Aug. 26, 1930. E. HASLETT 1,774,004

LIQUID TREATING DEVICE

Filed April 23, 1929

Fig. 1

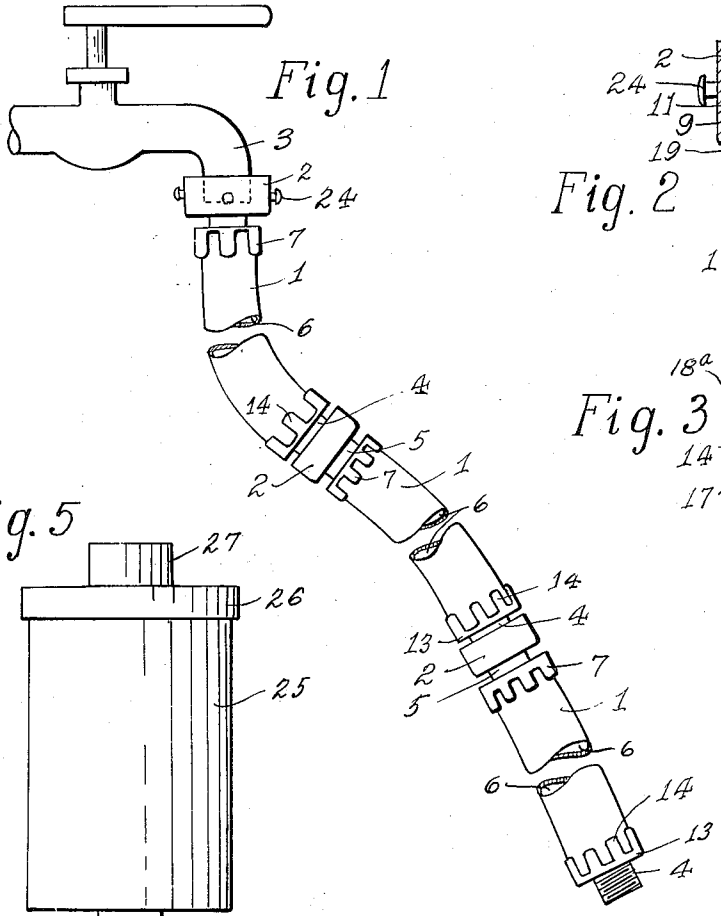


Fig. 2

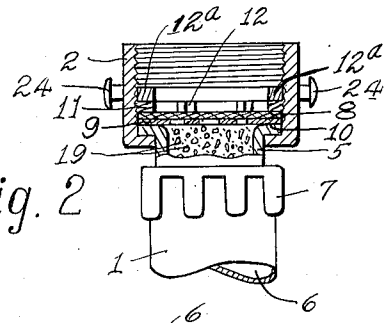


Fig. 3

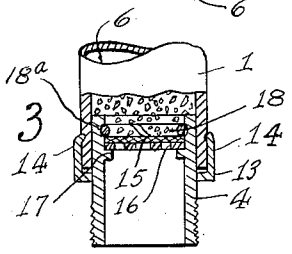
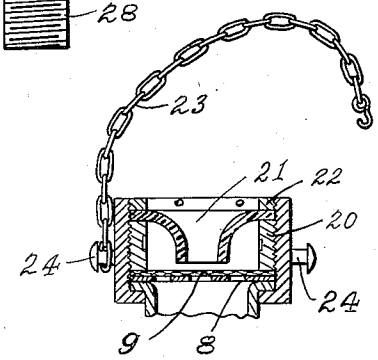


Fig. 5

Fig. 4



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Patented Aug. 26, 1930 1,774,004

UNITED STATES PATENT OFFICE

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LIQUID-TREATING DEVICE

Application filed April 23, 1929. Serial No. 357,417.

This invention relates to devices for treating liquids such as water for example, to change its characteristics or composition, or purify it.

An object of the invention is to improve and simplify devices for treating liquids.

Another object of the invention is to provide an improved device for treating liquids which will be easily portable, easily and quickly attachable to or detachable from faucets or other liquid outlet connections, which will be convenient for use in connection with kitchen sinks, wash bowls, bath and laundry tubs, and washing machines; which will always have continued maximum effectiveness in use, and which will be relatively simple and inexpensive.

Other objects will appear from the following description of an embodiment of the invention, and the novel features will be particularly pointed out in the appended claims.

In the accompanying drawing:

Figure 1 is a side elevation of a device constructed in accordance with the invention and showing the manner of its use;

Figure 2 is a sectional elevation of one end of the same;

Figure 3 is a sectional elevation of the other end of the same;

Figure 4 is a sectional elevation of the connection as adopted for use with non-threaded liquid outlets or faucets, and

Figure 5 is an elevation of a member connected between the device and the plumbing outlet to enable regeneration of the treating substance.

In the illustrated embodiment of the invention, a plurality of stretches of conduit or hose 1, such as rubber hose, of any suitable and convenient length or diameter are coupled together end to end, and each is provided, at one end, with a suitable connector 2, by which it may be connected to a faucet 3 or other source of a liquid to be treated. Where water is to be softened the faucet 3 may be the usual faucet or outlet of a domestic water supply. The other end of each stretch of conduit or hose may have connected thereto a discharge device or nozzle 4, which may couple the stretch to the connector 2 of another stretch of hose.

The connector 2 (Fig. 2) may have a nipple portion provided with internal threads extending from its open end for threaded engagement with the usual threads at the discharge ends of some faucets.

The rear end wall of the connector is provided with a tubular projection 5 which is received within the passage 6 of the conduit or hose 1, and secured against withdrawal by a suitable clamping device 7 which surrounds the portion of the conduit or hose that receives the projection 5 and clamps the hose thereto.

A screen 8 and reticulated plate 9 are disposed face to face and secured within the connector 2 against an internal shoulder or abutment 10 of the connector, by means of a ring 11 threaded into the open end of the connector.

The inner periphery of the ring may have lugs 12 by which the ring may be threaded into or out of the connector thru the use of a suitable spanner wrench or other tool. The usual compressible annular gasket 12^a may be placed against the ring 11.

The discharge or nozzle device 4 (Fig. 3) may comprise a short length of cylindrical tubing secured within the hose or conduit by a clamping device 13, similar to clamping device 7. Both of these clamping devices may comprise a flange on the tubing with fingers 14 which are clinched over the hose.

A screen 15 and reticulated plate 16 are clamped against an internal flange or abutment 17 of the tube 4, by a split ring 18 which is sprung into a groove 18^a in the inner end of the tube. The abutment or flange 17 may be provided in the tube 4 in any suitable manner, and the exterior of the outer end of the tube 4 may be threaded for connection.

The screens 8 and 15 are preferably disposed against the inner faces of the reticulated plates 9 and 16 respectively, that is, facing one another thru the passage of the hose or conduit.

The space in the passage of the conduit or hose 1, between the screens 8 and 15 is filled with a quantity of small solid particles or

granules 19 of the substance intended for treating the liquid, and these particles or granules are confined in the conduit or hose by the screens 8 and 15. The screens permit the passage of liquid thru the hose or conduit, and the liquid, while so passing, will move in contact with the said particles or granules and be modified thereby.

When water bearing any minerals in solution are to be treated in a manner to soften them, the particles or granules 19 may be of any natural or synthetic zeolite.

When the mineral bearing water passes over the zeolite particles or granules, there occurs what is called in the art a base exchange during which the minerals, such as calcium and magnesium which are the most common minerals found in water, are removed from the water. The zeolite substance may be regenerated in the usual manner by passing a salt solution thru the hose and allowing the salt solution to remain in contact with the zeolite a few minutes.

A liquid in passing thru a mass of small solid particles or granules tends to form channels thru the mass and then the liquid will flow thru the channels and not fully contact with the solid substance, such as zeolites. In such a case the liquid is not fully treated and various ineffectual or impractical attempts have heretofore been made to overcome this trouble.

This trouble has now been overcome by this improvement. Since the mass of granules or particles is confined loosely in the flexible hose or conduit, the flexing of the hose or conduit in use, agitates the mass automatically so as to break up any channels in the mass which may start to form, thus eliminating the necessity of special mechanical agitators. Instead of a device formed of a series of connected units or stretches, each complete, a single length may be employed but the series of coupled units serves to prevent packing of the material.

When one desires to connect this device to a liquid outlet or faucet having no threads upon its discharge end, the ring 11 of Fig. 2 is replaced by a longer but similar ring 20 (Fig. 4), and a hollow frusto-conical insert 21 of resilient material such as elastic rubber, is disposed within the cavity of the connector, with its peripheral flange resting upon the outer end face of the ring 20, and secured thereagainst by another ring 22, similar to ring 11, of Fig. 2.

This connector is then fitted to the faucet outlet, and the discharge end of the faucet will enter the insert 21 which stretches to receive and closely fit it, and make a water tight connection thereto. A chain 23 connected to the connector 2 by pins 24 may be hooked over the faucet to secure the connector thereon, and is adjustably connected to one pin to enable its length to be varied.

To facilitate regeneration of the zeolite, a casing 25 may be provided with a removable cover 26, which carries a nipple 27 similar to cennector 2 to enable connection of the casing to a faucet. The other end of the casing has a screened outlet nipple 28, externally threaded for coupling to a connector 2, which previously was connected to a faucet, so that water or liquid must pass thru the casing 25 before reaching the flexible hose sections. The casing may be filled with salt and water run slowly thru the casing to cause regeneration of the zeolite for ten or fifteen minutes. The casing may then be removed from the hose until regeneration is again needed. The casing may be recharged with salt by means of the removable cover 26.

A device such as illustrated and described is particularly useful as a water softener, when filled with a zeolite for example, and may be detachably connected to the usual faucets at kitchen sinks, laundry tubs, bath tubs, wash bowls, etc., in homes or hotels. The attachment or disconnection of such a device is a simple act and easily and quickly performed by anyone, even a child. A device of this type is not only simple and compact, but relatively inexpensive and very effective.

It will be understood that various changes in the details and materials herein described and illustrated may be made within the principle and scope of the invention as expressed in the appended claims.

What I claim is:

1. A liquid treating device comprising a flexible conduit having at one end, a connector for connection to a source of liquid, and, at the other end, a discharge passage of loose solid particles of a substance for treating the liquid disposed in said conduit, and means for confining said particles within the conduit while permitting flow of liquid thru the conduit in contact with said particles.

2. A liquid treating device comprising a flexible conduit having confined therein a quantity of loose, solid particles of a substance for treating any liquid passing thru said conduit, whereby channeling of said substance by the moving liquid will be prevented by the flexing of said conduit in use.

3. A liquid treating device comprising a flexible conduit having at one end means for connection to a source of liquid to be treated, a quantity of finely divided particles of zeolite in said conduit, and means for confining said zeolite in said conduit and permitting the flow of liquid therethrough, whereby channeling of the zeolite will be prevented by the flexing of the conduit in use.

4. A liquid treating device comprising a flexible conduit having confined therein a quantity of loose particles of zeolite, whereby a liquid passing through said conduit will have contact with the zeolite, and any chan-

nels forming in the zeolite will be destroyed by the flexing of the conduit.

5. A liquid treating device comprising a flexible conduit having at one end, a connector by which a detachable connection may be made to a faucet outlet, a reticulated retaining wall at each end of the conduit extending across the passage therein, and a quantity of loose particles of a substance for treating the liquid, confined in said conduit by said walls, whereby a liquid may pass from said faucet thru said conduit in contact with said particles, and any channels forming between said particles by the passing liquid will be destroyed thru the flexing of said conduit in use.

6. A portable water softener comprising a flexible hose having therein a pair of screens spaced apart along the length of the hose, and a quantity of loose solid particles of a water softening substance confined in said hose between said screens, whereby water passing thru said hose will move in contact with said particles and any channels forming between said particles by the passing water will be destroyed by the flexing of said hose in use.

7. A portable liquid treating device comprising a plurality of unit sections, each containing loose granular treating material, coupled to one another in series, each unit being flexible about axes crosswise of its length, thru which a liquid may be passed for treatment, the flexing of the conduit preventing channeling of said material and the charging of the coupled sections separately preventing packing of the said material.

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