

Aug. 27, 1968

M. F. ABELA

3,398,682

SPINNING PROJECTILE

Filed Sept. 14, 1966

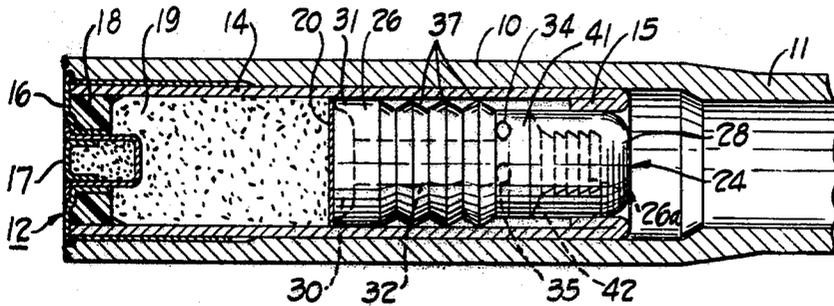


Fig. 1

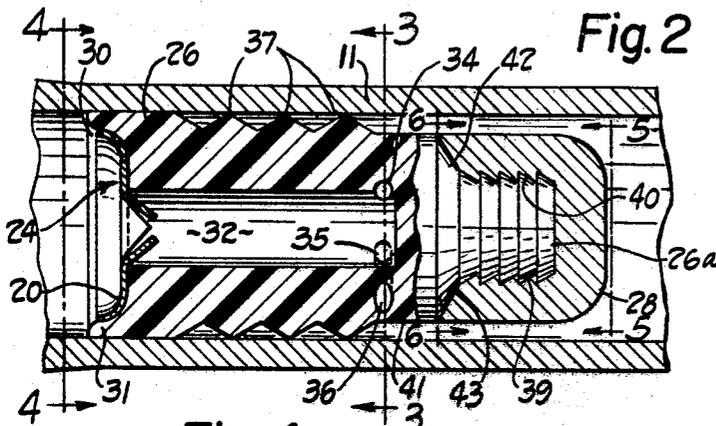


Fig. 2

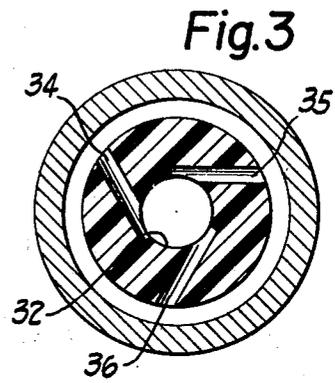


Fig. 3

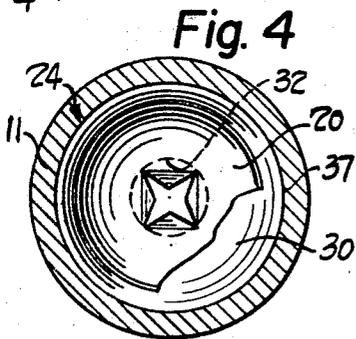


Fig. 4

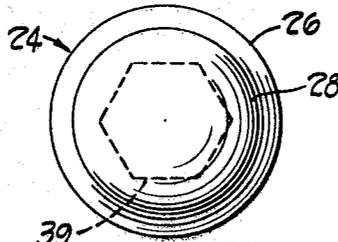


Fig. 5

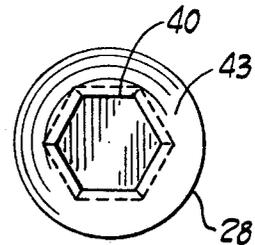


Fig. 6

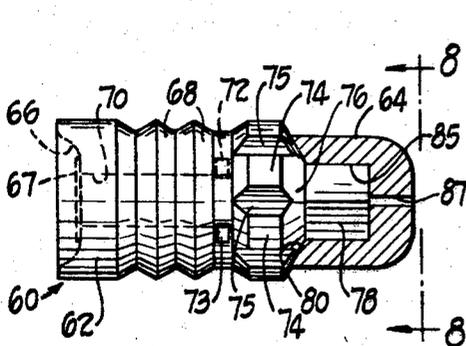


Fig. 7

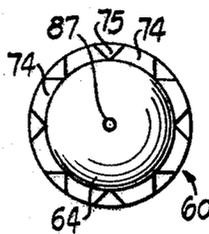


Fig. 8

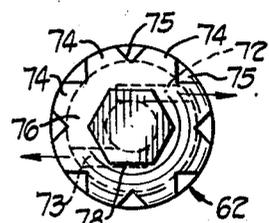


Fig. 9

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3,398,682

SPINNING PROJECTILE

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Filed Sept. 14, 1966, Ser. No. 579,359
6 Claims. (Cl. 102—38)

ABSTRACT OF THE DISCLOSURE

A shotgun shell comprised of a sleeve; a propellant within the sleeve; a destructible wad; and, forward thereof, a two-part projectile having between its ends a massive plastic body portion with encircling ridges for minimizing external blow-by and a serrated leading end to which is coupled a metal nose portion with a rearwardly facing recess for receiving said serrated leading end.

This invention relates to ammunition for smooth bore firearms, particularly shells incorporating projectiles capable of developing a spin notwithstanding the absence of rifling in the gun barrel.

Shells incorporating spinning projectiles intended for expulsion through smooth bore barrels are known, as, for example, from U.S. Patent No. 3,247,795 for "Spinning Projectile for Smooth Bore Guns." In some of its aspects, the present invention is of the nature of an improvement thereover more especially insofar as concerns simplicity, economy and ease of manufacture. Accordingly, a major object of this invention may be said to be to provide (a) improved spinning projectiles for incorporation in shells and (b) correspondingly improved shells for use in shotguns and other smooth bore firearms.

Other objects, advantages and features of the invention will be apparent from the description which follows and from the accompanying drawings, in which:

FIGURE 1 is a longitudinal section through the chambered portion of a shotgun barrel showing a shell and included projectile, the shell being illustrated in section and the projectile in side elevation;

FIGURE 2 is a longitudinal section on a larger scale showing the projectile and wad as they appear immediately after leaving the chambered portion of the barrel;

FIGURE 3 is a transverse section on line 3—3 of FIGURE 2;

FIGURE 4 is a transverse section on line 4—4 of FIGURE 2 showing the trailing end of the projectile;

FIGURE 5 is an elevation of the leading end of the projectile as seen from line 5—5 of FIGURE 2;

FIGURE 6 is a rear elevation of the nose or forward portion of the projectile, seen as if from line 6—6 of FIGURE 2;

FIGURE 7 is a side elevation with parts in section of a modified form of projectile;

FIGURE 8 is an elevation of the leading end of the projectile of FIGURE 7 as seen from line 8—8 thereof; and

FIGURE 9 is a like elevation of the body portion of the same projectile without the nose or forward portion seen in FIGURE 8.

Referring to FIGURES 1 to 3, shotgun barrel 10 has in the chambered portion thereof a shotgun shell 12 of a type conforming to the present invention. Shell 12 includes a cylindrical sleeve 14 the forward end of which is turned inwardly as indicated at 15. At the rear of shell 12 is an assembly made up of a metal cap 16, a primer 17 and a filler 18 of annular shape. A propellant charge 19 of conventional composition occupies the space between this assembly and a lightweight wad 20 of intrinsically frangible material such as thin cardboard.

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Within the forward end of sleeve 14 is projectile 24, which is made up of a massive body portion 26 of a synthetic resin such as polyethylene and a metal nose portion 28, preferably of lead or a lead alloy.

Body portion 26 has as its trailing end a rearwardly facing cup-shaped hollow 30 adapted to receive wad 20 after the gases produced by propellant 19 have displaced and ruptured it: see FIGURE 2. Body portion 26 is characterized outwardly of hollow 30 by an annular skirt 31 the diameter of which closely approximates the inner diameter of forward portion 11 of barrel 10. Communication with hollow 30 is an axially directed passage 32 that extends forward through much of body portion 26. At its leading end, passage 32 communicates with the tangentially arranged discharge passages 34, 35 and 36 seen in FIGURE 3.

Gases resulting from the combustion of propellant charge 19 first enter passage 32 in body portion 26 and then tangential passages 34, 35 and 36. Projectile 24 moves forward in the meanwhile, freeing itself of the forward end of sleeve 14. After skirt 31 comes into engagement with portion 11 of barrel 10, projectile 24 begins to spin, turning about its axis as a result of the discharge of the gases in jet-like fashion through the orifices at the outer ends of passages 34, 35 and 36. At this stage, skirt 31 and the series of circular ridges 37 shown as forming part of body portion 26 just forward of skirt 31 serve to support the projectile and minimize the possibility of blow-by.

The reduced end 26a of body portion 26 is integral with it, hexagonal in cross section, and characterized by a series of serrations 39 designated to engage the inside surfaces of a complementary hexagonal recess 40 in nose portion 28. As shown in FIGURE 2, serrations 39 flare rearwardly. The innermost of them adjoins and constitutes more or less of a continuation of a frusto-conical surface 42 which intervenes between reduced end 26a and a cylindrical portion 41 forming part of body portion 26. Frusto-conical surface 42 engages the complementary frusto-conical surface 43 at the rear of nose portion 28: see FIGURE 2.

Although not shown in FIGURE 2, a commercial adhesive adapted to bond nose portion 28 to body portion 26, permanently or temporarily, may be applied to the surfaces of recess 40 and/or the serrations 39 on the forward end 26a of body portion 26.

In the embodiment of the invention illustrated in FIGURES 7, 8 and 9, those portions of the shell that do not appear in the drawings are similar to those appearing in FIGURES 1 through 4. Projectile 60 includes a body portion 62 and a nose or forward portion 64 adapted to separate therefrom. Body portion 62, which is formed of a synthetic resin such as polyethylene, has at its trailing end a skirt similar to skirt 31 and a rearwardly facing cup-shaped recess 66 within which is disposed a combustible cardboard sealing disc 67 of the nature of a wad. Disc 67, which is impregnated with potassium nitrate, may be affixed to body portion 62 in any suitable fashion, as by means of an adhesive.

Two circular ridges 68 similar to ridges 37 in FIGURES 1 and 2 form part of body portion 62 forward of recess 66. Inwardly thereof is a longitudinally extending cylindrical passage 70 in body portion 62. Cylindrical passage 70 communicates at one end with recess 66 and at the other end with a pair of tangentially directed gas discharge passages 72, 73: see FIGURE 9.

Near the forward end of body portion 62 is what would otherwise be a circular supporting shoulder 74 that is interrupted by notches 75 at equal intervals around the circumference of the shoulder. Notches 75 are provided to facilitate the escape of gases expelled through tangential passages 72, 73. The forward end of body por-

tion 62 is further characterized by a frusto-conical surface 76 and a flat-sided end portion 78 of hexagonal cross section.

Nose portion 64 is provided at its trailing end with a frusto-conical seating surface 80 conforming to frusto-conical surface 76 on body portion 62. It is also provided with a recess 85 of hexagonal cross section lending itself to the reception of and frictional engagement with the flat sides of end portion 78. Recess 85 is slightly larger than end portion 78, thus permitting nose portion 64 to separate from body portion 62 under suitable conditions. Nose portion 64 includes an axially extending vent 87 that serves to prevent the development of a vacuum in recess 85.

When the shell is fired, projectile 60 moves as a whole into and through portion 11 of barrel 10, beginning to rotate at the same stage and in the same manner as in the previously described embodiment of the invention. However, when the projectile reaches the muzzle, the friction of the barrel choke slows down body portion 62. Nose portion 64 proceeds independently toward the target while still under the influence of the spin imparted to it by body portion 62. The latter follows a trajectory of its own.

It is evident that modifications may be made by those skilled in the art without departing from the spirit of the invention. The shape of the nose portion of the projectile need not necessarily be as shown; i.e., blunt at its leading end, but if desired may be pointed after the fashion of a rifle bullet. It is evident that the nose portion, however shaped, need not be of lead or of a lead alloy, but may be of a harder metal such as brass or steel. Similarly, it is not necessary that the body portion of the projectile be of polyethylene; instead, it may be of some other synthetic resin such as nylon, polypropylene, copolymers of ethylene and polypropylene, and the like.

It is intended that the patent shall cover, by sum-

marization in appended claims, all features of patentable novelty residing in the invention.

What is claimed is:

1. A shotgun shell comprising a sleeve; a propellant within the sleeve; a destructible wad; and, forwardly thereof, a projectile having between its ends a massive plastic body portion with a serrated leading end and a second portion coupled thereto having therein a recess in which said serrated leading end is received.

2. A shotgun shell according to claim 1 wherein said leading end is characterized by a multiplicity of flared surfaces frictionally engaging said second portion.

3. A shotgun shell according to claim 1 wherein said serrated leading end is polygonal in transverse cross-section.

4. A spinning projectile including a body portion formed of plastic and a nose portion formed of metal wherein said body portion has an axially extending gas passage, a plurality of gas expulsion passages extending angularly to said axially extending gas passage, and for minimizing external blow-by, a plurality of encircling ridges.

5. A projectile according to claim 4 wherein the leading end of said body portion is characterized by serration frictionally engaging said metal nose portion.

6. A projectile according to claim 4 wherein said body portion includes an annular shoulder notched to allow gas to escape toward the leading end thereof.

References Cited

UNITED STATES PATENTS

2,386,054	10/1945	McGee	244—3.1
2,982,550	5/1961	Francis	102—93 X
3,065,696	11/1962	Kleinguenther	102—93 X
3,137,195	6/1964	Rosenberg	102—93 X
3,148,472	9/1964	Hegge et al.	102—93 X

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