Nov. 22, 1966 R. L. LLOYD 3,286,506

SAMPLING PUMP

Filed May 20, 1964

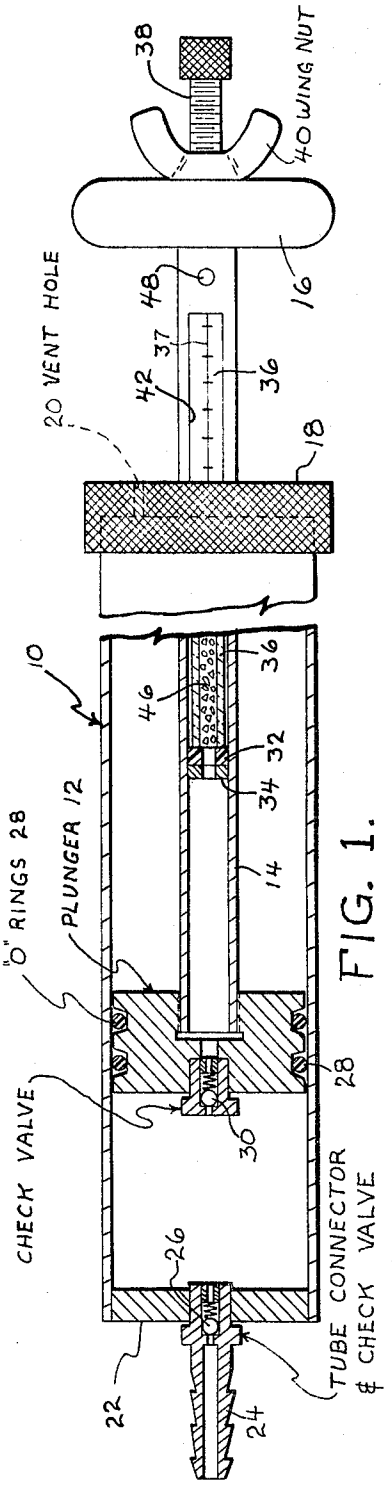

FIG. 1.

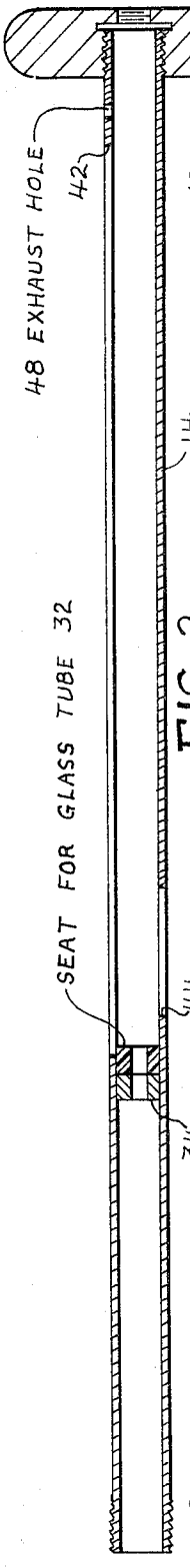

FIG. 2.

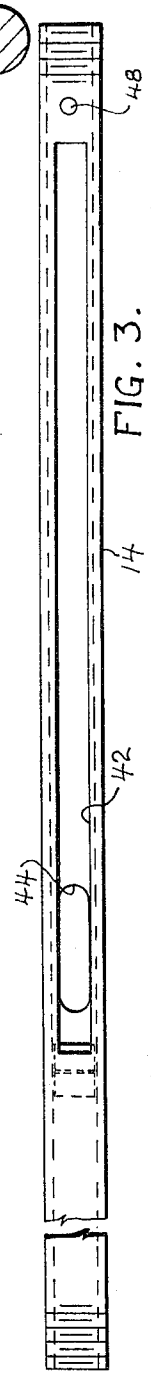

FIG. 3.

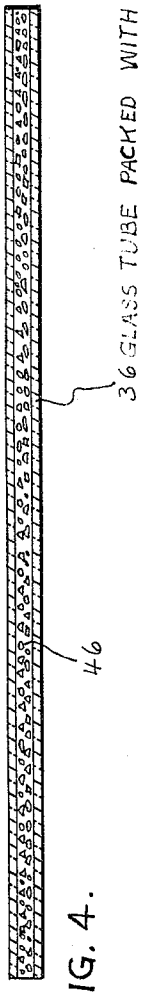

FIG. 4.

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SAMPLING PUMP

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1 Claim. (Cl. 73—23)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

The present invention relates to a pump to take a sample of air or other gas and test it to determine how much of a certain contaminant it contains. The sampling pump is of low-cost construction and simple to operate for quick on-the-spot testing.

In the drawings:

FIG. 1 is a side view of the pump with parts in cross section.

FIG. 2 is a view of the hollow piston rod.

FIG. 3 is a view of the hollow piston rod taken at right angles to the view of FIG. 2; and

FIG. 4 is a view of the glass tube containing an indicating compound and adapted to be inserted in the hollow piston rod.

Sampling pump casing **10** has a plunger **12** mounted on plunger rod **14** for manual reciprocation by the hand piece **16**. The pump is closed at one end by cap **18** with a vent hole **20** therein. The pump is closed at the other end by cap **22** having a tube connector **24** and check valve **26** therein. Plunger **12** has sealing O rings **28** and check valve **30** mounted thereon. Plunger rod **14** has a resilient seat **32** and a stop member **34** mounted therein to limit movement of glass tube **36**. The glass tube is calibrated along its length with visible indicia **37** and is further secured against movement in the opposite direction by threaded screw **38** and wing nut **40** which may be adjusted to press tube **36** gently against resilient seat **32**.

Plunger rod **14** has a slot **42** and an oval shaped hole **44** through which glass tube **36** with its indicating compound **46** may be viewed. The compound **46** may be secured in glass tube **36** by any means desired. Exhaust hole **48** is drilled near the end of plunger rod **14**.

OPERATION

The sampling pump is preferably transported to the site where it is to be used with the glass tube cartridge **36** removed from the pump casing **10** and sealed against contamination of the indicating compound **46**. At the site where the air is to be tested the plunger is reciprocated repeatedly to draw in the air to be sampled at **24** and to exhaust the air through exhaust hole **48** (and slot

42). When the pump is fully charged with air to be sampled, with the plunger **12** pulled all of the way toward cap **18**, the calibrated glass tube **36** with indicating compound **46** is inserted in plunger rod **14**. Hand piece **16** is attached to rod **14** and screw **38** is adjusted to prevent end movement of tube **36**. Plunger **12** is then pushed to its limit toward cap **22**. With this movement, the predetermined volume of sample air in pump casing **10** ahead of plunger **12** is forced thru check valve **30** into plunger rod **14**, thru glass tube **36** and indicating compound **46** and out thru exhaust hole **48**. Plunger rod **14** may then be pulled back. The extent of discoloration or other change in compound **46** may then be observed thru viewing slot **42** and hole **44**. With the aid of calibrations **37** on the side of glass tube **36** the operator may determine the relative amount of contaminating or other types of impurities in the air.

I claim:

A pump for testing a sample of a gas comprising:

a pump casing;

a plunger reciprocably mounted in the casing;

a hollow plunger rod having a cut-away area attached to the plunger and reciprocably mounted in the casing;

a glass tube with graduated indicia thereon viewable through said cut-away area and mounted in the hollow plunger rod;

a removable closure for the plunger rod that may be removed so that the glass tube may be inserted in the plunger;

a color-changeable indicating compound in the glass tube;

a valve means for the pump operative to admit a sample of air to be tested to the pump as the plunger is reciprocated in one direction;

and valve means for the plunger to admit the sample to the glass tube and the indicating compound as the plunger is reciprocated in a second direction to change the color of the compound in accordance with the characteristics of the air sample.

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