Aug. 31, 1965 C. A. SAUNDERS 3,203,698

ARCHERY TARGET WITH ARROW STOP MEANS

Filed May 14, 1962 2 Sheets-Sheet 1

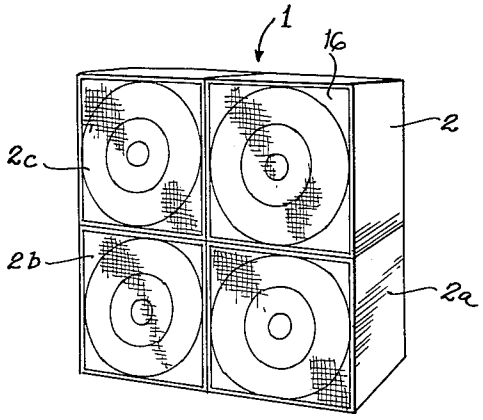


FIG. 1

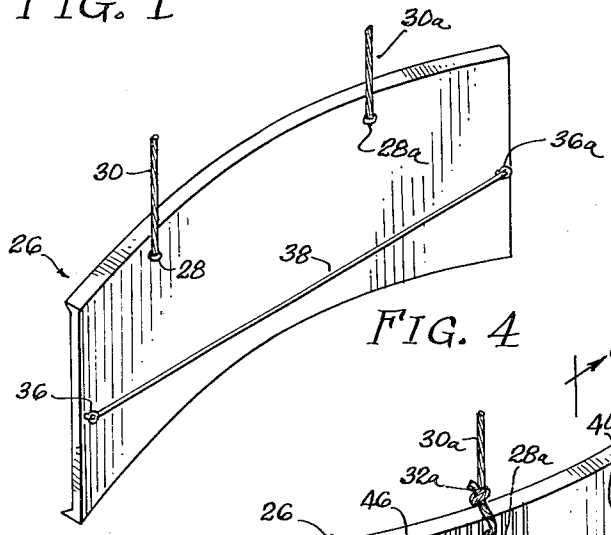


FIG. 4

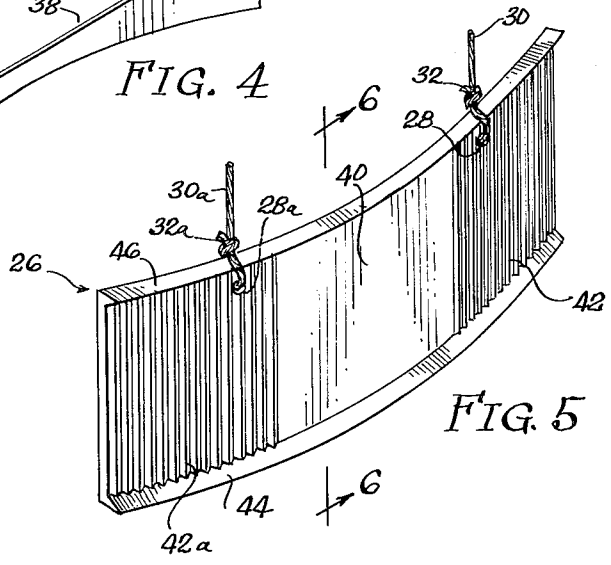


FIG. 5

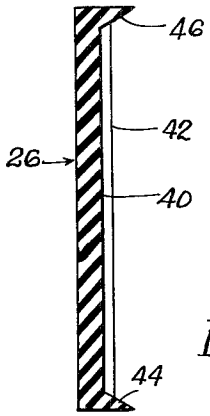


FIG. 6

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ARCHERY TARGET WITH ARROW STOP MEANS

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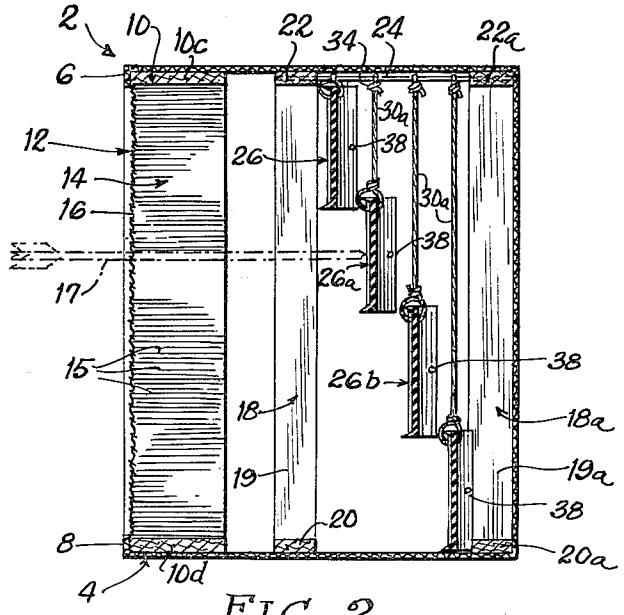


FIG. 2

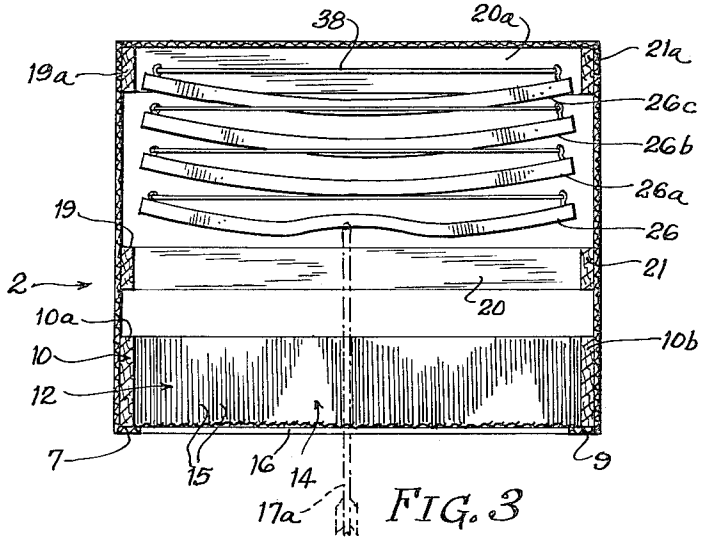


FIG. 3

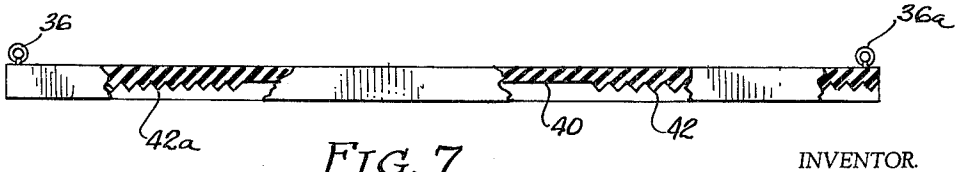


FIG. 7

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ARCHERY TARGET WITH ARROW STOP MEANS

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10 Claims. (Cl. 273—102.4)

This invention relates to archery targets and more specifically to a two-stage arrow slowing and arrow stopping target.

Heretofore, the only archery targets found in general use have been conventional straw filled units which are subject to rapid deterioration from the constant ingress and egress of arrow projectiles. Moreover, these targets possess the inherent danger of failing to adequately stop an impinging arrow whereby the arrow may be damaged or destroyed after passage through the target or, of even graver consequence, may damage or destroy property or persons behind the target.

This invention obviates the aforementioned difficulties by the provision of an entirely novel concept in the archery target art, namely, a two-stage target which first slows the arrow and then finally stops it with a characteristic "bounce-out" or partial reversal of flight of the arrow, whereby removal of the arrow from the target is expedited and damage to the target is minimized. Basically, the invention comprises a first target matt portion comprising an end grain straw-type arrow slow down means backed up by a second resilient arrow stop means, whereby the flight of an arrow projectile passing through the target matt is in sequential order slowed down, stopped, and then partially reversed.

Thus, it is an object of this invention to introduce a new concept in archery targetry which prevents deleterious wear and tear to the straw part of the target, which prevents damage to and destruction of persons and property positioned behind the target, which prevents damage to and destruction of the arrows themselves, and which facilitates the removal of arrows from the target.

These and other objects, features, and advantages of the subject invention will hereinafter appear, and, for purposes of illustration, but not of limitation, an exemplary embodiment of the invention is shown in the appended drawings, in which:

FIGURE 1 is a perspective view of four stacked arrow targets constructed in accordance with the teachings of the subject invention;

FIGURE 2 is a side sectional view of one of the arrow targets shown in FIGURE 1, showing, in phantom, an arrow about to impinge on one of the resilient back stops of the improved target;

FIGURE 3 is a top sectional view showing, in phantom, an arrow having impinged and resiliently deformed one of the resilient backstops of the improved target;

FIGURE 4 is a perspective view of the floating resilient backstop taken from the rear of the target;

FIGURE 5 is a similar perspective view taken from the front of the target;

FIGURE 6 is a side sectional view taken along the lines 6—6 of FIGURE 5; and

FIGURE 7 is a top plan view of an untensioned resilient backstop shield, partially broken away to show details of construction.

With reference to the drawings, the stacked target assembly 1 is shown in FIGURE 1. The assembly 1 comprises a plurality of four stacked target units 2, 2*a*, 2*b*, and 2*c*, each constructed in accordance with the teachings of this invention. One such unit 2 will be described in order to explain the operation of the subject invention.

In the described embodiment, the target unit 2 comprises an opened front box housing 4, which may conveniently be formed of a corrugated cardboard. A target matt frame 10 comprising the upright vertical members 10*a* and 10*b* on either vertical interior of the housing 4 and the horizontal frame members 10*c* and 10*d* at the top and the bottom interiors of the housing 4 respectively are positioned at the front of the target unit 2. The target matt frame 10 may conveniently be formed of wood. Preferably, the housing 4 is provided with horizontal overlapped portions 6 at the top and 8 at the bottom and with vertical overlapped portions 7 and 9 at either side to enhance the rigidity of the composite target unit 2. When the unit is constructed of a corrugated cardboard housing 4 and a wood frame 10, as preferred, maintenance of the relative components in their respective positions may be facilitated by a conventional stapling operation.

A target matt 12 is mounted within the frame 10. The target matt 12 comprises an end grain straw assembly 14 covered on its target line face with a conventional burlap bull's eye pattern 16. By an "end grain" target matt is meant that each individual straw element of the target (such as a straw element 15, see FIGURES 2 and 3) has its longitudinal axis perpendicular to the target face 16, that is, parallel to the flight of a directly impinging arrow projectile, such as the arrow 17 or 17*a* shown in FIGURES 2 and 3 respectively. The end grain target matt 12 serves to slow down an impinging arrow which passes partially therethrough, as opposed to a complete stopping operation as in a conventional straw type target wherein the longitudinal axis of the impinging arrow is generally perpendicular to, rather than parallel with, the axis of the individual straw elements which it contends.

Arrow stop means frames 18 and 18*a* are positioned within the housing 2 behind the target matt 14. The rear stop means frame 18*a* is positioned adjacent the rear of the housing 4 and the front stop means frame 18 is positioned between the target matt frame 10 and the rear arrow stop frame 18*a*. Each of the arrow stop frames 18 and 18*a* comprise upright vertical members 19, 19*a* and 21, 21*a* and horizontal members 20, 20*a* and 22, 22*a* which, correspondingly to target matt frame 10, may conveniently be formed of wood. Support means, such as the dowel rod 24 shown in FIGURE 2, are provided in conjunction with the arrow stop frames 18 and 18*a* to floatingly support the arrow stop means to be subsequently described. Also, the rear stop means frame 18*a* may be provided with cross-braces thereacross (not shown) in order to enhance the rigidity of the composite target unit 2.

In the preferred embodiment of the invention, the arrow stop means comprise a series of partially overlapping staggered shields 26, 26*a*, 26*b*, and 26*c*. The details of construction of each of the arrow stop shields may be appreciated by reference to the enlarged showing of arrow stop shield 26 in FIGURES 4 through 7.

The arrow stop shield 26 comprises a rectangular plate provided with two spaced apertures 28 and 28*a* adjacent its upper end. Cables or cords 30, 30*a* are passed through the apertures 28, 28*a* respectively and are secured thereto, as by the knots 32, 32*a*. These cables are then fixed at the opposite ends to dowel rods adjacent the uppermost portion of the target unit 2, as for instance the dowel rod 24 shown in FIGURE 2. Again, the cables 30, 30*a* may be secured to the dowel rods, as by the knot 34 shown in FIGURE 2.

Preferably, shield 26 is formed of a resilient rubber and is provided with eyelets 36 and 36*a* at either of its opposite sides. A cord 38 is secured to the eyelets 36 and 36*a* so as to bow the shield 26 under tension convexingly outwardly toward the target line. Preferably, the cables 30 and 30*a* and the cord 38 are each formed of resilient rubber stock so as to enhance the resilient

functioning of the apparatus, to be hereinafter described.

The convex front surface of the shield **26** is provided with a smooth central portion **40**, and with vertically corrugated end portions **42** and **42***a* on either side thereof. Abutment lips **44** and **46**, adjacent the bottom and the top of the shield **26** respectively, are provided to define horizontal corrugations or ridges.

In preferred use, a series of shield members of the type shown in FIGURES 4–7 is supported within a target unit **2** in a partially overlapping and staggered relation as shown in FIGURES 2 and 3. In this manner, a substantially continuous area of arrow stop means is presented to any impinging arrow projectile. Likewise, the free floating cable supports (such as **30** and **30***a*, for the shield **26**) are substantially protected from damage by virtue of an impinging arrow projectile due to the protective presence of an overlapping shield next adjacent thereto.

When an on-line clean arrow shot approaches the target unit **2**, the following sequence of events will be observed:

The arrow will pass perpendicularly through the target matt **12** and will be frictionally slowed down thereby. After passage through the target matt **12**, the arrow will strike one of the freely floating depending shields **26**, **26***a*, **26***b* or **26***c* which, being impermeable to the restricted velocity arrow projectile, will definitely stop the same. This stoppage is effected both by the resilient give of the shield itself and also by the free floating absorbtion of momentum as the shield is deflected rearwardly by virtue of the impact. The resilient give is schematically illustrated for shield **26** in FIGURE 3 by virtue of the impingement of arrow projectile **17***a*. When the tensioned shield reflexes to its initial concave position and returns to its gravity-induced free-floating station, a reversal of the arrow flight is evidenced. In effect, the arrow is caused to "bounce-out" partially back through the target matt **14**. This "bounce-out" feature results in an enhanced ability to retrieve the arrow from its lodgement in the target matt **14** without damage to either the arrow or to the matt itself. Obviously, provision of the cables **30** and **30***a* and the cord **38** as resilient rubber stock will facilitate the described arrow stoppage and reversal sequence with a minimum of deleterious wear to the target components themselves.

The vertical corrugations **42** and **42***a* and the horizontal retaining lips **44** and **46** are provided to prevent impact slippage of off-line or edge shots which do not pass cleanly through the target matt **14**. The exact proportion of the surface area of a shield divided into the smooth reflexing portion and the corrugated reflexing portion will, of course, depend upon many variables. However, in the preferred embodiment of the invention an approximately one-third central portion with one-third corrugated portions on either side along with the horizontal retaining lips **44** and **46** has been found to give the most satisfactory results.

While the invention has been described with reference to a square housed target and with reference to a plurality of arrow stop means shields, it should be understood that other constructions are contemplated within the confines of the invention. Thus, a circular target housing having one or more rectangular shields as described or having circular free floating shields may be provided in suitable occasions. Various other changes and modifications may be made in the details of construction, arragnements, operations, and materials for the various elements without departing from the spirit and the scope of the instant invention, especially as defined in the appended claims.

What is claimed is:

1. An improved archery target for receiving directed arrow projectiles comprising:
   - a housing;
   - an arrow-permeable target matt supported in the front of the housing;
   - resilient arrow stop means comprising a bowed, resilient, vertically supported shield presenting a convex face to said target matt; and
   - shield support means supporting said resilient arrow stop means rearwardly of said target matt and horizontally aligned with said matt;
   - whereby the flight of an arrow projectile passing through the target matt is slowed down and is interrupted by said stop means.

2. The archery target of claim **1** wherein said target matt comprises an end grain straw wall structure consisting essentially of a plurality of stacked elongated straw elements disposed with aligned longitudinal axes paralleling the direction of flight of an arrow directed toward and directly impinging said target matt.

3. The archery target of claim **1** wherein said resilient arrow stop means comprises a series of partially overlapped and staggered shields.

4. The archery target of claim **1** wherein said means supporting said arrow stop means comprises flexible couplings each fixed at one of its ends to said housing and at the other of its ends to said resilient shield.

5. The archery target of claim **1** wherein said convex face of said shield comprises a smooth central portion, opposed lateral portions having vertical corrugations, and inclined ridges extending peripherally about said face.

6. The archery target of claim **1** wherein said means supporting said arrow stop means comprises cords connected between said housing and said shield.

7. The archery target of claim **1** wherein said shield comprises an elastomeric member.

8. In an archery device the combination with a straw filled type target matt for receiving directed arrow projectiles, of an arrow-impermeable stop means comprising a series of partially overlapped and staggered bowed resilient shields having their convex sides presented towards said matt rearwardly and horizontally aligned with said matt and means tensioning said shields to bias the same into said bowed position.

9. An improved archery target for receiving directed arrow projectiles comprising:
   - a housing;
   - an arrow-permeable target matt supported in the front of the housing;
   - said target matt comprising an end grain straw wall structure consisting essentially of a plurality of stacked elongated straw elements disposed with aligned longitudinal axes paralleling the direction of flight of an arrow directed toward and directly impinging said target matt;
   - resilient arrow stop means comprising a bowed, resilient, vertically supported shield presenting a convex face to said target matt;
   - said resilient arrow stop means comprising a series of partially overlapped and staggered shields;
   - said convex face of said shield comprises a smooth central portion, opposed lateral portions having vertical corrugations, and inclined ridges extending peripherally about said face; and
   - shield support means supporting said resilient arrow stop means rearwardly of said target matt and horizontally aligned with said matt;
   - whereby the flight of an arrow projectile passing through the target matt is slowed down and is interrupted by said stop means.

10. In an archery target for receiving directed arrow projectiles and including a housing and an arrow permeable target matt supported in said housing, the improvement which comprises:
   - arrow impermeable stop means;
   - means supporting said arrow stop means rearwardly of said target matt and horizontally aligned with said matt;
   - said arrow impermeable stop means being resiliently

tensioned and bowed to present a generally convex face to arrows directed toward said target matt; whereby an arrow projectile passing through said target matt is slowed and arrow flight interrupted.

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