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L. PERLAKY ET AL

3,548,660

HUMIDITY-SENSING CLOSURE FOR A CONTAINER

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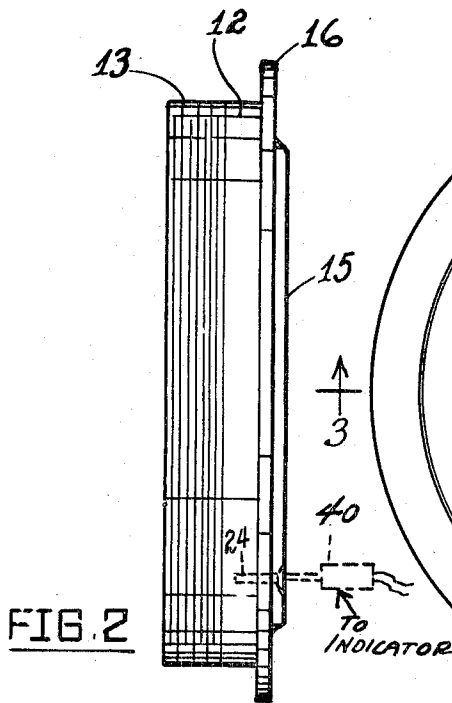


FIG. 2

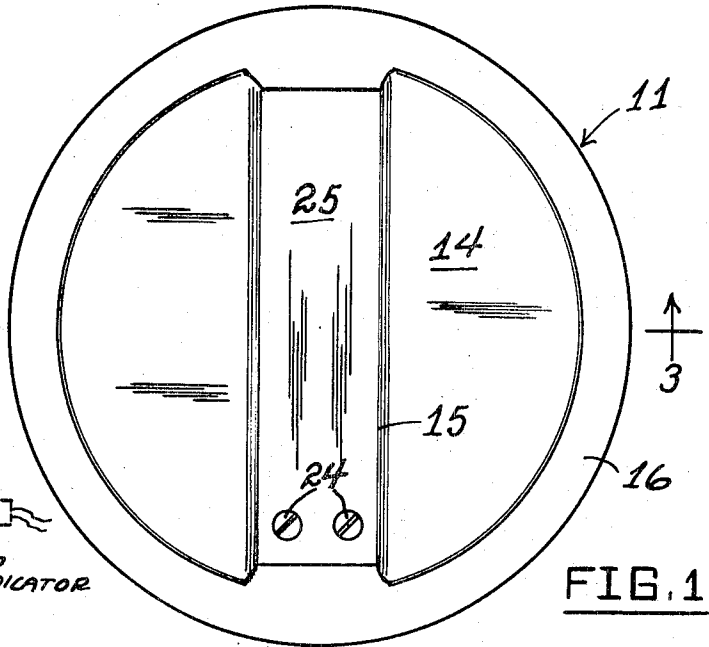


FIG. 1

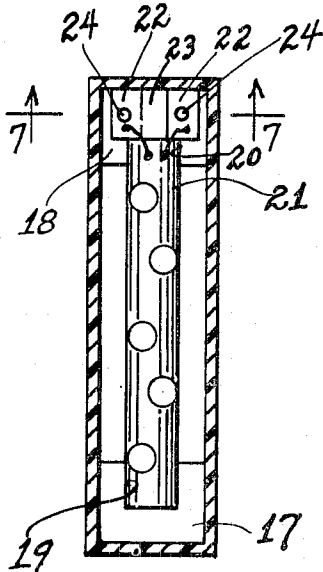


FIG. 4

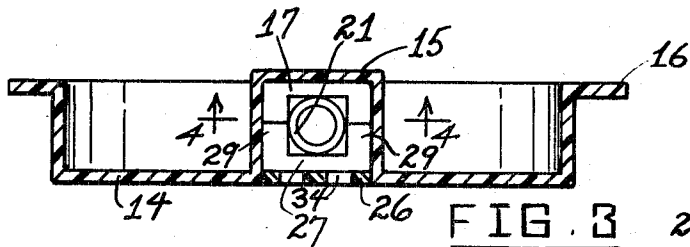


FIG. 3

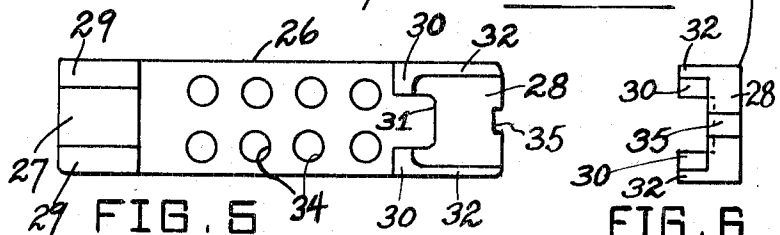


FIG. 5

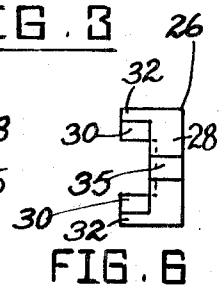


FIG. 6

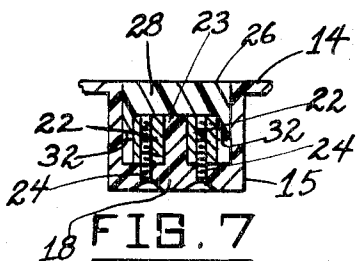


FIG. 7

INVENTORS

LEOPOLD PERLAKY
CARLTON E. OHLHEISER

BY *Herman Z Gordon*

ATTORNEY

1

2

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HUMIDITY-SENSING CLOSURE FOR A CONTAINER

Leopold Perlaky, Lanham, and Carlton E. Ohlheiser,
Silver Spring, Md., assignors to Hygro Dynamics, Inc.,
Silver Spring, Md.

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6 Claims

ABSTRACT OF THE DISCLOSURE

A closure for a solid rocket fuel container consisting of a threaded plug with a diametral hollow inwardly facing handle. Mounted in the handle is an electrical humidity sensing element which is thereby exposed to the interior of the container. A pair of contact blocks are mounted in the handle and are electrically connected to the terminals of the sensing element. The blocks are held in place by respective screws whose heads are exposed at the outside face of the handle so that they may be engaged by the prongs of the contact probe of a humidity indicating device.

This invention relates to covers for containers, and more particularly to a cover for a solid fuel container wherein the cover is provided with means for detecting and measuring moisture in the container.

A main object of the invention is to provide a novel and improved moisture-detecting cover for a fuel container, said cover being simple in construction, being easy to install, and being so arranged that the humidity in the associated container can be measured without opening the container.

A further object of the invention is to provide an improved moisture-detecting cover for a container, said cover being inexpensive to manufacture, being compact in size, and being durable in construction.

A still further object of the invention is to provide an improved moisture-detecting cover for a fuel container, or the like, the cover being substantially of unitary molded construction and having an integral handle, and the cover being arranged to receive an electrical humidity-sensing element and to support the sensing element so that it is exposed to the interior of the associated container while allowing electrical access to the sensing element at any time without the necessity of removing the cover from the container.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIG. 1 is a front elevational view of an improved moisture-detecting cover constructed in accordance with the present invention.

FIG. 2 is a side elevational view of the cover shown in FIG. 1.

FIG. 3 is a cross-sectional view taken substantially on line 3—3 of FIG. 1.

FIG. 4 is a cross-sectional view taken substantially on line 4—4 of FIG. 3.

FIG. 5 is a plan view of a closure plate for the hollow handle of the cover of FIGS. 1 to 4.

FIG. 6 is an end elevational view of the closure plate of FIG. 5.

FIG. 7 is a cross-sectional view taken substantially on line 7—7 of FIG. 4.

Referring to the drawings, 11 generally designates an improved cover or closure plug constructed in accordance with the present invention. The closure plug 11 is

adapted to be employed with a solid rocket fuel container, or the like, and comprises a generally cylindrical main body 12 having external threads 13 which are threadably engageable with corresponding internal threads in the closure aperture of the associated container. The body 12 is provided with the generally circular main wall 14 and is integrally formed with a diametrically located transverse hollow handle 15. Body 12 is formed with an annular peripheral outwardly projecting stop flange 16. As shown in FIGS. 2 and 3, the hollow transverse handle 15 projects outwardly (to the right, as viewed in FIG. 2) beyond the plane of stop flange 16, whereby to facilitate grasping the handle.

The inside of the handle 15 is integrally formed with opposite end blocks 17 and 18, recessed at 19 and 20 to receive the opposite end portions of a conventional electrical humidity-sensing element 21, which may be of the bifilar-wound type and which is of elongated generally cylindrical shape. The terminal wires of the element 21 are connected to respective metal terminal blocks 22, 22 which are secured on opposite sides of an intervening rib 23, integral with handle 15, by means of respective terminal screws 24, 24 engaged through the outer main wall 25 of the handle and threadably engaged with the metal blocks 22, 22. The screws 24, 24 have flat heads which are exposed externally of handle 15 and which may be contacted by the prongs of a conventional indicator probe 40, whereby to connect the element 21 to an external humidity indicating circuit whenever a reading of the humidity inside the associated container is to be made.

An apertured retaining cover plate 26 is frictionally secured in the hollow handle 15, said cover plate having thickened opposite end portions 27 and 28 formed with respective pairs of legs 29, 29 and 30, 30 spaced so as to receive the respective opposite end portions of the sensing element 21 therebetween. The legs 29, 29 are adapted to substantially abut the integral end block 17, with the adjacent end portion of element 21 snugly received between said legs. The thickened portion 28 is adapted to abut the rib 23 with the adjacent end portion of element 21 received in a recess 31 provided between legs 30, 30. The legs 30, 30 have reduced longitudinal portions 32, 32 snugly received between the metal blocks 22 and the side walls of the hollow handle 15, as shown in FIG. 7.

The plate 26 has a tight frictional fit within handle 15 and has a plurality of vent apertures 34 to provide free exposure of the sensing element 21 to the interior of the associated container. The end of plate 26 is provided with a release notch 35 adapted to receive the blade of a screw driver or similar implement for prying the cover plate 26 out of the handle whenever access is desired to the sensing element 21.

The closure plug body and the retaining plate 26 are made of any suitable insulating material having adequate strength and sealing properties.

In operation, with the closure plug or cover 11 screwed in place in the closure aperture of the associated container, the humidity in the container can be measured at any time by contacting the heads of the screws 24, 24 with the test prongs of a probe 40 connected to a conventional electrical humidity indicating instrument, for example, of the type responding to changes in conductivity of the conventional electrical sensing element 21 to provide a corresponding quantitative humidity reading.

While a specific embodiment of an improved humidity-sensing closure for a container has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art.

3

What is claimed is:

1. A humidity-sensing closure for a container comprising a closure body having a main wall, said main wall being formed with a hollow handle portion defining an outwardly exposed hand grip, an electrical humidity-sensing element mounted in said hollow handle portion so as to be exposed to the interior of a container with which the closure is employed, and a pair of conductive terminal members electrically connected to said sensing element and secured to said handle portion, said terminal members having externally exposed portions adapted to be contacted by external probe elements, and wherein said terminal members comprise respective metal blocks seated in said handle portion and headed terminal screws extending through the outer wall of said handle portion and being threadedly engaged with said metal blocks, said externally exposed portions comprising the heads of the screws.

2. The humidity-sensing closure of claim 1, and wherein said handle portion and sensing element are of elongated shape and said sensing element is mounted substantially lengthwise in said handle portion.

3. The humidity-sensing closure of claim 2, and wherein the outer wall of said handle portion is provided with thickened block elements at its opposite ends,

4

said block elements having recesses receiving the opposite ends of the sensing element.

4. The humidity-sensing closure of claim 3, and wherein one of the block elements is formed with a spacer rib, said metal blocks being located on opposite sides of said spacer rib.

5. The humidity-sensing closure of claim 4, and an apertured cover plate mounted on said main wall of the closure body and overlying said sensing element.

6. The humidity-sensing closure of claim 5, and wherein said apertured cover plate is engaged inside said hollow handle portion.

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LOUIS R. PRINCE, Primary Examiner

D. E. CORR, Assistant Examiner

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