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(54) Metering device to be applied on flexible wall bottles and the like and adapted to nebulize the metered liquid.

(57) The nebulizing device comprises a plug member adapted to operate as a reducing member and provided with a tubular member ending with a top nozzle and provided,on the inner surface of its wall,with longitudinal ridges formed at symmetric positions,within the tubular member there being arranged an elongated structure fitted at the end of a small tube immersed in the bottle containing the liquid to be nebulized.

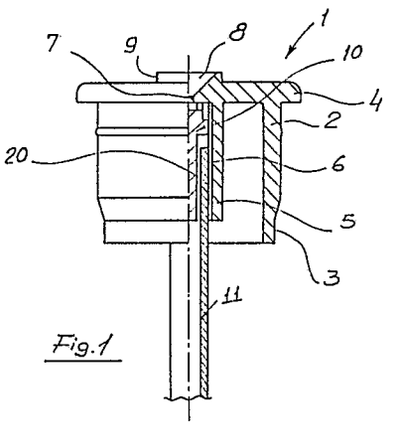

Fig.1

EP 0 310 569 A2

Description

METERING DEVICE TO BE APPLIED ON FLEXIBLE WALL BOTTLES AND THE LIKE AND ADAPTED TO NEBULIZE THE METERED LIQUID

BACKGROUND OF THE INVENTION

The present invention relates to a metering device to be applied to bottles and the like, having flexible walls and adapted to nebulize the supplied liquid.

As is known,liquid must be sometimes supplied in nebulized form, that is as very small droplets dispersed within a gaseous phase.

Also known is the fact that nebulizing devices are presently available which,however,have a rather complex structure which negatively affects the cost of the nebulizing device and requires frequent maintenance and replacement operations.

SUMMARY OF THE INVENTION

Accordingly, the task of the present invention is to overcome the above mentioned drawbacks by providing such a nebulizing device, to be applied to flexible bottles and the like,which is very simple construction-wise and has a very reduced cost.

Within the scope of the above mentioned task, a main object of the present invention is to provide such a neublizing device which comprises a very reduced number of component parts and which is very reliable in operation.

Another object of the present invention is to provide such a nebulizing device which is devoid of any wearable movable parts.

According to one aspect of the present invention the above mentioned task and objects,as well as yet other objects,which will become more apparent hereinafter,are achieved by a nebulizing device, to be applied to flexible wall bottles and the like, characterized in that said nebulizing device comprises a plug member,adapted to operate as a reducing member and provided,at its axis,with a tubular member ending with a top nozzle and provided, on the inner surface of its wall,with longitudinal ridges formed at symmetric positions,within said tubular member there being arranged an elongated structure fitted at the end of a small tube immersed in the vessel of the liquid to be nebulized,having longitudinal slots and being provided with a shaped head adapted to operate as a vortex generating member to intimately mix said liquid and the air sucked therewith.

BRIEF DESCRIPTION OF THE DRAWINGS

Futher characteristics and advantages of the neublizing device according to the present invention will become more apparent hereinafter from the following detailed description of a preferred embodiment thereof which is illustrated,by way of an indicative but not limitative example,in the figures of the accompanying drawings,where:

figure 1 is a partial cross-sectional view illustrating the nebulizing device according to the present invention; and

figures 2,3 and 4 are respectively a side view and two cross-sectional top views illustrating the vortex generating member included in the nebulizing device according to the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the figures of the accompanying drawings,the nebulizing device, to be applied to flexible bottle and the like according to the present invention,comprises a plug member,indicated at the reference number 1,and adapted to operate as a reducing member.

This plug member,in particular,consists of a box-like body (2) having a shape and size which depend on those of the mouth of the vessel thereon said plug member must be applied,and being provided with a tapering bottom portion 3 and a top projecting edge 4.

The plug member is coaxially provided with a tubular member 5 which is provided,at the inner face of its wall,with longitudinal ridges which are formed at preferably symmetric positions and are adapted to define corresponding slotted longitudinal portions 9.

The tubular member ends with a top nozzle 7 opening on a frustum of cone shaped cavity 8 which is formed on a projecting round portion 9 provided at the center of the mentioned box-like body,at said tubular member.

Inside the tubular member there is provided an elongated structure,indicated overally at the reference number 10,which is in turn fitted at the top of a small tube 11 immersed in the vessel of the liquid to be nebulized.

The mentioned elongated structure essentially consists of a stem 12 ending,at the bottom thereof, with a preferably ogival portion 13,and being provided with longitudinal ridges 14 having a top abutment 15 adapted to engage on the edge of the mentioned small tube.

At its top portion the stem bears a cylindrical portion 16 thereabove a disk member 17 is arranged said disk member being provided with discontinuous perimetrical ridges 18 defining corresponding slots 19 which are arranged on the extensions of the longitudinal ridges 14.

The mentioned cylindrical portion,in particular, has a cross-section which depends on that of the tubular member 5 so as it is engaged by friction in said tubular member.

Owing to the mentioned constructional features, as the flexible walls of the vessel or bottle containing the liquid to be nebulized are pressed, the liquid will flow along the stem 12, through the gaps 20 defined by the ridges 14.

Contemporaneously,air will flow upwardly along the gaps 6 and will be mixed with the liquid so as to arrive at the bottom of the mentioned disc like member 17.

Then the liquid-air mixture will enter,through the slots 19,the chamber defined by the ridges 18, thereby the inlet flows will impact to break the liquid

to be nebulizing into a lot of very small droplets which will be ejected through the mentioned nozzle 7.

From the above disclosure it should be apparent that the invention fully achieves the intended task and objects.

While the invention has been disclosed and illustrated with reference to a preferred embodiment thereof,it should be apparent that the disclosed embodiment is susceptible to several modifications and variations all of which will come within its spirit and scope.

Claims

1- A nebulizing device, to be applied to flexible wall bottles and the like, characterized in that said nebulizing device comprises a plug member, adapted to operate as a reducing member and provided, at its axis,with a tubular member ending with a top nozzle and provided,on the inner surface of its wall, with longitudinal ridges formed at symmetric positions, within said tubular member there being arranged an elongated structure fitted at the end of a small tube immersed in the bottle or vessel of the liquid to be nebulized,having longitudinal slots and being provided with a shaped head adapted to operate as a vortex generating member to intimately mix said liquid and the air sucked therewith.

2- A nebulizing device according to the preceding claim,characterized in that said plug member consists of a box-like body having a shape and size depending on those of the mouth of said vessel or bottle thereon said nebulizing device must be applied and being provided with a bottom tapering portion and a top projecting edge said longitudinal ridges formed on the inner face of said tubular member defining slotted portions.

3- A nebulizing device according to the preceding claims,characterized in that said tubular member ends with a top nozzle opening on a frustum of cone shaped cavity,provided in a projecting round portion arranged at the center of said box-like body,at said tubular member,an elongated structure being moreover provided fitted inside said tubular member,said elongated structure being in turn fitted to the top of a small tube immersed in the bottle or vessel of the liquid to be nebulized.

- A nebulizing device according to one or more of the preceding claims,characterized in that said elongated structure essentially consists of a stem ending,at the bottom thereof,with an ogival portion and being provided with longitudinal ridges having a top abutment adapted to be engaged on the edge of said small tube,said stem supporting,on the top thereof, a cylindrical portion thereabove a disc like member is arranged,said disc like member being provided with discontinuous perimetrical ridges defining corresponding slots arranged on the extensions of said longitudinal ridges.

5- A nebulizing device according to one or more of the preceding claims,characterized in that said cylindrical portion has a cross section which depends on the cross section of said tubular member coaxial with said box-like structure so as to be engaged by friction with said tubular member.

6- A nebulizing device according to one or more of the preceding claims,and substantially as broadly disclosed and illustrated in the preceding disclosure and figures of the accompanying drawings for the intended task and objects.

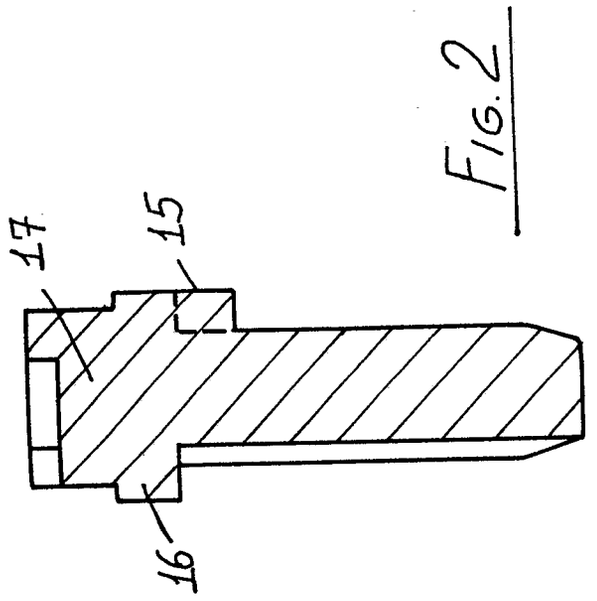

FIG. 2

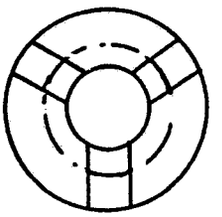

FIG. 4

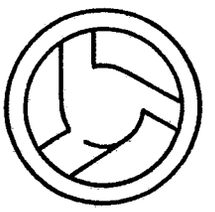

FIG. 3

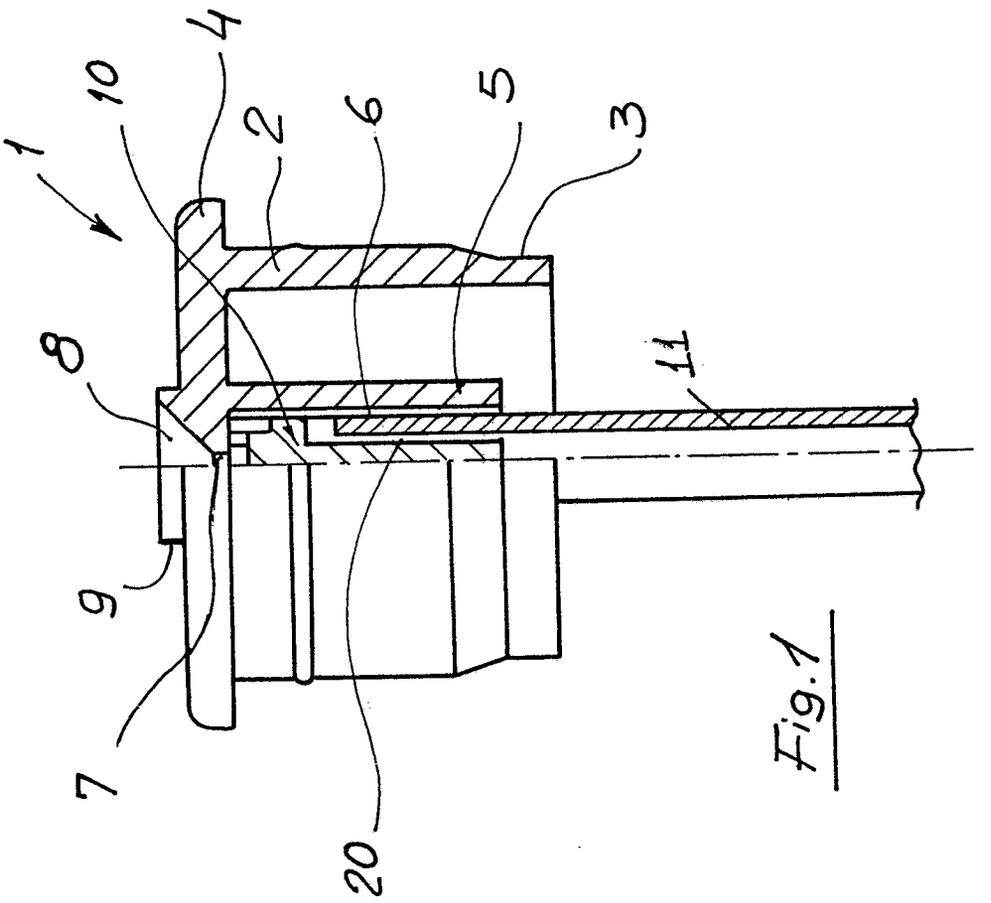

Fig. 1