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(54) **Valve member for automatic pool cleaner.**

(57) A valve member 38 for an automatic swimming pool cleaner 10 is disclosed and claimed. The valve member is symmetrical and defines similarly shaped and positioned recesses 52 and 54 in opposed sealing faces 48 and 50 thereof.

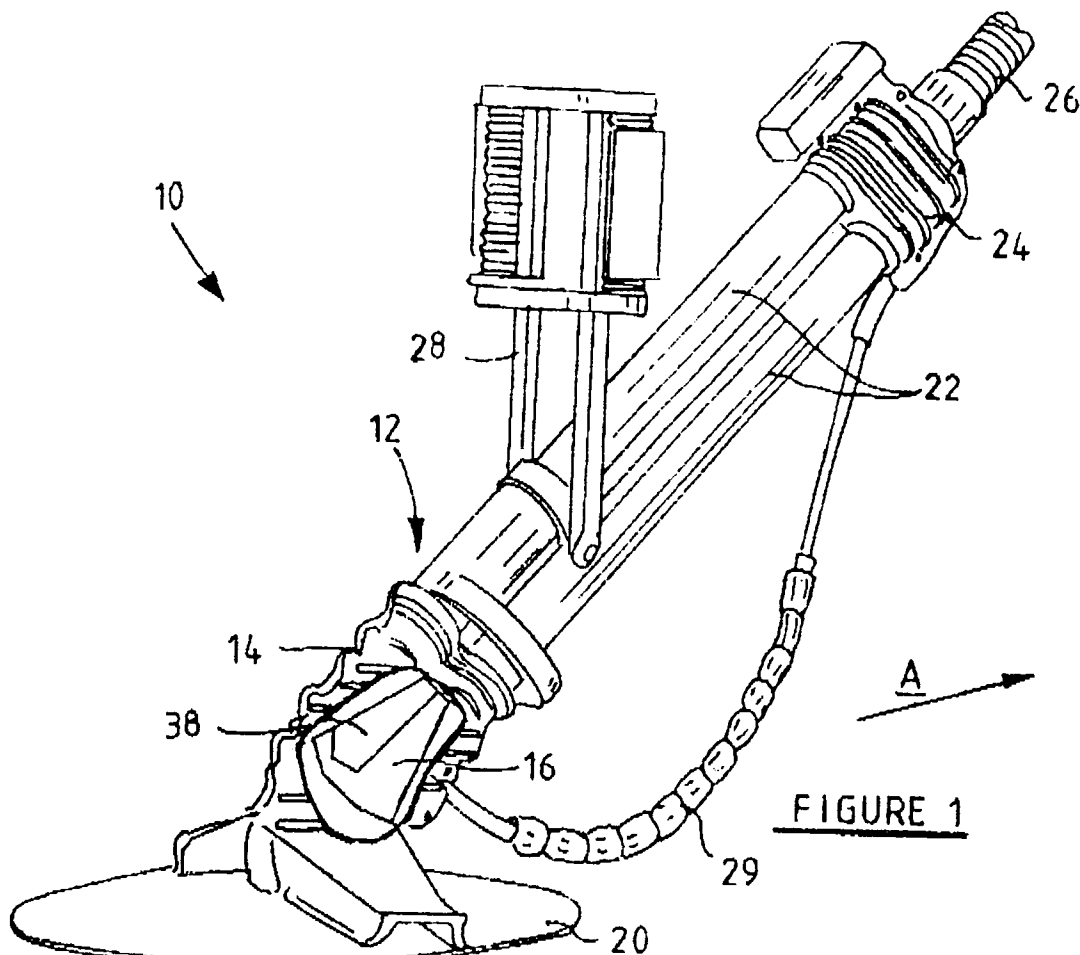


FIGURE 1

INTRODUCTION AND BACKGROUND

THIS invention relates to automatic cleaners for submerged surfaces and more particularly to automatic swimming pool cleaners.

Automatic swimming pool cleaners are well known in the art. One such a machine, which is disclosed in the complete specification of SA Patent 75/1166, comprises a body having a hollow head defining a water inlet in a peripheral region thereof. The head defines two outlets from which two elongate tubes extend. The other ends of the tubes terminate in a coupling which, in use, is connected via a flexible hose to a suction source, such as the suction inlet of a pump and filtration system of a swimming pool. In the head there is mounted a closure member or valve for pivotal movement between two valve seats defining ports to the two tubes. Due to water flow through the body, the valve alternately and repeatedly opens and closes the ports. The valve therefore intermittently interrupts water flow through the ports, thereby to impart kinetic energy to the body causing the body automatically to move over the surface to be cleaned. The valve is symmetrical and comprises opposed planar and continuous sealing surfaces.

The valve of the cleaner hereinbefore described, in use, generates some noise. Furthermore, flow of water through the cleaner and thus the efficiency of the cleaner is impaired by the configuration of the known valves.

OBJECT OF THE INVENTION

It is an object of the present invention to provide an alternative valve member with which the applicant believes the aforementioned disadvantages will be alleviated.

SUMMARY OF THE INVENTION

According to the invention there is provided a valve member for an automatic cleaner for submerged surfaces, the valve member being symmetrical and having opposed first and second sealing faces for ports in the cleaner, the first and second sealing faces defining similarly shaped and positioned recesses therein.

The valve member is preferably wedge-shaped and comprises an apex, a base, two opposed side faces and the said two opposed sealing faces.

In the preferred embodiment each of the first and second sealing faces defines only one recess therein. The said only one recess in each of the sealing faces may increase in depth in a direction from the apex to the base.

A mouth of the recess in the sealing face is preferably rectangular and a wall between the recess in the first sealing face and the recess in the second sealing face is of uniform thickness.

The mouth may occupy at least ten percent of the area of the sealing face wherein it is defined and preferably occupies in the order of forty five percent of the said area.

In another embodiment a wall defining the recess may be curved.

The valve member according to the Invention may be made by an injection moulding process from a suitable resinous material.

The invention also includes within its scope an automatic cleaner for submerged surfaces comprising a valve member as hereinbefore defined for intermittently varying liquid flow through the cleaner, thereby to cause the cleaner to move over a surface to be cleaned.

BRIEF DESCRIPTION OF THE DIAGRAMS

The invention will now further be described, by way of example only, with reference to the accompanying diagrams wherein:

figure 1 is a side elevation, partially broken away, of an automatic swimming pool cleaner;

figure 2 is a diagrammatic cross-sectional view of part of a head of the pool cleaner;

figure 3 is a perspective view of a valve member for the pool cleaner, from one side thereof; and

figure 4 is a similar view of the valve member, from the other side thereof.

DESCRIPTION OF PREFERRED EMBODIMENT OF THE INVENTION

A suction operable automatic swimming pool cleaner is designated generally by the reference numeral 10 in figure 1.

The cleaner 10 comprises a body 12 having a head 14 defining an internal chamber 16 communicating with a water inlet 18 (shown in figure 2) in a peripheral region of the head 14. A flexible seal 20 is mounted

about the peripheral region.

The head 14 defines two outlets from the chamber 18 and two elongate tubes 22 extend from the outlets and terminate in a coupling 24. Coupling 24 defines an outlet (not shown). In use, the outlet is connectable via a flexible suction hose 26 to a suction source (also not shown), such as the inlet of a swimming pool pump and filtration system. A dive float assembly 28 is pivotably mounted on the body to facilitate movement of the cleaner up and down the side walls (not shown) of a swimming pool (also not shown).

A bumper strap 29 is mounted on the body 12.

In the chamber 16 in the head 14, there are provided two ports 30 and 32, each communicating with one of the aforementioned outlets from the head. The ports are circumscribed by annular valve seats 34 and 36 respectively. Also in chamber 16 and between ports 34, 36 and the inlet 18 there is provided a wedge-shaped symmetrical valve 38. Valve 38 is mounted in the head for pivotal movement between a first position (shown in solid lines in figure 2) wherein it closes port 30 and a second position (shown in dotted lines in figure 2) wherein it closes port 32.

Symmetrical valve 38 has an apex 40, a base 42, opposed side faces 44 and 46, and opposed sealing faces 48 and 50. Sealing faces 48 and 50 define symmetrical rectangular recesses 52 and 54 respectively which increase in depth from the apex 40 to the base 42. Wall 56 between the recesses 52 and 54 is of uniform thickness.

The area of the mouth region of each of the recesses 52 and 54 is in the order of 45% of the surface area of the sealing face wherein it is defined.

The valve 38 is injection moulded from a suitable polymeric material.

In use, when the cleaner 10 is connected to the suction source, water is sucked through mouth 18 and flows through chamber 16, tubes 22 and the aforementioned outlet in the coupling 24 to the suction source. Water flowing past valve 38 causes the valve to oscillate between its aforementioned first and second positions, thereby alternately and repeatedly to open and close ports 30 and 32. The intermittent interruption of water flow through the tubes 22 causes kinetic energy to be imparted to the body 12, thereby to cause the cleaner to move in direction A over the surface to be cleaned.

It has been found that with the valve 38 defining the symmetrical recesses 52 and 54, flow of water through the body is improved and noise generated by the cleaner in use, is reduced.

It will be appreciated that there are many variations in detail on the valve member according to the invention without departing from the scope and spirit of the appended claims.

Claims

1. A valve member for an automatic cleaner for submerged surfaces, the valve member being symmetrical and having opposed first and second sealing faces for ports in the cleaner, the first and second sealing faces defining similarly shaped and positioned recesses therein.
2. A valve member as claimed in claim 1 wherein the valve member is wedge-shaped and comprises an apex, a base, two opposed side faces and the said opposed first and second sealing faces.
3. A valve member as claimed in claim 1 or claim 2 wherein each of the first and second sealing faces defines only one recess therein.
4. A valve member as claimed in claim 3 wherein said only one recess in each of said sealing faces increases in depth in a direction from the apex to the base.
5. A valve member as claimed in claim 4 wherein a mouth of the recess in the sealing face is rectangular and wherein a wall between the recess in the first sealing face and the recess in the second sealing face is of uniform thickness.
6. A valve member as claimed in claim 5 wherein the mouth occupies at least ten percent of the surface area of the sealing face wherein it is defined.
7. A valve member as claimed in claim 3 wherein a wall defining the recess is curved.
8. A valve member as claimed in any one of claims 1 to 7 wherein the valve member is made by an injection moulding process from a resinous material.

9. An automatic cleaner for submerged surfaces comprising a valve member as claimed in any one of claims 1 to 8 for intermittently varying liquid flow through the cleaner, thereby to cause the cleaner to move over a surface to be cleaned.

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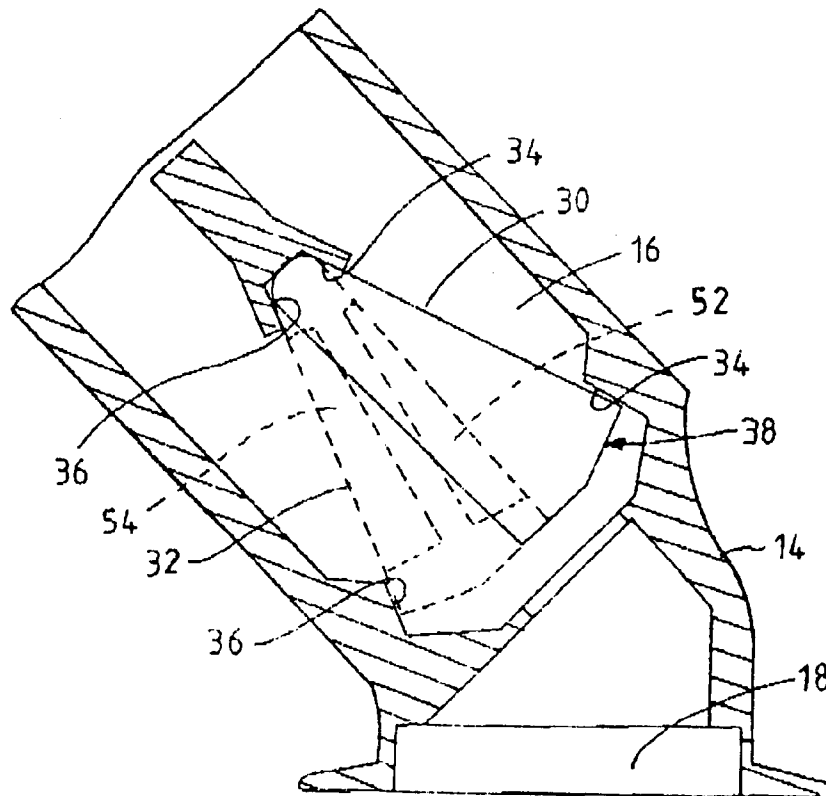
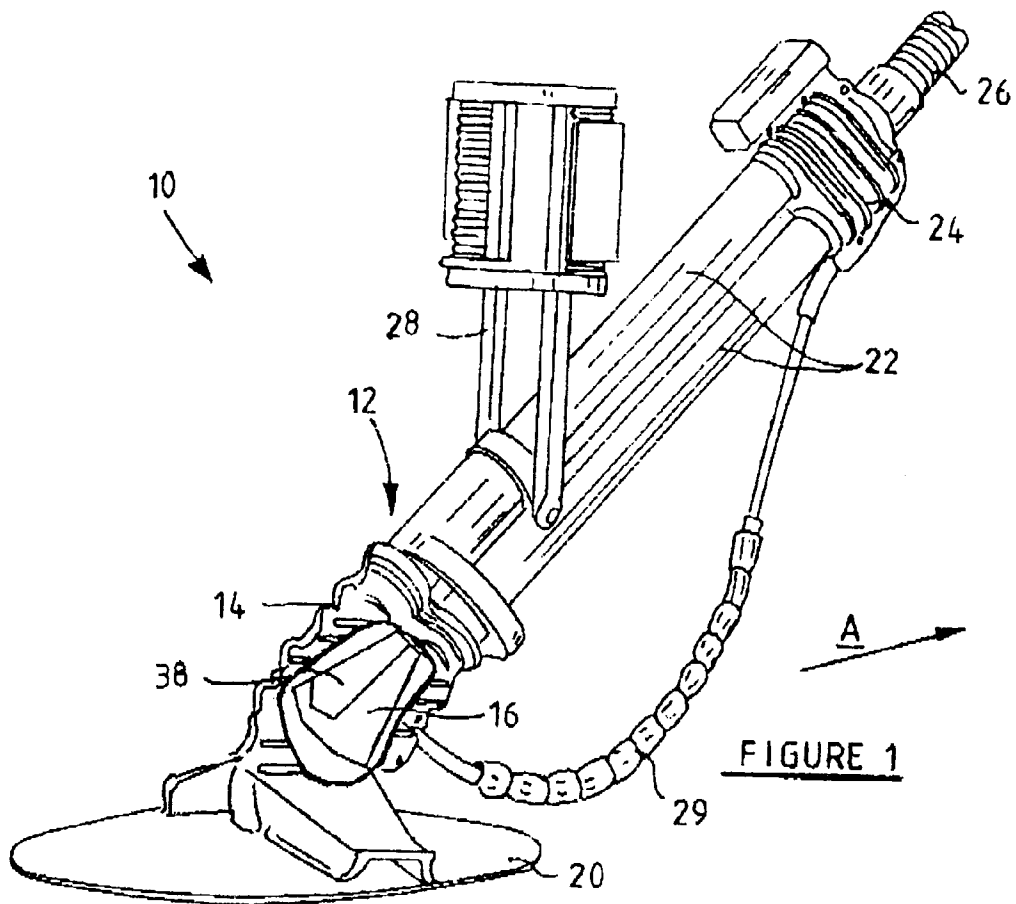
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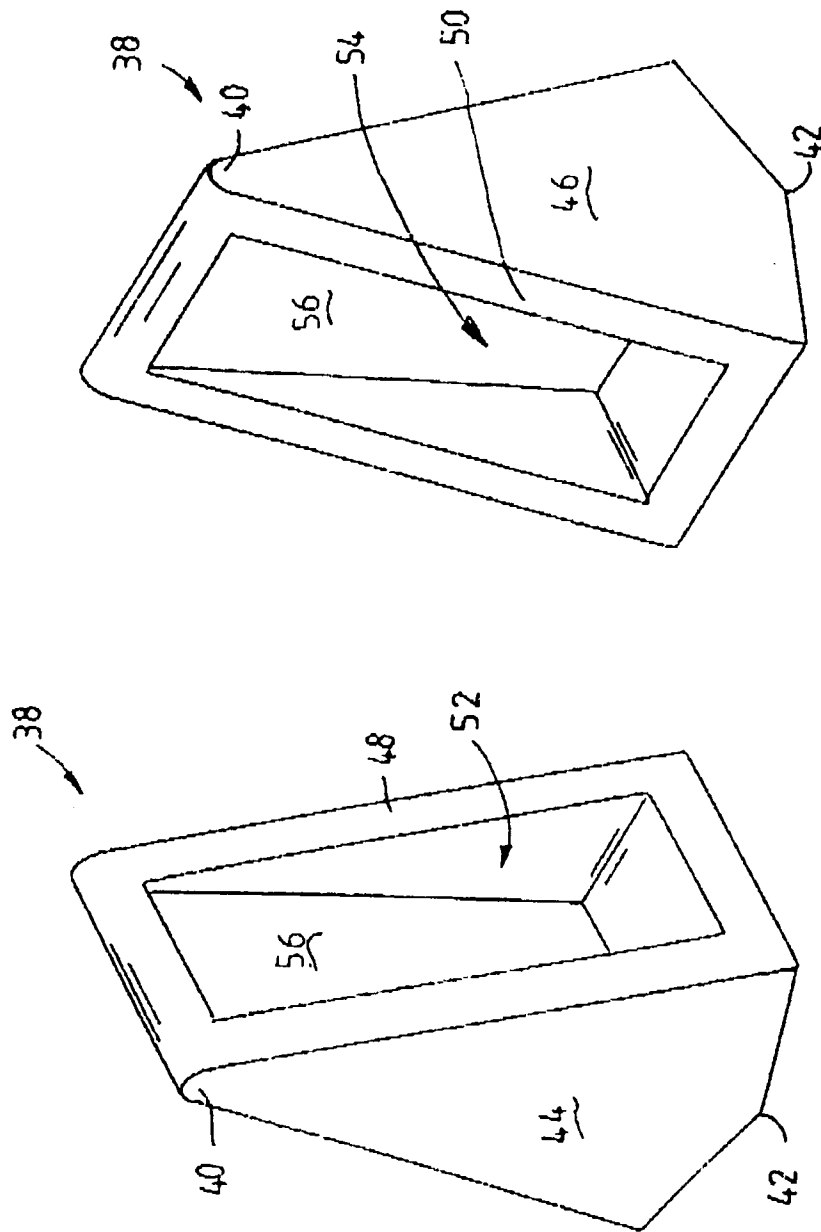
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EUROPEAN SEARCH REPORT

Application Number

EP 93 30 1666

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
P,A	EP-A-0 476 413 (RIEF) * column 4, line 28 - column 5, line 29 * * column 7, line 43 - column 8, line 10; figures 1,6 *	1,2,8,9	E04H4/16
A	DE-A-2 620 119 (CHAUVIER) * page 9, line 1 - line 4 * * page 9, line 25 - page 11, line 28; figure 2 *	1,2,8,9	
A	FR-A-2 520 422 (SA TUBSUD AUTOMATION) * page 4, line 10 - page 5, line 31; figures 1,2 *	1,2,8,9	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E04H
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 26 MAY 1993	Examiner HENKES R.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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