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Hawkins

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[54] **DESICCATING CARTRIDGE FOR FIREARM BARRELS**

[76] Inventor: **Edward J. Hawkins,** 13508 S. Normandie Ave., Gardena, Calif. 90249

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[52] **U.S. Cl.** ..... **42/1 N**
[51] **Int. Cl.** **F41c 27/08**
[58] **Field of Search** ..... 42/1 N

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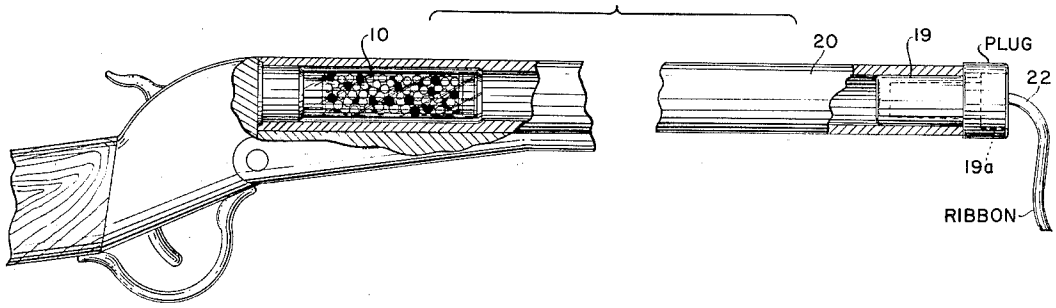
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Primary Examiner—Benjamin A. Borchelt
Assistant Examiner—C. T. Jordan
Attorney, Agent, or Firm—Jessup & Beecher

[57] **ABSTRACT**

A cartridge-shaped container is provided which contains desiccating material, and which serves to prevent corrosion within the barrel of the firearm. The cartridge is insertable into the firing chamber of the firearm, and it contains molecular sieve adsorbent pellets which adsorb the moisture present in the bore of the barrel, so as to prevent rust and other forms of corrosion due to moisture within the barrel. An impervious plug is provided having a hollow end which fits over the end of the cartridge in friction fit with the cartridge to preserve the integrity of the molecular sieve pellets when the cartridge is not in use, and the other end of the plug is dimensioned to be insertable into the muzzle of the firearm to seal and enclose the bore of the barrel when the cartridge is in place in the firing chamber. The molecular sieve pellets within the cartridge may take the form of synthetically produced crystalline metal aluminol-silicates which have a strong affinity for water and certain other gases and liquids.

5 Claims, 5 Drawing Figures



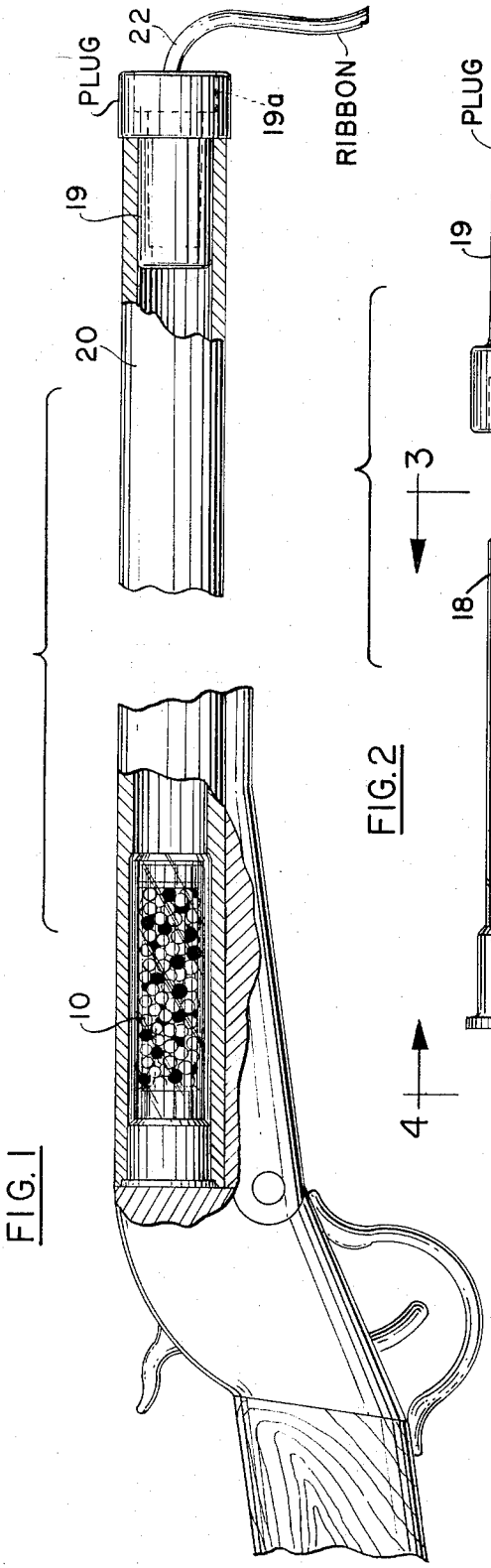


FIG. 1

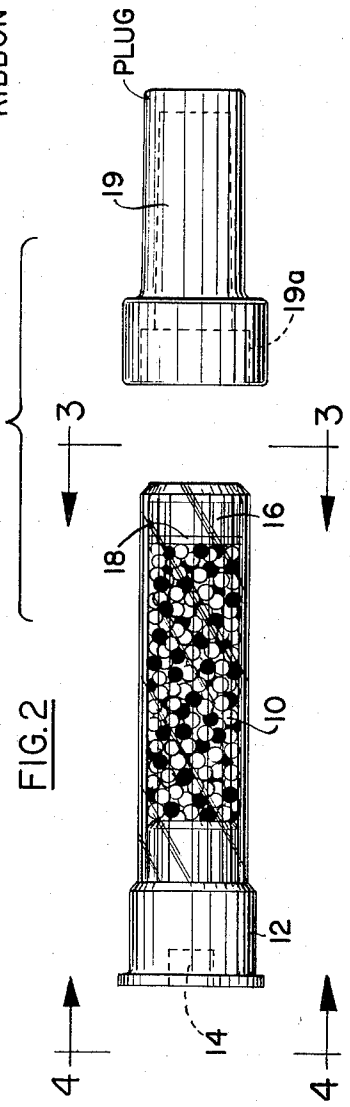


FIG. 2

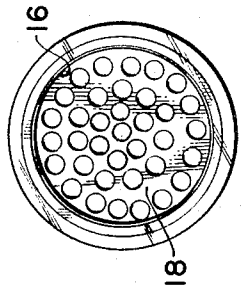


FIG. 3

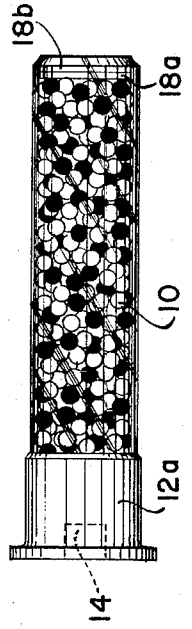


FIG. 5

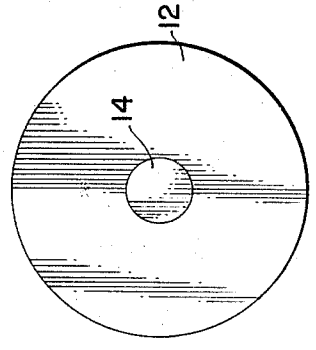


FIG. 4

DESICCATING CARTRIDGE FOR FIREARM BARRELS

BACKGROUND OF THE INVENTION

The interior surface of the barrel of a firearm is usually protected against rust and corrosion by the application of a film of gun oil or grease in order to prevent moisture-bearing air from coming into direct contact with that surface. However, the volatile components of such oils and greases usually vaporize in a relatively short time, leaving a viscous congealed coating. Heavy grease has been used in the past to protect the bore of the barrel for relatively long periods of time when the gun is not in use. However, the use of heavy grease constitutes a messy and arduous operation, since the grease must be completely removed before the firearm can be re-used. The presence of moisture, as accumulated by the residual oil, associates with the sulphurous compounds therein to form sulphuric acid which will corrode the bore.

Desiccating cartridges have been provided in the prior art for insertion into the barrel of the firearm, and these cartridges, for the most part, absorb the moisture in the barrel in an attempt to reduce rust and other forms of corrosion caused by moisture. The present invention is concerned with an improved construction for such a cartridge which uses molecular sieve adsorption materials to assure complete moisture elimination in the barrel. Cartridges incorporating the concepts of the invention are effective for extremely long periods, even in excess of a year, in performing their desiccating function. Inasmuch as this is a breach loading device there cannot exist the danger of a desiccant unit within the bore simultaneously with a live cartridge.

Bore corrosion in the barrel of a firearm is a progressive condition if allowed to exist, for, when microscopic oxidation of the bore surface takes place, it cannot be eradicated and, as time goes on, it becomes more widespread and deep seated. As atmospheric pressure varies the barrel breathes to reach equilibrium between the internal and external pressure thus causing the intrusion of more moisture into the bore. Under hunting conditions, for example, following the use of the gun by day, the changes in temperature at night will normally cause the condensation of moisture on the bore surface within the gun barrel.

The cartridge of the present invention is extremely advantageous since it can be inserted into the firing chamber of the firearm at any time following the use of the firearm; and it is effective either continuously over long periods of time when the firearm is not in use, or intermittently, since it can conveniently be removed from the firearm whenever the firearm is to be used.

The desiccating cartridge of the invention provides an instant and continuous getter for all latent moisture in the atmosphere within the bore of the barrel of the firearm. The cartridge is effective, as mentioned above, up to periods in excess of a year to de-moisturize lubricant oils normally used to protect the surface of the bore, or to de-moisturize the bore surface itself. The cartridge of the invention includes molecular sieve pellets which may be formed, for example, of sodium aluminol silicate, or other appropriate substance, to adsorb moisture and volatile hydrocarbons from the atmosphere in the bore. When adsorbed, the moisture and other gases and liquids, cannot be released from the molecular sieve except under high heat conditions.

This is a distinct advantage over the usual absorbent type of desiccants, which act merely as sponges, and which have a tendency to release moisture back into the bore atmosphere after saturation conditions have been reached.

The desiccant cartridge of the invention, in the embodiment to be described, is transparent, and moisture-indicating pellets, for example, may be formed of metallic chlorides which are blue when dry, and which turn buff as the adsorbed content increases to 75% of its total capacity. The moisture indicating pellets alert the user when a new cartridge should be inserted.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a fragmentary representation of a firearm, partly in section, and showing the desiccant cartridge of the invention in place in the firearm to perform its desiccating function;

FIG. **2** is a side view of a cartridge forming an embodiment of the invention;

FIG. **3** is an end view taken along the line **3—3**;

FIG. **4** is an end view taken along the line **4—4**; and

FIG. **5** is a view, like FIG. **2**, of a slightly modified cartridge.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

The cartridge of the invention includes a hollow shell case **10** formed, for example, of appropriate transparent plastic material, such as Lexan. A cap base **12** is inserted into one end of the shell case **10,** the cap base **12** being formed of an appropriate impervious plastic material such as "Delrin", or a suitable metal such as aluminum or brass. The transparent shell case **10** is received in a friction fit over the end of the cap **12.** The portion of the cap base **12** extending into the hollow shell case **10** is hollow, so that the capacity of the interior of the shell case is optimized. A plug **14** of high density plastic material, such as high density polyethylene, is formed in the cap **12** in position to receive the firing pin of a firearm when the cartridge is in the firing chamber of the firearm, so as to protect the firing pin from damage, acting as a shock absorber or buffer.

An annular collar **16** is formed on the other end of the hollow shell case **10,** and it supports a perforated metal member **18** which, in turn, serves as a support for a porous end wall formed, for example, of filter fiber. As an alternative, and as shown in FIG. **5,** the collar **16** may be eliminated, and two perforated metal members **18*a*** and **18*b*** may be supported in a countersunk recess at the end of the case **10,** with the filter fiber interposed therebetween.

The cap base **12*a*** in the embodiment of FIG. **5** fits over the end of the case **10** and it has a hollow interior to increase the capacity of the cartridge.

A plug **19** of impervious plastic material, such as polyethylene is provided. The plug has a hollow end portion **19*a*** which is dimensioned to fit over the collar **16** in friction fit with the collar. The plug forms a closure for the cartridge when it is not in use, in order to preserve the integrity of the desiccating material contained in the shell case **10.** The other end of the plug **19** is dimensioned to fit into the muzzle of a firearm, such as the firearm **20** in FIG. **1,** to form a closure for the bore of the barrel when the cartridge **10** is in place

in the firing chamber of the firearm, as shown in FIG. 1.

A ribbon **22** may be mounted within the hollow end portion **19***a* of the plug **19**, and the ribbon may be pulled out to an extended position when the plug **19** is in place in the muzzle of the firearm to serve as an indicator that the plug is in place, and to obviate any possibility of the firearm being fired before the plug is removed.

As mentioned above, the desiccant material in the shell case **10** may be in the form of molecular sieve pellets. Such pellets are presently on the market and, for example, may be synthetically produced crystalline metal aluminol-silicates which are activated for adsorption by removing their water of hydration. Because little or no change in structure occurs during the hydration process, unusually highly porous adsorbents are formed that have a strong affinity for water and certain other gases and liquids.

In addition, indicator pellets may be interspersed in the hollow shell case **10** to indicate the moisture adsorption by the molecular sieve pellets. The indicator pellets may be formed, for example, of metallic chlorides and they are blue when dry, but turn buff as the adsorbed moisture content increases to a saturated condition.

The invention provides, therefore, a simple cartridge that may be easily inserted into the firing chamber of a firearm whenever the firearm is not in use, and which has a plug portion which normally serves as an impervious cap for the cartridge when not in use, but which also serves as a closure for the muzzle of the firearm when the cartridge is inserted into the firing chamber. The combination of the invention operates effectively to maintain the bore of the barrel of the firearm in a completely dry condition, so as to prevent any corrosion, or other adverse effects on the surface of the bore due to moisture.

It will be appreciated that while a particular embodiment has been shown and described, modifications may be made. The following claims are intended to cover the modifications which come within the spirit and scope of the invention.

What is claimed:

1. A desiccant cartridge for use in a firearm, said firearm having a firing chamber, a firing pin, a muzzle, and a barrel having a bore therein, said cartridge being insertable into the firing chamber of the firearm, said cartridge including: a hollow shell case having a porous forward wall; a quantity of molecular sieve adsorbent material contained in said hollow shell case; and a removable impervious plug having a hollow end portion dimensioned to extend coaxially over the forward end of said shell case in friction fit therewith, and having a closed end portion dimensioned to be inserted into the muzzle of the firearm as a closure for the bore of the barrel thereof.

2. The cartridge defined in claim **1**, in which said molecular sieve adsorbent material is in the form of pellets.

3. The cartridge defined in claim **1**, in which said shell case is formed of transparent material, and which includes a quantity of moisture indicating pellets contained in the case interspersed with said molecular sieve material.

4. The cartridge defined in claim **1**, and which includes a cap base mounted on the rear end of said shell case, and a buffering pad of high density plastic material mounted on said cap for receiving the firing pin of the firearm.

5. The cartridge defined in claim **1**, and which includes a ribbon mounted in the plug to extend out of the end thereof when the plug is inserted into the muzzle of the firearm.

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