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TOY MOTOR BOATS

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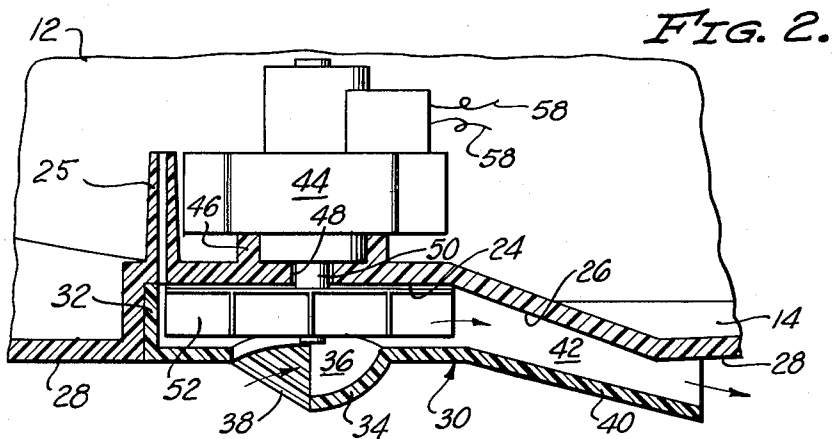
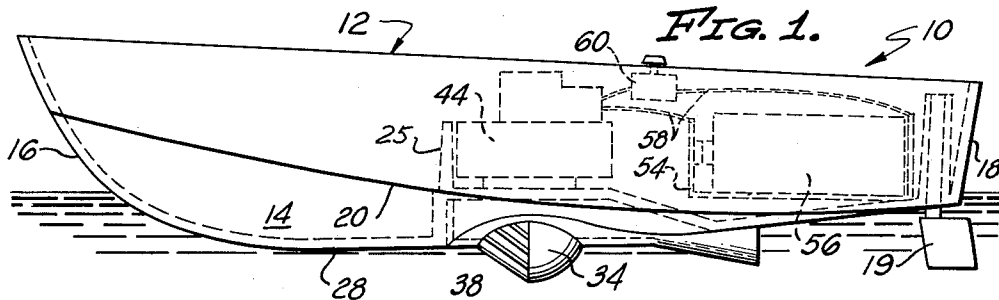
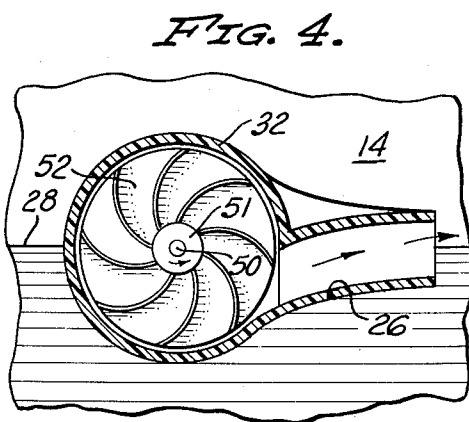
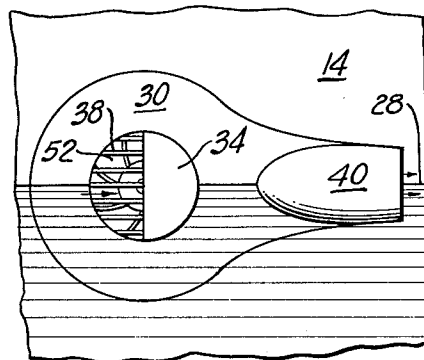


FIG. 3.



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TOY MOTOR BOATS

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2 Claims. (Cl. 46-243)

This invention pertains to new and improved toy electric motor boats.

Toy electric motor boats such as are commonly available at the present time utilize either inboard or outboard power. In the so-called outboard type of boat an electric motor is used so as to rotate a propeller through the use of some sort of a drive shaft structure extending along the stern of the boat. In the so-called inboard type of toy electric motor boat a motor is used so as to rotate a propeller through the use of a drive shaft extending at an angle through the hull of the boat. Neither of these types of constructions is considered to be desirable from either a production standpoint or from a toy standpoint.

From a production point of view both of the types of constructions indicated above are objectionable because of cost and production difficulties. As an example of this in both of these types of constructions the drive mechanism used to transmit power to a propeller tends to be relatively expensive. Further, with inboard type boats, the drive shaft is comparatively difficult to manufacture in such a manner that leakage does not occur. In considering these factors it must be taken into consideration that the toy industry is a highly competitive field and that in this field an "extra" cost of even a cent or two per toy frequently makes the difference between commercial acceptability and rejection.

In addition, toy electric motor boats of the type indicated in the preceding discussion are objectionable for certain reasons pertaining to play value. As boats are played with it not infrequently happens that the hand of a child is hurt by contact with a rapidly rotating propeller. With structures as indicated in the preceding there is a great deal of danger of bent propellers, drive shafts and the like as these toys are played with by a child. Such factors tend to limit the number of toy motor boats which are purchased and, hence, tend to limit the commercial acceptability of toys of this type.

An object of the present invention is to provide toy electric motor boats which overcome many of the inherent disadvantages and limitations of conventional toy boats. A further object of the present invention is to provide toy electric motor boats which do not employ a drive shaft or a propeller of the type utilized in conventional motor boat toys. A still further object of the present invention is to provide toy motor boats which are propelled through the water through the use of a stream or jet of liquid, and which do not contain operative parts in an exposed position.

Another related objective of the present invention is to provide toy electric motor boats of this type which may be easily and inexpensively manufactured without difficulty and which are constructed in such a manner that there is substantially no danger of leakage into the interior of such boats. A still further objective of the present invention is to provide toy electric motor boats which do not require specialized bearings, seals, drive shafts and the like such as are commonly utilized in related toys.

These and various other objects and advantages of the present invention will be fully apparent to those skilled in the toy field from a detailed consideration of the remainder of this description including the appended claims and the accompanying drawings in which:

FIG. 1 is a side elevational view of a toy electric motor boat of this invention;

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FIG. 2 is a partial cross-sectional view of part of this boat;

FIG. 3 is a partial bottom view of this boat; and

FIG. 4 is a view similar to FIG. 3 with part of the boat removed.

The accompanying drawings are primarily intended so as to clearly illustrate the functional nature of several preferred embodiments or forms of this invention. It will be realized, however, that a number of changes as far as appearance, minor functional details, etc., may be involved in adapting the present invention for commercial purposes. Such changes or modifications are well within routine design skill, and may be easily made on the basis of this disclosure.

As an aid to understanding this invention it can be stated in essentially summary form that it concerns electric motor boats, each of which includes a boat hull having a water line corresponding to the depth to which such a hull sinks beneath the surface of water when it is in use. Within the toy motor boats of this invention an electric motor is mounted above the water line of the hull so that a shaft extends from the motor into an impeller cavity located within the hull of the boat itself beneath the water line of the boat. Within such a cavity an impeller is attached to this shaft. Further, structure is provided so as to define an inlet into the central portion of this cavity and so as to define an outlet directed toward the stern of the boat from this cavity. With this type of construction all of the operative parts which are apt to be damaged by contact with the water are located above the water line of the hull of the boat so that they need not be especially formed so as to withstand the damaging effects of prolonged immersion. Further, with this type of structure there is substantially no danger of leakage.

The actual nature of this invention is best more fully described by referring directly to the accompanying drawings in which there is shown a toy electric motor boat 10 having a hull 12. This hull has a bottom 14, a bow 16, a stern 18, and a conventional rudder 19. A water line 20 corresponding to the depth to which the hull sinks beneath the surface of water 22 when in use is, of course, established upon this hull.

Generally beneath the water line 20 there is located within the bottom 14 of the hull 12 a substantially cylindrical cavity 24. A vent pipe 25 preferably extends above the water line 20 from the interior of the cavity 24 so as to prevent air from being trapped in this cavity 24 during the use of the boat 10. A curved groove 26 leads from one side of the keel 28 of the hull away from the interior of the cavity 24 toward the stern 18. A cover 30 is located upon the hull 12 so that a cylindrical wall 32 on the cover fits closely within the interior of the cavity 24 as best seen in FIG. 2 of the drawing. This cover 30 contains a scoop 34 which projects from the hull 12 beneath the various other parts of the boat 10 as shown; this scoop 34 thus serves to define an inlet 36 into the center of the cavity 24. If desired, a series of guard rods 38 may be located across the inlet opening 36 so as to tend to filter out various objects which, during the operation of the boat 10, might tend to be picked up by the scoop 34 so as to traverse the inlet 36. These rods 38 preferably extend in the direction of lines drawn between the bow 16 and the stern 18 so that as the boat 10 is operated the normal flow of water will tend to constantly clean any material off of these rods so that such material will pass behind the scoop 34. Further, the cover 30 preferably includes an extension 40 which fits over the groove 26 so as to define a passage 42 leading toward the stern 18.

Within the boat 10 a motor 44 is preferably mounted upon a cylindrical wall 46 which projects from the hull 12 directly above the center of the cavity 24. A small

opening 48 is located in the hull 12 in communication with the center of this cavity 24 so that a shaft 50 from the motor 44 can project directly into the cavity 24. The shaft 50 fits within the hub 51 of a conventional prop impeller 52.

Further, within the interior of the hull 12 there is preferably located a conventional mounting bracket 54 for batteries 56. This bracket 54 is connected by means of wires 58 to a switch 60 and to the motor 44.

With this structure when the switch 60 is turned to an "on" position the motor 44 will operate and will turn the impeller 52 causing liquid to be drawn in through the inlet opening 36 past the rods 38. The impeller 52 will propel this liquid so that it is ejected under pressure at a comparatively high velocity through the passage 42 toward the stern 18 of the boat 10. This in turn will cause the boat 10 to be propelled through the water, and as it is propelled in this manner the scoop 34 will become operative so as to pick up water and convey such water to the impeller 52. All of such conveyed liquid is, of course, ejected out through the passage 42.

A major advantage of this construction lies in the fact that the motor 44 and all of the other various parts used in supplying power to it are mounted within the hull 12 above the water line 20. As a consequence of this and the fact that the opening 48 is located slightly above the water line, and as a consequence of the fact that the wall 46 holds the motor 44 above this water line these various parts need not be constructed in such a manner to resist contact with water. Thus, the bearings within the motor 44 may be conventional bearings and need not be especially formed. Further, with this type of construction conventional drive shafts, packings etc., are not needed.

The entire boat 10 may be easily assembled together by a series of simple gluing operations and various other related operations. Thus, for example, during the manufacture of the boat 10 proper in effect only three very simple, inexpensive parts apart from the electric parts utilized are required. These are the hull 12, the impeller 52 and the cover 30. The impeller 52 may be easily attached to the shaft 50 from the motor 44 and, further, the cover 30 may be easily secured to the hull 12 by a simple gluing operation. It will be realized that the principal part of this cover 30 is formed so that when the cover is assembled as shown it constitutes a continuation of the shape of the hull 12, and that the cover 30 prevents the impeller 52 from moving away from its normal location. Thus, resistance to movement is not encountered with this cover except, of course, where a certain resistance of movement is inherent through the action of the scoop 34.

It will be realized that a number of differently appearing toy electric boats may be constructed in accordance with the principle of this invention. In the boat 10 the stream of water passing through the passage 42 is directed directly toward the stern 18 and is "balanced" with respect to each of the sides of the keel 28 by the curved shape of this passage so the boat 10 will normally be propelled in a straight line. This result can be achieved through the use of flow directing baffles or the like instead of a curved passage if desired. It is within the scope of this invention to utilize the constructional principles herein set forth in providing several impellers to create several streams of

water "balanced" as to equal force, velocity and pressure on opposite sides of a keel of a toy boat so as to utilize a dual or plural jet propulsion effect. It is also possible to provide toy boats as herein described in which the discharge passages for a jet stream employed are pointed downward slightly, as well as being pointed toward the stern of a boat so as to obtain a force component tending to lift the boat hull slightly in order to achieve improved performance characteristics. For reasons such as these this invention is to be considered as being limited only by the appended claims forming a part of this disclosure.

I claim:

1. A toy electrical motor boat which includes:

a hull having a bow, a stern, a keel and a water line, said hull having a flat cylindrical cavity located in the bottom thereof beneath said water line, the upper side of said cavity having a centrally located hole formed therein leading into the interior of said cavity, said hull including a continuous wall located within the interior thereof and extending around said hole and above said water line, said hull also including a curved groove leading from the periphery of said cavity toward said stern and a vent pipe leading from the top of said cavity to above said water line;

electrical motor means positioned within said hull so as to be supported by said wall, said motor means having a drive shaft extending vertically therefrom through said hole into the center of said cavity along the axis of said cavity;

a cover secured to the periphery of said cavity, said cover enclosing said cavity and conforming in external appearance to a part of said hull, said cover including an inlet scoop located adjacent to the center of said cavity and extending outwardly from said hull, said scoop being pointed toward said bow and defining an inlet into the center of said cavity, said cover also including an extension covering said groove and extending from the exterior of said hull toward said stern, said extension defining in conjunction with said groove a passage leading from the periphery of said cavity toward said stern; and

impeller means mounted upon said shaft within said cavity;

electric means for operating said motor means mounted within said hull above said water line and being electrically connected to said motor means; and

separate rudder means mounted on said hull adjacent the stern thereof, said rudder means being located so as to be capable of directing fluid ejected through said passage defined by said extension.

2. A toy motor boat as defined in claim 1 including a plurality of guard rods located on said cover so as to extend across said inlet, said rods leading from the bow of said hull toward the stern of said hull.

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