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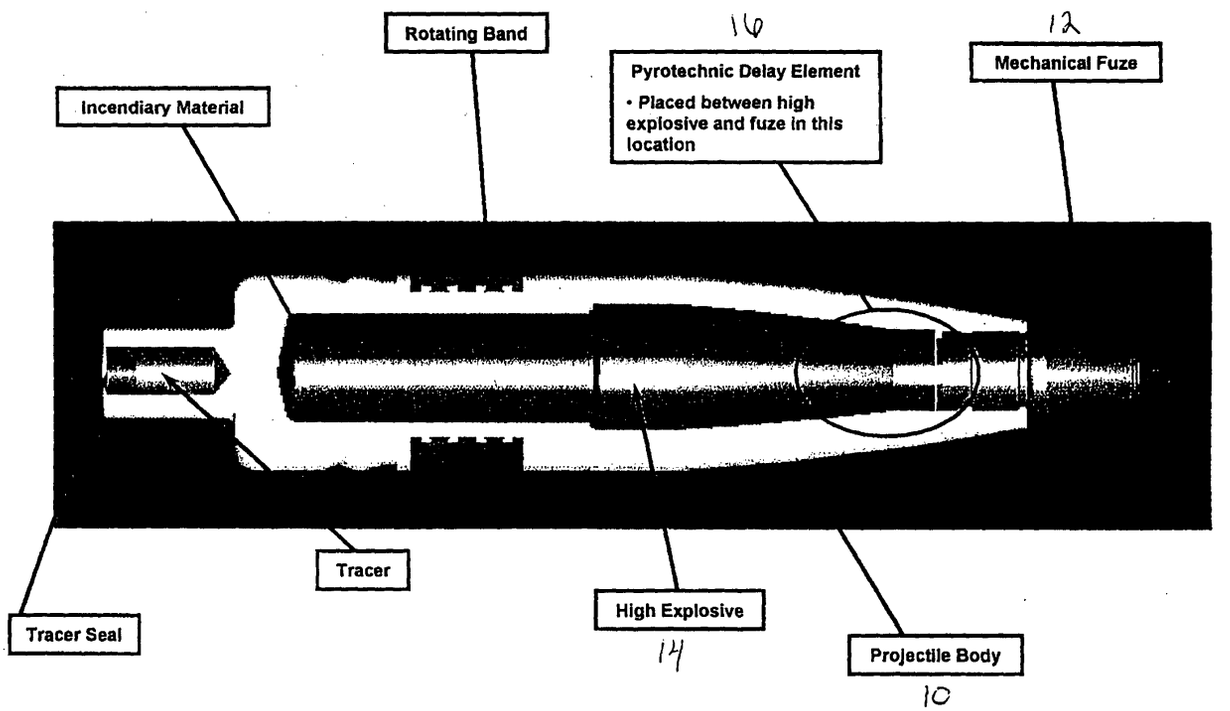
(54) Mechanically fuzed high explosive projectile using pryotechnic initiation delay

(57) A projectile which includes a pyrotechnic delay element placed between the fuze and the high explosive.



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Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH

[0002] Not applicable

TECHNICAL FIELD

[0003] The present invention relates to a projectile which incorporates an ignition delay element between the fuze and the high explosive.

BACKGROUND OF THE INVENTION

[0004] High explosive rounds of ammunition with mechanical fuzes typically use super quick initiation. This often prevents the projectile from entering soft or semi-armored targets prior to the initiation event, which results in little or no damage to the target. Therefore, adding a delay to allow penetration of the soft or semi-armored target is desirable.

[0005] Prior devices have attempted to incorporate the delay element in the fuze itself. This has proven to be an expensive alternative. Chemically fuzed projectiles also exist, but these projectiles fail at high impact angles or at extended ranges. Also, chemically fuzed projectiles do not contain mechanical or physical barriers that require two separate and independent environments for fuze arming to occur.

BRIEF SUMMARY OF THE INVENTION

[0006] Applicants have solved the problems discussed above by utilizing current low cost mechanical fuze designs and with the addition of a pyrotechnic ignition delay element which is placed between the fuze and the high explosive.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0007] A detailed description of the invention is hereafter described with specific reference being made to the drawings in which:

FIG. 1 is a side view of the inventive projectile.

DETAILED DESCRIPTION OF THE INVENTION

[0008] While this invention may be embodied in many different forms, there are shown in the drawings and described in detail herein specific preferred embodiments of the invention. The present disclosure is an exemplification of the principles of the invention and is not intended to limit the invention to the particular embodiments illustrated.

[0009] FIG.1 shows a side view of a standard projectile 10, which includes a fuze 12 at the front end of the projectile and a charge of high explosive at 14. A pyrotechnic delay element 16 is placed between the fuze 12 and the high explosive 14. In the preferred embodiment, the pyrotechnic delay element is comprised of a modified IM-68 incendiary mix, which is comprised of:

~24.2% barium nitrate;

~24.2% ammonium nitrate;

~48.6% Mg/Al Alloy, and

~3.0% Zinc Stearate

[0010] In testing with a 30mm projectile ~5 grams of the modified IM-68 powder were placed and consolidated on top of the high explosive 14, and this was found to provide an adequate delay to initiation.

[0011] The above examples and disclosure are intended to be illustrative and not exhaustive. These examples and description will suggest many variations and alternatives to one of ordinary skill in this art. All these alternatives and variations are intended to be included within the scope of the attached claims. Those familiar with the art may recognize other equivalents to the specific embodiments described herein which equivalents are also intended to be encompassed by the claims attached hereto.

Claims

1. A projectile of the type having a housing, the housing containing a fuze and a charge of high explosive, the improvement comprising:

   a pyrotechnic delay element placed between the fuze and the high explosive.

2. The projectile of claim 1 wherein the projectile has front and rear ends and the fuze is located at the front end of the projectile.

3. The projectile of claim 1 wherein the pyrotechnic delay element is a modified IM-68.

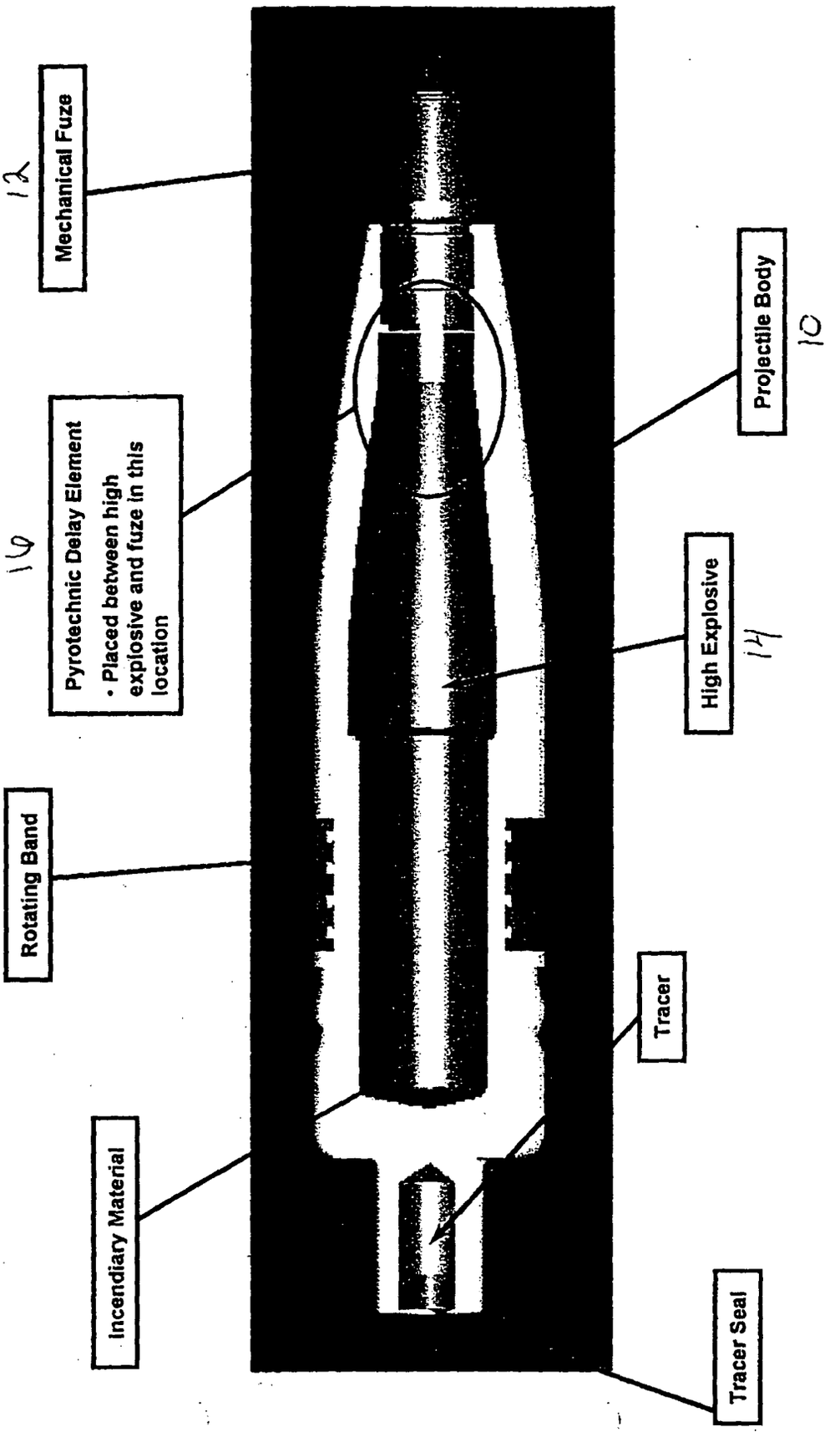
4. The projectile of claim 3 wherein the pyrotechnic delay element comprises:

   approximately 24.2% barium nitrate;

   approximately 24.2% ammonium nitrate;

approximately 48.6% Mg/Al Alloy, and

approximately 3.0% Zinc Stearate


12
Mechanical Fuze
16
Pyrotechnic Delay Element
• Placed between high explosive and fuze in this location
Rotating Band
Incendiary Material
Projectile Body
10
High Explosive
14
Tracer
Tracer Seal