Sept. 4, 1956 R. H. MOODY 2,761,562

INFILTRATION TYPE CHEMICAL FEEDER

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FIG. 1

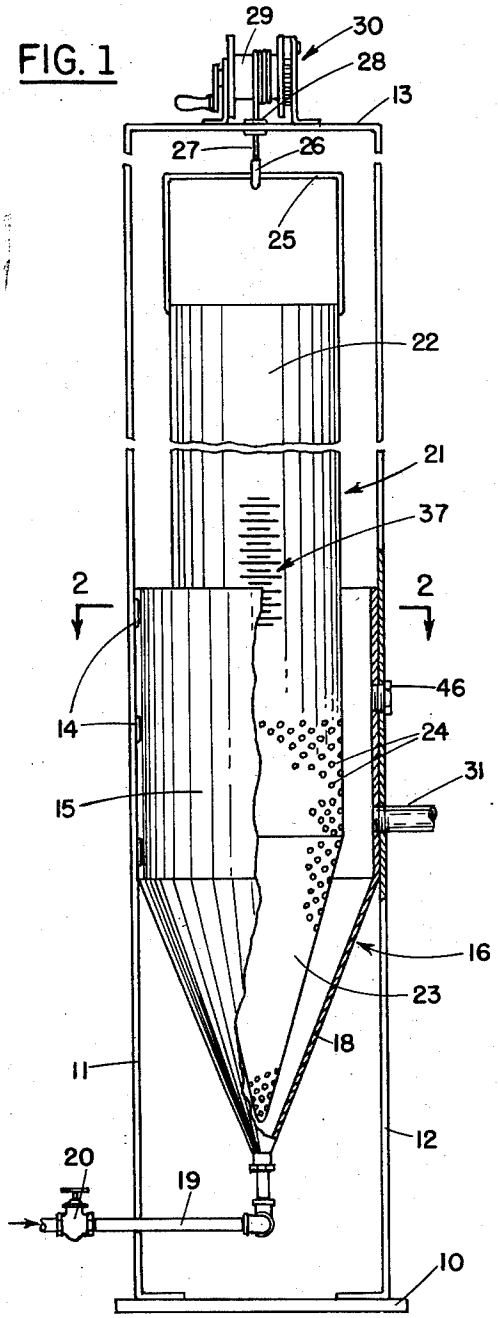


FIG. 2

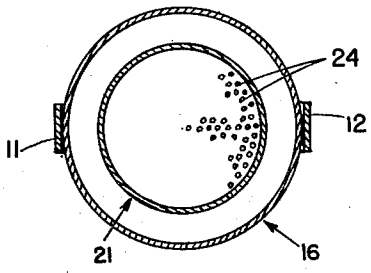
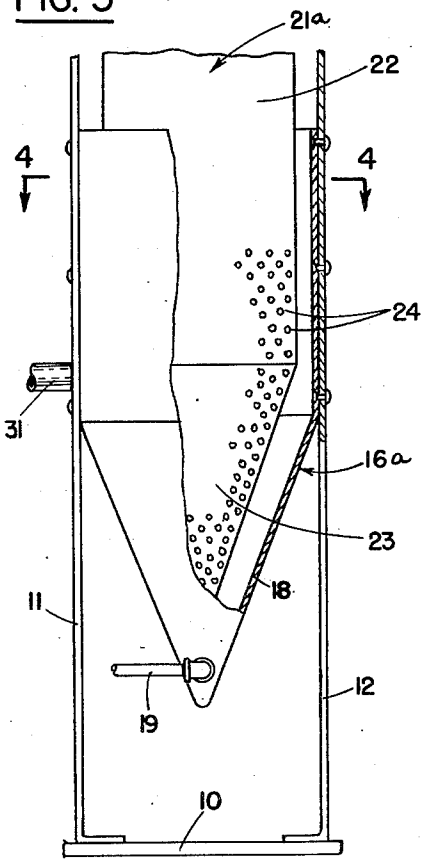


FIG. 3



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FIG. 4

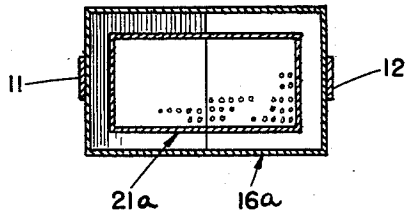


FIG. 5

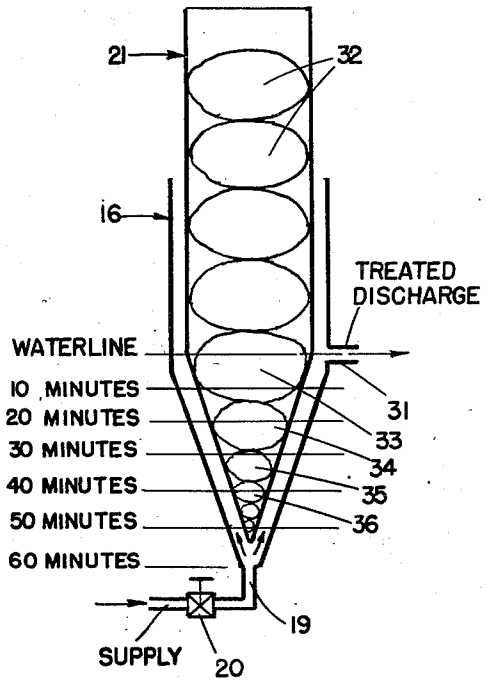
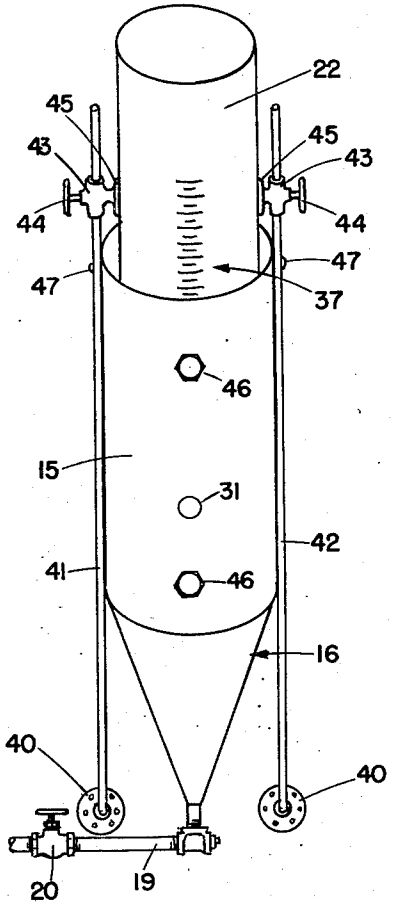


FIG. 6



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2,761,562

Patented Sept. 4, 1956

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INFILTRATION TYPE CHEMICAL FEEDER

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Application March 6, 1953, Serial No. 340,877

1 Claim. (Cl. 210—36)

The present invention relates to a device for adding treating compounds in water systems and it consists in the combinations, constructions and arrangements of parts herein described and claimed.

In the treatment of raw water to stabilize or soften the same, a variety of chemical stabilizing treatments for controlling or destroying various organisms present in such raw water, are known. Such organisms, if not controlled or destroyed, become major sources of slime.

For example, in the separation of fibers from waste papers, a considerable amount of water is required and, if the water contains objectionable organisms, screens which are used to separate the desired fibers from the waste become clogged due to such slime or scum deposits and such separation becomes impossible. One of the chemical means for treating such raw water consists of the use of balls of compressed chemical compounds, such as, for example, sodium aluminate. Such balls are conventional in the art and are usually the size and have the appearance of baseballs. Such balls are dissolved and fed into a water system. The present invention provides a device whereby the rate of dissolution of the balls in a stream of water being introduced to a supply of raw water may be controlled with exactness. Generally speaking the invention comprises an outer container having a downwardly and inwardly tapered lower end and an open top through which extends an inner container of like shape but which is perforated throughout its lower portion. A water inlet pipe is connected with the lowermost portion of the outer container and a water outlet pipe extends from the outer container at a point above its tapered portion. Means are provided for raising and lowering the inner container so that a plurality of the chemical balls above referred to mounted in such inner container in vertical juxtaposition may be immersed in the water flowing through the lower portion of the device in a specified amount. Since the balls become constantly smaller as they are dissolved, they will constantly move downwardly in the tapered portion of the inner container thus allowing additional unexposed balls to enter the water passing therethrough. This arrangement gives a substantially identical ball surface within the water at all times for a given setting of the inner container with respect to the outer container.

It is accordingly an object of the invention to provide a device of the character set forth which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

Another object of the invention is to provide, in a device of the character set forth, novel means for regulating with exactness the amount of chemical treatment imparted to a flow of water therethrough.

Another object of the invention is to provide, in a device of the character set forth, novel means for regulating the relative positions of an outer and an inner container both forming parts of the invention.

A further object of the invention is to provide, in a device of the character set forth, means for holding in

operative position a plurality of soluble chemical balls.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawing, in which:

Fig. 1 is a front elevational view, partly broken away, of an embodiment of the invention,

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1,

Fig. 3 is a fragmentary elevational view similar to Fig. 1 but showing another form the invention may assume,

Fig. 4 is a sectional view taken along line 4—4 of Fig. 3, and

Fig. 5 is a schematic view illustrating the manner in which the device operates,

Fig. 6 is an elevational view of a modified device constructed in accordance with the invention.

Referring more particularly to the drawings, there is shown therein a device of the character set forth comprising a horizontal base member 10 having mounted thereon a pair of spaced parallel vertically extending standards 11 and 12, preferably formed of strap iron, which are interconnected at their upper ends by a horizontal bar 13.

Affixed, as by welding 14 or the like to the inner faces of the standards 11 and 12 is a hollow cylindrical body 15 of an outer container generally designated at 16, the body 15 terminating at its lower end in a downwardly and inwardly tapering conical portion 18 whose lower or apex portion is connected with an inlet pipe 19 provided with a conventional valve 20.

There is also provided an inner container generally designated at 21 and having an elongated cylindrical body 22 whose lower end has integrally connected thereto a downwardly and inwardly tapering conical portion 23. The portion 23 and the lower portion of the body 22 are perforated, as indicated at 24. A yoke 25 is affixed to the upper end portion of the body 22 and has connected thereto, as indicated at 26, the free end of a cable 27 which extends through a guide member 28 centrally disposed in the cross bar 13, the other end of the cable being wound upon a drum 29 of a winch generally designated at 30 and mounted upon the upper side of the cross bar 13. An outlet pipe 31 extends through the standard 12 and the adjacent wall of the lower portion of the body 15.

In operation, it will be apparent that the inner container 21 may be loaded with chemical balls which are adapted to dissolve in water. When first loaded such balls, indicated at 32 in Fig. 5, will be of full size and hence the lowermost thereof will have but a portoin of its lower end within the conical portion 23. It will be understood that raw water to be treated will pass through the pipe 19 upwardly through the conical portion 18 and outwardly through the pipe 31 where eventually it will connect with a flow of water to be treated and that during such movement the water level in both the outer and inner containers 16 and 21 will be in substantially the same horizontal plane as the upper side of the pipe 31. Hence, as the balls become dissolved through the passage of water as aforesaid they will become lessened in size and hence the entire stack of balls within the inner container 21 will gradually move downwardly until the entire portion of the inner container 21 which is immersed in water will be filled with constantly decreasingly sized balls. The balls of decreasing size are shown in Fig. 5 at 33, 34, 35, 36, etc. Hence it will be understood that there will be a constantly equal total surface of balls immersed in such flow of water at all times once the lowermost portion of the member 23 is filled as shown in Fig. 5 of the drawings. With the inner container 21 in a fixed position at such time and the flow of water through the pipe

19 remaining constant, the supply of chemicals through the pipe 31 will also be constant. In order to vary the amount of treatment of the water passing through the pipe 19 to the pipe 31, the inner container 21 may be raised or lowered as called for by utilizing the winch 30 for such purpose. In this connection, a gauge generally indicated at 37, may be placed upon the outer wall of the container 21 and may be read in conjunction with the upper end of the body 15.

In Figs. 3 and 4 the construction and operation of the device therein shown is identical with that described with regard to the device shown in Figs. 1 and 2 with the exception that the outer container 16*a* and the inner container 21*a* are rectangular in cross sectional area instead of being circular as shown in the device shown in Figs. 1 and 2.

To illustrate another advantageous modification of the device of the invention as shown in Figs. 1 and 2, Fig. 6 shows the device equipped with a bracing structure which may be permanently secured to the device and to a flooring. As modified, annular base members 40 are provided with apertures for the reception of suitable anchoring bolts (not shown). Parallel and vertically extending standards 41 and 42, preferably formed of metal rods, are securely mounted within the base members 40 and affixed as by welding 47 or the like to the outer portion of the cylindrical body 15. Adjustable holding members 43 for the inner container 21 are preferably formed to slidably receive standards 41 and 42 and to approximate the configuration as shown in Fig. 6, having a base portion 45 affixed as by welding to the upper portion of the elongated cylindrical body 22, and a suitable adjusting and locking bolt handle 44. By this construction, it will be apparent that the inner container 21 may be adjustably and lockingly secured in a predetermined position to effect the intended purpose of the device.

To further flexibilize as well as facilitate the control of the compressed chemical compounds used to treat and concomitantly stabilize undesirable raw water, as for example, so-called hard or corrosive waters, the outlet pipe 31 may be repositioned. This is readily accomplished as indicated in Figs. 1 and 6 by the interchange of a plug 46 and threadedly fitting the pipe 31 into the hole provided thereby.

There has thus been provided simple and efficient devices of the kind described and for the purpose specified.

While the devices herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise devices, and that changes may be made therein without departing from the scope of the invention which is described in the appended claim.

What is claimed is:

A device for controlling the chemical treatment of water in a water system by means of conventional water-soluble chemical balls comprising a vertically extending fixed cylindrical outer container having a conical lower end, a vertically extending cylindrical inner container having a conical lower end, said inner container having its walls in spaced relation to the walls of the outer container, a water inlet pipe connected to the lowermost end of said outer container, and a water outlet pipe connected to said outer container immediately above its conical end portion, said inner container being perforated throughout its conical portion and to a point above said outlet pipe, said inner container having its largest diameter slightly larger than the diameter of said chemical balls whereby to support said balls in vertical stacked relationship, said balls being of progressively smaller size in proportion to their exposure to the flow of water through said device, said conical portion of the inner container supporting said progressively sized balls in vertical stacked relationship, whereby a substantially constant total surface of said balls is exposed to the flow of water through said device.

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