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COMPARTMENTED DISPENSER FOR PLURAL FLUIDS

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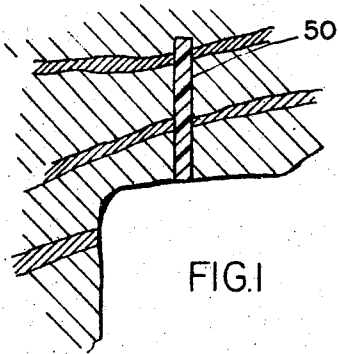


FIG. 1

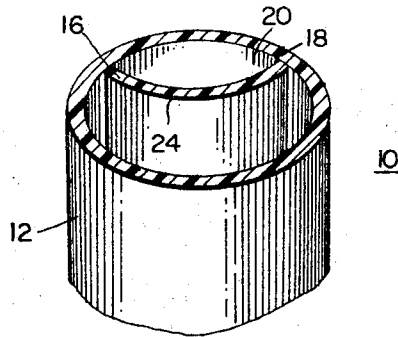


FIG. 2

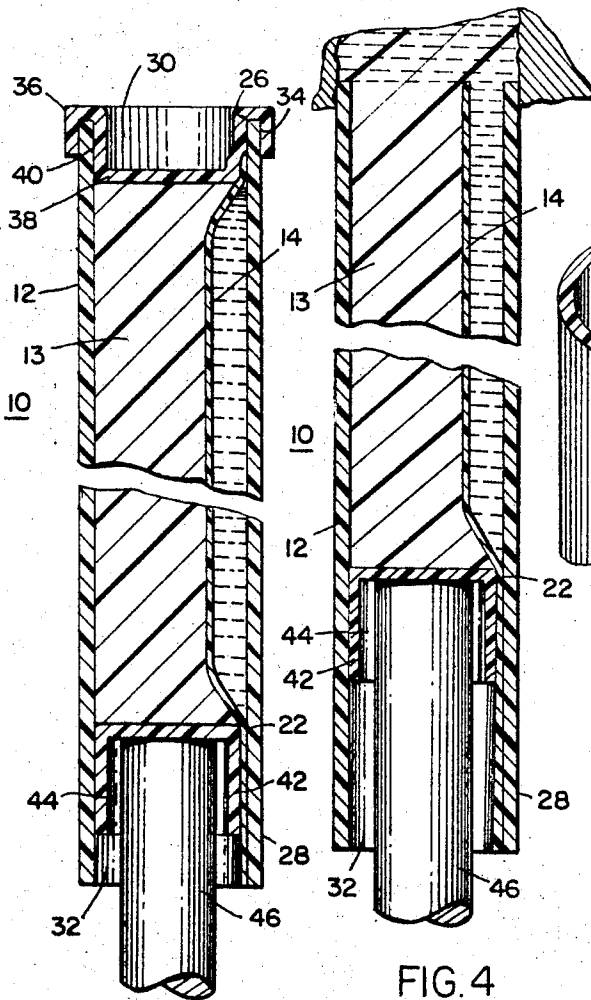


FIG. 3

FIG. 4

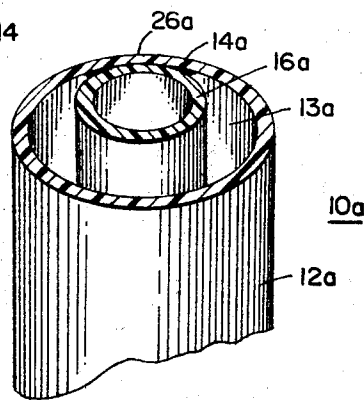


FIG. 5

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**3,266,671**  
**COMPARTMENTED DISPENSER FOR PLURAL FLUIDS**

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1 Claim. (Cl. 222-94)

This invention relates generally to dispensing devices and in particular to a refillable dispenser which accurately dispenses a plastic and hardener simultaneously within bolt hole installations in mining operation.

In the mining industry various means and methods have been developed in the past which provide roof support by interlocking rock strata. This system generally known as the mine bolt method of supporting roofs and walls of mines has gradually replaced the conventional shoring by timbers. One of the methods utilized consists of drilling vertical holes into the roof rock and horizontal holes into the wall structure and the insertion of expansion-type bolts or other suitable locking members into the holes. However, it has been found that due to natural water present in the rock strata using these holes as drainage, erosion of the walls of the holes causes failure of the expansion bolt and defeats the operation. Further innovations have resulted in the use of plastic or epoxy resins as a filler and base for reinforcing rods or the expansion-type bolts to prevent the erosion of the walls of the holes.

Various types of dispensers have been utilized to force the plastic or resin containing a hardening agent into the bolt holes, most of which require prior mixing externally of the dispenser and use within a limited time to prevent the setting of the plastic within the dispensing apparatus. Furthermore, since the majority of the plastics or resins utilized are toxic, they may cause skin and eye irritations and are combustible in their uncured state; a need has developed for a dispenser wherein the resin and hardener are fully enclosed and where mixing of the two takes place during the dispensing operation entirely within the bolt hole.

Therefore, it is an object of this invention to provide a novel, useful, inexpensive, practical and safe means and method of simultaneously dispensing a resin and hardener into bolt holes whereby problems now present in the industry are effectively and simply solved.

It is another object of this invention to provide a dispenser for resins having individual storage compartments for the resin and catalytic materials.

It is a further object of this invention to provide a dispenser wherein integrally stored resins and hardeners may be mixed within a blind opening during the dispensing process.

Another object of this invention is to provide a dispenser for resins and catalytic agents which is refillable.

A further object of this invention is to provide a dispenser adapted to inter-mix separately maintained resins and catalytic agents within a blind opening.

Other objects of the invention will in part be obvious and will, in part, appear hereinafter.

Broadly stated the feature of this invention is to provide a refillable dispenser which will maintain a resin and hardener in individual and separate compartments for prolonged periods of time. The dispenser is adapted for insertion within pre-drilled blind holes of varying depth and by the use of any suitable means pressure applied to the free end will permit the inter-mixing of the resin and the catalytic agent within the blind hole and exteriorly of the dispenser.

To the accomplishment of this and the foregoing related ends, the present invention then consists of the means hereinafter fully described and particularly pointed out in the claim, the annexed drawings and the following

description setting forth in detail certain means in the carrying out of the invention, such disclosed means illustrating, however, but one of the various ways in which the principle in the invention may be employed.

In the drawings:

FIG. 1 is a view in section illustrating the application of the dispenser within a blind opening.

FIG. 2 is a view in elevation of a portion of the barrel of the dispenser.

FIG. 3 is a view in section of the dispenser prior to removing the cap.

FIG. 4 is a view in section of the dispenser in the process of dispensing the resin and agent.

FIG. 5 is a view in elevation of a modified form of the invention.

Reference is now to be had to the drawings wherein an illustrative embodiment of the dispenser, a construction made in accordance with the present invention and designated by the reference numeral 10 is shown. The dispenser consists primarily of an outer elongated tubular barrel 12 formed of any of the poly-olefins, such as polyethylene or poly-propylene with a longitudinal opening 13 extending therethrough. The barrel may be constructed of varying lengths but the standard sizes utilized in mine bolt applications are 5 to 8 foot lengths. In some specific applications where it becomes necessary to interlock succeeding and widely spaced rock layers due to particular formations, sizes as large as 42 feet may be utilized. Within the interior of the barrel 12 and along one wall but spaced therefrom a membrane 14 is disposed. The membrane 14 is secured at its longitudinal edges 16 and 18 to the inner wall 20 of the barrel 12. The lower end 22 of the membrane is closed providing a sealed separate compartment with the barrel 12. The upper end 24 of the membrane is open and the entire length of the membrane is maintained in spaced relationship to the inner wall 20 by the filler or catalytic material contained therein.

Closures 26 and 28 are provided at both ends 30 and 32 of the barrel to preserve the integrity of the contents during shipment. The upper closure 26 is snapped into engagement with the walls of the barrel by means of a circular groove 34 formed adjacent the periphery 36. The central portion 38 of the upper closure 26 extends inwardly into the barrel 12 providing frictional surfaces 40 adapted to bear against the interior walls of the barrel to ensure cooperating engagement and prevent inadvertent removal.

The lower closure 28 comprises an inverted U having side walls 42 bearing against the inner walls of the barrel. The interior 44 of the U is adapted to receive and guide the end 46 of a driving rod for a purpose to be set forth more fully hereinafter.

In FIG. 5 there is illustrated a modified form of the dispenser designated by the numeral 10a. The dispenser 10a has an elongated tubular barrel 12a having a central longitudinal opening 13a extending therethrough. Positioned within the opening 13a of the barrel and secured to an interior wall 14a is a second elongated tubular barrel 16a having a diameter in proportion to the outer barrel of approximately 1-4. The lower end of the inner barrel (not shown) is closed similar to the basic form and the upper end 26a is open for a purpose to be set forth in the description of the operation.

The operation of the dispenser will now be described in view of the above description and the accompanying drawings. The dispenser 10 is prepared for use by removing the top closure 26. The entire dispenser is then inserted into the blind hole 50 as shown in FIG. 1 with the lower end 32 having its closure 28 in place extending from the hole 50. The end 46 of the driving rod is then placed within the interior 44 of the lower closure 28 and

by forcing the rod upwards so that the side walls bear against the interior walls of the barrel 12 and force the membrane 14 against the wall to propel the contents of both the barrel and the membrane sector out of the dispenser and into the blind hole. Since the resin and the hardener are in their chemically pre-determined relationship and they are forced out of the dispenser at the same rate, mixing takes effect within the blind hole. Since the mixing takes place exteriorly of the dispenser after the materials have been forced into the blind hole the dispenser is withdrawn and returned to a filling station for charging with the resins and hardeners.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that modifications and changes may be made therein without departing from the essence of the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claim, and that all modifications that come within the meaning and range of equivalency of the claim are intended to be included therein.

I claim:

A dispenser adapted to extrude heterogeneous fluids uniformly within a blind opening, said dispenser including a hollow tubular barrel having a long extending flexible membrane serving to divide the barrel into compartments of the membrane having its edge portions secured to the inner lateral wall of said barrel, a plug forming a moveable end wall of one of the said compartments and concentrically disposed within said barrel whereby movement of said plug will force said flexible membrane into abutting relationship with the inner wall of said barrel and simultaneously extrude the contents of both compartments.

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