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METHOD AND APPARATUS FOR PROPORTIONATELY FEEDING A TEXTILE TREATING COMPOSITION TO STEAM FLOWING THROUGH A CONDUIT

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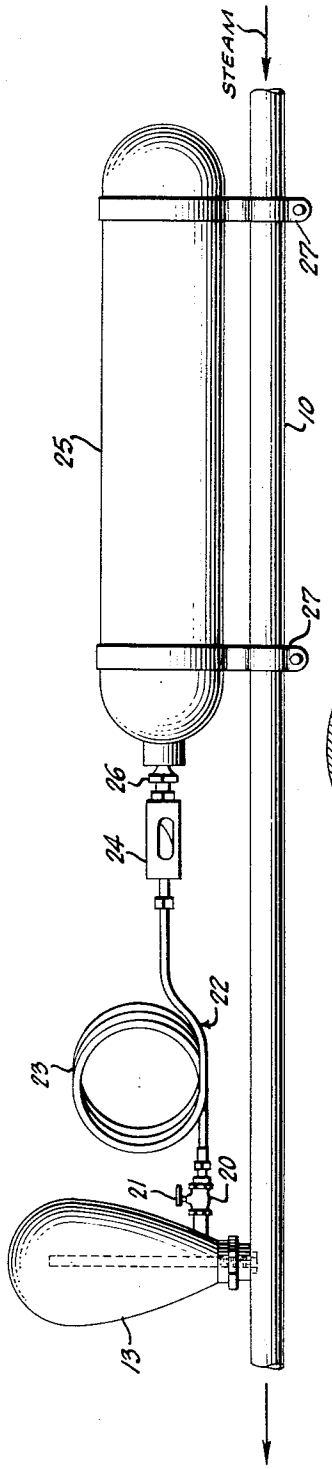


Fig. 1.

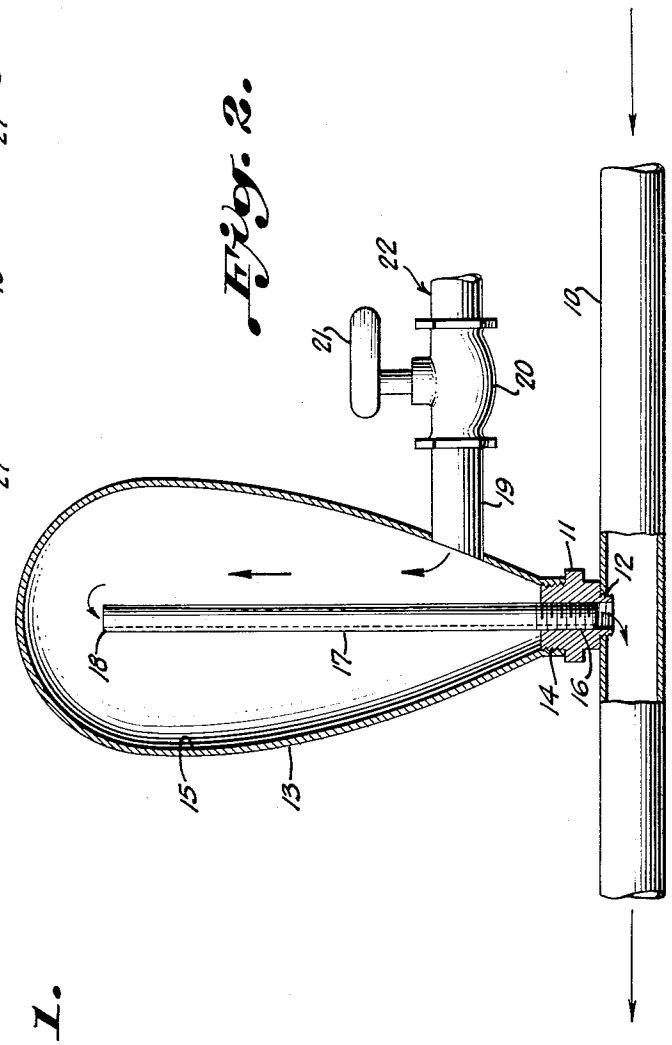


Fig. 2.

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METHOD AND APPARATUS FOR PROPORTIONATELY FEEDING A TEXTILE TREATING COMPOSITION TO STEAM FLOWING THROUGH A CONDUIT

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This invention relates to textile treatment and more particularly to a method and apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, the mixture of treating composition and steam being applied to textile fabrics of clothing during pressing thereof.

The fibers of fabrics utilized in clothing manufacture contain certain natural oils, but in order to impart desirable finish and softness characteristics to fabric garments it is necessary to add certain oils thereto which are known as finishing agents and which, furthermore, materially contribute to the good draping qualities of new clothing. New clothing retains these desirable characteristics until such time as it is necessary to clean the same, but during a wet or dry cleaning process a quantity of the added oils, as well as some of the natural oils in the fibers of the fabrics are extracted or dissolved which results in the garments becoming dull and lifeless and less able to resist wrinkling and abrasion from wear.

Heretofore it has been attempted to replace the oils removed from fabrics during cleaning operations by dipping or spraying, but such operations are relatively costly and time consuming and have not been particularly satisfactory. It has also been previously attempted to replace these oils by introducing the same into the steam utilized in the finishing or pressing operation subsequent to cleaning, but prior to the instant invention no method or apparatus had been developed whereby a treating composition having the necessary properties could be introduced into the pressing steam in an amount proportional to the steam utilized with the result that the garments were not properly or satisfactorily treated. Furthermore, the apparatus heretofore utilized for this purpose could not handle a treating composition of the type required for this operation since such composition includes certain forms of waxes and the introduction of such waxes in the apparatus heretofore used resulted in the clogging of such apparatus thereby rendering the same inoperative.

It is accordingly an object of the invention to provide a method for treating textile fabrics which includes feeding a treating composition to steam flowing through a conduit in an amount proportional to the flow of steam through such conduit.

A further object of the invention is the provision of a method for treating textile fabrics which includes feeding a treating composition to steam flowing through a conduit in an amount proportional to the flow of steam through said conduit and thereafter utilizing the mixture of treating composition and steam in a conventional pressing machine.

A still further object of the invention is the provision of a method for treating textile fabrics in which crystallized treating composition soluble in water to create a foam is provided in a closed container and in which steam is condensed with the condensate being forced into the container to create a foam, such foam thereafter flowing into a conduit in proportion to the flow of steam through such conduit.

Another object of the invention is the provision of an apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit.

A further object of the invention is the provision of an apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit in which the treating composition is provided in crystallized form soluble in water to form a foam, the apparatus further including one or more condensers for receiving a condensing steam from the conduit, the condensate flowing to the treating composition to dissolve the same and create a foam, such foam thereafter flowing into the conduit in an amount proportional to the flow of steam through the conduit.

A still further object of the invention is the provision of an apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, the apparatus being connected to the conduit in such a manner that back pressure created upon stoppage of flow through the conduit forces steam through a condenser and forces the condensate into a container of a treating composition to dissolve the same and form a foam and in which upon initiation of steam flow through the conduit, a partial vacuum is created whereby the foam will flow into the conduit in an amount proportional to the flow of steam therethrough.

A still further object of the invention is the provision of an apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit and in which the quantity of treating composition supplied to the conduit in proportion to the flow of steam may be conveniently varied.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawing wherein:

FIG. 1 is a side elevational view of a feeding apparatus for textile treating compositions constructed in accordance with this invention; and

FIG. 2 an enlarged side elevational view with parts in section for greater clarity and showing the structure of the condenser bulb and the related induction tube.

With continued reference to the drawing, there is shown a conduit **10** utilized to conduct steam from a suitable source, such as a boiler to a conventional pressing machine and since the pressing machine forms no part of the instant invention, it is not seen that any showing thereof or description is necessary or desirable.

Mounted on the conduit **10** is a textile treating composition feeding apparatus constructed in accordance with this invention and such apparatus may well comprise a nipple or fitting **11** threadedly received at **12** in the wall of the conduit **10**. A metallic condenser bulb **13** is threadedly attached at **14** to the nipple **11** and it is to be noted, that the bulb **13** is mounted in an upright position and normally this would be facilitated by mounting of the nipple **11** in the upper surface of the conduit **10**. The bulb **13** serves to provide a condenser chamber **15**. Threadedly received in the nipple **11** at **16** is the lower end of an induction tube **17** which is vertically disposed in the chamber **15** and it will be noted, that the induction tube **17** communicates through the lower end thereof with the nipple **11** and conduit **10** and through the upper end **18** with the chamber **15**.

A combined inlet and outlet fitting **19** is connected to the bulb **13** adjacent the lower end thereof and communicates with the chamber **15** and a shut-off valve **20** having a finger engaging operating knob or handle **21** is connected to the fitting **19**. A feed tube **22** is connected to the valve **20** and a portion of the feed tube **22** is coiled, as shown at **23**, to provide a second condenser. It is to be noted, as shown in FIG. 1, that the coil **23** is vertically disposed and that all portions of the coil are located above the feed tube **22**. A sight glass **24** is con-

nected to the feed tube **22** and a closed container **25** in the form of a cylinder or other suitable configuration is connected to the sight glass **24** through a suitable fitting **26**. The container **25** is shown in FIG. 1 as mounted on the conduit **10** by suitable brackets **27**, but obviously, the container **25** may be mounted in any other desired manner.

The container **25** may be filled with a crystallized composition of polyethylene glycol of a suitable type and which may also contain camphor and aromatic oils.

In operation and with steam supplied to the conduit **10** under suitable pressure, upon stopping the flow of steam through the conduit **10** to create a back pressure, steam will be forced through the induction tube **17** into the chamber **15** where at least a portion of such steam will condense and the condensate, together with any remaining steam will be forced through the fitting **19** and valve **20** into the coil **23** of the feed tube **22** wherein the remaining steam will be condensed and the resulting condensate will be forced through the sight glass **24** and into the container **25**. Since the treating composition in the container **25** is of such character that the same is soluble in water to create a foam upon the condensate reaching the container **25** foam will be created therein and thereafter upon initiating flow of steam through the conduit **10**, a partial vacuum will be created in the chamber **15** through the induction tube **17** and the foam by reason of the expansion thereof, as well as the vacuum in the chamber **15**, will flow through the feed tube **22** and into the chamber **15** and thereafter through the induction tube **17** into the conduit **10** where such foam will mix with the steam flowing through the conduit **10**. The quantity of foam flowing into the conduit **10** will consequently, be proportional to the flow of steam through the conduit **10**.

The above operation will take place intermittently as flow of steam through the conduit **10** is interrupted and initiated and experiments have shown that the crystallized treating composition will be dissolved at a sufficient rate to supply the necessary quantity of treating material to the steam in the conduit **10**, particularly in view of the fact that conventional pressing operations never require a continuous flow of steam, but by reason of the nature of such pressing operations, the flow of steam is intermittent.

The quantity of foam delivered to the conduit **10** may be varied by utilizing induction tubes **17** of different lengths, a longer tube providing a smaller quantity and a shorter tube providing a greater quantity with respect to the rate of steam flow through the conduit **10**.

The valve **20** is provided to permit replacement of the container **25** when the contents thereof have been exhausted and such replacement may be conveniently performed with only a minor interruption of feeding treating composition to the conduit **10**. The sight glass **24** provides a convenient means for checking the flow of treating composition through the feed tube **22** and also serves to provide an indication when the composition in the container **25** has been exhausted.

It will be seen by the above described invention there has been provided an extremely simple apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit and also a method for treating textile fabrics which will operate to replace the oils removed from such fabrics during wet or dry cleaning operations restoring the original properties of the fabrics and garments. The apparatus is entirely automatic in operation and requires no attention, other than replacing the cylinder or container of treating composition when the same has become exhausted and, therefore, the apparatus does not require the attention of highly skilled personnel and provides an economical and highly effective apparatus for the purpose intended.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawing and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. A method of proportionately feeding a textile treating composition to steam flowing through a conduit, said method comprising the steps of providing a closed container, filling said container with a crystallized textile treating composition soluble in water to create a foam, connecting said container to a conduit through a condenser and induction tube, stopping flow of steam through said conduit to create a back pressure, whereby steam is forced through said induction tube into said condenser and condensate is forced into said container to progressively dissolve said composition and create foam and initiating flow of steam through said conduit to create a partial vacuum in said induction tube, whereby said foam will flow through said condenser and induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

2. A method of proportionately feeding a textile treating composition to steam flowing through a conduit, said method comprising the steps of providing a closed container, filling said container with a crystallized textile treating composition soluble in water to create a foam, connecting said container to a conduit through a condenser, stopping flow of steam through said conduit to create a back pressure, whereby steam is forced into said condenser and condensate is forced into said container to progressively dissolve said composition and create foam and initiating flow of steam through said conduit to create a partial vacuum in said condenser, whereby said foam will flow through said condenser and into said conduit in an amount proportional to the flow of steam through said conduit.

3. A method of proportionately feeding a textile treating composition to steam flowing through a conduit, said method comprising the steps of providing a closed container, filling said container with a treating composition soluble in water to create a foam, connecting said container to a conduit through a condenser, stopping flow of steam through said conduit to create a back pressure, whereby steam is forced into said condenser and the condensate is forced into said container to progressively dissolve said composition and create foam and initiating flow of steam through said conduit to create a partial vacuum in said condenser, whereby said foam will flow through said condenser and into said conduit in an amount proportional to the flow of steam through said conduit.

4. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a nipple threadedly received in the wall of a steam conduit, a metallic condenser bulb mounted on said nipple in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and threadedly received in said nipple, said tube communicating with said conduit and said chamber, a combined inlet and outlet fitting connected to said bulb adjacent the lower end, a valve in said fitting, a feed tube connected to said valve, a portion of said feed tube being coiled to provide a second condenser, said coil being vertically disposed above said feed tube, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube and sight glass into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said feed tube into said container and through said induc-

tion tube into said conduit in an amount proportional to the flow of steam through said conduit.

5. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a metallic condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and threadedly received in said fitting, said tube communicating with said conduit and said chamber, a combined inlet and outlet fitting connected to said bulb adjacent the lower end, a valve in said last named fitting, a feed tube connected to said valve, a portion of said feed tube being coiled to provide a second condenser, said coil being vertically disposed above said feed tube, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam to said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil the resulting condensate flowing through said feed tube and sight glass into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

6. An apparatus as defined in claim 5, in which said induction tube may be selectively varied in length in order to adjust the amount of foam delivered to said conduit.

7. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a metallic condenser bulb mounted on said fitting in an upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and threadedly received in said fitting, said tube communicating wtih said conduit and said chamber, a valve connected to said bulb adjacent the lower end, a feed tube connected to said valve, a portion of said feed tube being coiled to provide a second condenser, said coil being vertically disposed above said feed tube, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube and sight glass into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

8. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a valve connected to said bulb adjacent the lower end, a feed tube connected to said valve, a portion of said feed tube being coiled to provide a second condenser, said coil being vertically disposed above said tube, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam to said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube and sight glass into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

9. An apparatus for approximately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a valve connected to said bulb adjacent the lower end, a feed tube connected to said valve, a portion of said feed tube being coiled to provide a second condenser, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube and sight glass into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

10. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a feed tube connected to said bulb adjacent the lower end, a portion of said feed tube being coiled to provide a second condenser, a sight glass connected to said feed tube and a closed container connected to said sight glass, said container being filled with a crystallized textile treating composition, soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube and sight glass into said container to progressive dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

11. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a feed tube connected to said bulb adjacent the lower end, a portion of said feed tube being coiled to provide a second condenser, a closed container connected to said feed tube, said container being filled with a crystallized textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said con-

duit to create a back pressure, steam will be forced through said induction tube into said chamber and into said coil, the resulting condensate flowing through said feed tube into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

12. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a feed tube connected to said bulb adjacent the lower end, a closed container connected to said feed tube, said container being filled with a crystallized treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber, the resulting condensate flowing through said feed tube into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said conduit.

13. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, an induction tube disposed vertically in said chamber and communicating with said conduit and said chamber, a feed tube connected to said bulb adjacent the lower end, a closed container connected to said feed tube, said container being filled with a textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced through said induction tube into said chamber, the resulting condensate flowing into said feed tube into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said induction tube, whereby foam will flow from said container through said feed tube into said chamber and through said induction tube into said conduit in an amount proportional to the flow of steam through said chamber.

14. An apparatus for proportionately feeding a textile treating composition to steam flowing through a conduit, said apparatus comprising a fitting received in the wall of a steam conduit, a condenser bulb mounted on said fitting in upright position and providing a condenser chamber, a feed tube connected to said bulb adjacent the lower end, a closed container connected to said feed tube, said container being filled with a textile treating composition soluble in water to create a foam, whereby upon stopping flow of steam through said conduit to create a back pressure, steam will be forced into said chamber, the resulting condensate flowing through said feed tube into said container to progressively dissolve said composition and create a foam and upon initiating flow of steam through said conduit a partial vacuum will be created in said chamber, whereby foam will flow from said container through said feed tube into said chamber and into said conduit in an amount proportional to the flow of steam through said conduit.

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