United States Patent [19]

Saunders

[11] **3,749,075**

[45] **July 31, 1973**

[54] **SLINGSHOT WITH CONNECTION FOR PROJECTILE PROPELLING ELASTIC MEMBER**

[75] Inventor: **Charles A. Saunders**, Columbus, Nebr.

[73] Assignee: **Saunders Archery Co.**, Columbus, Nebr.

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[52] **U.S. Cl.**..... **124/20 R**, 273/DIG. 5, 273/DIG. 4, 273/DIG. 8

[51] **Int. Cl.**..... **F41b 7/00**

[58] **Field of Search**..... 124/20 R, 21, 22, 124/17, 35, 41, 20 A, 20 B; 248/358 AA; 278/86; 128/214.2; 64/1 V

[56] **References Cited**

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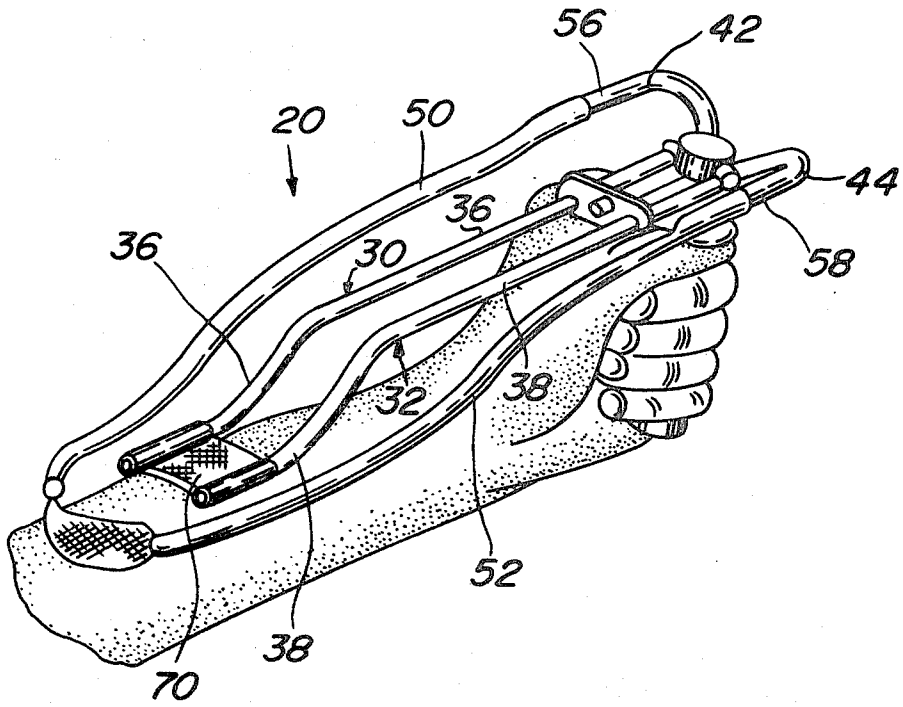
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Primary Examiner—Richard C. Pinkham
Assistant Examiner—William R. Browne
Attorney—Kegan, Kegan & Berkman

[57] **ABSTRACT**

In a slingshot having reversely hooked fork arms for securement of missile-projecting elastic tubes thereto, flexible and resilient spine-like probes fastened to and extending coaxially of rearwardly directed ends the hooked fork arms to buffer, control, and limit forward fold-over of the elastic tubes over the ends of the hooked fork arms upon recoil after distention and release of the elastic tubes, whereby the tubes are protected against extreme flexure and from abrasive wear against ends of the hooked fork arms during use of the slingshot. The probes extend into the ends to a position internally of the elastic members.

9 Claims, 7 Drawing Figures



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Fig - 1

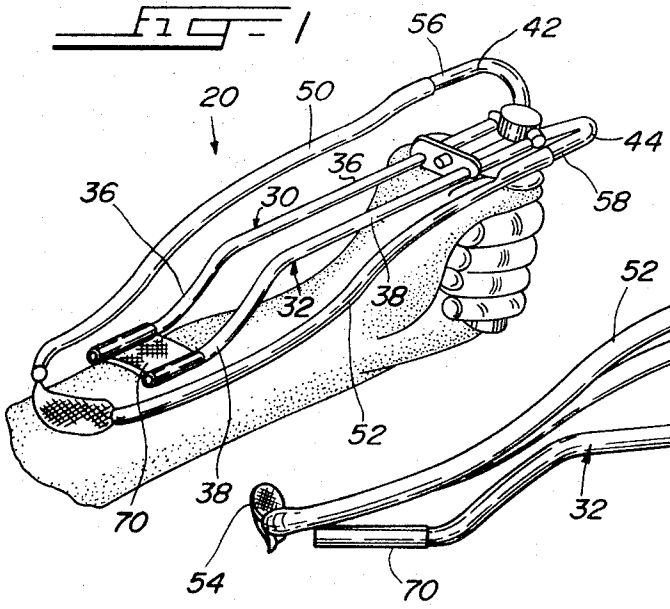


Fig - 2

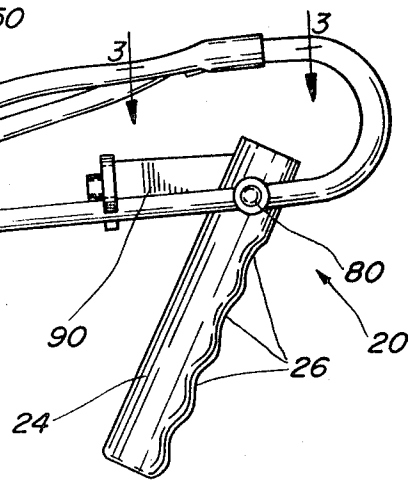


Fig - 3

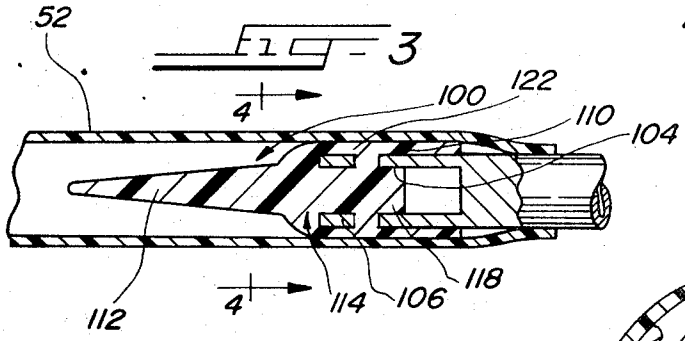


Fig - 5

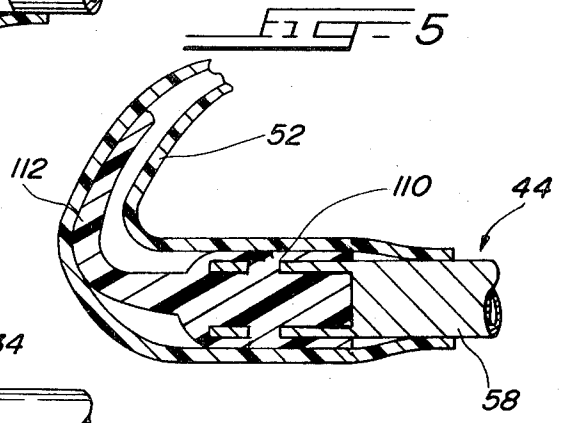


Fig - 6

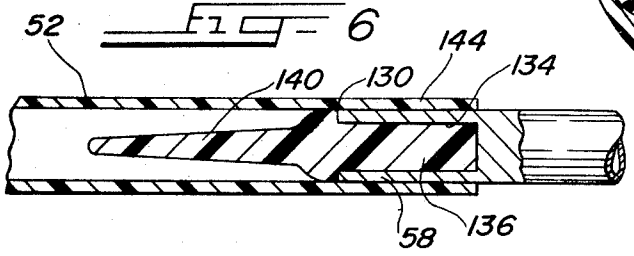


Fig - 4

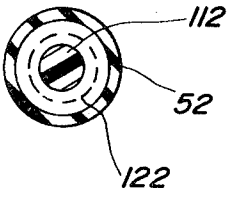
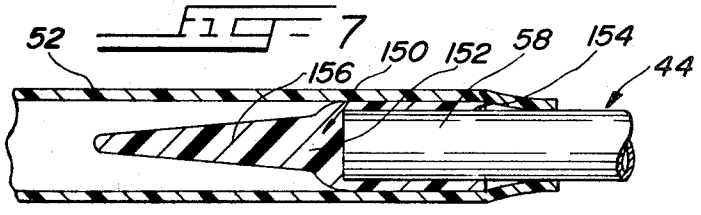


Fig - 7



SLINGSHOT WITH CONNECTION FOR PROJECTILE PROPELLING ELASTIC MEMBER

This invention relates to an improvement in slingshot structures. More particularly, the invention is directed to an improved slingshot of the type in which elastic tubes are secured to the ends of reversely hooked fork arms. Specifically, it is a principal feature of the invention that it obviates the destructive and abrasive wear suffered by the elastic tubes upon release and subsequent fold-over during recoil of the tubes after distention and release of the elastic tubes in use of the slingshot.

It is a principal object of the invention to provide a simple yet highly effective structural means by which the damaging, sharp fold-over of the elastic elements of the type commonly used in the slingshot apparatus is obviated, thereby to extend the useful life of the elastic elements.

A related object of the invention is to provide simple and readily attachable mechanical means by which the elastic tubes of the type used as propelling elements in a slingshot are supported internally at their juncture or connection to the fork ends or "hooks" of the slingshot.

While the protective elements of the invention are generally adaptable to many types of slingshots, they find particular utility in slingshots which include reversely bent hooks or fork components. Such a slingshot is described in Charles A. Saunders U. S. Pat. No. 3,511,221, and the entire disclosure of that patent is hereby specifically incorporated by reference to the extent that it is not inconsistent herewith.

Other and further objects, advantages, and features of the invention will become apparent from a reading of the following specification in conjunction with the drawings in which:

FIG. 1 is a perspective view of a slingshot of the type in which the elastic tube-protecting elements of the invention find utility;

FIG. 2 is a side elevational view of the slingshot of FIG. 1, and showing the elastic tubes secured to the reversely bent end portions of the slingshot hooks or fork;

FIG. 3 is an enlarged cross-sectional view taken substantially on the line 3—3 of FIG. 2 and showing one preferred mode of securement of the tube protectors to the ends of the reversely bent hooks of the slingshot;

FIG. 4 is a cross-sectional view taken substantially on the line 4—4 of FIG. 3;

FIG. 5 is a schematic representation indicating the manner in which the tube support elements of the invention secured to the ends of the hook or fork of the slingshot preclude sharp bend-over of the tube and obviate any abrasive contact of that tube with the metal ends of the hook;

FIG. 6 is a cross-sectional view of a second preferred embodiment of the invention illustrating an alternative manner of securement of the protective elements within the elastic tube; and

FIG. 7 is a cross-sectional view indicating a third preferred embodiment of the invention and showing still another mode of attachment of the protective element to the end of a slingshot hook.

In accordance with the concept of the subject invention, the aims and objects are achieved by providing, as an attached extension of the reversely bent hook portion of the slingshot, a flexible probe or spine which is substantially coaxial with the rearwardly directed hook

end and is disposed to lie internally within the elastic tube adjacent the point of attachment of the tube to the slingshot hook. In this disposition, the internal resilient and flexible support device of the invention precludes sharp fold-over of the elastic tube and prevents direct physical contact of the tube with the ends of the hook thereby protecting the tube from extreme flexure and from abrasive wear.

While the improvement in slingshots which constitutes the subject matter of the instant invention is generally applicable and adaptable to many and varied types of slingshot structures, for the purpose of illustrative disclosure, and not in any sense by way limitation, the improvement will be described with specific reference to a particular exemplary slingshot assembly. Referring more particularly to the drawing, such as slingshot 20 is shown in FIGS. 1 and 2 as including a generally upright handle 24 preferably contoured 26 to ensure secure and comfortable hand gripping. Secured to and laterally placed on opposite sides of the handle 24 is a pair of substantially symmetrically disposed, high-strength rods 30 and 32 of one-piece construction and including rearwardly extending legs 36 and 38 and integral forwardly projecting, reversely curved hooks 42 and 44. High-strength resilient bands 50 and 52, which in the particular embodiment of the invention shown take the form of elastomeric tubing, and a pellet pouch 54 complete the structure. The tubular bands 50 and 52 include open-ended sleeve portions adapted to overlie and securely grip rearwardly directed ends 56 and 58 of respective hooks 42 and 44, all as clearly illustrated in FIGS. 1 and 2.

In the particular embodiment of the invention illustrated, the rearwardly extending legs 36 and 38 are offset and contoured to establish a terminal portion adapted to support an arm-engaging, web-like strap or band 70 fastened to and bridging the rods 30 and 32 as seen most clearly in FIG. 1. The handle 24 is pivotally secured with respect to the rods 36 and 38, each rod being rotatable as well as independently shiftable forwardly and rearwardly in suitably sized passages formed in a transverse shaft 80 extending diametrically through the handle 24. A yoke assembly 90 supported on the shaft 80 and on the rods 30 and 32 stabilizes the entire structure.

A principal feature of the present invention is the improved mode of securing the resilient bands or tubes 50 and 52 to the ends 56 and 58 of the reversely curved hooks 42 and 44 of the slingshot assembly. The improvement constitutes novel means by which the adverse wearing and deteriorative effect of recoil of the flexible tubes or bands is obviated or minimized. In the instant disclosure several preferred structural embodiments of the invention are shown, these being illustrated in FIGS. 3, 6, and 7. The embodiments have in common probes or spines of a flexible material of plastic or the like secured to the ends of the slingshot hooks and extending rearwardly thereof, so that in the assembled device the probes lie within and essentially coaxially with the surrounding or ensleeving end of the elastic tubing. The various specific illustrative embodiment differ from one another principally in the manner in which the elastic probe is secured to the rod ends. It will be appreciated by those skilled in the pertinent art that the subject invention teaches an important improvement in slingshots. The flexible probe of the invention serves as a support means and restraint for the

flexible tubing, irrespective of any particular mode of attachment of that probe to the slingshot rods.

Referring now to the embodiment illustrated in FIG. 3, there is shown a probe or spine assembly **100** secured to an end **58** of a slingshot hook **44.** The metal end **58** which is fabricated of a high strength, preferably light-weight metal, is formed to include a socket or bore **104** extending exially inwardly from the end extremity of the rod to establish a cylindrical wall **106** as an integral end structure of the rod **58.** In the embodiment of the invention shown in FIG. **3,** the cylindrical wall is formed with a diametric bore or passage **110** communicating with the axial socket **104.** The probe assembly **100** includes a spine **112** and a base **114** the latter preferably being molded onto and into the tubular end **106** of the rod **58** so that an axially extending plug portion **118** projects into the end bore **104** of the rod and bonds to the interior wall surfaces of the tube **106.** At the same time, an integrally formed external sleeve **122** of the probe assembly **100** encircles the tubular body **106** and bonds firmly and contiguously therewith. In the molding operation the plastic material fills the transverse bore **110** as well as the socket **104** so that the base **114** of the probe assembly is mechanically interlocked with the tubular rod end **106.** This mechanical lock is in addition to frictional or to adhesive bonding of the plastic to the metal.

With the probe or spine assembly **100** secured in place on the end **58** of the slingshot hook **44,** it is necessary merely to slip the open end of the elastic tube **52** over the probe spine **112** and the probe base **114** and sleeve **122** to assume the position shown in FIG. **3.**

The manner in which the elongated, rearwardly extending probe or spine **112** fulfills its function is indicated schemati-cally in FIG. **5.** As the elastic tubing **52** is drawn and extended, and subsequently released, it recoils to fold over on the end **58** of the hook **44.** During this "fold-over" the rearwardly extending spine **112** acts as an internal support and resilient mechanical restraint to preclude such a sharpness of bend as would be physically detrimental to the elastic tubing. The spine or probe **112** also acts effectively to ovbiate any direct contact between the elastic tubing and the metal end of the hook. Thus, the probe assembly **100** serves both to protect the elastic band from physical abrasion and to preclude extreme flexure with its correlated rubber fatigue.

A second preferred embodiment indicating an alternative means of securing a probe assembly **130** to the end **58** of a slingshot hook **44** is shown in FIG. **6.** As indicated, the hook end **58** is provided with an axially inwardly projecting bore or cavity **134** in which the body portion or base **136** of the probe assembly **130** is received, the spine or probe **140** itself projecting rearwardly and coaxially from the end **58** of the hook. The probe assembly **130** may be secured to the hook end by frictional bonding, by means of any suitable adhesive, or the assembly may be molded in place to effect attachment. Again, the probe or spine **140** acts as an internal support for the elastic tubing **52** which is positioned in place, sleeve-like, over the end **58** of the slingshot hook **44.** In the FIG. **6** embodiment of the invention, there is direct and uninterrupted contact between the sleeve portion **144** of the elastic tube **52** and the end **58** of the hook **44.**

In the embodiment of the invention illustrated in FIG. **7,** the probe assembly **150** includes a body portion **152** formed with an axially inwardly extending cavity **154** adapted to receive the end **58** of the slingshot hook **44,** the probe or spine itself **156** becoming an axial "extension" of the hook end **58.** Any preferred means or technique including frictional means may be relied upon for securement of the plastic probe assembly **150** to the hook end **58.** The flexible tubing **52** is sleeved into place in the manner previously described with respect to the structure of FIG. **3.** Preferably, the elastic tubing is extended to a distance so that the end of the tubing lies in direct contact with the metal rod **44** itself.

In the several exemplary embodiments of the invention described and illustrated the probes or spines are of a configuration which tapers to define decreasing transverse cross-sectional areas as the spine is viewed from its point of hook attachment to the rearwardly extremity or tip of the probe. In accordance with the practice of the invention, it has been found that the structure of a tapered, decreasing cross-sectional area contributes to ensuring a more smooth and uniform curvature of the spine in response to recoil forces applied thereagainst. While the spine or probe may be round in cross-section (FIG. **4**), the cross-sectional shape or contour is not critical and any suitable cross-section may be adopted.

In accordance with the concept of the invention, any preferred resilient and/or elastomeric plastic or rubber-like material may be used as a compositional material for the spine or probe assembly. Such materials include but are not limited to the polyvinylchlorides, polyolefines, "synthetic rubber" compositions, polyurethanes, and latex. In preferred techniques, the flexible probe assembly is molded directly to the end of the reversely curved hooks. It is appreciated that other securement methods including adhesives may be used.

Various modifications of the invention will be apparent to those skilled in the art and such modifications may be made without departing from the spirit and scope thereof. It is, therefore, intended that the invention be limited only by the scope of the appended claims.

What is claimed is:

1. In a slingshot comprising: a handle, rod means for securing an elastic means to said handle and terminating in reversely looped rigid hook elements with free ends for attachment of elastic tubular band means thereto over said ends thereof, elastic band means for projecting a projectile, resilient spine means for protecting said elastic band means from the free ends of the hook elements and for providing an internal support and resilient mechanical restraint to preclude sharp fold-over of said band means and to prevent direct physical contact of said band means with ends of said hook elements thereby to protect said band means from both extreme flexure and abrasive wear, said spine means being attached to the free ends of said hook elements for flexing over a substantial portion of said spine means, and said spine means consisting of flexible and resilient elongated probes, each of said probes being fastened to and projecting rearwardly from a free end each of one of said elements and forming coaxial extensions thereof and disposed within said tubular band means upon attachment thereof to said elements at ends thereof.

2. The improvement as set forth in claim **10** wherein said spine means includes annular wall means integrally formed with said probes and defining an open-ended

socket adapted to receive an end of said hook elements therewithin for securement of said spine means to said hook elements to constitute said probes a coaxial extension of each said hook elements.

3. The improvement as set forth in claim 1 wherein said elongated flexible probe is integrally joined to a tubular body defining an open-ended socket coaxial with said probe and adapted to receive an end of a hook element therewithin.

4. The improvement as set forth in claim 1 wherein each of said probes taper along the length thereof to define a rod exhibiting progressively decreasing cross-sectional areas in a direction from a point of hook attachment to a rearwardly extending tip of said probe.

5. The improvement as set forth in claim 1 wherein said spine assembly is molded onto the end of each said hook elements in bonded relationship therewith to constitute coaxial flexible extension thereof.

6. The structure as set forth in claim 1 wherein each said hook elements is formed with an axial bore extended into an end thereof and adapted to receive and secure a plug base of said spine means therewithin.

7. The structure as set forth in claim 6 and further comprising open-ended sleeve means coaxial and connected to said probe and extending forwardly thereof for encircling and contiguously embracing and gripping a rearwardly directed end of said hook elements inserted therewithin.

8. The structure as set forth in claim 6 wherein each said hook elements is formed with a transverse opening therein extending through a wall thereof and communicating with said axial bore and wherein the base of said spine means fills said opening to key therewithin and to lock mechanically with said wall of said hook elements.

9. The structure as set forth in claim 8 wherein said spine means is molded onto the end of each one of said hook elements.

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