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Forsten et al.

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[54] SILENT HAND WEAPON

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[73] Assignee: **The United States of America as represented by the Secretary of the Army**

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[52] **U.S. Cl.** **89/7**, 89/1

[51] **Int. Cl.** **F41f 1/00**

[58] **Field of Search** 149/36; 60/218, 219, 37, 50; 89/7, 8

[56] **References Cited**

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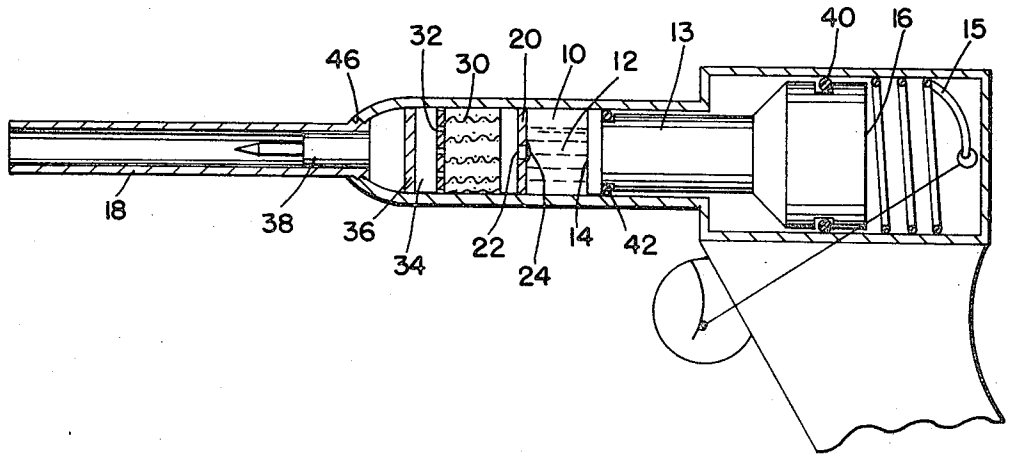
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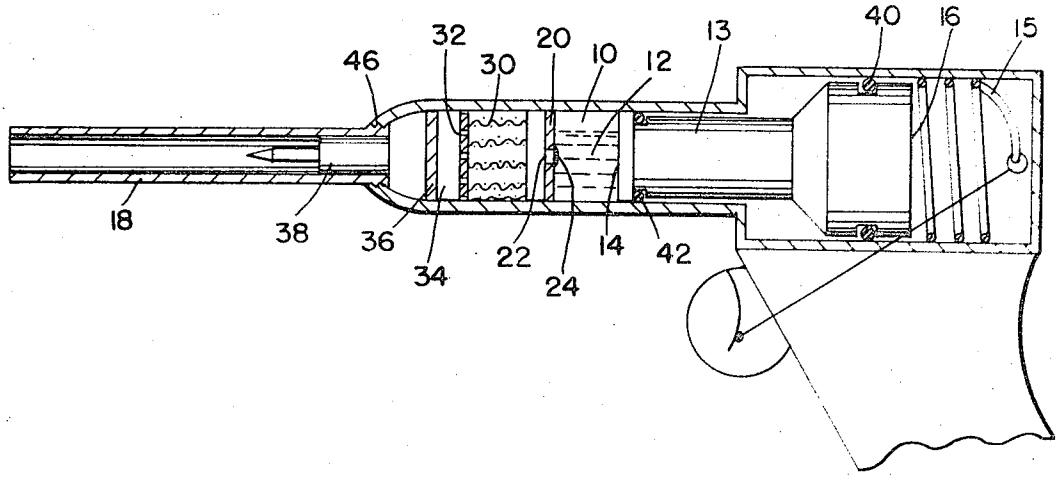
[57] **ABSTRACT**

A hand held weapon having especial value in guerilla fighting and the like since the weapon is capable of discharging projectiles without visible or audible signals. The weapon is actuated by having hydrogen peroxide controllably contact a silver screen for decomposition of the peroxide into superheated steam and oxygen which rupture a burst disc before sending the projectile toward the target. The pressure behing the projectile is substantially constant for the entire length of the weapon's barrel.

7 Claims, 1 Drawing Figure



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SILENT HAND WEAPON

The invention described herein may be manufactured, used, and licensed by or for the Government for governmental purposes without the payment to us of any royalties thereon.

This invention relates to hand weapons and more particularly concerns silent, smokeless hand weapons yielding no visible signals when actuated.

A silent, smokeless hand weapon would be of great value in assisting commandos and guerillas in conducting assigned missions. Such missions are generally carried out by a limited number of personnel using portable equipment. Since surprise is a vital factor in carrying out these missions, the assailant must be capable of moving rapidly and yet not be readily seen. Under these conditions, a standard pistol would obviously be undesirable because of the loud noise produced as well as the production of a visible signal in the form of a flash or smoke.

It is therefore an object of this invention to provide improved hand held weapons which are suitable for use in guerilla missions and the like.

Another object of the invention is to provide such a weapon which, when firing a projectile therefrom, is characterized by an absence of audible and visible signals.

Still another object of the invention is to provide such a weapon wherein a substantially constant pressure force is developed behind the projectile throughout the entire barrel length, thus obviating the high operating pressures required by standard weapons for achieving desirable muzzle velocities.

The exact nature of the invention as well as other objects and advantages thereof will be readily apparent from consideration of the following specification relating to the annexed single FIGURE of drawing wherein an embodiment of our inventive device in axial section is shown.

Briefly, we have discovered that an energy source of hydrogen peroxide, for example, may be caused to contact a suitable catalyst for decomposition of the peroxide into gases which, at a predetermined pressure, will eject a projectile from a weapon. As aforementioned, the pressure behind the projectile is substantially constant for the entire length of the barrel.

More specifically, and referring to the drawing, out weapon comprises a reservoir **10** for containing the fuel **12**, such as hydrogen peroxide, for example, which is effective in our device in concentrations ranging between about 70 to 100 percent. Amine derivatives such as hydrazine also work well. A piston **13** has a front face **14** forming a part of the reservoir **10**. The piston is actuated by a constant force spring **15**, held in tension, one end of which is attached to rear face **16** of piston **13**. Spring **15** urges the piston forward (toward the barrel **18**) to cause the hydrogen peroxide to penetrate disc **20**, forming another portion of reservoir **10**. The disc **20** includes a central opening **22** covered by a mylar sheet **24** which prevents the peroxide from escaping the reservoir **10** at atmospheric pressures, but readily ruptures when a predetermined pressure is applied to the peroxide through the action of the piston. We have determined that a mylar sheet of approximately 0.0002 inches thick is adequate for our purposes, i.e., it is sufficiently thick so as not to rupture during ordinary usage and yet thin enough to rupture upon application of a predetermined pressure thereto. If desired, a plurality of openings, each covered with a mylar sheet, may be used in place of the disc with the central opening.

A catalyst bed **30**, preferably a silver screen, is situated forwardly the hydrogen peroxide, or it may be spaced therefrom by any suitable porous disc unreactive to hydrogen peroxide. Upon contact with the silver screen **30**, the peroxide immediately decomposes into superheated steam and oxygen which pass through porous disc **32**. When a predetermined pressure is attained, the burst disc **36** ruptures and the pressure causes projectile **38** to travel down the length of the barrel and onto the target, the pressure behind the projectile remaining substantially constant for the entire length of the barrel, since peroxide continues to flow into the catalyst bed due to the force exerted by the piston on the peroxide. The ejection of the projectile is accomplished without any appreciable visible or audible signals. The burst disc **36** may conveniently be a mylar sheet which has been aluminum coated, as is well known in the art, the disc having a total thickness of about 0.0005 inches. Multiple layers of mylar discs may be used if increased pressure levels are desired.

In testing our weapon, 2.7cc of 90 percent hydrogen peroxide propelled a 16 grain projectile at a velocity of 405ft/sec. under a pressure of 860 psig. If higher velocities are required, the burst disc may be altered, as aforedescribed, or made from other suitable materials capable of withstanding higher pressure. The quantity of hydrogen peroxide entering the silver screen catalyst bed may also be increased by employing a spring of greater strength. It should be understood that the spring may be replaced by nitrogen gas or carbon dioxide, and the like, under pressure, which can be actuated to urge the piston forwardly by means well known. In such case, an O-ring **40** will be disposed rearwardly in piston **12**, which is satisfactory even for the spring means shown. O-ring **42** will be present regardless of the piston urging means employed.

The burst disc **36** and sheet **24** may be fabricated from such materials as tetrafluoroethylene or thin metallic discs and the like. The barrel length may be changed to permit projectiles to be fired at long or short ranges. To this end, barrel **18** will have screw threads **46** at its inner end for quick removal from the main body of the weapon.

To make the weapon extremely light and inexpensive, construction will be of plastic and reinforced plastic wherever possible, such as tetrafluoroethylene and glass filament reinforcement for example. These plastic materials could also be used for the structural components that contact the hydrogen peroxide as well as the O-rings. Because temperature levels of the exhaust gases would not exceed about 1350°F, and for very short durations, a glass fiber reinforced nylon could be used for the barrel as well as other parts which do not come in contact with the hydrogen peroxide. Although the use of plastics is preferred, metals such as aluminum and stainless steel could readily be used if desired.

Nor is our invention limited to the use of a silver screen catalyst. For example, iodine-pentoxide may be used advantageously with hydrazine.

Other suitable liquid propellants may also be introduced. Similarly, our weapon may be adapted by one skilled in the art to fire a plurality of projectiles separately as is well known in automatic hand weapon design.

We therefore wish it to be understood that we do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. In a weapon having a barrel for ejecting a projectile therefrom without visible or audible signals, said projectile being disposed at an inner portion of said barrel forward of a main portion of said weapon, said main portion having a tubular portion rearwardly adjacent said barrel,

a liquid propellant within said tubular portion,

a catalyst bed within said tubular portion forward of said liquid propellant, means separating said liquid propellant and catalyst bed, means for bringing said liquid propellant into contact with said catalyst bed and for producing a gas pressure behind said projectile, said pressure being substantially constant behind said projectile regardless of the location of said projectile within said barrel, said means including a piston disposed in said weapon rearwardly of said liquid propellant and having a front face adjacent thereto,

means for providing a constant force urging said piston forwardly,

an air space between said catalyst bed and said projectile,

a burst disc disposed within said air space and extending across said tubular portion of said weapon, and

a trigger for actuating said constant force providing means.

2. The device of claim **1** wherein said liquid propellant is hydrogen peroxide.

3. The device of claim 2 wherein said catalyst bed is a silver screen.

4. The device of claim 1 wherein said liquid fuel is hydrazine.

5. The device of claim 3 wherein said catalyst bed is iodine-pentoxide.

6. The device of claim 1 wherein said separating means is a disc having at least one opening therethrough, said opening having a thin sheet thereover capable of rupturing upon application of a predetermined pressure thereto.

7. The device of claim 6 further characterized by said catalyst bed having a porous disc wall at its outer portion for permitting gases to pass therethrough.

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