

Jan. 24, 1928.

J. ASTROM

1,656,896

WATER SOFTENING DEVICE

Filed Oct. 17, 1925

Fig. 1

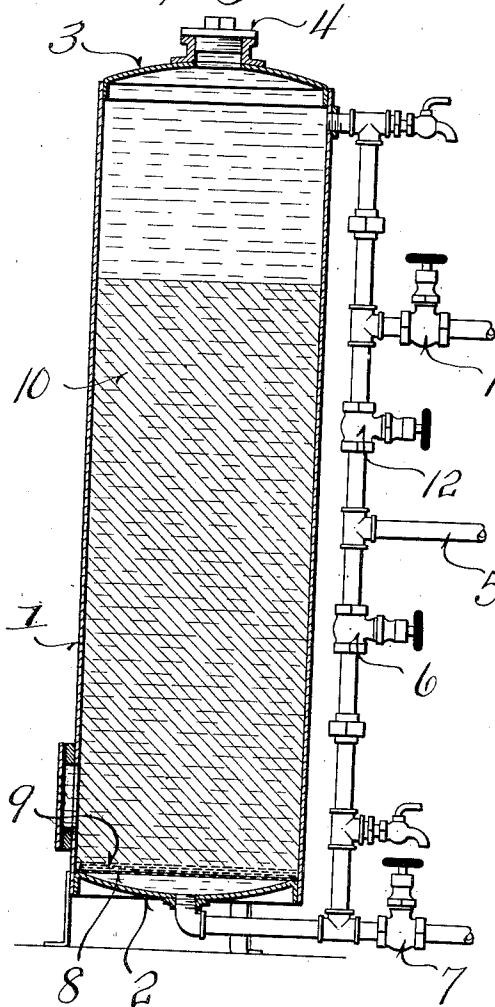


Fig. 2

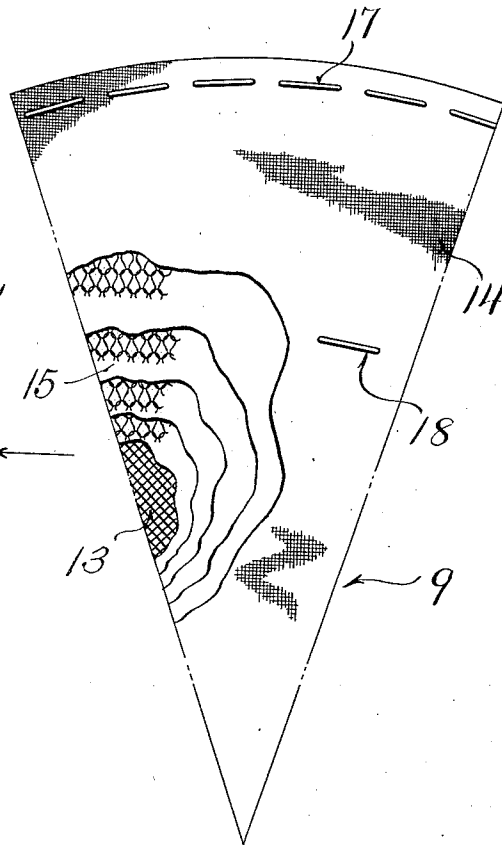
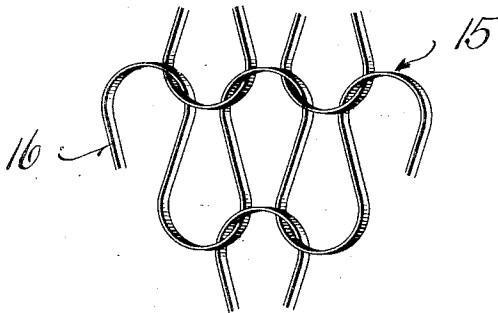


Fig. 3



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UNITED STATES PATENT OFFICE.

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WATER-SOFTENING DEVICE.

Application filed October 17, 1925. Serial No. 63,028.

This invention relates generally to water softeners, but is particularly directed to a distributor pad for water softening devices.

As heretofore constructed, it has been the usual practice to support the softening material, whether synthetic or natural mineral substances, by means of a perforated plate at the lower portion of the softener with or without a screen above such plate. The natural result of this construction is that the water enters the material at isolated points immediately above the perforations in the plate and channels its way through the material. The water at these points has a relatively high velocity and always acts at the same point. The deterioration, therefore, due to this effect is relatively rapid.

This invention is designed to overcome the above noted defects, and objects of such invention are to provide a water softener in which no channeling of the softening material can occur, and in which means are provided for evenly distributing the water throughout the entire cross-sectional area of the water softening material even at the point where the water enters such material.

Further, water softeners as heretofore constructed have been found to lose or drop their material through the perforations of the supporting plate. This action is particularly noticeable during cleaning when the flow of water is reversed.

This invention has the further objects of providing a novel and effective form of distributor pad which will not only allow the free and even flow of water into the material at all points across its bottom area, but will also prevent the falling of particles from the softening material even when the flow of water is reversed.

Further objects are to provide a distributor pad in which a space is provided for the temporary collection of solid material carried by the entering water, and which will permit the free discharge of this material upon reverse flow of the water as during washing.

Further, this invention does not require an increase in the height of the water softening apparatus as is necessitated whenever sand or other inert material is positioned above the plate in the usual construction.

An embodiment of the invention is shown

in the accompanying drawings, in which:—
Figure 1 is a vertical sectional view through a water softener having the pad in place.

Figure 2 is a very much enlarged and exaggerated fragment of the pad showing the successive layers thereof.

Figure 3 is a more greatly magnified view of the copper ribbon padding used in the intermediate layers of the pad.

Referring to Figure 1, it will be seen that the softener comprises a steel tank 1 having a bottom 2 and a top 3, such top being provided with an entrance aperture closed by a plug 4 for the supply of renewal material when needed. Further, the tank may be provided with the usual supporting legs and cleanout opening as in the ordinary practice.

Under normal conditions the water enters by means of the supply pipe 5, passes downwardly along the vertical pipes and through the valve 6 to the lower end of the apparatus, the valve 7 being closed. The water passes upwardly through the perforated screen 8 welded to the sides of the tank 1, through the composite distributor pad indicated generally at 9, upwardly through the softening material 10 and collects in the upper portion of the tank. From this point the water passes downwardly through the vertical pipe and outwardly past the valve 11, the valve 12 being closed.

When it is desired to wash the material, the flow of water is reversed by closing the valves 11 and 6 and opening the valves 12 and 7. This causes the water to pass upwardly through the vertical pipe and enter the top of the apparatus. The water then flows downwardly through the softening material, through the composite distributor pad, through the perforated plate 8 and passes outwardly through the drain or discharge valve 7. The distributor pad indicated generally by the reference character 9 does not increase the height of the apparatus and yet insures the even entrance of water at a uniform velocity through the entire bottom area of the softening material. It is illustrated in greater detail in Figure 2 and from this figure it will be seen that the pad comprises a relatively coarse wire screen 13 on its lower side and a relatively fine wire screen 14 on its upper side. In fact

this wire screen 14 may be of fine mesh, if desired, without danger of clogging due to the peculiar construction of the pad.

Between the upper and lower screens, a plurality of layers of padding of coarsely knitted fine strands of copper ribbon are positioned. These layers of padding are indicated by the reference character 15.

Referring to Figure 3, it will be seen that the padding is formed by a multitude of loops of this copper ribbon, the ribbon itself being indicated by the reference character 16. This ribbon is flat and forms in successive layers a multitude of deflecting vanes or members to insure a most uniform and even distribution of the water on the way from the coarser screen to the finer screen. The finer screen supplements this action and prevents the finest dislodged particles from the softening material from falling through the pad.

It is to be further noted that any sediment or solid particles carried by the water will be lodged in the pad and cannot clog the pad due to its peculiar construction. Upon reverse flow of water through the apparatus, these solid particles will be very freely washed from the copper padding through the relatively large screen 13 and discharged from the apparatus. Thus the distributor pad serves the original purpose of providing a place for collecting this solid material from the water and preventing clogging of the softening material. Further, this distributor pad absolutely prevents channeling of the softening material and insures an absolutely uniform distributing of water across the entire lower face of the softening material.

It is to be distinctly understood that any suitable materials may be employed in the

construction of this pad, such materials being selected as occasion demands. It has, however, been found eminently practical to construct the screens of Monel metal and to sew them together either by brads formed of Monel metal such as indicated at 17 and 18, or to stitch them together by means of Monel wire. Preferably, the knitted padding of ribbon formation is made from copper ribbon.

It is to be understood also that although the invention relates primarily to water softening apparatus that it is obvious also that the pad may be used in other capacities of a similar nature.

Although the invention has been described in considerable detail, it is to be understood that the invention may be variously embodied and is, therefore, to be limited only as claimed.

I claim:

1. A distributor pad for causing an even flow of liquid therethrough for all points on the outgoing surface of such pad, such pad comprising an entrance screen having a relatively large mesh, an outlet screen having a relatively fine mesh and a plurality of layers of padding interposed between said screens and composed of intermeshed metal ribbon.

2. A distributor pad comprising an entrance screen of relatively coarse mesh, an outlet screen of relatively fine mesh, a plurality of layers of padding interposed between said screens and each layer consisting of interknitted flat metal ribbon, and means for securing said screens together.

In testimony that I claim the foregoing I have hereunto set my hand at Fort Wayne, in the county of Allen and State of Indiana.

JOHN ASTROM.