

**EUROPEAN PATENT SPECIFICATION**

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| <p>⑨ Date of publication of application:<br/><b>07.08.85 Bulletin 85/32</b></p> <p>⑩ Publication of the grant of the patent:<br/><b>21.12.88 Bulletin 88/51</b></p> <p>⑪ Designated Contracting States:<br/><b>AT BE CH DE FR GB IT LI LU NL SE</b></p> <p>⑫ References cited:<br/><b>EP-A-0 129 608</b><br/><b>DE-C- 583 098</b><br/><b>FR-A-1 124 740</b></p> | <p>⑬ Proprietor: <b>BRANSCOMB CORPORATION N.V.</b><br/><b>De Ruyterkade 58a P.O. Box 837</b><br/><b>Willemstad Curaçao (AN)</b></p> <p>⑭ Inventor: <b>Sullivan, Leroy James</b><br/><b>19567 Vasile Circle</b><br/><b>Huntington Beach California 92646 (US)</b></p> <p>⑮ Representative: <b>Brunner, Michael John et al</b><br/><b>GILL JENNINGS &amp; EVERY 53-64 Chancery Lane</b><br/><b>London WC2A 1HN (GB)</b></p> |
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**EP 0 150 229 B1**

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## Description

The present invention relates to ammunition and is particularly useful in ammunition for use in conventional small arms weapons having non-rifled barrels.

In our European application publication no. 0129608 there is described a novel ammunition round comprising a casing for containing a propelling charge, a substantially full bore slug of ogival shape and a plurality of elongate elements preventing the slug from tilting off axis as it travels down a barrel, characterized in that the slug has a plurality of grooves in its outer surface extending substantially along the longitudinal axis of the slug, the elongate elements being seated in the grooves and having a dimension substantially the same as the radial depth of the grooves and extending substantially the length of the slug.

DE-C-583098 discloses a slug or bullet which has a star-shaped rear portion which is attached to the ogival front portion of the slug and which has a plurality of V-shaped grooves. In the grooves are located tubular elongate elements. As can be seen from Figures 2 and 3 of that specification the tubular elements significantly increase the overall diameter of the composite projectile, causing the slug to be undersized. The elements are secondary projectiles and extend longitudinally only over the length of the rear attachment portion.

FR-A-1124740 discloses a shotgun slug in accordance with the preamble of claim 1 with plural secondary projectiles in the form of spherical pellets which are housed in U-shaped grooves formed in the sides of a round-nosed, parallel-sided slug. Alternatively, the secondary projectiles can be located in a hollowed out portion of the slug.

According to the present invention, an ammunition round comprises a slug which has a plurality of grooves in its outer surface, each of the grooves being substantially "U" shaped in cross section and containing a plurality of spherical bodies arranged in rows in each of the grooves, characterized in that the slug is of ogival shape that the grooves extend helically around or substantially parallel to the longitudinal axis of the slug, and that the spherical bodies have a diameter substantially equal to that of the cross-section of the grooves to support and stabilize the slug in a barrel through which it is fired.

The ammunition of the invention is intended for use primarily as a shotgun slug and the bullet or slug may be made of steel or, as conventional, of lead. The spherical bodies lying in the grooves may be formed of steel, plastics or any other suitable material.

For civilian use the slug will preferably be formed of lead, for use e.g. when deer hunting, with a normal shotgun.

A military version would be formed of steel, with steel balls in the grooves, thus additionally providing a multiple projectile round. The balls

scatter like a shotgun for short range and the central streamlined projectile has long range energy and accuracy, so the round can be used as in applications normally requiring a rifle.

As in my above European application the flutes or grooves reduce frontal area and wind resistance to aid streamlining and form fins to help stabilize the slug in flight. The balls in the grooves prevent the streamlined slug, with its ogival shape, from tilting in the barrel. Normal shotgun slugs, as for example, shown in the prior art referred to above, have a cylindrical shape which prevents tilting, but are not streamlined.

The balls stabilize the slug and separate from it equally well whether the grooves are helical or parallel to the axis of the slug, but if they are helical then windflow through the grooves after separation of the balls begins to spin the slug and stabilize its flight to improve accuracy.

One example of a slug for an ammunition round according to the present invention is now described with reference to the accompanying drawings in which:

Fig. 1 is a side elevation of the slug itself,

Fig. 2 is a side elevation of the slug with the spherical bodies mounted on it, and

Fig. 3 is an end elevation on arrow A in Fig. 2.

A steel slug 1 of conventional ogival outline has four helical flutes 2 equiangularly positioned around its central axis 3. In each of the grooves 2 four spherical bodies 4 are positioned, each of the spherical bodies 4 having a diameter substantially the same as although slightly less than the diameter of the cross-section of the flute 2. The spherical bodies are also preferably made of steel and may be conventional ball bearings. The circular sectioned wall of the flutes 2 supports the spherical bodies 4 which are retained within the flutes 2 in the radial direction, prior to firing by the wall of the casing, and after firing by the wall of the barrel.

The rear of the slug 1 may be abutted by a plug (not shown) in order to provide a satisfactory seal to the casing (not shown) to prevent the blast from the explosion of the charge passing around the sides of the slug.

## Claims

1. A slug (1) which has a plurality of grooves (2) in its outer surface, each of the grooves being substantially "U" shaped in cross section and containing a plurality of spherical bodies (4) arranged in rows in each of the grooves, characterized in that the slug (1) is of ogival shape that the grooves extend helically around or substantially parallel to the longitudinal axis of the slug, and that the spherical bodies (4) have a diameter substantially equal to that of the cross-section of the grooves (2) to support and stabilize the slug in a barrel through which it is fired.

2. An ammunition round comprising a casing for containing a propelling charge and a bullet or slug of ogival shape as defined in claim 1.

**Patentansprüche**

1. Geschoß für Feuerwaffen mit einer Vielzahl von Rillen (2) an seiner Außenseite, von denen jede der Rillen im wesentlichen einen U-förmigen Querschnitt aufweist und eine Vielzahl von kugelförmigen Körpern (4) enthält, die in Reihen in jeder der Rillen angeordnet sind, dadurch gekennzeichnet, daß das Geschoß (1) die Form eines Spitzgeschosses hat, daß die Rillen wendelförmig um oder im wesentlichen parallel zu der Längsachse des Geschosses verlaufen, und daß die kugelförmigen Körper (4) einen Durchmesser haben, der im wesentlichen gleich dem des Querschnitts der Rillen (2) ist, um das Geschoß im Waffenlauf zu stützen und zu stabilisieren, durch den es abgefeuert wird.

2. Munitionspatrone bestehend aus einer Hülse zur Aufnahme einer Treibladung und einem spitzgeschossigen Geschoß nach Anspruch 1.

**Revendications**

1. Balle (1) qui présente une pluralité de rainures (2) dans sa surface extérieure, chacune de ces rainures étant sensiblement en forme de U en section transversale et contenant une pluralité d'éléments sphériques (4) disposés en rangée dans chacune de ces rainures, caractérisée en ce que la balle (1) est en forme d'ogive, en ce que les rainures s'étendent hélicoïdalement autour de l'axe longitudinal de la balle et sensiblement parallèlement à cet axe et en ce que les éléments sphériques (4) ont un diamètre sensiblement égal à celui de la section transversale des rainures (2) pour donner appui à la balle et la stabiliser dans le canon dans lequel elle est tirée.

2. Cartouche de munition comprenant un étui destiné à contenir une charge propulsive et une balle ou un plomb en forme d'ogive selon la revendication 1.

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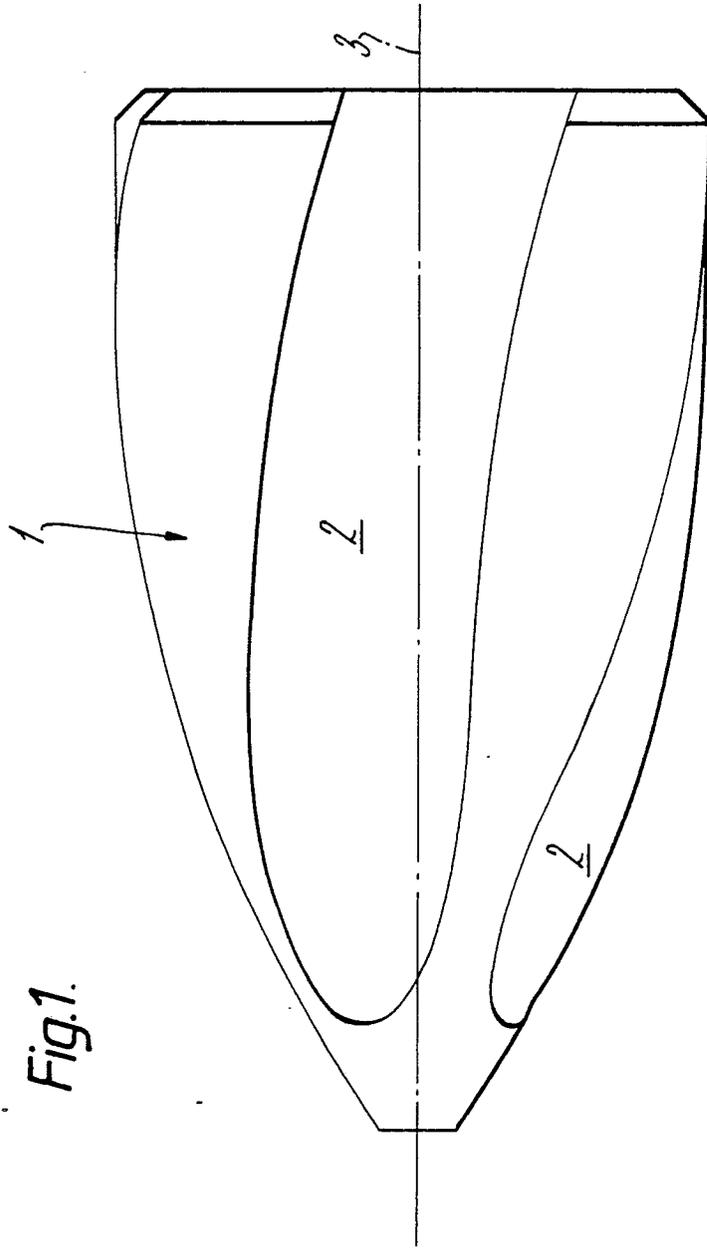


Fig.1.

Fig. 3.

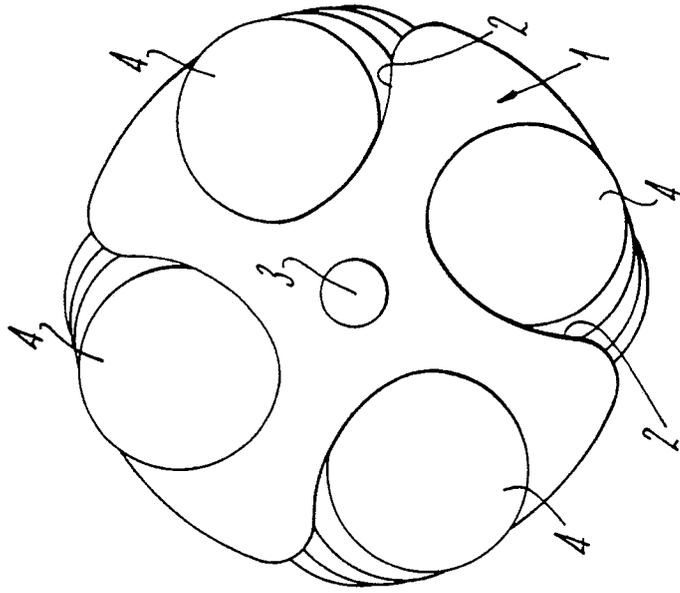


Fig. 2.

