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LIQUID DETERGENT DISPENSING SHOWER FIXTURE

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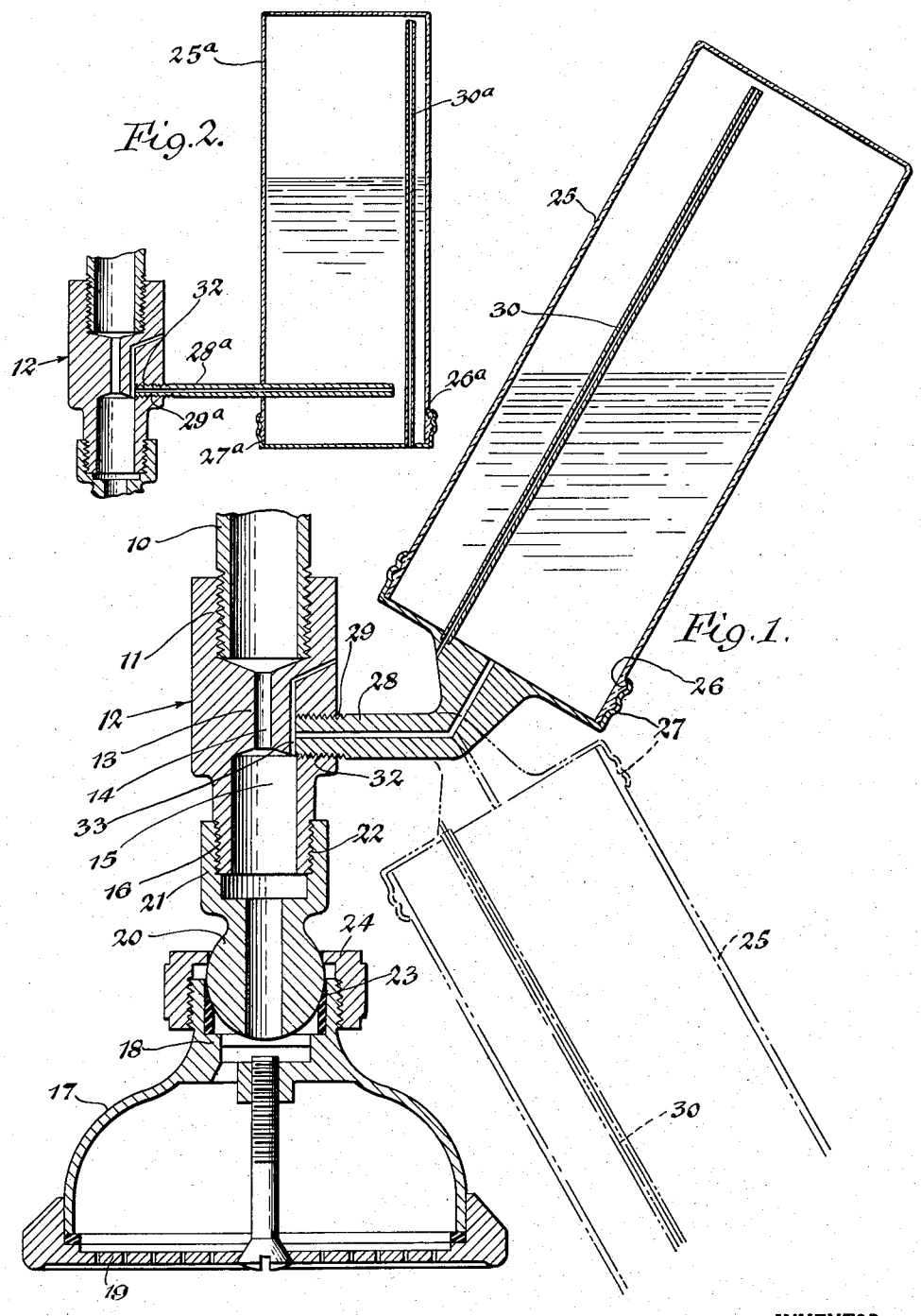

Fig. 2.

Fig. 1.

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LIQUID DETERGENT DISPENSING SHOWER FIXTURE

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1 Claim. (Cl. 261—18)

This invention relates to a liquid detergent dispensing shower fixture and more particularly to such a fixture for producing a cleansing foam by the mixture of water, air and a liquid detergent for bathing purposes and it has the object to produce a device of this character which is extremely simple and inexpensive in construction and capable of being easily installed in connection with the standard plumbing now in use and which can be readily rendered operative and inoperative for the purpose of either producing a cleansing foam or to discontinue the formation of such foam and merely use plain water for rinsing purposes.

In the accompanying drawings:

Fig. 1 is a vertical section of a shower bathing apparatus embodying this invention and showing in full lines the container adapted to hold a liquid detergent in its elevated operative position, the lowered inoperative position of the container being shown in dot-dash lines.

Fig. 2 is a similar fragmentary view showing a modified form of the invention shown in Fig. 1.

In the following description similar characters of reference indicate like parts in the several figures of the drawings.

In general this apparatus comprises a shower head for supplying water for bathing purpose, and means whereby either a liquid foam producing detergent may be supplied at will to the stream of water, or whereby clear water or a mixture of water and a cleansing detergent may be supplied to the bather.

Referring to Fig. 1, the numeral **10** represents a water supply pipe which in this instance is arranged vertically and adapted to be connected at its upper end with a valved water supply maintained under the usual pressure. The lower end of the water supply pipe **10** is shown as being externally threaded and on this externally threaded end is screwed the threaded upper end **11** of a fitting indicated generally at **12**. This fitting is shown as having a central internal cross wall **13** through which a relatively small coaxial bore **14** extends to project a jet of water into a mixing chamber **15** provided at the lower end of this fitting **12**. The lower end of the fitting **12** is externally threaded, as indicated at **16**.

Below the fitting **12** is arranged a spray head whereby either tap water and a mixture of water, air and liquid detergent can be delivered for bathing purposes. This spray head can be of any suitable construction that shown being constructed as follows:

The numeral **17** represents the shell or hollow body of a spray head which is provided at its upper end with an inlet neck **18** for the water, with or without liquid detergent, while its lower end is provided with a perforated head or plate **19** through which the water is delivered either in the form of a spray or in the form of foam for bathing purposes. The inlet neck of this spray head is connected with the lower or outlet end of the fitting **12** by means of a ball and socket joint whereby the water, with or without liquid detergent, is carried from the fitting **12** to the spray head. This ball and socket joint

permits the spray head to be adjusted into different angular positions as best suit the requirements of the bather. As shown in Fig. 1 this connection between the fitting **12** and the spray head is effected by means of a hollow ball **20** having a tubular neck **21** at its upper end which is connected by means of an internally threaded screw joint **22** with the lower externally threaded end **16** of the fitting **12**, and a spherical socket whereby the spray head turns on this ball and which comprises a lower seat **23** formed on the neck of the spray head and engaging with the lower part of the ball **20** and a clamping nut **24** engaging with the exterior of the ball **20** above its center and connected by means of a screw joint **24** with the neck of the spray head **17**.

The means whereby a liquid detergent may, at will, be added to the stream of water for producing a cleansing foam in accordance with this invention, are constructed as follows:

The numeral **25** represents a container having preferably the form of a bottle which is desirably made of plastic so as to be incapable of being shattered in any normal usage. This bottle is adapted to serve as a reservoir or tank for holding a supply of liquid detergent of a character which when mixed with water and air will produce a cleansing foam. This container is shown as having an end mouth or rim which is externally threaded, as indicated at **26**, and which is normally closed by means of a screw cap **27** through the removal of which the bottle or container can be replenished with the liquid detergent.

This screw cap **27** is also preferably made of plastic and preferably is also formed to provide a laterally extending external hollow stem **28** which is externally threaded, as indicated at **29**, at its end remote from the cap **27**. The cap **27** is also preferably provided with a vent tube **30** which can be formed integrally with the cap and which extends to the end of the bottle or container **25** remote from its threaded open end **26**.

The threaded end **29** of the stem **28** screws into a threaded opening **32** through the side of the fitting **12**. This threaded opening **32** communicates with an air duct **33** the lower end of which is in communication with the mixing chamber **15** and the upper end of which is in communication with the atmosphere.

In use the liquid detergent container **25** can be swung to either be elevated in full line position shown in Fig. 1 in which it is operative to deliver detergent to the water being discharged from the shower head **17** or it can be lowered to its inoperative position as shown by dot-dash lines in Fig. 1 in which position no detergent is delivered to the water delivered by the spray head **17** and also the container can be conveniently removed from the cap **27** for the purpose of refilling the same with liquid detergent.

When the bather desires a foamy water-detergent mixture to issue from the shower head **17**, the bather seizes the container or bottle **25** and swings it from the dot-dash lower inoperative position shown in Fig. 1 to the full line operative position shown in this figure. In this movement the capped container pivots about the screw connection between the threaded end **29** of the stem **28** and the threaded opening **32** in the fitting **12**. When this is done liquid detergent in the bottle or container **25** flows by gravity through the neck or stem **28** and air duct **33** into the mixing chamber **15**. Such flow of detergent is also induced by the suction or subatmospheric pressure created by the jet of water issuing from the central bore **14** of the fitting **12** into the mixing chamber **15**, this jet also serving to draw air in through the air inlet duct **33**. The air, detergent, and water, of course, mix in the mixing chamber **15**, the water, air and liquid detergent becoming thoroughly mingled and agitated in this mixing chamber

and being converted into a mass of cleansing foam or suds which is discharged through the perforated showerhead **17**.

When the bather desires to rinse with clear water, he seizes the container **25** and swings it about the axis of its stem **28** from the full line to the dot-dash line position shown in Fig. 1. In such movement the threads **29** of the stem **28** pivot in the threaded opening **32** of the fitting **12**. With the container **25** in this lowered position the inlet of the stem **28** is out of contact with the liquid detergent in the liquid container **25** and hence no detergent is drawn through this stem **28** into the mixing chamber **15** of the fitting **12**. Accordingly the bather is supplied through the shower ahead **17** with a spray of water which can be slightly aerated through air supplied through the air duct **33**. After the rinsing is complete the bather turns off the customary water valve (not shown) and, with the container **25** in its lowered position, no liquid detergent can leak from the container **25**.

When the quantity of liquid detergent in the container **25** is exhausted, all that is necessary is to unscrew the container **25** from its cap **27**, this being done when the container is in its lowered position shown by dot-dash lines in Fig. 1. The container **25** can then be refilled with liquid detergent following which the container can be rescrewed onto its cap **27**. When this is done the apparatus is ready for operation as above described.

The modified form of the invention shown in Fig. 2, differs from the preferred form shown in Fig. 1 only in that the stem **28***a*, instead of being formed integrally with the cap **27**, is shown as extended through an opening in the wall of the container **25***a* in which opening this stem can be welded. This opening is near the threaded end **26***a* of the container so that the inlet end of the steam **28***a* is close to the screw cap **27***a*. This screw cap can be made of metal and the vent tube **30***a* can be secured to vent through this cap in any suitable manner. The end of the stem **28***a* remote from the container **25***a* is externally threaded, as indicated at **29***a*, and, as with the form of the invention shown in Fig. 1, screws into a threaded opening **32** in the side of the fitting **12**.

It will be seen that the operation of the form of the invention shown in Fig. 2 is identically the same as with the form of the invention shown in Fig. 1 and hence this description is not repeated, the corresponding parts having been distinguished by the suffix "*a*."

From the foregoing it will be seen that the present invention provides a shower head with means for selectively mixing liquid detergent and air with the water so as to supply a detergent foam when desired and which can be manufactured and assembled at very low cost. Moreover all the parts are of sturdy construction which are not liable to get out of order and therefore will not require undue repair costs for maintaining the apparatus in serviceable condition.

I claim:

A liquid detergent dispensing device for use in conjunction with a shower fixture, comprising a fitting adapted to connect said shower fixture with a source of water under pressure and providing a mixing chamber, means arranged to discharge said water in the form of a jet into said mixing chamber to produce a subatmospheric pressure therein, an air inlet passage leading from said mixing chamber to the atmosphere and arranged to draw atmospheric air into said mixing chamber, said fitting also being provided in its side wall with a horizontally extending internally threaded opening extending from said air inlet passage to the exterior of said fitting, a liquid detergent container provided at one end with a laterally extending externally threaded hollow stem providing a passage leading from the outer end of said stem to the interior of said container, said externally threaded stem being screwed into said internally threaded opening whereby said container can be swung about the axis of said stem to an upright position to permit gravity flow of liquid detergent into said mixing chamber and to a pendent position in which such gravity flow is cut off, and means for venting said container when in said upright position.

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