Aug. 15, 1967 G. W. WOLFE 3,335,441

SWIMMING FINS AND PLANES

Filed March 7, 1966 5 Sheets-Sheet 1

Fig. 1.

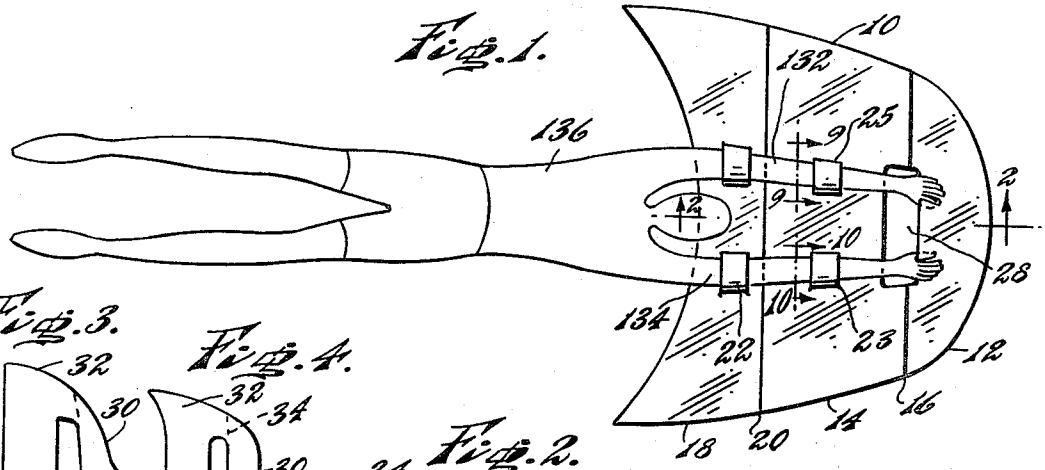


Fig. 3.

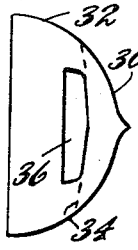


Fig. 4.

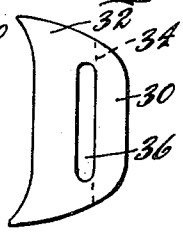


Fig. 2.

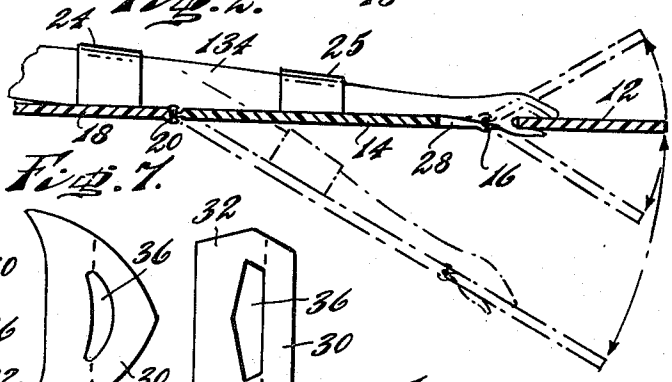


Fig. 5.

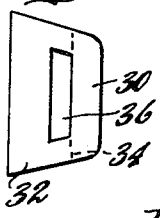


Fig. 6.

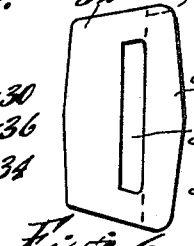


Fig. 7.

Fig. 8.

Fig. 9.



Fig. 10.



Fig. 11.

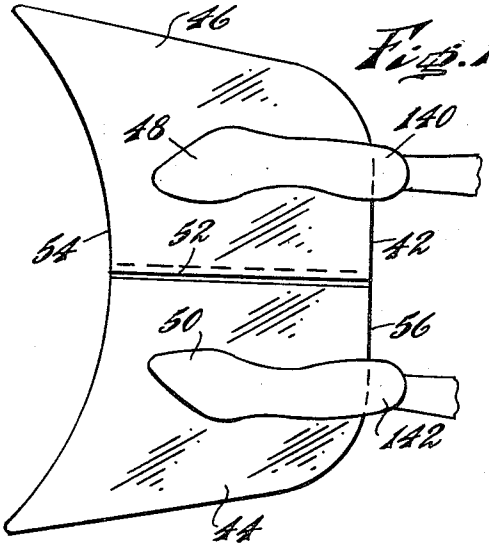
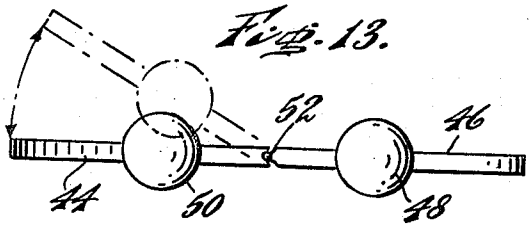


Fig. 13.



INVENTOR.
Gerald W. Wolfe
BY Karl L. Spivak
ATTORNEY

Aug. 15, 1967 G. W. WOLFE 3,335,441

SWIMMING FINS AND PLANES

Filed March 7, 1966 5 Sheets-Sheet 2

Fig. 12.

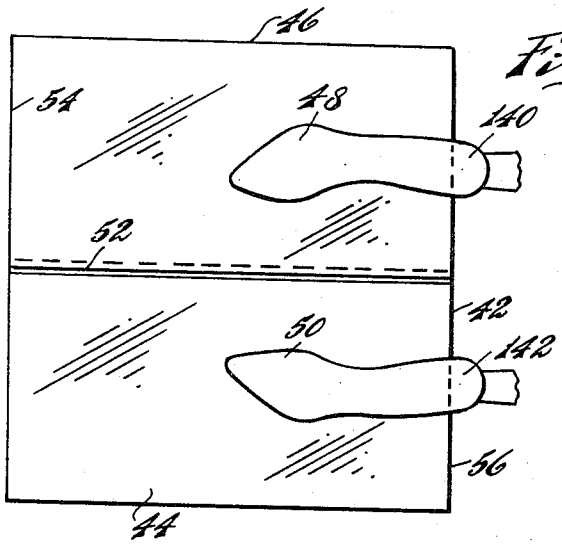


Fig. 14.

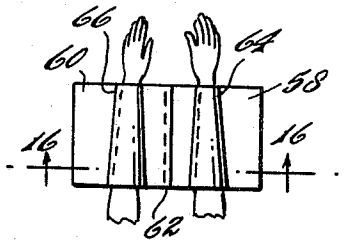


Fig. 15.

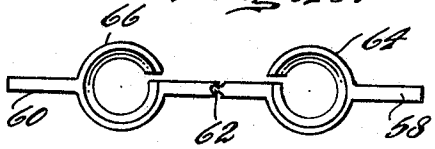


Fig. 28.

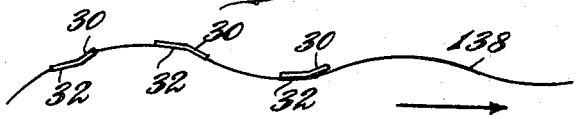


Fig. 17.

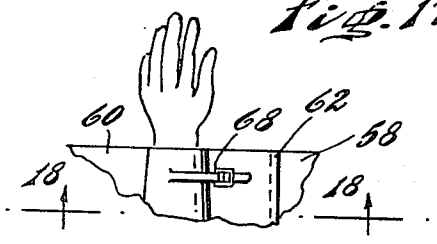


Fig. 16.

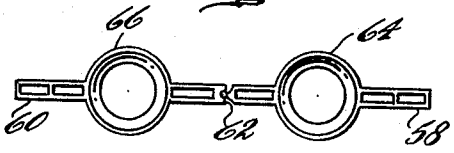


Fig. 16A.

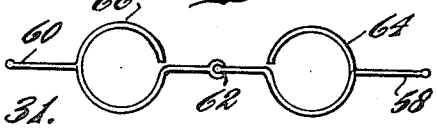


Fig. 18.

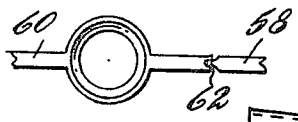


Fig. 31.

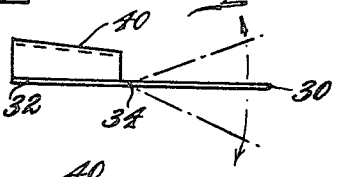
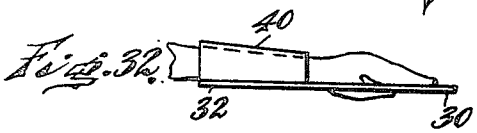


Fig. 32.



INVENTOR.
Gerald W. Wolfe
BY Karl L. Spivak
ATTORNEY

Aug. 15, 1967 G. W. WOLFE 3,335,441

SWIMMING FINS AND PLANES

Filed March 7, 1966 5 Sheets-Sheet 3

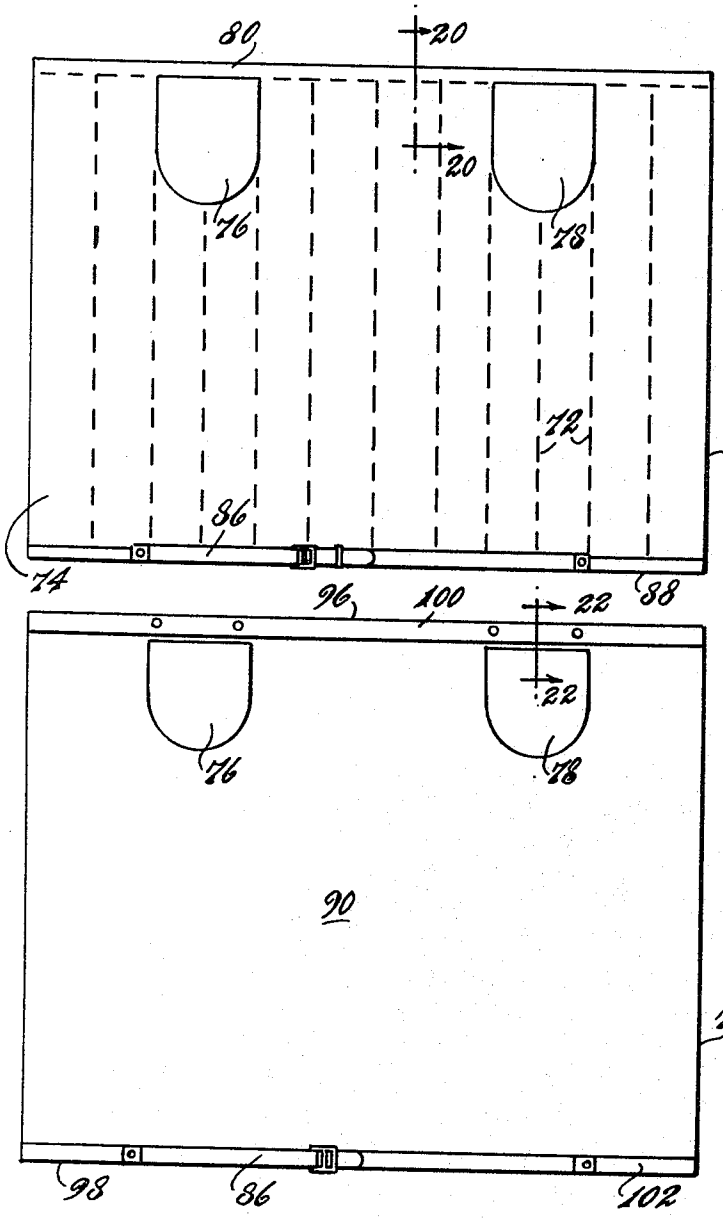


Fig. 19.

Fig. 20.

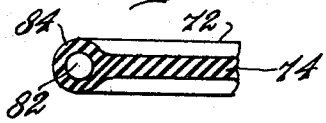
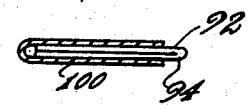


Fig. 21.

Fig. 22.



INVENTOR.
Gerald W. Wolfe
BY
Karl L. Spivak
ATTORNEY

Aug. 15, 1967 G. W. WOLFE 3,335,441

SWIMMING FINS AND PLANES

Filed March 7, 1966 5 Sheets-Sheet 4

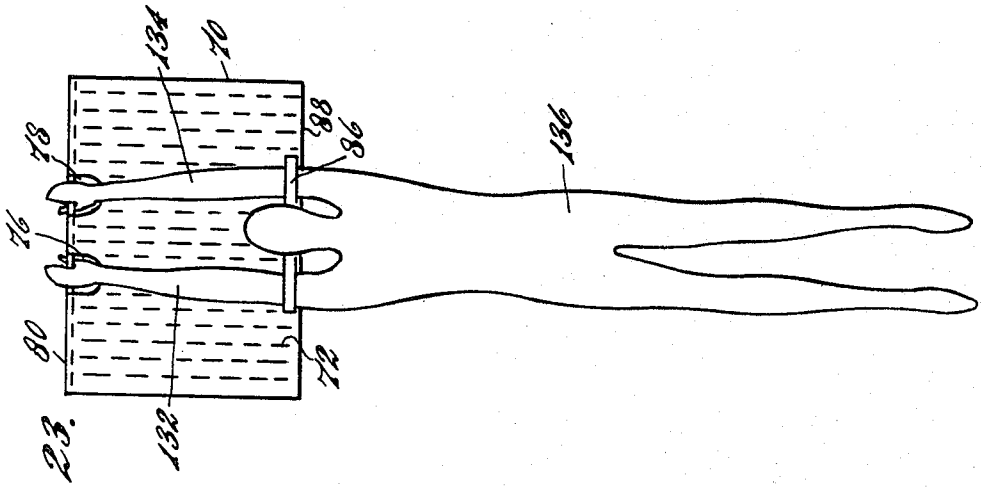


Fig. 23.

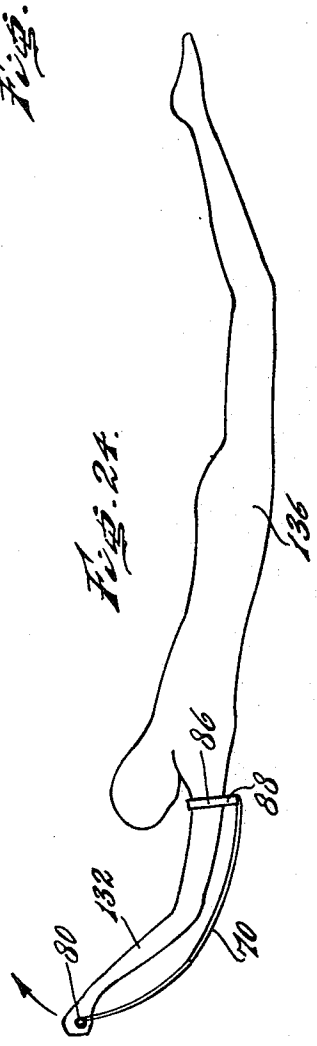


Fig. 24.

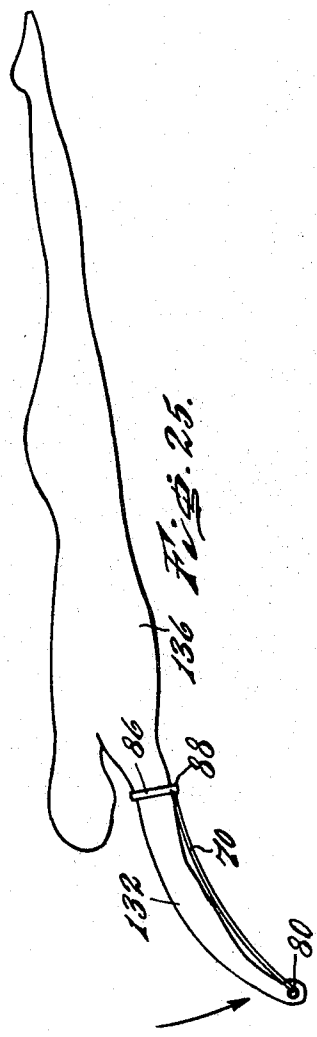


Fig. 25.

INVENTOR
Gerald W. Wolfe
Karl L Spivak
ATTORNEY

Aug. 15, 1967 G. W. WOLFE 3,335,441

SWIMMING FINS AND PLANES

Filed March 7, 1966 5 Sheets-Sheet 5

Fig. 26.

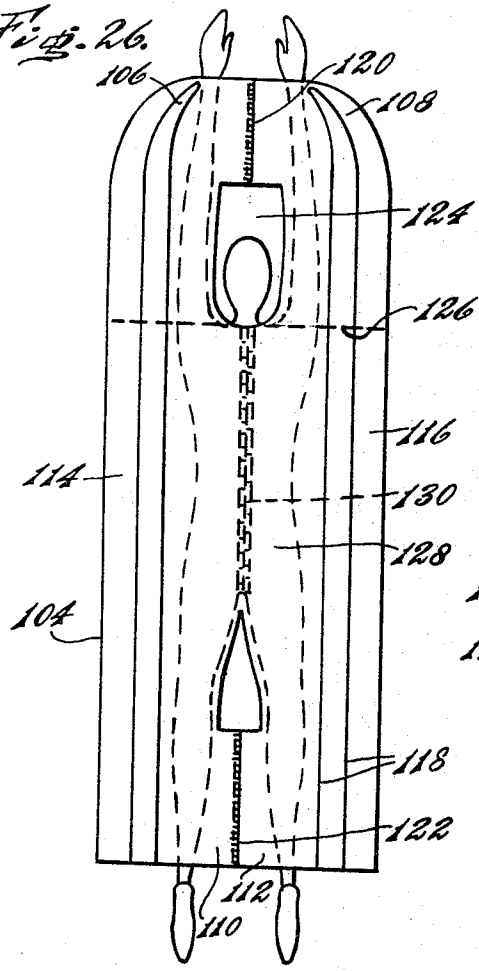


Fig. 27.

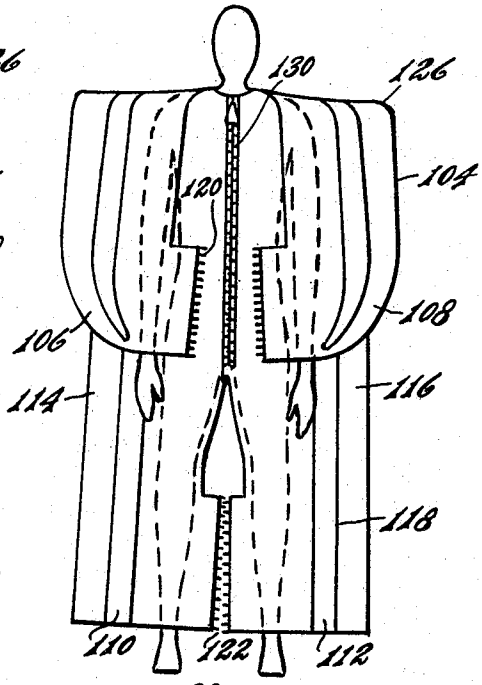
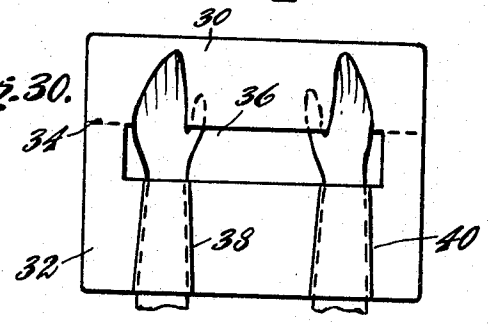


Fig. 30.



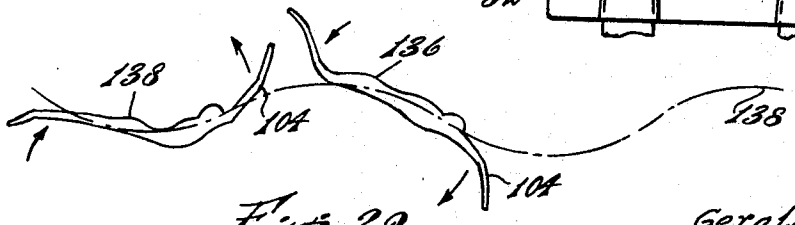


Fig. 29.

INVENTOR.
Gerald W. Wolfe
BY Karl L Spivak
ATTORNEY

United States Patent Office 3,335,441
Patented Aug. 15, 1967

3,335,441

SWIMMING FINS AND PLANES

Gerald W. Wolfe, 8040 Roosevelt Blvd.,
Philadelphia, Pa. 19152

Filed Mar. 7, 1966, Ser. No. 541,421
5 Claims. (Cl. 9—330)

This invention relates to the general field of aquatics, and is more particularly directed to a plurality of swimming aids and to a unique method of using these devices, the total result being to introduce and teach an entirely new procedure for propelling the human body through the water.

Prior art swimming devices such as fins for the feet, fins for the hands and boards of varying designs are all well-known and in popular use throughout this and other countries. The swimming aids as herein presently contemplated, all are directed to increasing the surface of contact between the swimmer and the water, and thus increase the rate of propulsion therethrough. Novel arm and hand swimming accessories in various configurations and sizes, all as hereinafter more fully set forth, furnish a greatly increased area of contact to be controlled by the arms of the swimmer than has ever before been considered possible. Further, the arms of the swimmer work together in unison to guide the novel swimming planes set forth in the drawings rather than independently and alternately as is now required with the presently known devices.

Similarly, swim flippers or fins have been designed to provide a large water contact area to be controlled by the feet of the swimmer. The fins are generally rectangular and flat in configuration, and the linear peripheral contours may be varied in accordance with the skill, strength and desires of the swimmer. Novel interlocking features have been incorporated to permit the fins to be used either singly as in present practice, or preferably as a unit with both feet working in unison to propel the swimmer through the water.

It is contemplated that by using the novel swimming planes affixed to the arms and the flipper attached to the feet and interlocked, the swimmer will be able to operate his arms in unison and his legs in unison in a new swimming motion and method. By grasping the blade of the swimming plane and flexing it upwardly and downwardly with the hands and simultaneously coordinating the actions of the hands with upward and downward movements of the arms, a rhythmic, paddle-like motion can be set up. Upon proper manipulation of the swimming planes by the hands and the arms, a hydrodynamic current action of the water may be established that is quite similar to the action of the flippers on a fish. The leg and foot operated fins can be utilized to amplify and augment the currents and movements of the arms by coordinating the leg strokes in a manner to give the optimum propulsion through the water. It is contemplated that the leg strokes and coordination presently used by expert swimmers when swimming the "butterfly" type of breast-stroke will be satisfactory for the present swimming method.

It is thus seen that an apparatus and method has been devised to enable a swimmer to guide his body upwardly and downwardly through the water by utilizing extended surfaced swimming planes and fins. By alternating upward and downward movements of the arms and coordinating the directing movements of the hands and the power strokes of the legs, the swimmer may guide his progress and propel himself through the water near the surface thereof in much the same manner as a porpoise.

It is therefore an object of this invention to provide improved swimming planes and fins of the type set forth.

It is another object of this invention to provide novel swimming planes and fins of configuration permitting large surface to water contact areas.

It is another object of this invention to provide novel swimming planes and fins designed to permit porpoise-like propulsion through the water.

It is another object of this invention to provide novel arm operated planes and leg operated fins to provide uniform simultaneous movements of the arms and of the legs.

It is another object of this invention to provide novel swimming planes and fins incorporating readily disengageable sections to facilitate alternating movements of the arms and of the legs.

It is another object of this invention to provide novel swimming planes and fins including body member engaging facilities adapted for easy grasping and ready disengagement in case of emergency.

It is another object of this invention to provide novel swimming planes and fins that are rugged in construction, inexpensive in manufacture and trouble-free when in use.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment thereof, taken in conjunction with the accompanying drawing wherein like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a top plan view of a novel swimming plane in operating position in accordance with the instant invention.

FIG. 2 is a cross section taken along line 2—2 of FIG. 1.

FIGS. 3–8 show modified configurations of the swimming plane of FIG. 1.

FIG. 9 is a cross section taken along line 9—9 of FIG. 1.

FIG. 10 is a cross section taken along line 10—10 of FIG. 1.

FIG. 11 is a top plan view of a preferred embodiment of a novel swim fin in accordance with the instant invention.

FIG. 12 is a top plan view of a modification of the swim fin of FIG. 11.

FIG. 13 is a front elevational view of a novel swimming fin.

FIG. 14 is a top plan view of a novel swimming plane.

FIG. 15 is a rear elevational view of the plane of FIG. 14.

FIG. 16 is a cross section taken along line 16—16 of FIG. 14.

FIG. 16*a* is a cross section similar to FIG. 16 showing a modified form thereof.

FIG. 17 is a partial top plan view showing a detail of the wrist connection of the swimming plane of FIG. 14.

FIG. 18 is a cross section taken along line 18—18 of FIG. 17.

FIG. 19 is a top plan view of a modified form of swimming plane.

FIG. 20 is a cross section taken along line 20—20 of FIG. 19.

FIG. 21 is a top plan view of a modified form of swimming plane.

FIG. 22 is a cross section taken along line 22—22 of FIG. 21.

FIG. 23 is a top plane view of the modified swimming plane of FIG. 19 in operating position.

FIG. 24 is a side elevation of view of the swimming plane of FIG. 19 illustrating the upward stroke.

FIG. 25 is a side elevational view of the swimming plane of FIG. 19 illustrating the downward stroke.

FIG. 26 is a top plan view of a novel one piece swimming suit and fins.

FIG. 27 is an elevational view of the suit of FIG. 26 with the suit in folded position.

FIG. 28 is a schematic representation of the operation of the swimming planes of FIG. 1.

FIG. 29 is a schematic representation of the swim suit of FIG. 26.

FIG. 30 is a top plan view of a two part swimming plane in accordance with the instant invention.

FIG. 31 is a side elevational view of a two part swimming plane.

FIG. 32 is a side elevational view of a two part swimming plane indicating the position of the swimmer's hand.

Although specific terms are used in the following description for the sake of clarity these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

Referring now to the drawings, I show in FIG. 1 a swimming plane or flipper **10** adapted for use with the arms of the swimmer. The flipper **10** may be constructed of a stiff material covered with a heat sealing vinyl plastic to render it waterproof or the entire board can be constructed of a flexible material such as rubber or suitable plastic. In the embodiment illustrated, the flipper includes a front guide **12** which is pivotally connected to the arm guide **14** by the transverse hinge **16**. Similarly, the arm guide **14** pivotally connects to the trailing guide **18** by the transverse hinge **20**. Right and left arm sleeves **22, 23** and **24, 25** secure the arms to the arm guide **14** and the trailing guide **13** and are arranged to permit quick and safe arm removal to prevent entrapment of the swimmer in case of emergency.

As best seen in FIGS. 9 and 10, the arm sleeves **22, 23, 24** and **25** are secured to the guides and are constructed of strong, flexible material to allow arm insertion without shearing. When desired, the free edge of the sleeve may be formed into a longitudinally rolled extension **26**. This construction allows arm insertion into the sleeve by a sideways action and permits quick disengagement upon reversing the sideways movements. A medially positioned hand opening **28** is provided along the transverse hinge **16**, to permit manual positioning of the front guide **12** as hereinafter more fully set forth.

FIGS. 3, 4, 5, 6, 7, and 8 all illustrate various configurations of two part swimming planes, each comprising a front guide **30** and an arm guide **32** pivotally joined by the transverse hinge **34** to permit hand operation of the front guide **30** by the swimmer arm sleeves. As shown in FIGS. 30, 31, 32 the hands of the swimmer are inserted through the hand opening **36** and grasp the front guide **30** for swimming control purposes. Right and left sleeves **38, 40** extend from the arm guide **32** to secure the arms of the wearer in operating positions.

In FIGS. 11, 12 and 13, I show swimming fins **42** comprising right and left flippers **44, 46** pivotally and separably joined by the longitudinal hinge **52**. The flippers may be used singly, but display superior performance characteristics when interlocked and operated in unison. Flippers **44, 46** are each provided with an integrally molded foot pocket **48, 50** and are fabricated to be relatively stiff near the foot pockets and relatively flexible near the trailing edge **54**. Rubber or molded plastic may be utilized for this purpose. The distance between the leading edge **56** and the trailing edge may be varied to expose more or less flipper surface to contact the water. As swimmers become stronger and more proficient in the use of the novel flippers, the front to rear distance can be correspondingly increased.

A modified type of arm operated swimming plane is set forth in FIGS. 14, 15, 16, 16A, 17 and 18 wherein adjacent right and left planes **58, 60** are pivotally joined along the longitudinal connecting hinge **62**. I prefer to fabricate the planes as vinyl extrusions both from a standpoint of economy in manufacture and function with the arm engaging sleeves **64, 66** integrally formed therewith. When in use, the plane will tend to move backwards due to the resistance of the water. In order to keep the planes from slipping past the elbows of the wearer and thus restricting his activity, wrist securing straps **68** adjustably secured to the planes have been found useful.

A one piece flexible swimming plane **70** is set forth and illustrated in FIGS. 19, 20, 21, 22, and 23 wherein the flexible planes may be fabricated of rubber or vinyl plastic suitably reinforced for the service. In the embodiment illustrated in FIG. 19, a plurality of longitudinally disposed, spaced ribs **72** strengthen the plane **70** and carry the flexible webbing **74** therebetween to provide a unitary construction. A pair of front hand openings **76, 78** are forwardly closed by the reinforced leading edge **80** which must be thin and strong, and preferably constructed of a transverse length of tempered wire **82** completely enclosed in the rubber or vinyl webbing material **84**. A securing strap **86** is secured above the trailing edge **88** of the plane **70** and is sized to accommodate both arms of the swimmer to permit maximum flexure and control during the swimming movements. The ribs **72** are fabricated of wire or molded plastic for stiffness in one direction and are preferably covered with the webbing material of rubber or vinyl which may be heat sealed, cemented or molded thereto in any well known manner.

In FIG. 21, I show an alternate method of constructing a one piece swimming plane utilizing a body **90** of flexible plastic sheet or core sheet **92** sealed completely in an enclosing envelope of vinyl plastic **94**. The leading edge **96** and trailing edge **98** are sandwiched between metal stiffeners **100, 102** to provide the required rigidity. The one piece swimming planes may be constructed approximately twenty-eight inches wide by eighteen inches deep for swimmers of average ability. However, the dimensions may be increased for stronger swimmers or decreased for novices in accordance with the individual skills of the swimmer.

Referring now to FIGS. 26 and 27, I show a complete swimming suit **104** incorporating in a unitary structure arm guided swimming planes **106, 108** and leg guided fins **110, 112**. Lateral right and left body extensions **114, 116** join the respective planes and fins and aid in guiding the swimmer through the water. The suit **104** may be constructed of vinyl plastic or rubber and is suitably reinforced by a plurality of longitudinal, spaced stiffening ribs **118**. It should be noted that both the hands and the feet of the swimmer remain clear of the suit to permit complete hand freedom for grasping during the swimming operations and complete foot freedom for walking or standing when not in the water.

An interlocking seam **120** or zipper permits the arms to be independently moved when dressing or swimming and a similar interlocking seam **122** or zipper facilitates individual leg movements when desired. A hinged joint **126** transversely crosses the suit at shoulder height to permit the swimmer to lower his arms when the arm interlocking seam **120** is opened. In order to allow a swimmer to readily wear the suit, a body cavity **128** of configuration to roughly conform to the body of the swimmer is integrally molded into the suit **104**. A longitudinal zipper **130** or zippers can be provided as required to facilitate easy donning and shedding of the suit. The longitudinal seams **120, 122** and the transverse hinge **126** all cooperate to give the swimmer mobility when on land.

In order to use the swimming plane of FIGS. 1, 2 the arms **132, 134** of the swimmer **136** are inserted through the sleeves **22, 23 24, 25** until the front edge of the opening **28** can be grasped with the thumbs below the front guide **12** and the other fingers above the guide. In this manner, the front guide **12** may be pivoted upwardly and downwardly about the hinge **16** by wrist action on the part of the swimmer and the arm guide **14** may be downwardly pivoted about the hinge **20** by the swimmer bending his elbows.

As best seen in FIGS. 31, 32, the swimming planes of FIGS. 3, 4, 5, 6, 7, 8 and 30 may be used by inserting the wrists of the swimmer through the sleeves **38, 40** until the front guide **30** is grasped between the fingers and

thumb of each hand as best seen in FIG. 32. In this manner, the front guide **30** can readily be flexed upwardly and downwardly as indicated in FIG. 31.

The swimming planes are used to propel the swimmer through the water by grasping the front guide with the hands as above described and swinging it in a rhythmic, paddle-like motion, leading the up-swing and down-swing motion of the arms to cause a hydro-dynamic current action of the water similar to the rolling movements of a porpoise. This action is illustrated in FIG. 28 wherein the front guide **30** and the arm guide **32** are schematically illustrated in sequential positions forming the undulating path **138**. When on the upward slope of the path, the front guide **30** is flexed upwardly to lead the swing of the arms in the upward direction. The front guide **30** is then downwardly directed to lead the downward swing of the arms and the attached arm guide **32**. In this manner, the swimmer can guide his movements through the water along a course similar to the path **138**.

The swimming fins **44**, **46** of FIGS. 11, 12 may be utilized in conjunction with the swimming planes by inserting the feet **140**, **142** of the swimmer into the pockets **48**, **50** in well known manner and connecting the fins along the hinge **52**. The fins can then be operated in unison to help propel the body of the swimmer along the path **138** by stroking and coordinating in a manner similar to that presently employed by racing swimmers using the butterfly stroke.

The swimming planes illustrated in FIGS. 19, 21 may be employed by a swimmer **136** in the manner illustrated in FIGS. 24, 25. The leading edge **80** is first grasped by the hands of the swimmer through the openings **76**, **78** and the arms **132**, **134** are secured to the trailing edge **88** by means of the strap **86**. The swimmer may then propel himself forwardly through the water by taking a series of rhythmic strokes. By alternately bending his arms upwardly and downwardly, the swimmer can cause water deflecting forces along the surfaces of the plane **70**. The arm curvature of the plane allows for a natural, rhythmic, waving motion.

The swimming suit of FIGS. 26, 27 enables the swimmer **136** to readily propel himself through the water along an undulating path **138** by operating his arms and legs in unison in alternating sequential upward and downward strokes as illustrated in FIG. 29. The "eel-like" or rhythmic action as shown will cause forward motion.

Although I have described my invention with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. In a swimming suit, the combination of a pair of disengagable arm planes, a pair of disengagable leg fins, lateral body extensions respectively joining the said planes and fins, said body extensions being interconnected to form a central, body receiving cavity, a longitudinal zipper joining the said body extensions and permitting access to the said body cavity and a plurality of longitudinal stiffening ribs integrally formed in the said body extensions.

2. The invention of claim **1** wherein a hinged joint transversely crosses the suit at the shoulder height of the wearer.

3. The invention of claim **1** wherein a longitudinal zipper disengages the said arm planes and a second longitudinal zipper disengages the said leg fins.

4. The invention of claim **1** wherein a longitudinal zipper disengages the said arm planes and a second longitudinal zipper disengages the said leg fins, a hinged joint transversely crosses the suit at the shoulder height of the wearer, and wherein the two said zippers and the said hinged joint cooperate to give the swimmer mobility when on land.

5. The invention of claim **1** wherein the hands, feet, and head of the swimmer extend beyond the confines of the swimming suit.

References Cited

UNITED STATES PATENTS

243,834	7/1881	Beeson	9—309 X
1,839,489	1/1932	Meroussis	9—307
2,851,707	9/1958	Samuels	9—309
3,015,829	1/1962	Gronkowski	9—307

MILTON BUCHLER, *Primary Examiner.*

P. E. SAUBERER, *Assistant Examiner.*