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NOTICE

LANYARD RETAINER FOR A SPEARGUN PROJECTILE

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DTIC QUALITY INSPECTED 3

1 Navy Case No. 77764
2

3 STATEMENT OF GOVERNMENT INTEREST

4 The invention described herein may be manufactured and used
5 by or for the Government of the United States of America for
6 governmental purposes without the payment of any royalties
7 thereon or therefore.
8

9 CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

10 This patent application is co-pending with related patent
11 applications entitled Hydraulic Impulse Speargun (Navy Case No.
12 72249) and Speargun Projectile Assembly (Navy Case No. 77765) by
13 the same inventor as this application.
14

15 BACKGROUND OF THE INVENTION

16 (1) Field of the Invention

17 The present invention relates to underwater spearguns, and
18 deals more particularly with an apparatus for retaining the
19 lanyard connected between the gun and the projectile launched
20 from the gun without entangling the operator of the gun.

21 (2) Description of the Prior Art

22 Underwater guns of the type used to spear fish generally
23 provide for some form of elastic or pneumatic catapult system to
24 launch the projectiles. In the elastic catapult a long spear is
25 launched by means of a stretched elastic band. The elastic band

1 is stretched and attached to the spear. The spear is prevented
2 from moving by a trigger mechanism. When the trigger is
3 actuated, the elastic band contracts and catapults the spear from
4 the gun. In the pneumatic catapult type of speargun, an air
5 spring is provided for launching the projectile. The speargun is
6 loaded by forcing the spear or a special loading pole against an
7 air piston, compressing the air behind the piston. The spears
8 are typically attached to the guns by lanyards such that fish or
9 the spear itself can be retrieved when the gun is discharged in
10 water. The lanyards on present spearguns are most often coiled
11 along the gun barrel. When the gun is discharged, the coiled
12 lanyard unravels rapidly and may easily entangle the gun
13 operator. If the operator wishes to fire another projectile, the
14 lanyard and projectile must be retrieved and the lanyard rewound
15 on the barrel, or the existing lanyard must be removed from the
16 speargun and a new lanyard is rewound on the barrel and attached
17 to a new projectile. In the latter case, the projectile
18 previously fired may be lost.

19
20 SUMMARY OF THE INVENTION

21 Accordingly, it is a general purpose and object of the
22 present invention to provide a lanyard system for a speargun
23 which does not expose the speargun operator to entanglement with
24 the lanyard. Another object is to provide a speargun with a
25 lanyard system which allows more rapid firing of numerous

1 projectiles. A still further object is to provide a lanyard
2 system which minimizes the possibility of losing the projectile
3 and any attached catch.

4 These objects are accomplished with the present invention by
5 providing a lanyard retainer with an attached projectile. One
6 end of the lanyard is attached to the projectile and the other
7 end is attached to and wound around the retainer. When the
8 trigger mechanism of the speargun is activated, the projectile
9 separates from the retainer and is launched. The retainer
10 remains with the gun and the lanyard is payed out as the
11 projectile travels through the water. The retainer is shaped to
12 prevent entanglement of the operator as the lanyard is payed out.
13 The retainer is made buoyant and removable from the speargun. A
14 number of retainers and attached projectiles may be carried by
15 the operator. If the operator wishes to quickly fire a second
16 projectile, he can merely remove the retainer from the previous
17 shot and allow it to float free and install a new retainer and
18 attached projectile. The buoyancy of the retainer allows for
19 easy recovery of the projectile and any attached catch. The
20 lanyard can be rewound onto the retainer and a previously
21 launched projectile reattached to the retainer should the
22 operator exhaust his supply of retainers or projectiles. The
23 retainer is ideally suited for use with a breech loaded speargun,
24 but may be adapted for use with any speargun.

1 BRIEF DESCRIPTION OF THE DRAWINGS

2 A more complete understanding of the invention and many of
3 the attendant advantages thereto will be readily appreciated as
4 the same becomes better understood by reference to the following
5 detailed description when considered in conjunction with the
6 accompanying drawings wherein corresponding reference characters
7 indicate corresponding parts throughout the several views of the
8 drawings and wherein:

9 FIG. 1 shows the preferred form for a speargun for which the
10 present invention is ideally suited; and

11 FIG. 2 shows a detail of the retainer with a projectile
12 attached.

13
14 DESCRIPTION OF THE PREFERRED EMBODIMENT

15 Referring now to FIG. 1, a speargun 10, for which the
16 preferred embodiment is ideally suited, is illustrated as
17 comprising a barrel 12, having a muzzle end 12a and an opposite
18 breech end 12b, the latter being closed by projectile assembly 14
19 shown in phantom. Barrel 12 is secured to stock 16. Elastomeric
20 bladder assembly 18 is secured to stock 16 at one end and is
21 supported on the other end by pump mechanism 20. Pump mechanism
22 20 is attached to barrel 12. Referring now additionally to FIG.
23 2, projectile assembly 14 is shown to consist of retainer 22 and
24 attached projectile 24. Lanyard 26 is secured to and coiled
25 around a spindle portion 22a of retainer 22. The other end of

1 lanyard 26 is secured to projectile 24 from which spear end 24a
2 protrudes. Projectile 24 and retainer 22 are joined by snap
3 joint 28 so as to avoid loss of projectile 24 during handling
4 prior to firing of speargun 10.

5 Upon entering the water, the user will breech load assembly
6 14 into breech end 12b of barrel 12. With speargun 10 loaded,
7 the diver or user can then conveniently charge the gun by
8 operating pump mechanism 20. In the speargun for use with the
9 preferred embodiment, pump mechanism 20 is hand operated by a
10 series of back and forth strokes. A stroke in one direction
11 allows water to enter pump mechanism 20 and a stroke in the other
12 forces water from pump mechanism 20 into bladder 18 under
13 pressure. A set of check valves in pump mechanism 20 prevents
14 flow in the opposite direction. Depressing trigger 30 causes
15 pressurized fluid to enter breech end 12b of barrel 12 at a point
16 near snap joint 28. Snap joint 28 is made such that the force of
17 the water from bladder 18 will overcome the limited frictional
18 forces required to retain projectile 24 in the position shown.
19 Projectile 24 separates from retainer 22 and is launched from
20 muzzle end 12a of barrel 12. Retainer 22 remains within barrel
21 12 and lanyard 26 is payed out behind projectile 24 from spindle
22 portion 22a of retainer 22 as projectile 24 travels through the
23 water. Shoulder 22b, adjacent to spindle portion 22a, prevents
24 lanyard 26 from unraveling onto rear portion 22c of retainer 22.
25 In the preferred embodiment for use with speargun 10 described,

1 rear portion 22c serves as a breech plug for barrel 12. Slot 22d
2 is formed in rear portion 22c and cooperates with release
3 mechanism 32 which holds retainer 22 within barrel 12. Once
4 speargun 10 is fired, release mechanism 32 can be withdrawn from
5 slot 22d such that retainer 22 can be removed through muzzle end
6 12a of barrel 12. Retainer 22 is preferably buoyant to permit
7 retainer 22 and projectile 24 to be readily retrieved when
8 retainer 22 is released from barrel 12. Releasing retainer 22
9 further allows the user to reload quickly. The diver preferably
10 has a number of projectile assemblies 14 so as to permit him to
11 load and fire the gun several times before retrieving his
12 equipment and any catch obtained from use of the speargun.

13 What has thus been described is a lanyard retainer which is
14 breech loaded into a speargun barrel with an attached projectile.
15 The retainer serves to seal the breech end of the barrel. A
16 notch within the retainer cooperates with a release mechanism to
17 hold the retainer within the barrel. A trigger mechanism
18 releases pressurized water from a bladder portion of the speargun
19 into the breech end of the barrel of the gun. The pressurized
20 fluid forces the projectile to separate from the retainer and the
21 projectile is launched out the muzzle end of the barrel by the
22 force of the water. A lanyard is attached between the retainer
23 and the projectile and is coiled about a forward or spindle end
24 of the retainer. As the projectile travels from the muzzle, the
25 lanyard is deployed through the muzzle end of the barrel. The

1 release mechanism can be withdrawn from the slot to release the
2 retainer from the barrel.

3 The retainer, speargun and projectile shown and described
4 herein is much safer and easier to load and to use than present
5 elastic or pneumatic spearguns. The retainer and projectile can
6 be loaded into the gun without charging the firing mechanism.
7 Charging the speargun for firing requires a simple back and forth
8 pumping action and is separate from loading the retainer and
9 projectile. Stowage of the lanyard within the barrel prevents
10 entanglement and is inherently safer than present designs. The
11 buoyant retainer facilitates rapid firing and reloading of the
12 present speargun without losing the projectile.

13 Obviously many modifications and variations of the present
14 invention may become apparent in light of the above teachings.
15 For example, the exact shapes and configurations of the
16 particular components shown can be changed to suit manufacturing
17 and assembly considerations. Additionally, the retainer can be
18 adapted for use with conventional elastic or pneumatic catapult
19 spearguns. Present projectiles would be modified to attach to
20 the retainer in a manner similar to that indicated and the
21 speargun would be similarly modified to accept the retainer and
22 projectile assembly. In an elastic catapult gun, the elastic
23 would be attached to the projectile as is currently the case.
24 The retainer would be held in place by a catch mechanism separate
25 from the trigger mechanism used to hold and release the

1 projectile. A similar double catch mechanism would be used in a
2 pneumatic catapult speargun.

3 In light of the above, it is therefore understood that
4 , the invention may be
5 practiced otherwise than as specifically described.

LANYARD RETAINER FOR A SPEARGUN PROJECTILE

ABSTRACT OF DISCLOSURE

A lanyard retainer for use in a breech loading hydraulic speargun. A projectile is attached to the retainer and the retainer and projectile are inserted into the breech end of the speargun barrel with the retainer sealing the breech end of the barrel. A trigger mechanism on the speargun releases water under pressure into the barrel at the location of the connection between the projectile and the retainer. The projectile separates from the retainer and is ejected out the muzzle end of the barrel while the retainer remains in the barrel. The retainer has a forward spindle portion about which a lanyard is wound. The rear portion of the retainer serves as the breech seal and the shoulder between the spindle and the rear portion prevents the lanyard from unwinding onto the rear portion and helps to prevent operator entanglement with the lanyard. The lanyard is attached between the retainer and the projectile such that the lanyard is payed out through the barrel as the projectile travels to its target. The retainer is removable from the barrel and is made buoyant for convenient retrieval of the projectile.

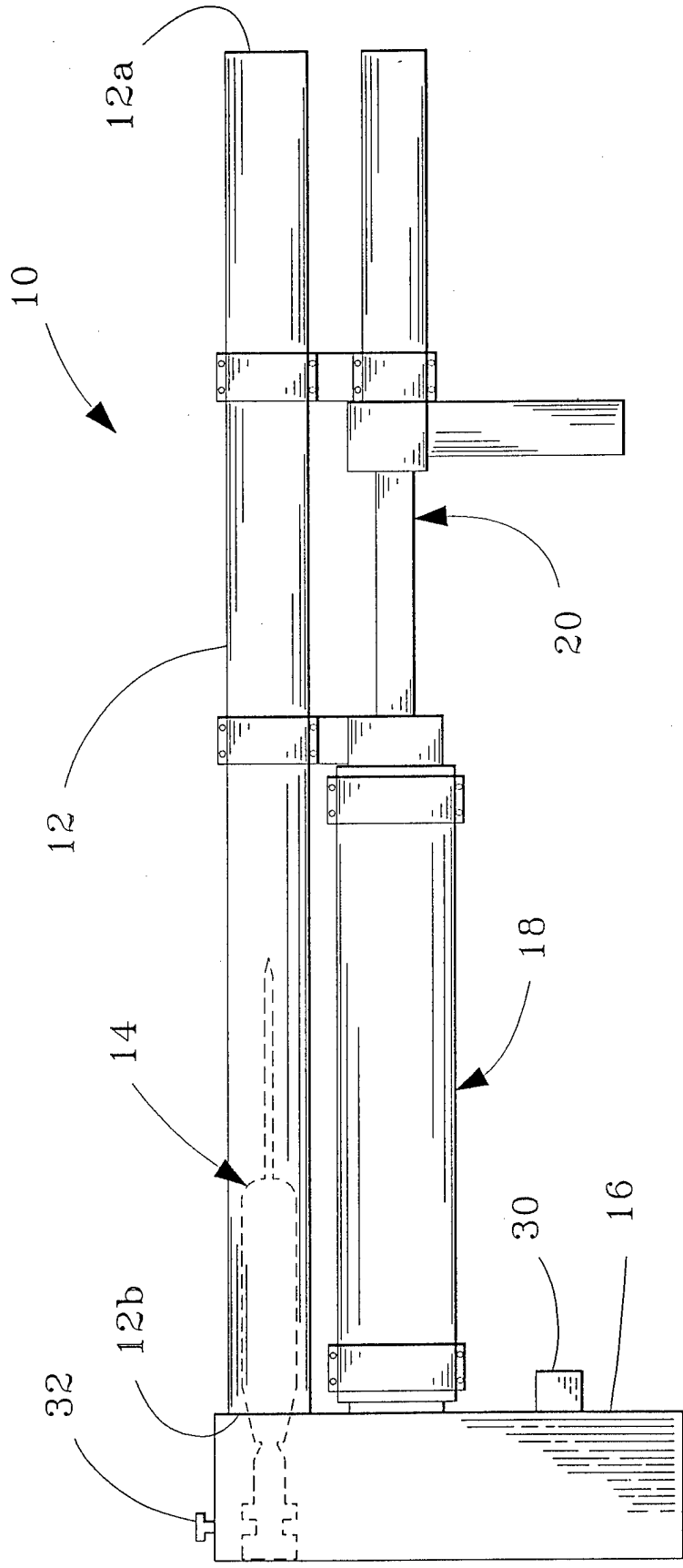


FIG. 1

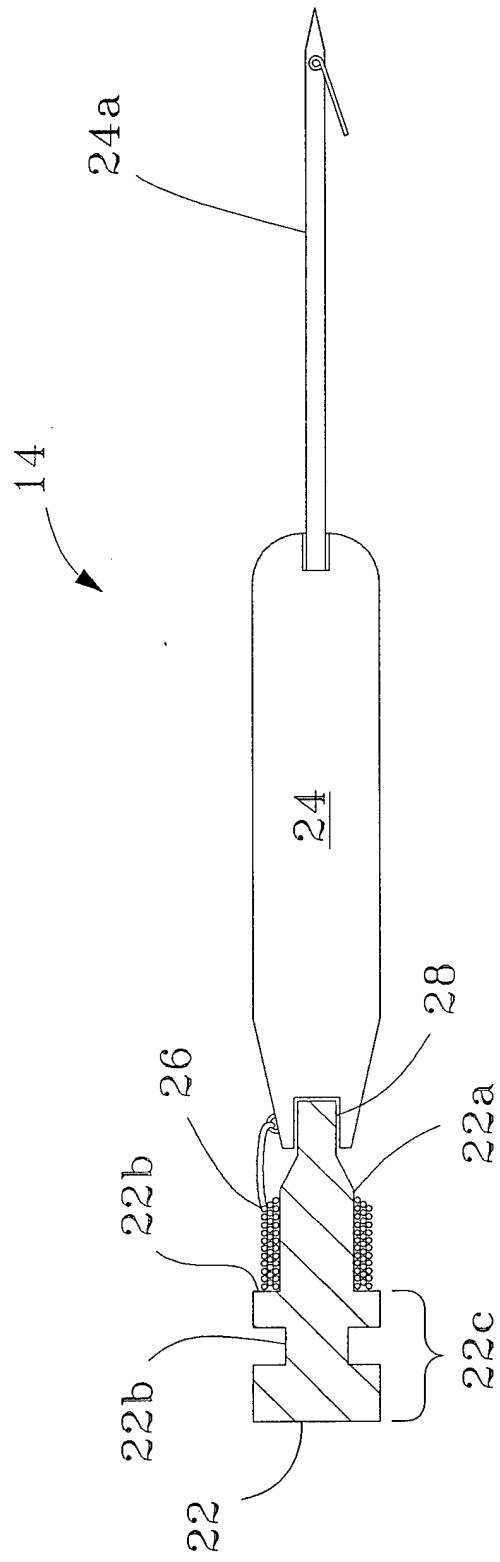


FIG. 2