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PLASTIC-LEAD MUSHROOMING BULLET

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FIG. 1

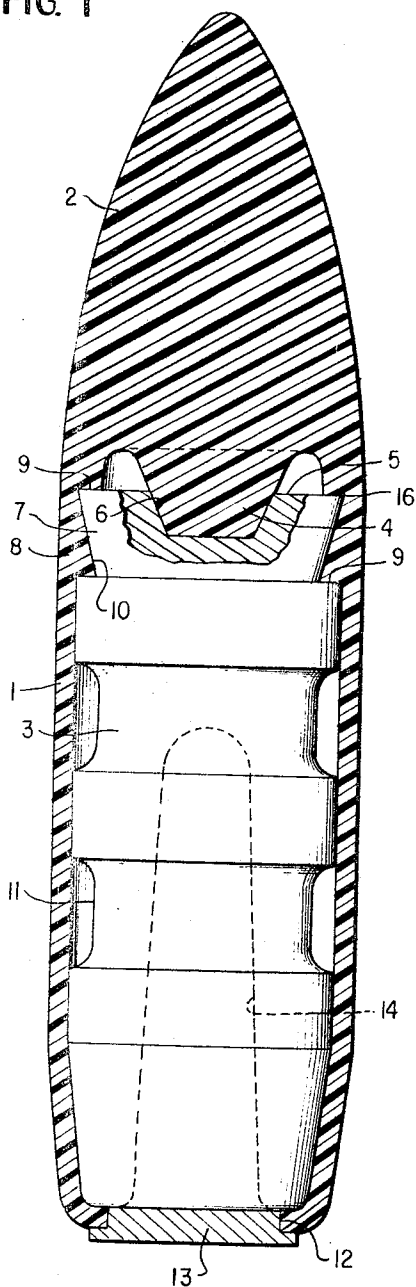
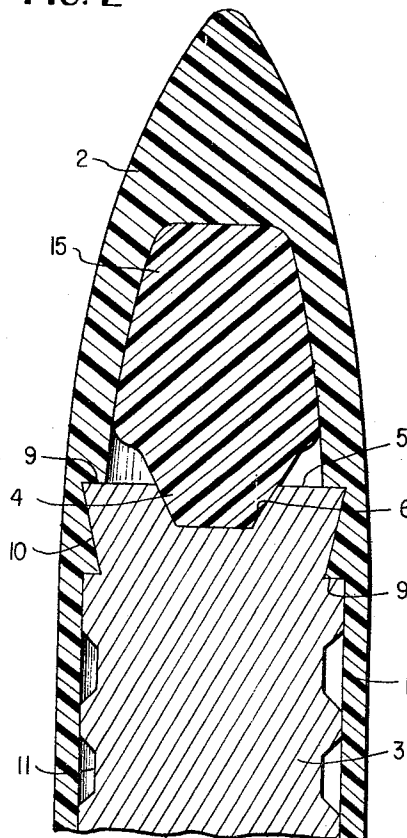


FIG. 2



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PLASTIC-LEAD MUSHROOMING BULLET

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22 Claims. (Cl. 102—92.3)

ABSTRACT OF THE DISCLOSURE

A bullet having a lead core and a synthetic plastic jacket surrounding it on its sides and forward end, wherein the jacket has a rearwardly extending conical wedge and the core has a forwardly extending correspondingly conically shaped aperture for mushrooming the core radially outwardly and forwardly where there is relative movement of the core toward the jacket upon impact with the target. The core and jacket may be provided with several axially aligned supporting shoulders spaced radially outwardly from the wedge for supporting the exterior of the core against relative movement and defining with the wedge an annular space therebetween to allow the above-mentioned mushrooming effect. The core may be provided with a plurality of annular rings on its outer surface and a central rearwardly opening aperture for weight reduction and to provide desired flight characteristics.

Background of the invention

It has been an aim for quite some time with cartridges to increase the bullet velocity and at the same time to reduce the bullet weight. By reason of the difficulties to so match these two factors to one another that the desired effect is achieved thereby, especially a corresponding behavior of the bullet in the animal body, these efforts heretofore did not always bring about the desired success.

Summary of the invention

Consequently, a new approach is followed according to the present invention for the solution of the aforementioned problem with cased or covered bullets for cartridges whereby one starts with the premise that increased bullet velocities with simultaneously reduced bullet weight only makes sense and is appropriate only if at the same time the disintegration of the bullet or the desired mushrooming of the core can take place rapidly. Accordingly, the present invention proposes to make the bullet case or jacket of thermoplastic material, preferably of polyethylene, polystyrene, or hard polyvinyl chloride, and the bullet core in a known manner of lead, and to so construct the two parts that the core is retained between the solidly constructed bullet jacket tip and the inwardly flanged bullet jacket end. The use of these materials having a very different specific weight makes it possible by a corresponding selection of the dimension and volumes of plastic bullet jackets and lead core, i.e., by corresponding matching of the proportions thereof to the over-all dimensions and over-all volume, to influence the weight and center of gravity of the bullet over a very wide range and therewith to match the same to very different ballistic requirements as regards shell velocity, penetrating force and flight or ballistic properties. Furthermore, the construction of the bullet jacket of plastic material offers the advantage that the latter opposes a hardly significant resistance during the mushrooming of the core upon impact on the animal body, at least, however, a considerably smaller resistance than the customary bullet jackets of steel or metal in use heretofore.

This ready and advantageous mushrooming of the core

can be further considerably improved if, according to a further proposal of the present invention, the core is axially supported in the jacket or casing in the direction toward the bullet tip along a ring-shaped rim strip of its forward end face, i.e., in such a manner that between the central area of the forward end face of the core and the oppositely disposed central area of the case or jacket tip, a hollow space is created. Upon impact of the bullet on the target, this has as a consequence that the core material is held back in the abutting or supported rim area whereas the core material disposed in the central unsupported area moves forwardly under the influence of the inertia until it finally impinges against or hits upon the bullet jacket tip and then seeks to deflect laterally whereby it forces away outwardly the material disposed in the rim area, thus bursting open the bullet jacket or case or shears off the same directly behind the solid case or jacket tip.

A further advantageous measure according to the present invention for improving the mushrooming of the bullet core resides in that the latter is provided at the forward end face thereof with a central conical aperture or recess, by means of which the bullet core is supported on a correspondingly constructed conical extension of the bullet jacket or casing or also on a separate damming body inserted in the axial direction between the bullet jacket tip and the core. This measure effects immediately upon impact of the bullet at the target, a deflection of the material forming the center of the core both forwardly and outwardly at an inclination corresponding to the conical inclination of recess and extension so that the mushrooming operation is initiated directly upon impact of the bullet and especially also the shearing effect on the bullet jacket is considerably reinforced or enhanced thereby.

The arrangement of a separate damming body offers thereby not only the possibility to influence the mushrooming by means of the damming body by a selection of a correspondingly hard material and to influence the bullet velocity by selection of a more or less heavy material, but especially also the possibility to construct the bullet jacket tip, shearing off upon mushrooming of the core, of such heavy weight and with such penetrating force that a slug channel is achieved with certainty in the animal body.

According to a further proposal of the present invention, provision is made to construct the core at the forward end by means of a constriction in such a manner as to taper conically toward the rear and to anchor the core thereat by means of an internal annularly shaped reinforcement of the bullet jacket of corresponding shape and engaging into this constriction of the core. Not only the requisite good securing of the core in the jacket is achieved by this measure but also at the same time the desired easy and good mushrooming of the core upon impact of the bullet at the target is favored as the outer forward end of the core is effective along its entire circumference as a pointed wedge directed obliquely forwardly and outwardly.

The possibilities to influence the velocity, the weight, and the center of gravity location of the bullet according to the present invention in the desired manner are not limited to varying the wall thickness of the bullet jacket and the length of its solid tip and to then construct correspondingly the core with a more or less large radial and axial dimension, rather an influencing in the desired sense also exists by the fact that the core is provided along the circumference with a more or less large number of annular grooves of corresponding width and depth and/or is provided with a more or less deep recess of corresponding cross-sectional dimensions which starts from its rear end face. Both measures, especially, however, the construction of the annular grooves, contribute additionally

to a good adaptability of the bullet to the given constructions and dimensions of the barrel of the gun as the possibility exists thereby for the core material to deflect and yield correspondingly in the axial direction with strong radial pressures.

Accordingly, it is an object of the present invention to provide a cartridge which is simple in construction, yet avoids the shortcomings encountered heretofore with the prior art constructions in an effective manner.

Another object of the present invention resides in the provision of a bullet jacket for cartridges in which the bullet velocity can be increased while at the same time the bullet weight can be decreased without affecting deleteriously the efficacy upon impact on the animal.

A further object of the present invention resides in a bullet jacket of the type described above which utilizes readily available materials that enhance the mushrooming explosion of the core in a rapid manner.

Still another object of the present invention resides in a bullet jacket or envelope of plastic material which permits variation over an extraordinarily wide range of the volume, weight, and location of the center of gravity of the bullet and therewith enables an adaptation of the particular bullet to the prerequisite ballistic conditions under given circumstances.

Still a further object of the present invention resides in a bullet jacket for cartridges which at least greatly reduces the resistance encountered by the core during the mushrooming release of the core upon impact on the animal body.

Another object of the present invention resides in the construction and arrangement of a bullet jacket and core therefor, which not only facilitates the mushrooming release of the core upon impact but also assures an initiation of such mushrooming directly upon impact of the bullet on the animal.

These and further objects, features and advantages of the present invention will become more obvious from the following description when taken in connection with the accompanying drawing, which shows, for purposes of illustration only, two embodiments in accordance with the present invention, and wherein:

Brief description of the drawing

FIGURE 1 is an axial cross-sectional view through a first embodiment of a bullet in accordance with the present invention provided with an internal conical damming body formed on the bullet jacket tip; and

FIGURE 2 is a partial axial cross-sectional view through a modified embodiment of a bullet in accordance with the present invention provided with a separate damming body.

Detailed description

Referring now to the drawing wherein like reference numerals are used throughout the two views to designate like parts, and more particularly to FIGURE 1, approximately the forward third of the bullet jacket 1 made of synthetic plastic material and surrounding the lead core 3 is constructed as solid bullet tip 2. On the inside of the bullet jacket 1, the bullet tip 2 extends into the projection 4 of conically truncated shape and engages with this projection 4 into the conically truncated recess 6 formed into the forward end face 5 of the core 3. The forward end 7 of the core 3 as well as the adjoining area 8 of the jacket 1 are provided, as viewed in axial cross section, with identical complementary Z-shaped configurations so that the jacket 1 and the core 3 mutually face one another by means of the plane annular surfaces 9 disposed one behind the other as well as the conical surface 10 and are thus mutually fixed in the axial direction. In its central part, the core 3 is provided with the two shallow wide annular grooves 11. The inwardly flanged rear end of the jacket 1 is provided with an aperture 12 closed by the disk 13. Reference numeral 14 designates a central aperture provided in the rear part of the core 3.

The shell tip 2, the bullet tip 2—and analogously, of course, also the core 3—may be of solid construction over a more or less large axial extent whence both an influencing of the bullet weight and therewith of the bullet velocity as also of the location of the center of gravity of the bullet can be achieved. The same, however, can also be achieved to a certain extent in that the cross-sectional dimensions of the core 3 as well as the wall conditions of the jacket 1 are varied in an analogous manner. Further possibilities for that purpose exist by the construction of a more or less large number of annular grooves of corresponding width and depth and also by a corresponding dimension of the recess or aperture 14 both as regards its depth as well as its cross-sectional dimensions.

The recess 6 and extension 4 may also be constructed conically with a point or apex. Possibly, however, the aperture 6 by itself could be constructed conically with a point or apex and the extension 4 could be retained in the illustrated truncated conical shape. It is furthermore clear that the possibilities of construction of the recess 6 and of the extension 4 is not limited to the shape of a cone but instead other shapes may be realized, by means of which the intended rapid and easy mushrooming of the core is achieved.

The forward end of the bullet tip 2 may be provided also with a conventional disintegration aperture and still considered to be substantially rigid.

According to FIGURE 2, in which the parts corresponding to those of FIGURE 1 are designated by the same reference numerals, the separate damming body 15 is arranged in the axial direction between the solid bullet tip 2 constructed of much smaller dimension than in FIGURE 1 and the core 3. One is able by appropriate selection of the material of the damming body 15, such as a relatively unyielding thermoplastic material or thermo-setting plastic material, to influence in the desired manner the mushrooming operation as also the bullet weight and in dependence of the latter correspondingly also the velocity and location of the center of gravity of the bullet. The core 3 is constructed in that case with a larger number of trapezoidally shaped annular grooves 11 and transitional sections disposed therebetween whereby the adaptability of the shell to the barrel of the gun is still further improved.

With both embodiments, upon impact of the bullet on the target, the core 3 is held back in its rim area by the annular surface 9 of the bullet jacket 1, whereas, in contrast thereto, the inwardly adjoining annularly shaped area of the core 3 is displaced forwardly by reason of lack of an abutment under the effect of the inertia. The inwardly adjoining rim-shaped area of the core 3 is thereby deflected obliquely forward and outwardly by the extension 4 also holding back the material of the core center and effecting a damming action and is thereby scattered and driven apart so that the jacket 1 bursts open about the entire circumference within the area of the edge 16 by the wedging effect and thus the desired mushrooming of the core can now take place without any considerable resistance.

While I have shown and described two embodiments in accordance with the present invention, it is understood that the same is not limited thereto but is susceptible of numerous changes and modifications as known to a person skilled in the art, and I therefore do not wish to be limited to the details shown and described herein but intend to cover all such changes and modifications as are encompassed by the scope of the appended claims.

I claim:

1. A bullet for cartridges, having an axis, an axial forward end and an axial rear end; a bullet jacket of synthetic plastic material; a core of lead material within said jacket; said jacket having a forward end substantially rigid jacket tip and an axially extending generally tubular portion, substantially enclosing said core at the forward end and the sides, respectively; said jacket tip having a rearwardly extending and inwardly tapered wedge means

for engaging the central portion of said core to mushroom the forward end of said core outwardly and forwardly upon relative axial movement toward each other.

2. The bullet according to claim 1, wherein said synthetic plastic material is selected from the group consisting of polypropylene, polyethylene and hard polyvinyl chloride.

3. The bullet according to claim 1, wherein said core has an outer forwardly facing annular shoulder and said jacket has a rearwardly facing annular shoulder engaging said core shoulder.

4. The bullet according to claim 3, wherein said shoulders are substantially perpendicular to the bullet axis.

5. The bullet according to claim 1, wherein said core has a forwardly opening and widening cam aperture in its central portion generally of the same shape as and engaging said jacket wedge means.

6. The bullet according to claim 5, wherein said wedge means is separate from the remainder of said jacket.

7. The bullet according to claim 3, wherein each of said jacket and said core has second shoulders substantially identical to, axially aligned with and axially spaced from said first mentioned shoulders connected together by a diagonally extending, as viewed in axial cross section, annular portion.

8. The bullet according to claim 1, wherein said core has at least one annular groove on its exterior substantially symmetrical with the axis and forming an annular empty space between said core and said jacket.

9. The bullet according to claim 1, wherein said core has a plurality of annular grooves on its exterior substantially symmetrical with the axis and forming annular empty spaces between said core and jacket.

10. The bullet according to claim 1, wherein said core is provided with a substantially central aperture opening rearwardly.

11. The bullet according to claim 10, further comprising closure means for closing said central aperture

12. The bullet according to claim 3, wherein said core has a forwardly opening and widening cam aperture in its central portion generally of the same shape as and engaging said jacket wedge means.

13. The bullet according to claim 12, wherein each of said jacket and said core has second shoulders substantially identical to, axially aligned with and axially spaced from said first mentioned shoulders connected together by a diagonally extending, as viewed in axial cross section, annular portion.

14. The bullet according to claim 13, wherein said core has at least one annular groove on its exterior substantially symmetrical with the axis and forming an annular empty space between said core and said jacket.

15. The bullet according to claim 14, wherein said core is provided with a substantially central aperture opening rearwardly.

16. The bullet according to claim 7, wherein said core has at least one annular groove on its exterior substantially symmetrical with the axis and forming an annular empty space between said core and said jacket.

17. The bullet according to claim 1, wherein the rearward end of said jacket includes an inwardly extending annular flange axially abutting against the rearward end of said core.

18. The bullet according to claim 1, wherein said tubular portion of said jacket is substantially cylindrical and said wedge means is substantially conical.

19. The bullet according to claim 7, wherein said diagonally extending annular portion is substantially radially aligned and spaced outwardly concentric with said wedge means.

20. The bullet according to claim 7, wherein said diagonally extending annular portion increases in diameter with respect to the axis in the forward direction.

21. The bullet according to claim 20, wherein said diagonally extending annular portion is substantially radially aligned and spaced outwardly concentric with said wedge means.

22. The bullet according to claim 21, wherein the rearward end of said jacket includes an inwardly extending annular flange axially abutting against the rearward end of said core and wherein said tubular portion of said jacket is substantially cylindrical and said wedge means is substantially conical.

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