Nov. 7, 1950 F. G. LOBO 2,529,258

APPARATUS FOR ARTIFICIAL RESPIRATION

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Fig. 1

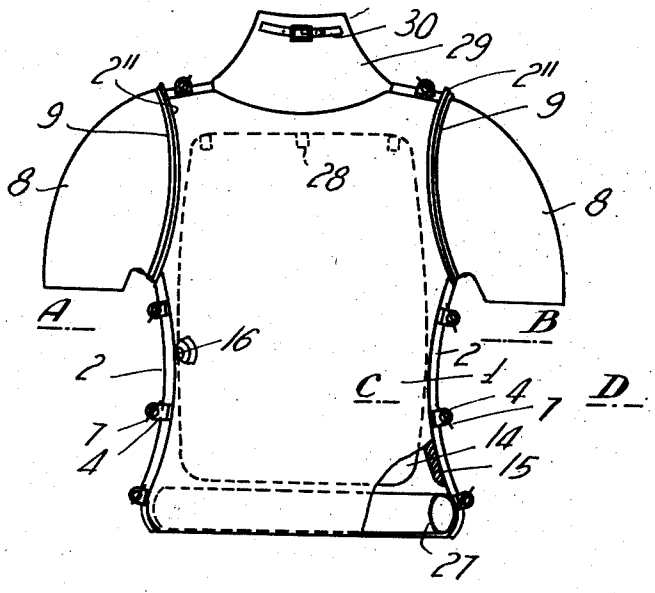
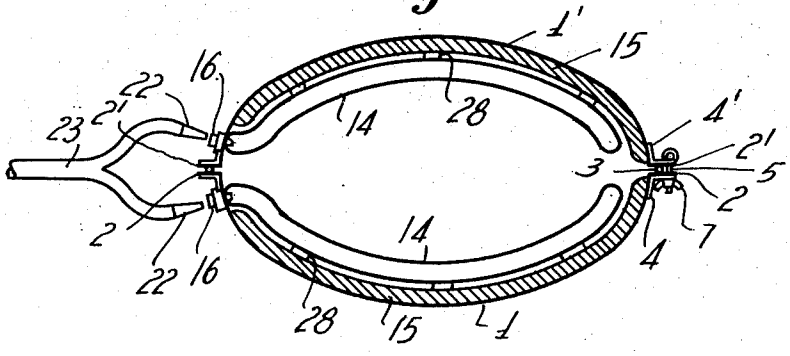


Fig. 2



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Fig. 3

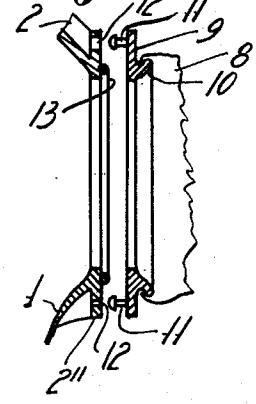


Fig. 4

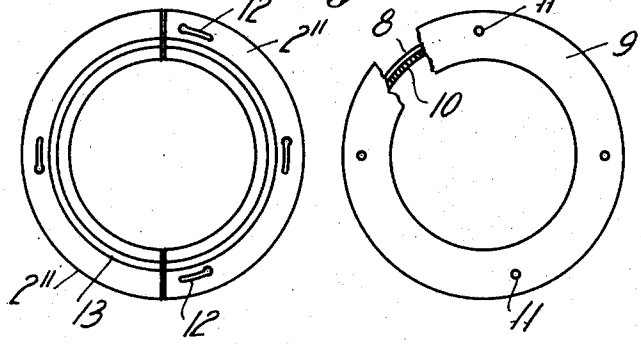


Fig. 6

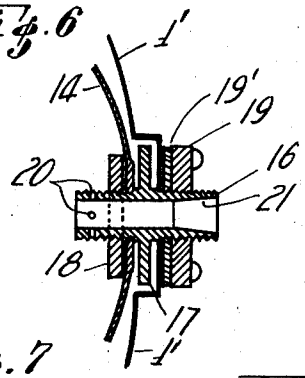


Fig. 5

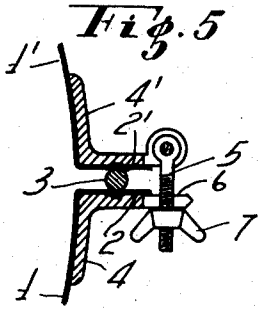


Fig. 7

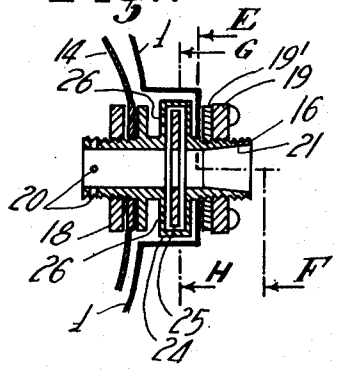


Fig. 8

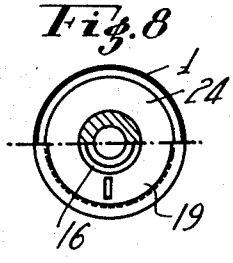
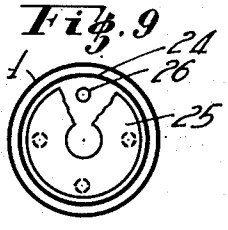


Fig. 9



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APPARATUS FOR ARTIFICIAL RESPIRATION

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Buenos Aires, Argentina

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In Argentina July 4, 1946

1 Claim. (Cl. 128—28)

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This invention refers to an apparatus for producing artificial respiration, applicable to the chest of an individual attacked by asphyxia under its different forms (immersion, strangulation, etc.) or having suffered a syncope, an electric shock, etc. The apparatus may likewise be used for respiratory gymnastics, both as an exercise or for fighting certain pulmonary diseases.

Owing to the special features of the apparatus, the limbs as well as the excretion ducts of the patient under the effects of asphyxia are left free and it will be possible for any coadjuvating treatment, such as injections, drainages, transfusions, enemas, massages, etc., to be carried out. On the other hand, the small size of the apparatus and its dismountability allow the same to be readily taken about and thus be made to operate right on the spot of an accident as well as during the conveyance of the patient in the very vehicle in which he is riding.

Again, this apparatus may be applied in any position occupied by the patient, that is to say, while he lies with his mouth either downwardly or upwardly, while he stands, while he is seated, and so on, as may be required by the nature of the disease or by the doctor's prescription.

The invention essentially comprises a cuirass divided in two portions, a breastplate and a backplate, which may be combined so as to surround the trunk of an individual. The inside is provided with a pneumatic chamber enveloping the said trunk like a waistcoat, and this chamber is made to operate by means of a pump or bellows to bring about artificial respiration by pressing and releasing the patient's breast in accordance with the respiratory rhythm, that is to say, positive and negative pressure is exerted directly on the thorax and the abdomen in an ample and efficient manner for the purpose sought.

The invention is illustrated in various figures on the accompanying drawings in order that it may be readily put into practice. On these drawings:

Fig. 1 is a front view of the apparatus as a whole,

Fig. 2 is a cross section along line A—B,

Fig. 3 is a center sectional view detailing the connection of one of the sleeves of the cuirass,

Fig. 4 is illustrative of the two pieces constituting this connection, being a front view of their contacting surfaces,

Fig. 5 is a section along C—D of the detail of the connection combining the two portions of the cuirass,

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Fig. 6 is a central section showing one of the mouthpieces connecting the pneumatic chamber to a pump or bellows not shown,

Fig. 7 is a central section showing the other mouthpiece connecting the same chamber, this mouthpiece providing a valve,

Fig. 8 is a partially sectional view along line E—F of the detail referred to in the foregoing figure,

Fig. 9 is a section along line G—H.

The structure in accordance with the accompanying drawings consists, roughly speaking, of the breastplate 1 and the backplate 1' constituting the apparatus and having the flanges 2—2', respectively, at their margins where the two pieces are joined together (Fig. 1, 2 and 5), an elastic packing 3 of rubber or similar material being interposed between the contacting surfaces. To secure the said pieces 1—1' to one another the external portion of the flanges 2—2' carries the angle pieces 4—4', the first one of which has the screw 5 pivoting therein while the second one is provided with a groove 6 through which the said screw 5 passes to receive the butterfly nut 7 whereby the adjustment is carried out.

The portion affording the connection of the sleeves (Figs. 1, 2, 3 and 4) is constituted by the washer 9 having all its circular front provided with the flange 10 whereon the upper mouth of sleeve 8 abuts, and as the latter is of a resilient material it is secured at that place. Furthermore, the said washer 9 has its other face equipped with a series of rigidly secured bolts 11 registering with the slots 12 on the flanges 2'' of the breastplate 1 and the backplate 1' so as to afford a bayonet connection. The said slots 12 have a widened portion for the heads of the bolts 11 to pass through and be held in place inside the very slots 12 after a rotating movement has been imparted the washer 9 to accomplish the connection. An elastic packing cord 13 is interposed between the washer 9 and the flanges 2'' to obtain an impervious seal.

Housed within the cuirass composed of the breastplate 1 and the backplate 1' is the pneumatic chamber 14 made of two halves, one for the pectoral zone and the other one for the back. The inside of these portions of the cuirass 1—1' is clad with a padding 15 to soften pressure on the patient's body in case he has to lie horizontally or lean against the back of a chair with the apparatus around him, this arrangement being of particular benefit in certain instances

when the chambers 14 will be deflated, with their elasticity of no avail.

The connection of one of the said chambers 14, i. e., the mouthpieces connecting it to a pump or bellows, is illustrated in detail in Figures 6, 7 and 8. The mouthpiece of Fig. 6 is made up by a tube 16 having exteriorly integral therewith the flange 17 onto which the corresponding chamber 14 is anchored after previously slipping its mouth over the tube 16, the nut 18 being used for the adjustment, to which effect it is threaded on from the rear end of said tube 16. The other end also receives a nut, 19, to secure the whole to the backplate 1' of the cuirass, the tube 16 passing through the same and the flange 17 being seated at the rear thereof. The end of the tube 16 which remains within the chamber 14 is provided with a couple of holes 20 to assure air circulation. The other end of tube 16 is interiorly conical as will be noted from 21, in order to be able to adjust the mouthpiece 22 (Fig. 2) when the apparatus is connected for operation with a pump or bellows by means of the flexible tube 23.

The second mouthpiece belonging to the other chamber 14 (Figs. 7 to 9) is composed of the same devices as the first mouthpiece, the only difference being that the tube 16 has added thereto the box 24 wherein is lodged the valve 25 constituted by a simple coaxial washer which acts on the holes 26 made in box 24 at the side thereof registering with the interior portion of the cuirass 1. In this way, the air remaining within the cuirass, exteriorly with respect to the chambers 14, may escape through these holes 26 together with that escaping from the chambers 14, but when air enters these chambers, the holes 26 are covered by valve 25.

The bottom portion of cuirass 1—1' is fitted with an elastic tube 27 (Fig. 1) to embrace the patient's hips to which effect it contains a certain amount of slightly compressed air.

It will be well for the chambers 14 to be fastened by means of the ribbons 28 (Fig. 2) to the pads 15 so they may stay in their respective positions when the apparatus is taken off the patient's body, thereby avoiding delays in refitting them in place.

The top portion of cuirass 1—1' has the elastic neck 29 (Fig. 1) which is applied thereto in the same manner as is the sleeve 8 to the flanges 10 (Fig. 3), for which reason no special description is needed in this respect.

The operation is as follows:

To place the apparatus on the patient's body the two portions thereof, i. e., the breastplate 1 and the backplate 1', are applied to their respective seats and connected with one another by means of the screws 5 and nuts 7 (Figs. 1 and 5) until they are perfectly well combined with one another. Thereafter the neck 29 is put on by slipping it over the head until it fits properly on the cuirass, whereupon it is locked on to the throat by means of the straps 30. Then the sleeves 8 already equipped with the washers 9 are put in place by having the bolts 11 engage the slots 12 of the flanges 2'' and imparting to the said washers 9 a slight rotating movement, as in the case of bayonet connections. Finally, the

mouthpieces 22 are introduced in the inlets or ends of the tubes 16, when the apparatus will be ready for operation by the aid of a pump or bellows. This pump, as will be readily appreciated, will work synchronously with the respiratory rhythm. When the chambers 14 become inflated, a uniform pressure will be exerted on the whole chest of the patient, and when the same air is evacuated or sucked off, the corresponding counterpressure will be brought about, whereby the artificial respiration as sought is attained.

Somewhere else it has already been explained that the air foreign to that of the chambers 14 will escape through the holes 26 (Figs. 7 and 9) when the pump or bellows is at its sucking stroke, so as to afford the chambers 14 liberty of action within the reach of the cuirass 1—1', so that the pressure they receive will act within a medium a little lower, relatively, than the atmospheric pressure, whereby the action of the apparatus is rendered more efficient.

The tight seals at the neck, the arms and the waist prevent air from entering from the outside, whereby the just described effect is obtained.

Having now fully described and ascertained the nature of my present invention and in what manner the same is to be carried into practice, I declare that what I claim is:

An apparatus for artificial respiration, comprising, in combination, a breast plate, a back plate, flanges connected with said plates and located opposite each other when the plates are joined, an elastic packing between adjacent surfaces of said flanges, locking means carried by said flanges for providing an airtight lock therebetween, said plates having sleeve openings and a neck opening formed therein, flanges around the edges of said sleeve openings, resilient sleeves, washers carried by said sleeves and located opposite the last-mentioned flanges, bayonet locks between said washers and the last-mentioned flanges to provide an airtight lock between said plates and said sleeves, a padding upon the inner surfaces of said plates, means forming two separate pneumatic chambers adjacent the inner surfaces of said breast plate and said back plate respectively, resilient sealing means carried by said plates and enclosing said neck opening, and separate means for pumping air into and out of said chambers and including a one-way valve in one of said chambers.

FERNANDO GONZÁLEZ LOBO.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
861,349	Beaubien	July 30, 1907
1,087,942	Hammond	Feb. 24, 1914
1,096,607	Deray	May 12, 1914
2,067,268	Hans	Jan. 12, 1937
2,227,847	Shoolman	Jan. 7, 1941
2,249,579	Rea	July 15, 1941
2,291,785	Baudistel	Aug. 4, 1942
2,354,397	Miller	July 25, 1944
2,379,497	Sellmeyer	July 3, 1945