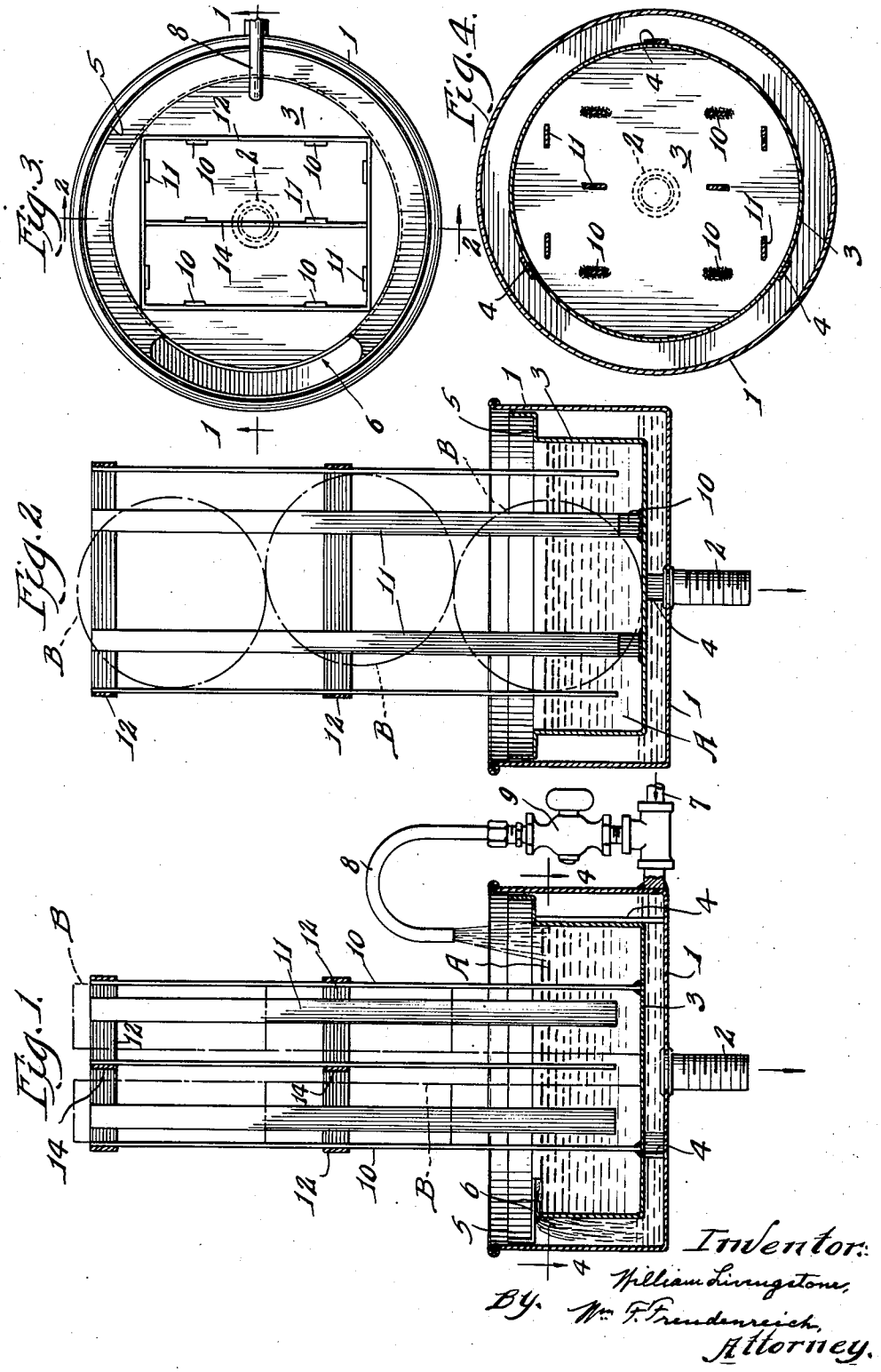
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LIQUID TREATING APPARATUS

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LIQUID TREATING APPARATUS

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1 Claim. (Cl. 23—267)

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Various devices are in use for dissolving detergents and water softening materials in cake or briquet form and delivering the solutions into washing machines or apparatus of various kinds. One of the main problems has been the obtaining of uniformity in the density or strength of a solution whenever it is being delivered or dispensed. Apparently the best results that have heretofore been achieved have been through the use of a stack of thick disks or cakes of the material laid flat one upon another; the lower part of the stack being immersed in the solvent, usually water. With such a device or apparatus, however, the solvent can attack only the cylindrical surface of that part of the stack immersed in solution. As the dissolving of the material progresses, the diameter of that part of the stack that is immersed decreases, so that the surface upon which the solvent acts becomes smaller and smaller; the result being a corresponding weakening of the solution for a given rate of flow of solvent.

The object of the present invention is to make it possible to secure substantial uniformity in the rate at which the thick disks dissolve when used one at a time or in a stack formation that provides a downward feed of the solids to be dissolved, as the dispensing process progresses.

The various features of novelty whereby the present invention is characterized will hereinafter be pointed out with particularity in the appended claims; but, for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a vertical section on line 1—1 of Fig. 3, through a device embodying the present invention, with cakes of the material to be dispensed shown in broken lines; Fig. 2, which also shows the cakes, is a section on line 2—2 of Fig. 3; Fig. 3 is a top plan view of the device; and Fig. 4 is a section on line 4—4 of Fig. 1.

In the drawing I have shown one of the old devices in which cakes in the form of thick disks composed of the material to be dissolved have heretofore been placed flat upon one another in stack formation, modified to meet the requirements of the present invention; but it will of course be understood that the invention is not limited to these particular details.

Referring to the drawing, 1 represents a little cylindrical tank open at the top and having an outlet in the form of a piece of pipe 2 extending down from the bottom wall at the axis of the

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tank. Within the tank is a cylindrical, open-top receptacle 3, smaller in diameter and shallower than the tank; the receptacle being held spaced apart from the bottom of the tank by short legs 4. The upper part 5 of the receptacle is preferably enlarged in diameter to hold the receptacle centered. A portion of the large upper section of the receptacle is cut away to create an arc-shaped overflow outlet 6 below the actual top of the receptacle. A solvent A, usually water, is supplied by a pipe 7 that is connected to a vertical goose neck 8, the open end of which terminates above the receptacle, so as to cause the solvent to be discharged downwardly into the latter; the flow of solvent being controlled by the usual valve 9. When the device is in use the outlet 6 and the goose neck 8 should be diametrically opposite each other. For convenience, the immediate support for the goose neck may be a part fixed to the outside of the little tank, as shown.

The receptacle 3 serves as a well in which the detergent or water softening material is dissolved by the solvent discharged into the receptacle. The little tank 1 simply supports the receptacle and receives therefrom the overflowing solution which it allows to flow toward its point of use through outlet pipe 2, without dilution thereof.

In accordance with the present invention, the thick disks B to be dissolved are set on edge in the well, with their flat faces at right angles to the diameter connecting the goose neck and the overflow outlet; whereby the solvent, entering at one side of the receptacle, must flow against and past one or more discs in order to reach the outlet at the other side. The disks are preferably arranged in stack formation and, for this purpose I provide suitable chute or rack means. There may be more than one stack and, in the particular construction shown, the disks may be arranged in two stacks; there being set in and fixed to the receptacle a high, hollow column, composed of two sets of upright bars or rods 10 and 11 and a plurality of rectangular frames 12, each having a cross piece 14, that tie the bars or rods together to form a cage open at top and bottom. The bars or rods 10 rest on the bottom of the receptacle and are welded or otherwise fixed thereto, while bars or rods 11 stand clear of the receptacle bottom; the arrangement being such that the interior of the hollow column or cage is divided into two compartments each a little wider than the diameter of one of the disks B, and each having its transverse dimension at right angles to the width a little greater than the thickness of a

disk. When a disk is inserted in either compartment it comes to rest, standing on edge, on the bottom of the receptacle or well. When other disks are added, there is built up a stack composed of disks standing on edge, one on top of another.

It will be seen that a fresh disk makes only line contact with the bottom of the receptacle, as it also does with a disk resting on the same. Thus, the solvent can attack the material to be dissolved, not only at the cylindrical surfaces of the disks up to the level to which the solvent rises, but also at the flat faces extending below that level. Consequently, a stack of disks dissolves progressively from the very bottom, because the solvent can from the start penetrate to the very line of contact between the lowest disk and the bottom of the well and thus the creation of a central post that holds up a stack of flat lying disks is avoided. For this reason, and because the solvent can also penetrate to the line of contact between the first and second disks, as soon as that line reaches the solvent, the area of surface of the soluble material presented to the solvent does not vary to any considerable extent and the strength of the solution created remains substantially uniform.

Not only does my new method of handling the disks achieve substantial uniformity of solution strength, but the materials are so well dissolved that no solvent need be introduced directly into the little tank to dilute the solution and prevent precipitation and solidification of materials from the solution in the tank. Therefore regulation of the process is much simpler and easier than under old practice.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the precise details thus illustrated and described; but intend to cover all forms and arrangements

that come within the definitions of my invention constituting the appended claim.

I claim:

An apparatus for dissolving detergents and water softening material in disk form, comprising an open top tank, an open top vessel arranged within the tank and spaced from the walls thereof, a pipe connected with a source of solvent supply directed to discharge into the vessel for accumulating therein a constant level of the solvent, said vessel having an over-flow opening at the brim thereof, an outlet pipe extending from the bottom of the tank, and an open framework rack rising from the bottom of the vessel, said rack consisting of upright bars and embraced by rectangular frames defining vertical magazine channelways for receiving and supporting a column of solvent treating tablets in disk form, whereby said tablets are stacked in said channelways in cylindrical surface to surface alignment, the lowermost tablet of said column being submerged in the solvent content accumulated in said vessel and exposing to solution, portions of all of its surfaces, curved and planar, as progressive dissolution effects gravitational descent of said column.

WILLIAM LIVINGSTONE.

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