United States Patent [19]

Garcia

[11] **3,913,516**

[45] **Oct. 21, 1975**

[54] **WING TO SWIM OR TO ROW**

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[22] Filed: **Aug. 27, 1974**

[21] Appl. No.: **500,921**

Related U.S. Application Data

[63] Continuation of Ser. No. 409,277, Oct. 24, 1973, abandoned.

[52] **U.S. Cl.** **115/31;** 115/21; 115/24.5

[51] **Int. Cl.²** **B63H 1/32;** B63H 16/04

[58] **Field of Search** 115/31–33, 115/24.1–24.6, 28, 29, 30, 21; 9/302–309

[56] **References Cited**

UNITED STATES PATENTS

1,028,093	6/1912	Ahlbrecht	115/31
1,522,526	1/1925	Kuhn	9/302

FOREIGN PATENTS OR APPLICATIONS

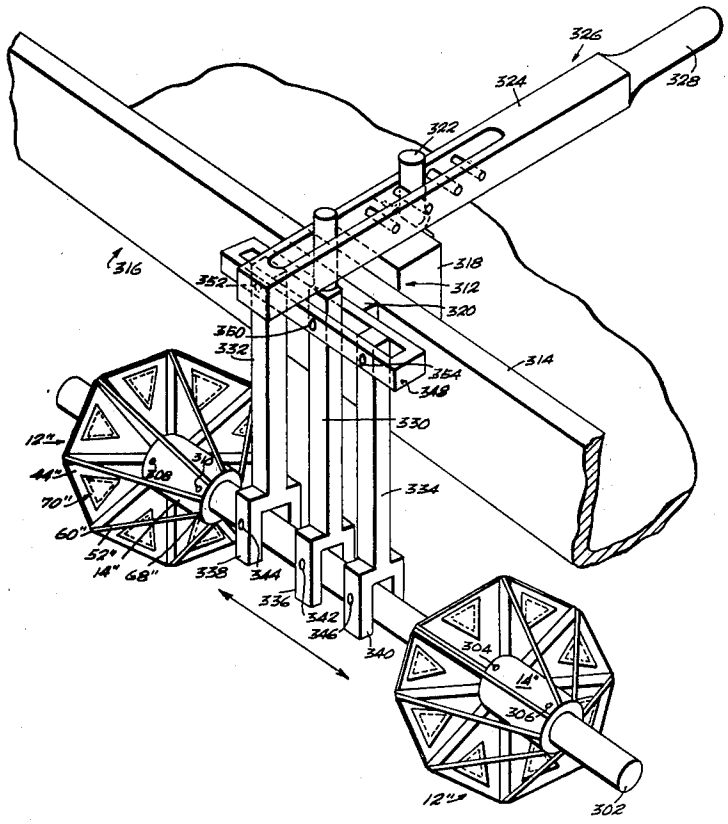
1,551,172	12/1968	France	9/302
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Primary Examiner—George E. A. Halvosa
Assistant Examiner—Sherman D. Basinger

[57] **ABSTRACT**

A wing to swim or row which includes a sleeve to attach to a member to be manipulated under water in generally fore to aft cycles of movement and an umbrella type collapsible canopy carried by the sleeve and moveable in response to water forces caused by the manipulation between canopy open position and a canopy collapsed position to propel an object through water.

6 Claims, 5 Drawing Figures



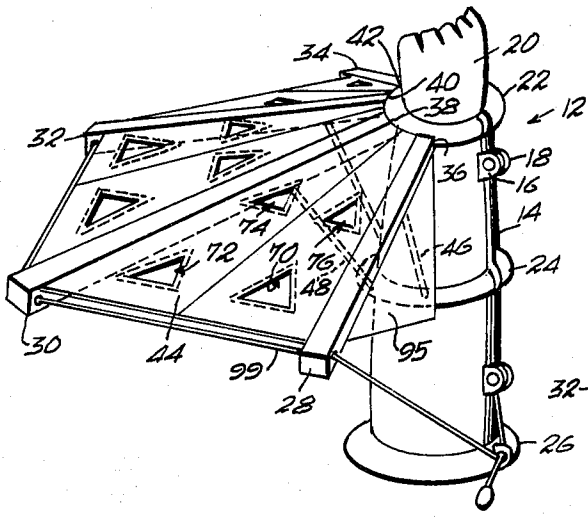


Fig. 1

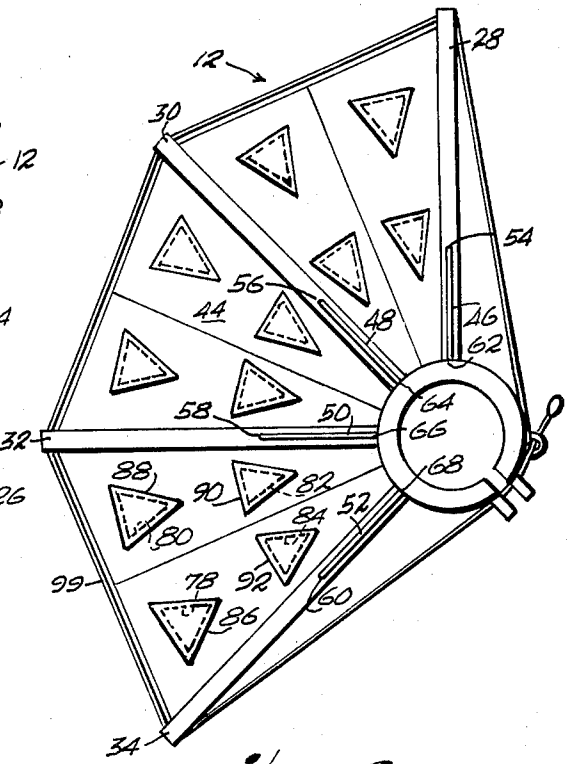


Fig. 2

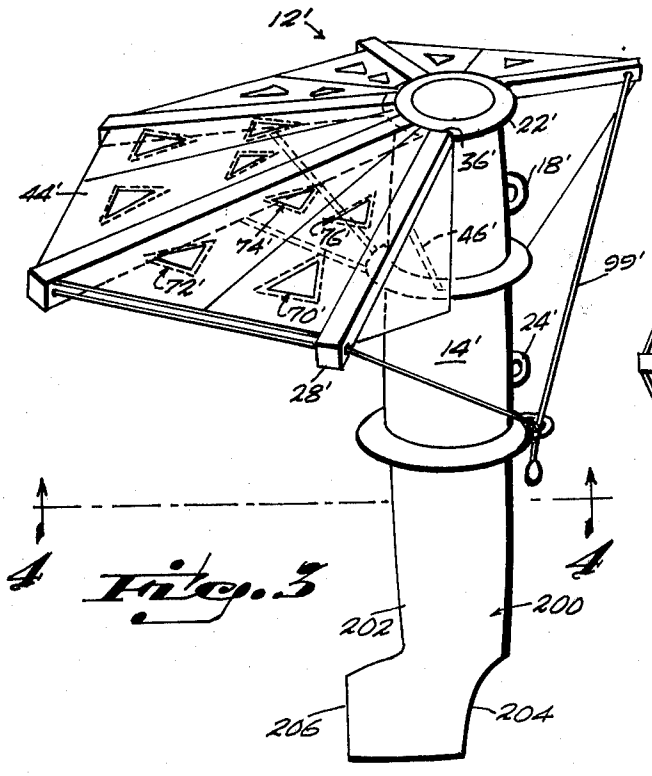


Fig. 3

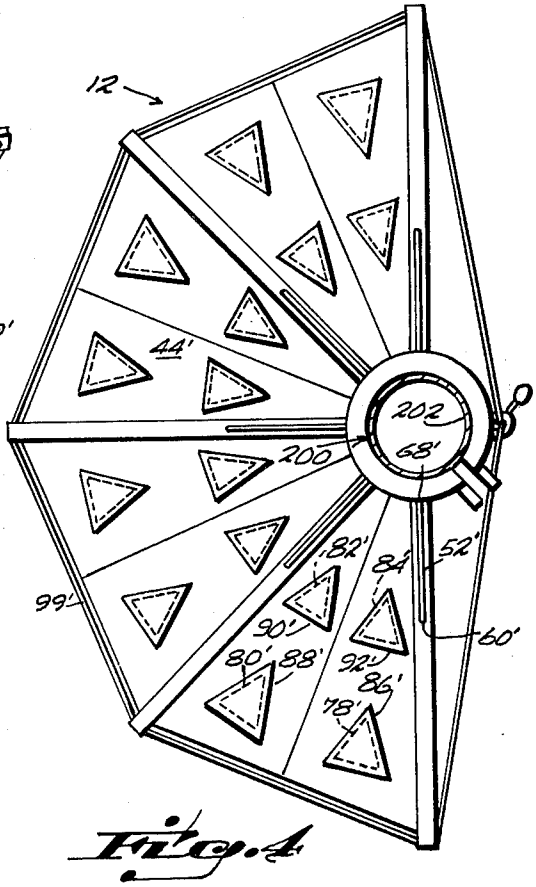


Fig. 4

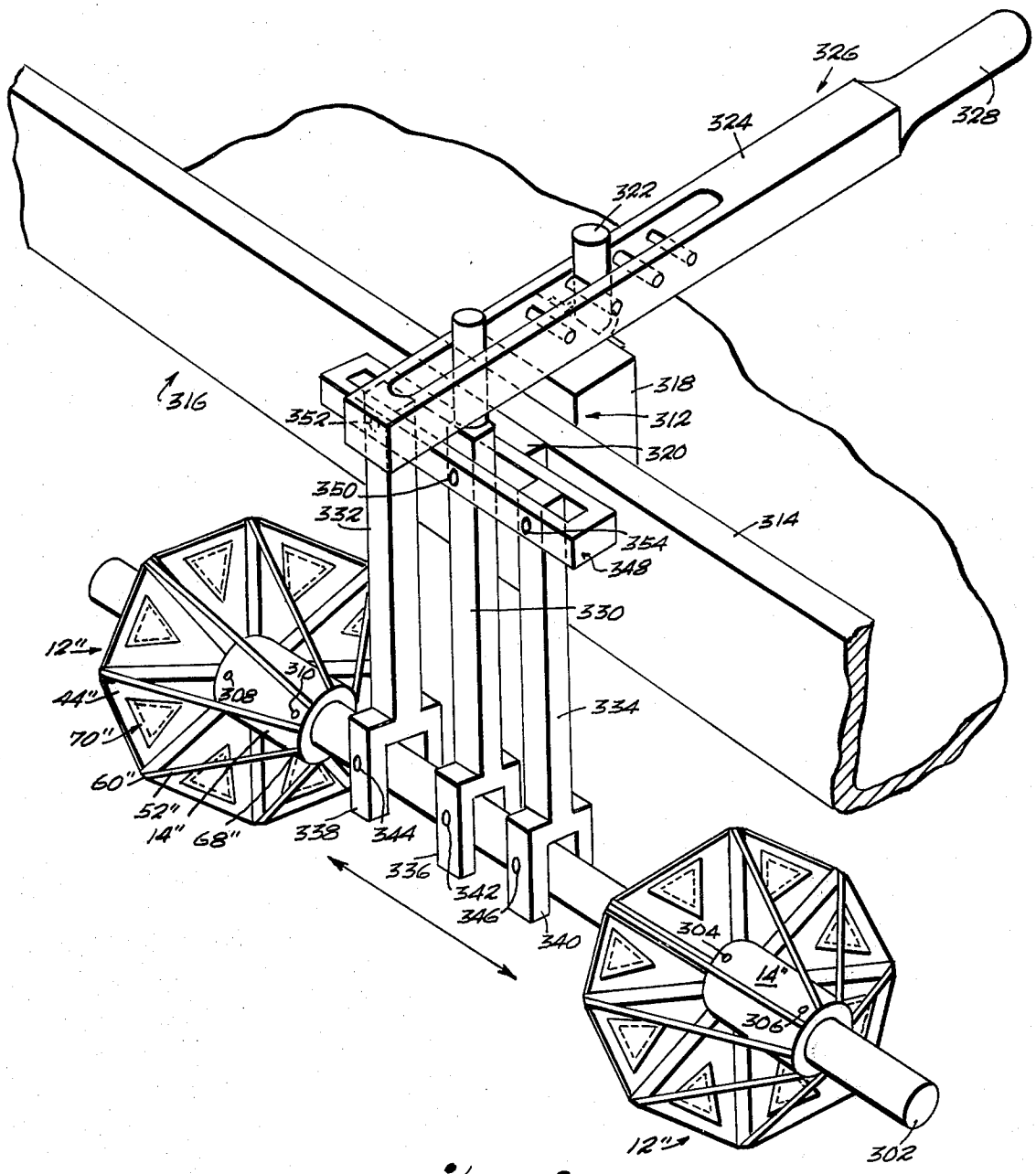

326
324
328
322
316
318
312
320
352
350
332
314
354
348
330
12"
310
308
44"
70"
60"
52"
14"
68"
334
338
344
336
342
346
340
304
14"
306
12"
302

Fig. 5

WING TO SWIM OR TO ROW

This is a continuation in part of an earlier filed U.S. Pat. application Ser. No. 409,277, filed Oct. 24, 1973 and now abandoned.

FIELD OF THE INVENTION

This invention relates to a device for use by a swimmer or oarsman for propulsion through water.

BACKGROUND OF THE INVENTION

In the past it has been known to attach various type of devices to a body to be propelled through water in response to manipulation of the devices below the water surface. For example, U.S. Pat. No. 1,522,526 is of such a device. This invention is an improved device of the general class of attachments of which the above mentioned patent is typical.

OBJECTS OF THIS INVENTION

This invention has as a general object the provision of a wing or umbrella canopy which is simple and inexpensive to manufacture and is well adapted for use as an attachment to the legs or arms of a swimmer or attachment to a rowing apparatus to be mounted to a boat; and the invention provides a sleeve to receive the member to which it is secured and an attachment means to maintain the sleeve in a predetermined position on the member; and on the sleeve a collapsible umbrella type canopy or wing is secured and supported by pivotal struts and constrained upon movement of the device to movement between an open and a closed position in response to forces exerted upon it by manipulation of the device in water to create propulsion forces through water.

It is also an object of this invention to provide a device of the type described which is adapted by reason of its structure and configuration to be used as an attachment for the leg or arm of a swimmer and which includes a glove portion or sock portion to accommodate the hand or foot of the wearer and includes a sleeve of sufficient length to transmit substantial forces of propulsion to the arm or leg in use and which is configured so as not to scrape against the body of a swimmer.

It is a further object of this invention to provide a rowing apparatus for attachment to a boat which includes the umbrella type under water propulsion improvement.

In accordance with these general objects and other objects which will be apparent from the following description, the invention in three preferred embodiments will now be described with reference to the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a first preferred embodiment of the device adapted for attachment to the arm of a wearer;

FIG. 2 is a bottom view of the device shown in FIG. 1;

FIG. 3 is a perspective view of a second preferred embodiment adapted for attachment to the leg and foot of a wearer;

FIG. 4 is a bottom view of the device of FIG. 3; and

FIG. 5 is a perspective view of a rowing apparatus utilizing the wing.

DESCRIPTION OF PREFERRED EMBODIMENTS

First Preferred Embodiment:

The first preferred embodiment of FIGS. 1 and 2 is adapted to be used on a swimmer's left arm. A mirror image of the device may be worn on a swimmer's right arm and will not be described further. The device generally designated by the numeral **12** includes a sleeve **14** which is preferably of flexible plastic material or sturdy cloth, such as canvas. It includes means to secure it to the distal end of the arm of a swimmer, such as belts not showns or mating hooks **16** and **18** which are adapted to be tied together. A glove segment **20** may be provided at the very end for passage of a hand. Reinforcing rings **22, 24** and **26** may be provided. To the end of the sleeve a plurality of equispaced struts **28,** 30, 32 and **34** are pivotally connected as at **36, 38, 40** and **42;** and the struts extend a common distance. The struts are spanned by a canopy **44** of water impervious plyable material, such as plastic, which is in the shape of a segment of a circle as seen from an end view and is suitably secured to form what may be described as a collapsible wing extending outwardly from the sleeve. The canopy may be composed of a plurality of generally triangularly shaped circle segments, as shown, each secured in spanning relation between adjacent struts. Flexible string means of a common length **46, 48, 50** and **52** connect the struts to the sleeve by suitable means, such as staples as at **54, 56, 58** and **60** and **62,** 64, 66 and **68** on the sleeve preferably at the reinforced zone **24.** In the preferred embodiment one way check valve means such as **70, 72, 74** and **76** may be provided and comprise openings **78, 80, 82** and **84** at predetermined spaced locations of the wing canopy which on the inside surface are covered by patches **86, 88, 90** and 92 which have margins that overlay the margins of the canopy about their respective associated openings. The margins are secured to the canopy at spaced point so that when the wing is pulled toward the elbow through water, the margins will closely overlay one another and not permit water to flow through the openings, but will open when the wing is pushed forwardly through water. Also, when the wing is pushed forwardly the wing will collapse as the struts pivotally approach allignment with the sleeve centerline; and when the wing has completed a forward stroke of a swimming cycle and pulled rearwardly, the canopy by pivotal action of the struts will open in response to the forces exerted by the water to a fully opened position shown in FIG. 1 with the string means being taut and restraining further movement until rearward movement has been completed. A flexible end flap **95** to trap water may be included on the wing.

Second Preferred Embodiment:

The second preferred embodiment of FIGS. 2 and 3 is adapted to be used on a swimmer's foot. It differs from the previously described embodiment in that a partial flexible sock **200** is suitably secured at the distal end **202,** which preferably is cut away at the heel zone **204** and tow zone **206.** In operation this embodiment is secured to the foot and used similarly to the description aforesaid. Rather than repeat the numbers and description in all detail with respect to this embodiment, similar parts of the wing corresponding to the embodiment of FIGS. **1** and **2** are designated by a series of corresponding numbers with a prime designation.

Third Preferred Embodiment:

The third preferred embodiment is shown in FIG. 5; and illustrates the use of the wing on a rowing apparatus. The common wing parts are designated by numbers corresponding to those used in the description of the first and second embodiments with the exception that double prime designations are utilized to shorten this specification. It should be noted that the sleeve is cylindrical, rather that of somewhat truncated cone shaped, to accommodate the elongate mating fore to aft alligned shaft **302** to which it it secured by suitable means such as the headed sets of screws **304, 306** and **308,** 310. Further it should be noted that the canopy is circular when expanded as seen in an end elevation view instead of a segment of a circle as in the case of the embodiments of FIGS. **1** and **2** and FIGS. **3** and **4** so as not to scrape against a swimmer's body.

The apparatus on which the wings are mounted will now be described. A bracket means **312** is secured to the gunnel **314** of a boat **316** for example in clamping engagement between two blocks **318** and **320.** A vertically oriented pivot pin **322** extends upwardly and is pivotally connected to the handle stem **324** of an oar type member **326** with a handle **328.** An elongate vertical force transmitting means composed of elements **330, 332** and **334** extends upwardly from the shaft **302.** Preferably each of these elements are bifurcated at their respective lower ends **336, 338** and **340** and pivotally connected in a generally clevis or yoke arrangement to the shaft by pivot pins **342, 344** and **346;** and, at their respective upper ends, the same are pivotally connected to a bridging member **348** by pivot pins **350,** 352 and **354,** the bridging member being fixed by suitable means to the clamp block **320.**

In operation the oar is manipulated in a fore and aft series of cycles to transmit fore and aft movement of the shaft **320** and carried wings which collapse and expand beneath the water to propel a boat on which it is installed through the water.

In each of the embodiments the canopy when collapsed may be secured in close collapsed relation about the shaft arm or leg, for example, as shown in FIGS. **1** and **2** by use of the draw string **99.**

What is claimed is:

1. A pair of devices for attachment to a member to be manipulated in water to cause forces of propulsion, each device comprising

a sleeve having a first end zone and a second end zone and being characterized by a longitudinal centerline,

a plurality of equi-spaced struts each of a common length and each having a first end and a second end,

pivot means connecting the first end of each strut to the first end zone,

said struts being swingable from a first position of general alignment of said struts with said sleeve and a second position of said struts extending radially outwardly and rearwardly toward said second end zone,

stop means to limit swinging movement of the second end of each of said struts toward said first end zone,

said stop means defining said second position,

said second position being such that each of said struts is oriented at a substantially common angle of divergence with respect to the centerline of said sleeve and with the second ends being in a substantially common transverse plane with respect to the sleeve centerline and said second ends defining a curved line in said plane of a substantially common radius from said centerline;

a flexible canopy connected to each of said struts and spanning the space between said struts and said sleeve, and

said sleeve being of an axial length greater that the distance between the first end zone and said transverse plane,

means to connect said sleeve to a member, each of said devices being in coaxial spaced relation and facing in a common direction and being characterized by said curved line of each device defining a complete circle in said transverse plane; and an elongate shaft in the sleeve of each device and said means to connect connecting said sleeve to said shaft, said shaft being pivotally connected to a force transmission means extending radially of said shaft.

2. The device as set forth in claim **1** wherein said curved line defines a sector of a circle.

3. The device as set forth in claim **2** wherein said sleeve is of flexible material.

4. The device as set forth in claim **2** wherein the device includes tie means to hold the struts in said first position when not in use.

5. The device as set forth in claim **1** wherein the force transmitting means comprises a plurality of elongate force transmitting elements extending a common length in a common direction to terminal ends, a bridging member in parallel spaced of said shaft, and pivot means connecting said termianl ends to said bridging member.

6. The device as set forth in claim **5** wherein clamp means are provided on said bridging member for attachment to the gunnel of a boat and an oar, first pivot means is connected to said clamp means and said oar for fore and aft swinging movement of said oar about said first pivot means; and second pivot means are provided to connect said bridging member to said oar; said second pivot means being outboard of said first pivot means.

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