FLYING TARGET FOR TRAP SHOOTING
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This invention relates to improvements in flying targets, sometimes known as clay pigeons or clay targets, suitable for use in trap shooting or the like.

The general object of my invention is to provide a target which is constructed in such a manner that, when hit by a single shot or pellet, the likelihood of breaking will be considerably increased as compared with comparable targets of the prior art. More specifically, the construction is such that if a fragment is broken off, it will be sufficiently large so as to be clearly visible, to the end that the shot will be scored as a hit.

Such targets are made of a suitable mixture of pitch and clay, or pitch and limestone dust, which provides a relatively fragile structure. However, the stress incident to the operation of the trap requires a relatively strong structure particularly in the radial direction. Therefore, it has been the practice to make the target in the form of a hollow dome-shaped structure, partially because this shape is inherently strong; and partially because it presents a larger projection to the path of the pellet, thereby increasing the chance of a hit.

However, it has been found that unless the pellet hits the curved surface of the dome within a certain small area which is close to the diametral line (termed "diametral hit") and which is also sufficiently low on the dome as to present a certain angle of impact to the pellet path, the pellet will tend to glance off. More specifically, if the point of impact is offset from the diametral line (termed an "offset hit") the pellet will glance off due to the low angle of impact. Also, a diametral hit on the upper part of the dome surface will glance off.

Even where the pellet penetrates the target in the relatively small high impact area, the piece of target knocked out may be so small as to be not perceptible, with the result that the hit will not be scored.

The present invention provides a target having a smooth rim portion and a dome portion characterized in that the dome portion is provided with a number of closely spaced depressions, the wall of each providing one surface portion or facet of high impact value with respect to a diametral hit, and other surface portions or facets of high impact value with respect to offset hits. I have found that if the surface irregularity of the dome does not extend to the outer rim surface, that the trajectory of the target is not adversely affected, as by skewing. Tests have indicated that the dome depressions actually stabilize the target trajectory.

I have also found that if the depressions are aligned with each other, that the pellet will not only penetrate the target, but will knock out a fairly large piece, with the result that the hit is visible from a distance and will be scored. In many instances, the hit will cause complete disintegration of the dome. This is due to the fact that the alignment of the depressions provides certain lines of potential fracture.

Other objects, features and advantages will become apparent as the description proceeds.

With reference now to the drawings in which like reference numerals designate like parts:

FIG. 1 is a plan view of a target embodying my invention;

FIG. 2 is a sectional view with the target in an inclined position with respect to the pellet path, as occurs in flight;

FIG. 3 is a fragmentary perspective view showing the shape of the depressions of the FIG. 1 embodiment;

FIG. 4 is a sectional view taken along the lines 4—4 of FIGS. 1 and 3;

FIGS. 5 and 6 are views corresponding to FIGS. 3 and 4 but showing a modified shape of depression;

FIG. 7 is a view similar to FIG. 6 but showing an alternative of the FIG. 6 construction;

FIG. 8 is a view similar to FIG. 3, but showing another modification;

FIG. 9 is an enlarged fragmentary section similar to FIG. 2, but showing a further modification;

FIG. 10 is a fragmentary plan view of the dome showing another type of depression; and

FIG. 11 is an enlarged fragmentary section taken along line 11—11 of FIG. 10.

With reference now to FIGS. 1 and 2, the target comprises a rim 10 and a central disk-like portion 11 which are connected to each other by a curved wall comprising the dome 12. The upper surface of the disk portion 11 is preferably recessed somewhat below the high point of the dome 12.

The rim 10 includes a flange portion 13 of substantial thickness and a shoulder 14 adjacent thereto. The shoulder 14 cooperates with the trap in such a manner that the flange portion 13 of the rim can be received in the groove of the trap in the customary manner.

The dome 12 is provided with a number of depressions 15, each of which, as shown in FIG. 3, comprises an inner wall 16, two radial walls 17 and a flat bottom wall 18 which intersects the surface 19 of the dome 12, thus providing a step type of depression. The inner wall 16 is substantially parallel to the spinning axis 20 of the target, and the bottom wall 18 is substantially perpendicular thereto.

In FIG. 1, the arrow 21 indicates the pellet path of a diametral hit, and the arrow 22 indicates the pellet path of an offset hit. The broken line 23 is the diametral line above referred to, that is, that diameter of the target which is parallel to the pellet paths 21 and 22, when viewed in projection, as in FIG. 1. It will be understood that the target, when in flight, is spinning and therefore there is relative movement between any given depression 15 and the diametral line 23. Furthermore, the target when in flight is inclined to the horizontal and also inclined to the pellet path 21 or 22, somewhat as shown in FIG. 2.

It will be seen therefore that the inner wall 16 constitutes a surface portion or facet of high impact value with respect to the pellet path 21 of a diametral hit. One of the radial walls 17 presents a surface portion or facet of high impact value with respect to the pellet path 22 of an offset hit.

As shown in FIGS. 2 and 4, the depressions 15 provide thin wall portions 24 which are aligned with each other to provide a line of potential fracture which extends in a circumferential direction. FIG. 1 indicates the concentric orientation of these lines 25 of potential fracture.

Since the depressions 15 are separated by dome surface portions 19 which present surfaces of low impact value, the effectiveness of the target may be increased either by undercutting the depressions as shown in FIG. 9, or by enlarging the depressions as shown in FIGS. 5 and 6 which reduces or eliminates the surface areas 19. In the modification of FIGS. 5 and 6, the radial walls 17 are sloped to provide a ridge 26 of tapering cross section which serves as an abutment which is effective in taking up the force of the impact and transmitting it to the body of the dome 12 to cause fracture along one or more of the lines 25 of potential fracture.

In the alternative construction of FIG. 7, the upper portion of the ridge 26 is rounded.

In the modification of FIG. 8, the depressions 27 are of semicircular shape instead of rectangular, thus providing
a continuous wall which has one portion 28 which is of high impact value with respect to a diametral hit, and having another portion 29 which is of high impact value with respect to an offset hit.

In FIG. 9, the bottom wall 30 of a rectangular or semi-circular depression 31 is relocated to provide an outer wall 32 which forms an acute angle with the dome surface 19', thus providing a sharp edge 33. In effect, the dome surface 19' is undercut, which considerably weakens the same. A pellet striking the dome surface 19' will tend to cave in, the undercut dome offering considerably little resistance to the pellet with the result that the pellet will engage the remote wall 34. Thus, substantially the full force of the impact is taken up by the remote wall 34, tending to cause fracture at the thin wall portion 24', and along lines 25 of potential fracture.

A modified form of undercut depression is shown in FIGS. 10 and 11 in which the depressions 35 are of circular cross section and of smaller diameter than the depressions 15, 27, or 31. The spacing between the depressions 35 is less than the diameter. The thin wall portions 36 are aligned so as to provide lines 37 of potential fracture which intersect each other. Here, as in FIG. 9, the depressions 35 have an outer wall 38, as well as an inner wall 39, and the outer wall 38 provides a sharp edge 40. As a result, a pellet striking the undercut dome surface 19' at a point between adjacent depressions 35 will tend to cave in and strike the remote or inner wall 39 to cause the dome to fracture along one or more of the lines 37.

In the embodiments shown, the target preferably has an overall diameter of approximately 4½ inches and an overall height of approximately 1½ inches. The thickness of the disk portion 11 is approximately 3/8 of an inch, and the thickness of the other portions follows substantially the proportions shown in FIG. 2. In FIGS. 1 to 4, the depressions are arranged in three tiers and the width dimension of the depression is of the order of from 3/16 to 3/16 of an inch. In FIGS. 10 and 11, the undercut depressions 35 are substantially ¼ of an inch in diameter.

In each instance, the depth of the depression is in excess of one-half of the wall thickness at that point. Preferably the thin wall portions 24 range in thickness from .025 inch up to 3/8 of an inch, and the same applies to the thin wall portions 36 of FIGS. 10 and 11.

In the embodiment of FIGS. 10 and 11, the spacing varies due to the circular orientation, but in general the distance between adjacent depressions 35 is less than their diameter. As an overall parameter, about 1/4 of the vertically projected area of the dome 12 is occupied by the depressions 35. In the embodiment of FIGS. 5 and 6, at the other extreme, substantially all of the vertically projected area of the dome is occupied by the depressions 15'.

In each of the embodiments shown herein, the depression presents a surface portion or facet of high impact value with respect to a diametral hit, and other surface portions or facets of high impact value with respect to offset hits. In either type of hit, the construction is such that the shock of the impact is transmitted to the body of the dome with the result that the dome will tend to fracture along one or more of the lines 25 of potential fracture, and in the case of the arrangement of FIGS. 10 and 11 the lines of potential fracture intersect which will materially increase the likelihood of knocking out a fairly large fragment.

In the arrangement of FIGS. 5 and 6, it will be observed that the extent of each of the thin wall portions 24 in the circumferential direction is several times the corresponding dimension of the ridge 26, with the result that a very fragile structure is provided with respect to the impact of a pellet.

It will be understood that an offset hit may occur at either side of the diametral line 23, and the construction is as effective in one instance as in the other, as well as for pellet paths lying between the arrows 21 and 22.

It has been found that when the surface irregularities provided by the depressions 15, 27, 31, or 35 are confined to the dome, the trajectory of the target is not adversely affected, as it would be if the peripheral surfaces 13a and 14 of the rim 16 were provided with similar depressions. The result of downwardly throwing the target is obtained with targets manufactured in accordance with my invention, as a result of which it appears that the dome depressions materially stabilize the trajectory of the target.

In some instances, such as encountered in skeet shooting, a pellet may engage the target at the concave underside of the dome. Here, the glancing off problem is not encountered in the same sense, but nevertheless the lines 25 or 37 of potential fracture tend to cause a substantial fragment of the target to fly outwardly, thus providing a visual indication which can be scored as a hit.

The present application is a continuation-in-part of my earlier application, Serial No. 37,910, filed June 22, 1960, now abandoned.

In the enlarged sections of FIGS. 9 and 11, it will be understood that the walls 32 and 34 of depression 31, and the cylindrical wall portions 38 and 39 of the depression 35 are parallel to the spinning axis of the target, the views being taken when the target is in an inclined position, similar to FIG. 2.

Although only preferred embodiments of my invention have been shown and described herein, it will be understood that various modifications and changes may be made in the constructions shown without departing from the spirit of my invention as pointed out in the appended claims.

I claim:

1. A flying target comprising an annular rim portion, a central portion offset in an axial direction from said rim portion, and a curved wall connecting said rim portion and said disk portion and providing a hollow dome, the peripheral surfaces of said rim portion being smooth, and the outer surface of said dome being provided with a plurality of depressions, said depressions each having a wall which provides one surface portion which is substantially parallel to the spinning axis of said target and perpendicular to a radius therefrom, and another surface portion which is substantially co-planar with said spinning axis, the spacing of said depressions being sufficiently close that, in the case of an offset hit, the pellet will engage one of said second mentioned surface portions directly without glancing off of an adjacent one of said first mentioned surface portions.

2. A flying target as claimed in claim 1 in which the depth of said depressions is more than one-half of the thickness of said curved wall, said depressions being aligned with each other to provide concentric lines of potential fracture.

3. A flying target as claimed in claim 1 in which the bottom of each of said depressions is substantially perpendicular to said spinning axis and intersects said dome surface to provide a step type depression.

4. A flying target as claimed in claim 1 in which the bottom of each of said depressions is undercut below said dome surface to provide an outer wall for said depression which intersects said dome surface to provide a sharp edge which is less than 90° whereby a diametral hit engaging said dome surface at a point between adjacent depressions will tend to cave in the outer wall of one of said depressions.

5. A flying target as claimed in claim 4 in which said undercut depressions are cylindrical.

6. A flying target as claimed in claim 5 in which the diameter of said cylindrical depressions is of the order of one-eighth of an inch.

7. A flying target as claimed in claim 5 in which the diameter of said cylindrical depressions is sufficiently great with respect to the spacing between them that substan-
tially one-third of the projected area of said dome surface is occupied by said depressions.

8. A flying target as claimed in claim 5 in which said depressions are arranged in a plurality of tiers, the depressions of adjacent tiers being aligned with each other to provide intersecting lines of potential fracture.

9. A clay target comprising an annular rim portion, a central disk-like portion offset in an axial direction from said rim portion, and a curved wall connecting said rim portion and said disk portion and providing a hollow dome, the outer surface of said dome being provided with a plurality of step type substantially rectangular depressions, said depressions each having an inner wall which provides a facet of high impact value with respect to a diametral hit, and two radial walls which provide facets of high impact value with respect to offset hits, the spacing of said depressions being sufficiently close that, in the case of an offset hit, the pellet will engage a radial wall directly without glancing off of an adjacent inner wall.

10. A clay target as claimed in claim 9 in which said depressions are arranged in tiers, adjacent depressions in the same tier being separated by tapering ridges.

11. A clay target as claimed in claim 10 in which said ridges are rounded.

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