Dec. 29, 1931. J. S. REID 1,838,636

NECK AND CLOSURE STRUCTURE

Filed Feb. 7, 1929

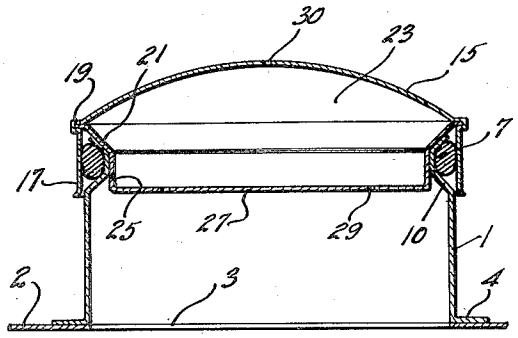


FIG. 1

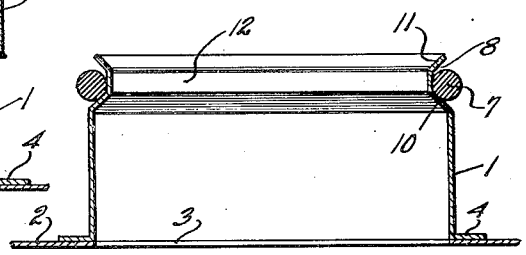


FIG. 2

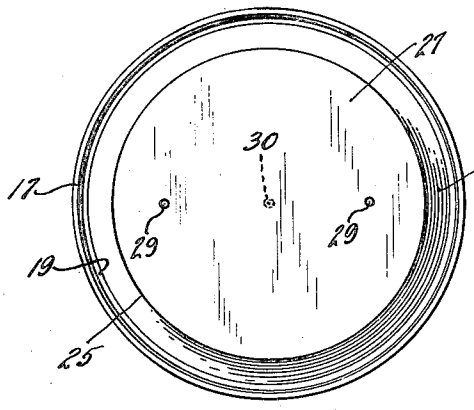


FIG. 3

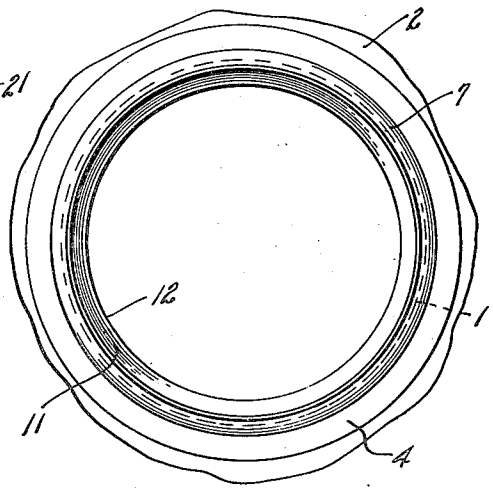


FIG. 4

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UNITED STATES PATENT OFFICE

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NECK AND CLOSURE STRUCTURE

Application filed February 7, 1929. Serial No. 338,136.

This invention relates to a neck and closure structure of the type having a tubular neck and a removable closure for one end thereof. More particularly, the invention relates to a neck and closure structure of this type where, for one reason or another, a seal is desired or required between the neck and the closure, such as in the neck and closure structures of automobile radiators and automobile gasoline tanks. Heretofore, seals for such structures have been produced by annular gaskets of cork or like material having the necessary resiliency but with the disadvantage of being more or less rapidly deteriorated if subjected to certain liquids or solutions, such as some of the anti-freezing solutions put into automobile radiators in the wintertime.

The general object of the present invention is the provision of an improved neck and closure structure of this type wherein cooperating metal portions of the neck and the closure provide the necessary or desired seal, so that the easily deteriorative cork gasket is dispensed with; wherein simple and improved means is provided for enabling the closure to be easily and quickly connected to and disconnected from the neck; and wherein the several parts are simple and inexpensive to manufacture and convenient to assemble.

Further objects of the invention are in part obvious and in part will appear more in detail hereinafter.

In the accompanying drawings, Fig. 1 is a central vertical sectional view of a neck and closure structure embodying the present invention; Fig. 2 is a central vertical sectional view of the neck of said structure; and Figs. 3 and 4 are respectively a bottom plan view and a top plan view of the closure of said structure.

The neck of the present structure is a one piece sheet metal member and includes a tubular body portion 1 which may be an integral part of an automobile radiator, fuel tank or other receptacle 2, or separate therefrom and suitably secured thereto around the opening 3 thereof, the latter arrangement being here shown with said body portion provided at its lower end with a laterally extending annular flange 4 for welding or other suitable securement to the receptacle 2. Surrounding the upper end of said neck body portion, which is the end to be closed, is a binding ring 7, of rubber or other yielding material, said ring lying within an annular groove 8 of said body portion. Said groove is formed by the lower, inwardly and upwardly extending annular portion 10; the upper, outwardly and upwardly extending annular portion 11; and the intermediate, vertically disposed annular connecting portion 12. Said upper inclined portion 11 is the sealing portion of the neck, and with the inner surface of said portion cooperates the sealing portion of the closure now to be described.

The present closure comprises two sheet metal members, a body member and a sealing member. Said body member includes a top portion 15, which may be of dome shape, as shown, and a depending cylindrical skirt portion 17 having a diameter which enables it to snugly surround the upper end portion of the neck, the binding ring 7 of the neck being slightly compressed by said skirt portion and thereby serving to frictionally maintain the closure connected to the neck, as will be readily understood.

The closure sealing member has a top portion 19 by means of which it is connected to the closure body member and a sealing portion 21 for cooperative engagement with the sealing portion 11 of the neck. In the present embodiment of the invention, said top portion 19 is an annular flange having its outer edge crimped to the closure body member at the junction of the top and skirt portions thereof and the sealing portion 21 is an annular portion inclined downwardly and inwardly from the inner edge of said flange, the inclination of said sealing portion corresponding, of course, to the inclination of the sealing portion 11 of the neck.

The closure is removably secured to the neck by pressing the closure skirt portion 17 down around the upper end of the neck, which causes the binding ring 7 of the neck to be compressed between said closure skirt portion and the groove wall parts 10, 11 and 12 of the neck body portion. At the same

time, the tapered closure sealing portion 21 enters the neck and firmly engages the tapered neck sealing portion 11, thereby providing a tight seal between the closure and the neck. To remove the closure, it is only necessary to grasp the body member thereof and pull it from the neck, perhaps slightly twisting or rotating the closure relative to the neck, as will be readily understood.

If desired, and as shown, the closure sealing member may be provided with a transverse wall to close the air chamber 23 of the closure. In the present embodiment of the invention, said sealing member is provided with a cup shaped extension, the cylindrical side portion 25 of which is of such size as to more or less snugly engage the neck portion 12 and the circular bottom portion 27 of which serves as the bottom wall of the air chamber 23. For venting purposes, said bottom portion 27 is provided with one or more openings 29 which establish communication between the inside of the neck and hence the inside of the receptacle 2 with the closure air chamber 23 and the top portion 15 of the closure body member provided with one or more openings 30 which establish communication between the closure air chamber and the outside atmosphere.

What I claim is:

1. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck being provided within its end to be closed with an annular metal sealing portion and said closure being provided with an annular metal sealing portion for cooperative engagement with the sealing portion of said neck, said closure being also provided with a depending skirt portion and said neck being provided exteriorly at its end to be closed with means for cooperation with said closure skirt portion to enable the closure to be removably connected to the neck.

2. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck being provided within its end to be closed with an annular metal tapered sealing portion and said closure being provided with an annular metal tapered sealing portion for cooperative engagement with the sealing portion of said neck, said closure being also provided with a depending skirt portion and said neck being provided exteriorly at its end to be closed with means for cooperation with said closure skirt portion to enable the closure to be removably connected to the neck.

3. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck being provided within its end to be closed with an annular metal sealing portion and said closure being provided with an annular metal sealing portion for cooperative engagement with the sealing portion of said neck, said closure being also provided with a depending skirt portion and said neck being provided exteriorly at its end to be closed with a binding ring for frictional securing engagement with said closure skirt portion, whereby said closure can be removably secured to said neck.

4. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck being provided within its end to be closed with an annular metal tapered sealing portion and said closure being provided with an annular metal tapered sealing portion for cooperative engagement with the sealing portion of said neck, said closure being also provided with a depending skirt portion and said neck being provided exteriorly at its end to be closed with a binding ring for frictional securing engagement with said closure skirt portion, whereby said closure can be removably secured to said neck.

5. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck at its end to be closed having a portion pressed inwardly to form an annular metal ridge which in turn provides an exterior annular groove, a yieldable binding ring arranged in said groove, said closure being provided with a skirt portion for telescopic relation with the end of the neck to be closed and for frictional securing engagement with the binding ring of said neck, whereby said closure can be removably secured to said neck, said closure being also provided with an annular metal sealing portion for cooperative engagement with the inwardly extending ridge of said neck.

6. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck at its end to be closed having a portion pressed inwardly to form an annular metal ridge which in turn provides an exterior annular groove, a yieldable binding ring arranged in said groove, said closure being provided with a skirt portion for telescopic relation with the end of the neck to be closed and for frictional securing engagement with the binding ring of said neck, whereby said closure can be removably secured to said neck, said closure being also provided with an annular metal tapered sealing portion for cooperative engagement with the inwardly extending ridge of said neck.

7. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck at its end to be closed having a portion pressed inwardly to form an annular ridge which in turn forms an exterior annular groove, a yieldable binding ring arranged in said groove, the upper portion of said ridge being inwardly tapered, said closure being provided with a skirt porton for telescopic relation with the end of the neck to be closed and for frictional securing

engagement with the binding ring of said neck, whereby said closure can be removably secured to said neck, said closure being also provided with an annular metal tapered sealing portion for cooperative engagement with the inwardly extending ridge of said neck.

8. A neck and closure structure, comprising a tubular neck and a removable closure for one end thereof, said neck at its end to be closed having an annular part bent inwardly and upwardly, an annular part bent upwardly and an annular part bent upwardly and outwardly, said three parts forming an exterior annular groove, a yieldable binding ring arranged in said groove said closure being provided with a skirt portion for telescopic relation with the end of the neck to be closed and for frictional securing engagement with the binding ring of said neck, whereby said closure can be removably secured to said neck, said closure being also provided with an annular metal sealing portion for cooperative engagement with the upwardly and outwardly extending part of said neck.

In testimony whereof I hereby affix my signature.

JAMES S. REID.