Abstract: The present invention is a training device for target shooting. The device contains a housing with an affixing means on one side and a sensory marker. The housing has a forward side, a back side and a perimeter edge forming a chamber with one or more compartments. The affixing means is preferably on the back side of the housing for attaching the housing to a shooting target. The sensory marker can be a colored powder, reflective particulate or a light. When the training device is hit either the colored powder of reflective particulate is expelled or the light is extinguished providing an easily identifiable visual indication of a successful shot even when the device is at a significant distance from the shooter.
TARGET SHOOTING TRAINING DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Not applicable.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not applicable

THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

[0003] Not applicable

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

[0004] Not applicable

TECHNICAL FIELD

[0005] The present invention relates generally to targets used to assist in training an individual on how to aim a weapon when firing a projectile or become more proficient and accurate in placing a projectile in a desired location when using a weapon. More specifically, the invention is a device that may be affixed to an existing target and allows the user to identify when that particular location of the target has been hit by providing a visual or audio signal that can be seen at a distance without the assistance of a visual aid.

BACKGROUND OF THE INVENTION

[0006] When learning how to aim and shoot projectile weapons, such as a gun, which includes guns that utilize gun powder or compressed air to launch a projectile or a bow which includes long bows, compound bow, crossbows and the like, an individual often visits a target range, places a paper target at a desired distance and shoots at the target. When a certain number of shots have been fired, the individual views the target by retrieving it with the use of a hand operated or mechanically operated clothes line. Alternatively, the individual may have binoculars
or a spotting scope to see the target or utilize a spotter who can provide information after each shot. With the exception of using a spotter which requires a second individual to be present with a visual aid during shooting, an individual can only determine their accuracy after firing several shots, evaluating the target and then shooting another series of rounds repeating the process. It would be preferable if the individual could aim the weapon, shoot and then know instantly whether the target was hit in the desired location without removing their eye from the sight. This would allow the individual to maintain their line of fire for the next series of shots. If this were the case, training times could be decreased, the amount of projectiles fired would be less and the amount of additional equipment and cost associated therewith could be reduced. Consequently, the overall cost of training individuals such as Policemen and Military personnel could be significantly reduced.

[0007] There are a number of targets that when contacted with a projectile, explode providing a clear indication that the target was hit. However, while this type of target provides an immediate indication of success, they are also costly to produce and consequently purchase, they increase the amount of noise associated with discharging a weapon, they discharge sparks that could, in dry area like California, have the potential of starting a fire and could be misinterpreted as an attack.

[0008] As such, there is a continuing unmet need for device that can be utilized amateurs and marksmen alike that will provide an immediate indication of whether the desired location on the target has been hit, reduce the cost of equipment and supplies required for target training and reduce the time required for training and/or reach a desired proficiency.

[0009] The foregoing examples of related art and limitation related therewith are intended to be illustrative and not exclusive, and they do not imply any limitations on the invention described and claimed herein. Various limitations of the related art will become apparent to those skilled in the art upon a reading and understanding of the specification below and the accompanying drawings.

**SUMMARY OF THE INVENTION**

[0010] The device herein disclosed and described is a training device for target shooting. The device comprises a housing, an affixing means on one side of the housing and a sensory marker.
The housing has a forward side, a back side and a perimeter edge. The affixing means is provided so that the training device may be attached to a shooting target. The sensory marker may be a visual or auditory indicator that the training device has been successfully hit. The marker allows the user, positioned at a distance from the target, to easily identify whether the training device has been hit without the use of an optical aid such as binoculars or a spotter.

[0011] In one embodiment, the housing is made of a soft material that allows passage of a high speed projectile without significant deformation of the housing, such as a flexible light weight polymer, a cardboard or a high basis-weight paper. The sensory marker may be a visual marker that can be seen a distance away from the training device or an audible marker that can be heard at a distance away from the training device, such as a powder or a light reflective particulate housed within the chamber. In addition, the powder or reflective particulate may be colored.

[0012] In another embodiment, the visual marker may be a lighted marker comprising an illumination source, an energy supply and an electrical circuit connected to the illumination source and energy supply. Preferably, but not by way of limitation the illumination source may an LED light.

[0013] In yet another embodiment, the audible marker is glass or rigid plastic.

[0014] In another aspect of the present invention, the training device housing may be made of a semi-rigid material on its forward side, such as semi-rigid polymer or aluminum, with a ruptureable perimeter edge

[0015] In other embodiments, the affixing means may be an adhesive or an adhesive tape; the chamber may be composed of multiple compartments that may be filled with difference colored powders; and each of the compartments may house a separate light and those lights may have different colors.

[0016] In another aspect of the present invention, a method of training an individual to shoot a weapon accurately is provided comprising the steps of: affixing one or more training devices to a standard paper target at locations of interest, and having the individual shoot at the training devices on the paper target wherein the marker provides a visual or audible signal when the
target devices are hit by a projectile providing immediate feedback while simultaneously shooting the weapon.

[0017] With respect to the above description, before explaining at least one preferred embodiment of the herein disclosed invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangement of the components in the following description or illustrated in the drawings. The invention herein described is capable of other embodiments and of being practiced and carried out in various ways which will be obvious to those skilled in the art. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[0018] As such, those skilled in the art will appreciate that the conception upon which this disclosure is based may readily be utilized as a basis for designing of other structures, methods and systems for carrying out the several purposes of the present disclosed device. It is important, therefore, that the claims be regarded as including such equivalent construction and methodology insofar as they do not depart from the spirit and scope of the present invention.

[0019] The objects, features, and advantages of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0020] Not applicable

**DETAILED DESCRIPTION OF THE INVENTION**

[0021] Unless defined otherwise, all terms used herein have the same meaning as are commonly understood by one of skill in the art to which this invention belongs. All patents, patent applications and publications referred to throughout the disclosure herein are incorporated by reference in their entirety. In the event that there is a plurality of definitions for a term herein, those in this section prevail.
The term "target shooting" or "shooting" as used herein refers to the discharging of a weapon wherein a projectile is directed at a target either for pleasure or for training purposes to increase accuracy. Shooting includes the use of weapons that discharge bullets utilizing gun powder or those that utilize compressed gas to discharge BBs or pellets as well as those that discharge arrows such as long bows, compound bows, crossbows and the like.

The term "affixing" as used herein refers to methods known to those skilled in the art for affixing one object to another. In this case, affixing the training device to an existing paper target or other object for target shooting purposes. Such methods would include for example, double sided tape affixed to the back side of the target training device or adhesive applied directly to the back side of the training device with a protective cover that can be removed to expose the adhesive for affixing to a paper target.

The phrase "a distance away" or "a significant distance away" as used herein refers to the distance between the individual discharging the weapon and the target on which the training device is affixed. This distance can range from 15 to 150 feet and can be any specific distance within that range such as 25, 50, 75, 100 or 150 feet and includes longer distances of 50 to 200 yards.

The phrase "a soft material" as used herein refers to the composition of the forward side of the training device housing that allows the bullet to easily pass through the training device forming a hole from which the sensory marker can be expelled. This is different from the term "semi-rigid material" which also refers to the composition of the forward side of the training device but that offers slight resistance to the impact of the bullet. That resistance distributes the force from the impact momentarily to the entire forward side compressing it against the back side of the training device. This forces the sensory marker against the perimeter edge, rupturing the membrane that forms the perimeter edge and expelling the marker.

The present invention is a training device for target shooting. The device contains a housing with an affixing means on one side and a sensory marker. The housing has a forward side, a back side and a perimeter edge forming a chamber with one or more compartments. The affixing means is preferably on the back side of the housing for attaching the housing to an existing target. The sensory marker can be a colored powder, reflective particulate or a light.
When the training device is hit either the colored powder of reflective particulate is expelled or the light is extinguished providing an easily identifiable visual indication of a successful shot even when the device is at a significant distance from the shooter.

Housing

[0027] The housing of the training device comprises a forward side or the side which is presented to the shooter, a back side which contains an affixing means that allows the user to affix the training device to a variety of targets that may be selected by the shooter and a perimeter edge that may be made of the same material as the forward and back sides or may be formed with a ruptureable membrane that provides a secondary release of the sensory marker when the training device is hit. In one aspect of the present invention, the training device is made of a soft material that allows easy passage of a projectile through both the forward and back sides releasing the sensory marker through the hole produced by the projectile. In this configuration the training device may be made of a soft material, for example a light weight, flexible polymer, a low density cardboard or a high-basis weight paper.

[0028] In another aspect of the present invention, the training device may be prepared having a forward side, a back side and ruptureable membrane perimeter edge. In this configuration the forward side is made of a semi-rigid material that offers slight resistance to the impact of the projectile, such as for example a low density polymer or thin metal. That resistance distributes the force from the impact momentarily over the entire forward side, compressing it against the back side of the training device. This force creates pressure on the perimeter edge, rupturing the membrane and expelling the sensory marker. The ruptureable membrane may be provided uniformly about the perimeter edge of the device or may be provide in only certain locations along the perimeter edge. For example, the perimeter edge may be primarily prepared from a soft material with areas or windows, three to five, which contain ruptureable membrane so that when impacted the pattern formed by the sensory material upon rupture of the membrane could be a three or five pointed star. The actual number of ruptureable sites, 1 to 10 or more, along the perimeter edge can be adjusted to the desire of the user, for ease of manufacturing or to assure the proper function of the during use. More specifically, it is desirable to have the forward side remain attached to the training device after impact. Consequently, the number of ruptureable
areas or windows should be an amount that would permit or allow the forward side to become disconnected from the back side after being hit.

[0029] The training device could be prepared in a variety of shapes such as a triangle, a square, a circle, an oval, a rectangle or any other shape desired having any of a number of images that may be printed on the forward side’s surface of interest to the shooter. The forward side, back side and perimeter edge may be prepared independently and then assembled, or as in the case of the configuration where the entire housing is prepared from a soft material, the sides and the perimeter edge may be prepared as a single sleeve with a sealable edge to allow incorporation of the sensory marker. Correspondingly, in this configuration the forward side and perimeter edge or the back side and the perimeter edge could be prepared from a single sheet of soft material and then assembled with the back side or forward side respectively. In the configuration having two or more pieces to be assembled they may be affixed by a variety of methods known to those skilled, including for example by adhesive or by stapling.

[0030] In each case, the housing creates one or more chambers that may be used to house one or more of the sensory markers. In one simple embodiment the forward side and back side are both made of a low density low cost cardboard that when joined together form a single interior compartment for housing a powder, reflective particulate or a combination of both. In another embodiment this configuration provides for a number of compartments that may comprise different colored powders or reflective particulates arranged in a particular orientation within the training device. For example, there may be three or more compartments with their apex positioned at the center of the training device. Alternatively, the center of the training device may have its own compartment with other compartments radiating from the central compartment. In these configurations and if the powder contained in the compartments is different, when the training device is hit different colors may result from the compartment hit or the mixing of the colors when two or more compartments are hit. For example, the device may be circular shaped having a central compartment containing red powder and two additional compartments one on either side of the central compartment one containing yellow on the left of center and the other containing blue to the right of center. If one of the compartments is hit independent of the other compartments the color of that compartment would be expelled. A center hit would be red and no further adjustment would be required by the shooter. If the
shooter was off to the left the projectile would hit the training device which would expel yellow powder letting the shooter know that he/she must adjust their shot to the right. Correspondingly, if the shooter was off to the right a blue color would be expelled when the training device was hit informing the shooter to adjust to the left. This also provides guidance if the shooter is on target but above or below center. This hit would expel a mixture of blue and yellow powder forming green, letting the shooter know he/she must adjust the next shot up or down. In addition, if the shooter were slightly left of center, rupturing both the red and yellow compartments, an orange color would be expelled and if slightly to the right a purple color would be expelled.

The chamber dividers may be prepared separately from the forward side, back side and perimeter edge or they may be constructed integral to or formed in these sections. For example, if the training device were provided in a circular configuration, then the divider and/or dividers may be made of the same material as the forward or back side and affixed in position using for example adhesive to one of these sides. The perimeter edge is then affixed or can be part and parcel of the divider or dividers, the chambers may then be filled with the colored powders and the remaining side affixed to this structure using adhesive or staples securing the markers within their chambers. Alternatively, the divider may be formed in the forward or back side such that when sealed to the other side the compartments are completed and secure the sensory marker within. A variety of methods are known to those skilled in the art for forming light weight flexible polymer, cardboard or high basis-weight paper into desired configurations for this purpose.

In the configuration where the perimeter edge is or comprises two or more ruptureable membranes, these membranes may be incorporated into the divider or may be separate from the divider. For example, one of the sides may incorporate the perimeter edge in which three or five windows are provided. The divider is affixed or prepared within this side such that the chambers are aligned with the perimeter edge windows. These windows are then covered by a single or multiple strips of ruptureable membrane, the chambers are filled with the sensory marker and the remaining side affixed to this structure in such a fashion that the chambers independently secure their marker contents.

**Sensory Markers**
[0033] The configurations thus far disclosed encompass sensory markers comprised of powders and reflective particulates. The powders and reflective particulates are designed to be visible at a distance from the shooter and may be colored to increase their detection when released from the training device. Other sensory markers include lights and auditory based indicators.

[0034] The training device of the present invention may have one or more lighted sensory markers. These markers comprise an illumination source such as a small light bulb or light emitting diode (LED) coupled with circuitry to dispense energy from an energy source such as a battery or capacitor to the illumination source. The light source, circuitry and capacitor are provided in a configuration that allows a projectile to completely incapacitate or remove the electronics from the training device upon impact. The training device may contain multiple light sources and those may be provided in different colors to allow the user to assure that the light source targeted is the one eliminated. In use the circuitry that provides the energy to the illumination source(s) comprises a tab that when removed completes the circuit and initiates energy transfer to the light source thereby lighting the light bulbs or LEDs for target practice. When a light source is targeted and hit the light goes out indicating a successful shot.

[0035] Audible sensory markers may also be utilized that emit a sound when the marker is hit. These could be a sheet of glass or high density polymer that emits a cracking sound when hit. The training device could also have a small electronic sound producing device similar to those used for cellular phones with a switch and energy source such that when the switch is hit by a projectile the circuit is completed and energy is transmitted to the sound producing device to emit a short burst of sound audible to the shooter. In this configuration, the switch is placed at the center of the training device and the sound producing device is off to one side in a region not expected to be impacted by projectiles.

Use

[0036] In use the shooter removes one or more training devices from their packaging. The target used for training is prepared to accept the training devices of the present invention. The protective coatings are removed from the adhesive strips on the back side of each device and the devices are positioned as desired on the target. If any of the training devices have illumination
sources the tabs that initiate illumination of the light sources are removed so that the lights illuminate. The target containing the training devices is then placed at a desired distance from the shooter. When in position the shooter can commence shooting at the training devices. For those training devices having light sources or auditory sensory markers, the user obtains information about their accuracy when the light is extinguished or the audible sound of the training device is emitted. Training devices using powders or reflective particulates provide information on the shooters accuracy when the powders or particulates are released upon impact from a projectile. More advanced shooters may use the training devices having colored powders and/or reflective particulates which provide indication of accuracy based on the color of the powder or reflective particulates released upon being hit by a projectile. Depending on the location of the colored powders and/or reflective particulates colors are produced that give the shooter an indication of how to adjust their shot for better accuracy in hitting the center of the training device.

[0037] For example, as described above, using a circular training device having three compartments, one central compartment contain a red sensory marker and two side compartments surrounding the central compartment the left side containing a yellow sensory marker and the right side containing a blue sensory marker, a center hit would result in a red puff of powder upon impact and no further adjustment would be required by the shooter. If the shooter was off to the left the projectile would hit the training device and expel a yellow puff of powder letting the shooter know that he/she must adjust their shot to the right. Correspondingly, if the shooter was off to the right a blue puff of color would be expelled when the training device was hit informing the shooter to adjust to the left. This also provides guidance if the shooter is on target but above or below center. This hit would expel a mixture of blue and yellow powder forming green puff of powder, letting the shooter know he/she must adjust the next shot up or down. In addition, if the shooter were slightly left of center, rupturing both the red and yellow compartments, an orange puff of color would be expelled and if slightly to the right a purple puff of color would be expelled.

[0038] Consequently, the training device of the present invention provides the shooter with immediate information as to the shot recently taken allowing them to maintain their aim, applying the information obtained from their last shot and adjusting the their aim prior to taking the next shot. This can all be done without the visual assistance of binoculars or a spotter and
allows the user to maintain his line of sight readjust his/her aim and firing another shot without relaxing their weapon, or removing their weapon from their aim on the target.

[0039] While all of the fundamental characteristics and features of the invention have been shown and described herein, with reference to particular embodiments thereof, a latitude of modification, various changes and substitutions are intended in the foregoing disclosure and it will be apparent that in some instances, some features of the invention may be employed without a corresponding use of other features without departing from the scope of the invention as set forth. It should also be understood that various substitutions, modifications, and variations may be made by those skilled in the art without departing from the spirit or scope of the invention. Consequently, all such modifications and variations and substitutions are included within the scope of the invention as defined by the following claims.
CLAIMS

I claim:

1. A training device for target shooting comprising:
   a housing having a forward side, a back side and a perimeter edge, wherein said housing
   forming a chamber, wherein said back side has an affixing means for attaching said
   housing to a shooting target; and
   a sensory marker that can be identified a distance away from said training device.

2. The training device according to claim 1, wherein said housing is made of a soft material
   that allows passage of a high speed projectile without significant deformation of said
   housing.

3. The training device according to claim 2 wherein said soft material is a polymer, a
   cardboard, a high basis-weight paper.

4. The training device according to claim 1, wherein said sensory marker is a visual marker
   that can be seen a distance away from said training device or is an audible marker that
   can be heard at a distance away from said training device.

5. The training device according to claim 4, wherein said visual marker is a powder or a
   light reflective particulate housed within said chamber.

6. The training device according to claim 5 wherein said powder or reflective particulate is
   colored.

7. The training device according to claim 4, wherein the visual marker is a lighted marker,
   wherein said lighted marker comprises an illumination source, an energy supply and an
   electrical circuit connected to said illumination source and said energy supply.

8. The training device according to claim 6, wherein said illumination source is an LED
   light.

9. The training device according to claim 4, wherein said audible marker is glass or plastic.
10. The training device according to claim 1, wherein said housing is made of a semi-rigid material on its forward side with a ruptureable perimeter edge.

11. The training device according to claim 10, wherein said forward side is made of a semi-rigid polymer or aluminum.

12. The training device according to claim 1, wherein said affixing means is an adhesive or an adhesive tape.

13. The device according to claim 1, wherein said chamber is composed of multiple compartments.

14. The device according to claim 13, wherein said compartments are filled with difference colored powders.

15. The device according to claim 13, wherein each of said compartments house a separate light.

16. The device according to claim 15, wherein each compartment houses a different colored light.

17. A method of training an individual to shoot a weapon comprising the steps of:
   affixing one or more training devices to a standard paper target at locations of interest, wherein said one or more training devices comprises a housing having a forward side, a back side and a perimeter edge, wherein said housing forming a chamber, wherein said back side has an affixing means for attaching said housing to a shooting target; and a sensory marker that can be identified a distance away from said training device; placing said paper target with said training devices attached a distance away from said individual; and having said individual shoot at said training devices on said paper target wherein said marker provides a visual or audible signal when said target devices are hit by a projectile of said weapon shot by said individual, thereby providing feedback while simultaneously shooting said weapon.