

Oct. 15, 1968

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3,405,413

SWIM FIN

Filed March 1, 1967

2 Sheets-Sheet 1

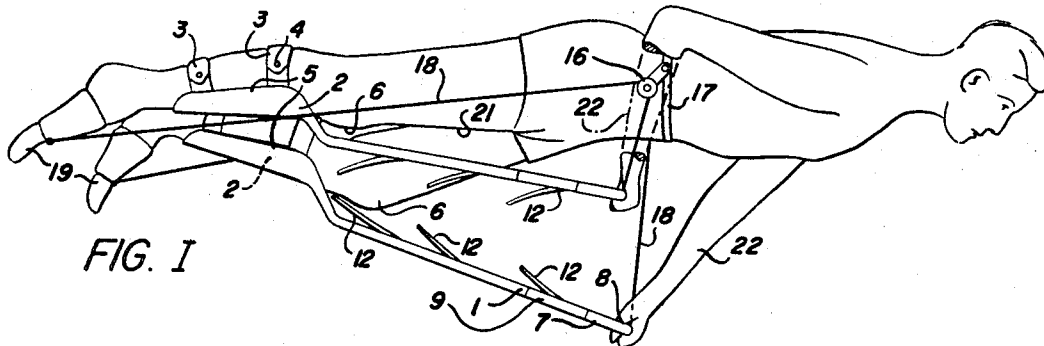


FIG. I

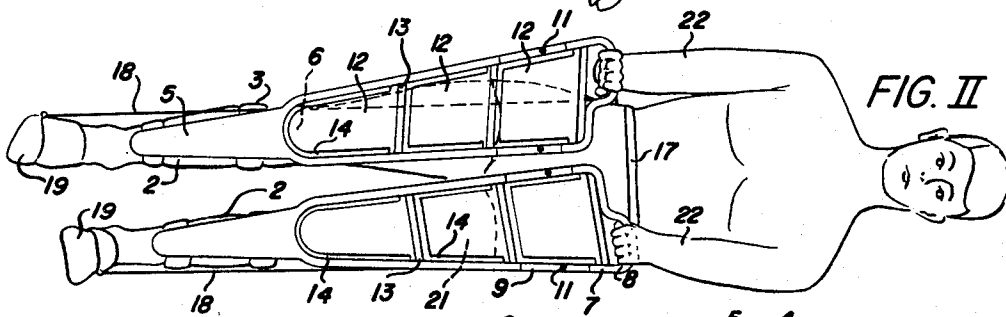


FIG. II

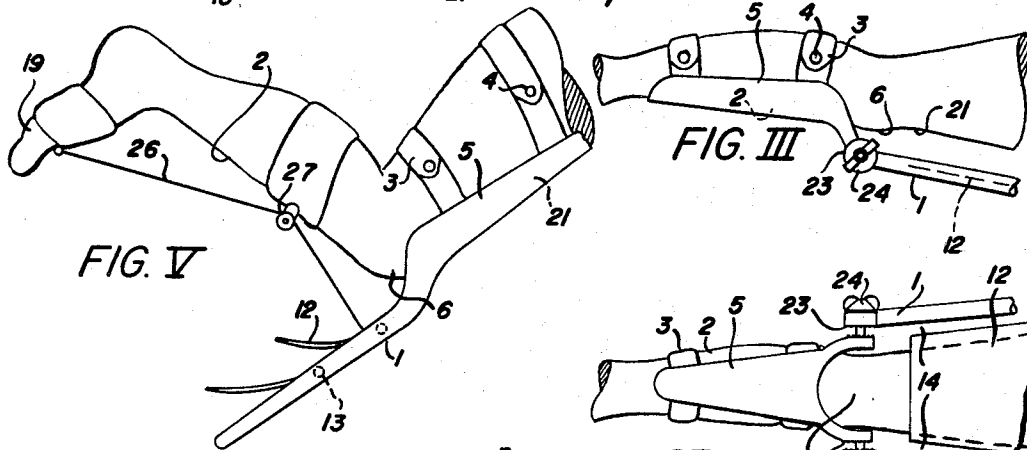


FIG. III

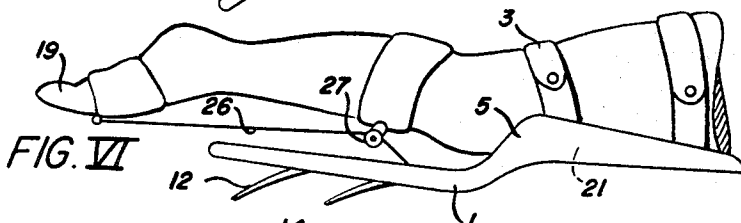


FIG. IV

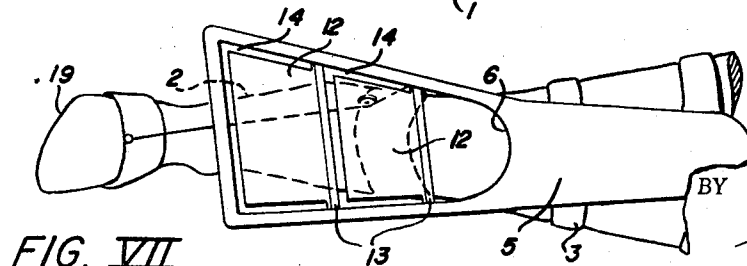


FIG. V

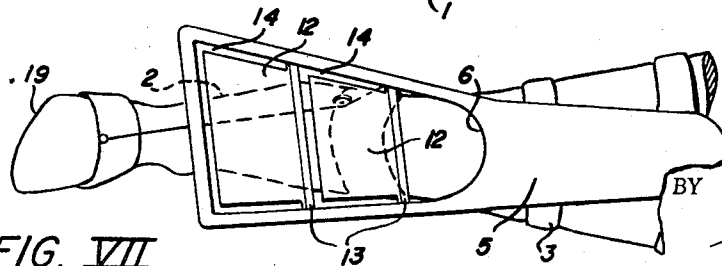


FIG. VI

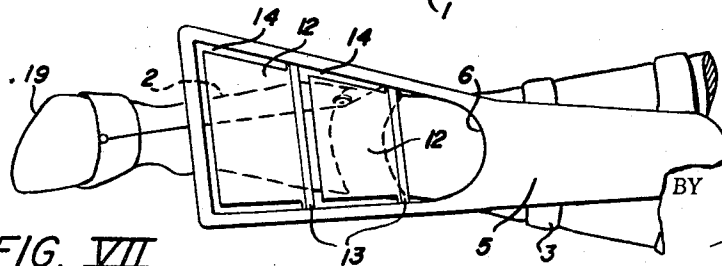


FIG. VII

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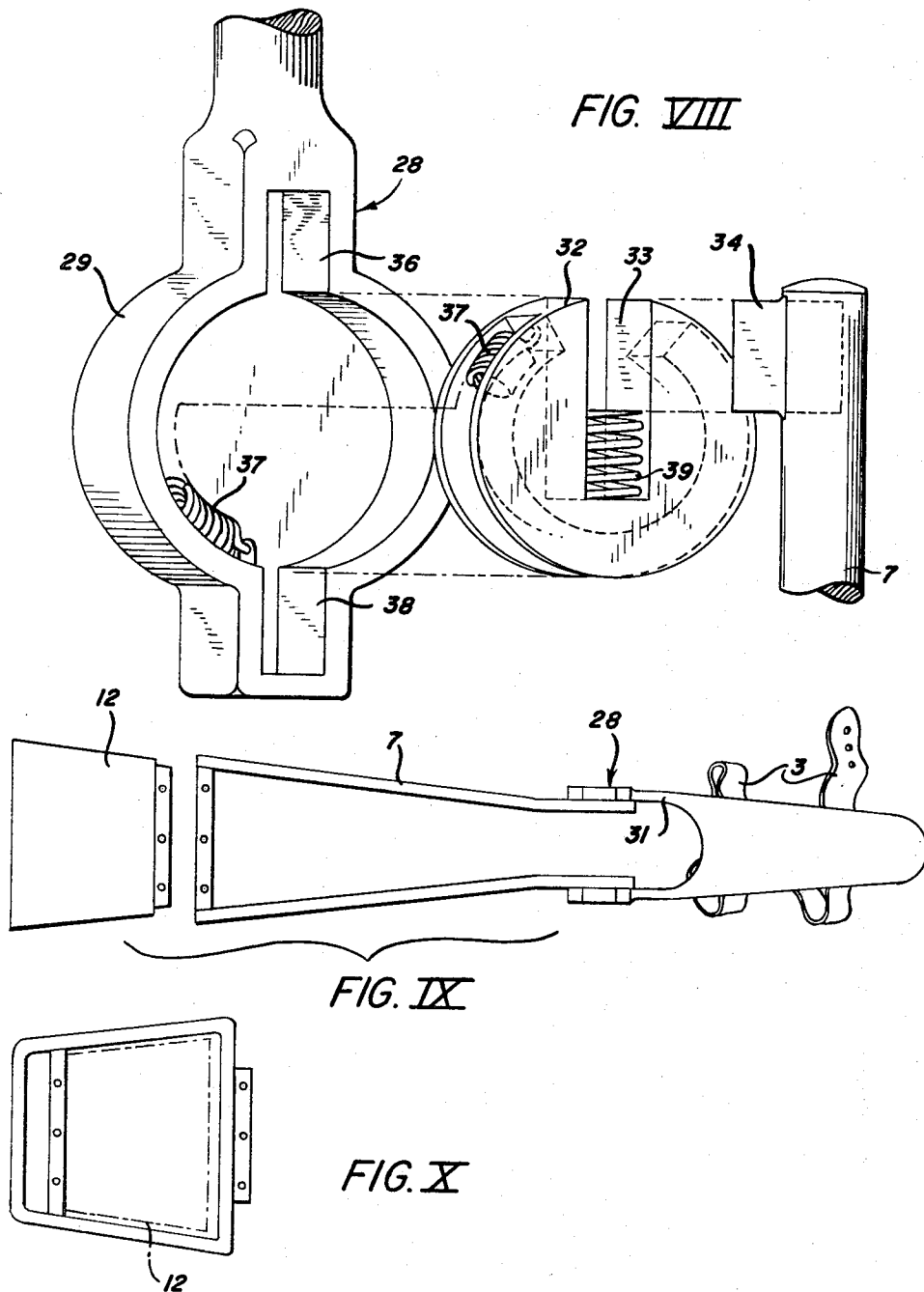
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ABSTRACT OF THE DISCLOSURE

A pair of swim fins each connectable to one of a swimmer's legs and aligned with either the shin or thigh so that each fin is articulable independently of the other by a normal walking action of the swimmer. The fins have distal portions and resilient blade members organized to push water. The distal portions can extend above the knees and can be provided with handles for coaction of the swimmer's hands. Alternately distal portions may project below the knees with or without pulley mounted cords arranged to harness kicking of the swimmer's feet in moving the fins.

This invention teaches an improved fin device for attachment to legs of a swimmer so that more effective use of leg-operating muscles can be achieved in propelling the swimmer through water.

The primary objective is to offer improved propulsion to the swimmer. A more particular objective is to provide a device whereby normal flexing of the swimmer's legs (as in walking) is translated into effective propulsion. Another objective is to accommodate coaction of the swimmer's arms and legs in a propulsion effort. It is a further objective of this invention to harness motion of the swimmer's feet.

The foregoing and other features will appear more fully from the accompanying drawing wherein:

FIGURE I is a side view of a swimmer using a first embodiment of a fin device according to this invention and connected to the swimmer's lower legs.

FIGURE II looks upward toward the swimmer of FIGURE I.

FIGURES III and IV depict an arrangement for folding the fin device in the vicinity of the swimmer's knee.

FIGURES V through VII show a second embodiment of this fin device mounted on the swimmer's upper leg.

FIGURES V and VI illustrate the action of the swimmer's foot in operating the fin.

FIGURE VIII is an exploded view of a swivel arrangement used with the fin mounted on the upper leg, for positioning the fin in a plurality of settings.

FIGURE IX illustrates a flexible web foot attachment for use with the fin when it is mounted on the upper leg.

FIGURE X shows a handle piece which can be interchanged with the web foot attachment of FIGURE IX for use when the fin is to be connected to the swimmer's lower leg.

The muscles of the human abdomen and leg are highly developed for walking and running. These muscles also adapt readily for bicycle riding. Bicycle riders use hips, knees and ankles in much the same manner as they are used in walking or in running. In swimming, however, the general instruction is to "stiffen the knees and kick from the hips." Even with the popular web foot attachment, the same instruction still applies. A considerable amount of effort is required to keep the swimmer's legs relatively stiff, effort which does not do any work in propelling the swimmer. The fin device of this invention permits a swimmer to avoid the strain of keeping his legs stiff and allows him to use well developed walking and running muscles in their natural action to improve propulsion.

In this description a separate fin is contemplated for each of the swimmer's legs. Accordingly for simplicity,

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unless otherwise indicated, the designation of thigh, knee, calf, ankle, foot and the like are to be construed as those parts of one leg in their usual operative relationship. Also unless otherwise indicated the swimmer should be understood to be positioned prone, chest-down in water.

FIGURE I shows fins 1 each substantially aligned with one of the swimmer's calves 2 and each connected to its associated calf by means of leg-encircling bands 3 held by snap fasteners 4 along with saddle members 5. Fins 1 extend above the swimmer's knees 6 to define distal ends 7 with handles 8. The lengths of fins 1 can be adjusted and set by arrangements such as telescopically assembled slides 9 and clamping devices such as set screws 11 (of known design). Blades 12 are made of a resilient material (such as rubber) and are rigidly connected to fins 1 by means of framing members 13. Blades 12 are spaced from fins 1 and from adjacent framing members 13 to define clearances 14 so that the blades 12 can articulate either toward or away from the swimmer's thighs to push water. Pulleys 16 are mounted by means of belt 17 at the swimmer's hips. Chords 18 are connected via pulleys 16 between feet 19 and distal ends 7 of the fins.

In operation the swimmer uses a normal walking motion. As his knees 6 bend, fins 1 are reciprocated toward and away from the swimmer's thighs 21 so that resilient blades 12 flex forcing water rearwardly whereby the swimmer is propelled forward.

The operation of this device is not limited to action of the swimmer's legs. Handles 8 permit the swimmer's arms 22 to join with his legs in pulling and pushing distal ends 7. Further the power of the swimmer's feet-operating muscles can also be harnessed by means of pulls on chords 18.

Using these fins as shown in FIGURES I and II the swimmer obtains substantial magnification of power as compared with conventional web foot devices. Translation of thighs 21 brought about by hip movement coacts with rotation of fins 1 on bending of the swimmer's knees 6 to give about double the stroke one would expect from a web foot device. Accordingly propulsion is improved.

As shown in FIGURES V through VII the fins could also be aligned with and connected to the fronts of the swimmer's thighs 21 for projection of distal ends 7 below his knees 6. Here again chords 26 with associated pulleys 27 can be used to harness the swimmer's foot operating muscles.

When the swimmer is in tight quarters or if he is swimming through vegetation, he may want to fold the fins against his thighs 21 for compactness. Toward this objective clutches 23 with locking nuts 24 are provided as shown in FIGURES III and IV. Should the swimmer want to use his hands alone, he can unlock clutches 23 so that fins 1 are free to rotate at his knees.

A second arrangement for folding the fin and used with the fin mounted on the upper leg is shown in FIGURE VIII. Socket 28 is formed at the swimmer's knee 6 by member 29 which is part of fixed portion 31 of fin 1. Swivel disk 32 is received in socket 28 and has keyway 33 formed therein. Under normal operations key 34 connected to distal end 7 is maintained in locking engagement between keyway 33 and recess 36. When the swimmer wants to fold the fin against his thigh 21, he pushes downward on distal portion 7 to force key 34 out of recess 36 so that swivel disk 32 is free to rotate. He then pulls the fin toward him. When distal portion 7 is at the swimmer's thigh, key 34 moves into locking engagement between keyway 33 and recess 38 under the urging of coil spring 39. To reset distal end 7 in its normal operating position the swimmer pulls upward on distal portion 7 to force key 34 out of recess 38. Spring 37

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(connected between portion 29 and swivel disk 32) then rotates distal portion 7 to its normal operating position and coil spring 39 reengages key 34 into recess 36.

I claim:

1. A pair of rigid fins each substantially aligned with one of the shins of the swimmer,
means for attaching each of the fins rigidly to its associated shin so that each of the fins is articulated independently by a normal walking motion of its associated leg,
each of the fins extending above its associated knee to define a distal portion. 5
2. The pair of devices of claim 1 with each of the distal portions including at least one blade member made of a resilient material and organized to push water. 15
3. A device for a swimmer to increase his propulsion and comprising:
a fin substantially aligned with one of the shins of the swimmer,
means for attaching the fin rigidly to that shin so that the fin is articulated by a normal walking motion of the swimmer's leg,
the fin extending above its associated knee to define a distal portion,
the distal portion including at least one blade member made of a resilient material and organized to push water,
the distal portion including a handle,
the handle arranged for reciprocating the distal portion by at least one of the arms of the swimmer. 20
4. The device of claim 3 with means for adjusting the length of the distal portion. 25
5. The device of claim 3 with:
a pulley mounted at the swimmer's side,
a chord connected over the pulley between the swimmer's foot and the distal portion so that a pull can be exerted on the distal portion by moving the foot. 30
6. The device of claim 3 with:
the fin having a hinge in the vicinity of the swimmer's knee,
means for locking the hinge in a desired position. 40
7. A device for a swimmer to increase his propulsion and comprising:

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- a rigid fin substantially aligned with the front of one of the swimmer's thighs,
means for attaching the fin rigidly to that thigh so that the fin is articulated by a normal walking motion of the swimmer's leg,
the fin extending below its associated knee to define a distal portion,
the distal portion including at least one blade member made of a resilient material and organized to push water,
8. The device of claim 7 with:
a pulley mounted at the swimmer's shin,
a chord connected over the pulley between the swimmer's foot and the distal portion so that a pull can be exerted on the distal portion by moving the foot.
 9. The device of claim 7 with:
the fin including a fixed portion connected to the swimmer's thigh,
the fixed portion defining a socket at the swimmer's knee,
a circular disc arranged for swivelling in the socket, the disc defining a radially oriented keyway,
the fixed portion defining at least one recess outward of the socket,
a key connected to the distal portion and positioned in the keyway,
a coil spring arranged in the keyway to urge the key into engagement in the recess.
 10. The device of claim 9 with a spring connected between the fixed portion and the disc for urging the distal portion toward the swimmer's shins.

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