March 10, 1942. P. W. SAUNDERS 2,276,098

VENOM EXTRACTOR

Filed May 10, 1941

Fig. 1.

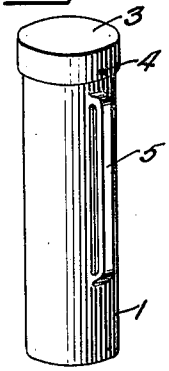


Fig. 2.

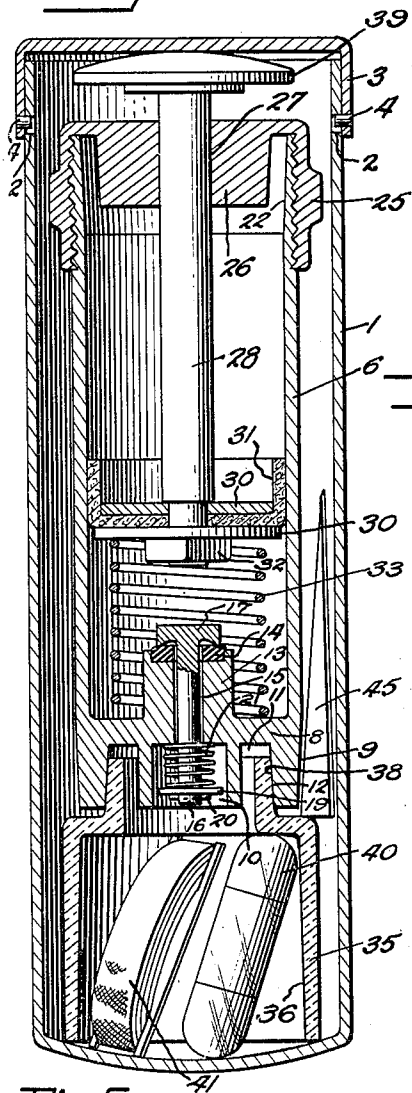


Fig. 3.

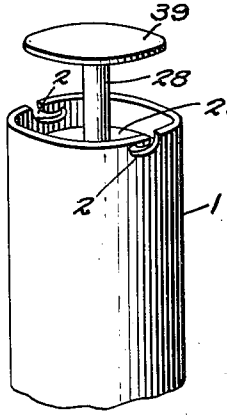


Fig. 4.

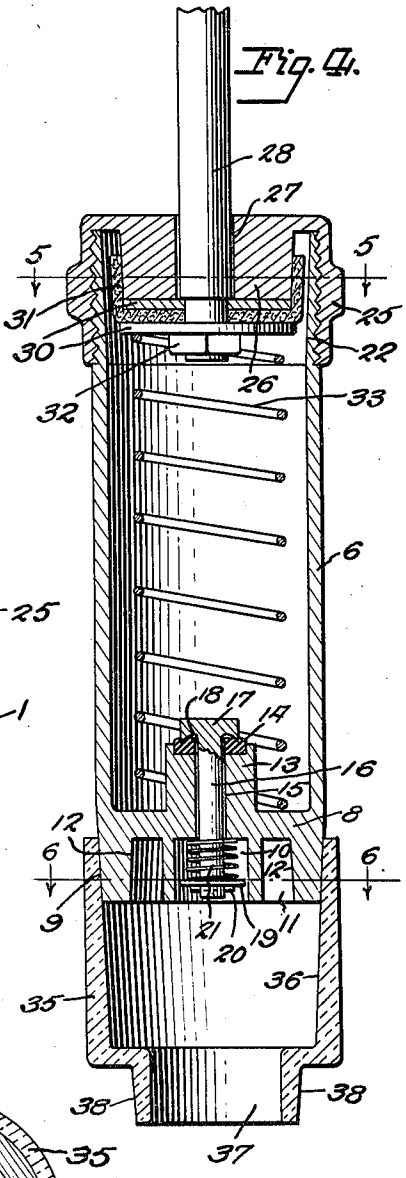


Fig. 5.

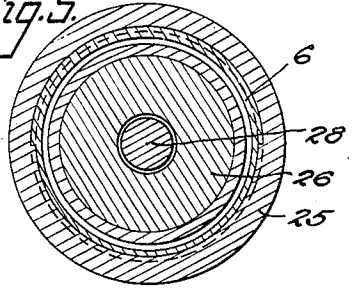
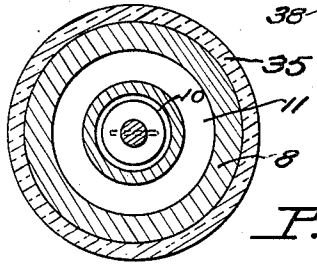


Fig. 6.



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UNITED STATES PATENT OFFICE

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VENOM EXTRACTOR

Paul W. Saunders, Tarpon Springs, Fla.

Application May 10, 1941, Serial No. 392,972

5 Claims. (Cl. 128—300)

This invention relates to a device for mechanically extracting venom in cases of snake bites, and the object of the invention is to provide a simple compact device which can be readily carried in field or woods, and which permits the quick and efficient removal of venom when occasion requires.

A further object of the invention is to provide a device of the character indicated, having means adapted to efficiently contact large or small areas where the bite may occur, as for instance, on fingers or the larger limbs or body.

A further object of the invention is to provide improved structure assuring constantly efficient operation of the device, regardless of long periods of nonuse.

Further objects will more particularly appear in the course of the following detailed description.

The invention consists in the novel construction, arrangement and combinations of parts hereinafter more particularly described and claimed.

One sheet of drawings accompanies this specification as part thereof, in which like reference characters indicate like parts throughout.

In the drawing:

Figure 1 is a small scale perspective of the complete unit;

Figure 2 is a vertical cross-section view through the assembled device;

Figure 3 is a fragmentary perspective showing the container top with the cap removed and the pump in position;

Figure 4 is a vertical cross-section view through the pump;

Figure 5 is a transverse cross-section taken on line 5—5 of Figure 4; and

Figure 6 is a transverse cross-section taken on line 6—6 of Figure 4.

In accordance with the present invention a cylindrical container 1 having one end closed, is provided, the same being formed near its open end with oppositely disposed bayonet joint slots 2—2. A cap 3 is provided for the container 1 adapted to telescopically embrace the open end of the latter, and having oppositely disposed inwardly directed pins 4—4 arranged to co-act with the bayonet slot 2—2 to secure the cap in position.

The pump arrangement consists of a cylinder 6 having an integral end wall 8, the outer portion of the cylindrical wall adjacent the end 8 being beveled as at 9 and said end formed with a central cup-like orifice 10 surrounded by an annular groove 11 having one of its walls beveled as at 12. The end wall 8 is further provided with an inwardly directed stud 13 formed on its inner end with a seat for a washer 14 surrounding a bore 15 which communicates with the cavity 10 and provides a sliding support for a valve stem 16 having on its inner end a head 17, the head being beveled concavely on the side adjacent the valve stem, as indicated at 18, to provide an annular knife edge to engage the washer 14. A washer 19 is positioned on the outer end of valve stem 16, being secured thereon by a transverse pin 20 and a compression spring 21 is interposed between the bottom of cavity 10 and washer 19 to maintain valve head 17 in normal engagement with washer 14.

The open end of cylinder 6 is externally threaded to receive the internally threaded cap 25, which cap is provided with an inwardly directed conical stud 26 having a central orifice 27 in which is slidable a piston rod 28. The inner wall of cylinder 6 adjacent stud 26 is beveled as at 22 to form with said stud a conical chamber adapted to expand a cup washer 31 which is carried on the inner end of piston rod 28 between flat washers 30—30 on a reduced portion of said rod, all of said washers being secured on said rod as by a nut 32.

A compression spring 33 bears at one end against the outer washer 30 of the piston, while its other end seats over the projection 13 and this spring operates normally to force the piston with its cup washer toward cap 25 whereon each stroke of the piston it will be noted the cup washer is expanded to a diameter slightly larger than the inner wall of the cylinder 6, thus assuring a continuous tight fit and perfect suction regardless of nonuse of the device over long periods.

An adapter element 35 is provided with two bores of substantially different diameter, the larger bore having an annular beveled wall 36 adapted to frictionally engage the outer beveled portion 9 of cylinder 6, while the smaller bore 37 has its outer wall beveled as at 38 and adapted to frictionally engage the beveled wall 12 of the annular groove 11 when the adapter is reversed from the position shown in Figure 4, or as illustrated in Figure 2.

It will be apparent from the consideration of Figures 2 and 4 that the pump elements can with this adapter be used with either the large bore in cases where the bite occurs on relatively large portions of the body, or can be used

with the small bore where the bite occurs on a finger or other small part of the body.

A tourniquet tape **41** is conveniently coiled on a small bobbin and adapted to be received within the larger bore **35** of the adapter which will also accommodate a capsule **40** of some suitable antiseptic. A small lancet **45** can be accommodated within container **1** along with the pump.

When the pump element is positioned in container **1** with the adapter end at the bottom as illustrated in Figure 2, it will be noted that to position the cap the piston must be depressed, thus compressing spring **33** so that when cap **3** is then engaged by means of the bayonet slots **22** the piston end **39** will engage the inner wall of cap **3** and exert an outer pressure thereon, thus securely locking the cap against accidental disengagement and preventing any rattling of the pump element in the container.

Preferably, the adapter **35** will be formed of glass or other transparent material, so that venom extracted by operation of the pump element with accompanying blood can be visible and the pump removed and the accumulated blood and venom released as occasion requires.

In operation, where a person is bitten by a poisonous snake, the pump element and lancet **45** will be removed from the container, together with the capsule of disinfectant **40** and bobbin of tourniquet tape **41**. The tourniquet will be immediately applied between the bite and the heart, to stop circulation of the venom toward the heart and the area surrounding the bite will be sterilized with the antiseptic from capsule **40**. With the lancet **45** incisions will be made directly at the bite and with the adapter **35** positioned on the end of cylinder **6** to best accommodate itself to the particular location of the bite, the piston rod **28** will be rapidly reciprocated, thus producing a substantial suction for drawing blood and venom from the incisions. The cup washer will have uniform close adhesion to the cylinder wall **6** and the valve **16** will operate to permit the passage of air upwardly into the cylinder on each stroke.

Various modifications in the precise construction and arrangement of the parts will readily suggest themselves to those skilled in the art but within the scope of the present invention as claimed.

What I claim as my invention is:

1. Venom extractor comprising a closed cylinder, a piston and piston rod reciprocable in the cylinder having a cup washer engaging the walls of the cylinder, a valve controlled port at one end of the cylinder and a washer expanding element at the other end of the cylinder.

2. Venom extractor comprising a cylinder, a piston and piston rod reciprocable in the cylinder having a cup washer adapted to expandingly engage the cylinder wall, a valve controlled port at one end of the cylinder, a cap engaging the other end of the cylinder, the cap provided with an inwardly extending conical projection having a central bore for the piston rod, the cylinder having its inner wall adjacent said projection outwardly beveled to form with said projection an outwardly flaring seat for the cup washer to expand same, substantially as specified.

3. Venom extractor comprising a closed cylinder, a piston reciprocable in the cylinder, a valve controlled port at one end of the cylinder, an adapter having differential bores with tapered walls, the cylinder being formed at its valve end with tapered seats adapted to interchangeably engage the tapered walls of the adapter.

4. Venom extractor comprising a cylinder, closure means at one end of the cylinder forming with the adjacent cylinder wall a conical chamber to expand a cup washer, a piston carrying a cup washer, reciprocable in the cylinder, a port in the opposite end of the cylinder a washer seat formed around the inner end of the port, a valve having a stem reciprocable in the port and a head on its inner end formed with an annularly beveled edge adapted to engage a washer in the washer seat and spring means operative on the valve stem to maintain the valve head against said washer.

5. The device of claim 2 with a compression spring operative on the piston to eject the piston rod from the cylinder, and a container adapted to receive the cylinder with its piston rod in its innermost position, a closure for the container, and interlocking means between the container and closure comprising slot and pin connectios held locked by the outward pressure of the piston rod.

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