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EXTERNAL LUBRICANT FOR AMMUNITION

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9 Claims. (Cl. 102—12)

This invention relates to the external lubrication of ammunition and will be disclosed in relation to small arms ammunition such as cartridges of the rim fire or center fire type.

The desirable properties of a lubricant to be applied to a bullet are manifold. In the first place, it must possess actual lubricating value as the bullet is passing through the gun barrel. In the next place, the lubricant must be such that when applied to the bullet it will not be liable to creep into the shell and be absorbed by the powder and priming mixture thereby deteriorating the cartridge, even when the cartridge is stored at a temperature as high as 150° F.

Moreover, it is highly desirable that the film of lubricant be not noticeable upon casual inspection of the bullet and likewise that the lubricant be sufficiently hard and non-tacky that the lubricated bullets are clean to handle and may be safely carried in the pocket without gathering grit or dust.

Therefore, the object of the invention is to provide a lubricant of the class described which will be possessed of these desirable properties.

It is likewise an object of the invention to provide a lubricant which will be susceptible to facile and uniform application to the bullets, that is, which may be deposited upon the bullets in films of uniform and invariable thickness as a matter of quantity production.

Heretofore, so far as we are aware, a mixture of low-melting point waxes and greases have been used as a lubricant for bullets. Mixtures of petrolatum, tallow, beeswax and paraffin have been used. Owing to the presence of the low-melting point greases, such a bullet lubricant would become liquid and mobile when stored at temperatures of 100° F. to 110° F. which are normal temperatures for many localities. Such a lubricant is liable, in the liquid state, to enter the shell and deteriorate the powder and priming mixture.

The lubricants of this invention comprise high-melting point waxes, preferably combined with water insoluble soaps. For the purpose of applying the lubricant to the bullets, the waxes and soaps are preferably reduced by solvents sufficiently to be liquid at temperatures suitable for applying the lubricant to the bullets.

As an example of carrying out our invention, loaded cartridges are assembled into place and then dipped momentarily into the lubricating bath. Regulation of the depth to which the cartridges are immersed in the lubricant, is maintained so that only the bullet of each cartridge is coated with lubricant. Regulation of the depth to which the cartridges are immersed in the lubricant may also be maintained so as to coat the bullet and also the mouth end of the shell. The coating of the mouth end of the shell will thus act as a seal to moisture and at the same time facilitate the extraction of the fired case. The cartridges are then passed over a felt mat in order to drain the excess lubricant adhering to the nose of the bullet. They are then dried in a current of air.

The application of the lubricant may also be accomplished by spraying, brushing or barrel tumbling.

The bath of lubricant comprises a high melting-point wax dissolved in a suitable solvent. Any wax melting above 145° F. may be used. We may use carnauba wax, candelilla wax, ceresin wax, Montan wax or the synthetic waxes of the chlorinated naphthalene type. Volatile solvents such as naptha, benzene or carbon tetrachloride may be used to reduce the viscosity of the waxes. A water insoluble fatty acid soap such as aluminum stearate may be added to the lubricant. We have found that the addition of small amounts of aluminum stearate will hold the lubricant in a solid state and not allow the wax to flow, even though the lubricant be exposed to temperatures in excess of the melting-point of the wax.

A lubricant which has proven successful is one prepared according to the following formula:

	Parts
Carbon tetrachloride	90
Ceresin wax melting-point 176° F	9
Aluminum stearate	1

In proceeding to make the mixture the aluminum stearate is first dissolved in the wax at a temperature of approximately 260° F. with thorough stirring. The wax is then cooled and dissolved in the solvent at somewhat elevated temperatures, approximately 130° F.

In applying the lubricant the lubricating bath is maintained at a temperature of approximately 120° F.

It will be readily understood by the skilled in the art that the reduction of the wax to a highly liquid form by means of the solvent and the temperature, brings into play the laws of surface tension of liquids the operations of which insure a deposit of a uniform film on each bullet by vir-

tue of the uniform operation of the laws of surface tension for a given liquid.

Having described our invention, we desire to be limited only by the following claims:

1. A liquid bath adapted to lubricate bullets, comprising, ceresin wax, aluminum stearate, and carbon tetrachloride.

2. A liquid bath adapted to lubricate bullets, comprising 9 parts of ceresin wax, 1 part of aluminum stearate, and 90 parts of carbon tetrachloride.

3. A cartridge having a thin and uniform film of high melting-point wax and a water insoluble fatty acid soap applied to the bullet end thereof.

4. A cartridge, the bullet end of which is lubricated by a uniform coating of high melting-point wax and a water insoluble fatty acid soap which has been deposited upon the bullet by immersion of the bullet in a solution of the wax in a volatile viscosity reducer for the wax.

5. A cartridge, the bullet end of which is covered with a uniform coating, which coating consists of ceresin wax, and aluminum stearate.

6. A cartridge, the bullet end of which is covered with a uniform coating consisting of 9 parts of ceresin wax and 1 part of aluminum stearate.

7. A liquid bath adapted to lubricate bullets, comprising, ceresin wax, aluminum stearate, and a volatile solvent for the ceresin wax and aluminum stearate.

8. A liquid bath adapted to lubricate bullets, comprising, 9 parts of ceresin wax, 1 part of aluminum stearate, and 90 parts of a volatile solvent for the ceresin wax and aluminum stearate.

9. A cartridge, the bullet end of which is covered with a uniform coating of lubricant having a melting point above 110° F., said coating comprising ceresin wax and aluminum stearate.

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