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White et al.

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[54] **PRIMER**

[75] Inventors: **Wilmer White**, Haddonfield, N.J.; **Thomas Q. Ciccone**, Cornwells, Pa.

[73] Assignee: **The United States of America as represented by the Secretary of the Army**

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[52] **U.S. Cl.** **102/45**

[51] **Int. Cl.** **F42b 19/10**

[58] **Field of Search** 102/45, 38, 86.5

[56] **References Cited**

UNITED STATES PATENTS

2,021,498	11/1935	Campbell	102/45
3,320,887	5/1967	Quinlan et al.	102/45

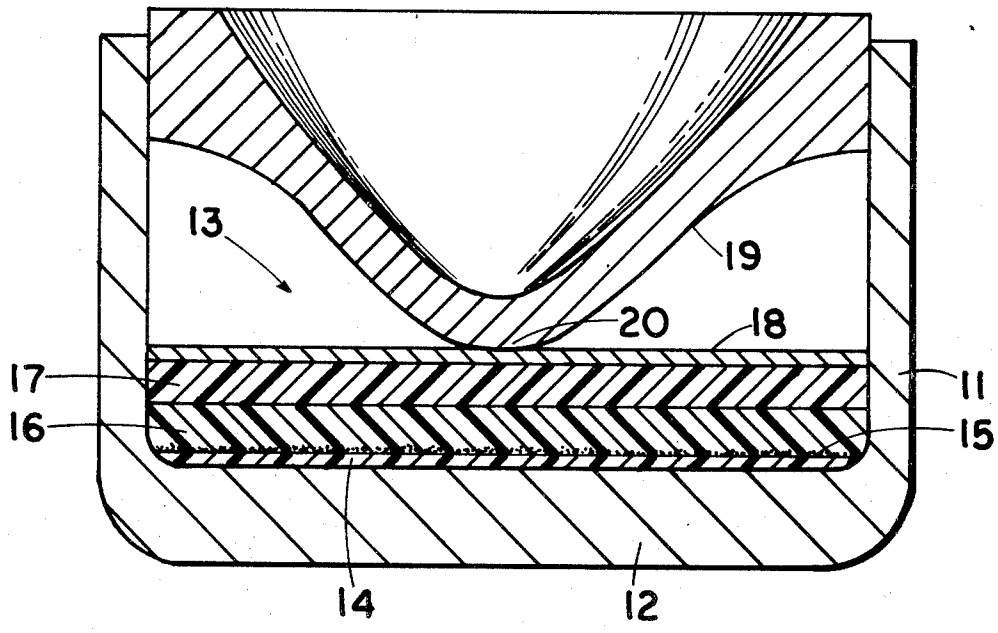
Primary Examiner—Robert F. Stahl

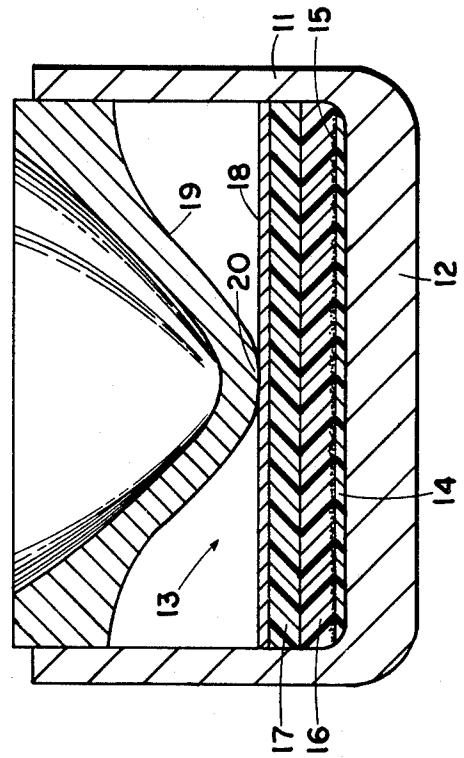
Attorney—Harry M. Saragovitz et al.

[57] **ABSTRACT**

A percussion primer for small caliber ammunition in which the pellet loading can be accomplished by disc punching machines to increase primer production rates. A thin sheet of plastic material is seated in the base portion of the primer cup and has an upper surface coated with an abrasive material, preferably antimony sulfide. A plastic disc of igniter material overlies the abrasive material, and a plastic disc of high energy combustible material overlies the igniter disc. A protective foil overlies the combustible disc, and an anvil is seated in the cup and pressed against the foil.

4 Claims, 1 Drawing Figure

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PRIMER

This invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalty thereon.

This invention relates to primers, and more particularly, to percussion primers for small caliber ammunition.

Heretofore, a loosely bound mix of chemical ingredients for a primer pellet were mixed and pelleted by manually rubbing the mix over perforated plates of predetermined dimensions prior to loading with a knockout plate.

It is an object of the invention to provide a primer having a laminated plastic pellet.

Another object of the invention is to provide such a primer that enables a high volume production rate to be obtained with product uniformity.

These and other objects, features and advantages will become more apparent from the following description and accompanying drawing which is a sectional view of a percussion primer embodying the principles of the invention.

The substantially cylindrical brass cup **11** has a closed base portion **12** of predetermined thickness to accommodate penetration by a firing pin of a munition firing mechanism (not shown). The laminated primer pellet, shown generally at **13,** preferably includes a thin sheet **14** of plastic material having a lower or bottom surface that seats against the cup base portion **12** as well as an upper surface that is coated with an abrasive material **15.** A plastic disc **16** of igniter material overlies the abrasive coating **15,** and a plastic disc **17** of high energy combustible material overlies the igniter disc **16.** A waterproof seal of protective foil **18** overlies the combustible disc **17,** and the conically shaped brass anvil **19** is press-fitted within the sidewalls of cup **11** with the anvil nose portion **20** pressed against the foil **18.**

Preferably, the abrasive coated thin plastic sheet **14** comprises a thin layer of cellulose nitrate base sealing compound having a bottom surface that adhers to the cup base **12** and an upper surface which is coated with antimony sulfide **15.** The igniter plastic material **16** is prepared in sheet form and consists of a polymerized

mixture of nitrocellulose, acetone, lead styphnate and tetracene. The highly combustible plastic material **17** is prepared in sheet form and consists of a polymerized fuel and oxidizer mixture of nitrocellulose, acetone and barium nitrate. An appropriate disc punching machine punches the desired igniter plastic disc **16** of predetermined size from the igniter sheet and the disc **16** is allowed to fall directly into its cup **11** upon the abrasive coated sheet **14.** Similar punching technique is utilized for loading one or more highly combustible discs **17** from its sheet, prior to assembling a punched aluminum protective foil **18** which also can be of wax paper or tin material. After being loaded, the primer cup is drained and dried prior to insertion of anvil **19.** Upon drying of the primer, substantially all of the acetone will have been evaporated.

Various modifications, changes or alterations may be resorted to without departing from the scope of the invention as defined in the appended claims.

We claim:

1. A percussion primer for small caliber ammunition, comprising

a substantially cylindrical cup member having a closed base portion,

a thin sheet of plastic material having a bottom surface seated against said base portion and an upper surface coated with an abrasive material,

a plastic disc of igniter material overlying said abrasive material,

a plastic disc of high energy combustible material overlying said igniter disc,

a protective foil overlying said combustible disc, and

an anvil seated in said cup member and pressed against said foil.

2. The structure in accordance with claim **1** wherein said abrasive material is antimony sulfide.

3. The structure of claim **2** wherein said igniter material includes nitrocellulose, lead styphnate and tetracene, and said combustible disc includes nitrocellulose and barium nitrate.

4. The structure of claim **3** wherein said foil is a material selected from the group including aluminum, tin and wax paper.

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