

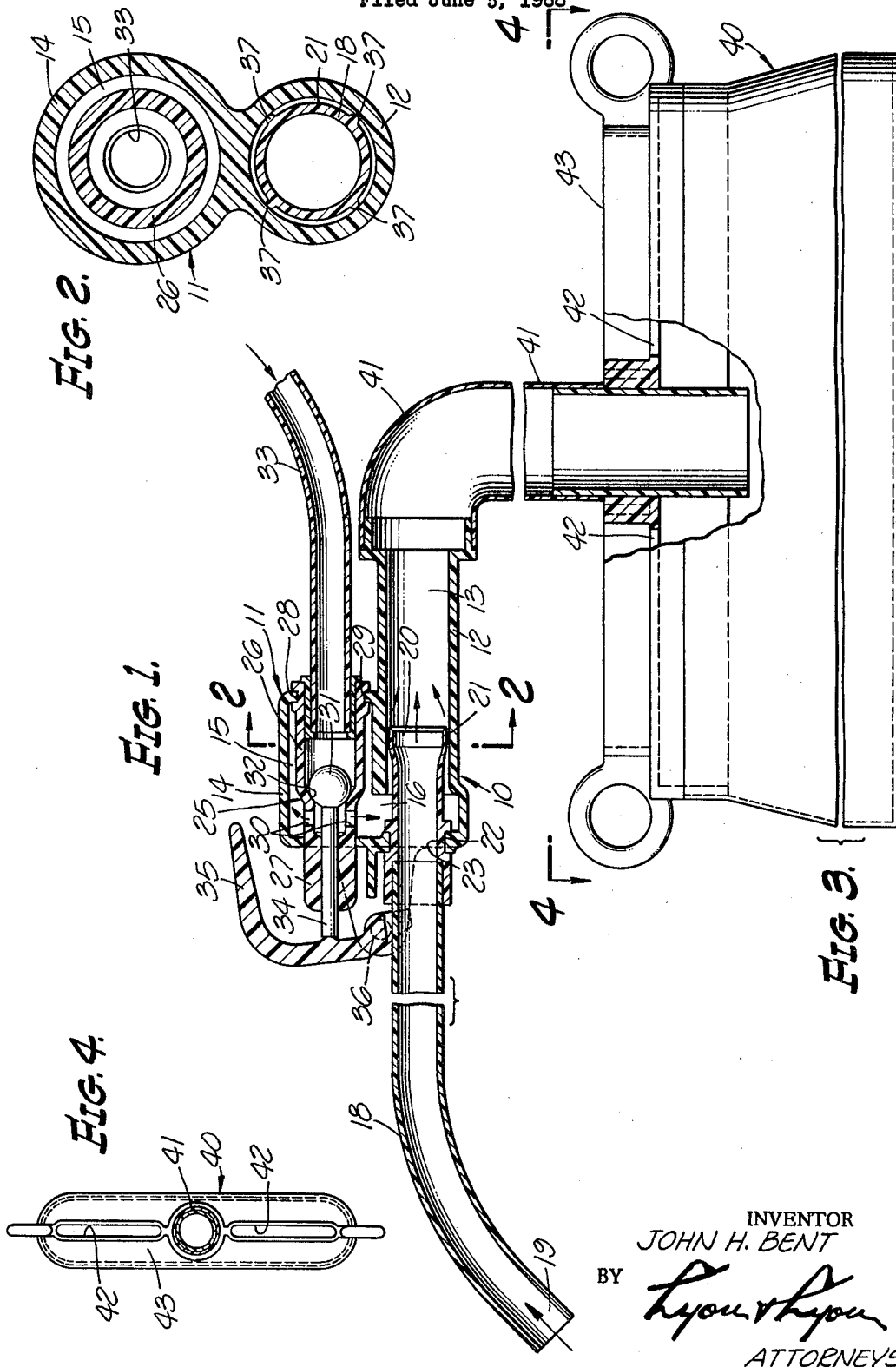
March 10, 1970

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3,499,393

SURGICAL ASPIRATOR

Filed June 5, 1968



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3,499,393

SURGICAL ASPIRATOR

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Filed June 5, 1968, Ser. No. 734,621

Int. Cl. F04f 5/24

U.S. Cl. 103—263

5 Claims

ABSTRACT OF THE DISCLOSURE

A disposable surgical aspirator has a suction tube projecting into one end of a tubular passage to define a ring orifice therebetween, and a manually operable valve is positioned adjacent a port in the tubular passage upstream from the ring orifice, to control flow of gas under pressure through the port and the orifice, and a disposable bag is connected to the other end of the tubular passage.

This invention relates to aspirator devices which are particularly adapted to remove unwanted fluids during a surgical operation. At the present time, most surgical aspiration is accomplished with a motor driven vacuum pump unit mounted on a cart. There are several disadvantages. Clogging is a constant problem, since the lower pressure available does not clear clots, etc., through small bore vacuum hoses. Also, there is no way of determining, without prolonged tests, whether the metal suction tips and opaque vacuum hose are sterile, so that cross contamination cannot occur. Furthermore, there is the constant danger of the possibility of failure of the vacuum pump or the electric motor which drives it. The danger of explosion in the operating room occasioned by sparks from an electric motor is a real hazard. Finally, the pump and motor assembly and attendant paraphernalia occupy valuable space near the operating table.

The objects of this invention are to provide an aspirator which is extremely reliable and clog-proof, and which is constructed of simple moldable plastic parts, so that the cost is low enough to allow it to be used once and then disposed of, and not re-used, thereby eliminating the cost of sterilization, including high labor costs. The device is simple, with no moving parts except a valve which has very little failure potential. Little or no floor space is required.

In the drawings:

FIGURE 1 is a sectional elevation showing a preferred embodiment of this invention.

FIGURE 2 is a transverse sectional view taken substantially on the lines 2—2 as shown in FIGURE 1.

FIGURE 3 is a side elevation partly broken away showing the disposable bag connected to the aspirator unit.

FIGURE 4 is a sectional plan view taken substantially on the lines 4—4 as shown in FIGURE 3.

Referring to the drawings, the aspirator device generally designated 10 includes a housing 11 having walls 12 forming a tubular passage 13, and having walls 14 forming a chamber 15 at one side of the passage 13. A port 16 connects the chamber 15 to the tubular passage 13. A suction tube 18 having an entrance end 19 and a discharge end 20 projects into one end of the tubular passage 13 and is secured with respect to the housing 11. The discharge end 20 is flared or enlarged to define a ring orifice 21 within the tubular passage 13. The discharge end 20 of the suction tube 18 is positioned downstream from the location of the port 16. A groove 22 in the outer wall of the suction tube 18 receives a circular lip 23 on the wall 12 to anchor the tube 18 with respect to the body 11.

A valve assembly generally designated 25 includes

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a valve body 26 mounted within the chamber 15 and having a portion 27 projecting from one end of the chamber. The groove 28 in the outer wall of the valve body 26 receives a circular lip 29 on the housing 11 to anchor the valve body 26 in place. The body 26 contains lateral ports 30. A ball 31 is adapted to close against a seat 32 under pressure supplied through a pressure tube 33 leading from a source of gas under pressure, not shown, for example a cylinder of compressed gas. A push rod 34 is slidably mounted within the portion 27 of the valve body 26, and a manually operable lever 35 acts on this push rod 34 to displace the valve 31 from the seat 32. The lever is pivotally mounted on the housing as shown at 36. When the lever 35 is moved in a clockwise direction, as viewed in FIGURE 1, the push rod 34 moves the ball 31 off of the seat 32 to permit gas under pressure to flow through the port 30 into the chamber 15 and through the ports 16 through the ring orifice 21 and into the tubular passage 13. This action creates suction pressure within the interior of the suction tube 18.

It will be observed that there are no restrictions in the flow path through the suction tube 18 and through the tubular passageway 13. Clogging is thus eliminated because anything which can pass into the suction tube 18 passes completely through the device.

In order to center the discharge end 20 of the suction tube 18 within the tubular passage 13, there are provided a series of small protuberances 37 (see FIGURE 2) around the outer periphery of the enlarged or flared portion of the suction tube 18 at the discharge end 20.

A disposable bag generally designated 40 is connected to the tubular passage 13 by means of a flexible hose 41 of larger diameter than the tubular passage 13. Openings 42 in the upper plate 43 at the top of the bag 40 permit escape of gas from the interior of the bag.

Having fully described my invention, it is to be understood that I am not to be limited to the details herein set forth but that my invention is of the full scope of the appended claims.

I claim:

1. In an aspirator device, the combination of: a housing having walls forming a tubular passage and a port in a wall of the passage, a valve assembly mounted on the housing and having means for connection to a source of gas under pressure, a suction tube extending into one end of said tubular passage and projecting downstream from said port and having an enlarged discharge end cooperating with the interior of the tubular passage to form a ring orifice, a series of protuberances on said enlarged discharge end of the suction tube to center it within said tubular passage, and manually operable means for opening the valve to permit flow of gas through the port and ring orifice.

2. In an aspirator device, the combination of: a housing having walls forming a tubular passage and a chamber at one side of the passage, means forming a port connecting the chamber to the passage, a valve assembly including a ported valve body mounted in the chamber, means on the valve body for connection to a source of gas under pressure, a suction tube extending into one end of said tubular passage and projecting downstream from said port and having an enlarged discharge end cooperating with the interior of the tubular passage to form a ring orifice, and movable means on the housing for opening the valve to permit flow of gas through the ported body into the chamber and through the port and ring orifice.

3. In an aspirator device, the combination of: a housing having walls forming a tubular passage and a chamber at one side of the passage, means forming a port connecting the chamber to the passage, a valve assembly including a ported valve body mounted in the chamber,

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means on the valve body for connection to a source of gas under pressure, a suction tube extending into one end of said tubular passage and projecting downstream from said port and having an enlarged discharge end cooperating with the interior of the tubular passage to form a ring orifice, and means including a manual lever pivoted on the housing for opening the valve to permit flow of gas through the ported body into the chamber and through the port and ring orifice.

4. The combination set forth in claim 3 wherein the valve assembly includes a ball element moved into closed position against a seat by gas pressure from said source.

5. The combination set forth in claim 3 wherein a disposable bag is connected to the other end of said tubular passage.

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U.S. Cl. X.R.

32—33, 40; 103—268