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54 **Automatic pool cleaners.**

57 An automatic pool cleaner comprising a dive float assembly pivotably mounted to an elongate drive tube 11 for limited movement on both sides of a substantially central position is disclosed and claimed. The cleaner is characterised in that dive float assembly centralising means 21 are provided to ensure that the dive float assembly returns to the substantially central position with respect to the drive tube as a dive float rotates about an axis which is transverse to a longitudinal axis of the drive tube when the cleaner changes to a downward path at a uppermost position on a wall of a pool, thus ensuring that said downward path is substantially vertical.

THIS invention relates to automatic swimming pool cleaners. It more particularly relates to cleaners of the type which is coupled through a flexible hose to a suction inlet of a filtration and pump system of the swimming pool and which cleaners comprise means for periodically varying the rate of water flow through the cleaner thereby to impart kinetic energy to the cleaner to cause the cleaner to move over the bottom and walls of the pool. One such cleaner which has been widely marketed throughout the world under the trade mark "Kreepy Krauly" is described in South African Patent 75/1166.

Generally, cleaners of the type described climb the wall of a swimming pool on a path at an angle of approximately 30 degrees to the horizontal until a flexible seal mounted on a main body of the cleaner and which seal, in use, is in contact with the wall, reaches the water level. Then, under the influence of what is known as a dive float assembly, the cleaner rotates and moves down the wall at an angle of approximately 30 degrees. The dive float assembly comprises a pilot weight assembly rotatably mounted on the drive tube for limited rotation about the longitudinal axis of the drive tube on both sides of a substantially central position and at least one dive float which is pivotally mounted on the pilot weight assembly for rotation about an axis transverse to the longitudinal axis of the drive tube.

It may happen that if the cleaner moves up and down the walls of the pool at angles of approximately 30 degrees, that the cleaner may repeatedly follow substantially the same path through the pool and that it thus do no move through the pool in random fashion.

It is an object of the present invention to provide a cleaner which the applicant believes, in use, will travel down the wall along a substantially vertical path.

According to the invention there is provided an automatic pool cleaner of the type described having a dive float assembly comprising at least one dive float pivotally mounted on an elongate drive tube for limited movement on both sides of a substantially central position relative to a longitudinal axis of the drive tube and for rotation about on an axis transverse to the longitudinal axis of the drive tube characterised in that dive float assembly centralising means are provided to ensure that the dive float assembly returns to the substantially central position with respect to the drive tube as the at least one dive float rotate about said axis when the cleaner changes to a downward path at an uppermost position on a wall of the pool, thus ensuring that said downward path is substantially vertical.

It has been found that if the dive float assembly is confined to a substantially central position with the floats substantially vertical the cleaner will move down the wall along a substantially vertical path and then across the bottom of the pool, thus facilitating random

movement of the cleaner.

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 of one embodiment of the cleaner according to the invention;

figure 2 is a sectional view in an axial direction with the dive float assembly centralising means in an inoperative position;

figure 3 is a similar view, but with the dive float assembly centralising means in an operative position;

figures 4a and 4b are views of the centralising means showing the preferred configuration thereof;

figure 5 is a fragmentary side elevation showing the centralising means in the operative position; and

figure 6 is a fragmentary side elevation showing the centralising means in the inoperative position.

As shown in the drawings, the cleaner is of the type described in the specification of South African Patent 75/1166. It comprises a pair of drive tubes 11 and 12 connected at lower ends thereof to a main body 14 of the cleaner. On main body 14 there is mounted a flexible seal 15. The upper ends of the drive tubes are connected through a swivel joint to a hose 16. A pilot weight assembly comprising a sleeve 17 rotatably mounted on the upper drive tube 11 is provided with an extension 18 which encircles the lower drive tube 12. The outermost portion of the extension 18 has a weight (not shown) enclosed therein. Floats 19 are carried on the upper ends of arms 20 which are pivotally mounted on the sleeve for rotation about an axis transverse to the longitudinal axis of the drive tubes 11 and 12. The cleaner is shown in the normal operating position in figure 1 with the seal 15 in contact with the surface 100 being cleaned, the drive tubes 11 and 12 projecting rearwardly and upwardly at an angle of approximately 45 degrees and the floats 19 substantially vertical. The dive float assembly is capable of limited rotation (approximately 30 degrees on either side of a substantially central position) about the longitudinal axis of the drive tube 11.

In accordance with the invention centralising means comprising two centralising members 21 are provided on the dive float assembly. Each of the members is positioned between an arm 20 and the drive tube 11 and is fixed to the arm 20 so that in the cleaner's normal operating position (shown in figures 1 and 6) the centralising members are clear of the drive tube 12. The arms 20 are mounted on spigots 20a on the sleeve 18 or they may be mounted on a transverse shaft extending from one side of the sleeve to the other. When the arms 20 rotate about the aforementioned transverse axis to bring the dive float assembly into operation, the centralising members 21

are rotated to the position shown in figures 3 and 5 where they are disposed on both sides of and in contact with the lower drive tube 12. However, for the sake of clarity, the centralising means have been shown clear of the tube 12 in figure 3. The centralising members now cause the dive float assembly to be substantially centralised above the drive tubes 11 and 12 so that the cleaner moves down the wall on a substantially vertical path.

The preferred form of centralising members 21 is shown in figures 4a and 4b. Each centralising member is provided with a short hollow shaft 31 adapted to engage in a socket (not shown) in the arms 20 so as to rotate therewith. A collar 32 being provided to limit the extent to which the hollow shaft 31 is engaged in the socket. An operative portion 33 of the centralising member projects in the opposite direction from the collar and the regions of the centralising member which bear against the tube 12 are cam-shaped so that as they engage the lower drive tube 12 they facilitate the movement of the dive float assembly to the central position.

wherein the centralising members means are shaped as shown in figures 4a and 4b of the diagrams.

5. An automatic pool cleaner substantially as herein described with reference to the accompany diagrams.
6. A dive float assembly substantially as herein described with reference to the accompanying diagrams.

Claims

1. An automatic pool cleaner of the type described having a dive float assembly comprising at least one dive float pivotally mounted on an elongate drive tube for limited movement on both sides of a substantially central position relative to a longitudinal axis of the drive tube and for rotation about on an axis transverse to the longitudinal axis of the drive tube characterised in that dive float assembly centralising means are provided to ensure that the dive float assembly returns to the substantially central position with respect to the drive tube as the at least one dive float rotate about said axis when the cleaner changes to a downward path at an uppermost position on a wall of the pool, thus ensuring that said downward path is substantially vertical.
2. An automatic pool cleaner as claimed in claim 1 wherein the drive tube is the upper of two drive tubes and wherein the centralising means, in an operative position, bear against the lower drive tube.
3. An automatic pool cleaner as claimed in claim 2 wherein the centralising means comprises at least one centralising member mounted on the dive float assembly, the at least one centralising member comprising a cam-shaped region for bearing against the lower drive tube in said operative position.
4. An automatic pool cleaner as claimed in claim 3

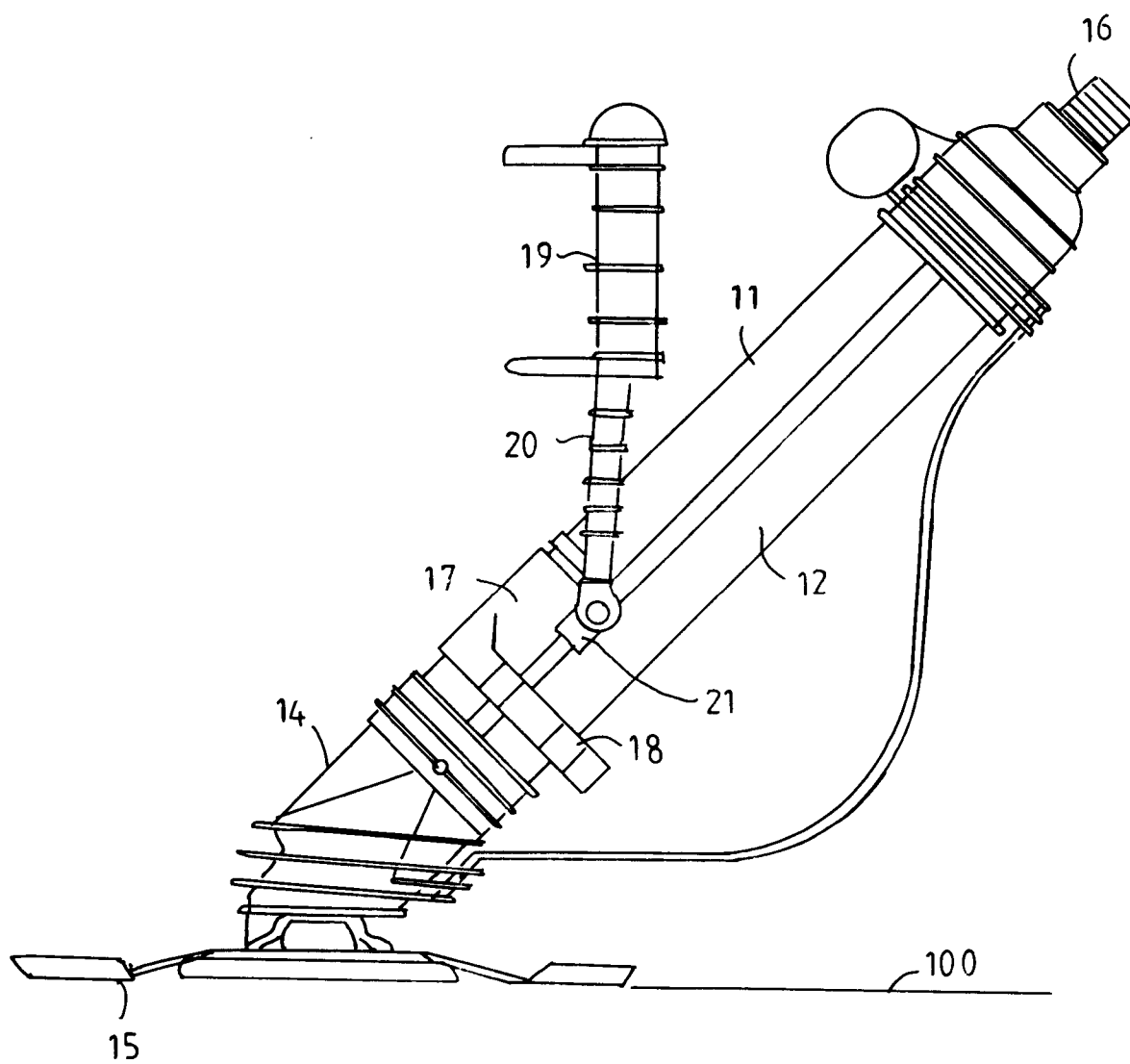


FIGURE 1

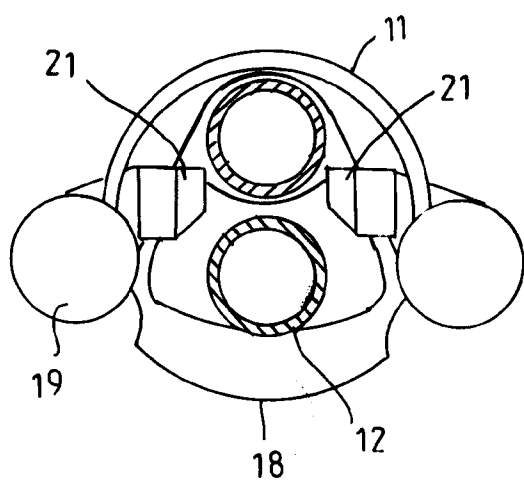


FIGURE 2

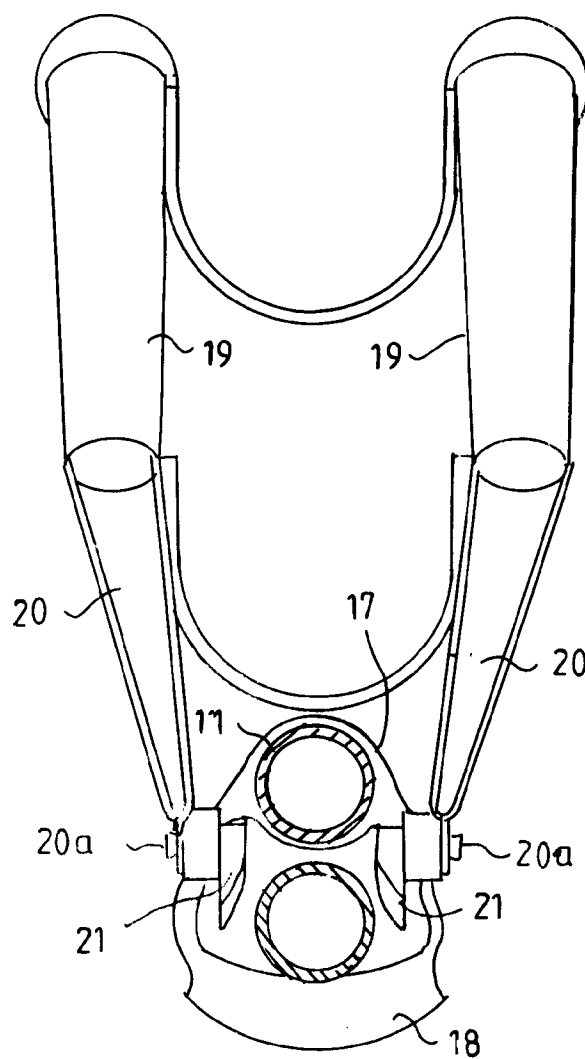


FIGURE 3

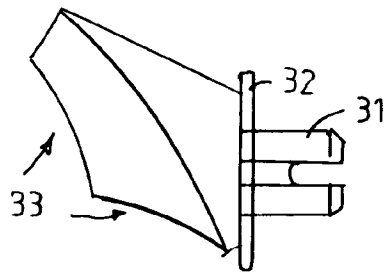


FIGURE 4a

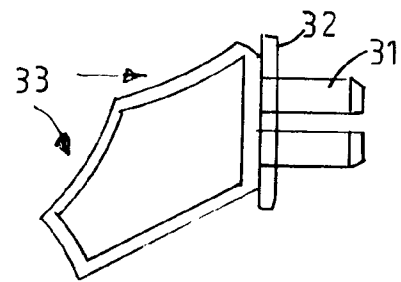


FIGURE 4b

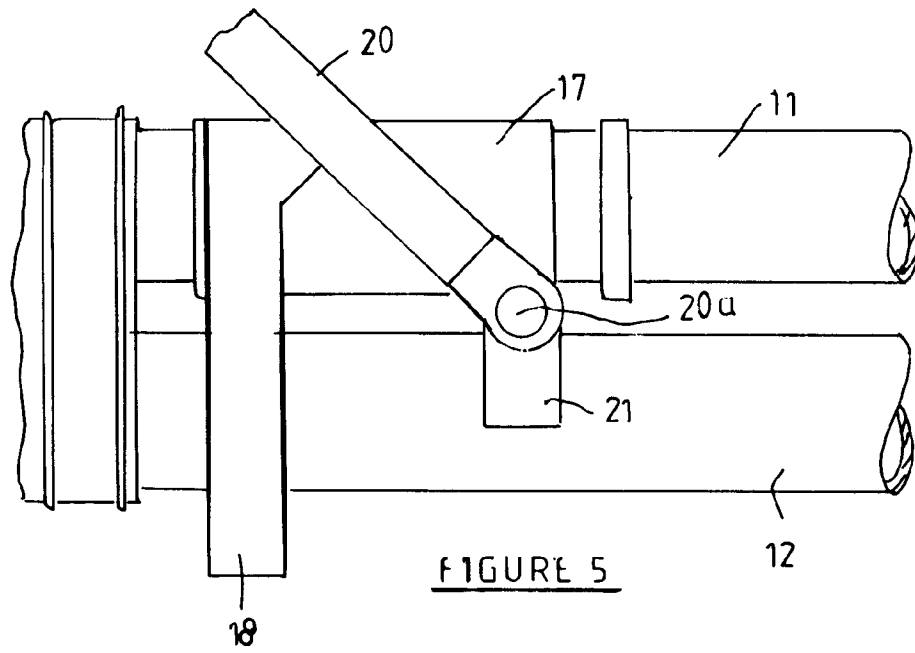


FIGURE 5

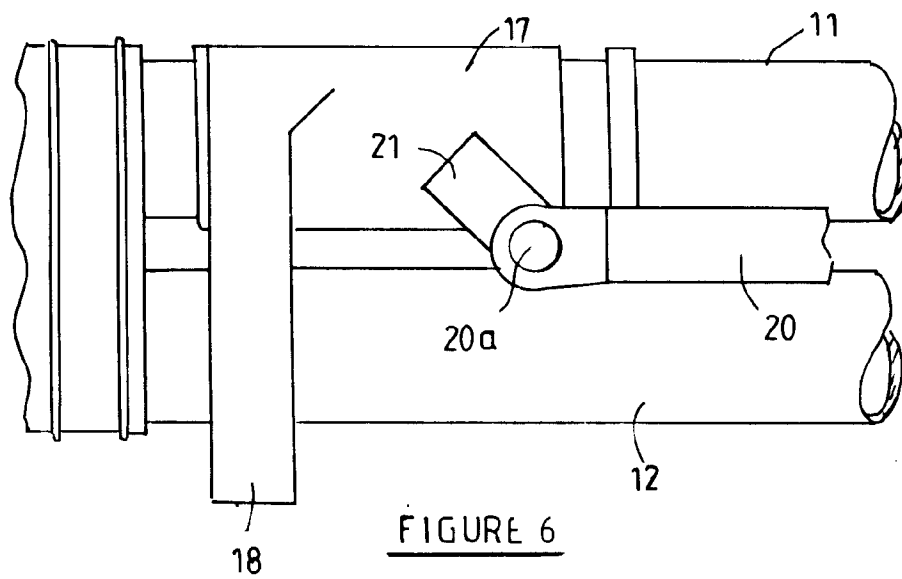


FIGURE 6