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(54) **ADVANCED TARGET SYSTEM**

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(76) **Inventor: Mark Sullivan, Littleton, CO (US)**

(57) **ABSTRACT**

Correspondence Address:

HOVEY WILLIAMS TIMMONS & COLLINS
2405 GRAND BLVD., SUITE 400
KANSAS CITY, MO 64108

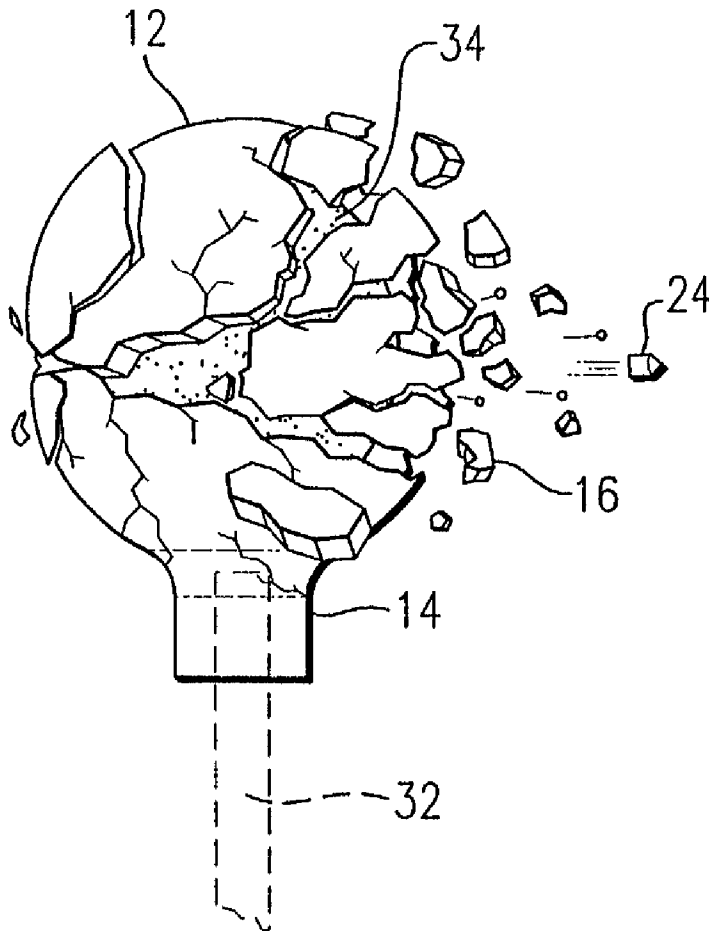
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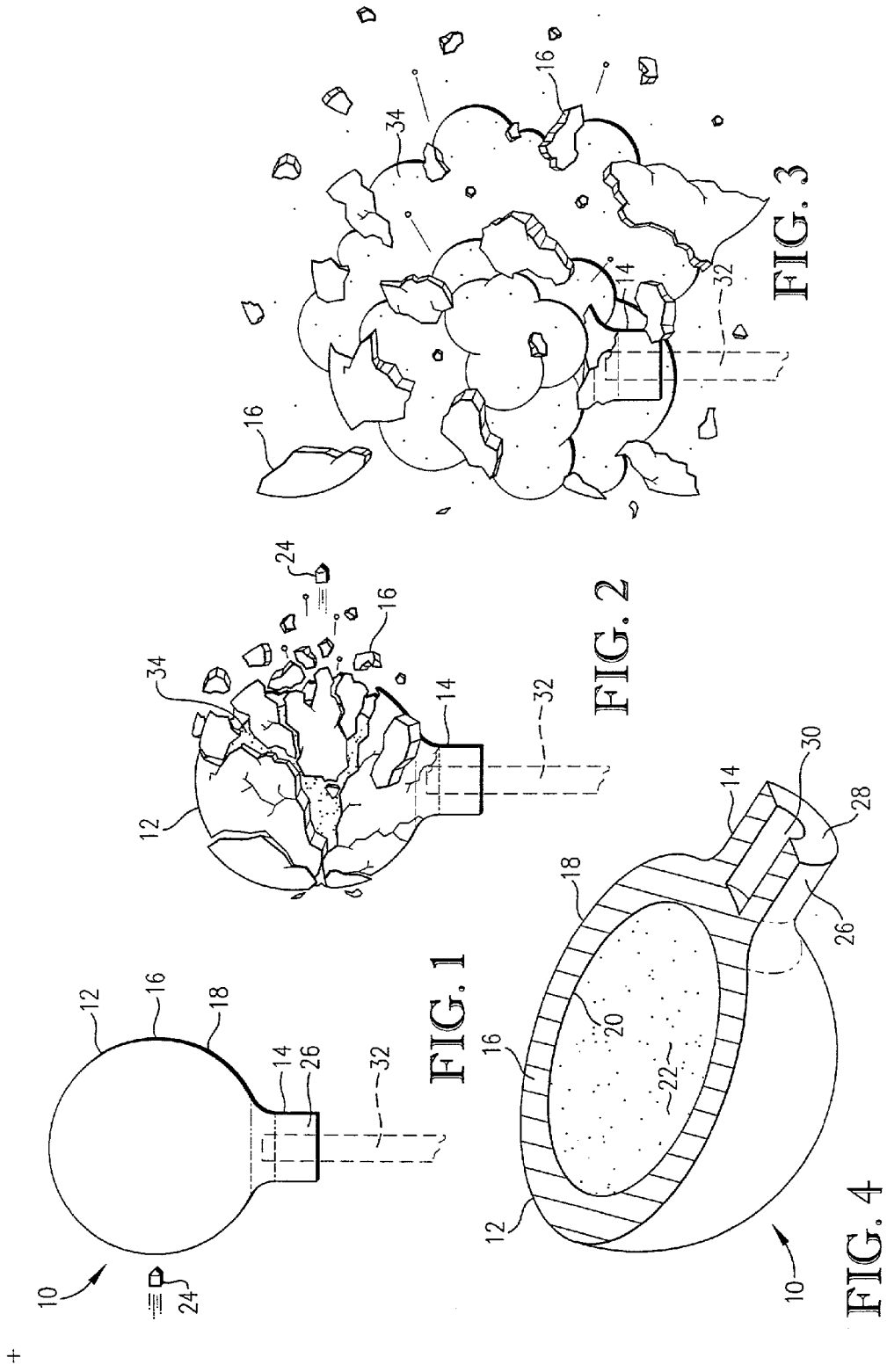
A biodegradable target (10) for sports-shooters comprising a body (12) defining an internal cavity (22), and a display material (34) is contained within the cavity (22) wherein the display material (34) expands upon breakage of the body (12) by a projectile (24), such as a bullet, to give visual confirmation that the projectile (24) has hit the body (12). The target (10) is made by molding body segments which are configured to cooperatively define an internal cavity (22) when joined, adding a display material (34) to at least one of the body segments and joining the body segments to form the target (10).

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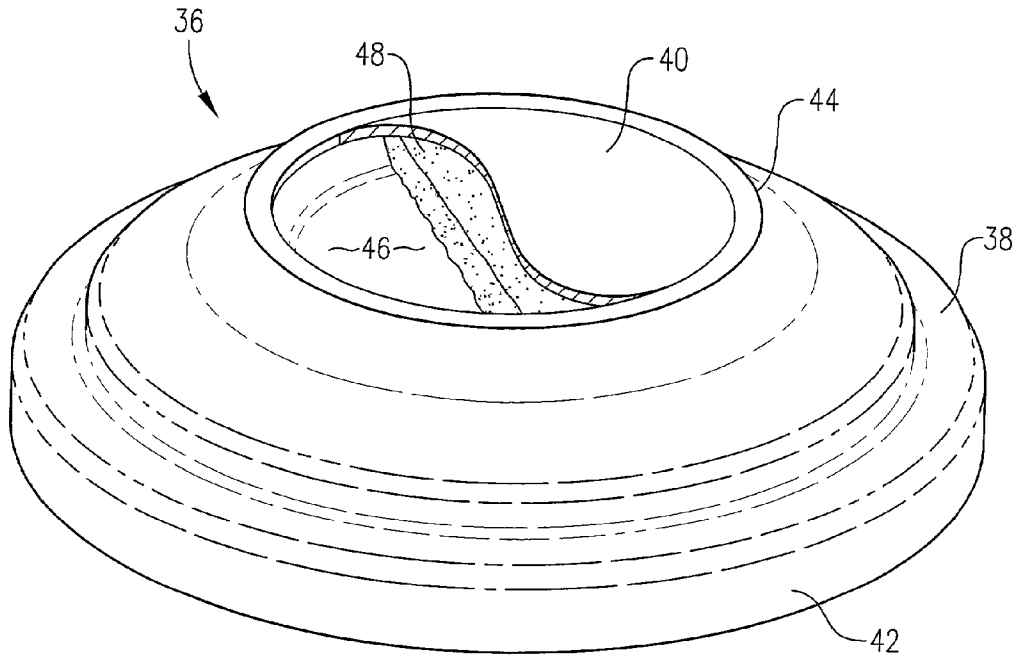


FIG. 5

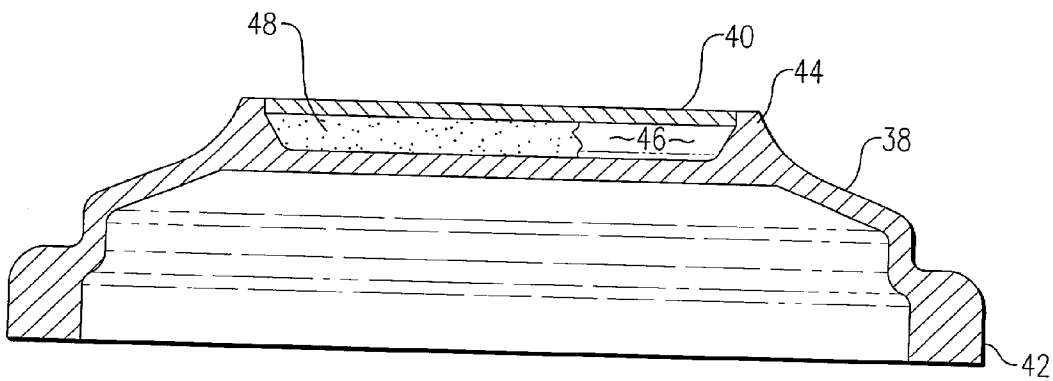


FIG. 6

ADVANCED TARGET SYSTEM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to the field of sport-shooting targets. In particular, the present invention is concerned with a frangible, biodegradable and non-toxic shooting target having a body and an internal cavity containing a flowable colorant that expands and spreads upon breakage of the body by a projectile.

[0003] 2. Description of the Prior Art

[0004] Conventional target practice with firearms involves the use of stationary paper targets or skeet, also known as clay pigeons. Because paper targets are generally uninteresting, many sport-shooters substitute other objects such as beverage cans, bottles or other breakable targets. The destruction of these objects when used for target practice is not only dangerous to the shooter because of the risk of flying debris, but the debris is also detrimental to the environment as well as the wildlife that inhabits the particular area.

[0005] Skeet is typically mechanically thrown into the air to allow shooters to aim at the skeet and to provide a more realistic practice environment for hunting birds and the like. Once hit, the skeet will shatter and the remains will scatter throughout the surrounding environment. Skeet is typically formed of asphalt pitch which is a toxic and non-biodegradable material and therefore harmful to the environment. Accordingly, a biodegradable stationary or skeet-like target that will not harm the environment and is relatively easy to manufacture is needed.

[0006] There is also a need in the sport of skeet-shooting for a target that provides visual confirmation when hit during both shooting practice and competition and is particularly beneficial to home viewers during televised competitions.

SUMMARY OF THE INVENTION

[0007] The present invention solves the prior art problems discussed above and provides a distinct advance in the state of the art. In particular, the advanced target system hereof provides a frangible, biodegradable and non-toxic target that is easily manufactured and provides visual confirmation when hit by a projectile.

[0008] A first preferred embodiment of the biodegradable target of the present invention includes a body (typically spherical) defining an internal cavity and containing a quantity of a spreadable display material that expands when the body of the target breaks upon impact with a projectile such as a bullet. The preferred target also includes a mounting portion configured to receive a support member, such as a rod or hanger, for stationary positioning of the target. More particularly, the preferred target body is composed of respective quantities of sugar, water and corn syrup.

[0009] A second preferred embodiment of the biodegradable target of the present invention includes a generally disc-shaped target body including a sidewall and a bottom wall. The sidewall and bottom wall cooperatively define an internal cavity containing a quantity of display material that expands upon breakage of the target by a projectile. The preferred target is made from a sugar composition. A method of making the target of the present invention is also provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a front elevational view of the target of the present invention according to one preferred embodiment;

[0011] FIG. 2 is a front elevational view of the target of FIG. 1 upon breakage by a projectile;

[0012] FIG. 3 is a front elevational view of the target of FIG. 2 showing the expansion of the display material of the present invention;

[0013] FIG. 4 is a perspective view of a cross-section of the target of FIGS. 1-3;

[0014] FIG. 5 is a perspective view of the target of the present invention according to a second preferred embodiment; and

[0015] FIG. 6 is a vertical sectional view of the target of FIG. 5.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Referring to FIGS. 1 and 4, a first embodiment of target 10 is disclosed. Target 10 includes a body 12 and a mounting portion 14. Body 12 is generally spherically-shaped and presents a sidewall 16 having an outer surface 18 and inner surface 20. Sidewall 18 defines an internal cavity 22 and has a thickness of 0.25 inches which is sufficient to withstand user handling yet break upon impact by a projectile 24 shot from a rifle or pistol at a range of 10-100 yards. It will be appreciated that the thickness of sidewall 18 may vary according to the user's preferences, the range at which the target is being placed, the type of firearm and the type of projectile used. Outer surface 18 presents an outer diameter of from about 1 to 4 inches and inner surface 20 presents an inner diameter of from about 1.5 to 3.5 inches. Mounting portion 14 is generally cylindrical and radially extends from outer surface 18 of sidewall 16. Mounting portion 14 presents an outer surface 26 and an annular generally flat face 28. Outer surface 26 has a diameter smaller than outer surface 18 preferably from about $\frac{5}{8}$ to $\frac{3}{4}$ inches. Bore 30 radially extends from face 28 through mounting portion 14 toward but not through sidewall 18. Bore 30 is configured to receive a support member 32 for positioning target 10 in a stationary manner. The preferred support member 32 may be rod or the like which may be inserted into the ground for positioning target 10. Another preferred support member 32 may be a string or the like having opposed ends wherein one end is coupled with a resilient body configured to be received within bore 30 and the other end is coupled with a hanging member such as a hook to be placed over a tree branch or the like for hanging target 10 at a desired height. Internal cavity 22 is configured to receive a display material 34 therein. Display material 34 may be a powder, liquid or gel capable of expanding and providing a visual marker when body 12 is broken by projectile 24 as shown in FIG. 3. The preferred display material 34 is a flour or other flowable colorant.

[0017] Target 10 is preferably comprised of 75 to 80% by volume of sugar. Any type of edible sugar may be used to provide the preferred composition of the body. In addition to the sugar, preferred components of the body composition include corn syrup, and water. Preferred corn syrup content ranges are from about 15 to 20% by volume and water, preferably distilled water, comprises from about 5 to 10% by volume.

[0018] The preferred target **10** may be formed by molding the preferred mixture of sugar, water, and corn syrup to form a plurality of body segments and preferably two segments. Display material **34** is added to one of the body segments so that, when body segments are joined, display material **34** is contained within internal cavity **22**. The body segments may be joined using an adhesive or the like.

[0019] In use, a shooter inserts support member **23** into bore **30** and positions target **10** in the desired location at a desired height. Upon discharge of a firearm, projectile **24** enters and breaks sidewall **18**, as shown in **FIG. 2**, thereby releasing display material **34** which expands and confirms that target **10** has been successfully hit by projectile **24** as shown in **FIG. 3**. Cross-hairs or other target-identifying designs may be printed on outer surface **18** of target **10** to aid the user in aiming at target **10** for maximum impact.

[0020] Referring now to **FIGS. 5 and 6**, a second embodiment of the present invention is disclosed. A skeet **36** is provided having the generally disc shape customary in skeet or clay pigeons. Skeet **36** includes a sidewall **38** and a cap **40**. Sidewall **38** has a preferred thickness of 0.1 inches and includes a bottom rim **42** and an integral depending annular rim **44**. Bottom rim **42** has a preferred diameter of four inches as is customary for skeet or clay pigeons. It will be appreciated, however, that the thickness of sidewall **38** as well as the diameter of bottom rim **42** may vary according to the user's preferences, the type of mechanical skeet-tosser, the type of firearm being used, and the type of projectile used. Annular rim **44** extends radially upwardly from sidewall **38** and presents an outer diameter of two inches. Annular rim **44** cooperatively engages cap **40** to define an internal cavity **46**. Internal cavity **46** is configured to receive a display material **48** therein. Display material **48** may be a powder, liquid or gel capable of expanding and providing a visual marker when skeet **36** is broken by a projectile. The preferred display material **48** is flour or other flowable colorant. The preferred total weight of display material **48** is 3 grams and the preferred weight of skeet **36** is 95 grams.

[0021] Skeet **36** is preferably comprised of sugar. The preferred composition contains from about 90 to 95% tableting dextrose and from about 5 to 10% maltose. The preferred skeet **36** may be formed by compression molding the preferred sugar mixture to form sidewall **38** and cap **40**. Display material **48** is added to the inner surface of annular rim **44** so that, when annular rim **44** and cap **40** are joined, display material **48** is contained within internal cavity **46**. Annular rim **44** and cap **40** may be joined using an adhesive or the like.

[0022] In use, skeet **36** is thrown into the air as a target for a shooter. Upon discharge of the shooter's firearm, a projectile enters and breaks skeet **36** thereby releasing display material **48** which expands and confirms that skeet **36** has been successfully hit by the projectile.

[0023] Having described the invention in detail, those skilled in the art will appreciate that other embodiments may be made of the invention without departing from the spirit of the invention described herein. For instance, many different target shapes may be used. Therefore, it is not intended that the scope of the invention be limited to the specific and preferred embodiments illustrated and described herein. Rather, it is intended that the scope of the invention be determined by the appended claims and their equivalents.

I claim:

1. A biodegradable projectile target comprising:
 - a frangible body defining an internal cavity; and
 - a display material contained within said cavity;
 - said material characterized by the property of rapid expansion upon breakage of said body by said projectile in order to give a visual confirmation of said projectile hitting said body.
2. The target of claim 1, said body having a substantially spherical shape.
3. The target of claim 2, said body having an outer diameter of from about 1 to 4 inches.
4. The target of claim 1, said body being substantially disc-shaped.
5. The target of claim 4, said body having an outer diameter of four inches.
6. The target of claim 1, said body comprising sugar.
7. The target of claim 6, said body further comprising corn syrup and water.
8. The target of claim 6, said sugar being respective quantities of dextrose and maltose.
9. The target of claim 1, said display material being a flowable colorant.
10. The target of claim 9, said flowable colorant being selected from the group consisting of powder, gel and liquid.
11. A biodegradable projectile target comprising:
 - a body defining an internal cavity;
 - said body comprising sugar; and
 - a display material contained within said cavity, said material characterized by the property of rapid expansion upon breakage of said body by said projectile in order to give a visual confirmation of said projectile hitting said body.
12. The target of claim 11, said body having a substantially spherical shape.
13. The target of claim 12, said body having an outer diameter of from about 1 to 4 inches.
14. The target of claim 11, said body being substantially disc-shaped.
15. The target of claim 14, said body having an outer diameter of four inches.
16. The target of claim 11, said body comprising sugar.
17. The target of claim 16, said body further comprising respective quantities of corn syrup and water.
18. The target of claim 16, said sugar being respective quantities of dextrose and maltose.
19. The target of claim 11, said display material being a flowable colorant.
20. The target of claim 19, said flowable colorant being selected from the group consisting of powder, gel and liquid.
21. A method of making a biodegradable projectile target comprising the steps of:
 - (a) molding a plurality of frangible body segments, said segments being configured, when joined, to cooperatively define an internal cavity;
 - (b) adding a display material to at least one of said molded body segments; and
 - (c) joining said body segments to form said target.

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