United States Patent

[11] 3,599,568

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[21] Appl. No. **444,142**
[22] Filed **Mar. 31, 1965**
[45] Patented **Aug. 17, 1971**
[73] Assignee **Olin Mathieson Chemical Corporation**

[54] **LONG-RANGE SHOTSHELL**
12 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** ..... **102/42 C,** 102/93, 102/95
[51] **Int. Cl.** **F42b 7/02,** F42b 13/16
[50] **Field of Search** ..... 102/42, 42 C, 38, 50, 92.5, 93, 43 P, 95

[56] **References Cited**

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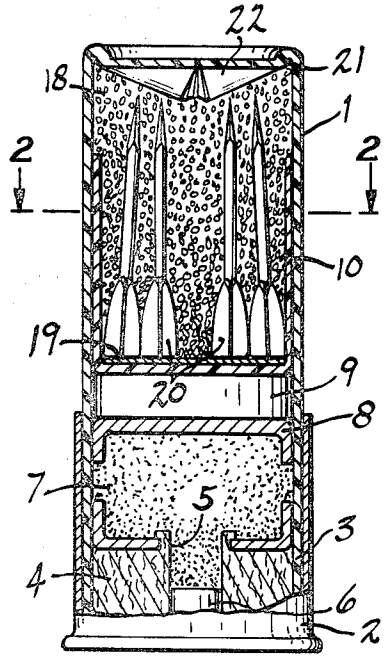
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Primary Examiner—Robert F. Stahl
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ABSTRACT: A cartridge including a casing, said casing having a base at one end and a mouth at the other end, a propellant in said casing adjacent said base, ignition means to ignite said propellant, wad means positioned over said propellant, a projectile-surrounding member adjacent said wad means, a plurality of elongated projectiles arranged in said member and extending substantially longitudinally of said casing, filler means dispersed in and occupying the spaces between said projectiles to maintain the projectiles in a predetermined arrangement and control the dispersion of the projectiles, and a closure closing said mouth.



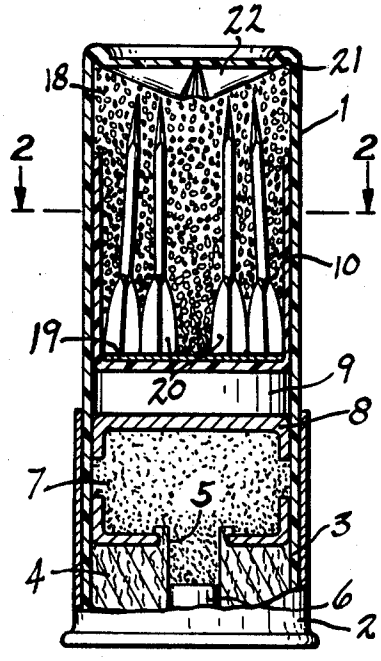


FIG- 1

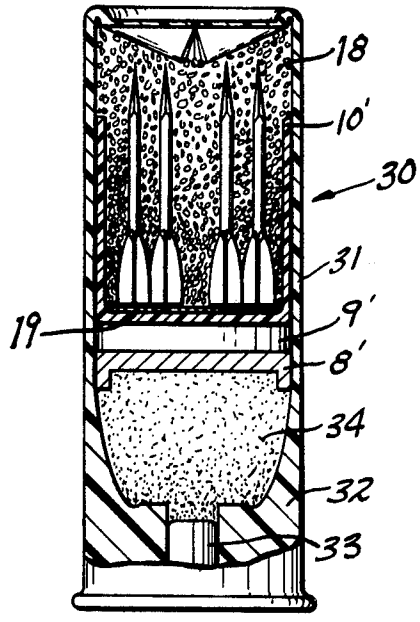


FIG-6

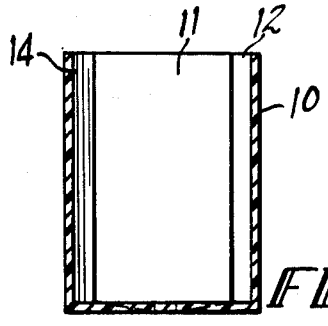


FIG-3

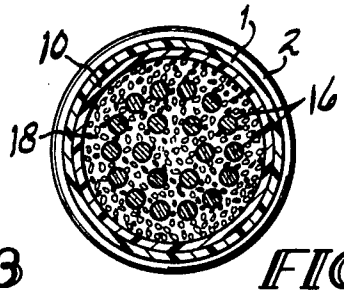


FIG-2

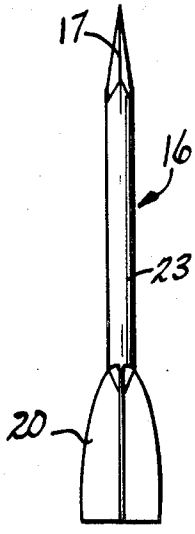


FIG-5

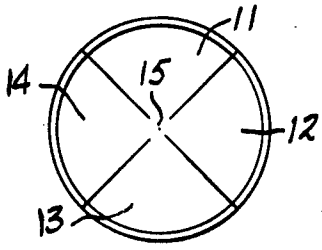


FIG-4

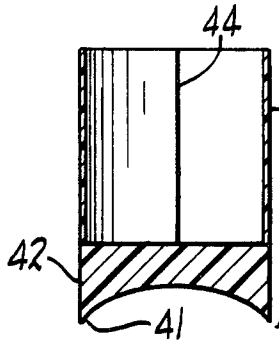


FIG-7

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LONG-RANGE SHOTSHELL

This invention relates to a long-range shotshell.

This invention, more specifically, relates to a shotshell having an effective range two or more times greater than the range of a conventional shotshell.

To obtain this increased range, the shotshell of this invention is provided with elongated, needlelike finned projectiles in place of the ordinary round shot normally found in conventional shotshells. These elongated projectiles are positioned in a protective cup placed inside the shotshell casing. A filler material is dispersed in the spaces between the individual projectiles to hold the projectiles in a predetermined orientation as they are driven down the barrel of a shotgun or the like.

This invention will now be described in detail with a reference to the accompanying drawings in which:

FIG. 1 is a sectional side view of a long-range shotshell made in accordance with this invention.

FIG. 2 is a sectional view taken along the line 2–2 of FIG. 1.

FIG. 3 is a sectional side view of the barrel-protecting cup member used in the shotshell embodiment shown in FIG. 1.

FIG. 4 is a top-plan view of the cup member shown in FIG. 3.

FIG. 5 is an enlarged side view of a projectile used in the shotshell of this invention.

FIG. 6 shows an alternate embodiment of this invention, utilizing an integral wad structure.

FIG. 7 shows an integral wad and cup structure which can be used with this invention.

Referring to the drawings, and particularly FIG. 1, we show a shotshell formed according to this invention and including a tubular casing 1 formed from paper or rigid polyethylene. A cup-shaped metallic head 2 is fixed to base 3 of casing 1. A wound base wad 4 is compressed into the base 3 to frictionally retain base 3 in metallic head 2. A primer opening 5 is formed in the metallic head 2 and the base wad 4 communicating with the interior of the casing. A primer 6 is positioned in said primer opening. A charge of propellant powder 7 is positioned above the base wad. Positioned over the powder charge is a cup wad 8 and filler wad structure 9. Positioned over the filler wad 9 is a projectile-carrying cup 10.

As seen in FIGS. 3 and 4, the cup 10 is preferably cut into four pie-shaped sections, 11, 12, 13, and 14, by four slits which extend longitudinally through the sidewall and into the bottom of the cup leaving only a portion 15 uncut to hold the cup together. It has been found that this configuration allows the cup to separate immediately from the projectiles 16 as the cup 10 and projectiles 16 emerge from the gun barrel without imparting any canting force to the projectile, which will affect the stability and the dispersion patterns of the projectiles. The cup 10 may be cut to provide fewer than or more than four sections so long as the cup readily separates from the projectiles upon leaving the gun barrel.

As seen in FIG. 1 and FIG. 2, the projectiles 16 are preferably loaded into the shotshell in two concentric rows. The projectiles in the outer row are preferably canted inwardly at an angle of approximately 15° (included angle) with the finned ends adjacent the sidewall of the cup 10 and the tips 17 of the projectiles brought together to form an outer circle as seen in FIG. 2. The inner row of projectiles are positioned axially aligned with the casing. This arrangement has been found to be preferable in providing a tighter dispersion pattern than the alternate arrangement of positioning all the projectiles axially aligned with the shotshell casing.

As seen in FIG. 1, a filler 18, such as granulated polyethylene, is dispersed in the spaces existing between the projectiles. The filler holds the projectiles in a predetermined alignment in the casing and maintains the alignment as they travel down the barrel of the firearm. The filler is very helpful in maintaining controlled dispersion of the projectiles since it holds them in a predetermined alignment as they emerge from the muzzle of the barrel. A metallic disc 19 is positioned in the bottom of the cup 10 to prevent the projectile fins 20 from cutting into the bottom of the cup member 10 as the projectiles 16 are accelerated out of the cartridge casing.

The mouth 21 of the cartridge casing is closed by infolding to provide a well-known and conventional integral closure 22.

It should be noted that when the projectiles are loaded in the casing, a space exists between the closure and the tips of the projectiles. This space is also filled with filler 18. This provides a cushioning layer of material between the closure 22 and projectiles which acts to open the closure upon firing of the cartridge. This arrangement prevents the pointed tips 17 of the projectiles from becoming embedded in the closure and interfering with the dispersion pattern of the shotshell as it is fired.

Referring now to FIG. 5, we show an enlarged view of the projectile 16 used in this invention. The projectile 16 includes a pointed tip 17 at one end, an elongated body 23 and a plurality of fins 20 formed integral with or secured to the other end. Preferably, four fins are provided on each projectile. The fins 20 are canted at a slight angle relative to a normal angle to increase the flight stability of the projectile. A canted angle of about 1°25′ has been found satisfactory.

Referring now to FIG. 6, we show a long-range shotshell similar to the embodiment of FIG. 1 but varying in certain details. The casing 30 shown in FIG. 6 is a plastic casing of the type disclosed in U.S. Pat. No. 3,171,350, having a tubular body portion 31 of high tensile strength and integral head portion 32.

The casing 30 of FIG. 6 requires no separate base wad and is provided with a conventional primer 33. A powder charge 34 is located inside the casing, adjacent to the shell primer. An over-powder wad 8′, filler was 9′, disc 19′ and projectile-carrying cup 10′ are provided in casing 30, which are structurally and functionally the same as those shown in the FIG. 1 embodiment.

Projectiles 16 are shown positioned in casing 30 all axially aligned with respect to the sidewall of the casing. While this arrangement of the projectiles may not be as effective under all firing conditions as the canted arrangement shown in the embodiment of FIG. 1, it does provide a satisfactory and workable arrangement.

As in the FIG. 1 embodiment, a granulated filler is positioned in the casing in the spaces provided between the projectiles and over the projectiles between the tips and the shell closure. The mouth of the casing 30 is closed by infolding in the same manner as the casing shown in FIG. 1.

In FIG. 7 is shown an integral wad and projectile-carrying cup member 40 which can be used in place of the separate over-powder wad, filler wad, and projectile-carrying cup described above.

Member 40 includes an obturating skirt portion 41, a filler portion 42, and a projectile-carrying cup portion 43. The cup 43 is provided with slits 44 which allow the cup to open up and release the projectiles as they leave the gun muzzle.

Of course, any combination of elements which function as an over-powder wad, filler wad, and projectile-enclosing cup is contemplated. In some instances, it is even contemplated that the filler wad or its equivalent structure may be eliminated should it be desired to provide space for longer projectiles or other reasons.

A sample, made in accordance with this invention, comprising five rounds, each having 20 projectiles, and fired at 150 yards, had an extreme spread of the 10 closest projectiles of 60.6 inches.

At 150 yards the projectiles were moving with a velocity sufficient to cause penetration through at least one side of an infantryman's helmet.

This is at least twice the effective range which can be achieved with buckshot or regular shot.

While this invention has been described in detail with reference to certain preferred embodiments, it is understood that variations and design changes are contemplated which are within the spirit and scope of the appended claims.

What we claim is:

1. A cartridge including a casing, said casing having a base at one end and a mouth at the other end, a propellant in said casing adjacent said base, ignition means to ignite said propellant, wad means positioned over said propellant, a projectile-surrounding member adjacent said wad means, a plurality of elongated projectiles arranged in said member and extending substantially longitudinally of said casing, filler means dispersed in and occupying the spaces between said projectiles to maintain the projectiles in a predetermined arrangement and control the dispersion of the projectiles and a closure closing said mouth.

2. The cartridge of claim 1 in which said filler means is a granular substance.

3. The cartridge of claim 1 in which said projectiles are arranged in said casing in a pattern including an outer circular row, the projectiles in said circular row being canted inwardly at an angle relative to the longitudinal axis of said cartridge.

4. The cartridge of claim 1 in which said projectiles are arranged in said casing in two concentric circular rows, an outer row including a plurality of projectiles each canted inwardly toward the central axis of said casing and an inner row including a plurality of projectiles axially aligned with the casing.

5. The cartridge of claim 1 in which said member is an open-ended cup including a sidewall and base, said cup having a plurality of slits extending longitudinally through the sidewall and into the base to divide said cup into a plurality of sections hinged centrally of the base.

6. The cartridge of claim 5 in which said projectiles each have an elongated body, a pointed nose and a plurality of fins, said fins being canted at a slight angle to increase the stability of said projectile.

7. The cartridge of claim 1 in which said wad means and said member are a single integral unit molded from plastic.

8. The cartridge of claim 1 in which said closure is an integral closure formed by infolding the sidewall adjacent the mouth of the casing and the base of the casing is formed integral with the sidewall.

9. A long-range shotshell type cartridge comprising a casing, a propellant charge in said casing, wad means positioned over said propellant including a flanged obturating wad having a skirt portion directed toward said propellant, a cup-shaped projectile-carrying member positioned over said wad means, said cup-shaped member having a sidewall and a base, a plurality of slits extending through said sidewall and into said base to allow said member to separate into a plurality of segments as it leaves the barrel of a firearm, a plurality of elongated finned projectiles positioned in said cup in a predetermined arrangement, at least some of said projectiles being canted inwardly toward the axis of said casing, a filler dispersed in and filling the spaces between said projectiles to maintain said arrangement until the projectiles leave the gun barrel, and a layer of said filler means in a space formed between the ends of said projectiles and a closure of said casing to facilitate opening said closure.

10. The cartridge of claim 9 in which said filler is granulated polyethylene.

11. The cartridge of claim 9 in which said slits divide said member into four pie-shaped segments connected centrally of the base.

12. The cartridge of claim 9 in which said projectiles are arranged in two concentric rows, the projectiles in the outer row being canted inwardly toward the axis of said casing and the projectiles in the inner row being axially aligned with the casing.

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,599,568 Dated August 17, 1971

Inventor(s) Richard J. Shellnutt et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Claim 9, line 15, after "arrangement" insert -- substantially aligned with the logitudinal axis of said casing --.

Signed and sealed this 22nd day of February 1972.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334