Jan. 18, 1955 H. COANDA 2,699,644

HYDROPROPELLER

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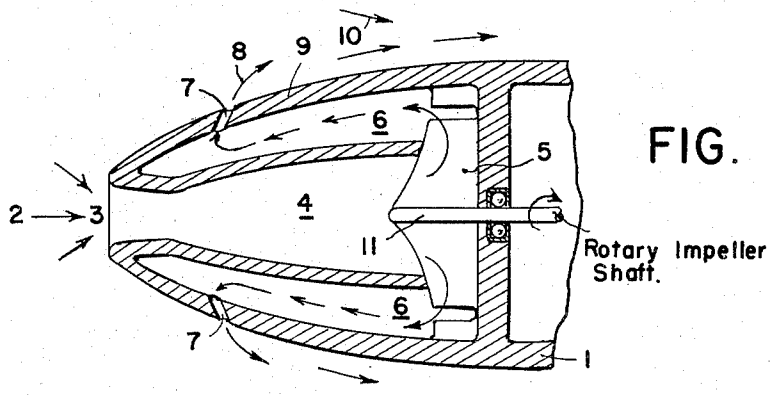


FIG. 1

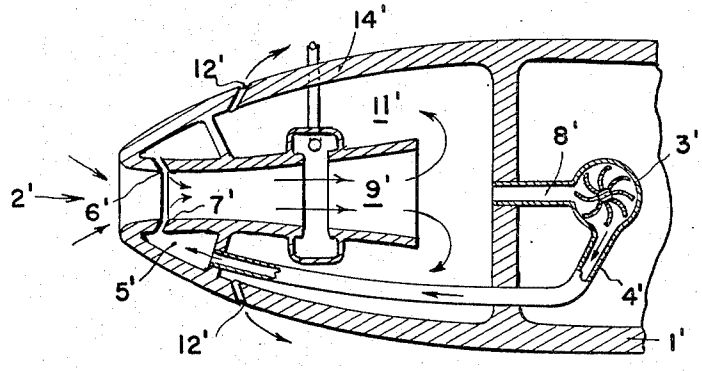


FIG. 2

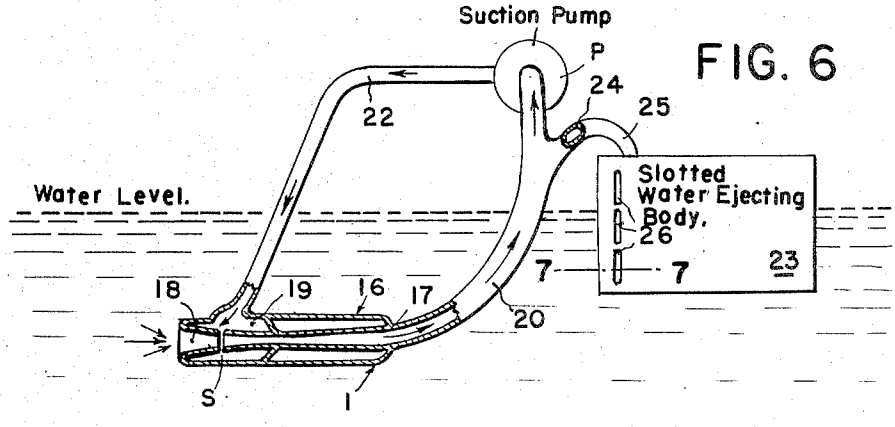


FIG. 6

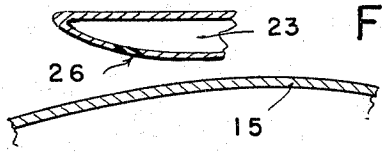


FIG. 7

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FIG. 3

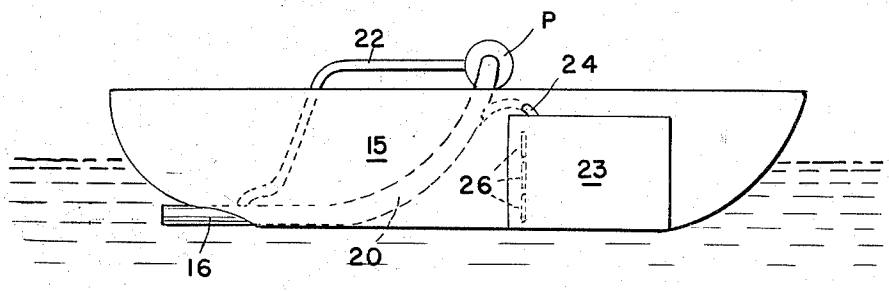


FIG. 4

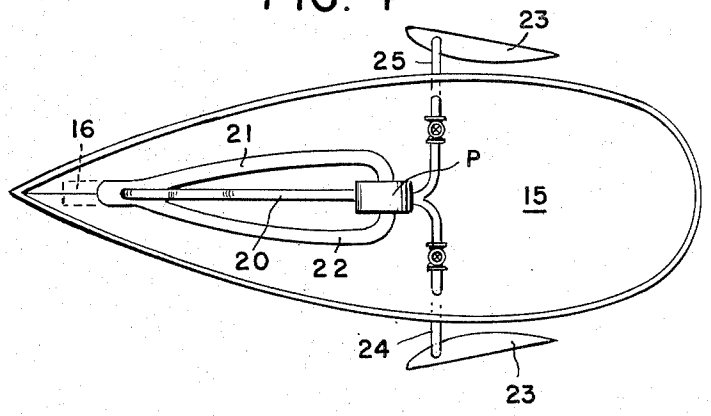
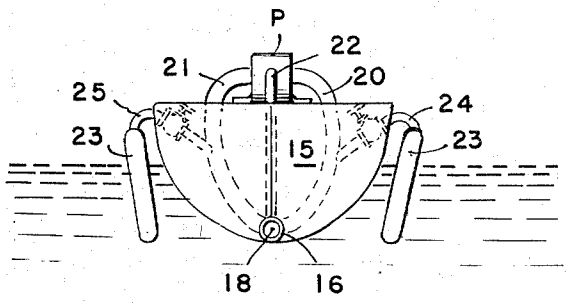


FIG. 5



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HYDROPROPELLER

Henri Coanda, Paris, France

Application February 2, 1948, Serial No. 5,735
In France November 21, 1946

Section 1, Public Law 690, August 8, 1946
Patent expires November 21, 1966

4 Claims. (Cl. 60—35.5)

The present invention relates to a device working in such a manner that it forms a means for propulsion of a boat in or on the water and mainly comprising:

(*a*) Water intake means,

(*b*) Means for raising the pressure acting upon the water taken in by said means,

(*c*) Means for ejecting this water under pressure, said means comprising at least a slot-shaped tuyère one lip of the mouth of which is extended while continuously diverging from the direction of the axis of the slot so that the flat water jet issuing from said slot is turned down towards the said extended lip. In other words, the wall of the unit posterior to the slot-shaped tuyères forms a lip and in effect becomes an extension of the lip as it diverges from the direction of the axis of the slot.

The said unit can either form an integral part of the boat to be propelled, the slot or slots being distributed at chosen points of the hull, or be provided in part or in totality outside the boat, for instance in chambered bodies fast with the boat or in any other similar manner.

The boat may, for instance, be provided with one or more self-governing propeller bodies pulling or propelling the boat.

The various means can be used for applying a pressure to the water taken by the members mentioned under (*a*) before it is ejected through the tuyère or tuyères mentioned under (*c*).

The slots forming the tuyères may be formed in the hull of the boat in the manner of fish gills and the water intake members may be located either quite in the front or in any other chosen place.

In case the propelling unit is located in ailerons the latter may be mounted so that beside the water which is carried away in the manner of an induced current by the water leaving the tuyère and playing the part of the inducing current, the latter also carries along with it a certain quantity of air which flows along the hull of the boat in order to reduce its rubbing action.

The invention will now be described more particularly with reference to the appended drawings which show diagrammatically different embodiments thereof. In said drawings:

Figs. 1 and 2 are fragmentary longitudinal sectional views showing two variants of the adaptation of the hydropropulsive unit on the same front part of the body to be propelled.

Figs. 3 and 4 show in a side elevational and in a plan view, respectively, the application of the invention in a suction and force system including laterally spaced water ejecting bodies placed along the sides of the hull of the boat;

Fig. 5 is a front end elevation of the structure of Figs. 3 and 4;

Fig. 6 is a view partly in elevation and partly in section of the propulsion unit of Figs. 3, 4 and 5 on an enlarged scale; and

Fig. 7 is a detail horizontal view taken on the line 7—7 of Fig. 6, and additionally including a fragment of the hull of the boat.

In the example shown in Fig. 1 a boat body **1** is immersed in a mass of water at **2** and draws in water through an opening **3**, said water entering a vane compressor **5** through a convergent-divergent inlet chamber or portion **4**, whereafter it is forced into a chamber **6** and ejected through slots **7**, the direction of which makes an angle **8** with the wall of the body **1** which forms a

posterior extension of the lip **9**, thus carrying off a quantity of water **10** taken out of the mass of water **2**. The vane compressor **5** is driven through the shaft **11** which transmits the power supplied by any suitable source.

In Fig. 2, a boat body **1'** immersed in a liquid mass at **2'** draws in through a suction compressor **3'** a quantity of water which is delivered through the pipe **4'** into a chamber **5'** provided with a circular slot **6'** and which carries along through the convergent-divergent portion or chamber **7'** a mass of water **9'**, a portion of which passes through the conduit **8'** and feeds the compressor **3'** while the remainder passes through chamber **11'** which it leaves through a circular slot **12'**, the direction of which makes a predetermined angle with the extended lip **14'** of the mouth of said slot.

Referring now to the form of the invention shown in Figs. 3 to 7, **15** designates the hull of a nautical vessel which is equipped with a suction and force system or apparatus. The latter includes a longitudinally disposed body **16** carried by the hull and disposed below the water level of said hull as shown and it has an inner wall or conduit **17**, the latter being formed into a convergent-divergent inlet portion **18** centrally located and open at the bow of the vessel. A suction pump P is carried by the hull and communicates with the chamber **19** of body **16** through conduit branches **20** and **21**, the former being an extension of conduit **17**.

Another conduit or branch **22** communicates with the pump P, extending centrally forwardly and downwardly therefrom and to the chamber **19**. Said convergent-divergent inlet portion adjacent the outlet of conduit **22** has an annular slot S for injection of water from conduit **22** into chamber **19** and then into said inlet portion **18**.

Water ejection bodies **23** in laterally spaced apart relation are located one on each side of said hull and they provide chambers which receive water from the branch conduits **20** and **21** through oppositely directed pipes **24** and **25**. From the chambers of bodies **23**, the water is ejected through slots **26** located rearwardly of annular slot S and in walls of the bodies **15** facing said hull **1**.

In the operation of this form of Figs. 3 to 7, pump P draws in water through the convergent-divergent inlet portion **18** which partly circulates in conduits **20** and **21**, and most of such water passes through conduits **24** and **25** into the chambers of bodies **23** and is ejected through slots **26** to propel the vessel. The conduit **12** at the same time directs a portion of the water passing through the pump into chamber **19** and ejects it through the slot S back into portion **18**. It is to be noted that the location of slots **26** causes the water ejected therethrough to carry with it air which thus passes between the hull and the water.

What I claim is:

1. In a nautical vessel, a suction pump, a body below the water level of the hull thereof, said body having a convergent-divergent inlet portion, said portion having an annular slot therein, conduit means between the pump and body to eject through said slot a portion of the water which passes through said convergent-divergent inlet portion, laterally spaced ejection bodies having chambers in receiving relation to water passing through said convergent-divergent inlet portion, and said ejection bodies having slots spaced rearwardly from the annular slot through which water from said chambers is ejected.

2. In a nautical vessel, a suction pump, a body below the water level of the hull thereof, said body having a convergent-divergent inlet portion, said portion having an annular slot therein, conduit means between the pump and body to eject through the said slot a portion of the water which passes through said convergent-divergent portion, means providing an injection chamber in receiving relation to water passing through the convergent-divergent inlet portion, and said chamber having slot means spaced rearwardly from the annular slot through which water from said chamber is ejected to propel the vessel under the action of said pump.

3. A nautical vessel according to claim 1 wherein the slots of said chambers face said hull.

4. A nautical vessel according to claim 2 wherein an

ejection body is laterally spaced from the hull of the vessel and is provided with the said chamber and the slot means thereof faces said hull.

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