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(54) **SELF-DESTRUCTING BULLET**

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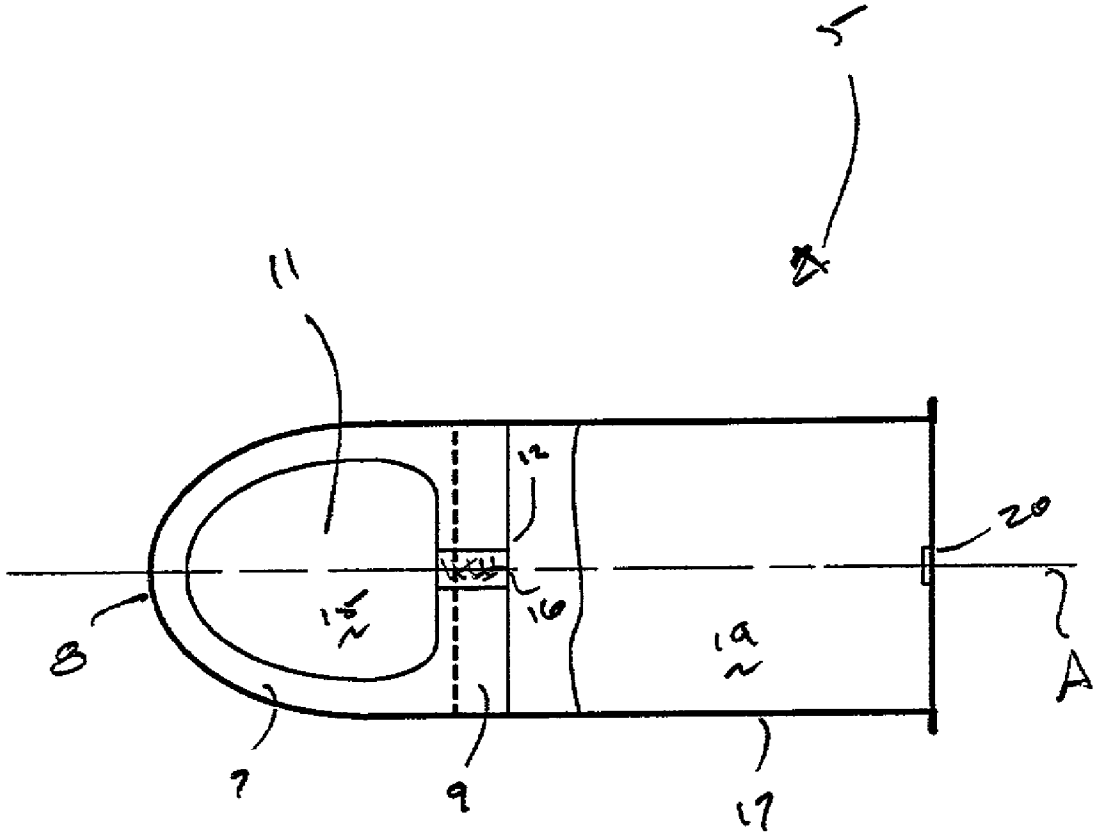
(57) **ABSTRACT**

A self-destructing bullet for use with a firearm is disclosed. The self-destructing bullet comprises a body portion having a leading end, a spaced base portion, and a hollow chamber defined within the body intermediate the leading end and base portions thereof. The body of the bullet is formed of a low temperature melting point metallic material. A catalyst, comprised of a high temperature combustible material, is positioned within the hollow chamber of the bullet. A combustible fuse extends from the base portion of the bullet into engagement with the catalyst. In usage, when fired the gun powder charge of the firearm will ignite the fuse of the self-destructing bullet. After the bullet has traveled for predetermined period of time the fuse ignites the catalyst, and once ignited, the catalyst in turn combusts and melts or consumes the metallic material which comprises the body of the bullet to accomplish the self-destruction of the bullet.



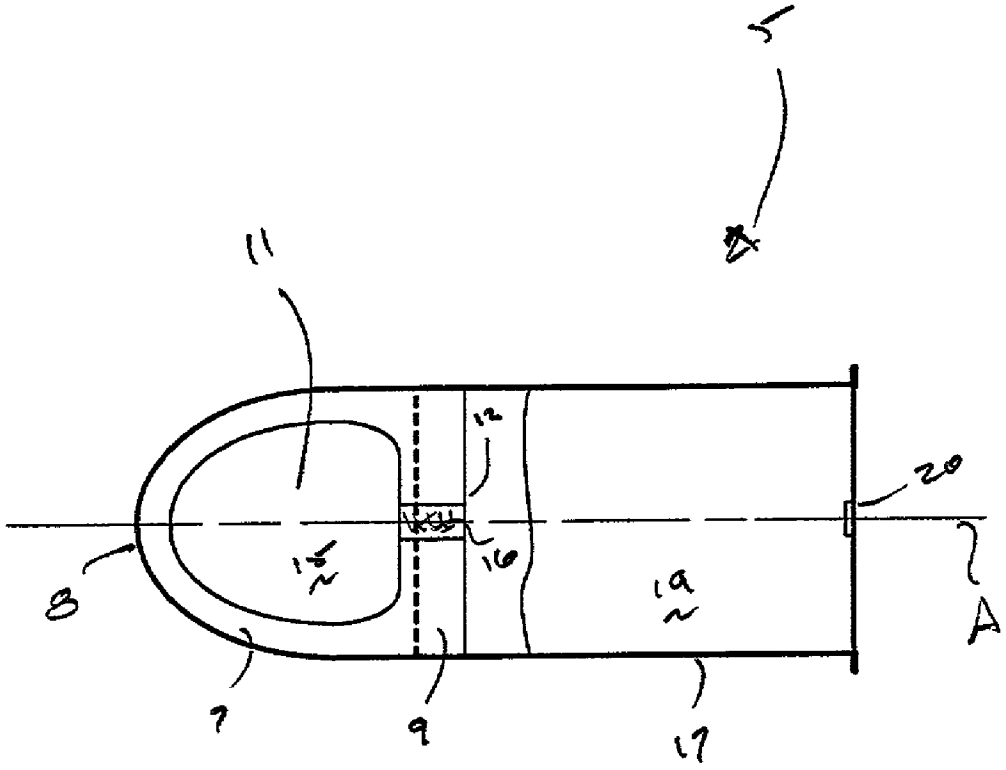


Fig. 1

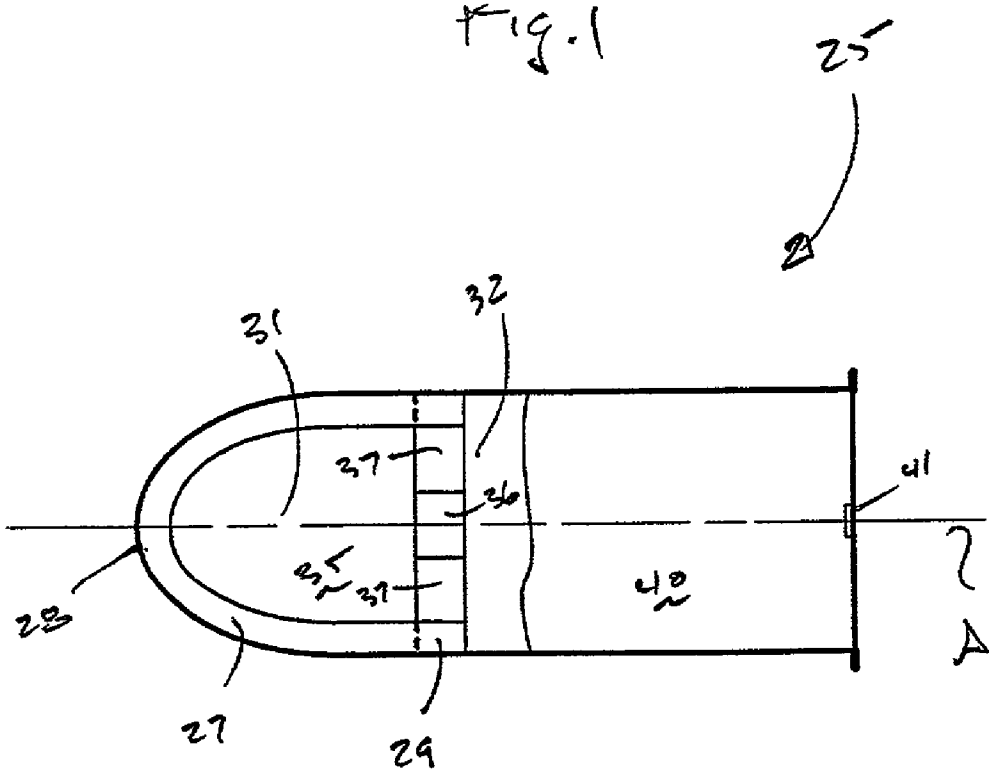


Fig. 2

SELF-DESTRUCTING BULLET

FIELD OF THE INVENTION

[0001] The present invention relates in general to small arms ammunition. More particularly, the invention relates to a self-destructing bullet for use with a firearm.

BACKGROUND OF THE INVENTION

[0002] The manufacture and use of small arms ammunition of the type that can be fired from any of the known types of conventional firearms, to include side arms, for example a pistol or handgun, as well as rifles, and in some instances, automatic weapons, is well known. Small arms ammunition is typically comprised of a bullet seated within a case or cartridge with a gun powder charge stored inside the case, and a primer seated on the cartridge for being struck by the firing pin of the firearm. Upon actuation of the firearm, by pulling the trigger or firing mechanism thereof, the firing pin strikes the primer which then ignites the gun powder charge. The gun powder charge in turn combusts and propels the bullet or projectile from the firearm.

[0003] As is known, when a bullet is fired it will either strike its target or will continue to travel until its velocity is diminished to the point that the earth's gravitational field pulls the bullet downwardly, whereupon the bullet will ultimately strike the earth or the surrounding environment. Accordingly, bullets are capable of traveling rather long distances, at relatively high velocities, and without any control once fired and having left the barrel of the firearm. A problem that results from the known types of small arms ammunition, therefore, arises when public safety or law enforcement officials, for example, are forced to draw their firearms and enter into an exchange of gun fire while trying to suppress criminal activities. In so doing, the possibility exists, and it oftentimes occurs, that the rounds may miss their intended target and continue traveling onward until the bullet strikes an unintended target, for example the pavement, a building, or an automobile, whereupon the bullet may shatter and then ricochet with the possibility of injuring innocent bystanders.

[0004] A more dangerous situation exists, naturally, where a public safety official fires a weapon and the round misses the target entirely, and instead strikes an innocent bystander. What has been needed, therefore, but which has not been made available in the art, is a bullet which can be more safely used by public safety or law enforcement officials, and which will greatly minimize the prospects of injuring innocent bystanders, or property during an exchange of gun fire. What is also needed is a suitable, high velocity round of small arms ammunition, i.e., a bullet, for use by public safety or law enforcement officials and which will possess lethal force through a prescribed range, and will then self-destruct after traveling for a predetermined time period or distance to minimize the likelihood of injuring the person or property of innocent bystanders.

[0005] The manufacture and use of a "short range" projectile for use as practice ammunition is disclosed by U.S. Pat. No. 4,128,060 to Gawlick et al., who teach a bullet for use as practice ammunition. The bullet is provided with an axial air inlet duct formed at the leading end thereof and extending into communication with an outer duct. After being fired, a blocking member, a piston, positioned within a fluid passageway defined by the duct within the bullet is displaced in response to the air pressure from the flight of the bullet passing therethrough. Once the blocking member is displaced, the bullet is in effect braked and will thereafter fall to the ground. The short range projectile of Gawlick et al., however, is not intended for use by public safety or law enforcement officials while on duty or patrol, and does not self-destruct after firing such that the possibility exists that if this round was used by public safety or law enforcement officials in an exchange of gun fire, the round would continue traveling onward for some distance if it missed its intended target.

[0006] U.S. Pat. No. 4,008,667 to Look, discloses a controlled range bullet which is constructed to deploy a speed brake after a prescribed period of time for slowing the bullet such that it will have a limited range of travel. The bullet is provided with a lead body having a rotary aerodynamic brake. When fired from a firearm the bullet will travel for a prescribed distance whereupon the rotary brake extends from the jacket of the bullet for the purpose of slowing its travel. Although the controlled range bullet of Look is intended for use as other than a practice round, the problem still exists in that the round remains integral, and once fired the round will continue in one piece until it strikes an object, or the rotary aerodynamic brake otherwise stops the round. In any instance, however, the bullet may travel a greater distance than that desired, and may thus strike an unintended target.

[0007] Brede et al., U.S. Pat. No. 4,411,200, teach a short trajectory round having an aerodynamic resistance which increases at a predetermined time after discharge of the round from the barrel of a weapon, such that the round thereafter disintegrates. Again, however, the short trajectory round of Brede et al. continues to travel while disintegrating, and portions of the round will continue traveling until they strike the earth, the ground, or perhaps an unintended target. Moreover, those portions of the round which are disintegrating may ricochet when striking a hard paved surface, and may unintentionally strike the person or property or innocent bystanders.

[0008] Crilly et al. disclose a dual-purpose bullet in U.S. Pat. No. 5,880,398, consisting of a thermoplastic body with a base cap, and a pressed powder core received therein. The bullet can either penetrate and destroy human tissue with lethal effect, or it can be used so that it does not penetrate human tissue, but instead delivers a strong shock force and creates a thermal nuisance. This is accomplished by configuring the bullet to be used in either a lethal or non-lethal mode. If the bullet of Crilly et al is used in the non-lethal mode, a low velocity launch of the bullet occurs and the pressed powder core of the bullet is ignited, which thereafter softens, but does not melt or otherwise destroy the plastic projectile body. Regardless, in either the lethal or non-lethal modes, the bullet remains integral and travels until it either strikes the intended target, an unintended target, or the earth. Moreover, the dual purpose bullet of Crilly et al must be configured for use as either a lethal or a non-lethal round, and thus does not provide a ready solution to the problems of law enforcement officials who require a high velocity and potentially lethal round, but yet which will minimize the likelihood of injuring innocent bystanders, or damaging the property of others.

[0009] What remains needed, therefore, but otherwise unavailable in the art, is a self-destructing projectile possessed of potentially lethal force and which can be used as small arms ammunition. The self-destructing bullet should be configured so that it will deliver a lethal force when, and as desired, but should the bullet travel for more than a predetermined period of time, or distance, the bullet will quickly self-destruct.

SUMMARY OF THE INVENTION

[0010] The present invention provides an improved self-destructing bullet or projectile that overcomes some of the design deficiencies of the art. The self-destructing bullet of this invention is intended for use with a firearm, and to be discharged therefrom.

[0011] The self-destructing bullet comprises a body having a leading end, an opposed base portion, and a hollow chamber defined within the body and extending intermediate the leading and end base portions thereof. The body of the bullet is preferably comprised of a low temperature melting point metallic material. A catalyst comprised of a high temperature combustible material is positioned within the chamber defined within the body portion of the bullet. A fuse extends from the base portion of the body and into engagement with the catalyst.

[0012] In usage, when the projectile is discharged from a firearm, the fuse is ignited and thereafter burns for a predetermined period of time. The fuse then ignites the catalyst carried within the projectile body. Once the catalyst is ignited it burns and in turn melts the body of the bullet such that the bullet is destroyed in flight to minimize the likelihood that the bullet will not otherwise strike an unintended target or strike the ground and ricochet.

[0013] The fuse provided as a part of the self-destructing bullet is itself comprised of a combustible material, which may be the same material of which the catalyst is comprised. The body portion of the bullet may be comprised of one of the materials selected from the group of materials consisting of lead, copper, silver, and alloys thereof. The catalyst may be comprised of a solid material, a powdered material, a gel, or a liquid held within the hollow chamber defined within the body portion of the bullet. For example, the catalyst may be comprised of a mixture of aluminum, cuprous oxide, cupric oxide and iron oxide.

[0014] It is to these objects, as well as the other objects, features, and advantages of the present invention, which will become apparent upon reading the specification, when taken in conjunction with the accompanying drawings, to which the invention is directed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] **FIG. 1** is a cross sectional view of a first embodiment of the self-destructing bullet of this invention.

[0016] **FIG. 2** is a cross sectional view of a second embodiment of the self-destructing bullet of this invention.

DETAILED DESCRIPTION

[0017] Referring now in detail to the drawings, in which like reference characters indicate like parts throughout the several views, a first embodiment of a self-destructing bullet **5** for use with a firearm (not illustrated) is illustrated in **FIG. 1**. The bullet of **FIG. 1** is comprised of an elongate body **7** having a leading end **8**, and an opposed base portion **9**. The body is formed in the shape of a conventional projectile, or bullet, or as otherwise desired. The body is preferably formed of a relatively soft metallic material having a low temperature melting point, which material may include lead, copper, silver, and alloys in various combination thereof, as desired. Moreover, although not illustrated in either one of FIGS. **1** or **2**, the body portion of the bullet can be configured as a soft point or a hollow point bullet, and may also be jacketed, as desired.

[0018] Still referring to **FIG. 1, a** hollow chamber **11** is defined within the body **7**, intermediate the leading end and base portions thereof. An opening **12** is defined within at least a portion of the base portion **9**, the opening being in communication with a passageway or channel **13** defined within the base portion of the bullet and extending therefrom and into the hollow chamber within the body of the bullet.

[0019] A catalyst is positioned within the chamber **11**. The catalyst is comprised of a high temperature combustible material, and may be formed as a solid material, a powdered material, a gel, or a liquid, all as desired and developed in response to the needs of the end user. The material comprising the catalyst comprises any type of material that is adapted to burn quickly, and at a high temperature sufficient to melt the body of the bullet with which the catalyst is used. By way of example and not of limitation, the material comprising the catalyst may comprise a mixture of aluminum, cuprous oxide, cupric oxide, and iron oxide, an illustrative mixture of which includes 35 percent aluminum, 25 percent cuprous oxide, 25 percent cupric oxide, and 15 percent iron oxide, by weight. Other materials and other mixtures thereof may be used to form the catalyst in order to obtain the necessary and/or desired exothermic reaction and melting of the body of the bullet.

[0020] The fuse **16** may be comprised of the same combustible material as the catalyst **15**, or may be comprised of a separate combustible material. The fuse is adapted to burn in a controlled or timed manner, and will ignite the catalyst. Examples of some of the materials which may suffice for use as the fuse of the respective bullets **5**, **25**, of **FIGS. 1 and 2** comprise any one, or mixture, of the materials selected from the group of materials including P-dichlorobenzene, iron powder, magnesium, naphthalene, phosphorus, and sulfur. Other materials and other mixtures thereof may be used to fashion the fuse of the bullet, as desired.

[0021] The bullet **5**, and in particular the body **7** thereof, in **FIG. 1**, is seated within a case **17** of a known construction, for example made of brass and intended to be received within a firearm. Both of the body **7** and the case **17** are sized and shaped for the respective caliber firearm with which the bullet will be used, which caliber may comprise any of the known calibers, or calibers yet to be developed, for use in small arms. Small arms as referred to herein include handguns, rifles, and automatic weapons, when and as appropriate.

[0022] In known fashion the case **17** contains a gun powder charge **19**, and is provided with a primer **20** of known construction. Once the bullet **5** is received within the firing chamber (not illustrated) of the firearm (not illustrated) with which it will be used, and the trigger or firing

mechanism of the of the firearm is actuated, the firing pin (not illustrated) will strike the primer, which will in turn ignite the gun powder held within the case. As known, the gun powder explodes/burns thereby creating an explosive pressure force which will propel the bullet from out of the barrel of the firearm, and which in this instance will also ignite the fuse **16** as the body **7** of the bullet exits the firearm. The fuse **16** will burn for a predetermined period of time, whereupon the fuse will then ignite the catalyst **15** housed within the chamber **11** of the bullet body. The catalyst will then burn in a high temperature exothermic reaction and will quickly melt and/or consume the metallic material comprising the body of the bullet, thereby destroying the bullet.

[**0023**] The fuse **16** is sized and shaped as needed based upon the size and weight of the body of the bullet, the gun powder charge used, the initial velocity of the projectile as it leaves the firearm, and the intended usage of the bullet. For example, a bullet used with a handgun would have a relatively short fuse as it is known to those of skill in the art that bullets fired from handguns typically have a limited range of accuracy, and thereafter will quickly fall off from the target. Where, however, the bullet **5** is going to be used with a rifle, where a much longer range of travel is intended, the fuse will burn for a longer period of time prior to igniting the catalyst housed within the body of the bullet.

[**0024**] Therefore, the composition and burn rate of the fuse, as well as the physical size and shape of the fuse, and the physical size and shape of the passageway **13** leading into the interior chamber of the body portion will be constructed based upon the expected velocity of the projectile, the weight of the projectile, and the intended usage of the projectile so that the travel time and distance of the bullet prior to its self-destruction can be determined using methods well known to those skilled in the art of bullet manufacture and ballistics.

[**0025**] A second embodiment of the self-destructing bullet **25** of this invention is illustrated in **FIG. 2**. The bullet **25** is constructed in fashion similar to the bullet **5** of **FIG. 1**, in that it has an elongate body **27** having a leading end **28**, and a spaced base portion **29**. A hollow chamber **31** is defined within the body intermediate the leading end and base portions thereof. Here, however, the opening **32** at the base portion of the bullet is much larger than the opening **12** defined within the base portion **9** of the bullet **5**, so that the bullet, for example, may be easier to manufacture.

[**0026**] Still referring to **FIG. 2, a** catalyst **35** is positioned within the chamber **31** of the body portion **27**. The catalyst **35** is comprised of the same material or materials as is the catalyst **15** described above. In similar fashion, the body portion **27** is formed of the same materials as is the body portion **7** of the first embodiment of the bullet, and the material comprising the fuse **36** of bullet **25** may be the same material used for the fuse **16** of the bullet **5**.

[**0027**] In the second embodiment of the bullet **25**, however, the fuse is positioned within the base portion, and is sandwiched or encircled by at least one layer of inert material **37** extending about the longitudinal axis A of the bullet, and along the length of the fuse. In making the bullet **25** therefore, the body portion may be cast with the hollow chamber **31** provided as a part thereof, or the chamber may be machined out. Thereafter, the catalyst will be placed within the chamber, and then the fuse and inert material will be packed into the open base portion of the bullet. The fuse **36** will be sized and shaped as desired, and as fully described above for the fuse **16** used with the bullet **5**. The inert material may comprise, for example, a ceramic material, as well as any other inert material which will not burn or combust in any fashion, it being intended that only the fuse **36** will function as a timing device for igniting the catalyst **35** positioned within the hollow chamber of the bullet **25**.

[**0028**] As shown in **FIG. 2**, the bullet **25** once again comprises the body **27** seated within a cartridge or case **39** of known construction, as described above, holding a gun powder charge **40** therein and provided with an otherwise conventional primer **41** for being struck by a firing pin (not illustrated) of the firearm (not illustrated) with which the bullet **25** is used.

[**0029**] When using either one of the bullets **5**, **25**, the firing pin will strike the primer, whereupon the primer will ignite the gun powder charge held within the case of the bullet **5**, **25**, respectively. As the gun powder ignites, burns, and/or explodes the bullet is propelled from the barrel of the firearm, and also ignites the respective fuse **16**, **36** thereof. The fuse will burn for a predetermined period of time, which can also be thought of as allowing the bullet to travel for a predetermined distance, before the catalyst is ignited. Once the catalyst is ignited, and based upon the composition of the catalyst and the speed with which it burns, as well as the composition, size, and shape of the metallic body **7**, **27** of the bullets **5**, **25**, respectively, the catalyst will consume the body thereof after a predetermined time from the firing of the bullet passes to self-destruct the bullet.

[**0030**] If so desired, the material used to construct the fuses **16**, **36**, respectively, could also comprise materials which function as a tracer such that the user of the firearm is able to track the trajectory of the rounds that have been fired during an exchange of gun fire. All that is required is that the fuse, and in particular the combustible material thereof, be sized and shaped, i.e., have the proper composition and burn characteristics, and possess the necessary diameter and length, to ignite the catalyst within the predetermined time period, which time period will take into account the travel distance of the bullet upon its initial velocity, composition, and weight, as well as the burn rate of the fuse and the catalyst, all of which can be calculated by the known methods of firearm ballistics and bullet manufacture.

[**0031**] By constructing the bullet **5**, **25** of this invention as described above, a bullet with lethal force is provided, yet the bullet will also self-destruct within a predetermined time period, thus greatly minimizing the likelihood of injuring innocent bystanders, or damaging the property of others not involved in the incident leading to the exchange of gun fire. Based upon the needs and uses of the self-destructing bullet by the law enforcement and/or public safety officials using same, for example, whether used in a crowded urban environment, or in a relatively open rural environment, the timing function of the fuse can be shorted or lengthened as desired to lead to the self destruction of the round sooner or later, respectively, again based on the intended usage of the bullet, and/or the amount of the catalyst placed in the bullet can be varied, as desired and necessary to accomplish the self-destruction of the bullet. For example, it is anticipated that in a densely packed urban environment the fuse will be

relatively short so that the bullet will self destruct in relatively short order in order to prevent its passage beyond its intended target.

[0032] The body portions **7**, **27**, respectively of the two illustrated embodiments of the bullet may be jacketed if so desired, and may be formed to have a hollow point, a soft point, or even a ballistic tip, all as desired. If the bullet is jacketed, it is anticipated that the jacket material itself will comprise a low temperature melting point metallic material which will be consumed with the body portion of the bullet upon the ignition of the catalyst. The body portions **7**, **27**, the catalysts **15**, **35**, and the fuses **16**, **36**, respectively, can be comprised of any conventional materials known to bullet manufacturers, so long as the bullet functions in the above-described manner. Similarly, the cases **17**, **39** of the two illustrated embodiments of the bullet will be formed and fashioned as known.

[0033] Although several embodiments of the invention have been disclosed in the foregoing specification, it is understood by those skilled in the art that many modifications and other embodiments of the invention will come to mind to which the invention pertains, having the benefit of the teaching presented in the foregoing description and associated drawings. It is thus understood that the invention is not limited to the specific embodiments disclosed hereinabove, and that many modifications and other embodiments are intended to be included within the scope of the appended claims. Moreover, although specific terms are employed herein, as well as in the claims which follow, they are used only in a generic and descriptive sense, and not for the purposes of limiting the described invention, nor the claims which follow.

I claim:

1. A self-destructing projectile for being discharged from a firearm, said projectile comprising:

A body portion, said body portion having a leading end, an opposed base portion, and a hollow chamber defined within said body intermediate the leading end and the base portion thereof, said body being comprised of a metallic material;

a catalyst positioned within said chamber, said catalyst being comprised of a combustible material; and

a fuse extending from the base portion of the body and into engagement with said catalyst.

2. The projectile of claim 1, wherein said base portion is formed to be at least partially open, and wherein said fuse is positioned within said base portion.

3. The projectile of claim 1, wherein said fuse is constructed and arranged to be ignited upon the discharge of the projectile from the firearm.

4. The projectile of claim 3, wherein said fuse is constructed and arranged to burn for a predetermined period of time.

5. The projectile of claim 3, wherein said fuse is constructed and arranged to ignite the catalyst.

6. The projectile of claim 5, wherein said catalyst is constructed and arranged to melt the projectile body upon the ignition thereof by said fuse.

7. The projectile of claim 1, wherein said catalyst is constructed and arranged to melt the projectile body once the catalyst is ignited.

8. The projectile of claim 1, wherein said fuse is comprised of a second combustible material.

9. The projectile of claim 1, wherein said body portion is comprised of a low temperature melting point metallic material.

10. The projectile of claim 1, wherein said catalyst is comprised of a high temperature combustible material.

11. The projectile of claim 1, wherein said catalyst comprises a solid material.

12. The projectile of claim 1, wherein said catalyst comprises a powdered material.

13. The projectile of claim 1, wherein said catalyst comprises a gel.

14. The projectile of claim 1, wherein said catalyst comprises a liquid.

15. A method of self-destructing a projectile discharged from a firearm, said method comprising the steps of:

discharging a projectile body from the firearm;

igniting a fuse provided as a part of the projectile body in response to the discharge of the projectile;

the fuse igniting a catalyst carried within the projectile body; and

the ignited catalyst melting the projectile body.

16. The method of claim 15, the fuse burning for a predetermined period of time after being ignited.

17. The method of claim 16, further comprising the step of the projectile traveling for a predetermined distance prior to the ignition of the catalyst by the fuse.

18. A self-destructing projectile for being discharged from a firearm, comprising:

A body having a leading end, an opposed base portion, and a hollow chamber defined within said body intermediate the leading end and base portion thereof, said body being comprised of a low temperature melting point metallic material;

a catalyst positioned within said chamber, said catalyst being comprised of a high temperature combustible material;

said base portion being received within a projectile casing;

said casing having a primer and a charge held therein; and

a combustible fuse extending from the base portion of the body and into engagement with the catalyst, said fuse also being exposed to the charge held within said casing.

19. The projectile of claim 18, wherein said charge is ignited by the primer upon the actuation of the firearm.

20. The projectile of claim 19, wherein said fuse is ignited by the charge and burns for a predetermined period of time.

21. The projectile of claim **20**, wherein said fuse ignites the catalyst, and the catalyst in turn melts the body of the projectile.

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