Sept. 3, 1946. M. E. CHANDLER 2,406,993

ANTI-CORROSION PLUG

Filed Feb. 18, 1942

Fig. 1.

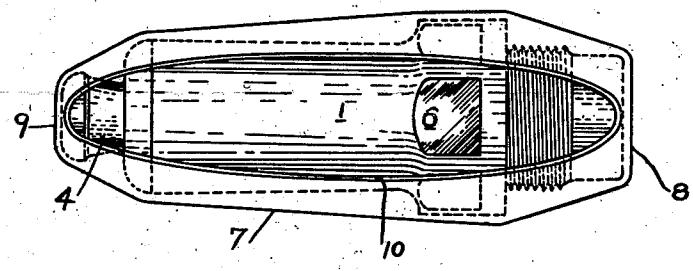


Fig. 2.

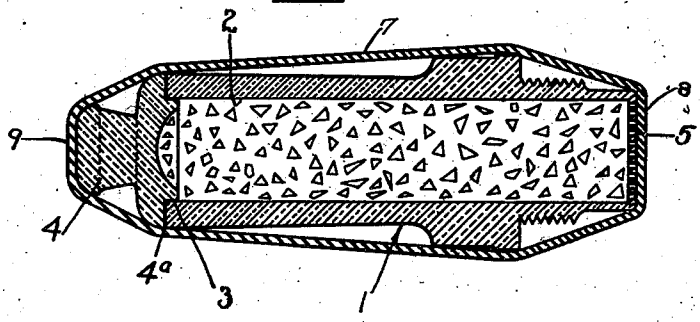


Fig. 3.

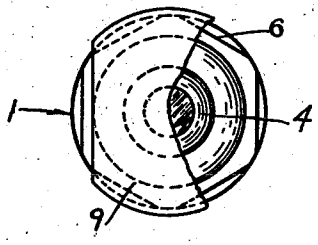
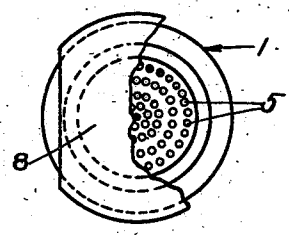


Fig. 4.



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2,406,993

ANTICORROSION PLUG

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8 Claims. (Cl. 206—46)

1

My invention relates to anti-corrosion plugs.

In making such plugs, usually of transparent plastic, which are connectible to the chamber requiring protection from corrosion, as, for example, the cylinder of an airplane engine, difficulty has been experienced in sealing the plugs in such manner that the dehydrating material therein will not absorb too much moisture before use. Various seals have been used, but the moisture content has continued to exceed the required very small minimum permissible absorption of 2% of the weight of the dehydrating material in an atmosphere that has a 100° temperature and a humidity of 100%. Further, since such plugs have a filling aperture in one end and an air inlet in the other, the packaging of the same for shipment has also presented other problems of considerable difficulty. One arises from the fact that if the air inlet remains open for any appreciable time, too much absorption of moisture is permitted, and from the further fact that the closure for the filling aperture being adhesively connected to the plug, as, for example, by the use of acetone, a form of closure is thus presented which requires a drying period before the adhesive can form the desired tight bond. Moreover, a packaging is required which is inexpensive and which also can be readily and quickly applied and removed, while also being completely removed so that no extraneous matter can find its way into the chamber. As a result of the above problems, the preparation of such plugs for shipment has entailed considerable difficulty, delay and expense, while despite this, the plugs have failed to meet the rigid specifications as regards moisture absorption mentioned.

My invention has among its objects to provide an improved packaging means for such plugs whereby it is made possible to reduce moisture absorption to the desired minimum, while expediting the packaging operation, and also enabling the plugs to be immediately sealed, packaged and shipped, following filling. A further object of my invention is to provide such a plug having improved and inexpensive packaging means which are readily and quickly applied and whereby the closure may be held in place and the inlet sealed in a single quick and simple operation. Other objects include the provision of such an improved plug which is adequately protected by the packaging means, and one wherein, at the same time, portions of the transparent plastic comprising the same are so exposed that the condition of the dehydrating material may be readily determined at a glance. A still further

2

object of my invention is to provide such an improved packaging means which retains its effectiveness over long periods and is readily, quickly and completely removable whenever it is desired to use the plug. Another object is to provide an improved sealing structure for a plug of the type described, so constructed that the plug cannot be used without first removing the sealing structure. These and other objects and advantages of my improvements will, however, hereinafter more fully appear.

In the accompanying drawing, I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In this drawing,

Figure 1 is a side elevation of a plug equipped with my improvement;

Fig. 2 is a vertical section through the same;

Fig. 3 is an end elevation of the closure end of the plug, and

Fig. 4 is an end elevation of the air inlet end of the plug.

In this illustrative construction, I have shown a transparent plastic plug generally indicated at 1, and of well known construction and including a chamber 2 containing a suitable dehydrating material, as, for example, silica gel; this plug having a usual filling aperture 3 at one end and a closure 4 adhesively connected thereto as at 4a, and also having an air inlet 5 in the form of a usual flat perforated disc-like opposite end, while a portion 6 of the plug adjacent the inlet 5 is, as usual, suitably shaped to receive a wrench and also suitably threaded, to enable the plug to be connected to the wall of the chamber to be protected.

In my improved plug, the closure 4 is held in place and the air inlet 5 is sealed by a suitable resilient band 7. As shown, this band is disposed longitudinally of the plug and is of such width that a portion 8 thereof at one end of the plug completely overlies and extends laterally at opposite sides beyond the periphery of the air inlet 5, while snugly conforming to the perforated surface of the air inlet in such manner as to provide an effective seal therefor. The other end 9 of the band 7 similarly extends longitudinally around the extremity of the closure 4 in such manner as to hold the same in place while the adhesive 4a hardens. Between these end portions 8 and 9 of the band 7, the latter also is of such width as to provide on each side of the plug an aperture 10 extending substantially throughout the full length of the plug in such manner as thereby to permit the dehydrating

material to be visible through the packaging band, while, apart from these apertures 10, the entire surface of the plug is covered by the resilient band.

I preferably provide an endless band 7 which is of uniform resiliency throughout and normally of shorter length than the plug so that it is maintained tensioned by the plug when in position thereon; a wide rubber band of good quality rubber being found to be entirely satisfactory. Such an endless rubber band is not only simple and inexpensive and quickly applied and removed, and also adapted to provide an effective seal for the air inlet 5, but further expedites and facilitates assembly on the plug since any portion of the band is adapted to form the seal and be disposed over the air inlet, as distinguished from requiring the location of a particular portion of the band over the latter. Further, the resiliency of such a band enables the desired tension to be maintained thereby on the plug, while sealing the air inlet and holding the closure securely in position.

As a result of my improvements, it is made possible for the plug to be immediately packaged and shipped following filling and the insertion of the closure 4. More particularly, as soon as the closure 4 is in place and without waiting for the adhesive 4a to dry, either end of the plug can be inserted in any portion of the band 7, and the band extended and snapped over the other end of the plug in the relation indicated in Fig. 1. When the band is in this position, it will be evident that the plug is ready for immediate shipment; the inlet 5 continuing to be effectively sealed, while the tension under which the band is placed will tend to maintain this seal while also holding the closure 4 securely in position while it dries.

Plugs packaged in my improved manner readily meet the requirements as regards minimum absorption of moisture. Further, they are maintained in this condition for long periods. In addition, the difficulties heretofore experienced in packaging are eliminated in such manner as not only materially to expedite shipment, but also substantially to reduce the expense of packaging. Attention is also directed to the fact that the band 7 not only acts to protect the plug during shipment, but enables the plugs to be securely and compactly packed in larger containers without the use of additional material. Moreover, the apertures 10 enable the condition of the dehydrating material to be determined at a glance, while when it is desired to use the plug, the band may obviously be quickly and completely removed.

Furthermore, since the sealing band 7 extends laterally beyond the threads by which the plug is held in an aperture in the wall of the space to be protected against moisture, it may be seen that the sealing band 7 must positively be removed before the device can be used. Where previous types of sealing devices have been used, trouble has been experienced because of the insertion of the device in the aperture to be protected by an unskilled person who failed to remove the seal. Of course, the device is completely inoperative unless the seal is removed. With devices of the type described herein, this trouble has never been encountered, because the sealing member itself obstructs the insertion of the device into the aperture when the sealing member is in its effective position. The device

cannot be inserted into the aperture before the sealing member is removed.

While I have in this application specifically described one form of my invention, it will be understood that this form of the same is shown for purposes of illustration, and that the invention may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The step in preparing for immediate shipment an anti-corrosion plug containing dehydrating material and including an air inlet and a material retaining member, and also having an adhesive connection to said plug requiring a drying period for the adhesive connection to set, which consists in, resiliently wrapping the plug longitudinally for shipment while in the same operation sealing said inlet and holding said member in place during drying.

2. The step in preparing for immediate shipment an anti-corrosion plug containing dehydrating material and having an air inlet and a filling aperture at opposite ends thereof, a separable closure for said filling aperture, and an adhesive between said closure and plug requiring a drying period, which consists in, resiliently wrapping the plug longitudinally for shipment with the closure thereon before the adhesive dries and while simultaneously sealing said inlet and holding said closure in place during drying.

3. The step in preparing for immediate shipment an anti-corrosion plug containing dehydrating material and having an air inlet and a filling aperture at opposite ends thereof, a separable closure for said filling aperture, and an adhesive between said closure and plug requiring a drying period, which consists in, extending lengthwise an endless resilient band wider than said inlet and normally shorter than the combined length of said plug and closure, while an inner portion of the band engages one end of said plug and until the other end of said band overlies the other end of the plug, and releasing said band to grip the plug and hold said closure in place during hardening of the adhesive while sealing said inlet.

4. The method of preparing for immediate shipment an anti-corrosion plug having an air inlet in one end and a filling aperture in the other end adapted to be closed by a closure adapted to be adhesively connected to the plug by an adhesive requiring a drying period, which consists in, filling said plug with dehydrating material, applying a closure over said aperture while a bonding material between said closure and plug is wet, and placing a resilient band, wide enough to cover said air inlet, lengthwise around said plug and closure to seal said inlet and hold said closure in place during drying of said bonding material.

5. A dehydrator plug adapted to be threadedly mounted in an internally threaded passage in the wall of a chamber to be dehydrated, comprising a generally elongated cylindrical casing having at one end a portion apertured to permit the entrance of air and an intermediate externally threaded portion, dehydrating material in said casing, and a member covering said apertured portion and sealing said end, said member having an integral portion thereof extending laterally beyond the largest diameter of said threaded portion and longitudinally around said

casing to prevent insertion of said end in said passage without removal of said member.

6. A dehydrator plug comprising a casing externally contoured to conform with the inner surface of a chamber in which said plug is to be used, dehydrating material in said casing, a screen in a wall of said casing to permit the entrance of air, and a structure for sealing said screen during shipment and storage to prevent the entrance of air into said casing, said structure comprising a seal portion covering said screen, and a projecting portion at least as wide as said seal portion and of substantial thickness, said projecting portion extending beyond the edges of said screen sufficiently to provide a massive obstruction preventing conformity of said casing to the inner surface of said chamber as long as said projecting portion is in place, said projecting portion being integrally connected to said sealing portion around a major part of its periphery so as to permit ready removal of said projecting portion only by removal of the entire sealing structure.

7. A dehydrator plug adapted to be threadedly mounted in an internally threaded passage in

the wall of a chamber to be dehydrated, comprising a generally elongated cylindrical casing having at one end a portion apertured to permit the entrance of air and an intermediate externally threaded portion, dehydrating material in said casing, and a member covering said apertured portion and sealing said end, said member having an integral portion thereof extending longitudinally around said casing so that it overlies the largest diameter of said threaded portion and prevents insertion of said end in said passage without removal of said member.

8. A dehydrator plug, comprising a generally elongated cylindrical casing having at one end a portion apertured to permit the entrance of air and at an intermediate point adjacent said end a joint structure on the exterior of said casing, dehydrating material in said casing, and a member covering said apertured portion and sealing said end, said member having an integral portion thereof extending longitudinally around said casing so that it overlies said joint structure and prevents the use thereof without removal of said member.

MILTON E. CHANDLER.