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[72] Inventor **Timothy B. Johnston**
Granada Hills, Calif.

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[73] Assignee **Aquaria, Inc.**
Los Angeles, Calif.

[54] **HAND-MANIPULATED, PARTICLE-REMOVING DEVICE FOR AQUARIUMS**
5 Claims, 7 Drawing Figs.

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[50] **Field of Search** 210/169; 134/167; 15/1.7, 345; 4/172, 172.12

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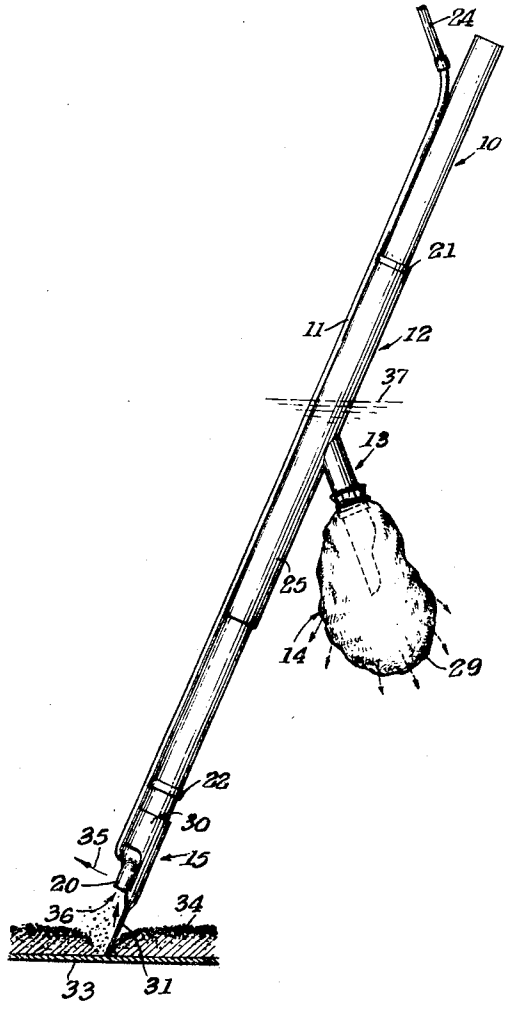
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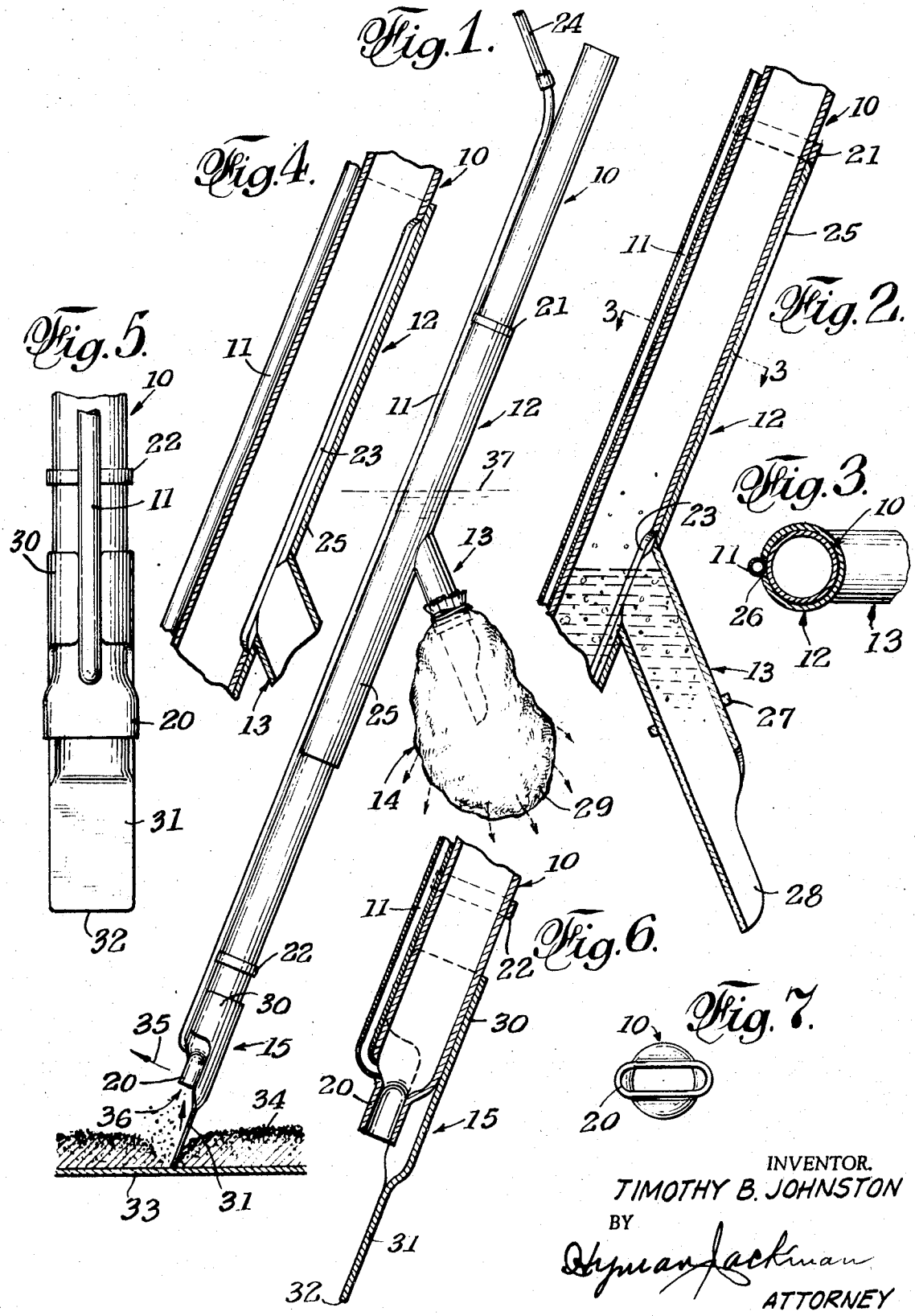
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Primary Examiner—Reuben Friedman
Assistant Examiner—Charles N. Hart
Attorney—Hyman Jackman

ABSTRACT: An elongated tubular body terminating in a nozzle at its lower end, an air outlet at its upper end, and an elongated lateral opening therein; a tube for compressed air substantially coextensive with said body and having its lower air-discharging end opening into the body adjacent the nozzle thereof; a longitudinal adjustable sleeve on the body provided with a downwardly directed tubular extension in communication with the mentioned lateral opening in the body for discharging water-borne particles received from the nozzle end thereof when immersed in the water of an aquarium, the discharged air entering the body and, in the form of bubbles, percolating upwardly through the water in said body and, finally, venting from the upper end of the body; a longitudinally adjustable scraper fitting on the nozzle end of the body for loosening accumulations of matter desired to be removed so particles thereof are buoyed upwardly and into the influence of the upwardly percolating air bubbles and carried thereby toward the mentioned downwardly directed extension, and a filter bag on the end of said extension to receive and pass water entering the same while intercepting particles of matter entering therein.





INVENTOR.
TIMOTHY B. JOHNSTON
BY
Hyman Lackman
ATTORNEY

HAND-MANIPULATED, PARTICLE-REMOVING DEVICE FOR AQUARIUMS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The removal, from the water of household aquariums, of the waste matter of denizens occupying said water and simultaneously aerating said water.

2. Description of the Prior Art

Cleaning aquariums and similar tank bottoms by means of compressed air is known, such devices using compressed air for the purpose of removing particles of matter and floating them upwardly with the air bubbles created in the aquarium water. Such known devices, whether permanently affixed to or hung on an aquarium wall, are stationary and, in the main, depend on the convection type of movement of the water to convey the particles of matter into the sphere of influence of the air bubbles percolating toward the surface of the tank.

SUMMARY OF THE INVENTION

A hand-manipulated device for removing from aquariums, the waste matter of the denizens occupying such aquariums comprising, generally, an elongated and preferably cylindrically tubular body **10**, a tube **11** for conducting a compressed gas, as air, for discharge into the hollow of said body adjacent to the lower end thereof, a sleevelike member **12** longitudinally adjustable along the body **10** and provided with an angularly and downwardly directed tubular projection **13** extending from an intermediate portion of said body, filter means **14** removably connected to said projection **13**, and a slidably adjustable scraper fitting **15** mounted on the lower end of the body **10**. This invention has for its objects to provide an easily handleable and easily stored device for effecting the aquarium cleaning operations as characterized hereinabove.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description, which is based on the accompanying drawing. However, said drawing merely shows, and the following specification merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is an elevational view showing the present device in operative position.

FIG. **2** is an enlarged longitudinal sectional view of the upper portion of said device.

FIG. **3** is a cross-sectional view as taken on the line **3–3** of FIG. **2**.

FIG. **4** is a longitudinal sectional view similar to FIG. **2**, with the parts in a different position.

FIG. **5** is an elevational view of the lower portion of the present device.

FIG. **6** is a longitudinal sectional view of the portion of the device that is shown in FIG. **5**.

FIG. **7** is an end detail view of a water inlet nozzle provided in the device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The device that is illustrated comprises, generally, a body **10** which is provided at its lower end with a generally flattened nozzle **20** which has a widened form larger than the diametral size of the remainder of the body which is preferably round in section. The upper end of the body is open. Spaced abutments **21** and **22** on said body are provided on beyond the ends of an elongated port **23** in the wall of said body.

The tube **11**, preferably of plastic, has an upper end adapted to be connected to a source of compressed air, as by a flexible tube **24**. The tube **11** preferably extends alongside the body **10** on the side thereof opposite to the port **23** and may be cemented in place so the body **10** and tube **11** comprise a unitary, easily handled and manipulated item. The lower end of said tube, as best seen in FIG. **6**, is directed to open into the interior of the body **10** adjacent to the nozzle **20**.

The member **12** is formed as a sleeve **25** having a longitudinal slit **26**. Said sleeve has a sliding fit on the body **10**, between the abutments **21** and **22**, the tube **11** being disposed in the slit **26** and serving to key the member **12** against rotation relative to the body. Said sleeve is substantially shorter than the distance between the abutments **21** and **22**. The relationship between the length of the port, the distance between the abutments **21** and **22**, and the length of the sleeve **25** being such that when the member **12** is slid to engage either of said abutments, said port remains covered.

The tubular projection **13** is located between the ends of sleeve **25** so the same, in all positions of longitudinal adjustment of the member **12**, is open to the mentioned port **23**, as shown in FIGS. **4** and **6**. An annular shoulder **27** is provided on the projection **13**, the discharge end **28** is formed to allow for unrestricted flow into the filter means **14**.

Said latter means is here shown as a porous bag **29** that may be connected to the projection **13** and held in place by the shoulder **27**. The bag **29** may be lined with a refining material, as fuller's earth, if desired.

The scraper fitting **15** is shown as a sleeve part **30**, having a cross-sectional form similar to that of the sleeve **25**, and slidingly engaged with the body **10** between the abutment **22** and the nozzle **12**. As with said sleeve **25**, said part **30** is retained against rotative movement relative to the body **10** by the tube **11**. Said fitting **15**, extending from the part **30**, is provided with a flattened blade **31** that may extend variously below the nozzle **12** according to the longitudinally adjusted position of the scraper fitting. It will be noted from FIG. **1** that the lower edge **32** of blade **31** is adapted to engage the aquarium bottom **33**, to, thereby, space the nozzle **12** above said bottom according to the mentioned adjustment of the fitting **15**. In cases where the aquarium bottom **33** is provided with a layer of sand **34**, said blade may be used to penetrate said layer and, by manipulation of the device, scatter the grains of sand comprising the latter and, in the process dislodge accumulations of waste matter in said bed.

The arrow **35** suggests the type of sand-dislodging movement that may be employed, and the arrows **36** indicate the upwardly buoyed movement of such dislodged matter toward the nozzle **12**, the buoyancy of said particles of matter in the water **37** of the aquarium, brings the same into the influence of the upwardly percolating air bubbles that are generated by the compressed air forced into the interior of the body **10**.

Operation

After the fitting **15** has been adjusted to space the blade edge **32** from the nozzle **20**, as desired—a shorter distance when there is no sand layer **30** on the aquarium bottom **33**, or a larger distance according to the depth of said layer, and the member **12** is adjusted along the body so the projection **13** is substantially immersed when the blade edge **32** is in contact with the bottom **32** or layer **34**. The latter adjustment may be approximate but should be such that the water level **38** in the body which is the level of the aquarium water **37**, shall be above the level at which said water will enter the extension **13**.

The device is held by its upper end and moved through various vertical and slightly angled positions as the blade **31** scrapes the bottom **33**, or flicks portions of the bed to loosen and dislodge particles of matter as hereinabove explained. During such manipulation the flow from the interior of the body into the extension **13** may not be a continuous one but will depend on the vertical or angled disposition of the device. In any case, as shown in FIG. **2**, as the rising air bubbles in the

body reach the variable level **38**, the water at that level will spill over into the extension **13** carrying the particles of matter that were released by the bubbles as the same break through said surface **38**. The air thus released will vent through the upper end of the body **10** and the water, bearing the released particles of matter will discharge into the filter means **14**, the water passing through said means to return to the tank and the particles being intercepted by said means, as is common in such type of separation.

While the foregoing has illustrated and described what is now contemplated to be the best mode of carrying out the invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. A particle-removing device for aquariums comprising:

an elongated, tubular body open at both ends, one end constituting an air vent and the other, when immersed in the water of an aquarium, constituting an inlet nozzle for water from the bottom of the aquarium,

a tube to conduct compressed air to the interior of said body adjacent to said inlet nozzle to produce air bubbles that percolate upwardly in said water in the body interior and carry foreign particles in said water,

an elongated port in the wall of said elongated body,

a sleevelike member slidably adjustably mounted on said body and provided with a downwardly directed tubular extension,

said member being formed with a longitudinal slit in which the mentioned compressed air tube is disposed to retain the body and said member relatively nonrotational,

the downwardly directed tubular extension being in communication, through said elongated port, with the interior of the body and receiving particle-containing water from the interior of the body,

two longitudinally spaced abutments on said body, the spacing therebetween being greater than the length of the port, whereby the interior of the body and the downwardly directed extension are in communication in all adjusted positions along the body between the abutments, and

filter means connected to the outlet end of the tubular extension to allow water to pass therethrough and intercept particles in said water.

2. A particle-removing device according to claim **1** in which the inlet nozzle has a flattened form and in which the end of the compressed air tube enters the interior of the body spaced from the flattened nozzle.

3. A particle-removing device according to claim **1** provided with a longitudinally adjustable fitting for scraping foreign accumulations from the bottom of the aquarium.

4. A particle-removing device according to claim **3** in which said fitting is formed to have a bottom-scraping and sand-dislodging blade, whereby particles loosened by the blade are buoyed by the aquarium water to move into the influence of the compressed air entering the body and to be caught up in bubbles formed by said compressed air rising toward the mentioned downwardly directed extension.

5. A particle-removing device according to claim **4** in which the blade of the mentioned fitting when fully retracted, extends beyond the nozzle of the body, thereby the blade at all times spaces the nozzle from the aquarium bottom.

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