A partial fragmentation bullet comprising a nose core, which forms a fragmenting portion of the partial fragmentation bullet, and a rear core, which forms a penetration portion of the partial fragmentation bullet. The nose core and the rear core are made of materials having the same level of hardness. This level of hardness is in the Brinell hardness range.
PARTIAL FRAGMENTATION BULLET

[0001] The instant application should be granted the priority date of Mar. 3, 2009, the filing date of the corresponding German patent application 10 2009 011 095.3.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a partial fragmentation bullet for hunting purposes.

[0003] Modern rifle projectiles or bullets must satisfy various hunting-related requirements. The most important of these requirements is the target precision, i.e. the firing precision from various hunting weapons. Furthermore, the game is to be killed rapidly and without great agony. For this purpose, it is necessary that the bullet has a spreading effect and a depth effect in the body of the game. To fulfill this requirement, the bullet should fragment in the body of the game, and at the same time should retain a defined residual mass. This is achieved by a separation into two cores. A further requirement of modern rifle bullets is a formation of cut hair and blood at the entry wound in order to facilitate a possible search for a wounded animal, even where there is no exit wound. Since due to the elasticity of the fur coat, the skin, and the fat layer disposed below it, the point of entry frequently closes very rapidly, so that it is desirable to have an exit wound with the formation of blood, even when the firing angle is not favorable.

[0004] Coming very close to these requirements are the rifle projectiles that are attributable to the assignee of the present application and that are known world-wide under the trademark TUG (Torpedo-Universal-Geschoss [-projectile]) and TIG (Torpedo-Ideal-Geschoss [-projectile]). These projectiles have their origin in a hunting bullet patented for the founder of the assignee, Wilhelm Brenneke, on 11 Dec. 1920, by the German Patent Office under the number 370 908.

[0005] These projectiles are partial fragmentation projectiles having a casing or jacket of nickel-plated low-carbon or ingot steel that in a form-locking manner receives two lead cores, namely a softer nose core and a harder rear core. These projectiles obtain their name due to their base or bottom, which in the rear has a torpedo shape. These bases have inferior ballistics advantages. The dual-core construction of the above-mentioned Brenneke rifle bullets provide for an optimum release of energy in the target with a reliable spreading and depth effect. This occurs due to the rapidly occurring deformation and fragmentation of the front, soft lead core, while the rear, hard lead core in most cases leads to the desired exit wound. Characteristic for the TIG and TUG projectiles is a sharp edge that is formed in the region of the head of the projectile and that in most instances delivers cut hair and blood to the entry wound.

[0006] This line of development of the aforementioned type of partial fragmentation projectiles, i.e. with a soft nose core and a hard rear core, was maintained over nearly 100 years. Evidence of this is also a partial fragmentation projectile patented in 2007 (EP 1 214 560 B1). Involved here is a projectile that is free of lead. Proposed as metallic materials for these projectiles are copper, tin, zinc, iron, tungsten, titanium, silver, aluminum, tantalum, vanadium, and alloys of these metals.

[0007] It is an object of the present invention to provide an improved partial fragmentation bullet of the aforementioned general type that has a dual-core construction.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] This object, and other objects and advantages of the present application, will appear more clearly from the following specification in conjunction with the accompanying schematic drawings, in which:

[0009] FIG. 1 is a longitudinal section through a first exemplary embodiment of an inventive partial fragmentation bullet,

[0010] FIG. 2 is a longitudinal section through a second exemplary embodiment of an inventive partial fragmentation bullet,

[0011] FIG. 3 is a longitudinal section through a third exemplary embodiment of an inventive partial fragmentation bullet,

[0012] FIG. 4 is a longitudinal section through a fourth exemplary embodiment of an inventive partial fragmentation bullet,

[0013] FIG. 5 is a longitudinal section through a fifth exemplary embodiment of an inventive partial fragmentation bullet, and

[0014] FIG. 6 is a longitudinal section through a sixth exemplary embodiment of an inventive partial fragmentation bullet.

SUMMARY OF THE INVENTION

[0015] The partial fragmentation bullet of the present application comprises a nose core, which forms a fragmenting portion of the partial fragmentation bullet, and a rear core, which forms a penetration portion of the partial fragmentation bullet; the nose core and the rear core are made of materials having the same level of hardness or hardness value, with such level of hardness being in the Brinell hardness range (HBW). Thus, the partial fragmentation bullet of the present application breaks with the concept that was accepted and practiced for many decades, and which states that the nose core of partial fragmentation bullets must be softer than the rear core. However, with the partial fragmentation bullet of the present application, it has been surprisingly shown that it is also possible with nose cores and rear cores that have the same hardness to achieve the desired interior ballistics of bullets, namely a mushrooming and fragmentation of the nose core as well as an exit wound in most instances.

[0016] The solution of the present application makes it possible, pursuant to one advantageous embodiment of the invention, to use the same materials for the nose core and for the rear core, which results in considerable advantages in fabrication techniques during the manufacture of the bullet.

[0017] Pursuant to one advantageous embodiment of the present invention, the nose core and the rear core are made of tin.

[0018] When using materials for the rear core and the nose core having greater hardness values of up to 200 HBW it can be advantageous to provide mushrooming aids to enhance the mushrooming of the nose core. Such mushrooming aids can be in the form of hollow tips, through-holes that extend through the nose core in the longitudinal direction, or blind holes in which expanding bodies are placed.
Further specific features of the present application will be described in detail subsequently.

DESCRIPTION OF SPECIFIC EMBODIMENTS

Referring now to the drawings in detail, the partial fragmentation projectile or bullet 1 shown in FIG. 1 corresponds in principle to the construction of assignee's known TUG-projectile, while the partial fragmentation projectile or bullet 1 shown in FIG. 4 corresponds in principle to the construction of assignee's known TUG-projectile. Accordingly, the two partial fragmentation bullets 1 of FIGS. 1 and 2 have a dual-core construction comprised of a nose core 2 and a rear core 3. Furthermore, common to both of these partial fragmentation bullets 1 is a bullet casing or jacket 4 (partial jacket projectile or bullet) that is open at the tip of the nose; the thickness of the jacket 4 increases from the tip of the bullet toward the rear. Characteristic of both of the partial fragmentation bullets 1 is furthermore a sharp edge 5, which during entry of the bullet pouches or forms a circular hole and thus delivers cut hair and blood to the entry wound or point of impact, and also a torpedo-rear 6 that results in interior ballistic advantages due to its bottom shape. Further, common features of the partial fragmentation bullets 1 of FIGS. 1 and 4 include circumferential retention grooves 7 and crimping grooves 8, which, however, are differently shaped with the two partial fragmentation bullets 1 yet have the same function. The retention grooves 7, as their name already implies, serve to retain or hold the rear core 3 against the bullet jacket 4 while the crimping grooves 8 serve for the establishment of a crimp connection between a non-illustrated cartridge or round casing and the partial fragmentation bullet 1.

With the partial fragmentation bullet 1 of FIG. 1, the end at the nose side of the rear core 3 is provided with a funnel-shaped recessed area 9, into which a correspondingly shaped pin 10 of the nose core 2 engages in a positive or form-locking manner. Both the nose core 2 and the rear core 3 are made of tin.

When the partial fragmentation bullet 1 of FIG. 1 strikes the body of game, the nose core 2 mushrooms and at the same time the pin 10 of the nose core 2 penetrates into the rear core 3, so that this rear core is also splayed open, i.e. its cross-section increases. In this connection, the bullet jacket 4 remains connected to the rear core 3. Due to the great expansion of the cross-section of the partial fragmentation bullet 1, a significant shock effect is caused in the body of the game, so that the animal quickly perishes. At the same time, the rear core 3, which does not fragment, in most instances provides for an exit wound in light and middle-weight game.

The target ballistics of the partial fragmentation bullet 1 of FIG. 4 differs from that of the target fragmentation bullet 1 of FIG. 1. This is primarily brought about in that with the partial fragmentation bullet 1 of FIG. 4, the front portion of the rear core 3 extends into the nose core 2 by means of a cone-shaped tip 3. The nose core 2 rests against the rear core 3 in a positive or form-locking manner via a corresponding cone-shaped recessed area 12.

When the partial fragmentation bullet 1 of FIG. 4 strikes the body of game, the nose core 2 mushrooms before it fragments, so that due to the increase in cross-sectional area, again a shock effect is achieved in the body of the game. Due to this mushrooming, the bullet jacket 4 separates at the crimping groove 8. Due to its cone-shaped tip 11, the rear core 3 essentially experiences no increase in cross-section, so that the partial fragmentation bullet 1 of FIG. 4 as a rule provides for an exit wound, even with heavier game.

The partial fragmentation bullets 1 of FIGS. 2 and 3 and FIGS. 5 and 6 differ from the partial fragmentation bullet of FIG. 1 and of FIG. 4 respectively in that they are provided with mushrooming aids. Such mushrooming aids are particularly required when metallic materials having greater hardness values are used.

With the partial fragmentation bullets 1 of FIGS. 2 and 5, the mushrooming aid is in the form of a thin through-bore 13 that extends centrally through the nose core 2 from the front to the rear.

With the embodiment of FIGS. 3 and 6, the nose core 2 has a blind hole 14 that opens into the tip and expands in a conical manner at the opening. An expanding body 15 of a harder material, which forms the tip of the partial fragmentation bullet 1, is inserted into the blind hole 14. A shaft 15.1 of the expanding body 15 extends into the blind hole 14. At the shaft 15.1, a conical expansion, which corresponds to the expansion of the blind hole 14, adjoins the shaft 15.1 at the transition to the tip of the bullet. The connection between the expanding body 15 and the nose core 2 is established by a positive material connection.

The specification incorporates by reference the disclosure of German priority document 10 2009 011 093.3 filed 3 Mar. 2009.

The present invention is, of course, in no way restricted to the specific disclosure of the specification and drawings, but also encompasses any modifications within the scope of the appended claims.

What we claim is:

1. A partial fragmentation bullet (1), comprising:
   a. nose core (2), wherein said nose core forms a fragmenting portion of said partial fragmentation bullet (1); and
   b. rear core (3), wherein said rear core forms a penetration portion of said partial fragmentation bullet (1), further wherein said nose core (2) and said rear core (3) are made of materials having the same level of hardness, and wherein said level of hardness is in the Brinell hardness range.

2. A partial fragmentation bullet according to claim 1, wherein said level of hardness of said nose core (2) and said rear core (3) is a maximum Brinell hardness of 200.

3. A partial fragmentation bullet according to claim 2, wherein said nose core (2) and said rear core (3) are made of the same materials.

4. A partial fragmentation bullet according to claim 3, wherein said nose core (2) and said rear core (3) are made of tin.

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