By the intended guidance of the shockwaves produced during the impact, the amount of explosive material can be basically reduced; the dangerous PENT nowadays often used can furthermore be avoided.

The different run times of opposing shockwaves are in the range of milliseconds so that as a result of the inertia of the explosive agent an extremely high densification and thereby a safe initiation directly follows.

The amount of explosive agent can be reduced significantly according to the object of the invention, as reproducible shooting trials at different targets with a multipurpose projectile of caliber 0.5 showed, the same without blind shells, deflagrations or flashfires.

In one embodiment, according to claim 1, there is provided a full jacket safety projectile with a full jacket and a central penetration core centered in the full jacket with a front-sided, blind hole-like recess being filled with an explosive agent, wherein the penetration core having at least one first and one second wedge-shaped constriction, wherein the full jacket has circumferential notches in the front region of the penetrating core, wherein on impact on a target the resulting central shockwave acting front-sided on the explosive agent and the recess in the penetration core splinters inside the target, wherein at the circumferential notches and/or wedge-shaped constrictions shockwaves are reflected at the full jacket and/or in the penetration core and wherein the same are impinging the explosive agent, by opposingly directed shockwaves, so that compressions counteracting to each other are evolving, which are directly initiating the explosive agent.

Advantageous developments of the subject matter of the invention are described in the dependent claims.

According to claim 2, a simple guidance of shockwaves takes place by circumferential notches at the full jacket.

Constrictions with front-sided faces at the penetration core are particularly efficient for the effective reflection of shockwaves according to claim 3.

In a preferred embodiment of the invention, a front-sided face, that means the face causing and aligning the reflection of the shockwaves towards the recess 5, formed as upper wedge face particularly of a wedge-shaped first and/or second constriction. Preferably, the upper wedge

face is formed flat, even and conical-shaped particularly regarding opposing the axial direction (F) (shooting direction). Alternatively, the upper wedge face can be formed at least partly, preferably fully, convex, preferably parabolic-shaped (viewed from the outer side of the penetration core) in order to focus the shockwaves to the explosive material at the recess.

Preferably, also the other lower face of the wedge-shaped constriction can either be formed flat, even or convex, particularly parabolic-shaped in addition.

The alignment of the front-sided faces at the penetration core takes place in the simplest manner, in that the alignment is determined geometrically by a central line

Claims

1. Full jacket safety projectile with a full jacket and a central penetration core centered in the full jacket with a front-sided, blind hole-like recess being filled with an explosive agent, wherein the penetration core having at least one first and one second wedge-shaped constriction, wherein the full jacket has circumferential notches in the front region of the penetrating core, wherein on impact on a target the resulting central shockwave acting front-sided on the explosive agent and the recess in the penetration core splinters inside the target, wherein at the circumferential notches and/or wedge-shaped constrictions shockwaves are reflected at the full jacket and/or in the penetration core and wherein that the same are impinging the explosive agent, by opposingly directed shockwaves, so that compressions counteracting to each other are evolving, which are directly initiating the explosive agent.

2. Full jacket safety projectile according to claim 1, characterized in that a part of the outer lying shockwaves being guided from circumferential notches of the full jacket to the recess.

3. Full jacket safety projectile according to claim 1 or 2, characterized in that a part of the outer lying shockwaves being reflected on a front-sided face of the second constriction of the penetration core and being guided to a rear-sided tip of the recess.

4. Full jacket safety projectile according to claim 1 to 3, characterized in that a front-sided face of the first and/or second constriction being an upper wedge face, which is particularly formed flatly or convexly.

5. Full jacket safety projectile according to one of the preceding claims, characterized in that a front-sided face of the second constriction being aligned orthogonally to the presumptive, reflected shockwave.

6. Full jacket safety projectile according to one of the preceding claims, characterized in that the recess forming a rear-sided cone face with a tip, wherein the resulting cone angle is 90° to 130°, preferably 120°.

7. Full jacket safety projectile according to one of the preceding claims, characterized in that the first wedge-shaped constriction being formed in such a way that they let the main amplitudes of the reflected shockwave to pass through and that they are optimal predetermined breaking points.

8. Full jacket safety projectile according to one of the preceding claims, characterized in that the steel tip being hardened and containing a central titanium pin.

9. Full jacket safety projectile according to one of the preceding claims, characterized in that the penetration core providing a blind hole-like recess at the rear side, in which a metallic sleeve is introduced, which contains a marking charge.

10. Full jacket safety projectile according to one of the preceding claims, characterized in that the elastic sleeve comprises a pyrotechnical mixture, wherein a polymer matrix, preferably polyether ketone, contains embedded metal powder, like titanium, magnesium, aluminum or zirconium and/or mixtures of the same.

11. Full jacket safety projectile according to one of the preceding claims, characterized in that the penetration core and a front part forming the front-sided, blind hole-like recess being made in one piece, particularly metal piece, wherein particularly the one-pieced penetration core is formed of steel preferably without a magnesium cobalt additive.

12. Full jacket safety projectile according to one of the preceding claims, characterized in that a rear-sided front face of the penetration core being formed evenly or convexly, particularly in that shockwaves are focused towards the recess.

13. Use of a full jacket safety projectile according to claim 1 to 8 for the specific arrest of getaway vehicles.

14. Use of a full jacket safety projectile according to claim 1 to 12 as multipurpose projectile against lightly armored objects.

15. Use of a full jacket safety projectile according to claim 1 to 12 in the manufacturing or repair technology and in rescue services, for forming drill holes without tool machines.

16. Use of a full jacket safety projectile according to claim 1 to 12 in mining, in civil engineering for the preparation of blast holes, outlet bores, injections and pressure releases.

17. Use of a full jacket safety projectile according to claim 1 to 12 for the stepwise drift of bore holes during the exploration of raw materials.