Sept. 18, 1934. J. C. CROWLEY 1,973,799

VALVE CAP

Filed May 14, 1932

Fig. 1.

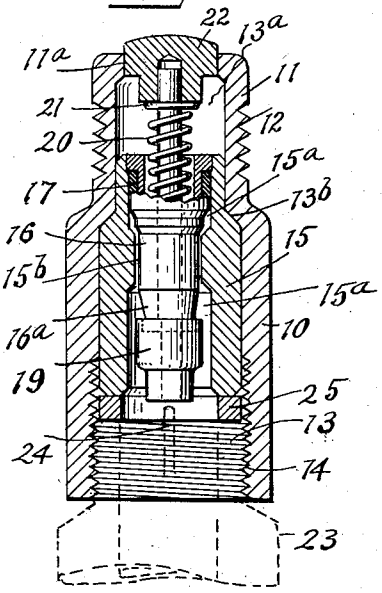


Fig. 2.

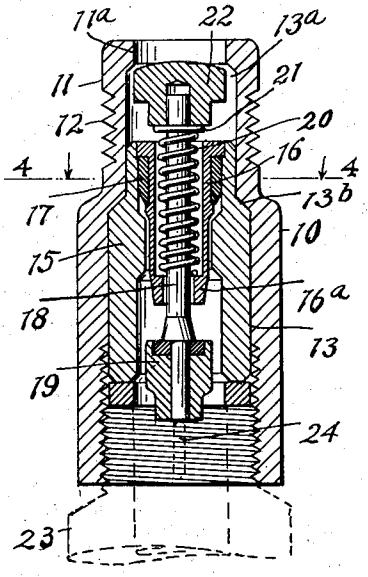


Fig. 3.

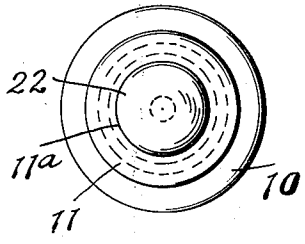
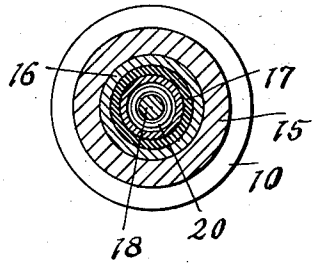


Fig. 4.



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Patented Sept. 18, 1934 1,973,799

UNITED STATES PATENT OFFICE

1,973,799

VALVE CAP

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Application May 14, 1932, Serial No. 611,322

1 Claim. (Cl. 152—12)

This invention relates to a valve cap and particularly to a valve cap that is especially suitable for use upon the valve stems of pneumatic tires.

It has been common practice to provide caps for the ends of the valve stems of pneumatic tires for the purpose of excluding dust, water, or other foreign matter from the interior of the valve stems which would prove injurious to the valve insides that are arranged in the stems and would have a tendency to render such insides inefficient or inoperative, with a resulting leakage of air from the pneumatic tire. The ordinary form of dust cap must be removed to permit the tires to be inflated, or pressure readings of the same to be taken, and it frequently happens that such caps are lost as the user forgets to replace the same after inflating the tire or taking a pressure reading thereof.

The main object of the present invention is to provide a cap for use upon valve stems, such as the standard valve stem of a pneumatic tire, which will efficiently exclude dirt, moisture and other foreign substances from the interior of the valve stem, but which does not have to be removed from the valve stem to permit the inflation or deflation of the tire, or the taking of a pressure reading thereof.

Another object is to provide a cap of the character specified in the first mentioned object which is of simple and economic construction.

Additional and further objects of the invention will become apparent hereinafter during the following detailed explanation of an embodiment thereof, such embodiment being illustrated in the accompanying drawing, wherein,

Figure 1 is a longitudinal sectional view through the cap, a portion of the valve stem with which the cap is to be used being illustrated in said figure in dotted lines, and the valve within the cap being in the seated or closed position;

Fig. 2 is a view similar to Fig. 1, but illustrating the valve within the cap as having been moved to the open position;

Fig. 3 is a top plan view of the valve cap illustrated in Fig. 1; and

Fig. 4 is a transverse sectional view taken substantially on line 4—4 of Fig. 2, looking in the direction of the arrows.

The valve cap comprises an outer shell member 10 provided at one end with a reduced nipple portion 11 exteriorly threaded, as indicated at 12. The member 10 is provided with a bore 13 extending therethrough, the portion 13*a* of said bore, that lies within the reduced nipple 11, being of reduced diameter, while the opposite end of the bore is threaded, as indicated at 14. The interior diameter of the bore 13 adjacent the threaded portion 14 thereof is such that the cap may be screwed upon the externally threaded reduced nipple of the standard valve stem, while the external diameter of the reduced nipple 11 of the member 10 substantially corresponds to the external diameter of the nipple of the standard valve stem, in order to receive thereupon the usual or conventional form of air chucks used in inflating pneumatic tires. An inner shell member 15 is pressed into the outer shell member 10 and has a reduced extension at one end projecting into the portion 13*a* of the bore 13, it being noted that the tapered portion 13*b* of the wall of the bore 13 fits against a similarly tapered portion of the inner shell member 15.

The usual valve insides comprises a barrel to the outer end of which is swivelly connected an exteriorly threaded plug member to enable the insides to be screwed into the standard valve stem. It is proposed to employ in the present valve cap a standard form of valve insides in which the exteriorly threaded swivel plug is omitted. That is, the barrel only of the insides will be used in the present valve cap.

Referring to the drawing, the barrel of the valve insides is indicated at 16 and such barrel is pressed into the bore through the inner shell member 15, it being noted that said bore comprises enlarged portions 15*a* adjacent each end of the member 15 that are connected by a reduced portion 15*b* intermediate the ends of said member. The barrel 16 is pressed into the inner shell member 15 until the external gasket 17 on the barrel is in air sealing engagement with the wall of the portion 15*a* through the member 15, while that portion of the barrel, forming the valve seat for the insides and indicated at 16*a*, extends through the portion 15*b* of the bore and into the other enlarged portion 15*a* thereof. The usual valve pin 18 extends through the valve insides and is provided at its lower end with the valve proper 19 that is normally held seated against the valve seat portion 16*a* of the barrel 16 by means of the valve spring 20 arranged on the pin 18 and abutting at one end an internal shoulder formed in the barrel 16 and at its opposite end a washer 21 secured to the valve pin. A headed button 22 is secured upon the outer end of the valve pin 18 and is of such size that the headed end thereof will have a snug fit in the opening at the outer end of the nipple portion 11 of the member 10, that is formed by an inturned annular flange 11*a* on the end of the

nipple. When the valve 19 is seated, the head portion of the button 22, as previously explained, will be located in the opening at the end of the nipple 11 and will effectively close said opening, it being noted that the button 22 will project slightly beyond the end of the nipple to enable the same to be depressed when desired. A portion of a standard valve stem is indicated at 23 in Figs. 1 and 2, while the outer end of the valve pin 24 of the valve insides, arranged in the stem 23, is also indicated in said figures.

The valve cap is applied to the valve stem 23 by screwing the same upon the reduced nipple at the end of the valve stem, such nipple, of course, extending into the bore 13 with its external threads mating with the threads 14 of the bore. A suitable gasket 25 is arranged in the valve cap, so as to be compressed between the inner end of the member 15 thereof and the outer end of the stem 23, such gasket being either of rubber or other flexible material, or, if desired, being formed of metal.

Referring to Fig. 1 it will be noted that, when the valve 19 is seated on its seat 16*a*, the lower end of the valve and of the pin 18 are not in engagement with the valve pin 24 of the insides carried by the stem 23 and that, therefore, the valve of the insides in the stem will be seated. It will also be noted that the opening at the outer end of the valve cap is sealed by the button 22. When it is desired to inflate the tire, or to take a pressure reading thereof, the air chuck at the end of an air line or the air chuck of a pressure gauge is positioned upon the nipple 11 of the valve cap and the button 22 is depressed, as indicated in Fig. 2. The depression of the button 22 in turn unseats the valve 19 and causes the latter to engage with the valve pin 24 of the valve insides in the stem to unseat the valve carried by said pin. When this relationship of the parts takes place it will be clear that a continuous passageway is provided for the incoming air to pass into the pneumatic tire or for the air in the tire to pass to the pressure gauge as the case may be.

It will be seen that the present construction provides a cap which adequately protects the interior of the valve stem from dirt, moisture, or other substances and which does not have to be removed in order to inflate the tire or to take a pressure reading thereof. It will further be noted that the valve cap is of simple construction and employs as a principal part thereof a portion of the conventional valve insides that are used in the standard valve stem, wherefore, there are substantially no additional difficult parts to be manufactured in producing the valve cap other than are made in connection with the standard valve stem and valve insides, with the exception of the members 10 and 15 which can be manufactured very simply.

Although a preferred embodiment of the invention has been illustrated and described herein, it will be understood that the same is susceptible of various modifications and adaptations within the scope of the appended claim.

Having thus described my invention, I claim:

In a valve cap, in combination, a tubular shell member interiorly threaded adjacent one end to adapt said member to be secured to a valve stem and provided with a threaded nipple at its opposite end of an external diameter substantially equal to the internal diameter of the interiorly threaded end, said nipple being provided at its outer end with a restricted opening, a second tubular shell member of less length than the first named member fitted therein and having a bore receiving a valve comprising a barrel having a valve seat, a valve proper, and a valve pin extending through said barrel to adjacent the restricted opening in said nipple, and a button on said pin normally closing said restricted opening, said barrel having an air-tight seal with the wall of said bore.

JOHN C. CROWLEY.