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Lidolph

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[54] **COMBINED PUMP AND PERMANENT SIPHON TUBE**

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[52] **U.S. Cl.**..... **137/142,** 417/234, 417/437

[51] **Int. Cl.**..... **F04f 10/00,** F16l 43/00

[58] **Field of Search**..... 137/123, 142–153; 417/234, 437

[56] **References Cited**

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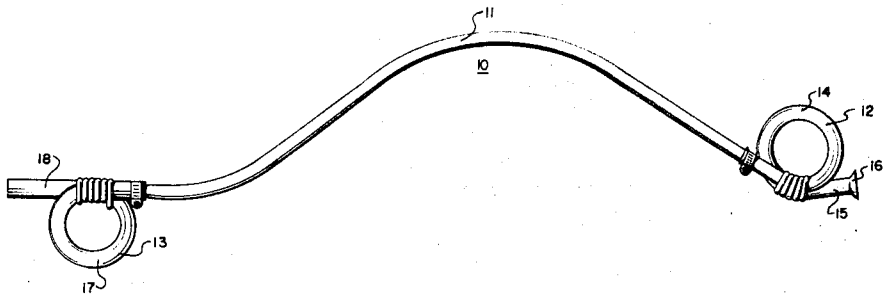
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[57] **ABSTRACT**

The combined pump and permanent siphon tube of the present invention comprising a substantially inverted U-shaped siphon conduit; a head lock including a conduit having a single-looped spiral portion upstandingly and parallelly disposed at one of the terminal ends of the siphon conduit, and a horizontally disposed tube portion disposed at the end opposite the conduit-receiving end of the spiral portion; and an orifice lock including a conduit having a single-looped spiral portion disposed dependently from the siphon conduit at its end opposite the head lock-engaging end, and a horizontally disposed tube portion disposed at the end opposite the siphon conduit-receiving end of the spiral portion. The combined pump and permanent siphon tube may be provided with a head lock and an orifice lock fabricated of flexible resilient material.

2 Claims, 2 Drawing Figures



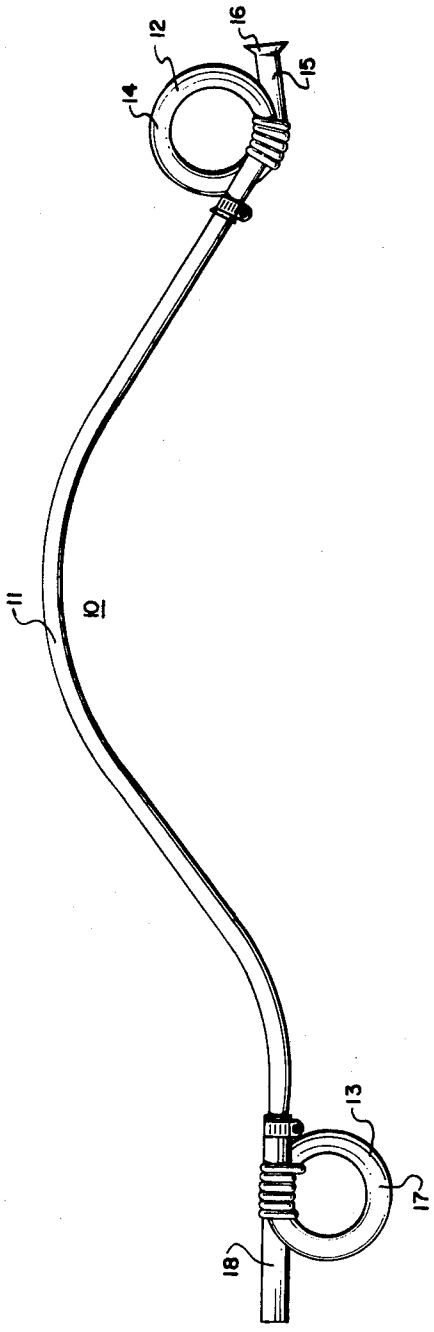


FIG. 1

BEN B. LIDOLPH INVENTOR.

BY

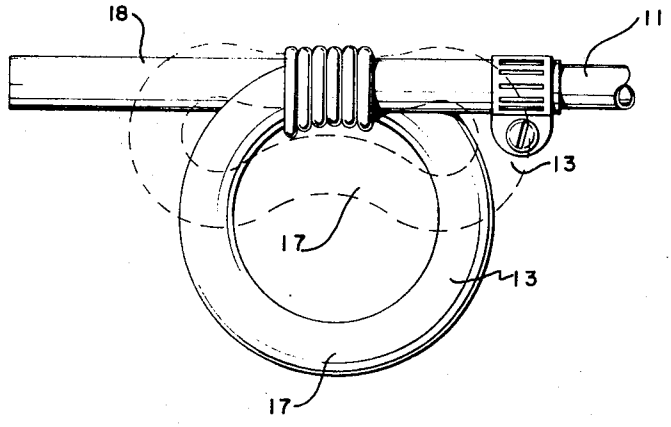


FIG. 2

BEN B. LIDOLPH INVENTOR.

COMBINED PUMP AND PERMANENT SIPHON TUBE

FIELD OF INVENTION

The present invention relates to siphon apparatus, and more particularly to siphon apparatus which are operable to permanently maintain liquid in a siphon conduit and which may be operable to resume a siphon.

DESCRIPTION OF THE PRIOR ART

Means commonly used and employed to retain the prime of a siphon in a conduit include a variety of plugging mechanisms disposed at the head or orifice of the siphon. Plugging mechanisms often include hingedly mounted gates or valves actuated by levers or other linkages. An alternative method used to retain the prime of a siphon is to dispose the entranceway of the head of the siphon conduit in a standing body of water. In this type of prime-holding apparatus a surplus of water, over the minimum level, creates a pressure on the entranceway, and the siphon is resumed.

Means commonly used and employed to resume a siphon in a suitably configured conduit usually employ a variety of pumps disposed at either of the terminal ends or in the middle of the siphon conduit. Generally, pumps used with siphon tubes include a variety of ventricle pumps and bladder-type pumps. Ventricle pumps employ complex mechanisms for pumping liquid into the siphon conduit. Bladder pumps are intended to be collapsed thereby creating a low pressure equilibrium and then released creating a suction by a change in equilibrium.

Accordingly, it is an object of the present invention to provide means operable to hold the prime of a siphon in a conduit, employing means integrally in a simple arrangement of the siphon conduit.

It is another object of this invention to provide siphon resuming means, provided as an integral part of the siphon conduit, employing an arrangement of the siphon conduit which is operable to create suction.

These and other objects shall become apparent from the description following, it being understood that modifications may be made without affecting the teachings of the invention here set out.

SUMMARY OF THE INVENTION

Generally, the combined pump and permanent siphon tube of the present invention comprising a substantially inverted U-shaped siphon conduit; a head lock including a conduit having a single-looped spiral portion unstandingly and parallelly disposed at one of the terminal ends of the siphon conduit, and a horizontally disposed tube portion disposed at the end opposite the conduit-receiving end of the spiral portion; and an orifice lock including a conduit having a single-looped spiral portion disposed dependently from the siphon conduit at its end opposite the head lock-engaging end, and a horizontally disposed tube portion disposed at the end opposite the siphon conduit-receiving end of the spiral portion. The combined pump and permanent siphon tube may be provided with a head lock and an orifice lock fabricated of flexible resilient material.

A more thorough and comprehensive understanding may be had from the detailed description of the preferred embodiment when read in connection with the drawings forming a part of this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of the combined pump and permanent siphon tube of this invention.

FIG. 2 is a fragmentary, side elevational view of the orifice lock of the permanent siphon tube of this invention, and includes the orifice lock compressed in broken lines for illustrative purposes, and is typical of both the head lock and orifice lock of this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the FIG. 1, the combined pump and permanent siphon tube is shown to advantage and identified by the numeral **10**. The tube **10** comprises a siphon conduit **11**, a head lock **12**, and an orifice lock **13**. The siphon conduit **11** is a conduit which has a summit or raised portion between its opposite terminal ends. Hence, the conduit **11** is of a substantially inverted U-shaped curved configuration. The curved configuration of the conduit **11** is uniform over the range of the curve. For reasons hereinafter later described with respect to the operation, it has been found to advantage to fabricate the conduit **11** of a material which is substantially rigid and being operable to retain a predetermined curve. The conduit **11** may be fabricated with metal tubing or with flexible conduit provided with a rigid spine having a predetermined curvature.

The head lock **12** is a conduit having a single-looped spiral portion **14** disposed at one of the terminal ends of the conduit **11** and being parallel to the conduit **11**. The spiral portion **14** is disposed upstandingly from the uppermost terminal sides of the conduit **11**. The spiral portion **14** is provided with a projecting tube **15** at the end opposite the siphon conduit-receiving end of spiral portion **14**. The tube **15** is disposed from the spiral portion **14** substantially horizontally with respect to the rectilinear axis of the tube **10**. In practice, it has been found to advantage to slightly incline the tube **15** upwardly toward the the terminal end of the conduit **11** to facilitate flow and to provide means to maintain distance of the terminal end above the bottom of the channel from which the combined pump and siphon tube **10** is to draw. It has also been found to advantage to include an entranceway **16** disposed at the terminal end of the tube **15** to further facilitate intake of the tube **10**.

The orifice lock **13** is a conduit disposed parallelly to the siphon conduit **11** at the end opposite the head lock **12** on the conduit **11**. The orifice lock **13** includes a single-looped spiral portion **17** dependently disposed from the lowermost terminal side of the head-engaging end of the tube **10**. In like manner to the head lock **12**, the orifice lock **13** is provided with a horizontally projecting output tube **18**. In operation, the tube **10** may be filled with liquid, such as water, by creating a sufficient suction at the orifice lock terminal end, while disposing the opposing head lock **12** into a body of liquid. A continuous volume of liquid is retained in the tube **10** by cohesion of the liquid which maintains an equilibrium by the high pressure pull on the liquid created by the head lock **12**, and by an equal and opposite pressure in the orifice lock **13**. The siphon may be activated by disposing the head lock entranceway **16** into reservoir of fluid and orienting the orifice lock **13** at a level sufficiently lower in elevation than the head lock **12** to dis-

place the equilibrium to result in a flow of liquid through the tube **10**.

Referring to the FIGS. **1** and **2**, it has been found to advantage to fabricate the head lock **12** and the orifice lock **13** of flexible resilient material, such as rubber, plastic, or the like, which may be operable to be selectively compressed. In operation, a siphon can be activated by disposing the entranceway **16** of the head lock **12** in a body of liquid and alternately compressing and releasing the spiral portion **14** against the conduit **11** while blocking the terminal end of the orifice lock **13**. Fluid is expelled from the tube **10** by compressing the resilient spiral portion **14** and creating a low pressure equilibrium. When the spiral portion **14** is released, a suction is created in the tube **10**; and fluid is drawn from the source of fluid through the tube **10**. The process is repeated until a siphon is established. Alternatively, a siphon can be activated by means of an orifice lock **13** made of flexibly resilient material. The terminal end of the orifice lock **13** need not be blocked. The spiral portion **17** of the orifice lock **13** is compressed against the conduit **11**. The terminal end of the entranceway **16** of the head lock **12** is disposed into a source of liquid. The resilient spiral portion **17** is released, thus starting a siphon.

Having thus described in detail a preferred apparatus which embodies the concepts and principles of the invention and which accomplishes the various objects, purposes and aims thereof, it is to be appreciated and will be apparent to those skilled in the art that many physical changes could be made in the apparatus without altering the inventive concepts and principles embodied therein. Hence, it is intended that the scope of the invention be limited only to the extent indicated in the appended claims.

I claim:

1. A combined pump and permanent siphon tube, comprising

a siphon conduit having a substantially inverted U-shaped smooth curved configuration;

a head lock including a conduit having a single-looped spiral portion upstandingly and parallelly disposed from one of the terminal ends of said siphon conduit, and a substantially horizontally disposed tube portion disposed at the end opposite the conduit receiving-end of said spiral portion; and

an orifice lock including a conduit having a single-looped

spiral portion disposed parallelly dependently from the end opposite the head lock-engaging end of said siphon conduit, and a horizontally disposed tube portion disposed at the end opposite the siphon conduit-receiving end of said spiral portion.

2. The apparatus of claim **1**, wherein said head lock and said orifice lock are fabricated of flexible resilient material.

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