Sept. 28, 1965 I. MARKEVITCH 3,208,203

DEHYDRATOR

Filed May 14, 1962

Fig. 1

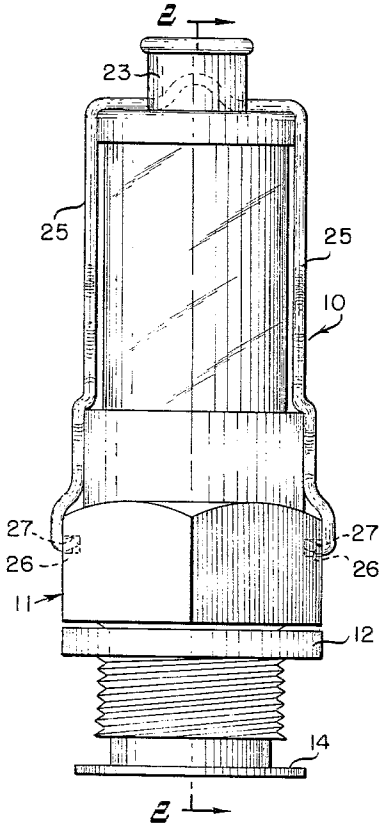


Fig. 2

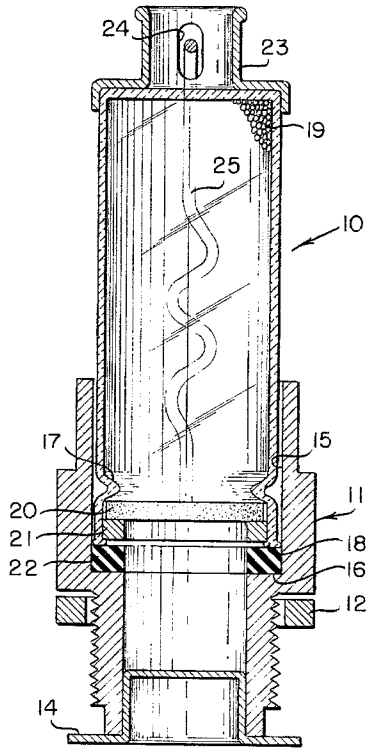
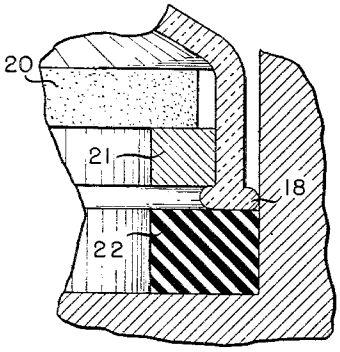


Fig. 3



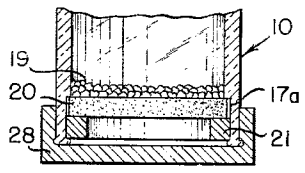


Fig. 4

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DEHYDRATOR

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4 Claims. (Cl. 55—387)

This invention relates to a dehydrator and, more particularly, to a dehydration plug and a container for dehydrating material used in such a plug.

Dehydrators containing moisture absorbing materials have heretofore been attached to closed structures in gaseous communication therewith for the purpose of removing moisture from the interior of such structures. In a particular application, dehydrator plugs containing a desiccant have been screwed into the openings for spark plugs in internal combustion engines so that the desiccant therein is in communication with the interior of the engine through a moisture permeable member to thereby permit absorption of moisture and prevent corrosion on internal metal surfaces which is normally incident to exposure of such surfaces to moisture over extended periods of time such as during transportation or storage. Dehydrator plugs used for the last mentioned purpose have heretofore been unsatisfactory or very complicated. In certain types of plugs, it has been necessary to unscrew the plug from the engine to replace the desiccant.

It is an important object of this invention to provide a highly effective and uncomplicated dehydrator plug.

It is another object of the invention to provide a dehydrator plug so constructed that the desiccant can be replaced without removing the plug from the socket for the spark plug.

It is a particular object of the invention to provide a novel container for desiccants used in dehydrator plugs.

Other advantages and features of the invention will be apparent from the illustrative embodiment of the invention shown in the accompanying drawings and more fully described by reference thereto.

In the drawings:

FIG. 1 is a side elevational view of a dehydrator plug adapted for screwing into the socket for a spark plug;

FIG. 2 is a longitudinal sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is an enlarged fragmentary view of the open end of a tubular desiccant container having a moisture permeable disc positioned in the end thereof and seated on a sealing gasket; and

FIG. 4 is a fragmentary view of the open end of a container filled with desiccant and provided with a moisture impermeable cap.

Referring to the drawings, the dehydrator plug is composed of two principle elements, a container, or cartridge, for the desiccant generally designated as **10** and plug element, or portion, generally designated as **11**. The plug element may be molded from a high temperature polypropylene or from a phenolic resin. The plug element **11** has an axial passageway and is generally shaped like the plug portion of a spark plug having a conventional hexagonal exterior configuration and is threaded to fit into the opening for a spark plug. A conventional annular washer **12**, such as one made of neoprene, or other resistant and resilient material, is provided to establish a fluid tight seal between the ambient atmosphere and the interior of the motor or the like. A plug **14** is provided to seal the threaded end of the dehydrator against the ingress of atmospheric moisture when the plug is not in use.

The upper end of plug portion **11** of the dehydrator is provided with a bore **15** terminating in an annular shoulder **16** and designed to receive a container for a desiccant.

As shown, the container for the desiccant **10** is a flat bottomed tube, advantageously made of glass, and is provided, near its open end, with an annular inwardly extending collar **17** and the open end has a small internally extending annular lip **18**. When filling the container **10** for use in the dehydrator, it is positioned so that the open end is facing upward and a desiccant **19**, typically silica gel, is introduced thereinto. Then a moisture permeable disc **20**, such as sintered bronze or a suitable ceramic, having a diameter less than that of the annular lip **18** and greater than that of the annular collar **17** is placed in and across the open end of the tube **10** to hold the desiccant within the tube when it is inverted. Disc **20** is held in the tube and in contact with collar **17** by a resilient annular ring **21** fitting sungly within the open end of tube **11** and anchored against lip **18**.

In assembling the dehydrator, the container **10** is inverted and inserted into bore **15** so that the open end thereof is positioned on an annular resilient sealing gasket **22** positioned on shoulder **16**. The bottom of the tube **10** is provided with an upstanding open-ended metal cap **23** having oppositely positioned slots **24** for the receipt of retainer spring **25**. The cartridge is held in sealed relation with sealing gasket **22** by having the arms of spring **25** of such a length that a moisture impermeable seal is established between the open end of the container **10** and gasket **22** when the spring is put under sufficient tension for the upwardly extending ends **26** to be inserted in mating holes **27**.

A study of the drawing makes it apparent that the diameter of bore **15** is related to the diameter of container **10** and its annular lip **18** so that disc **20** and annular collar **21** would be held in the bore **15** by shoulder **16** should they accidentally be dislodged.

It will also be apparent from the foregoing description that container **10** and its desiccant content may be easily removed from plug portion **11** without unscrewing the plug portion from its seat. In this way, the exhausted, or impaired, desiccant may be easily and readily replaced or reactivated. In some types of dehydrator plugs, such a procedure is not possible without the desiccant spilling into bore **15** thereby necessitating the ultimate removal of the plug portion and, in certain instances, leading to a fouling of the bore **15**.

As shown in FIG. 4, a filled container **10** having a moisture permeable disc **20** seated on a suitable inwardly protruding shoulder means **17***a* (in this case a tubular ocntainer having a thicker base terminating in a shoulder near its mouth) and held in place by annular ring **21** is provided with a moisture impermeable cap **28**. Upon removal of cap **28**, this container may be used as a replacement in plug element **11** or it may be used as dehydrator by being placed, for instance, among other metal parts subject to corrosion by contact with moisture.

It will be apparent the inwardly extending support means may be discontinuous and that it may be adhesively or otherwise attached to the walls of the container. Also, it will be apparent that the disc or other vapor permeable means may be supported by other means such as by the insertion of an inner container of lesser depth inside the other container or by the use of a molded shoulder or molded inwardly extending arms. Further, it will be recognized that a container with a different configuration may be used especially for the alternative purpose indicated in discussing FIG. 4.

The invention has been described by reference to an important specific embodiment thereof but it will be understood that changes may be made in the illustrative details without departing from the spirit of the invention or the scope thereof as defined in the appended claims.

I claim:

1. In a dehydrator structure, a plug element having one end adapted to fit into a socket and having a first bore, a larger bore in the other end of the plug element communicating with said first bore and terminating in a shoulder, a one piece desiccant container having a closed end and an open end, said open end being positioned in said larger bore adjacent said shoulder, a desiccant material within said container, a moisture permeable rigid member positioned across said container between said desiccant and said open end, and a removable member within said container between said permeable member and said open end so constructed and arranged to retain said moisture permeable member between said desiccant and said open end.

2. In a dehydrator structure, a plug element having one end adapted to fit into a socket and having a first bore, a larger bore in the other end of the plug element communicating with said first bore and terminating in a shoulder, a one piece disiccant container having a closed end and an open end, said open end being positioned in said larger bore in substantially moisture impermeable communication with said shoulder, a desiccant material within said container, a moisture permeable rigid disc positioned across the open end of said container between an inwardly extending supporting means and an inwardly extending retaining means, said moisture permeable disc maintaining said desiccant material in said container, and a removable means within said container between said permeable disc and said open end and supported by said retaining means for maintaining said disc between said supporting means and said retaining means.

3. A dehydrator structure comprising a unitary desiccant container having a closed end and an open end, an inwardly extending member on said container near but removed from said open end adapted to form a shoulder, a rigid moisture permeable member extending across said open end and engageable with said shoulder, a desiccant material maintained in the closed end of said container by said permeable member, removable retainer means within said container between said rigid member and said open end for retaining said permeable member between said open end and said shoulder, and a moisture impermeable cap covering said structure at an end thereof adjacent the open end of said container.

4. In a desiccant container, a unitary tube closed at one end, an internally extending annular lip on the open end of the tube, an internally extending means near the open end of the tube forming an internal zone of restricted cross-sectional area, said zone having a lesser diameter than the diameter of said lip, a moisture permeable disc having a greater diameter than the diameter of said zone and a lesser diameter than said annular lip, said disc being positioned within said tube between said internally extending means and said lip, a desiccant material maintained in said container by said permeable member, and an annular resilient member located between said disc and said lip for removably holding said disc within said tube.

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