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VALVE STEMLESS INNER TUBE, SELF SEALING SECTION AND THE LIKE

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Fig. 1.



Fig. 2.

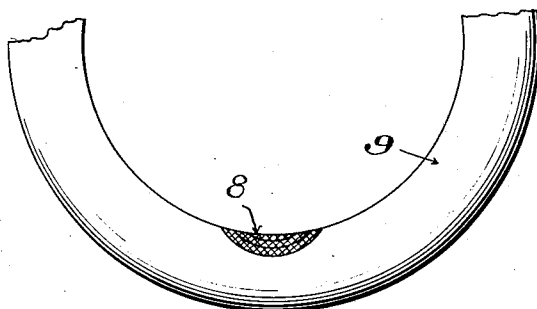
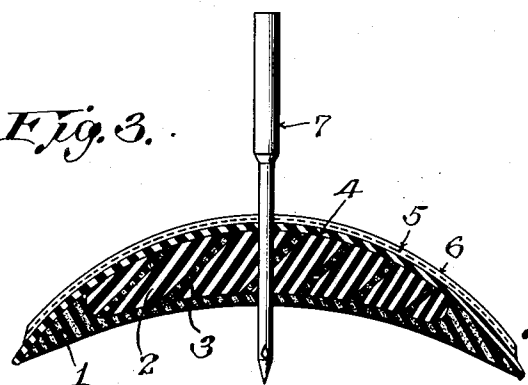


Fig. 3.



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VALVE STEMLESS INNER TUBE, SELF-SEALING SECTION AND THE LIKE

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3 Claims. (Cl. 152-12)

This invention relates to inner tubes and puncture sealing sections thereof, and aims particularly to improve the construction of such puncture sealing sections, thereby to provide for repeated puncturing and resealing thereof, as occurs in the case of a valve-stemless innertube inflated by means of a hollow needle pushed through its self-sealing wall.

In the accompanying drawing illustrating one mode of applying my invention for purposes of illustrating the same:

Fig. 1 illustrates a needle of the type used in inflating innertubes embodying a self-sealing section according to my invention;

Fig. 2 illustrates the application to an innertube of a small self-sealing section according to my invention; and

Fig. 3 is a detailed sectional view through an innertube embodying a self-sealing section according to my invention, and showing an inflating needle inserted therethrough.

Referring to the embodiment of self-sealing section according to my invention shown in Fig. 2 and in detail in Fig. 3, it will be seen that this illustrative embodiment (indicated generally at 8 in Fig. 2) is constituted by an internal assembly 1, 2, 3 and an external assembly 5, 6, suitably secured on opposite sides of the wall 4 of an ordinary innertube, indicated at 9 in Fig. 2.

As shown in Fig. 3, the internal assembly consists of a gum-rubber body 1 comprising the inner wall of the section, a raw-rubber body 2 embraced therein, and gum-rubber strips 3 separating the raw-rubber body 2 into sections, which strips 3 are positioned at an incline of about 45°, as shown, for the purpose hereinafter set forth; and this internal assembly is suitably secured to the body 4 of the innertube in any suitable manner, as by vulcanization of the gum-rubber body 1 to the tube wall 4.

The external assembly of the embodiment shown consists of a cloth reinforcing member 5 and a reinforcing rubber layer 6 vulcanized on over the cloth, and secured, as shown, in superposed relation to the internal assembly on the other side of the innertube wall 4. The cloth reinforcing member 5 is preferably of coarse-mesh construction, so that an inflating needle, such as that shown in Fig. 1, may readily pass between the meshes of the cloth during inflation of the inner tube. The cloth reinforcing member 5 prevents the innertube from bulging through the valve stem hole of the ordinary automobile wheel rim when the innertube and a suitable casing are mounted thereon, and the reinforcing rubber

layer 6 also reinforces the innertube at the valve stem hole and protects the cloth layer 5 from moisture and friction.

It is sufficient, according to my invention, to construct inflation sections embodying this construction of a relatively small size, if care is to be taken to align the section with the valve stem hole in mounting the tube and casing on a rim, and to facilitate mounting under these conditions I preferably make the reinforcing rubber layer 6 of a different color from the inner tube wall 4, and preferably make the inflation section about three inches by six inches in size, although the size of this section is obviously a matter of choice and convenience.

My preferred construction is particularly advantageous because it employs, with the sealing rubber 2, the angularly arranged gum-rubber strips 3. As indicated in Fig. 3, the insertion of a needle 7, similar to that shown in Fig. 1 and described hereinafter, punctures the vulcanized walls 6 and 4 and the gum-rubber walls 3 and 1, and upon withdrawal of the needle 7, the air pressure on the gum-rubber wall 1 causes the raw-rubber 2 to flow into the holes thus formed and seal the same. Furthermore, the use of gum-rubber in the body 1 and strips 3 insures a maximum tendency of these parts to seal readily because of the extreme elasticity and tenacity of the gum rubber. Moreover, in the event that after a number of punctures the sealing rubber 2 is forced out of the cells defined by the strips 3, the air pressure will press down against the gum-rubber body 1 and press the gum-rubber strips 3 between the same and the innertube wall 4, and because of the diagonal disposition of the partitions 3, the holes therethrough (which will be very small because these members are formed by gum-rubber), after collapse of the internal assembly by the air pressure, will not coincide with the other holes formed by the needle, so that the diagonal strip will constitute a sealing wall over such other holes assisting the raw rubber flowing into the same to seal them.

As above mentioned, I have indicated at Fig. 1 a preferred form of inflation needle, which is preferably constructed so that it may be screwed into the end of an ordinary pump hose or be used with an air chuck. As indicated in Fig. 1, the needle is preferably provided with a lateral hole 11 adjacent its forward end communicating with the valve end 10 by a passage provided with an ordinary check-valve, as shown. The valve needle is preferably made with a shoulder about three inches from its point to prevent the needle

from entering too far into the tube being inflated, to thus avoid puncturing of the wall of smaller sized innertubes opposite from the inflation section.

5 When the innertube is inflated it will close up the valve stem hole entirely, thus preventing the moisture from entering through the valve stem hole and rusting the rim and rotting the inner-
10 tube and bead of the casing. With the valve stem eliminated, the tire may be removed from the wheel 100% easier than with the old style innertube with the valve stem. This device also eliminates the pulling the valve stem out of the
15 innertube in case the tire is deflated while car is in motion. It also prevents punching holes in the opposite side of the innertube with the valve stem, and prevents breaking the cords in the casings and punching holes in them if the
20 tire happens to be deflated while the car is in motion. This device also eliminates leaky valves caused by the constant jar of the wheel and sand that may be forced into the valve by centrifugal force of the turning wheel.

I therefore claim:

25 1. In an article of manufacture adapted to be inflated by pneumatic pressure; a valve consisting of an internal assembly secured to the in-

terior of the wall of the article, said assembly comprising a gum-rubber wall, a body of self sealing rubber lying between said gum-rubber wall and the wall of the article, and gum-rubber partitions or strips separating the body of self-
80 sealing rubber into sections and arranged at an angle to the said walls, substantially as and for the purposes described.

2. A device according to claim 1, further comprising an external assembly secured on the exterior of the wall of the article in superposed
85 relation to the internal assembly, said external assembly comprising a reinforcing cloth layer and a reinforcing rubber layer vulcanized on over said cloth layer, substantially as and for the pur-
90 poses described.

3. A device according to claim 1, further comprising an external assembly secured on the exterior of the wall of the article in superposed
95 relation to the internal assembly, said external assembly comprising a reinforcing cloth layer and a reinforcing rubber layer vulcanized on over said cloth layer, said cloth layer being of coarse mesh material to facilitate the passage of an
100 inflating needle through its meshes, substantially as and for the purposes described.

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