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J. Y. COUSTEAU ETAL

3,082,442

SWIMMER'S FIN

Filed Sept. 1, 1959

Fig. 1

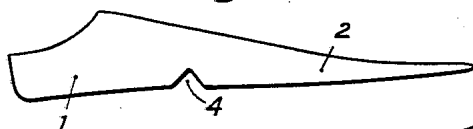


Fig. 2

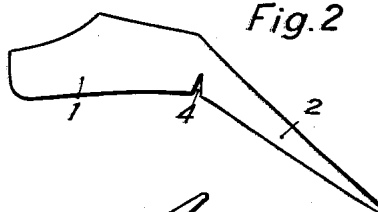


Fig. 3

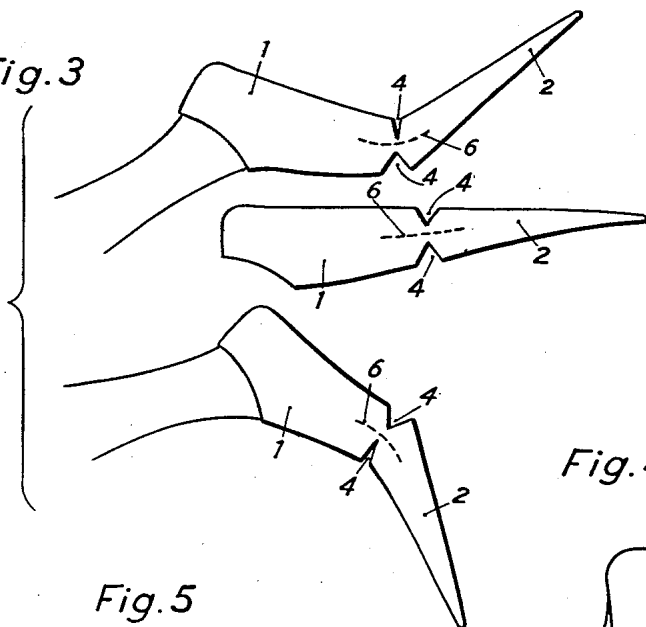


Fig. 4

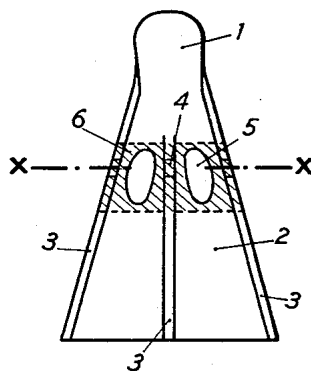


Fig. 5

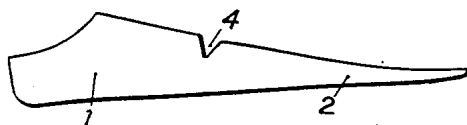
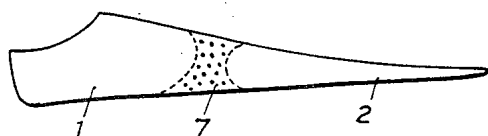


Fig. 6



INVENTORS:

JACQUES-YVES COUSTEAU

EMILE GAGNAN

By Irwin S. Thompson
ATTY.

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SWIMMER'S FIN

Jacques Yves Cousteau, Paris, France, and Emile Gagnan, Montreal, Quebec, Canada, assignors to La Spirotechnique, Paris, France

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Our invention has for its object a swimmer's fin or web to be fitted on a swimmer's foot.

Swimmer's fins as usually executed include a foot-gear section extending into a generally flat, ribbed, flaring and yielding element. When the swimmer's feet beat, the yielding section is deformed, which increases the thrust exerted on the water.

With a view to obtaining during operation as automatic positioning into its optimum position of the flat operative or propelling section of the fin and thereby to reducing to a minimum the effort to be given by the swimmer, it has already been proposed to separate the flat section from the foot-gear section of the fin by providing a transverse pivotal axis for connecting said sections together; such fins are however more intricate in their structure and consequently more expensive since they must include two different sections provided with passageways for the pivotal axis and with stops.

Our present invention has for its object means for automatically setting into its optimum position the flat propelling section of the fin in the manner disclosed hereinabove while resorting to a simple unitary fin structure devoid of any pivotal axis.

To this end and according to the invention, the propelling section of the fin is connected with the footgear section through the agency of an intermediate section the rigidity of which is less than that of the remainder of the fin.

The invention thus defined may be executed in practice in various manners which differ chiefly through the nature of the intermediate area or section interconnecting the two sections of the fin as also through the fact that the flat section is rigid or deformable within a predetermined extent.

Accordingly, it is possible to provide the fin according to the invention with one or more of the following advantageous features:

The fin being made in the conventional manner of a single member of deformable material such as rubber for instance, the flat section is provided with longitudinal ribs extending over a part of the footgear section, but the rigidity of said ribs is weakened at points which are distributed in a transverse plane containing the geometrical axis corresponding to the desired hinge or pivotal connection.

The rigidity of the ribs is reduced by means of cuts provided across same.

The cuts are formed only on one of the sides of the flat section.

The cuts are shaped in a manner such that their sides act as stops limiting the maximum value of the angular shifting of the flat section of the fin round the pivotal axis with reference to the footgear section, the curvature of the flat section not being taken into account.

The fin is provided with a medial area connecting the footgear section with the flat section, which area is made of a material which is more yielding than that forming said sections, so as to constitute a sort of hinge between said two sections.

The flat section is perforated in its terminal area corresponding to the hinge.

The hinge area is reinforced in the part merging into the

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flat section by a very yielding material showing a considerable resistance against tractional and flexional efforts such as a fabric.

The accompanying diagrammatic drawings illustrate various embodiments of the invention and in particular:

FIGS. 1 and 2 are side views of a fin, the ribs of which are cut along the lower surface of the fin, FIGS. 1 and 2 corresponding to two different angular positions of the propelling section.

FIG. 3 shows in side view and in three different positions a fin, the ribs of which are provided with cuts both on the upper and lower surfaces of the fin.

FIG. 4 is a plan view of the fin illustrated in FIG. 3.

FIG. 5 is a side view of a fin, the ribs of which are provided with cuts only on the upper surface of the fin.

FIG. 6 is a side view of a fin wherein the intermediate area is made of a material of a reduced rigidity.

In all said figures, the footgear section of the fin and the flat section forming the actual fin are designated respectively by the reference numbers 1 and 2.

Generally speaking, the sections are provided on one or both surfaces with ribs 3 as clearly shown in FIG. 4.

In accordance with the invention, the ribs are cut at 4 at least on one of the sides of the flat section.

These cuts are V-shaped and arranged transversely as shown at X—X (FIG. 4) in a plane containing the geometrical pivotal axis between the two sections.

It is apparent from inspection of FIGS. 1, 2, 3 and 5 that the sides of the cuts 4 act as stops for limiting the angular shifting of the flat section 2 in one direction only in the case of FIGS. 2 and 5 and in both directions in the case of FIG. 3 to a total value of about 90° for instance.

The flexibility of the section 2 near the intermediate area may be increased in the area X—X by perforating it as shown at 5 in FIG. 4. Said intermediate area may also be reinforced by a piece of fabric 6 as shown in FIGS. 3 and 4. In the particular fin shown in FIG. 6, the two sections 1 and 2 are connected by an intermediate zone made with a kind of rubber more yielding than that of the remainder of the fin.

What we claim is:

1. A swimmer's fin including a footgear section adapted to be fitted over the swimmer's foot, a flat, flexible, flaring and ribbed propelling section extending forwardly from the toe portion of said footgear section in prolongation thereof and an intermediate section integrally connecting said propelling section with said footgear section, the rigidity of said intermediate section being lower than that of said footgear and propelling sections.

2. A unitary swimmer's fin made of a yielding material and comprising a footgear section adapted to be fitted over a swimmer's foot, a flat, flexible, flaring propelling section integral with the footgear section and cooperating with the toe end of said footgear section as an extension thereof and longitudinal ribs extending over at least the major part of the surface of at least one side of said flat flexible section and over the adjacent part of the footgear section, means for reducing the rigidity of said ribs on their portion in transverse registry with the cooperating ends of the two sections to produce a pivotal connection between the two sections.

3. A unitary swimmer's fin made of a yielding material and comprising a footgear section adapted to be fitted over a swimmer's foot, a flat, yielding, flaring propelling section integral with the footgear section and cooperating with the toe end of said footgear section as an extension thereof and longitudinal ribs extending over at least the major part of the surface of at least one side of said flat yielding section and over the adjacent part of the footgear section, the rigidity of which ribs is reduced through transverse cuts in transverse registry with the cooperating

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ends of the two sections to produce a pivotal connection between the two sections.

4. A unitary swimmer's fin made of a yielding material and comprising a footgear section adapted to be fitted over a swimmer's foot, a flat, yielding, flaring propelling section integral with the footgear section and cooperating with the toe end of said footgear section as an extension thereof and longitudinal ribs extending over at least the major part of the surface of at least one side of said flat yielding section and over the adjacent part of the footgear section, said ribs being provided with transverse cuts on one side of the yielding flat section in registry with the cooperating ends of the two sections to produce a pivotal connection between the two sections.

5. A unitary swimmer's fin made of a yielding material and comprising a footgear section adapted to be fitted over a swimmer's foot, a flat, yielding, flaring propelling section integral with the footgear section and cooperating with the toe end of said footgear section as an extension thereof and longitudinal ribs extending over at least the major part of the surfaces of both sides of said flat yielding section and over the adjacent part of the footgear section, said ribs being provided with transverse cuts on both sides of the yielding flat section in registry with the cooperating ends of the two sections to produce a pivotal connection between the two sections.

6. A unitary swimmer's fin made of a yielding material and comprising a footgear section adapted to be fitted over a swimmer's foot, a flat, yielding, flaring propelling section integral with the footgear section and cooperating with the toe end of said footgear section as an extension thereof and longitudinal ribs extending over at least the major part of the surface of at least one side of said flat yielding section and over the adjacent part of the footgear section, the rigidity of which ribs is reduced through transverse cuts in V shape, in transverse registry with the cooperating ends of the two sections to produce a pivotal connection between the two sections, the opposite sides of the cuts in each rib forming a stop defining the maximum flexing of the two sections with reference to each other.

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7. A swimmer's fin including a footgear section adapted to be fitted over the swimmer's foot, a flat, flexible, flaring and ribbed propelling section extending forwardly from the toe portion of said footgear section in prolongation thereof and an intermediate section integrally connecting said propelling section with said footgear section and perforations disposed in said intermediate section to provide a rigidity thereof which is lower than that of said footgear and propelling sections thereby increasing the flexibility thereof.

8. A swimmer's fin including a footgear section adapted to be fitted over the swimmer's foot, a flat, flexible, flaring and ribbed propelling section extending forwardly from the toe portion of said footgear section in prolongation thereof and an intermediate section integrally connecting said propelling section with said footgear section, the rigidity of said intermediate section being lower than that of said footgear and propelling sections and a sheet of fabric inserted longitudinally inside said intermediate section to impart reinforcement thereto.

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