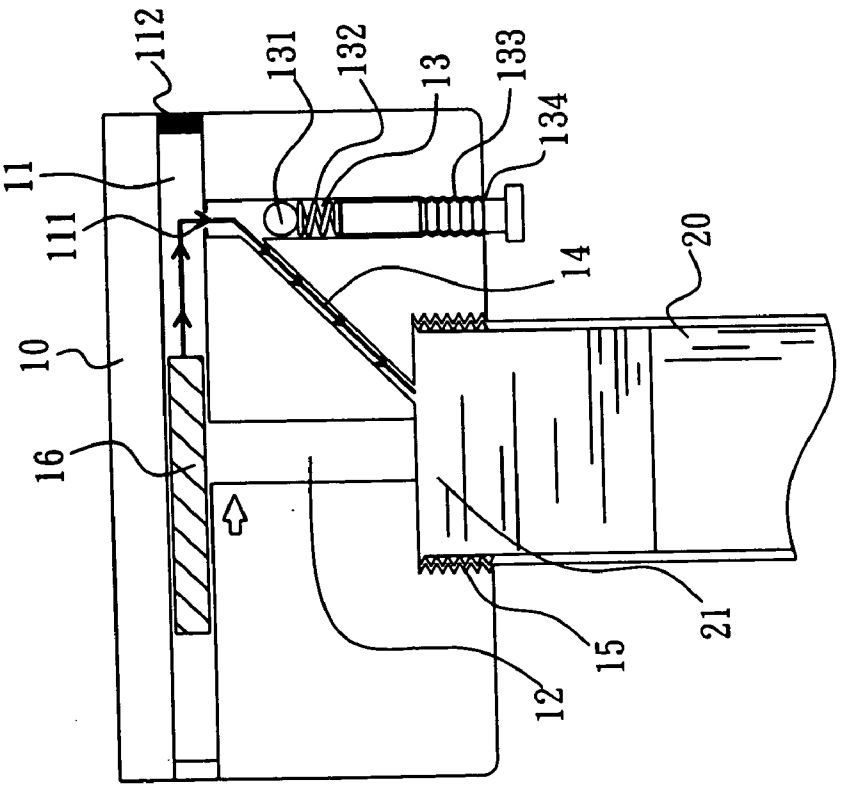
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FIG. 4

RELIEF VALVE FOR A GREASE GUN

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention is related to a grease gun for the grease being injected into a machine or apparatus and particularly to a relief valve for an electric or pneumatic grease gun.

[0003] 2. Brief Description of Related Art

[0004] Patents such as U.S. Pat. No. 5,779,05, U.S. Pat. No. 4,219,131 and U.S. Pat. No. 4,063,618, U.S. Pat. No. 4,062,425 disclose a grease gun with a relief device. However, the preceding US patents do not disclose structure with regard to grease being moving back the grease barrel. It is known that it is wasteful to discharge the grease outside the grease gun with the relief device and it pollutes the environment and makes dirty to the user if the discharged grease is left outside.

[0005] Referring to **FIG. 1**, Issue No. 242941 of Taiwanese Patent Official Gazette discloses an electric grease gun, which provides a feature that an automatic relief outlet **32** is located near the outer opening of the compression passage **31** at the cover **3** on the grease barrel **2**. A ball **33** is disposed in the relief outlet **32** with being biased by a spring **34**. Due to the relief outlet **32**, grease with excessive pressure is pushed back to the grease barrel **2** to secure the grease gun **1** being not damaged.

[0006] The preceding grease gun disclosed in the Taiwanese patent Issue No. 242941 provides a fixed relief pressure, which it is incapable of being adjusted in accordance with actual need, although the function of grease discharging back the grease barrel can be performed. That is, the grease has to be moved back the grease barrel once the pressure of the grease exceeds the fixed pressure in spite of the grease being not filled with the compression passage. As a result, it is inconvenient while in use.

SUMMARY OF THE INVENTION

[0007] An object of the present invention is to provide a relief valve for a grease gun with which the relief pressure can be adjusted based on need.

[0008] Another object of the present invention is to provide a relief valve with which the relief pressure can be adjusted conveniently for broadening the application thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The present invention can be more fully understood by reference to the following description and accompanying drawings, in which:

[0010] **FIG. 1** is a plan view of a conventional relief valve for a grease gun;

[0011] **FIG. 2** is a plan view of a relief valve for a grease gun according to the present invention;

[0012] **FIG. 3** is a plan view illustrating the relief valve of the present invention being in a state prior to pressure relief;

[0013] **FIG. 4** is a plan view illustrating the relief valve of the present invention being in a state of pressure relief; and

[0014] **FIG. 5** is a plan view of another embodiment of a relief valve for a grease gun according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] Referring to **FIGS. 2, 3** and **5**, a relief valve for a grease gun according to the present invention includes a main member **10** with a compression passage **11**, a first passage **12**, a second passage **13**, a third passage **14** and an opening **15** associated with a grease barrel **20**. The compression passage **11** has a relief outlet **111** and an external opening **112** communicating with the main member **10**. A plunger **16** is received in the compression passage **11**. The relief outlet **111** is disposed near the external opening **112**. The first passage **12** communicates with the compression passage **11** and the opening **15** at both ends thereof respectively. The second passage **13** has a relief outlet **111** at an end thereof to communicate with the compression passage **11** and has an external opening **134** at another end thereof at the bottom of the main member **10**. The second passage **13** receives a ball **131** and an elastic element **132** and engages with a screw rod **133**. The screw rod **133** has a head end extends outward the external opening **134**. Alternatively, an end of the screw rod **133** is in the second passage **13** instead of the head end as shown in **FIG. 5**. The screw rod **133** biases an end of the elastic element **132** at another end thereof and the other end of the elastic element **132** biases the ball **131** such that the ball **131** can block the relief outlet **111** with a force. The third passage **14** communicates with the second passage **13** and the opening **15** at both ends thereof respectively.

[0016] The opening **15** is joined to an opening **21** of the grease barrel **20**. When the plunger **16** moves leftward along the direction of the arrow shown in **FIG. 2**, the grease in the grease barrel **20** enters the compression passage **11** via the first passage **12**. When the plunger **16** moves rightward along the direction of the arrow shown in **FIG. 3**, the grease in the compression passage **11** is pushed to discharge via the opening **112**.

[0017] Referring to **FIG. 4**, in case of the compression passage being full with the grease and incapable of discharging via the opening **112**, pressure at relief outlet **111** is greater than the force of the elastic element **132** biasing the ball **131** and the grease pushes the ball **131** away the block position such that the grease moves back to the grease barrel **20** via the third passage **14**. In this way, the grease gun would not be hurt by pressure rise in compression passage **11**.

[0018] The screw rod **133** can be turned with a screw driver or fingers to adjust the length thereof in the second passage **13** so such the compression amount of the elastic element **132** is regulated to control the force of the ball **131** blocking the relief outlet **111** for meeting different pressure requirements of grease injections. Due to the screw rod **133** providing a head end extending outward the main member, it is convenient for the user regulating relief pressure.

[0019] While the invention has been described with referencing to preferred embodiments thereof, it is to be understood that modifications or variations may be easily made without departing from the spirit of this invention, which is defined by the appended claims.

What is claimed is:

1. A relief valve for a grease gun, comprising:

a main member; and

a grease barrel with a barrel opening, being associated with the main member;

wherein, the main member further comprises:

a compression passage, having a relief outlet and a first opening communicating outside the main member and near the relief outlet, receiving a plunger, which slidably moves back and forth;

a first passage with two ends, communicating the with compression passage at one of the ends and being joined to the barrel opening with the other one of the ends;

a second passage with two ends, communicating with the relief outlet at one of the ends thereof and having a second opening communicating with outsides of the main member, receiving a ball, which is biased by an end of an elastic element, engaging with a screw rod, which presses against another end of the elastic element, for the ball having a force to maintain a state of blocking the relief outlet; and

a third passage with two ends, communicating with the second passage at one of the ends and joining the barrel opening at the other one of the ends;

whereby, once the screw rod is adjusted the length thereof in the second passage for regulating compression amount of the elastic element, the force of the ball for blocking the relief outlet is capable of being controlled.

2. The relief valve for a grease gun as defined in claim 1, wherein the screw rod has a head end extending outward the second passage.

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