

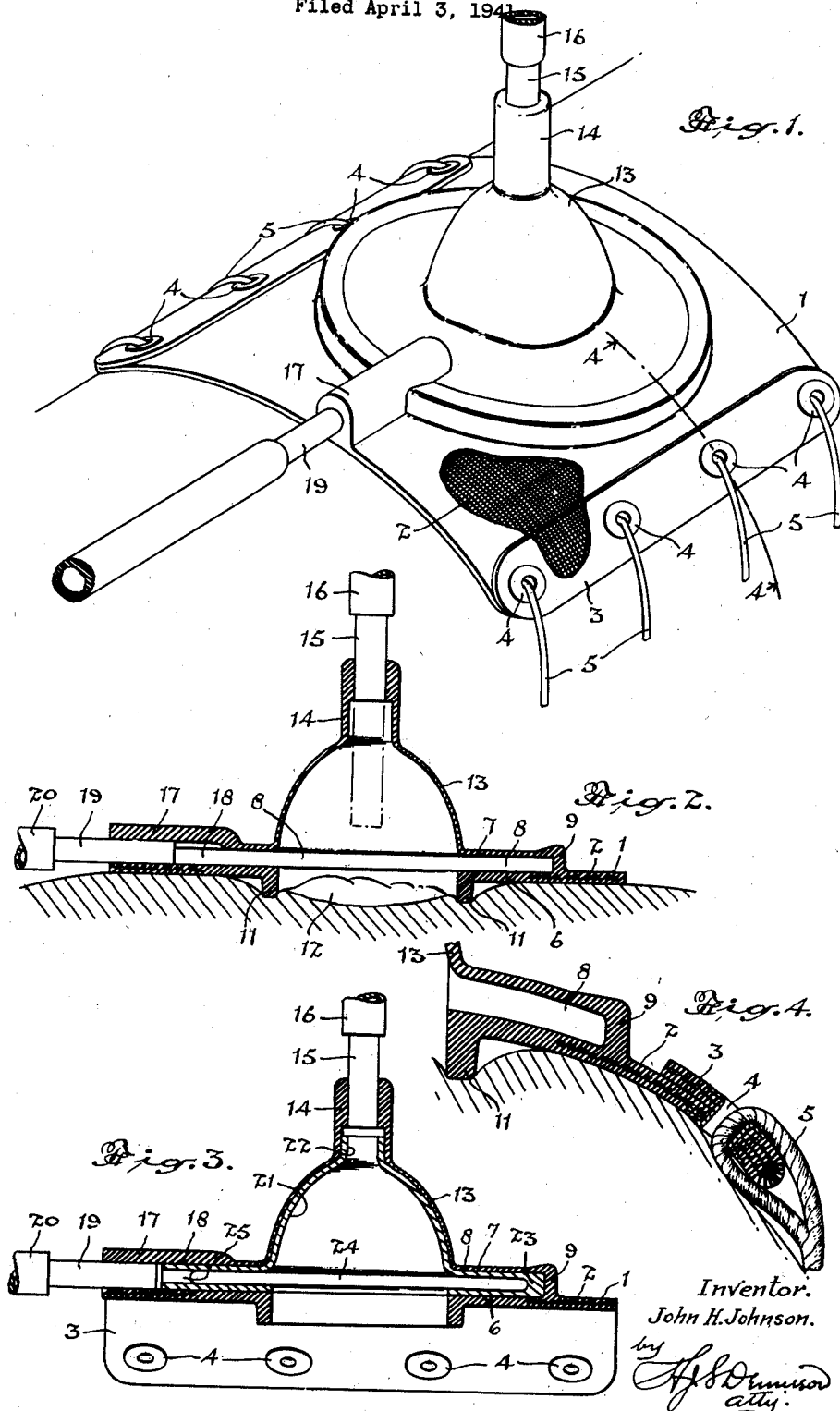
April 28, 1942.

J. H. JOHNSON

2,280,915

DEVICE FOR IRRIGATING AND TREATING WOUNDS

Filed April 3, 1941



Inventor.
John H. Johnson.

by *J. H. Johnson*
att'y.

UNITED STATES PATENT OFFICE

2,280,915

DEVICE FOR IRRIGATING AND TREATING WOUNDS

John H. Johnson, Toronto, Ontario, Canada

Application April 3, 1941, Serial No. 386,644

8 Claims. (Cl. 128—350)

This invention relates to a device of the class adapted to be applied about a flesh wound to form a cavity thereabout into which a sterilizing fluid may be introduced, and the principal object of the invention is to provide an improved form of construction which may be clamped tightly about the wounded area in an effective sealing manner and which will provide for an unobstructed flow of the cleansing or antiseptic fluid to and from the wound to carry away the poisons and matter exuded from the wound.

A further and important object is to provide for the adaptation of the device to the treatment of a wound either under pressure or suction conditions.

The principal feature of the invention resides in the novel construction of a device in the form of an attachment pad having a reinforced skirt portion to be clamped tightly about the wounded area and having the central region diverging into spaced flexible wall areas, one of which is provided with a central opening to receive or expose the wound and presenting an annular bead about the opening for sealing engagement about the wound, while the other wall is formed with a hollow flexible protuberance opposite the opening of the other wall adapted for the reception of a cleansing or sterilizing fluid, the spaced walls forming an annular chamber connected to a discharge outlet.

A further and important feature resides in the provision of a cupped element of hard or rigid form adapted to be inserted in the wall protuberance and having a flange portion to fit between the spaced walls to support the central flexible structure against collapse when it is desired to treat the wound under suction conditions.

In the drawing

Figure 1 is a perspective view of a device constructed in accordance with the present invention showing same applied to a wounded member.

Figure 2 is a transverse sectional elevation through the device shown in Figure 1.

Figure 3 is a transverse sectional elevation through the device showing same adapted for the treatment of a wound under suction conditions.

Figure 4 is an enlarged fragmentary sectional view taken on the line 4—4 of Figure 1.

In the treatment of suppurating wounds it has been proposed to apply cup-shaped members of more or less rigid form in a sealing manner about the wound and to introduce a cleansing fluid

which may be in the form of a saline solution within the cup and allowing the same to drain off through an outlet and it has also been proposed to apply a suction influence within a cupped element.

The present invention has been proposed to overcome difficulties associated with prior constructions, particularly in regard to the sealing and draining features and to provide a form of device which will be of rugged form, dependable in its action and comfortable to the patient.

In the form of the construction shown a main pad 1 of rectangular form is provided, preferably formed of rubber having incorporated therein a reinforcing fabric 2 having the edges 3 turned backwardly to form a reinforcing margin in which eye members 4 are secured for the reception of the fastening laces 5.

The central region of the pad is moulded with integral flexible spaced wall portions 6 and 7, preferably quite thin and free from interior reinforcement and forming an annular chamber 8 therebetween, the wall 7 being merged with the wall 6 about the channel by a thickened reinforcing and stiffening flange 9 and the reinforcing fabric 2 may extend slightly past the flange 9 into the outer zone of the wall 6 and, as represented at 10, a portion thereof may extend into the flange.

The walls 6 and 7 are of annular form and the inner periphery of the wall 6 terminates in a thickened out-turned annular sealing flange 11 for sealing contact with the flesh about the wound 12. The inward extremity of the annular wall portion 7 is extended laterally in a flexible cup formation 13 which converges to a tubular neck portion 14, the latter being adapted to receive a length of glass or rubber tubing 15 with which a length of rubber tubing 16 is connected which may lead from a supply of the solution which it is desired to apply to the wound.

The pad is moulded with a tubular outlet 17 which leads inwardly from one edge of the pad on the upper side thereof and overlies a portion at least of the annular wall 7 and provides a discharge passage 18 which leads directly from the annular passage 8 formed between the walls 6 and 7. A length of glass tubing 19 is adapted to be inserted in the passage 18 and this may have a tubular extension 20.

In the use of this device when it is desired to supply a cleansing solution to the wound the device is attached in the manner defined so that the wound 12 will be exposed through the open-

ing within the sealing flange 11 and the container, or other source of supply of the solution with which the tubing 16 is connected, is arranged at a desired height above the patient to cause the solution to flow into the flexible cup portion 13 and variable pressures may be established within the flexible cup, depending on the height of the container for the solution.

The rate of flow may be regulated by any well known means and as this solution enters the pocket it will circulate over the wounded area and will carry off poisons or pus accumulations from the wound out through the discharge passage 18 where they will be carried off.

It is important to note that the annular passage 8 extends completely about the wound so that should the wound present a pronounced protuberance into the pocket it will not result in the closing of the outlet passage 18, since there will always be available a free outlet for the solution and the poisons picked up thereby through the annular passage 8.

Moreover the flexible nature of the wall 7 and pocket 13 enables the pressure of the fluid to exert a separating action on the walls 6 and 7, thus maintaining the annular passage 8.

The tubular sleeve 15 may be readily adjusted in the neck 14 as represented in broken lines so that its discharge end will be in the most effective relation to the wounded area.

When it is desired to apply a suction treatment to the wounded area it is necessary to provide against the collapse of the flexible wall 7 and cupped portion 13, and in Figure 3 I have shown a preferred manner of accomplishing this special support which will now be defined.

A cup-shaped member 21 moulded from rigid or semi-rigid material is adapted to be inserted within the cup-shaped portion 3 and may advantageously be provided with a tubular nipple 22 which extends a short distance within the neck 14 of the cup.

The cupped member 21 is provided with a base flange 23 of annular form which is adapted to fit within the channel 8 between the flexible walls 6 and 7, the wall 6 being adapted to readily flex to permit the insertion of the cupped member 21 and its flange 23.

An annular groove 24 is here shown formed on the inner side of the flange 23 communicating with the interior of the cup and leading from the groove 24 is a tubular extension 25 which extends into the outlet passage 18. It will thus be evident that a suction may then be applied, preferably from any suitable suction-producing means connected with the tube 25 either during the feeding of the cleansing solution from the tubing 16 or independent thereof.

The presence of the semi-rigid cup 21 and flange 23 and tubular extension 25 effectively supports the areas with which these parts contact against collapse due to the reduction of the interior pressure, and any matter exuded from the suppurating wound will be effectively carried off through the tubular outlet 25 to discharge.

A device such as described possesses considerable utility for the purposes outlined and it enables the treatment of the wound in the most effective manner and being of such flexible character it will adapt itself readily to the various contours of the human body.

The rigid cupped insert may be made with a plurality of perforations adjacent to the bottom to allow the flow of fluid to the annular chamber

8 and will not have the lateral flange above described.

What I claim as my invention is:

1. A device as claimed in claim 4 in combination with a rigid or semi-rigid cupped element adapted for insertion within said hollow cup-shaped protuberance to reinforce the same against collapse and having a flange portion for entry into said annular channel to support said annular wall portions against collapse and having inlet and outlet passages adapted to register respectively with said fluid inlet and outlet passages.

2. A device of the class described having a main flat pad portion provided with a centrally disposed annular sealing bead projecting below the under surface of the pad adapted to press into and seat about the wounded zone, a cup-shaped portion, means flexibly connecting said cup-shaped portion with said annular sealing bead and forming therewith a chamber of variable volume including a thin flexible wall spaced substantially parallelly from the said flat pad portion beyond the said sealing bead of the pad and forming therewith a drainage channel, said flexible wall being connected with the pad only at the outward side of the said channel leaving the channel unobstructed on the inward side, and means for introducing and discharging fluid into and out of said chamber and channel respectively.

3. A device of the class described having in combination a flat flexible pad for extensive surface contact about a wounded zone and having an integral annular bead projecting perpendicularly below the undersurface of the flexible pad for sealing encirclement immediately about the wound, means forming with said flexible pad and spaced therefrom an annular passage extending outwardly above the pad well beyond the annular bead, said means being cupped centrally to form a central pocket and being connected with the pad at the outward limit only of the annular passage in a peripheral zone between the said annular bead and the outer perimeter of the said flat flexible pad, a tubular inlet leading to said central pocket, and a tubular outlet leading from said annular passage.

4. A device of the class described comprising a thin flexible moulded pad element for embracing the body about an injured zone and having integral substantially parallelly spaced upper and lower annular flexible wall portions forming an annular channel therebetween and being connected together only at the outward side of said annular channel, the lowermost of said wall portions having an inner peripheral bead projecting perpendicularly therebelow adapted to seal against the body about the wounded zone well within the marginal limits of the said thin flexible pad element and the upper wall having a hollow cup-shaped protuberance, the said upper wall forming a floating support for said cup-shaped protuberance whereby the latter may ride up and down on variation of internal pressure, a fluid inlet leading to the interior of said cup-shaped protuberance, and a fluid outlet leading from said annular chamber.

5. A device as claimed in claim 4 in which said pad member has incorporated therein a flexible reinforcing medium extending inwardly from the edges and terminating short of the annular upper flexible wall portion leaving the latter free for maximum flexing.

6. A device as claimed in claim 4 in which said moulded pad member is reinforced on the

outward side of said spaced flexible channel-forming wall portions leaving the latter mainly free of internal reinforcement for enhanced flexing action, and fastening means associated with opposite reinforced sides of said pad member.

7. A device as claimed in claim 4 in combination with a rigid or semi-rigid cupped element adapted for insertion within said hollow cup-shaped protuberance to reinforce the same against collapse and having a flange portion for entry into said annular channel to support said annular wall portions against collapse and having inlet and outlet passages adapted to register respectively with said fluid inlet and outlet passages, the flange portion of said cupped member being provided with a circumferential channel on the inward side communicating with the outlet passage of said cupped member to take the place of the annular channel within which the flange portion fits.

8. In a device of the class described, the combination of a flexible pad having an opening formed with a flanged edge to encircle a wound and form a seal therearound, means co-operating with said pad to form a drain passage on the outward side of said opening, a cupped extension connected with the aforesaid means and extending above the aforesaid opening and having an inlet thereto, means forming a tubular outlet from said drain passage, and a rigid reinforcing cup adapted to be inserted in said cupped extension and having the bottom thereof open and being formed with an extension engaging the flexible pad in supporting contact to support the drain passage against collapse, and means forming drainage communication from the interior of the rigid reinforcing cup through said drain passage to said tubular outlet.