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United States Patent	12385712
Kind Code	B2
Date of Patent	August 12, 2025
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Slingshot

Abstract

An improved slingshot comprises a grip comprising a handle, a first arm coupled to the handle and a second arm coupled to the handle, a resiliently stretchable sling comprises a first resiliently stretchable band comprising a first end and an opposite second end, a second resiliently stretchable band comprising a third end and an opposite fourth end, a first mounting formation integrally formed with the first band second end, a second mounting formation integrally formed with the second band fourth end, and a first pouch integrally formed with the first band first end and the second band third end. The first resiliently stretchable band, the second resiliently stretchable band, the pouch and the first and the second mounting formations are all formed from the same material, where the first mounting formation is configured to be releasably attached to the first arm, and the second mounting formation is configured to be releasably attached to the second arm.

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Family ID: **1000008749087**

Appl. No.: **18/222134**

Filed: **July 14, 2023**

Prior Publication Data

Document Identifier	Publication Date
US 20240263909 A1	Aug. 08, 2024

Related U.S. Application Data

continuation-in-part parent-doc US 18114581 20230227 PENDING child-doc US 18222134
continuation-in-part parent-doc US 18107160 20230208 PENDING child-doc US 18222134

Publication Classification

Int. Cl.: **F41B3/02** (20060101); **F41B3/00** (20060101)

U.S. Cl.:

CPC **F41B3/005** (20130101); **F41B3/02** (20130101);

Field of Classification Search

CPC: F41B (3/005); F41B (3/02); A63B (65/12)

USPC: 124/17

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Background/Summary

BACKGROUND

(1) The present invention relates generally to sling shot rifles for shooting arrows and metal balls or pellets. More particularly, the present invention relates to a sling shot rifle having a trigger mechanism, a rail, an improved elastic pouch, and projectiles for use in the sling shot rifle.

(2) Sling shot rifles have been in existence for some time. For example, U.S. Pat. No. 9,395,139 discloses a sling shot rifle that comprises a stock and butt having a trigger mechanism. Two rubberized bands 31 are coupled on one end to a respective spaced arm 18 and on the other end to a pocket 30. A loop 42 is coupled on one end to the pocket 30 and on an opposite end to a washer 100. The washer is used to couple the patch to a fire mechanism block 38.

(3) The designs disclosed above for shooting arrows or round projectiles present many problems

for the user. For example, in the case of both the sling shot rifle for shooting arrows or round metal projectiles, one of the many issues centers around the rubberized bands impart uneven reactive forces on the arrow or the sack when in the cocked position thereby causing the projectile or arrow to not fly where the shooter expects. Said another way, if one band exerts more force on one side of the pocket or the arrow, then the flight path of the arrow or the projectile can be off center making it more difficult for the user to hit their target. The present invention seeks to address many of the concerns that arise with modern sling shot guns shown in the prior art.

SUMMARY OF THE INVENTION

(4) In various embodiments, an improved slingshot comprises (1) a first resiliently stretchable band comprising a first end and an opposite second end, (2) a second resiliently stretchable band comprising a third end and an opposite fourth end. (3) a first mounting formation coupled to the first band second end, (4) a second mounting formation coupled to the second band fourth end, and (5) a pouch coupled intermediate the first band first end and the second band third end. In various embodiments, the first resiliently stretchable band, the second resiliently stretchable band, the pouch and the first and the second mounting formations are all integrally formed with one another. In some embodiments, the resiliently stretchable first and second bands, the pouch and the first and second mounting formations are all formed from a material selected from a group consisting of (1) rubber, (2) an elastomer, (3) a compounded rubber, (4) a compounded latex. (5) neoprene, and (6) dipped latex tubing.

(5) In various embodiments, the first and second mounting formations are substantially flat. In other embodiments, the first and second mounting formations are substantially cylindrical in shape.

(6) In still other embodiments, the improved slingshot further comprises a grip comprising (1) a handle, (2) a first arm coupled to the handle, and a second arm coupled to the handle. In some of these embodiments, the first arm is configured to releasably receiving the first mounting formation and the second arm is configured to releasably receive the second mounting formation. In some embodiments, the first arm further comprises a first slot and the second arm further comprises a second slot. In some of these embodiments, the first slot is sized and shaped to releasably receive the first mounting formation, and the second slot is sized and shaped to releasably receive the second mounting formation.

(7) In various embodiments, the pouch defines a cavity therein that is shaped to receive a projectile. In some embodiments, the shape of the pouch cavity is selected from a group consisting of (1) circular, (2) semicircular, (3) substantially cylindrical, (4) square, and (5) rectangular.

(8) In yet another embodiments, an improved slingshot comprises (1) a grip comprising (a) a handle, (b) a first arm coupled to the handle, and (c) a second arm coupled to the handle, and (2) a resiliently stretchable first sling comprises (a) a first resiliently stretchable band comprising a first end and an opposite second end. (b) a second resiliently stretchable band comprising a third end and an opposite fourth end, (c) a first mounting formation integrally formed with the first band second end. (d) a second mounting formation integrally formed with the second band fourth end, (e) a first pouch integrally formed with the first band first end and the second band third end. In various embodiments, the first resiliently stretchable band, the second resiliently stretchable band, the pouch and the first and the second mounting formations are all formed from the same material. In some embodiments, the first mounting formation is configured to be releasably attached to the first arm, and the second mounting formation is configured to be releasably attached to the second arm. In various embodiments, the material is rubber. In other embodiments, the material is latex. In some embodiments, the pouch defines a cavity therein that is substantially semicircular.

(9) In various embodiments, the improved slingshot further comprises a second sling comprising (1) a third resiliently stretchable band comprising a fifth end and an opposite six end, (2) a fourth resiliently stretchable band comprising a seventh end and an opposite eighth end, (3) a third mounting formation integrally formed with the third band sixth end, (4) a fourth mounting formation integrally formed with the fourth band eighth end, and (5) a second pouch integrally

formed with the third band fifth end and the fourth band seventh end. In some embodiments, the third resiliently stretchable band, the fourth resiliently stretchable band, the second pouch and the third and the fourth mounting formations are all formed from the same material, the third mounting formation is configured to be releasably attached to the first arm, and the fourth mounting formation is configured to be releasably attached to the second arm. In various embodiments, the first pouch defines a first cavity having a first shape, the second pouch defines a second cavity having a second shape, and the first shape and the second shape differ.

(10) In various embodiments, the first mounting formation is substantially flat, and the second mounting formation is substantially flat. In some of these embodiments, the first mounting formation is releasably attached to the first arm using a first clip, and the second mounting formation is releasably attached to the second arm using a second clip. In other embodiments, the first arm comprises a first slot formed therein that is configured to releasably receive one of the first mounting formation and the third mounting formation therein, and the second arm comprises a second slot formed therein that is configured to releasably receive one of the second mounting formation and the fourth mounting formation therein.

(11) In yet another embodiment of an improved slingshot, the slingshot comprises (1) a first resiliently stretchable band comprises a first end and an opposite second end. (2) a second resiliently stretchable band comprising a third end and an opposite fourth end, and (3) a pouch coupled intermediate the first band first end and the second band third end. In some of these embodiments, the pouch defines a cavity therein that is shaped and sized to releasably receive a projectile therein, and the first resiliently stretchable band, the second resiliently stretchable band and the pouch are all integrally formed with one another from the same resiliently stretchable material. Some of these embodiments further comprises a grip comprising (1) a handle, (2) a first arm operatively coupled to the handle, and a second arm operatively coupled to the handle. In some embodiments, the first resiliently stretchable band second end is configured to be coupled to the first arm, and the second resiliently stretchable band fourth end is configured to be coupled to the second arm. In some embodiments, the first resiliently stretchable band second end is configured to be releasably coupled to the first arm, and the second resiliently stretchable band fourth end is configured to be releasably coupled to the second arm.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) Various embodiments of an apparatus, system, and method for utilizing a slingshot rifle having an elongated rail, a stock, and an elasticized pouch are described below. In the course of this description, reference will be made to the accompanying drawings, which are not necessarily drawn to scale, and wherein:

(2) FIG. **1** is a perspective view of an embodiment of a sling shot rifle having a rail and a resiliently stretchable pouch;

(3) FIG. **2** is a side sectional view of the sling shot rifle of FIG. **1**;

(4) FIG. **3** is a perspective view of the resiliently stretchable pouch of the sling shot rifle of FIG. **1**;

(5) FIG. **4** is an exploded view of the resiliently stretchable pouch of FIG. **3**;

(6) FIG. **4**A is a zoomed in perspective view of the insert from the resiliently stretchable pouch of FIG. **4**;

(7) FIGS. **5**A and **5**B are sectional views of the insert shown in FIG. **4**A, where the sectional view of FIG. **5**B is taken through the insert 90 degrees rotated from the insert position shown in FIG. **5**A;

(8) FIGS. **6** and **7** are sectional views of the resiliently stretchable pouch shown in FIG. **3**, where the sectional view of FIG. **7** is taken through the resiliently stretchable pouch 90 degrees rotated

from the resiliently stretchable pouch shown in FIG. **6**;
(9) FIG. **8** is a sectional view of another embodiment of the resiliently stretchable pouch for use in the sling shot rifle of FIG. **1**;
(10) FIGS. **9**A and **9**B are another embodiment of an insert for use in the resiliently stretchable pouch of FIGS. **6**, **7** & **8**, where FIG. **9**A is an exploded view and FIG. **9**B is a sectional view;
(11) FIG. **10**A is a perspective view of the sling shot rifle of FIG. **1** with the resiliently stretchable pouch moved from an initial position shown in FIG. **1** to a second position shown in FIG. **10**A;
(12) FIG. **10**B is a perspective view of the sling shot rifle of FIG. **10**A with the rear end of the resiliently stretchable pouch attached to a trigger mechanism and an arrow loaded into the resilient stretchable pouch;
(13) FIG. **10**C is a perspective view of the sling shot rifle of FIG. **10**B with the open second end of the resiliently stretchable pouch moved to a third position with the generally cylindrical body locked in place so that the pouch is in a fully stretched position;
(14) FIG. **10**D is a perspective view of the sling shot rifle of FIG. **10**C just after the trigger is pulled and the rear end of the resilient stretchable pouch returns to the initial position thereby ejecting the arrow from the pouch;
(15) FIG. **11** is perspective view of another embodiment of a handheld slingshot using the resiliently stretchable pouch of FIG. **3**
(16) FIG. **12** is sectional view of the slingshot of FIG. **11** with an arrow nocked in the insert;
(17) FIG. **13**A is a perspective view of another embodiment of a resiliently stretchable pouch using a different embodiment of a cylindrical ring;
(18) FIG. **13**B is a perspective view of the cylindrical ring used with the resiliently stretchable pouch of FIG. **13**A;
(19) FIG. **14**A is a perspective view of another embodiment of a slingshot;
(20) FIG. **14**B is a cross sectional view of the slingshot of FIG. **14**A;
(21) FIG. **14**C are perspective views of resiliently stretchable bands for use in the slingshot of FIG. **14**A or the slingshot rife of FIG. **1**;
(22) FIGS. **15** and **15**A is a perspective view of another embodiment of an improved slingshot FIG. **16** is a perspective view of another embodiment of an improved slingshot;
(23) FIG. **17** is an exploded view of the improved slingshot of FIG. **16**;
(24) FIG. **18** is a perspective view of the resiliently stretchable band for use in the slingshot of FIG. **16**;
(25) FIG. **19** is another perspective view of the resiliently stretchable band shown in FIG. **16**;
(26) FIG. **20** is a perspective view of another embodiment of an improved slingshot;
(27) FIG. **21** is a perspective view of the resiliently stretchable band for use in the slingshot of FIG. **20**;
(28) FIG. **22** is a perspective view of another embodiment of an improved slingshot; and
(29) FIG. **23** is a perspective cutaway view of the resiliently stretchable band shown in FIG. **22**.

DETAILED DESCRIPTION

(30) Various embodiments now will be described more fully hereinafter with reference to the accompanying drawings. It should be understood that the invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Like numbers refer to like elements throughout.
(31) Description of Sling Shot Rifle
(32) Referring to FIG. **1**, a sling shot rifle **10** having a stock **12**, an elongated rail **14** having a first end **14**A coupled to the stock, a slide grip **16**, and a resiliently stretchable launch mechanism **20**. The slide grip **16** comprises a grip handle **18**A coupled to a generally cylindrical body **18**B that is received on the elongated rail **14**. Resiliently stretchable launch mechanism **20** comprises a generally cylindrical body **22** that is received on the elongated rail **14**, a resiliently stretchable pouch **24** having a first end **24**A and an opposite second end **24**B.

(33) Resiliently stretchable pouch first end **24**A contains within the pouch a generally cylindrical reinforced body **26** having a head (FIG. **2**: **26**A) with a larger diameter then the cylindrical body **26** (FIG. **2**). A ring **30** made from any suitable material such as stainless steel, carbon fiber, a polymer, etc. is slid on the outside of resiliently stretchable pouch **24** along generally cylindrical reinforced body **26** until it seats against the head **26**A (shown in FIG. **2**). A loop **28** made from stainless steel wire, a polymer, carbon fiber material, etc. or any other suitable material is then coupled to ring **30** on opposite sides of ring **30**. Loop **28** may be coupled by weldments, tying the loop material to ring **30** or by any other suitable means of coupling the ends of the loop material to ring **30**.
(34) Second end **24**B of resiliently stretchable pouch **24** is coupled to generally cylindrical body **22**. In various embodiments, generally cylindrical body **22** has a circular mounting body **32** either integrally formed with, or coupled to, generally cylindrical body **22**. Second end **24**B of resiliently stretchable pouch **24** can be secured to the circular mounting body in various suitable ways. In some embodiments, circular mounting body **32** may be formed from a first fixed body and a second insert body that allows the user to fold second end **24**B of the resiliently stretchable pouch **24** over the first ring before it is removably inserted into the first fixed body. In other embodiments, second end **24**B of the resiliently stretchable pouch **24** may be glued to circular mounting body **32**. In still other embodiments, second end **24**B of resiliently stretchable pouch **24** may be formed with an integral circular flange that may be coupled to circular mounting body **32** in various ways to secure second end **24**B of the resiliently stretchable pouch to circular mounting body **32**. A front cover **34** is formed from a flexible material such as rubber, polymer, elastomer, bristles, or any other suitable material that function as an arrow rest. Front cover **34** is attached to circular mounting body **32** by any suitable attachment means such a glue, threads, etc. Front cover **34** may be formed from any suitable material as mentioned above even a hard plastic, metal, etc. However, in preferred embodiments, the material is made from a flexible material so as not to interfere with the projectile being shot from the pouch.
(35) For example, when an arrow is being shot from the pouch, you do not want the cover material on front cover **34** to interfere with the fletching of the arrow. Furthermore, if a pellet is being shot from the pouch and it is not traveling straight through the round opening in the cover, you also do not want front cover **34** to interfere with the trajectory of the pellet. In various embodiments, when shooting a pellet, the user may want to remove the cover so that it does not interfere with the flight of a pellet.
(36) An arrow carrying system **36** may be mounted to first end **14**A of elongated rail **14** and second end **14**B of elongated rail **14** by suitable coupling means such as glue, weldments, attachments, etc. The arrow carrying system may be configured to carry one or more arrows **38**. In various embodiments, the arrow carrying system **36** may be mounted on one or both sides of the elongated rail **14**.
(37) Stock **12** contains a trigger mechanism **40** and a hook **42** that is operatively coupled to trigger mechanism **40**. A safety device **46** is operatively coupled to trigger mechanism **40** to prevent the trigger from being inadvertently pulled when the user is not ready to shoot the sling shot gun. A blow back plate **48** is mounted to the back of stock **12** to prevent accidental blow back of any debris into the user's eyes. In various embodiments, blow back plate **48** may be made from any suitable material. In preferred embodiments, blow back plate **48** is made of a clear polymer to allow the user to see where they are aiming the sling shot gun. In various embodiments, the blow back plate contains a vertical slot **48**A that allows the user to have a clear line of vision to a sighting mechanism **44**. In some embodiments, sighting mechanism **44** can be a standard sighting mechanism, a laser sight, a lighted dot sight or any other suitable sighting mechanism.
(38) Stock
(39) Referring to FIG. **2**, stock **12** may be formed from any suitable material such as s polymer, a metal, a metal alloy, etc. and comprises a handle **12**A. Handle **12**A in various embodiments may comprise a hollow cavity **12**B that is configured to removably receive a magazine (e.g., storage

compartment) configured to hold one or more pellets (e.g., round balls, slugs, etc.) or any other material the user wishes to carry. Stock **12** is also configured to receive trigger **40**. Trigger **40** comprises an elongated lever having a first end **40**A configured to receive input from the user, a second end **40**B that is configured to engage with the hook **42**. Hook **42** may be formed in various configurations, and in preferred embodiments, hook **42** is formed from a generally circular body **42**A that is operatively held in stock **12** by a pin **42***b*. Generally circular body **42**A is operatively engaged with second end **40**B of trigger **40**. A spring **42**C is operatively positioned between stock **12** and generally circular body **42**A and biases the hook **42** into the vertical position as shown in FIG. **2**.

(40) Stock **12** also houses a safety button **46** (FIGS. **1**& **2**) that is operatively engaged with a safety pin **46**A. A spring **46**B is operatively positioned between an end of pin **46**A and stock **12** and is configured to bias pin **46**A toward elongated rail first end **14**A. In operation, if safety button **46** (FIGS. **1** and **2**) is not pushed, pin **46**A blocks trigger lever first end **40**A from being puller rearward. When safety button **46** is depressed, trigger first end **46**A can be pulled rearward against bias of spring **46**B thereby disengaging trigger second end **40**B from hook cylindrical body **42**A.

(41) Grip

(42) Still referring to FIG. **2**, grip **18** comprises a grip body **18**A, a generally cylindrical body **18**B and a trigger **18**C. Generally cylindrical body **18**B is slidably mounted on elongated rail **14** intermediate elongated rail first end **14**A and second end **14**B. Trigger **18**C is rotatably coupled to grip body **18**A by a pin **18**F. A spring **18**E is positioned between grip body **18**A and trigger **18**C. An insert **18**D is received in a cavity (not labeled) in trigger **18**C such that when the trigger **18**C is not squeezed, spring **18**E biases trigger **18**C forward away from grip body **18** so that insert **18**D does not engage with elongated rail **14**. Insert **18**D may be made from any suitable material such as a polymer, elastomer, rubber, or any other suitable material that causes a frictional grip when trigger **18**C is squeezed toward grip body **18**A thereby causing insert **18**D to engage with elongated rail **14**.

(43) Generally Cylindrical Body

(44) Generally cylindrical body **22** comprises a first portion **22**A that extends from a generally cylindrical second portion **22**B and a third portion **22**C that extends from the second portion **22**B. In various embodiments, first, second and third portions **22**A, **22**B and **22**C may be formed from two separate parts that are coupled together. In other embodiments, first, second and third portions **22**A, **22**B and **22**C may be integrally formed from any suitable material (e.g., polymers, metals, etc.). Generally cylindrical body **22** further comprises a pin **22**D that is received in a cavity (not numbered) formed in first portion **22**A. Pin **22**D is surrounded by a spring **22**F that is positioned around pin **22**D and radially inwardly biased toward elongated rail **14**. Generally cylindrical body **22** is configured to be slidably received on elongated rail **14** and can slide between elongated rail first end **14**A and second end **14**B. In various embodiments, pin **22**D is configured to be received in at least one opening **14**C formed in elongated rail **14** so that generally cylindrical body **22** can be secured at the at least one particular location on elongated rail **14**. Generally cylindrical body third portion **22**C is configured to be mounted to resiliently stretchable launch mechanism **20** as explained in more detail below. In various embodiments, it should be understood that generally cylindrical body **22** may be formed without pin **22**D.

(45) Resiliently Stretchable Launch Mechanism

(46) Referring to FIG. **3**, resiliently stretchable launch mechanism **20** comprises the resiliently stretchable pouch **24**. Resiliently stretchable pouch **24** may be formed from any stretchable material such as a stretchable polymer, elastomer, rubber, latex, etc. or any other suitably stretchable compound. In various embodiments, resiliently stretchable pouch **24** comprises a closed first end **24**A and an open second end **24**B. Closed first end **24**A may be reinforced (e.g., formed from thicker walls, reinforced with a laminate material, etc.) to strengthen the material. Second open end **24**B may be formed with a uniform thickness similar to the center portion of the pouch or it may be formed with a thicker wall or lip portion **24**C (FIG. **3**). Resiliently stretchable pouch second end

24B is operatively coupled to generally cylindrical body third portion **22**C by circular mounting body **32**.
(47) In some embodiments, resiliently stretchable pouch second end **24**B may be glued to circular mounting body **32** (FIG. **2**), pinch fit between circular mounting body **32** and a ring **32**A (FIG. **2**) that is press fit into, threaded on circular mounting body **32**, or secured in any other suitable fashion that securely couples resiliently stretchable pouch second end **24**B to circular mounting body **32**. In various embodiments, generally cylindrical body third portion **22**C and circular mounting body **32** are formed as separate parts. In other embodiments, generally cylindrical body third portion **22**C and circular mounting body **32** are integrally formed. In various embodiments, resiliently stretchable pouch **24** is elongated in length and in some embodiments, it may be tapered in diameter between resiliently stretchable pouch first end **24**A and resiliently stretchable pouch second end **24**B. In some embodiments, the diameter at first end **24**A is smaller than the diameter of second end **24**B.
(48) In operation, the closer generally cylindrical body **22** is fixed to elongated rail second end **14**B, the more force will be exerted on a projectile shot from resiliently stretchable pouch second end **24**B when resiliently stretchable pouch first end **24**A is released from the catch **42**. Thus, when shooting close targets or small varmint, generally cylindrical body **22** may be fixed at a position more distal from the resiliently stretchable pouch second end **24**B.
(49) Improved Resiliently Stretchable Launch Mechanism
(50) Referring to FIG. **3**, resiliently stretchable launch mechanism **20** is formed from a stretchable pouch **24** having an inner surface and an outer surface. Stretchable pouch **24** has a closed first end **24**A, an open second **24**B and a lip **24**C. Lip **24**C may be formed from curved material or it may be formed as a circular bead. In either case, lip **24**C is configured to be received by a mounting ring **32** (FIG. **2**).
(51) Referring to FIGS. **3**, **4** and **4**A, an insert **26** configured to be received in stretchable pouch closed first end **24**A. In particular, insert **26** is placed into open second end **24**B of the pouch and moved into closed first end **24**A. Once seated, ring **30** is slide over the outside of open second end **24**B of the pouch and seated over insert **26**. Loop **28** is positioned so that it extends rearward of closed pouch first end **24**A. Ends **28**A and **28**B of loop **28** are attached to opposite sides of ring **30** by any suitable means such as weldments, glue, fasteners, or by wrapping and twisting the ends to the wire around itself or tying two ends of a cord around ring **30**.
(52) Referring now to FIGS. **5**A, **5**B, **6** and **7** insert **26** comprises an insert first body **50** and an insert second body **52**. Insert first body **52** has a first end **54**, a second end **56**, a first length **58**, and a first diameter D1. In various embodiments, an axial cavity **56**A extends inward from first body second end **56** and contains a curved base **56**B. Curved base **56**B is configured to seat a round pellet **78** (FIG. **8**). Insert second body **52** also comprises a first end **60**, a second end **62**, a second length **64**, and a second diameter D2. In various embodiments, insert first body **50** may be generally cylindrical in shape, and insert second body **52** may also be cylindrical in shape.
(53) In some embodiments, insert first body first length **58** is longer than insert second body second length **64**. In other embodiments, the insert first body length **58** many shorter than the insert second body second length, and in still other embodiments, the two lengths may be substantially the same (i.e., equal lengths). In some embodiments, insert first body **50** and insert second body **52** are separately formed and coupled together using a suitable coupling such as weldments, glue, fasteners, etc. In other embodiments, insert first body **50** and insert second body **52** are made from a suitable material such as polymer, rubber, elastomer, etc. and are integrally formed together. In various embodiments, insert first body first diameter D1 is smaller than insert second body second diameter D2. Accordingly, in these embodiments, insert second body **52** functions as a flange that ring **30** seats against.
(54) In various embodiments, one or more cavities **66** (FIG. **4**A) may be formed through insert first body **50** and insert second body **52**. One or more magnets **70** are configured to be placed in a

respective one of the one or more cavities **66** so that the ends of the one or more magnets **70** are configured to retain round pellet **78** (FIG. **8**) in the curved base **56**B. Said another way, the ends of one or more magnets **70** are positioned proximate to curved base **56**B (as shown in FIG. **5**B) thereby magnetically retaining a pellet in curved base **56**B. In some embodiments, a pin or tab **68** may be formed in insert **26** such that the tab is accessible from the rear of axial cavity **56**A proximate to curved base **56**B. Tab **68** is configured to receive the nock arrow. It should be understood that other structure for retaining the pellet in the insert are within the scope of the present invention. For example, the insert radial cavity **56**A may contain additional material such as a rubber or elastomer material that is configured to releasably retain the pellet in the cavity.

(55) In various embodiments, insert second body **52** may also contain two recesses **72** formed in an outer surface of insert second body **52** on opposite sides of insert second body **52** (FIG. **5**B). Recesses **72** are configured to provide space for loop **28** first end **28**A and second end **28**B to attach to ring **30** as shown in FIG. **3**. In this way, the recesses help prevent loop **28** from digging into pouch **24**. Another reason to have recesses **72** is to rotationally retain ring **30** in its proper position and to prevent it from rotating around the insert.

(56) In various embodiments, insert first body first diameter D1 may vary along the length of insert first body **50** between insert body first end **54** and insert body second end **56** so that first diameter D1 at insert body first end **54** is larger than first diameter D1 at insert first body second end **56**. In these embodiments, when ring **30** is slipped over the outer surface of resilient stretchable pouch **24** and over insert first body **50**, ring **30** will wedge against an insert first body outer surface as it approaches and abuts against insert second body second end **62**.

(57) Referring to FIG. **8**, resiliently stretchable launch mechanism **20** is shown coupled to circular mounting body **32** and ring **32**A from FIG. **2**. Ring **32**A has a thread **32**B formed on an outer surface. In some embodiments, ring **32**A is threaded into mounting body **32** as shown in FIG. **8**. In this configuration, stretchable pouch lip **24**C is press fit between mounting body **32** and ring **32**A. A cover **34** like the one described in FIGS. **1** and **2**, is coupled to an end of ring **32**A. In other embodiments, ring **32**A may be press fitted into mounting body **32** instead of threadedly coupled thereto.

(58) Referring to FIGS. **9**A and **9**B, a second embodiment of an insert **26**′ like the insert of FIGS. **4**A-**8** has a first body **50** and a second body **52**. For purposes of discussion, the description associated with FIGS. **4**A, **5**A and **5**B apply to insert **26**′. As such and for brevity, only the differences associated with insert **26**′ will be discussed herein. Insert **26**′ has a blind cavity **74** formed in insert second body first end that is configured to seat a magnet **76** therein. A cavity **56**A′ is formed in insert first body second end **52** and is configured to receive round pellet **78**. Magnet **76** is configured to releasably retain round pellet **78** in cavity **56**A. In this second embodiment, insert **26**′ is only configured to receive and shoot a pellet (e.g., round ball, slug, etc.) and can also shoot an arrow that has a small steel nock since the magnet will retain the steel nock in the cavity.

(59) Operation of the Sling Shot Rifle

(60) Referring to FIGS. **10**A-**10**D, in operation of the sling shot rifle, FIG. **10**A shows slide grip **16** and generally cylindrical body **22** moved rearward in a first position proximate elongated rail first end **14**A. Generally cylindrical body **22** is moved by the user by pulling pin head **22**E downward thereby disengaging pin **22**D (FIG. **2**) from elongated rail **14** proximate the elongated rail second end **14**B. Referring to FIG. **10**B, once the generally cylindrical body **22** is in the first position, the user than grasps stretchable pouch closed first end **24**A and insert **26** and pulls the loop **28** toward catch **42** until the loop is releasably engaged with catch **42**. Once this step is complete and the sling shot rifle is in the second position, the user may then load an arrow **38** into the pouch open end **24** through cover **34** until the back end of the arrow is nocked on tab **68** (FIG. **6**) in insert **26**. Cover **34** functions as an arrow rest thereby aligning the arrow flight with sight **44**.

(61) To cock the sling shot rifle, and referring to FIG. **10**C, the user holds grip **12** with one hand while grasping slide grip **16** being careful not to squeeze grip body **18**A and grip trigger **18**C

together so as not to fix slide grip **16** to elongated rail **14**. The user than pushes slide grip **16** forward out of the second position thereby pushing generally cylindrical body **22** forward until the pin **22**D (FIG. **2**) engages with at least one opening **14**C in elongated rail **14** in to a cocked third position. Once pin **22**D engages with the at least one opening **14**C, stretchable pouch **24** will be in a fully loaded third position. Said another way, stretchable pouch **24** will be fully extended and ready to fire arrow **38** or another projectile loaded in insert **26** such as a round pellet ball, slug, etc. Comparing FIGS. **10**B and **10**C, as pouch open second end **24**B is moved forward toward elongated rail second end **14**B, the arrow body is pulled into stretched stretchable pouch **24**.

(62) Referring to FIGS. **10**C and **10**D, once the sling shot rifle is cocked and in the third position as shown in FIG. **10**C, the user can move slidable grip **16** to any comfortable position since generally cylindrical body **22** is locked in place. Once the user moves slidable grip **16** into a comfortable position, the user can squeeze grip body **18**A and grip trigger **18**C thereby causing the slidable grip to become frictionally fixed to elongated rail **14**. The user may then aim the sling shot rifle using sight **44**. When the user is ready to fire the arrow, the user depresses safety button **46** allowing trigger **40** to be pulled rearward toward grip **12**. Once safety button **46** is depressed, the user can pull trigger **40** causing catch **42** to be released. As catch **42** is released, it can rotate allowing loop **28** to be released. Stretchable pouch closed first end **24**A snaps forward as stretchable pouch **24** unstretches and returns to its unstretched state as shown in FIG. **10**D causing the arrow **38** to be catapulted forward. When the arrow or other projectile is fired, the sling shot rifle returns to its initial position shown in FIG. **1**.

(63) In various embodiments, the locking pin system of generally cylindrical body **22** may be removed and instead of the pin locking generally cylindrical body **22** in the third position, the user instead retains the generally cylindrical body **22** in the third position using slidable grip **16** by squeezing the grip trigger **18**C with the grip body thereby causing the slidable grip **16** to be frictionally locked to the elongated rail **14**. In this configuration, the user must maintain the slingshot rifle in the third cocked position with the slidable grip or generally cylindrical body **22** will naturally return to the second position as a safety feature.

Alternate Embodiments

(64) Referring to FIGS. **11** and **12**, an alternate embodiment of a handheld slingshot is shown using the resiliently stretchable pouch shown in FIGS. **3**-**7**. In various embodiments, the circular ring **32**′ is mounted to a handle **32**B′. In all other aspects, the resiliently stretchable pouch **20**, insert **26** and ring **30** function the same as described in FIGS. **3**-**7**. In the embodiment shown in FIGS. **11** and **12**, the user holds handle **32**B′ with one hand and pulls back on loop **28** with the other hand thereby stretching the resiliently stretchable pouch. When the user wants to shoot a projectile (e.g., arrow **38** or a pellet), the user releases the loop **28**. The user can aim the projectile using a mechanical sight **44**′.

(65) In yet another alternative embodiment mentioned above and shown in FIGS. **13**A-**13**B, a generally flat cylindrical ring **30**′ (FIG. **13**B) is shown for use with the resiliently stretchable pouch **20**. As described earlier, an inner diameter D3′ varies in length as across the surface so that the diameter at end **30**C′ is smaller than the diameter D3′ at end **30**D′. In this configuration, as ring **30**′ is slid over resiliently stretchable pouch **20** and seated on insert first body **50**, the ring wedges onto the insert first body first end **54** adjacent insert second body second end **62** (FIG. **5**A). This occurs because diameter D1 of insert first body also varies from insert first body first end **54** to insert first body second end **56** (FIG. **5**A) where D1 at insert first body first end **54** is larger than D1 at insert first body second end **56**. Ring recesses **30**A′ and **30**B′ allow the ends of loop **28** to be seated in the recesses when loop **28** is coupled to ring **30**′. The configuration of ring **30**′ allows the ring to better seat around resilient stretchable pouch **20** on insert **26** minimizing any rocking by ring **30**′.

(66) Finally, referring to FIGS. **14**A-**14**C, another embodiment of a slingshot is shown where the resiliently stretchable pouch **20** of the previous FIGS. **11** and **12** are replaced with one or more of resiliently stretchable bands **80** and **81** or a combination of bands **80** and/or **81**. In the embodiment

disclosed, an insert **26**′ is seated on band **80** at a band insert section **80**A. The first and second ends **80**B and **80**C are fed through ring **30** and ring **30** is moved down around insert first body **50** until it abuts with insert second body **52**. The first and second ends of band **80** are then attached to respective sling shot arms **84** by any suitable means such as a press fitted connection, etc. Sling shot arms are coupled to a handle **84**. In various embodiments, the slingshot arms **84** may be integrally formed with handle **84**. The operation of the slingshot embodiment shown in FIGS. **14**-**14**C is similar to the embodiment of the slingshot shown in FIGS. **11**-**12**.

(67) Referring to FIGS. **15** and **15**A, another embodiment of the improved slingshot is shown where the resiliently material is at least one elongated resiliently stretchable tubing **92** is used with another embodiment of an insert **26**″. The insert **26**″ contains two recesses **86** and **88** that allow the at least one elongated resiliently stretchable tubing **92** to seat in insert **26**″. Ring **30** is received around the outside of the at least one elongated resiliently stretchable tubing **92** so that the ring seats on the insert first body adjacent the insert second body as shown in FIG. **15**. Otherwise, the improved slingshot of FIGS. **15** and **15**A is similar to that of FIGS. **14**A—**14**C.

(68) Referring to FIG. **16**, another embodiment of an improved slingshot **100** is shown having a handle grip **102** coupled to two arms **104**. The sling is formed from a resiliently stretchable band having a first portion **106** and a second portion **108** that are each releasably coupled to a respective arm **104** of the grip **102**. A pouch **110** is coupled to each respective resiliently stretchable band first portion **106** and a second portion **108**. In various embodiments, pouch **110** is generally cupped in shape to allow a projectile to sit in the base of the pouch **110**. In some preferred embodiments, the resiliently stretchable band first and second portions **106** and **108** are integrally formed with the pouch **110** and are all made from the same material. In some embodiments, a knurling **118** (FIG. **17**) is formed on an outer surface of pouch **110** to allow a user to firmly grasp the pouch **110**.

(69) Referring to FIG. **18**, resiliently stretchable band first and second portions **106** and **108** terminate in a respective end **116** that comprises a mounting formation **114**. Mounting formation **114** may be formed in various shapes such as a cylindrical body as shown in the figure, a flat mounting formation **114**′ (FIG. **21**), a substantially cylindrical mounting formation **114**″, or any other suitable shape. It should be understood that the mounting formation **114**, **114**′ or **114**″ may be in any suitably shape to allow resiliently stretchable band first and second portions **106** and **108** to be mounted to arms **104**.

(70) Still referring to FIG. **18**, each mounting formation **114** also comprises ends **114**A that may be formed on one or both ends of mounting formation **114**. Ends **114**A assist in retaining the resiliently stretchable band first and second portions **106** and **108** in arms **104**. In various embodiments, mounting formations **114** are integrally formed with resiliently stretchable band first and second portions **106** and **108** and can be made from the same material as resiliently stretchable band first and second portions **106** and **108**.

(71) Referring to FIG. **19**, pouch **110** forms a cavity **120** therein that is shaped and sized to releasably retain a projectile therein. In various embodiments, pouch cavity can be sized and shaped to releasably retain a pellet, a slug, a round ball, etc. In various embodiments, pouch **120** may be sixed and shaped to releasably retain one or more different shaped projectiles. For example, in various embodiments, pouch cavity **120** may hold both pellets and arrows. In these embodiments, pouch **110** can have a first cavity portion that releasably retains a pellet and a second portion that releasably retains the knock end of an arrow.

(72) In various embodiments, the resiliently stretchable band first and second portions **106** and **108** are formed from a rubber material. In other embodiments, resiliently stretchable band first and second portions **106** and **108** are formed from an elastomer material. In still other embodiments, resiliently stretchable band first and second portions **106** and **108** and pouch **110** may be formed from a blend of resiliently stretchable material (e.g., thermoplastic elastomers, rubber blends, etc.). In these and other embodiments described herein, the sling comprising the resiliently stretchable band first and second portions **106** and **108**, mounting formations **114**, ends **116** and pouch **110** are

integrally formed together in a single unitary piece from the same material thereby forming a one-piece band and pouch sling. In various embodiments, the sling may be formed by rubber injection moldings, latex injection molding, using a dipped latex process, or by any other suitable manufacturing process for forming a one-piece integrally formed sling. However, it is contemplated that other forms of manufacture are possible where the resiliently stretchable band first and second portions **106** and **108** and pouch **110** are formed from a integral one-piece unit where the mounting formations **114** are attached to resiliently stretchable band first and second portions **106** and **108** at band ends **116**.

(73) Referring to FIGS. **20** and **21**, an alternate embodiment of a slingshot. **100′** is shown having similar structure to the slingshot **100** shown in FIGS. **16-19**. The main difference in the structure of the slingshot **100′** is in the mounting of resiliently stretchable band first and second portions **106** and **108** to arms **104′**. In the embodiment shown, ends **116′** comprise a flat mounting formation **114′** that are each respectively secured to an arm **104′** via a mounting clip **122′**. Mounting clip **122′** is formed from any suitable material such as metal, alloy, elastomer, or rubber material. In embodiments where mounting clip **122′** is formed from an inflexible material such as metal or alloy, mounting clip **122′** is sized and shaped to be releasably secured to arm **104** in a manner that secures a respective flat mounting formation **114′** to a corresponding arm **104**. Like the embodiments shown in FIGS. **16-19**, the resiliently stretchable band first and second portions **106** and **108**, ends **116′**, flat portions **114′** and pouch **110′** are all integrally formed from one piece of resiliently stretchable material. In this way, the entire resiliently stretchable material can be switched out quickly.

(74) Referring to FIGS. **22** and **23**, another embodiment of a slingshot **100″** is shown comprising resiliently stretchable band first and second portions **106″** and **108″** that are coupled to a hand grip **102″** via arms **104″**. A pouch **110″** is positioned intermediate resiliently stretchable band first and second portions **106″** and **108″** and forms a cavity **120″** for releasably receiving a projectile (not shown). In various embodiments, resiliently stretchable band first and second portions **106″** and **108″** and pouch **110″** are integrally formed from a suitable resiliently stretchable material such as rubber, elastomer, etc. Resiliently stretchable band first and second portions **106″** and **108″** are coupled to arms **104″** via respective slots **112″** formed in each arm **104″**. Mounting portions **114″** are sized and shaped to prevent the resiliently stretchable band ends **116″** from slipping out of slots **112″**. In the embodiments disclosed in FIGS. **22-23**, pouch cavity **120″** is semicircular in shape to releasably receive a round projectile. It should be understood that the shape of the cavity can differ depending on the shape of the projectile to be launched by slingshot **100″**. In various embodiments, the user can change the resiliently stretchable band first and second portions **106″** and **108″** and pouch **110″** to a different resiliently stretchable band and pouch depending on the type of projectile that the user wishes to launch using slingshot **100″**. This can be easily accomplished by sliding the resiliently stretchable band first and second band ends **116″** out from slots **112″** and inserting a different band and pouch.

CONCLUSION

(75) Many modifications and other embodiments of the invention will come to mind to one skilled in the art to which this invention pertains having the benefit of the teachings presented in the foregoing descriptions and the associated drawings. For example, as will be understood by one skilled in the relevant field in light of this disclosure, the invention may take form in a variety of different mechanical and operational configurations. For example, resiliently stretchable band first and second portions **106″** and **108″** and pouch **110″** may be used in the slingshot embodiment **100** in FIGS. **16-19** or FIGS. **20-21**. Additionally, one or more parts of the resiliently stretchable band first and second portions **106** and **108**, and pouch **110** may be integrally formed from the same material or they may be formed from different material and operatively coupled to one another. Finally, features of the pouches or bands from the embodiments shown in FIGS. **1-15** may be incorporated into the slingshot embodiments shown in FIGS. **16-23**.

(76) Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed herein, and that the modifications and other embodiments are intended to be included within the scope of the appended exemplary concepts. Although specific terms are employed herein, they are used in a generic and descriptive sense only and not for the purposes of limitation.

Claims

1. An improved slingshot comprising: a. a grip comprising: i. a handle; ii. a first arm coupled to the handle; and iii. a second arm coupled to the handle; b. a first resiliently stretchable first sling comprising: i. a first resiliently stretchable band comprising a first end and an opposite second end; ii. a second resiliently stretchable band comprising a third end and an opposite fourth end; iii. a first mounting formation integrally formed with the first resiliently stretchable band second end; iv. a second mounting formation integrally formed with the second resiliently stretchable band fourth end; and v. a first pouch integrally formed with the first resiliently stretchable band first end and the second resiliently stretchable band third end; wherein, the first resiliently stretchable band, the second resiliently stretchable band, the pouch and the first and the second mounting formations are all formed from the same material; the first mounting formation is configured to be releasably attached to the first arm; and the second mounting formation is configured to be releasably attached to the second arm; a second sling comprising: a. a third resiliently stretchable band comprising a fifth end and an opposite six end; b. a fourth resiliently stretchable band comprising a seventh end and an opposite eighth end; c. a third mounting formation integrally formed with the third resiliently stretchable band sixth end; d. a fourth mounting formation integrally formed with the fourth resiliently stretchable band eighth end; and e. a second pouch integrally formed with the third resiliently stretchable band fifth end and the fourth resiliently stretchable band seventh end; wherein, the third resiliently stretchable band, the fourth resiliently stretchable band, the second pouch and the third and the fourth mounting formations are all formed from the same material; the third mounting formation is configured to be releasably attached to the first arm; and the fourth mounting formation is configured to be releasably attached to the second arm; a. the first pouch defining a first cavity having a first shape; b. the second pouch defining a second cavity having a second shape; and c. the first shape and the second shape differ.
2. The improved slingshot of claim 1, wherein the material is rubber.
3. The improved slingshot of claim 1, wherein the material is latex.
4. The improved slingshot of claim 1, wherein either the first or second pouch defines a cavity therein that is substantially semicircular.
5. The improved slingshot of claim 1, wherein a. the first mounting formation is substantially flat; and b. the second mounting formation is substantially flat.
6. The improved slingshot of claim 5, wherein a. the first mounting formation is releasably attached to the first arm using a first clip; and b. the second mounting formation is releasably attached to the second arm using a second clip.
7. The improved slingshot of claim 1, wherein a. the first arm comprises a first slot formed therein that is configured to releasably receive one of the first mounting formation and the third mounting formation therein; and b. the second arm comprises a second slot formed therein that is configured to releasably receive one of the second mounting formation and the fourth mounting formation therein.