April 5, 1966 R. CONRAD 3,243,830

SWIMMING POOL VACUUM CLEANER

Filed Sept. 29, 1964

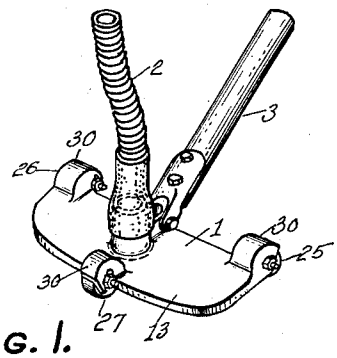


FIG. 1.

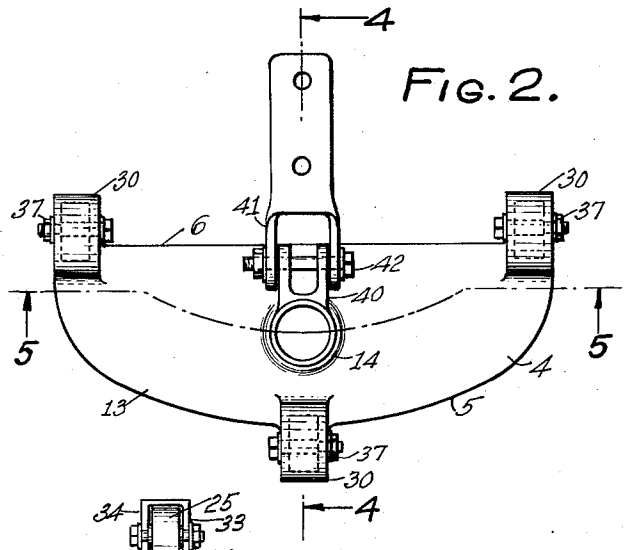


FIG. 2.

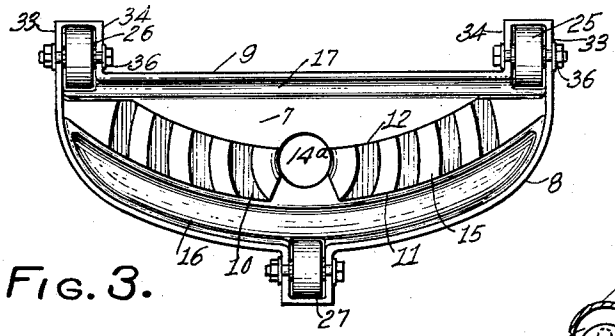


FIG. 3.

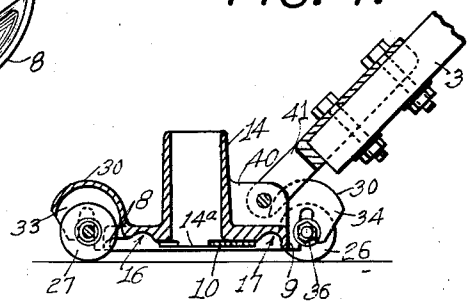


FIG. 4.

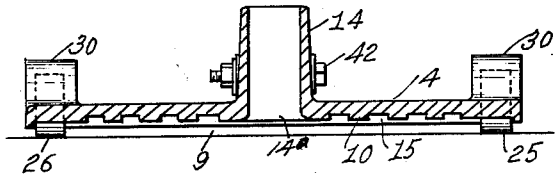


FIG. 5.

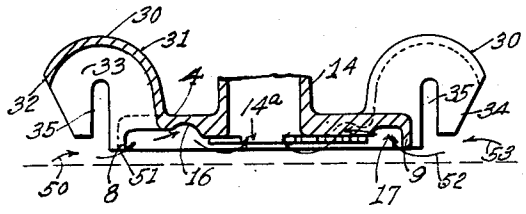


FIG. 6.

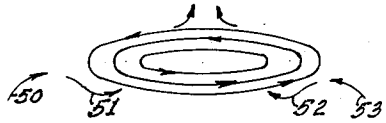


FIG. 7.

INVENTOR,
ROBERT CONRAD;
BY
Calvin Brown,
ATTORNEY

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SWIMMING POOL VACUUM CLEANER

Robert Conrad, 1531 N. Rose St., Burbank, Calif.

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The present invention relates to a swimming pool vacuum cleaner of a type which does not use a brush of the bristle type, nor a water pressure nozzle.

The average vacuum brush provided with bristles is moved through the medium of a long handle by an operator standing at the edge of a pool. Such brush movement against the pool wall and floor disturbs the water and any debris on the wall and floor rises within the water with resultant inefficient cleaning of the pool.

My invention has for one of its objects a swimming pool vacuum cleaner which does not create disturbance in the water sufficient to cause suspension of debris therein, and which cleaner is so constructed that the cleaning action of the pool is continuous without intermittent stops and which will readily pick up heavy debris such as sand and leaves.

A further object is the provision of a vacuum cleaner for swimming pools which washes a swimming pool from debris by hydraulic washing action alone without the use of a brush.

A further object is the provision of a swimming pool vacuum cleaner having a head adapted to be moved over the pool walls and floor and wherein a swirling action of the water is created beneath the head to effectively dislodge debris from the swimming pool enclosure effectively and efficiently.

A further object is the provision of a swimming pool vacuum cleaner which provides a hydraulic circular washing action.

Other objects include a swimming pool vacuum cleaner which is inexpensive in cost of manufacture, readily constructed and efficient in use and operation.

Other objects of my invention will appear as a detailed description of the invention is set forth.

In the drawing:

FIGURE 1 is a fragmentary, perspective view of my invention shown as an entirety;

FIGURE 2 is an enlarged fragmentary top plan view of the head of the vacuum cleaner;

FIGURE 3 is a bottom plan view of the head shown in FIGURE 2;

FIGURE 4 is a fragmentary transverse sectional view on the line 4—4 of FIGURE 2;

FIGURE 5 is a cross sectional view on the line 5—5 of FIGURE 4;

FIGURE 6 is a fragmentary, sectional view on an enlarged scale of the head; and,

FIGURE 7 is a diagrammatic view illustrating the flow path of water beneath the vacuum head during operation thereof.

Referring now to the drawing, the swimming pool vacuum cleaner includes a vacuum head **1** to which is connected a hose **2** leading to a source of vacuum such as a vacuum pump, not shown, and **3** is a handle secured to the vacuum head **1** for moving the vacuum head over a pool floor or the side walls of a pool.

The vacuum head **1** comprises a flat or plane plate **4** of segmental form in that it has a substantially arcurate leading edge **5** and a chord constituting a straight trailing edge **6**. The bottom or base surface **7** of the plate **4** is surrounded by an arcuate marginal flange **8** bounding the arcuate leading edge **5** and a straight flange **9** bounding the straight edge **6**, thus providing a depressed base. Extending transversely of the base **7** is a flat or plane surfaced arcuate embossment **10**, the bounding edges **11** and **12** of which generally conform to the arcuate edge **5** of the plate **4**. Extending from the top surface **13** is a tubular throat member **14** which is positioned substantially intermediate the plate **4** both transversely and laterally thereof, as shown. The tubular throat member **14** extends through the base **7** of the plate, as shown by FIGURE 5, to porvide a mouth **14***a*.

The embossment **10** is provided with spaced surface grooves designated generally as **15** which communicate on one side; to wit, the arcuate edge **11** of the embossment, with the elongated arcuate groove **16** formed in the base **7** and positioned between the arcuate edge **11** of the embossment and the marginal flange **8**. There is an elongated straight groove **17** of uniform depth between the marginal flange **9** and the arcuate edge **12** and formed in the base **7**. Thus the embossment divides the base **7** transversely into two areas, one of which includes grooves **16** and the other a flat area having groove **17**. Such a construction of the base of the head results in high and low planes as shown in FIGURES 4 and 6.

The vacuum head plate **4** is adapted to be supported by rollers of which in the present instance there are three, as shown at **25**, **26** and **27**. The rollers **25** and **26** are offset from the marginal edge **6** of the plate **4** while the roller **27** extends beyond the arcuate edge **5** and substantially central of the plate **4** to provide a tricycle support. The construction is such that the rollers are carried within the wells of fenders **30**. Thus, referring to FIGURE 6, the fenders extend above the top surface of the plate **4** and are curved to conform to the curvature of the rollers, as shown at **31**. The outer ends of the fenders terminate above the periphery of each roller, as shown at **32**. Each fender includes side walls **33** and **34** which are integral with the marginal flanges **8** and **9**. Each side wall is provided with an open ended slot **35** which is normal to the plane of plate **4** and the rollers are mounted upon suitable axles **36** which extend through the aligned slots **35** and provided with means **37** for holding the axles at adjusted heights within the slots. Thus the axle may comprise a bolt having a smooth shank portion for the rollers, a head, and a screw threaded portion receiving a nut whereby the axle may be held in a selected position relative to the fender side walls. In this manner, the vacuum head may be raised or lowered relative to a pool surface to be cleaned.

In the showing of the drawing I have provided a pair of lugs at **40** which extend from the tube **14** as shown in FIGURE 2 and a yoke **41** bridges the lugs **40** and is held thereto by the means shown at **42** which may comprise a headed bolt passed through aligned openings in the yoke and the lugs and secured by a nut carried on threads of the bolt. The handle **3** is fastened to the yoke bracket as shown in FIGURE 1.

The operation, uses and advantages of my invention are as follows.

Having made an adjustment as to the height of the vacuum head **1** above a surface to be cleaned by means of the adjustability permitted the rollers **25**, **26** and **27**, and assuming that the tube **2** is connected to vacuum apparatus which draws water therethrough to be filtered so as to remove debris therefrom, the operator by means of handle **3** moves the vacuum head over the surface which may be a pool floor or a side wall thereof, the water ordinarily being passed through the tubular suction throat **14** and into the flexible tube **2** at approximately sixty gallons per minute. The movement of water between the vacuum head base and the pool floor or wall causes a hydraulic circular washing action between the base of the vacuum head and the pool floor or wall due to the arcuate groove **15** in the embossment **12** forming flow paths for the water. A rapid hydraulic circular wash-

ing action results such that suspension of debris in the water does not occur. Thus, the flow path for the water is inwardly of the marginal flange area and toward the mouth **14***a* of the tubular throat member **14**. In other words, the water moves towards the center of the throat and through the flexible tube **2**. I have found that the low profile type cleaner head of my invention is superior to any brush construction type vacuum cleaner which only disturbs the debris and causes suspension thereof in water as the brush is moved over a pool floor or wall. Furthermore, brushes wear rapidly and the present invention does not provide any means adapated to engage the floor or wall other than the rollers at **25**, **26** and **27**. The base of the vacuum head may be raised to different levels by the adjustment provided for the rollers so that almost any character debris such as sand and leaves may be readily washed from the pool floor or wall. The fender arrangement by rising above the top surface of the vacuum head allows ready adjustment of the rollers to lift the vacuum head to different levels and particularly levels for the base of said head. In this manner the best hydraulic circular action for the head can be ascertained for a given pool condition to assure that the flow of water is circular or on a radius using the suction throat tube as a center.

The high and low planes for the base surface of the head resulting from the raised embossment **10** and the grooves **16** and **17** in the base surface have a direct effect of the flow of water passing inwardly under the marginal flanges. The direction of water flow inwardly of the head is illustrated in FIGURE 7 by the arrows at **50**, **51**, **52**, and **53**. This construction provides a cleaner which attains the objects of the invention.

I claim:

1. A swimming pool vacuum cleaner including: a head and means supporting the head for movement on the pool enclosure: said head comprising a plate having a base provided with a surrounding marginal flange and provided with a transverse embossment having spaced apart transverse arcuate grooves, a tubular throat communicating with the base, said tubular throat adapted to be secured to a vacuum line whereby when the vacuum line is operating and the head is within water upon a pool enclosure surface, water is moved in a circular path under the plate by the arcuate grooves of the embossment and into said tubular throat.

2. The combination in a swimming pool vacuum cleaner adapted to be connected with a source of vacuum for drawing water through said vacuum cleaner, of: a vacuum head comprising a substantially segmental plate provided with adjustable height rollers for positioning the plate above a pool surface, said plate having a top and a base surface and a tubular throat transversely passed through the plate intermediate the transverse and lateral widths of the plate, the vacuum line being connected to said tubular throat; the base surface of said plate having a surrounding marginal flange, and a laterally extending arcuate embossment on said base surface, said embossment provided with a series of spaced arcuate grooves transverse of the embossment.

3. The device set forth in claim **2**, the tubular throat interrupting the continuity of the embossment.

4. The device as set forth in claim **2**, said base surface provided with an arcuate groove positioned between the marginal flange and the arcuate edge of the embossment.

5. The device as set forth in claim **2**, the base of the plate provided with elongated grooves positioned between the marginal flange and the embossment to provide high and low planes on the base surface.

6. The device as set forth in claim **2**, said arcuate grooves in said embossment being on a radius with the axis of the tubular throat as the center thereof.

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CHARLES A. WILLMUTH, *Primary Examiner.*