

(No Model.)

P. BUTLER.  
CARTRIDGE SHELL.

No. 306,383.

Patented Oct. 14, 1884.

Fig. 2

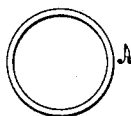
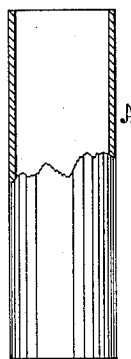


Fig. 1



Witnesses

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# UNITED STATES PATENT OFFICE.

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## CARTRIDGE-SHELL.

SPECIFICATION forming part of Letters Patent No. 306,393, dated October 14, 1884.

Application filed December 12, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, PAUL BUTLER, of Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Cartridge-Shells and Process of Preparing the Same for Fire-Arms, of which the following is a specification.

My invention relates to paper cartridge-shells for fire-arms, composed of a series of layers of paper folded one over the other to the desired thickness, and secured together by paste or other similar adhesive substance; and it consists in saturating such shells with solid fat containing tristearine or tripalmitine, and from which the oleine has either been removed or neutralized, such saturation being accomplished at such a heat as shall allow the tristearine or tripalmitine to remain and fill and solidify in the cavities and interstices of said paper shell when cooled, all substantially as hereinafter described.

It has long been known that the solid fats of which tristearine or tripalmitine forms an important part possess a cohesion which renders them capable of resisting the shock of an explosion of gunpowder in a high degree, as is evidenced by the familiar experiment of firing a tallow candle from a gun through hard substances. It has further been known that such fats were highly useful in lubricating cartridges and balls for guns and for keeping out moisture from the contents of such cartridge-shells. The paper cartridge-shell composed of a series of folds of paper, as before mentioned, is widely used to hold charges of gunpowder and shot for loading fire-arms; but, owing to the liability of the paper, and especially of the paste between its folds, to become hardened and crack, it is in most cases capable of but a single use, and is then thrown away as worthless. In many cases this liability of such shells to crack also allows the gases of the ignited powder to escape without expending their force in propelling the shot, especially in breech-loading fire-arms. It has heretofore been found difficult to employ the solid fats to saturate such cartridge-shells, and so render them more homogeneous and elastic, because the presence of the oleine in its natural condition as a component part of such fats caused the latter, in greater or less degree, to escape

from the shell and be absorbed by the powder, which greatly impaired or substantially destroyed the explosive force of the latter. It was further found that when such cartridge-shells were saturated with such solid fats at a sufficiently high temperature to penetrate them they did not remain in the interstices and paste of such shells, so as to fill the same, but escaped therefrom before cooling, and so left air-spaces in the body of the shell, which aided rather than prevented its bursting when fired. I have discovered that by removing the oleine of such solid fats, or by neutralizing its action, as hereinafter described, I am not only able to prevent such action in causing their escape from the paper shell and consequent absorption by the gunpowder at ordinary temperatures, but I am also enabled to use a degree of heat which shall cause the tristearine or tripalmitine of such fats to thoroughly penetrate the interstices of such shell and the paste contained therein, while it allows them to remain therein during the cooling process, and so impart to it their qualities of adhesive resistance against explosion and to moisture.

In the drawings, Figure 1 represents a cartridge-shell formed of successive layers of paper folded one over the other and secured together by paste, as described, before the metallic head is attached to it. Fig. 2 is an end view of Fig. 1.

A is the wall of the shell, formed of layers of paper and paste in the well-known manner. When solid fat is used from which the oleine has been removed, by pressure or otherwise, in the ordinary and well-known manner, leaving the tristearine or tripalmitine, I heat it slowly by steam or other proper means until it is raised to a temperature of between 160° and 200° Fahrenheit, and preferably to a temperature of about 195°. I then immerse the paper shell in this liquid until thoroughly saturated therewith, which, at the preferable heat indicated, usually requires about fifteen to twenty minutes for shells of ordinary thickness. The time of saturation for thicker or thinner shells should be varied in proportion. I then remove the shells and cool and dry them, when it will be found that they have become hard and firm in texture, resembling horn or vulcanized rubber in a great degree,

and they will not injure the powder by its absorption of the fatty matters they contain at ordinary temperatures, and possess great capacity to resist explosion and moisture. In  
5 case I wish to neutralize the oleine in the solid fat, I proceed to mix it with a fatty substance containing monatomic alcohol—such as glycerine—or a cerotate—as, for instance, Japan wax—which will be found effective for that  
10 purpose. As an example, I take unadulterated tallow, and, heating it until well melted, I put into the vessel used two-thirds to three-fourths part of Japan wax to from one-third to one-fourth part tallow, and melt the whole to-  
15 gether, and when the ingredients are thoroughly incorporated together the mixture is ready for use. It is used at the same heat, substantially, and in the same way, as in the case of the solid fat from which the oleine has  
20 been removed. In case other solid fats than tallow containing a larger proportion of oleine are used, a proportionately larger quantity of Japan wax should be mixed with them to neutralize the oleine.

The metallic heads may be attached to the 25 paper shell before saturation, as above described, if desired.

What I claim as new and of my invention is—

1. The process of saturating the paper cartridge-shell composed of a series of layers of 30 paper united by paste in a solid fat containing tristearine or tripalmitine, and having the oleine therein removed or neutralized at a heat which will permit such fat to remain in the pores and interstices of such shell when such 35 saturation is completed, substantially as described.

2. As a new article of manufacture, the paper cartridge-shell composed of a series of layers of paper and paste saturated with a 40 solid fat containing tristearine or tripalmitine, and from which the oleine has been removed or neutralized, substantially as described.

PAUL BUTLER.

Witnesses:

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DAVID HALL RICE.