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3,208,090

CLEANER FOR INNER SURFACE OF THE WALLS OF A FISH AQUARIUM

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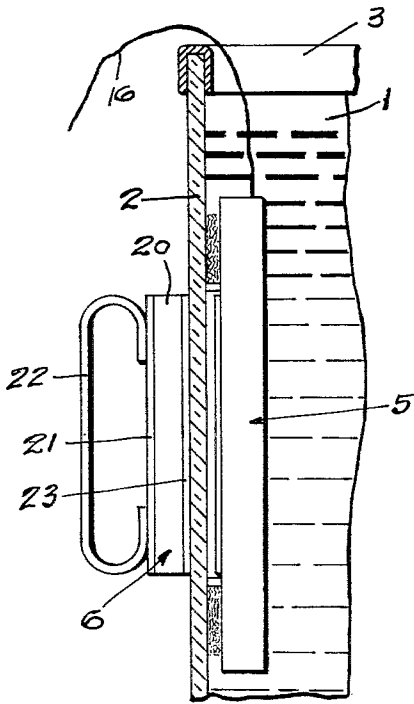


FIG. 1

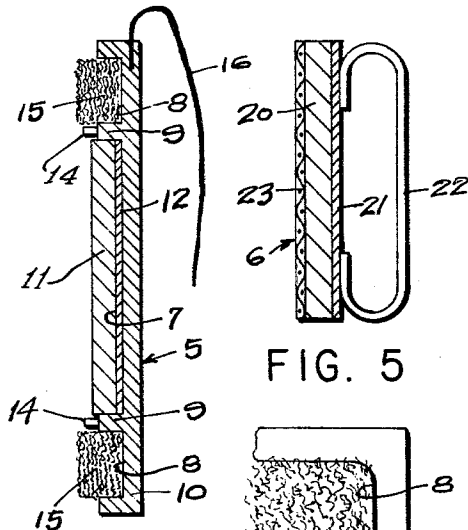


FIG. 4

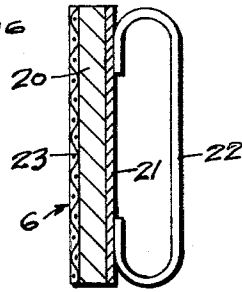


FIG. 5

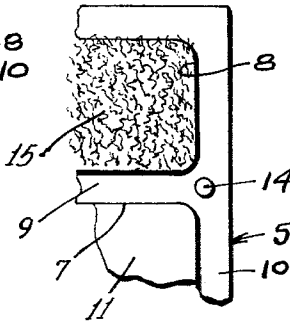


FIG. 6

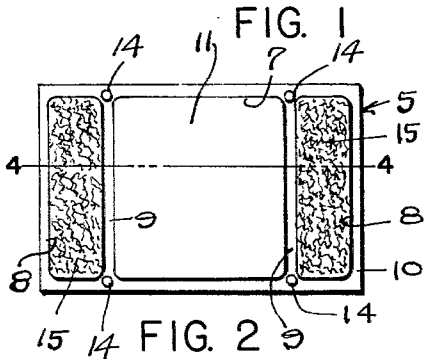


FIG. 2

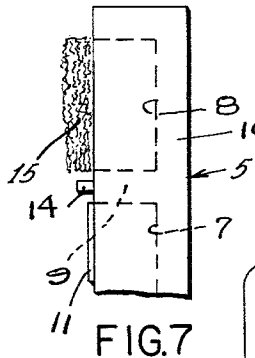


FIG. 7

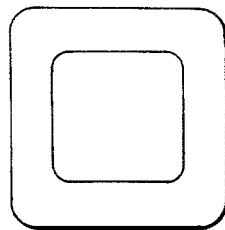


FIG. 8

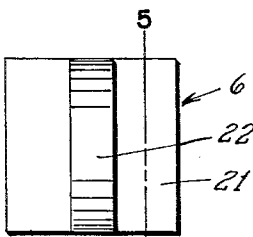


FIG. 3

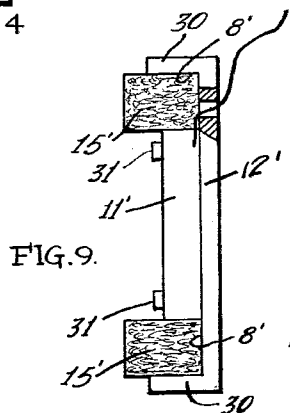


FIG. 9

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1

3,208,090
**CLEANER FOR INNER SURFACE OF THE WALLS
 OF A FISH AQUARIUM**

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 1 Claim. (Cl. 15—220)

This invention relates to cleaner for cleaning algae or other foreign matter from the inner surface of the glass walls of a fish aquarium.

In aquariums such as are used in homes or elsewhere for containing and displaying tropical or other fish, algae (i.e. a greenish scum) forms on the inner surface of the glass walls of the aquarium, and not only detracts from the transparency of the glass but gives an undesirable dirty, murky appearance, materially detracting from the normally pleasant attractiveness of the aquarium and fish therein.

It has heretofore been the practice to remove the fish, plant life, and any decorative objects from the aquarium and scour the inner surface of the glass, with a scouring pad, cloth or the like. In cleaning the aquarium in this manner it is necessary to remove the fish, etc. otherwise they would be greatly disturbed and might be injured either by contact with the hand or cleaning element used, or injured by the murk created by such cleaning, or material used in cleaning the glass may be toxic to the fish. Also it has been the practice to remove the scum from the inner surface of the glass walls by scraping it from the walls with a razor blade or some type of scouring pad. Cleaning the aquarium in this manner necessitates the introduction of the hand into the water (in the case of the scouring pad) or results in severe scratches in the glass after prolonged use of a razor blade for the removal of the growth.

The present invention provides a magnetically controlled cleaner for cleaning the inner surfaces of the glass walls of an aquarium, which will permit such cleaning, without introducing the hands into the water, without risk of scratching the glass, without removal of the fish, etc. from the aquarium, will not stir up the contents of the aquarium, and is non-toxic to the fish.

There are many magnetic cleaners for cleaning windows, but none of these are constructed or designed for cleaning the inner surface of the walls of an aquarium, as their construction is such that their use would undesirably stir up the contents of the aquarium, agitate the fish and in fact provide no real advantages over the old method of cleaning as above set out.

With these and other objects in view, as may appear in the accompanying specification, the invention consists of the various features of construction and combination of parts, which will be first described in connection with the accompanying drawing, showing a cleaner for the inner surfaces of the walls of an aquarium, and features forming the invention will be set out in the claims.

In the drawings.

FIGURE 1 is a fragmentary view of an aquarium showing the cleaner in cleaning position therein.

FIGURE 2 is a face view of the inner movable cleaning member.

FIGURE 3 is a plan view of the outer motive member of the cleaner.

FIGURE 4 is a cross-section on the line 4—4 of FIGURE 2.

FIGURE 5 is a cross-section taken on the line 5—5 of FIG. 3.

FIGURE 6 is an enlarged fragmentary face or plan view of the movable cleaning element.

FIGURE 7 is an enlarged fragmentary side or edge elevation of the movable cleaning element.

2

FIGURE 8 is in effect a diagrammatic view of one of the magnets employed in the cleaning device.

FIGURE 9 is a side elevation partly in section of a modified form of the invention.

Referring to the drawings, a fragment of an aquarium is indicated at 1, having a glass wall 2 the upper edge of which is bound by a metal strip 3 as is customary in the manufacture of aquariums.

The cleaner for removing algae or other foreign matter from the inner surface of the glass wall 2, consists of a moving or follower member 5 and a motive or controller member 6.

The body 10 of the follower 5 is made of a suitable, mouldable plastic which is non-toxic to fish and its face is provided with a central indentation or pocket 7 and two end indentations 8 of equal length and equal in length to the width of the central indentation 7. These indentations 7 and 8 are separated by partitions 9, integrally joined to the sides of the body 10.

A relatively thin magnet 11, preferably square in shape, is placed in the central indentation or pocket 7 and is separated from the back wall or surface of the indentation 7 by a steel back plate 12, as clearly shown in FIGURE 4. The magnet 7 and steel plate 12 are rigidly and permanently fixed in the indentation in any suitable manner.

Since it is desirable to provide a magnet of long life and is necessary to provide one which is completely inert and non-toxic, a plastic magnet is used, which embodies a permanent magnet ferrite material such as $Ba_{0.6}Fe_2O_3$ in powdered form with a plastic or rubber binder. Such a magnet is completely inert, is soft and inexpensive in cost. It has extraordinary long life, resists demagnetization, or if heated, within reasonable limits will, upon cooling, recover its full magnetic strength.

The use of a ferrite magnet permits use of a very thin magnet, which prevents any stirring up of water in the aquarium and provides a magnet which will stand up under water.

The steel plate 12 on or at the back of the magnet 11 completes the magnetic flux path, thereby reduces magnetic reluctance in the back so as to provide additional magnetic force in the front of the magnet.

Glide pins 14 are on the body 5 preferably at the corners of the central indentation or pocket 7 and project a short distance outwardly of the outer or forward face of the magnet 11, to prevent magnet from touching the glass wall 2, this eliminates friction between the magnet and glass and also facilitates flow of water in the aquarium during the cleaning operation.

The indentations or pockets 8 have cleaning sponges 15 therein the outer surfaces of which project beyond the forward face of the magnet 11 and glide pins 14 as clearly shown in FIGURES 4 and 7. The sponges 15 are made of inert, nontoxic plastic material, preferably soft nylon in sponge formation, and their front surfaces or faces which contact the glass are treated to make them abrasive. Soft nylon of sponge formation having one face treated to render it abrasive may be purchased upon the open market. The treated faces of the sponges are sufficiently abrasive to remove algae or other foreign matter from the surface of the glass 2 without scratching the glass.

A string 16 is attached to the body of the follower member 5 in any suitable manner, preferably by having one end of the string embedded in the body when it is formed. The string is for use in withdrawing the follower or movable member 5 from within the aquarium.

The controller or motive element 6 embodies a magnet 20 which is of the same material as the magnet 11. A steel back plate 21 is attached to the back surface of the magnet 20 and functions the same as the steel back plate 12. A suitable handle 22 of any desired shape or con-

struction is attached to the steel back plate 21. A soft non-abrasive sheet 23, preferably of suitable cloth is attached to the front face of the magnet 21 to prevent scratching of the glass wall 2 and reduce friction between the glass and controller 5 as the latter is moved over the surface of the glass wall.

Each magnet 11 and 20 is in effect double poled, to increase the magnet strength of the cleaner, and FIGURE 8 illustrates the manner of their polarization. One of the magnets has a central positive and an enclosing negative polar section surrounding the central positive section, while the other is just the reverse, thereby providing double magnetic action between the two magnets.

In use the follower or movable member 5 is placed in an aquarium with the outer faces of the sponges 15 against the inner surface of the glass wall 2 and the controller or motive member 6 is moved against the outer surface of the glass wall 2 and in alignment with the magnet 11.

When the controller 6 is moved over the outer surface of the glass, the magnetic attraction will cause the follower 5 to be correspondingly moved over the inner surface of the glass to clean it.

The sponges 15 project beyond the outer or front face of the magnet 11 a distance greater than the thickness of the metal rim 3 and this permits cleaning of the glass up to the edge of the metal binder or strip 3.

In the modified form of the invention shown in FIGURE 9 of the drawings, the plastic body 10 of the follower 5 is eliminated and the metal back plate 12' forms the body of the follower. The ends 30 of the back plate 12' are bent or turned at right angles to the back plate to form end abutments, or outer walls for engagement with the sponges or brushes 15' which correspond to the sponges or brushes 15 of the form of the invention shown in FIGURES 1 to 7 inclusive.

The magnet 11' which is identical with the magnet 11 is attached to the back plate 12', and its opposite end edges co-operating with the right angled ends or flanges 30 form

channels 8' in which the sponges or brushes 15' are located.

The glide pins 14 are replaced in the modified form by small pads 31 of a material with a low coefficient of friction such as "Teflon" which are attached directly to the magnet 11'.

What is claimed is:

A cleaner for the inner surface of the walls of an aquarium including a controller and a follower, said follower including a plastic carrying body having a centrally located magnet receiving indentation and end located cleaning element receiving indentations at two sides of said magnet receiving indentation, partitions separating said indentations, a ferrite magnet in said magnet receiving indentation, said magnet being double poled, a metal plate in said magnet receiving indentation and engaging the inner surface of the magnet to complete the magnetic flux path and thereby reduce the magnetic reluctance in the back of the magnet and provide additional magnetic force in the front of the magnet, cleaning sponges of inert material in said cleaning element receiving indentations and having their outer cleaning surfaces extending outwardly of the outer surfaces of the magnet, and glide pins carried by said body and extending outwardly of the outer surface of the magnet and terminating inwardly of the outer surfaces of the cleaning sponges, to prevent contact of the magnet with a surface being cleaned but permit contact of the cleaning sponges with such surface.

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WALTER A. SCHEEL, *Examiner.*