

Fig. 1

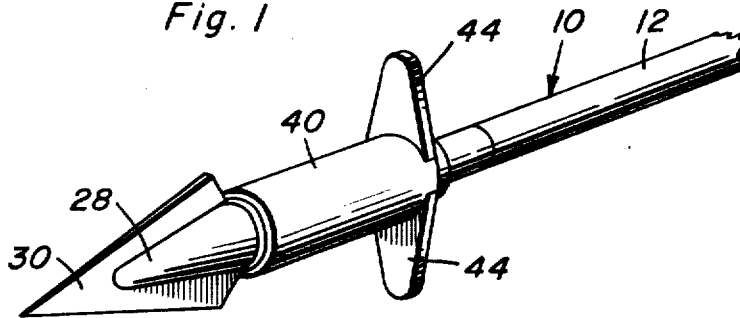


Fig. 2

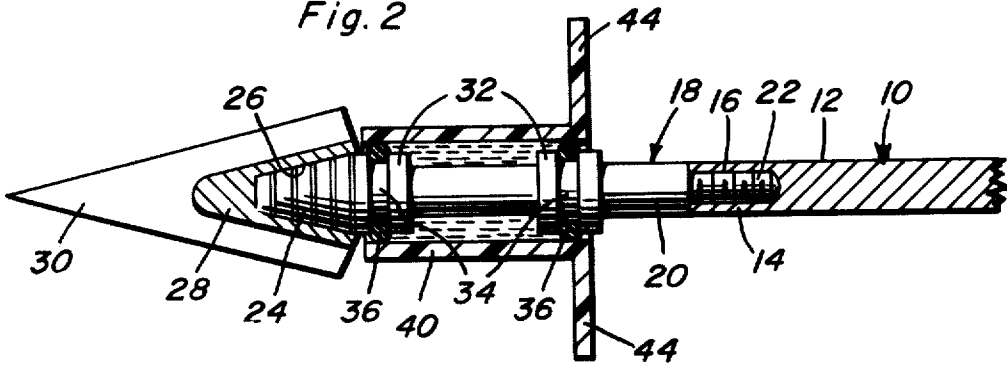
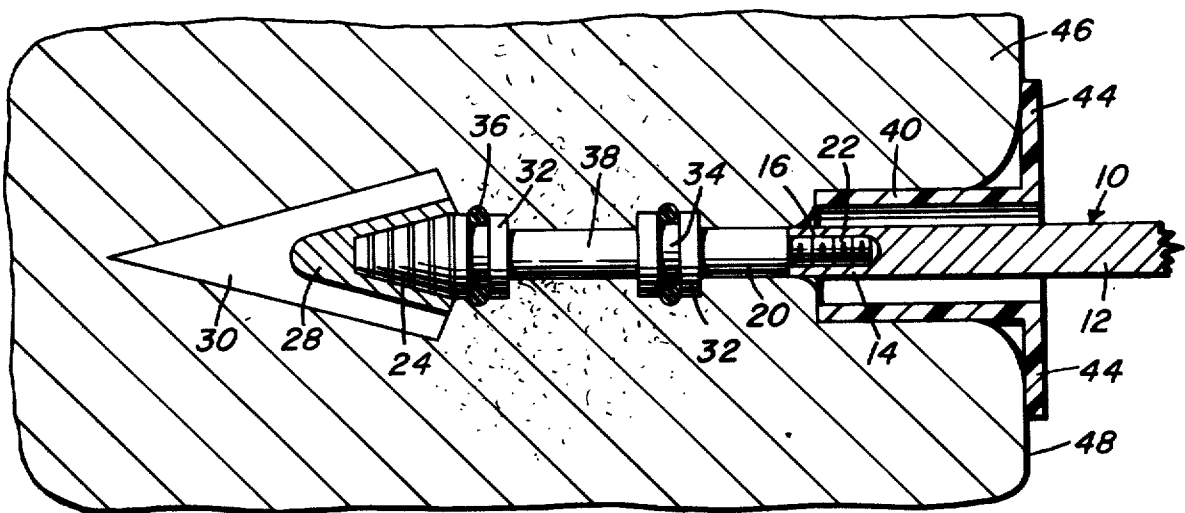


Fig. 3



ARROW HEAD WITH FLUENT MATERIAL RELEASE MEANS

BACKGROUND OF THE INVENTION

In at least one locale within the United States bow and arrow hunting with the use of a poison to be released upon impact of the arrow has been legalized. Heretofore there has been designed many different forms of hypodermic projectiles which utilize inertia during initial deceleration of the forward end of a projectile upon its contact with a target to express liquid from a compartment therefor within the projectile. These previous hypodermic projectiles have included projectiles constructed in the manner of a hypodermic syringe and also projectiles including frangible liquid reservoirs which are punctured upon impact of the forward end of the projectile with a target.

However, these previous forms of hypodermic projectiles are limited in the amount of liquid that can be expressed therefrom after hitting a target or the structure thereof by which liquid is expressed therefrom greatly reduces the penetrating power of the projectile.

BRIEF DESCRIPTION OF THE INVENTION

The projectile of the instant invention has been primarily designed for the purpose of injecting poison into an animal upon impact and penetration of a projectile with that animal. However, the projectile of the instant invention may also be utilized as a means for injecting liquid medicines, drugs, and the like, into animals.

The projectile includes an elongated shank having a penetration head on its forward end and a liquid receiving recess is defined in the shank immediately rearward of the head. A sleeve is slidably disposed on the shank and closes the liquid receiving recess and the rear end of the sleeve includes a laterally outwardly projecting abutment for abutting engagement with an animal after the head end of the projectile has penetrated the animal. Impact of the abutment carried by the sleeve with the animal prevents further movement of the sleeve but does not in anyway effectively retard forward movement of the shank of the projectile. Accordingly, the shank of the projectile continues forward after piercing the animal while the sleeve is maintained stationary relative to the animal and the recess defining portion of the shank of the projectile in which liquid is disposed moves forwardly out of the forward end of the sleeve so as to be released within the animal.

It is accordingly the main object of this invention to provide a projectile which will be capable of releasing substantial quantities of liquid within an animal penetrated by the forward end of the projectile and without penetration of the projectile in the animal being reduced by excessive forces required to release the liquid within the animal.

Another object of this invention is to provide a projectile in accordance with the preceding object and including a liquid receiving compartment which may be readily exposed and filled with a predetermined liquid with a minimum of effort.

An important object of this invention is to provide a projectile constructed in a manner whereby the target piercing head thereof and liquid injecting portions thereof may be readily removably secured to the forward end of a conventional arrow shank.

A final object of this invention to be specifically enumerated herein is to provide a projectile in accordance with the preceding objects and which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other object and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of the forward end of a projectile constructed in accordance with the present invention;

FIG. 2 is an enlarged fragmentary longitudinal vertical sectional taken substantially upon a plane extending through the longitudinal center line of the forward end portion of the projectile; and

FIG. 3 is a view similar to FIG. 2 but with the head end of the projectile imbedded in a target and the relatively movable portions of the projectile in position to release liquid within the target penetrated by the projectile.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more specifically to FIGS. 1 and 2 of the drawings, the numeral 10 generally designates a projectile constructed in accordance with the present invention. The projectile 10 includes a shaft member 12 having a forward end portion 14 provided with a forwardly opening central blind bore 16 which is internally threaded. The projectile head of the instant invention is referred to in general by the reference numeral 18 and includes an elongated cylindrical shank portion 20 provided with a diametrically reduced and threaded cylindrical extension 22 on its rear end removably threadedly engaged within the bore 16. The outside diameter of the shaft member 12 and the adjacent end of the shank portion 20 may be the same.

The forward end of the shank portion 20 includes an externally threaded frusto-conical terminal end 24 threaded tightly into a complementary recess 26 opening rearwardly through the major diameter end portion of a generally conical projectile head body 28. The projectile head body 28 includes a notched sharply acute triangular cutting member 30 secured thereto.

The shank portion 20 includes a pair of axially spaced diametrically enlarged cylindrical portions 32 disposed immediately rearward of the terminal end 24 and each of the diametrically enlarged portions 32 includes a circumferential groove 34 having an O-ring 36 seated therein. The portion of the shank portion 20 disposed between the diametrically enlarged portions 32 defines a portion 38 of reduced diameter and a sleeve member 40 has its opposite ends slidably telescoped over the diametrically enlarged portions 32 and the O-rings 36. The major diameter end portion of the body 28 is disposed immediately forward of the forward end of the sleeve member 40 and is of a diameter at least substantially equal to the outside diameter of the sleeve member 40. Also, the rear end of the sleeve 40 includes

a pair of diametrically opposite outwardly projecting abutment members 44.

In operation, the sleeve member 40 is slightly rearwardly displaced relative to the shank portion 20 so as to expose the annular chamber defined between the diametrically reduced portion 38 and the inner cylindrical walls of the sleeve member 40. Then, with the projectile 10 positioned in a head upward direction, the annular chamber defined about the diametrically reduced portion 38 and within the sleeve member 40 is filled with a desired liquid, such as poison. Thereafter, the sleeve member 40 is shifted forward to the position thereof illustrated in FIG. 2 of the drawings, while the projectile is still disposed in a head upward position.

When the sleeve member has been forwardly positioned in the manner illustrated in FIG. 2 of the drawings, the O-rings 36 form a fluid-tight seal with the internal surfaces of the sleeve member and thus the liquid disposed in the annular chamber defined outwardly of the diametrically reduced portion 38 and within the sleeve member 40 is sealed within that chamber.

The projectile 10 is then ready for flight toward a target by any conventional propulsion means, such as a bow. Upon impact of the cutting member 30 with the target 46 illustrated in FIG. 3, the cutting member and body 28 will penetrate the target 46 and form a hole therein sufficient in size to receive the forward end of the sleeve member 40 within the target 46. Then, upon further penetration of the projectile 10 with the target 46, the abutment members 44 contact the external surface 48 of the target 46 and prevent further movement of the sleeve member 40. Upon continued penetration of the projectile 10 subsequent to the abutment members 44 impacting with the outer surface 48 of the target 46, the diametrically reduced portion 38 of the shank portion 20 will move forwardly relative to the sleeve member 40 and the liquid within the annular chamber defined outwardly of the diametrically reduced portion will be released deep within the target 46.

Because the liquid within the aforementioned annular chamber is in motion upon impact of the projectile 10 with the target 46 and the liquid need not be expressed through a small passageway in order to be injected into the target upon impact of the projectile 10 with the target, deep penetration of the projectile within the target 46 is not resisted. The only energy loss which opposes deep penetration of the projectile 10 in the target is that energy which is absorbed in order to terminate forward movement of the sleeve member 40

as the abutment portions 44 contact the outer surface 48 of the target 46. Of course, the sleeve member may be constructed of lightweight material so that any loss at impact is maintained at a minimum and deep penetration of the projectile 10 with the target 46 is possible.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as new is as follows:

1. A projectile for injecting fluent materials, said projectile including an elongated shank having front and rear ends, the front end portion of said shank including a sharpened head, said shank, rearward of said head including a generally cylindrical portion provided with a zone of reduced diameter intermediate its opposite ends with the opposite ends of said cylindrical portion defining zones of greater diameter than said zone of reduced diameter, a sleeve member having its opposite ends slidably telescoped over at least adjacent portions of said zones of greater diameter and defining an annular chamber for receiving fluent material within said sleeve about said zone of reduced diameter, said sleeve, at least slightly spaced from the forward end thereof, including a laterally outwardly projecting abutment for engagement with a target penetrated by said sharpened head to terminate forward movement of said sleeve and allow said zone of reduced width to advance relative to said sleeve upon further penetration of said target by said head and shank, said zones of greater diameter including seal means extending thereabout slidably and sealingly engaged with the inner surfaces of said sleeve, said head including a rear end portion immediately forward of the forward end of said sleeve, said rear end portion of said head being circular in crosssection and of a diameter at least closely equal to the outside diameter of said sleeve.

2. The combination of claim 1 wherein said zones of greater diameter include circumferentially extending outwardly opening grooves, said seal means comprising O-ring seals seated in said grooves.

3. The combination of claim 1 wherein said abutment is carried by the rear end of said sleeve.

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