

March 27, 1945.

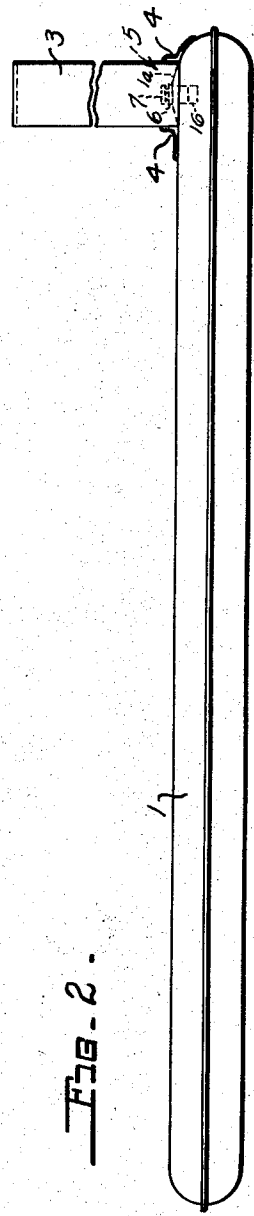
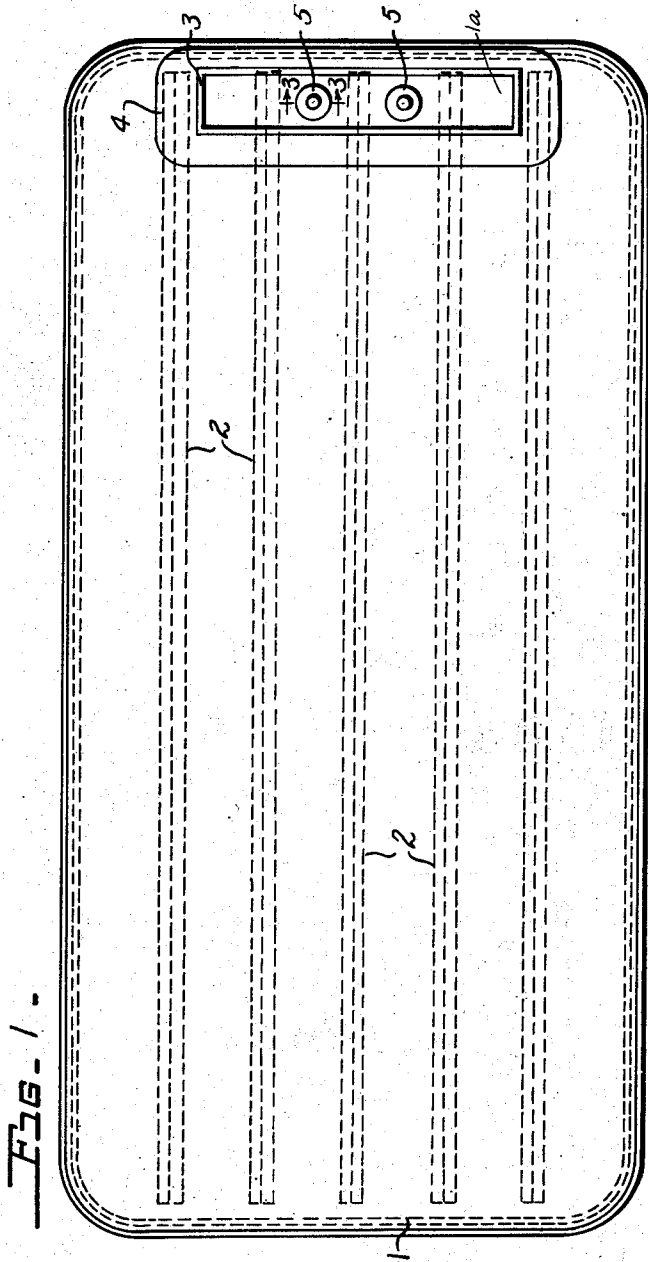
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2,372,218

PNEUMATIC MATTRESS

Filed July 25, 1941

2 Sheets-Sheet 1



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FIG. 3

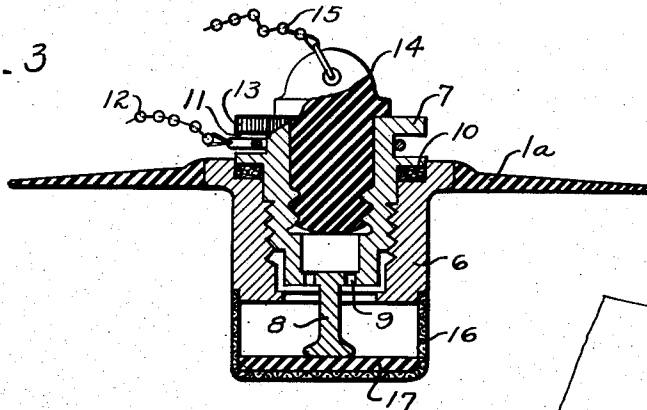


FIG. 6

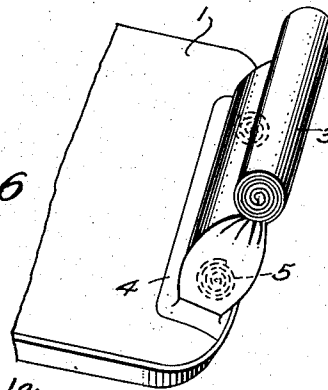


FIG. 4

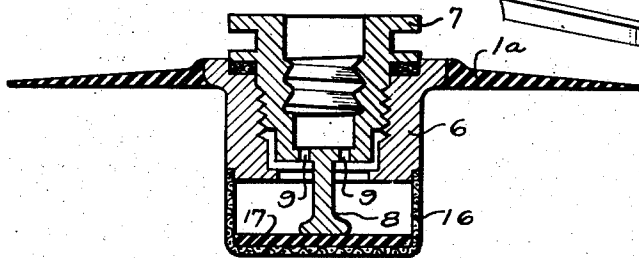
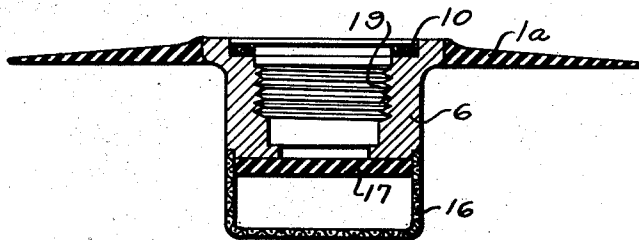


FIG. 5



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2,372,218

PNEUMATIC MATTRESS

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Application July 25, 1941, Serial No. 404,030

2 Claims. (Cl. 5—348)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to us of any royalty thereon.

This invention relates to a pneumatic mattress, and particularly to a mattress having a bag-like member constituting a bellows for inflating the same, and a valve mechanism operatively associated with the bellows for facilitating inflation and deflation of the mattress.

It is, therefore, an object of this invention to provide in a pneumatic mattress, a mechanism integral therewith for readily inflating and deflating the same.

Other objects of the invention will become apparent from the following description taken in connection with the drawings, in which:

Fig. 1 is a plan view of a pneumatic mattress incorporating the novel features of the invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is a cross-sectional view taken along the lines 3—3 of Fig. 1, showing the valve in stopper-closed position;

Fig. 4 is a cross-sectional view similar to Fig. 3 and showing the stopper removed and the valve in discharging position;

Fig. 5 is a view similar to Figs. 3 and 4 with the valve in closed but bag-inflatable position.

Fig. 6 is a view showing the manner of employing the mattress inflating means.

Referring to the drawings, a hollow pneumatic mattress 1, composed of rubber or other airtight material and having therein longitudinally disposed form-sustaining ribs 2, is provided with a flexible flap-like bag 3 which is open at its upper end and having its lower end secured to the top of the mattress by means of a patch 4 cemented or otherwise secured to both the bag and the mattress. The bottom of the bag indicated by reference character 1a thus forms an integral part of the mattress and is provided with a plurality of valve members, each generally indicated by the reference numeral 5, which afford a means of flow communication between the bag 3 and the interior of the mattress. If the bag 3 is extended and the upper edges gathered together in the manner of closing a paper bag, a considerable volume of air will be trapped in the bag 3. By then rolling up the bag in the manner shown in Fig. 6, the same will act as a pump and compress the air therein and the valves 5 are so constructed as to permit the compressed air to flow into the mattress to inflate the same. The bag may be extended and rolled up as many times as necessary to completely inflate the mattress,

the valves 5 being normally operative to prevent flow of air from the mattress to the bag. The open end of the bag also serves as a means for manual access to the valves 5 for operating the same to deflate the mattress. The valve construction will now be described.

Referring now to Figs. 3, 4 and 5, the valve comprises a body portion 6 suitably integrally united with the portion of the mattress 1a constituting the bottom of the bag. Member 6 is provided with an opening 19 internally screw-threaded to receive an externally and internally screw-threaded cylindrical member 7 provided with a valve disk engaging projecting member 8, for holding the disk 17 in valve-open position, and a plurality of discharge openings 9. The body portion 6 is provided at its upper end with an annular recess for receiving an airtight sealing means 10.

Cylindrical member 7 is provided with an annular groove 11 for receiving a suitable loss-preventing fastening means 12, suitably attached to the mattress. The cylindrical member is knurled as at 13 to facilitate manual removal thereof from the valve body member. A stopper member 14, of rubber or other suitable material, is screw-threaded into the cylindrical member 7 in airtight engagement therewith. For preventing loss of the stopper 14, a fastening means 15 suitably attached to the mattress is provided. The body portion 6 has attached thereto at the lower end thereof a screen portion 16 adapted to slidably receive and floatingly support a disk valve 17 of suitable lightweight material having high air-sealing properties when in contact with the lower portion of body member 6.

Coming now to the operation of the device: The parts are positioned as shown in Fig. 3 when the mattress is inflated for use. When it is desired to deflate the mattress, the stopper member 14 is removed and with the parts as shown in Fig. 4, air is allowed to discharge to the atmosphere through screen 16 and orifices 9, valve 17 being held in inoperative position by stem member 8. This construction enables quick and ready discharge of air from the pneumatic mattress, without using extraneous tools. When it is desired to again inflate the mattress, the cylindrical member 7 is removed from the valve as shown in Fig. 5 and with the bag 3 in expanded position, the upper end portions thereof are gathered together and the air trapped therein forced through the valve by rolling the bag into a compact cylindrical roll. When the bag is in its completely rolled position, the bag is again distended so as

to fill up with air from the atmosphere, valve 17 being moved by the difference in air pressure between the interior and exterior of the mattress into valve-closing position as shown in Fig. 5. The rolling operation of the bag may be repeated as many times as is desirable or necessary to reach the desired degree of inflation, whereupon the cylindrical members 7—with the stopper 14 in place—is screw-threaded into the body member 6 to assemble the parts as in Fig. 3.

Various modifications may be made in the device without departing from the spirit of the invention, it being intended that the scope of the invention be limited only by the terms of the appended claims.

We claim:

1. In combination, a pneumatic mattress, an extensible bag-like inflating member secured to said mattress and having one end open and the other end forming a bottom wall integral with the mattress, and valve means positioned in the said bottom wall and controlling communication between the inflating member and the interior of the mattress, said valve means including a valve body sealingly secured in said bottom wall, a central passage in said valve body terminating in a valve seat within the mattress interior, a

valve guide carried by said valve body, a disc valve guidingly supported by said valve guide and adapted to cooperate with said valve seat to open or close said passage in accordance with the pressure within the mattress being less or greater than the pressure within the mattress respectively, a member sealingly received in said valve body passage and axially movable therein, said member having an air-flow passage therethrough, a removable plug for opening or closing said air-flow passage and means carried by said member for engaging said disc valve to maintain the same in non-closing position and permitting mattress deflation upon removal of said plug.

2. A valve comprising a valve body member having a valve seat portion thereon, a disc valve adapted to rest on said valve seat and freely slidably carried by said body, a hollow cylindrical member carried by said body member and axially movable with respect thereto, said cylindrical member having flow passages therethrough, a disc valve depressing member carried by said cylindrical member and removable plug means sealingly received in the hollow of said cylindrical member.

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