Sept. 3, 1929. H. A. GOLLMAR 1,726,892

AERATION APPARATUS AND METHOD

Filed March 29, 1926

Fig. 1

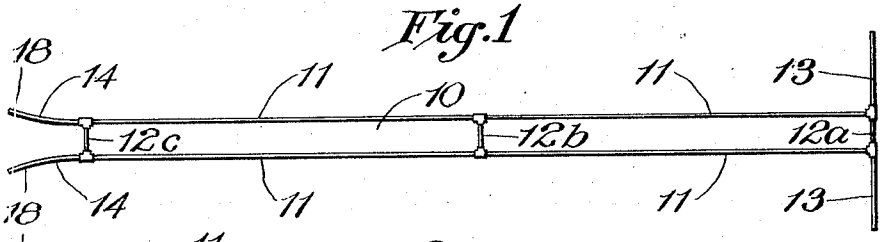


Fig. 2.

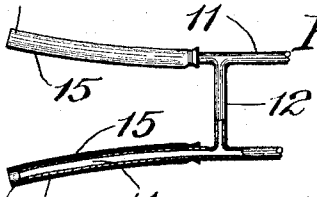


Fig. 4.

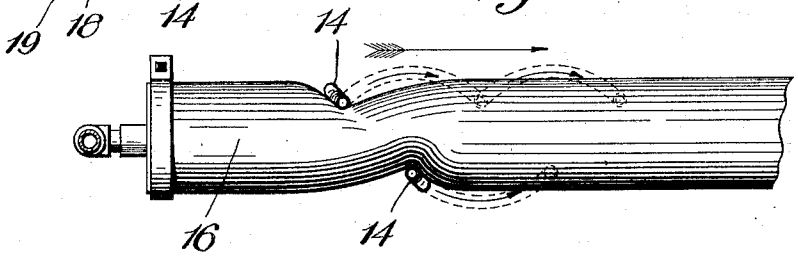
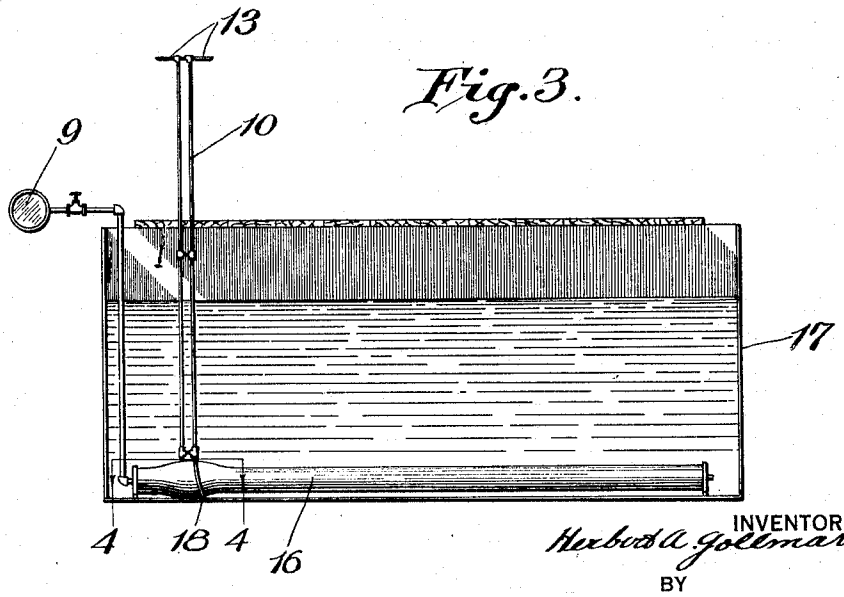


Fig. 3.



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UNITED STATES PATENT OFFICE.

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AERATION APPARATUS AND METHOD.

Application filed March 29, 1926. Serial No. 98,341.

This invention relates to the cleaning of porous fabric aerators, and more particularly to means and method of cleaning vibratile tubular fabric aerators.

The said aerators are particularly useful in processes of gas purification, wherein the spent liquors that have been used to absorb hydrogen sulphide from gas are aerated with compressed air. The air is preferably introduced to the liquid in very finely comminuted form by passing it into the said liquid through porous media. Stoppages in such aerators, due to precipitated and insoluble material and other causes, occur only after extended periods of service, and operating troubles are greatly reduced, as compared to other and non-vibratile media, such as filtros ware, etc.

The object of the present invention is to provide means for cleaning and/or for reconditioning said aerators, when stoppages may have occurred, which means does not necessitate removing the aerators from the liquid, in which they are immersed, for such cleaning purposes; and the invention has for further objects such other new and useful improvements, and such other operative advantages or results, as may be found to obtain in the method and apparatus hereinafter described or claimed.

In the accompanying drawing, forming a part of this specification, and showing, for purposes of exemplification, a preferred form and manner in which the invention may be embodied and practiced, but without limiting the claimed invention specifically to such illustrative instance or instances:—

Figure 1 is a plan view of a preferred form of tool for cleaning and reconditioning tubular aerators;

Fig. 2 is an enlarged plan view, partly in section, of a portion of Fig. 1, illustrating means for covering a portion of the tool;

Fig. 3 is a sectional elevational view of an aeration tank, wherein is situate an aerator for aerating a liquid contained therein, and showing a method of applying the tool shown in Fig. 1; and

Fig. 4 is a longitudinal elevational view taken on the plane 4—4 of Fig. 3.

The same characters of reference designate the same parts in each of the several views of the drawings.

The preferred tool 10 consists of a pair of rods or pipes 11, preferably of round cross-section, situate parallel and at a slight distance from each other, and secured to each other in this position by means of a plurality of cross members 12^a, 12^b, 12^c, etc., disposed at right angles to and rigidly connecting the pair of rods 11. At one extremity, the handles 13 are conveniently provided by extending the cross member 12^a past the intersections of the said cross member 12^a and the rods 11, to such a length as to provide convenient grips for the hands of the operator. At the opposite end, the rods 11 terminate in the tines 14, that extend past the cross member 12^c, and curve slightly away from each other while remaining in the plane of the tool as a whole.

The cross members 12^a, 12^b, 12^c, etc., which regulate the distance from one rod 11 to the other, are preferably made somewhat shorter than the diameter of the aerator to be treated, and the tines 14 are flared until their extremities 18 are disposed slightly farther apart than the said diameter. To protect the fabric aerator from any roughness of the tool 10, the tines 14 are encased in a soft covering, as for example, the rubber hose 15, which is firmly secured thereto, and extends some distance 19 beyond the ends 18 of the said tines.

When it is desired to clean an aerator, the operator takes hold of the fork 10 by the handles 13, and forces the tines over and past the tubular aerator 16 in the aeration tank 17. This squeezes the tube 16, causing it to assume a roughly oval shape, with a relatively longer vertical axis. The tool 10 is preferably rotated to a position that is at an angle with the longitudinal axis of the tube 16, thus accentuating the squeezing action. He then advances one tine, as for example the left, by rotating the handles 13, then the right, then the left, thus progressing along the length of the aerator 16, as is shown by the diagram of Fig. 4, until the tool has traversed the entire length of the tube. The operation may be repeated as many times as it is thought desirable, until the desired results are obtained. It is preferable to accomplish the operation when the tube is inflated with air from the air manifold 9, that is, during the course of aeration and regeneration.

The present invention provides simple and convenient method and apparatus for cleaning vibratile fabric aerators, that have shown a greater ability for diffusing air or gas into

liquids in very finely comminuted state and with greater freedom from stoppages than any other convenient method, and the method and apparatus may be used without interrupting the process. The progressive squeezing action has been found in practice to be an efficient, simple and effective method of cleaning aerator tubes and eliminating stoppages in the fabric thereof.

The invention as hereinabove set forth is embodied in a particular form but may be variously embodied within the scope of the claims hereinafter made.

I claim:

1. A tool for cleaning aerators, comprising in combination: a pair of spaced parallel rods; a plurality of cross members disposed at right angles to and rigidly connecting the pair of rods; a handle at one extremity of the connected rods extending transversely to both of said rods and for a distance greater than the distance between said rods; said rods terminating at the other extremity in tines that extend past the cross member nearest thereto and that are curved slightly away from each other while remaining in the plane of the tool as a whole.

2. A method of cleaning flexible aerators adapted to operate in a body of liquid which comprises temporarily deforming the normal shape of said aerators while submerged in said liquid and effecting such deformation progressively throughout the aerator.

3. A method of cleaning flexible tubular aerators which comprises temporarily deforming the normal shape of said aerators while said aerators are inflated and effecting such deformation throughout the length of the aerators by a step by step movement therealong.

4. The method of cleaning flexible aeration tubes constructed to provide a multitude of minute pore-like openings so as to diffuse air in finely atomized condition into a liquid containing solid matter suspended therein which consists in applying transversely directed pressure on said tubes with a longitudinal movement over the surface of said tubes while said tubes are operating to diffuse air into said liquid so as to squeeze said tubes transversely throughout the length of said tubes, whereby not only the surface of said tubes is freed but also the pore-like openings of said tube are freed of solid matter therein.

5. The method of cleaning flexible aeration tubes constructed to provide a multitude of minute pore-like openings so as to diffuse air in finely atomized condition into a liquid containing solid matter suspended therein which consists in temporarily deforming said tubes while submerged in said liquid by applying transversely directed pressure thereon with a longitudinal movement so as to squeeze said tubes transversely and progressively longitudinally thereof, whereby not only the surface of said tubes is freed but also the pore-like openings of said tube are freed of solid matter therein.

6. A method of cleaning flexible tubular aeration envelopes that are constructed to provide a multitude of minute openings so as to diffuse air in an atomized condition into a liquid containing solid matter which consists in squeezing said envelope while inflated and shifting the region of such squeezing throughout said envelope.

7. A method of cleaning compressible aeration envelopes that are constructed to provide a multitude of minute openings so as to diffuse air in an atomized condition into a liquid containing solid matter which consists in compressng said envelope transversely and simultaneously moving the pressure medium longitudinally over the surface thereof whereby to clean the surface of the envelope and also to dislodge matter held in the minute openings thereof.

In testimony whereof I have hereunto set my hand.

HERBERT A. GOLLMAR.