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INFLATING DEVICE FOR INFLATABLE SPLINTS

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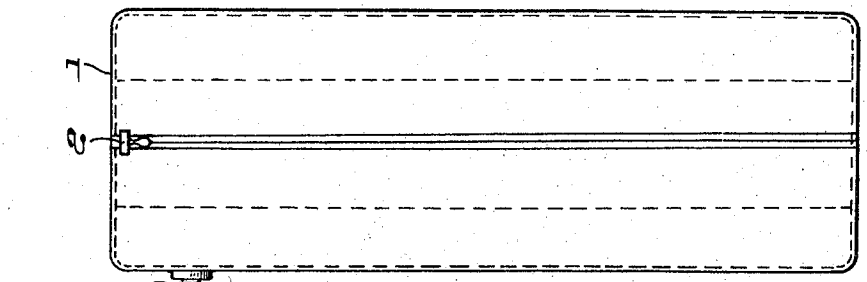


Fig. 1.

Fig. 2.

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INFLATING DEVICE FOR INFLATABLE SPLINTS

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This invention relates to inflatable splints, and more particularly to a device for inflating them.

Inflatable splints, which also can be used as bandages, usually consist of a double walled flexible sleeve that can be fastened around the member to be splinted, and means for inflating the sleeve to cause it to exert pressure against that member. In one popular type of inflatable splint the inflating means includes a rotatable valve secured to the outside of the splint and provided with a short flexible inlet tube which can be held between the lips in order to blow air into the splint. Before the tube is removed from the mouth the valve is turned to close it. A disadvantage of inflatable splints now on the market is that they can be overinflated, because there is nothing to indicate when the pressure is becoming excessive. An overinflated splint can be a dangerous thing because it may act like a tourniquet and cut off circulation.

It is among the objects of this invention to provide a device for inflating such a splint, which is provided with a relief valve that will open when a predetermined pressure is reached and thereby prevent overinflation. Other objects are to provide an inflating device which can be quickly attached to and removed from the inlet tube of an inflatable splint, and through which air can be supplied to the splint either directly from the lungs or from an aspirator bulb, a pump or a pressurized can of air.

In accordance with this invention, my inflating device has a tube for detachable connection with the air inlet of an inflatable splint. Means are provided for forcing air through the tube into the splint and for preventing escape of air from the splint during inflation. Overinflation is prevented by means of a relief valve connected with the tube. Preferably, the tube is provided with two inlets, one of which is formed to be blown into by the mouth and the other of which is connected with mechanical means for inflating the splint.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which

FIG. 1 is a side view of an inflated splint with my inflating device attached to it; and

FIG. 2 is an enlarged fragmentary side view of the apparatus with the inflating device shown partly in section.

Referring to the drawings, the splint itself may take various forms, the one shown being a double walled bag **1** of flexible material, such as a plastic. The opposite ends of the bag are adapted to be connected together by a slide fastener **2** after the bag has been wrapped around the part that is to be splinted or bandaged. This forms a double walled sleeve around that part. The outer wall of the splint is provided with an opening in which a valve is mounted. This may be the well-known type of valve in which a hollow core **3** is threaded into an encircling ring **4** fastened to the sleeve. The core projects from the ring and a flexible inlet tube **5** is mounted on it. By turning the tube or core in one direction the core is screwed into the ring to close the valve. When rotated in the opposite direction, the core is backed away from its seat and the valve is opened. Everything described thus far is known and on the market.

It is a feature of this invention that an inflating device is provided, which can be quickly attached to and removed from inlet tube **5** in order to supply air at a predetermined maximum pressure to the inflatable splint. Accordingly, a rigid tube **7** is provided at its front end with a barbed nozzle **8** (FIG. 2) that can be inserted in

the inlet tube to hold the two tubes together. The rigid tube preferably has a generally Y shape to provide it with two inlets **9** and **10**. One of these inlets **9** is adapted to be blown into by the person applying the splint. For this purpose, a short mouth tube **12** is provided. To prevent air from escaping through this tube every time the person inflating the splint inhales, inlet **9** is provided with a check valve. This check valve may be formed from a short tubular housing **13** projecting from the inlet and provided with an inwardly facing valve seat **14**. Inside the housing there is a ball **15** that normally is pressed against the seat by a coil spring **16** that engages the end of tube **7**. The mouth tube **12** fits around the valve housing.

As it is desirable to be able to inflate the splint by a bulb, pump, pressurized can of air or the like, the other inlet **10** of the rigid tube is provided with a coupling **18** for connecting such a device to the tube. The inflator shown is an aspirating bulb **19** that is fastened to the coupling. The coupling may be provided with an inwardly facing valve seat **20**, against which a ball **21** normally is held by the air pressure in the splint during inflation. The ball can be retained in the coupling by a pin **22** extending across the coupling and mounted therein. The bulb can be used for complete inflation of the splint, or the splint can be blown up to some extent through the mouth tube and then the bulb used to complete the inflation at the higher pressure.

To prevent overinflation of the splint, the inflating device is provided with a relief valve. This can be done by providing one side of the tube with an outlet port **24**, from which a tubular housing **25** projects outwardly. The inside of this housing is provided with an outwardly facing valve seat **26** around the port. This seat normally is engaged by a ball **27** held against it by a coil spring **28** compressed between the ball and a washer **29** pressed into the outer end of the housing. A spring is used that will hold the ball against its seat until an air pressure in the tube and splint has been produced which has been determined to be sufficient for proper functioning of the splint, but yet which is not great enough to cause the splint to exert too much pressure for safety on the member it surrounds. Any attempt to increase the air pressure beyond that predetermined point will unseat the ball and allow the excess pressure to escape through the relief valve, thereby avoiding over-inflation. As soon as the user hears air escaping through the relief valve during inflation of the splint, he will know that the splint is fully and properly inflated. Thereupon, he can turn the hollow valve core **3** to close the splint valve, after which the inflating device nozzle can be pulled out of inlet tube **5** and the device laid aside or used for inflating another splint.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. An inflating device for an inflatable splint that is adapted to surround an injured limb and is provided with an air inlet, the inflating device comprising a tube provided with means for detachable connection with said inlet, the tube also being provided with two inlets, one of the tube inlets being formed to be blown into by the mouth means for forcing air through the other tube inlet into the splint, a check valve associated with said one tube inlet for preventing escape of air from the splint during inflation, and a relief valve connected with said tube to limit the air pressure in the splint.

2. An inflating device according to claim 1, in which said air-forcing means includes aspirating means having an aspirator bulb and a check valve.

3. An inflating device for an inflatable splint that is adapted to surround an injured limb and is provided with an air inlet, the inflating device comprising a tube provided with means for detachable connection with said inlet, said tube having two inlets, one of the tube inlets having an inwardly facing valve seat therein, a ball for the seat, a spring normally holding the ball against the seat, a mouth tube attached to said one inlet for blowing up the splint, means connected to the other tube inlet for also inflating the splint, said means including a check valve, and a relief valve connected with said tube to limit the air pressure in the splint.

4. The combination with an inflatable splint adapted to surround an injured limb and provided with an air inlet valve having a short resilient inlet tube projecting outwardly therefrom, of an inflating device comprising a rigid tube having a nozzle inserted in said inlet tube and tightly gripped thereby, said rigid tube having two inlets, a squeeze bulb connected to one of the tube inlets for forcing air through the rigid tube into the splint, a check valve connected with the rigid tube for preventing return

of air from the splint to the bulb when the bulb is released, a mouth tube attached to the other of said tube inlets to permit the splint to be inflated by blowing into it, a check valve associated with said mouth tube for preventing escape of air outwardly therethrough, and a relief valve connected with said rigid tube to limit the air pressure in the splint to a predetermined value, said nozzle being removable from said inlet tube after said splint inlet valve has been closed.

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