SINGLE ROUND EXPLODER

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ABSTRACT

A single round exploder is a system for remotely exploding a firearm cartridge. The system includes a regular firearm cartridge having a casing with a rim, a primer, a propellant, and a bullet. A receiving body made of a frangible material defines a hole to permit insertion of the cartridge up to its rim. An ignition cover holds a primer pin that can be made to strike the cartridge to fire it. A payload may be included within the receiving body. A solenoid may be used to move the primer pin to strike the case head discharging the cartridge. A plunger handle extending out of the ignition cover enables activation by throwing or dropping the single round exploder. An adhesive may be affixed to the receiving body on an exterior surface to enable combining more than one single round exploder together.
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TECHNICAL FIELD

[0001] In the field of ordnance, a charge-explosive mechanism using a cartridge made for a firearm, the cartridge being a standard cartridge having a casing, propellant, bullet and a primer.

BACKGROUND ART

[0002] Exploding devices to cause a diversion, stun an enemy, or confuse an adversary as to the number of shooters typically take the form of hand grenades. The hand grenade has been the standard for an offensive explosive weapon because they have a relatively low cost, come in a relatively small hand-held size, and are easy to use.

[0003] The standard hand grenade is made of metal and has a flask that is designed to shatter, thus producing a large number of projectiles traveling at high speed. Other designs include those made by packing a cardboard container with a combustible charge so as to produce an explosion and a brilliant flash of light upon detonation. None of the existing hand grenades uses a standard firearm ammo cartridge nor do they contain a firing pin mechanism for discharging the cartridge.

SUMMARY OF INVENTION

[0004] A system for remotely exploding a firearm cartridge to cause a diversion, to disable an enemy, or to confuse an adversary as to the number of shooters. The system includes a cartridge serving as ammunition for a firearm. The typical cartridge includes a casing having a rim defining a case head at a firing end, a primer, a propellant, and a bullet. The system includes a receiving body made of a frangible material, the receiving body defining a right-circular cylindrical opening with a diameter and depth to permit insertion of the cartridge up to the rim. The system includes an ignition cover attachable to the receiving body over the right-circular cylindrical opening. The ignition cover holds a primer pin configured to ignite the primer through impact with the case head. Shrapnel may be included within the receiving body. A coil wrapped around the primer pin so as to create a solenoid may be used to cause the primer pin to move axially within the coil and impact the case head discharging the cartridge. The primer pin may have a plunger handle extending out of the ignition cover that is configured to be physically pushed, for example by throwing or dropping, so as to fire the cartridge. An adhesive may be affixed to the receiving body on an exterior surface to enable combining more than one single round exploder together.

TECHNICAL PROBLEM

[0005] In law enforcement and military combat situations, often times a soldier or police officer wishes he had additional equipment to help complete his mission and come home safe. Many times he wishes that he would have explosive devices in addition to his gun. He could use these devices to distract and confuse the enemy, make the enemy think there were a number of different soldiers in different positions shooting at him, place the devices to explode when the enemy walks close to them, use the explosive devices to blind the enemy, throw the explosive devices at the enemy, put the explosive devices close to an object like a fuel or gas tank to create a large secondary explosion, have the devices explode a tire on the enemy escape vehicle, insert the devices into the enemy or stick them to parts of his body and gather intelligence from the scared enemy, etc.

[0006] In reality, usually the soldier or police officer only has a single gun and numerous rounds of ammunition. If only there was a way to take some of the rounds of ammunition and convert them into multi-functional explosive devices. Having these extra explosive devices can mean the difference between the life and death of the officer, and the success or failure of the mission.

[0007] Regular explosive devices are too heavy, bulky and dangerous to always be carried around. A lightweight explosive device is needed.

SOLUTION TO PROBLEM

[0008] The solution is the Singe Round Exploder. It is an ultra lightweight ammo round container in which a round of ammunition can be inserted. There is a plunger-firing pin that can be electrically and/or non-electrically moved to strike and discharge the cartridge. For example, electrical operation may be by radiofrequency (RF) activated remote control and non-electrically by impacting a plunger by throwing or dropping the ammo round container.

[0009] The ammo round container may include a payload containment volume surrounding the cartridge, so that if desired it can be filled with shot, cutting grit, chemical agents or any type of material that the soldier would want to be propelled away from the exploding cartridge.

[0010] The Singe Round Exploder is preferably made of a frangible material that immediately breaks apart when the cartridge is exploded. An exemplary frangible material is a lightweight plastic, so it would be very easy for the soldier or officer to carry on his ammo belt, in his pack, or in his pocket.

[0011] The Singe Round Exploder is safe to carry around because it can be carried around without a cartridge loaded in it, yet can be instantly loaded when needed. Thus, there need be no explosive inside the single round exploder that can go off by accident. The only explosive is the one in the cartridge that is typically carried at all times, which is considered safe.

[0012] The Singe Round Exploder may be employed so that it is not converted into an explosive device until the officer loads a round into it and pulls back the firing plunger. The outside of the Singe Round Exploder has a number of flat sides such as the shape of a pentagon. Each flat side has a peel of paper strip with a glue surface underneath so the Singe Round Exploder can be stuck onto strategic locations or stuck together to make a larger explosive device.

ADVANTAGEOUS EFFECTS OF INVENTION

[0013] The “Singe Round Exploder” that will now give our bravest and finest soldiers and police officers a whole new line of combat options and tools. The officer no longer has to wish for explosive devices to protect his life, he just has to take some of his extra ammunition and create them.

[0014] The invention of the Singe Round Exploder opens up a whole new line of strategic tools and options for our brave police and soldiers. This will help them to keep America safe and win the War on Terror.

BRIEF DESCRIPTION OF DRAWINGS

[0015] The drawings illustrate preferred embodiments of the single round exploder according to the disclosure. The reference numbers in the drawings are used consistently
throughout. New reference numbers in FIG. 2 are given the 200 series numbers. Similarly, new reference numbers in each succeeding drawing are given a corresponding series number beginning with the figure number.

FIG. 1 is an exploded sectional view of the system for exploding a single cartridge.

FIG. 2 is a side sectional view of the system shown in FIG. 1.

FIG. 3 is a side sectional view of an alternative embodiment of the system with a hollow receiving body holding a shotgun shell and projectile pieces in the form of pellets.

FIG. 4 is an end view of the receiving body having a hexagonal cross section.

FIG. 5 is a sectional view of a cartridge.

FIG. 6 is a side elevation view of the coil and magnetic field that moves the primer pin in some embodiments.

DESCRIPTION OF EMBODIMENTS

In the following description, reference is made to the accompanying drawings, which form a part hereof and which illustrate several embodiments of the present invention. The drawings and the preferred embodiments of the invention are presented with the understanding that the present invention is susceptible of embodiments in many different forms and, therefore, other embodiments may be utilized and structural, and operational changes may be made, without departing from the scope of the present invention.

FIG. 1 and FIG. 2 illustrate a preferred embodiment of a system (100) for exploding a cartridge. The system (100) may be referred to as an explosive cartridge carrier or a single round exploder. The system (100) includes a cartridge (105), a receiving body (110), and an ignition cover (115).

The cartridge (105), also shown in FIG. 3 and FIG. 5, is a standard or typical cartridge, also called a round or a shell made for use in a firearm, such as a rifle, pistol, shotgun, or other portable gun. The cartridge (105), shown in FIG. 3 as a shotgun shell and in FIG. 5 as a rifle or pistol round, includes a casing (510) having a rim (515). The rim (515) defines a case head (320) and a firing end (525) of the cartridge (105). The rim (515) as defined herein may be larger than, smaller than, or the same diameter as the remainder of the casing (510). When the rim (515) is the same diameter as the casing, it is often referred to an extractor groove. The cartridge (105) further includes a primer (325), a propellant (330), and a bullet (335). The bullet (335) is a term defined herein to include one or more small metal projectiles: one projectile usually in a rifle or pistol cartridge; and a plurality of shot in a shotgun shell as shown in FIG. 3.

The receiving body (110) is a container made of a frangible material, so that it readily fragments when the cartridge (105) is discharged. The receiving body (110) defines a right-circular cylindrical opening (405) with a diameter (410) and depth (205) to permit insertion of the cartridge (105) up to the rim (515). The rim (515) of the cartridge (105) does not necessarily have to rest on the edge outside the right-circular cylindrical opening (405), but this is preferably when the rim (515) is larger in diameter than the remainder of the casing (510). The receiving body (110) may be a solid or a hollow container that contains shrapnel, such as projectile pieces (415) shown in FIG. 4, a chemical agent such as a sleep-inducing gas, shot (315), or any other payload. A solid container is illustrated in FIG. 1 and FIG. 2. A hollow container is illustrated in FIG. 3.

The receiving body (110) may take on any convenient cross-sectional shape, but is preferably one that will easily stack with others like it. For example, a hexagon shape as shown in FIG. 4 can easily stack together with six other explosive cartridge carriers. An adhesive (420) may be affixed to the receiving body (110) on an exterior surface (425), for example on one or more of the hexagonal faces. The adhesive (420) would then hold at least two explosive cartridge carriers together so that they might be discharged together. For the hexagon configuration, six explosive cartridge carriers could be adhered together.

The receiving body (110) has a length that need only be slightly larger than the cartridge (105) that it holds. The receiving body (110) need only be a little larger than the cartridge (105) in width, preferably about three or four times the diameter of a cartridge (105). The receiving body (110) preferably has an overall size that makes it easy to carry and deploy.

The ignition cover (115) is a lid that is attachable to the receiving body (110) over the right-circular cylindrical opening (405) to hold the cartridge (105) within the receiving body (110) in a position ready to be fired. The ignition cover (115) includes a primer pin (120) configured to ignite the primer (325) through impact with the case head (320) and fire the cartridge (105) in the same manner as a would a firing pin in a firearm. The primer pin (120) is preferably constrained to move in a particular path, such as to slide within a cylindrical tube to ensure that it travels along a path to strike the cartridge (105) in a place where it will ignite the primer (325).

FIG. 2 illustrates one possible attachment mechanism to hold the ignition cover (115) to the receiving body (110). This attachment mechanism involves a hinge (215) on one side and a latch (220) on the opposite side.

Alternatively, a sliding attachment mechanism, like that on a file cabinet drawer, may be used with a lock to keep it closed. Alternatively, snap-on tabs extending from either the receiving body (110) or the ignition cover (115) may engage projections on the opposing part to snap the parts together. Other means well known in the art to hold two components together may be used.

The system (100) may further include a coil (305) wrapped around the primer pin (120). This is conventionally known as a solenoid with the primer pin (120) acting as an armature, which are well known in the art. For this embodiment, the primer pin (120) is made of metal, such as iron or steel, such that when the coil (305) is activated with an electrical current a magnetic field (605) is generated that causes the primer pin (120) to move axially within the coil (305) and impact the case head (320) discharging the cartridge (105). An external or internal battery or electrical connection may be used. A battery (310) is preferably included in this embodiment to provide the electrical current upon demand. An alternative embodiment may use a capacitor instead of, or in combination with a battery (310). The coil (305) may be activated remotely, for example by a radiofrequency device similar to a garage door opener. Alternatively, the coil (305) may be activated by a timer built into the ignition cover (115).

The system (100) may include a plunger handle (125) attached to the primer pin (120) in order to physically cause the primer pin (120) to ignite the primer (325) in the cartridge (105).

The plunger handle (125) may be made to be operable by pulling it back and locking it into a firing position, like the hammer on some firearms, except that impact by throwing...
or dropping dislodges the lock and immediately releases the plunger handle (125) causing the primer pin (120) to impact the cartridge (105).

Alternatively, for example the plunger handle (125) may be made to be operable simply by dropping a weight on the plunger handle (125), or by throwing it against the wall, or by causing it to hit the ground from a height.

If the cover is made heavier than the receiving body (110), then upon being thrown, the plunger handle (125) will by action of momentum and gravity turn toward the direction of travel to impact a wall or the ground. For these embodiments, the plunger handle (125) extends out of the ignition cover (115).

The plunger handle (125) may be biased in the outward direction by a spring (210). In such embodiment, the plunger handle (125) is configured to push the primer pin (120) into the case head (320) to discharge the cartridge (105) when the plunger handle (125) is impacted with force to overcome the spring bias and ignite the primer (325).

The above-described embodiments including the drawings are examples of the invention and merely provide illustrations of the invention. Other embodiments will be obvious to those skilled in the art. Thus, the scope of the invention is determined by the appended claims and their legal equivalents rather than by the examples given.

INDUSTRIAL APPLICABILITY

The invention has application to the firearms industry.

1. A system for exploding a cartridge made for use in a firearm, the system comprising: a cartridge serving as ammunition for a firearm, the cartridge comprising a casing having a rim defining a case head at a firing end, a primer, a propellant, and a bullet; a receiving body made of a frangible material, the receiving body defining a right-circular cylindrical opening with a diameter and depth to permit insertion of the cartridge up to the rim; projectile pieces within the receiving body; and an ignition cover attachable to the receiving body over the right-circular cylindrical opening, the ignition cover comprising a primer pin configured to ignite the primer through impact with the case head.

2. (canceled)

3. The system of claim 1, further comprising a coil wrapped around the primer pin, the primer pin made of metal such that when the coil is activated with an electrical current a magnetic field is generated that causes the primer pin to move axially within the coil and impact the case head discharging the cartridge.

4. The system of claim 1, further comprising a plunger handle attached to the primer pin, the plunger handle extending out of the ignition cover, the plunger handle configured to push the primer pin into the case head to discharge the cartridge when the plunger handle is impacted.

5. The system of claim 1, further comprising an adhesive affixed to the receiving body on an exterior surface.

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