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(54) SWIM TRAINER

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Publication Classification

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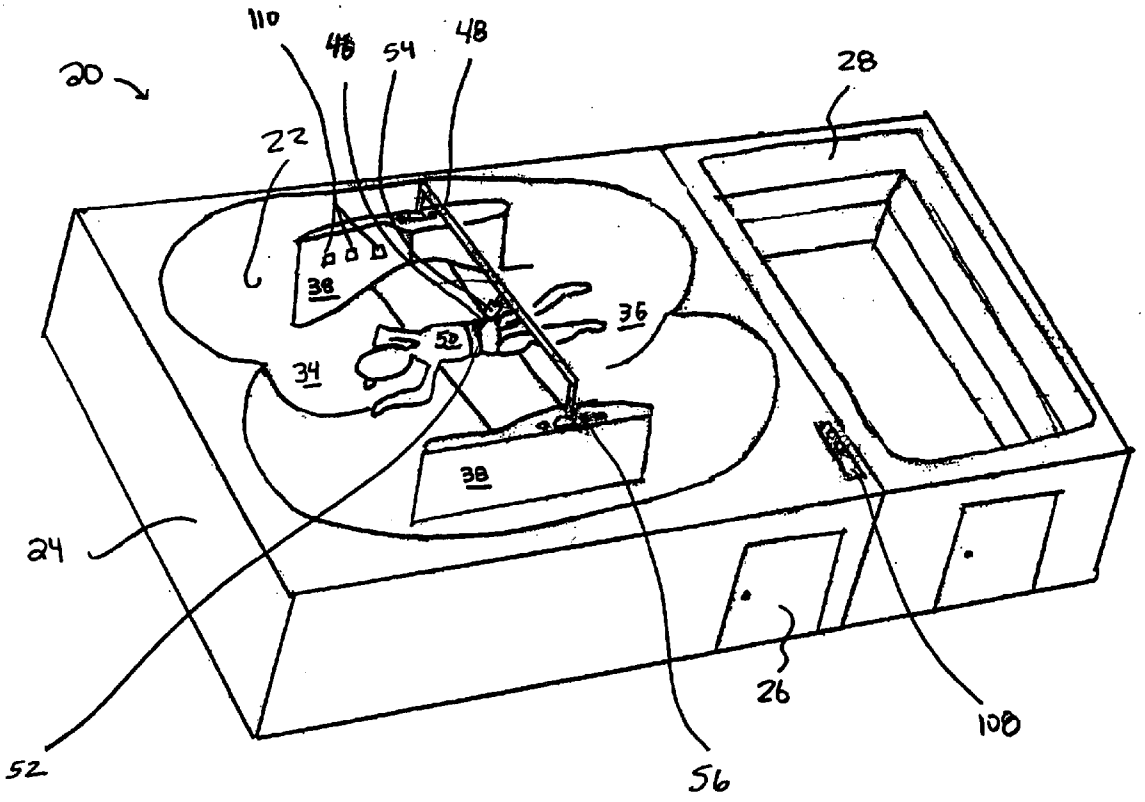
(52) **U.S. Cl.** **482/55**

(57) **ABSTRACT**

A swim-in-place trainer having flow assist features incorporated into the pool design. The flow assist features may include a contoured bottom having a flow directional hump located in approximately the center of the swim area. The flow directional hump may extend laterally across the entire swim area and separate a deeper front portion of the pool from a shallower rear portion of the pool. Other flow assist features may include a front and rear ridge for directing water to and from the swim area, respectively. Interior side walls disposed on opposing sides of the swim area may each include an inner front portion for creating a flow improving vortex to reduce water friction. An optional propulsion means, such as a pump or impeller, may provide a variable water flow dependent upon the location of a swimmer in the swim area or other factors.



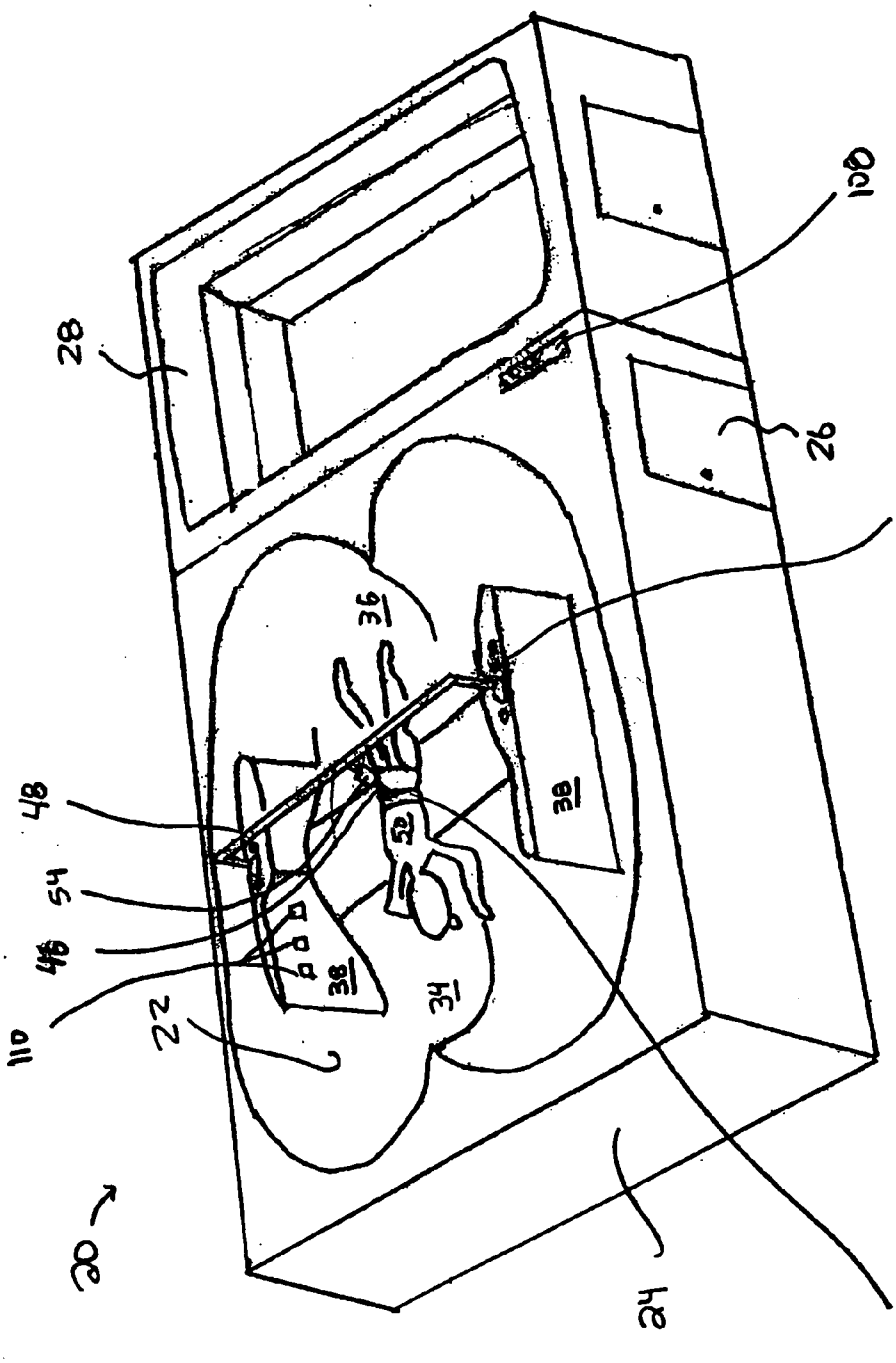
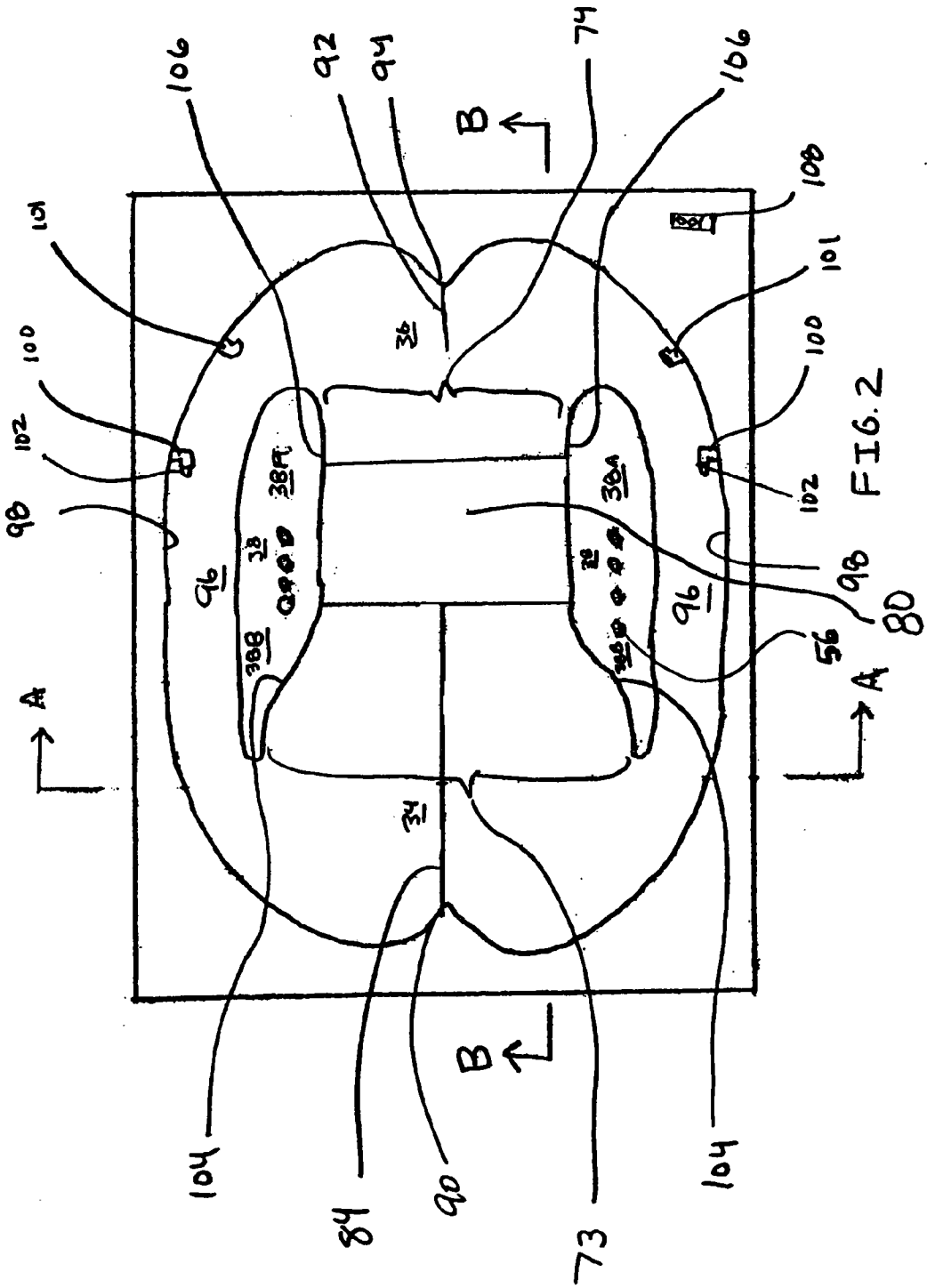


FIG. 1


106
92
94
74
B
106
108
101
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90
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38A
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34
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80
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84
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73
104

FIG. 2

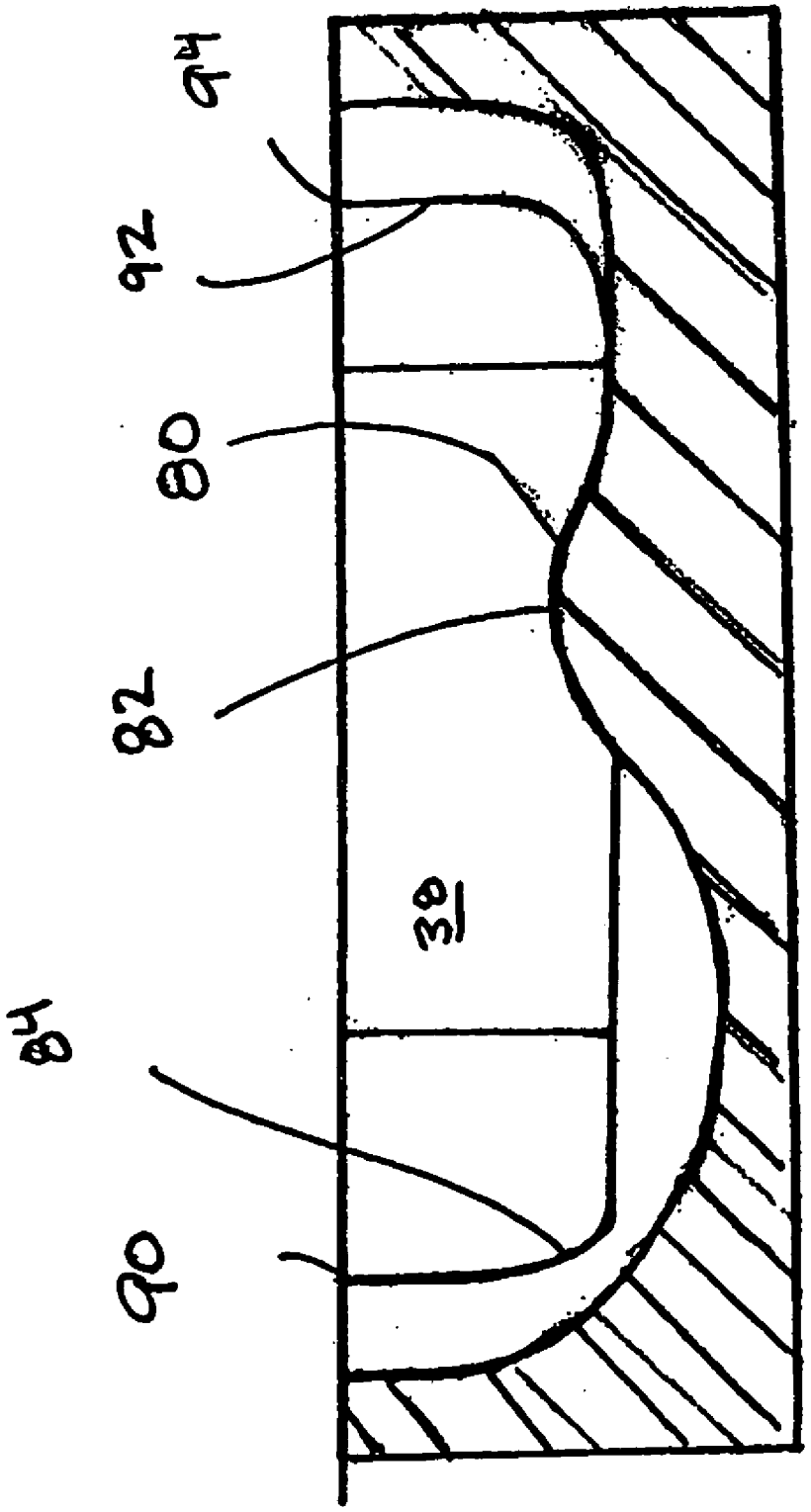

FIG. 3

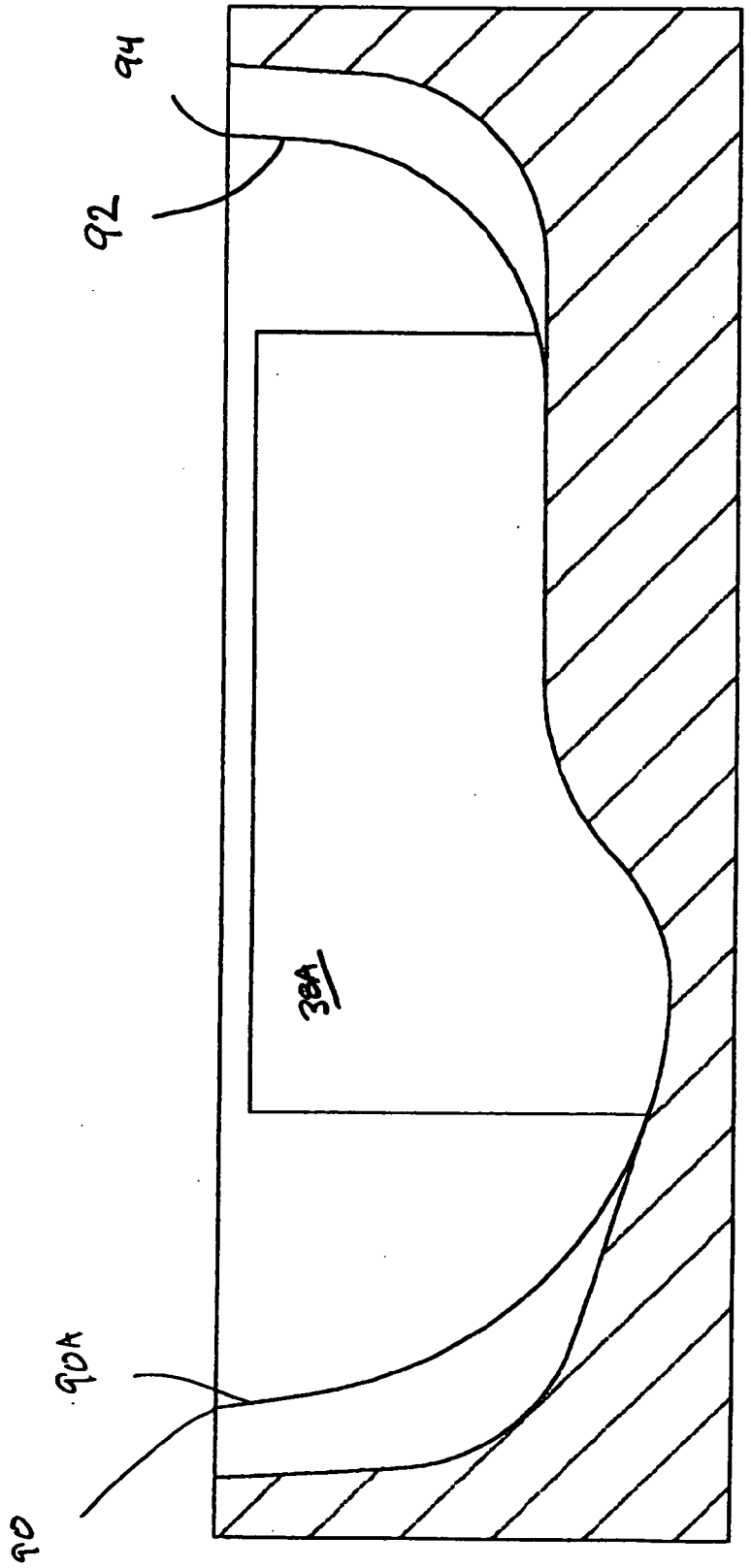

FIG. 3A

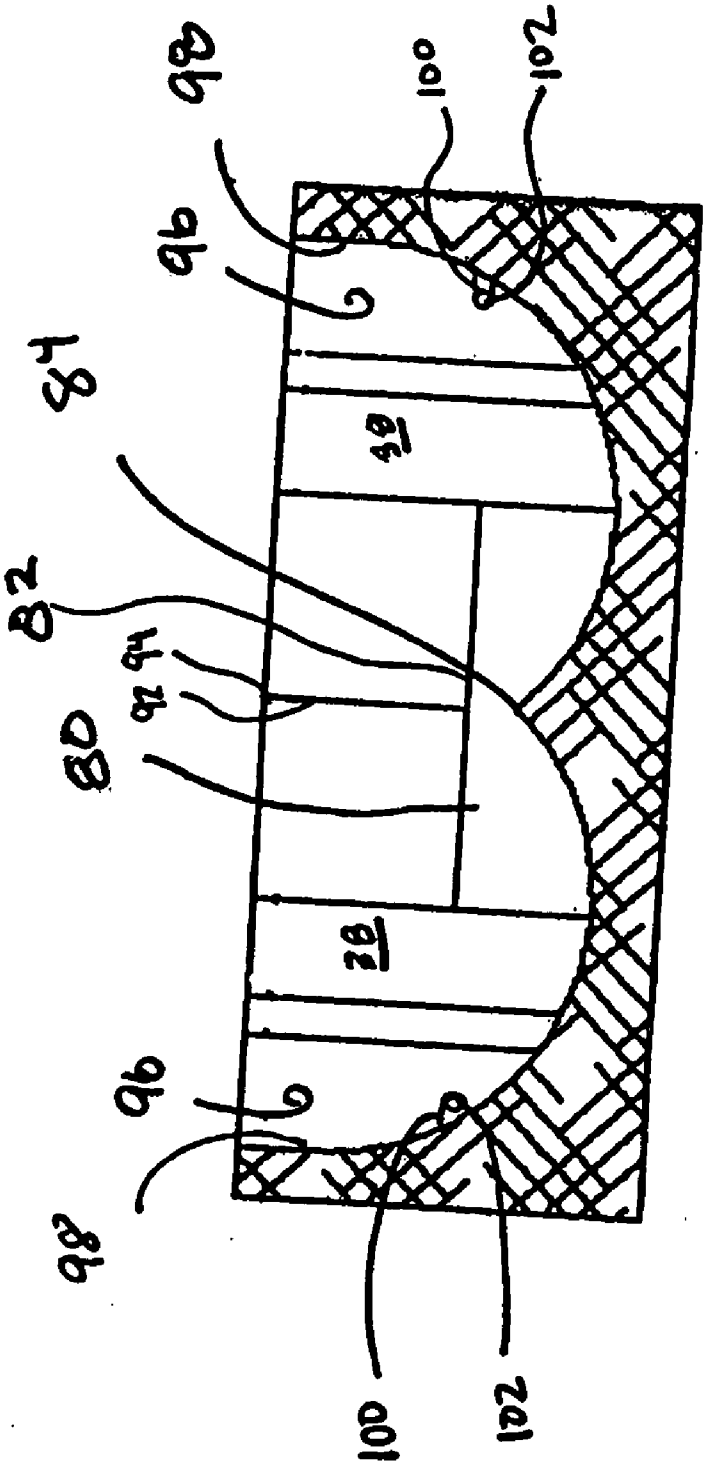

FIG. 4

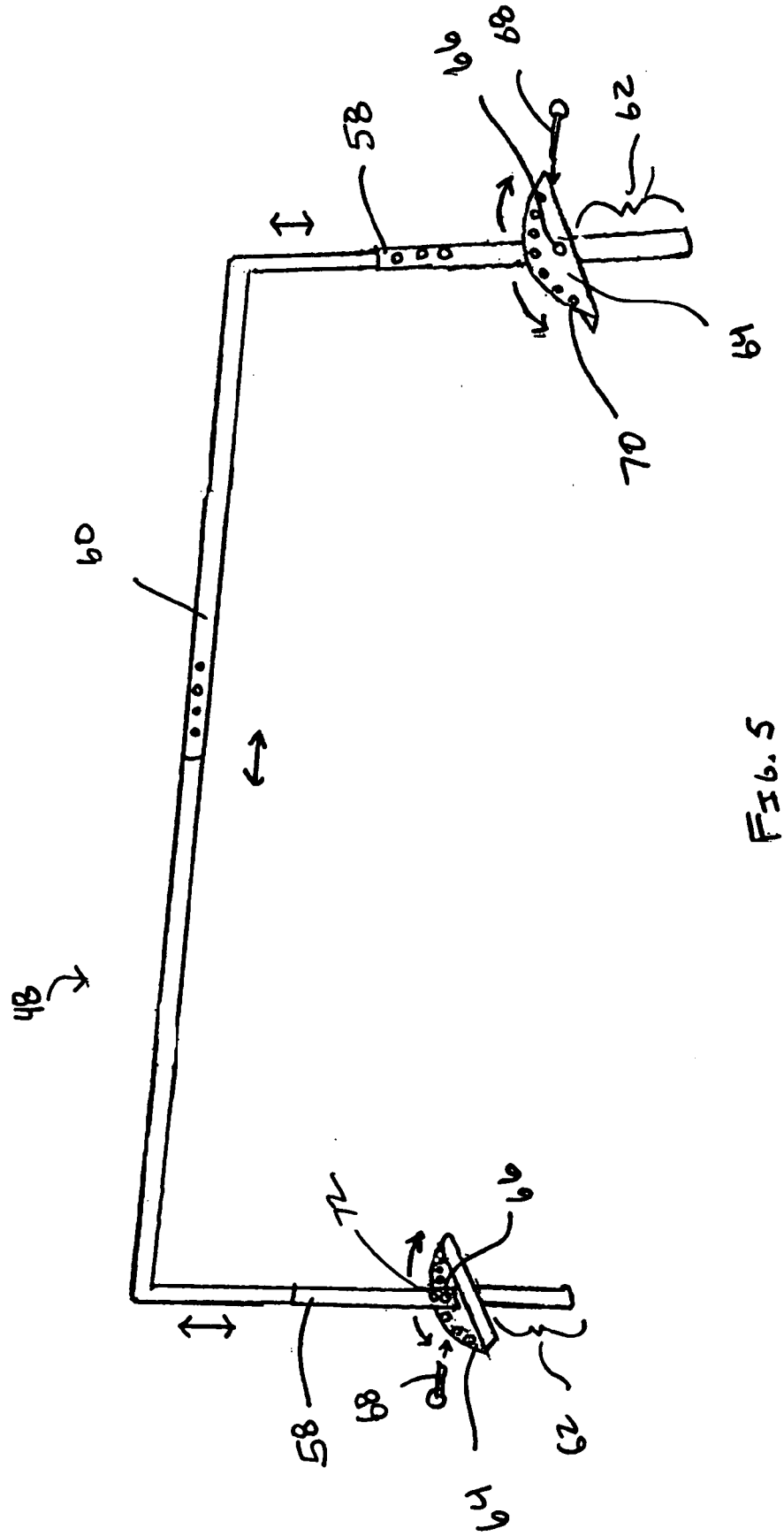

FIG. 5

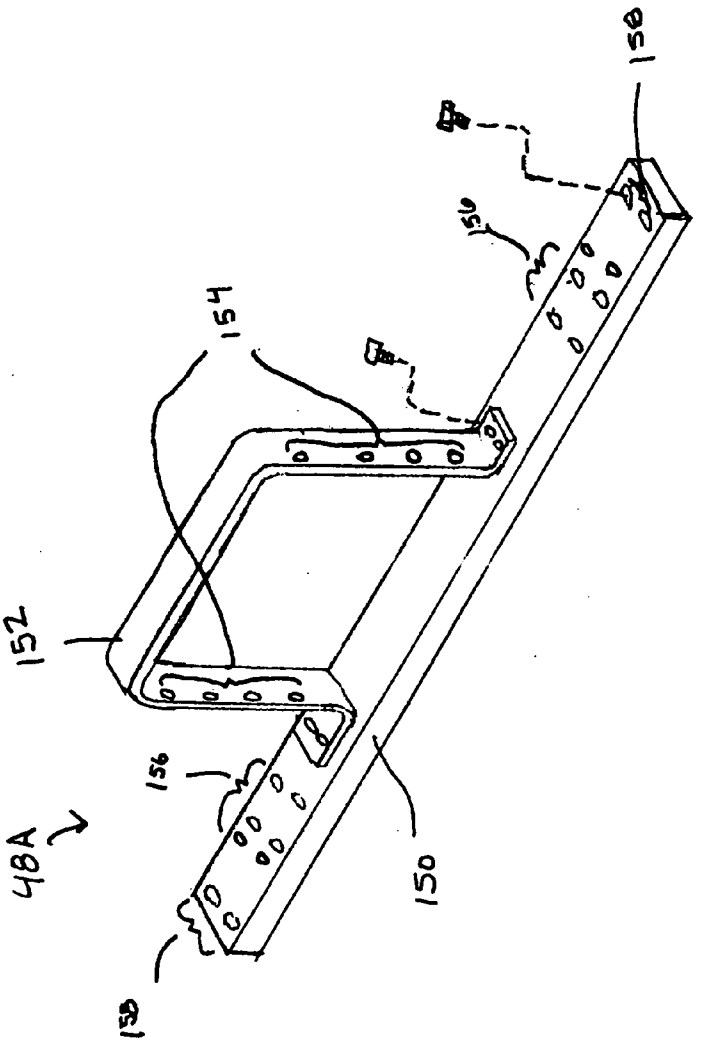

FIG 5A

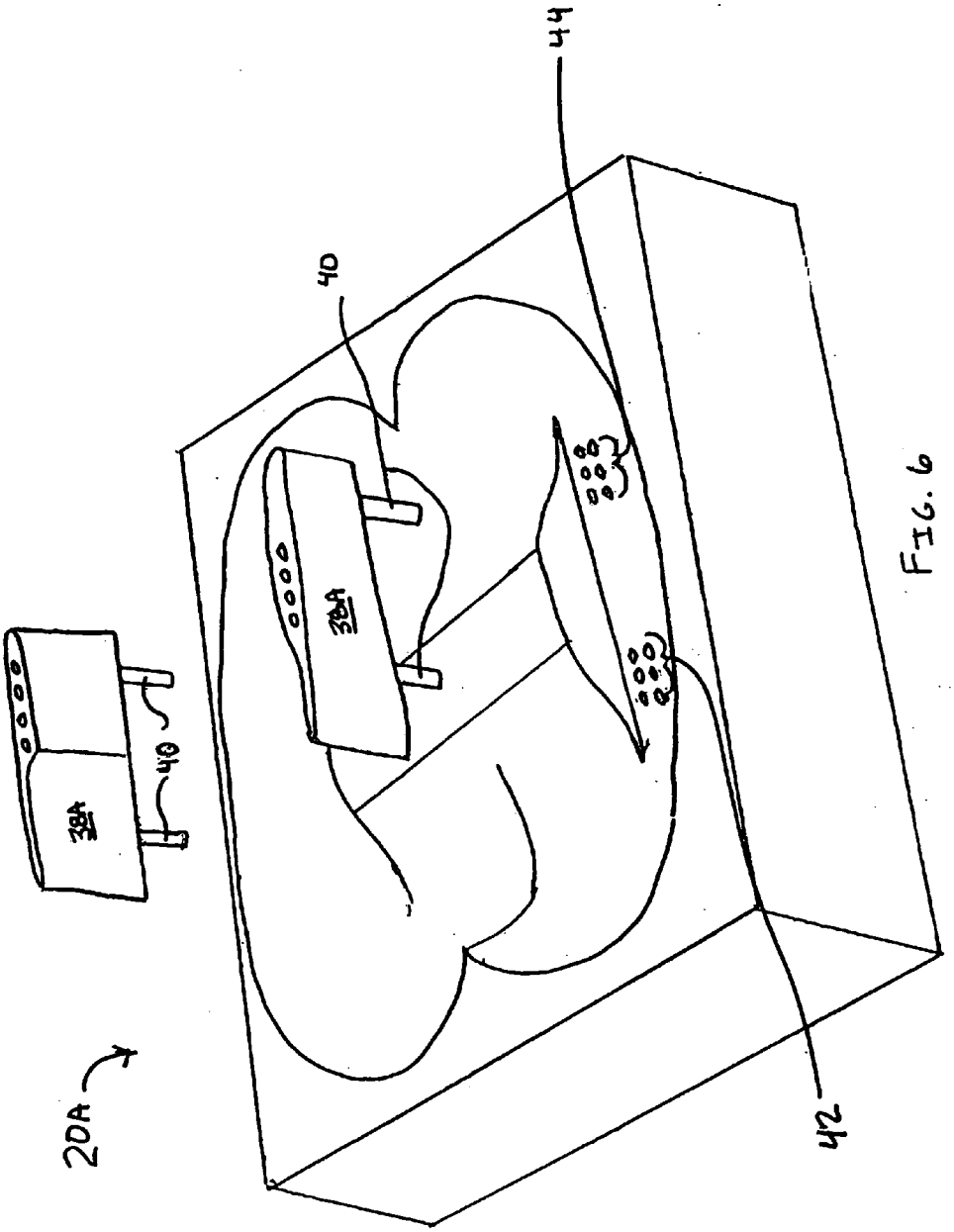

FIG. 6

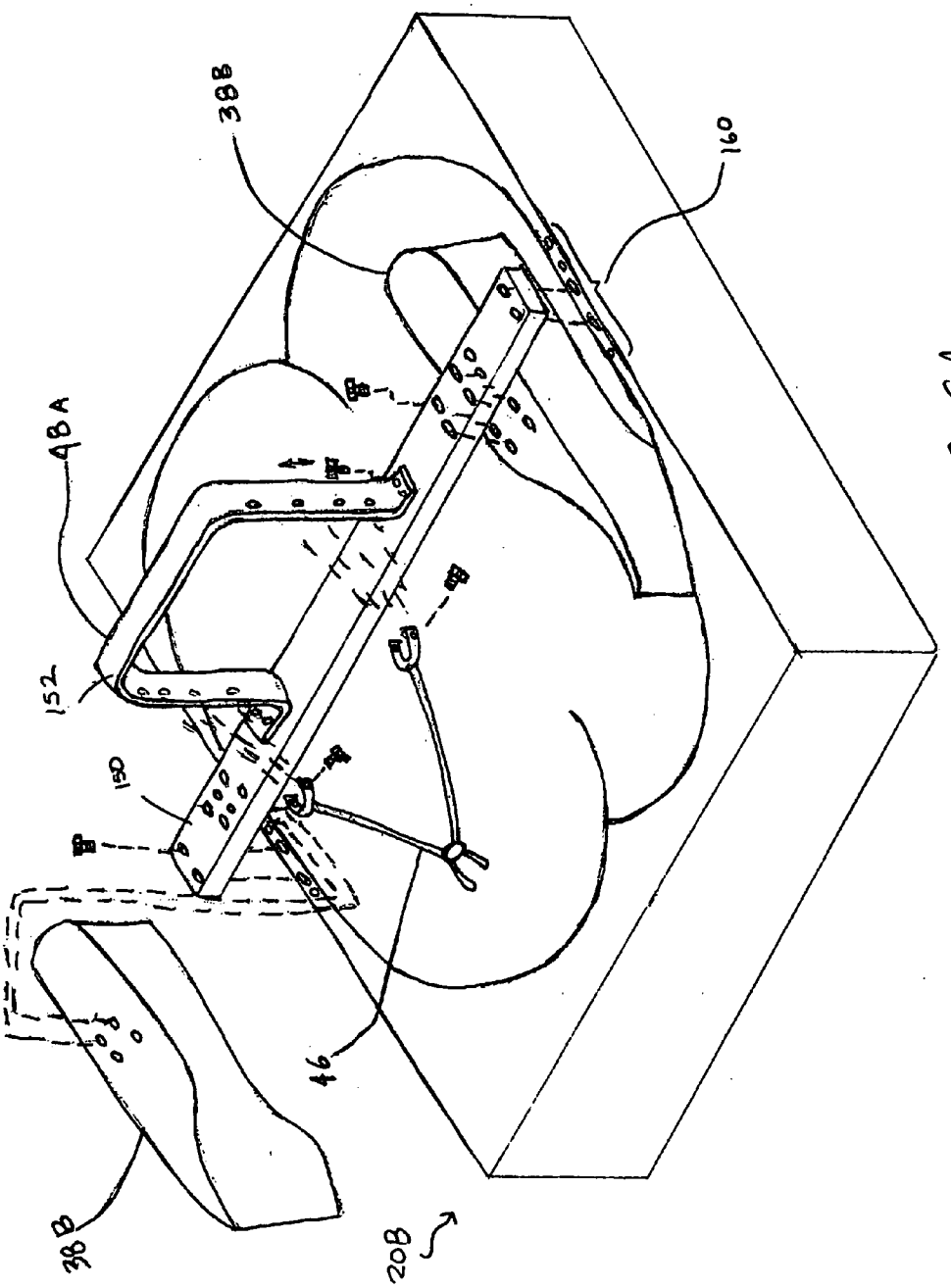

FIG. 6A

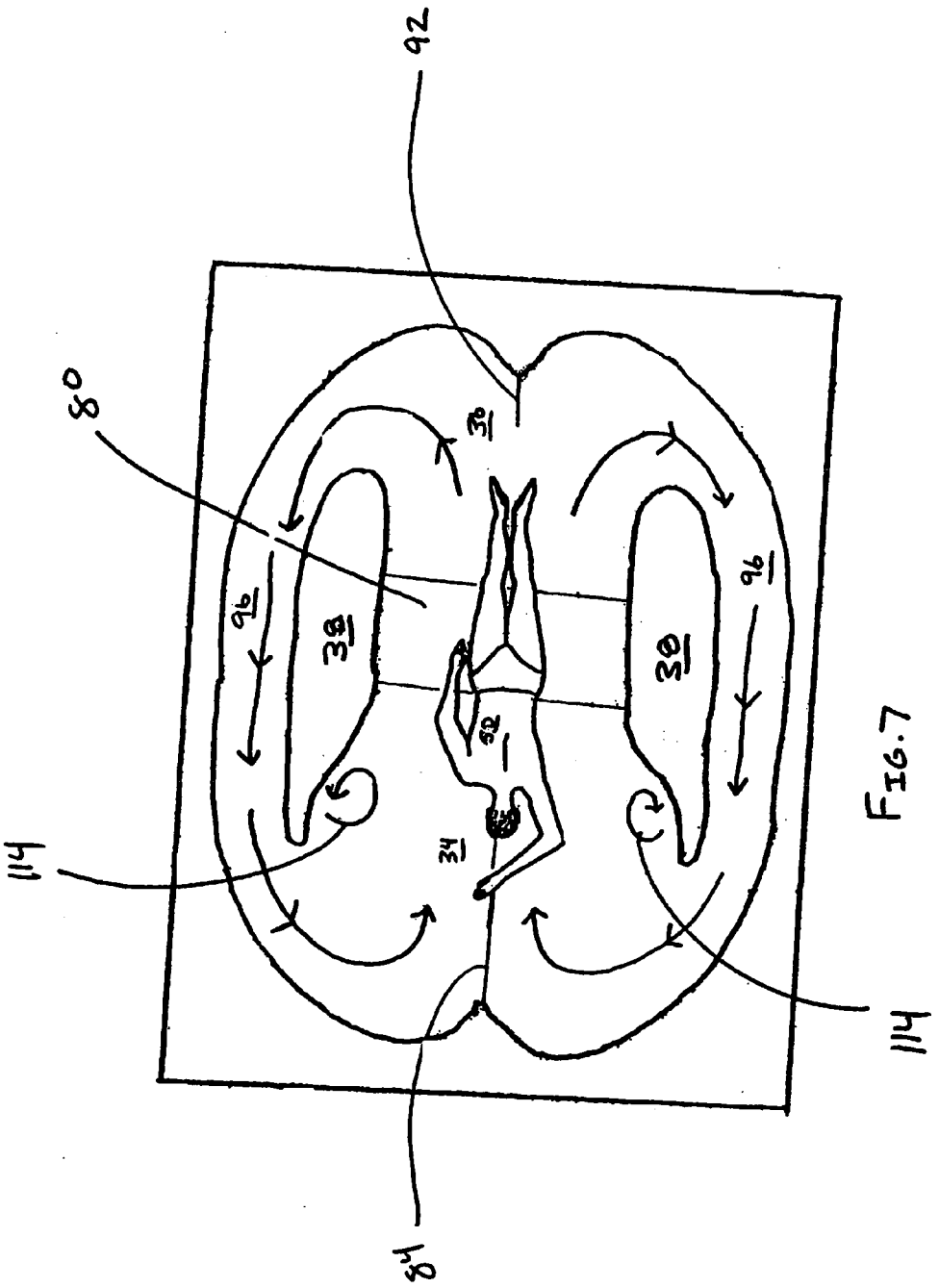

FIG. 7

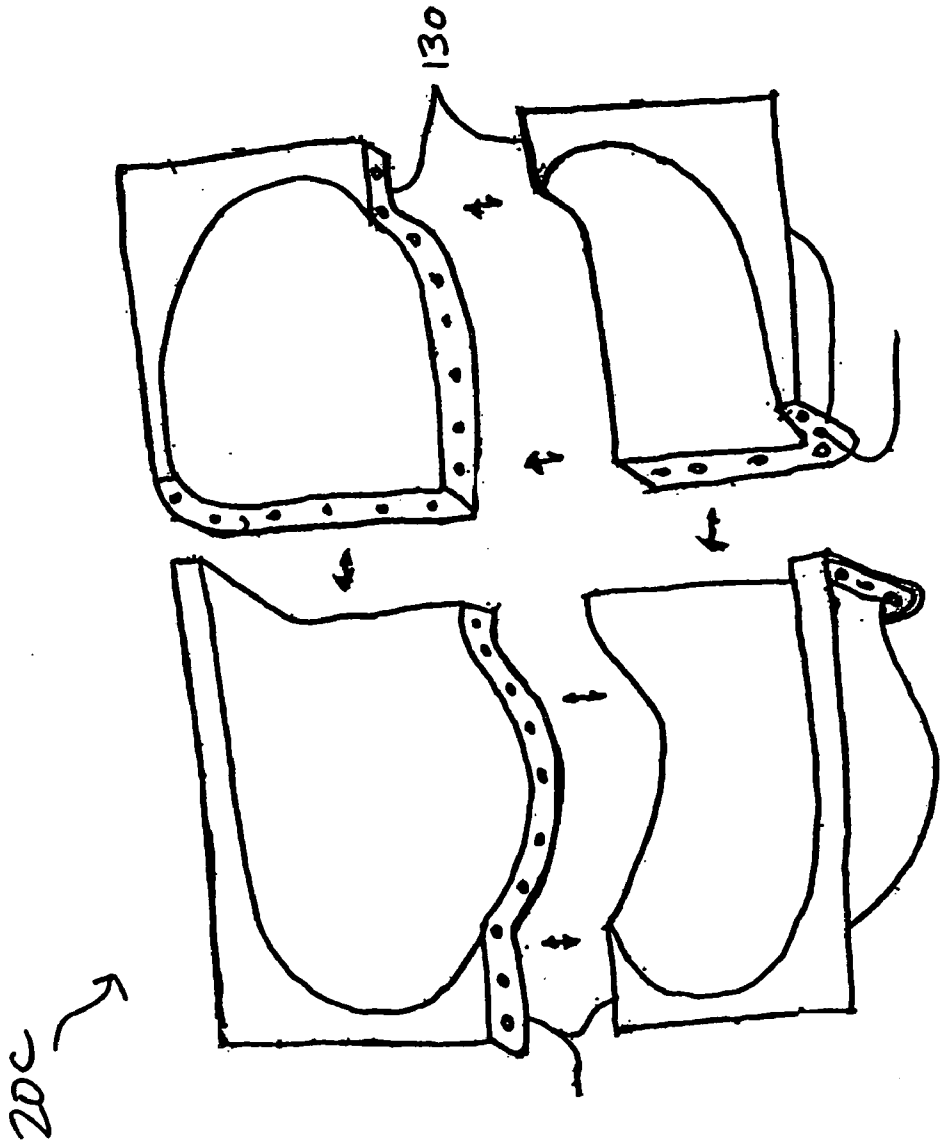

FIG. 8

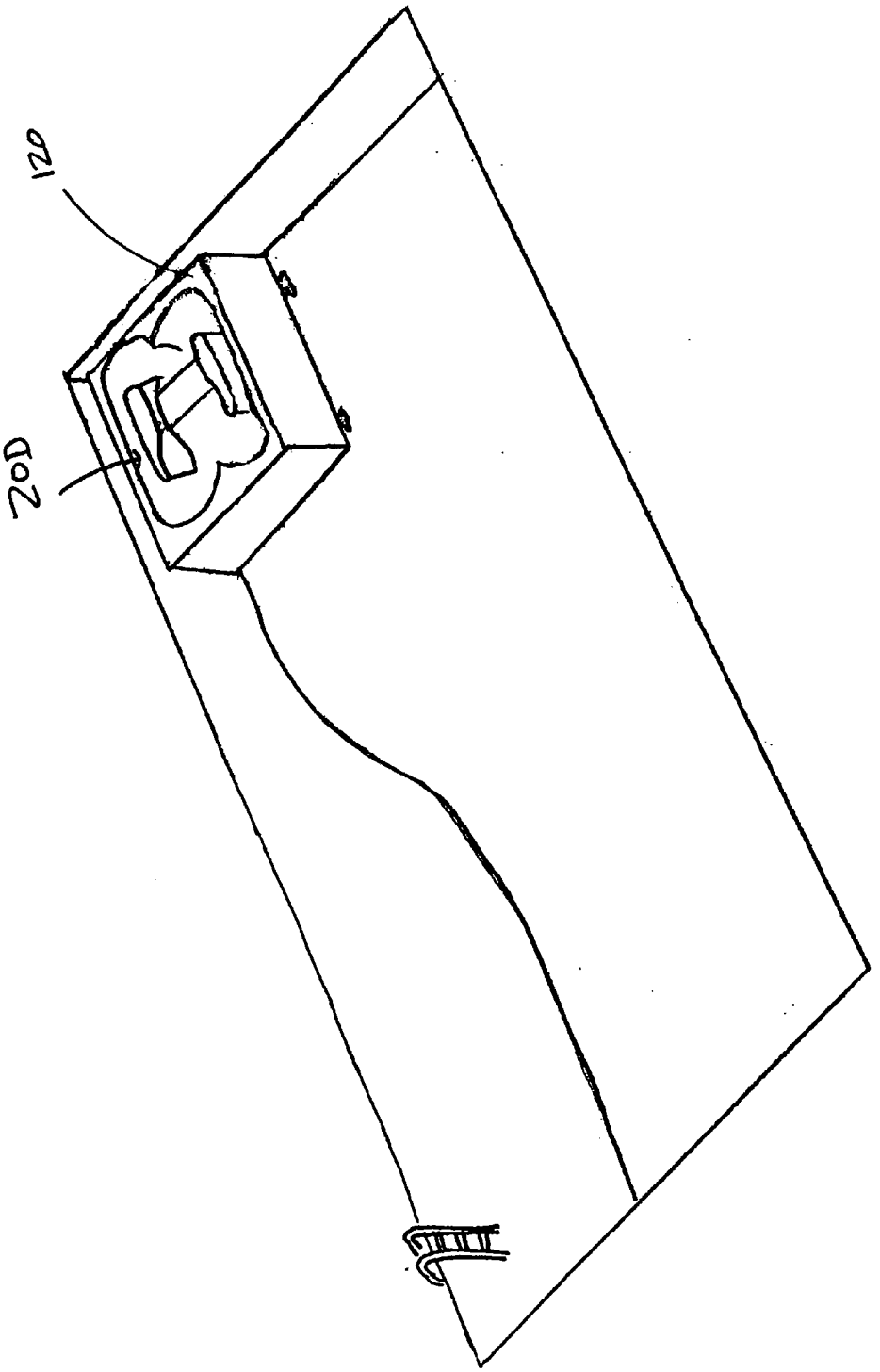

Fig. 9

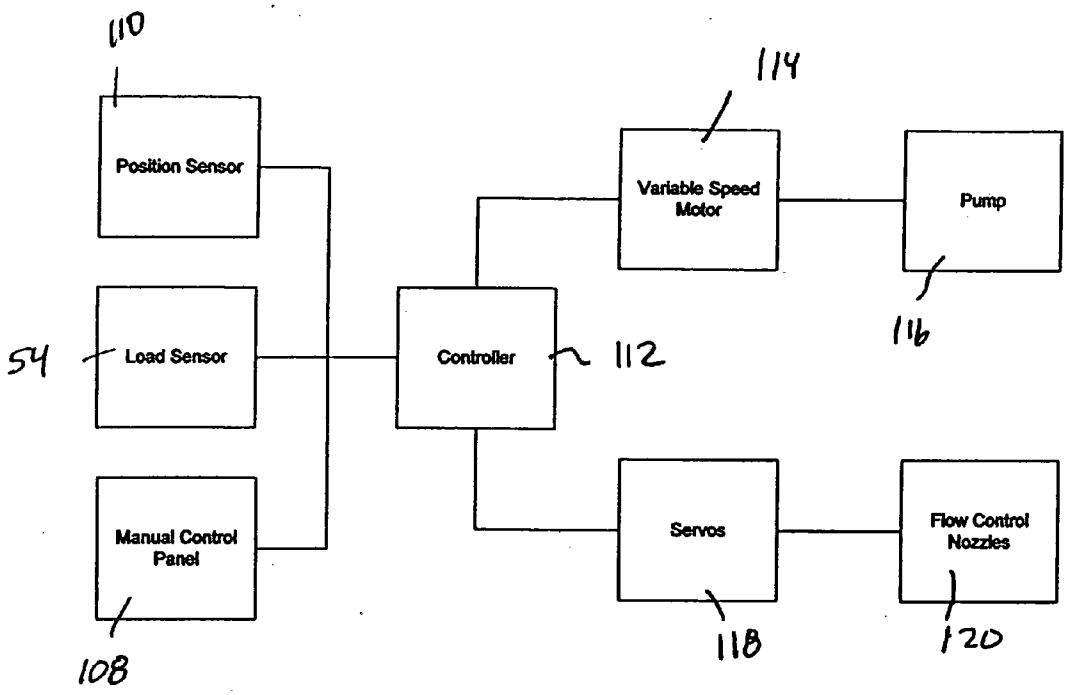
110
Position Sensor
54
Load Sensor
Manual Control Panel
108
Controller
112
114
Variable Speed Motor
Pump
116
Servos
118
Flow Control Nozzles
120

FIG. 10

SWIM TRAINER

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 60/535,417, filed on Jan. 9, 2004, which is hereby incorporated by reference herein in its entirety, including but not limited to those portions that specifically appear hereinafter, the incorporation by reference being made with the following exception: In the event that any portion of the above-referenced provisional application is inconsistent with this application, this application supercedes said above-referenced provisional application.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] NONE.

BACKGROUND

[0003] 1. The Field of the Invention.

[0004] The present disclosure relates generally to swimming pools, and more particularly, but not necessarily entirely, to swim-in-place training pools.

[0005] 2. Description of Related Art

[0006] Swim-in-place pools allow a swimmer to engage in swimming, particularly aerobic swimming, without the need for a full-sized pool. Swim-in-place pools are advantageous over full-sized pools due to their reduced footprint, reduced water requirement, and lower installation and operating costs. Swim-in-place pools can be used for, among other things, exercise, training, and therapy. In the past, a swim-in-place pool typically comprised a small pool where one or more circulating means is used to circulate the water to simulate the swimmer moving forward in the water as the swimmer swims. Using a tether to simply hold a swimmer in place without a means to circulate the water has proven to be inadequately effective.

[0007] U.S. Pat. No. 2,035,835 (granted Mar. 31, 1936 to Raber) discloses a swim-in-place pool comprising a false bottom forming a chamber between a swimming area and the actual bottom of the pool. Housed in the chamber are one or more propellers used to circulate the water around the false bottom. The '835 patent also discloses a pool having a quadrangular shape and rounded corners. Two partition walls running parallel to the sides of the pool define a swim area and two circulating loops. Driving propellers are disposed between the partition walls and the pool sides in order to circulate the water through the swim area.

[0008] U.S. Pat. No. 2,875,528 (granted Mar. 3, 1959 to Garate) discloses a swim-in-place pool comprising a generally rectangular tank having a post with a U-shaped saddle for supporting the swimmer in the proper swimming position. Strategically placed mirrors are also located on the bottom of the tank to thereby allow a swimmer to observe and make corrections to the swimmer's stroke. No water circulation means is provided.

[0009] U.S. Pat. No. 3,534,413 (granted Nov. 6, 1967 to Plasseraud) discloses a swim-in-place pool having one or more water jets to circulate the water. Each of the water jets has an adjustable nozzle whereby the swimmer can move against the repelling action of the jets while performing swimming motions. The water jets are driven by electric pumps.

[0010] U.S. Pat. No. 4,001,899 (granted Jan. 11, 1977 to Mathis) discloses a combined swim-in-place pool and spa. A vertical divider is removably mounted between the spa area and the swim-in-place area to thereby allow separate heating of each area. Water jets are directed such that a user can swim in a substantially stationary position against the force of the water jets.

[0011] U.S. Pat. No. 4,577,859 (granted Mar. 25, 1986 to Gossett) discloses a swim-in-place pool with a restraining assembly to maintain a swimmer in place in the pool while swimming. The restraining assembly is configured to allow the swimmer to roll back and forth relatively freely while swimming.

[0012] U.S. Pat. Nos. 5,027,449 and 5,058,219 (granted Jul. 2, 1991 and Oct. 22, 1991, respectively, to Teratsuji et al.) disclose a swim-in-place pool having a curved front leading to a lower water return passage. The pool includes guide vanes to channel the water into and out of the lower water return passage. An impeller located in the lower passage circulates the water through the swim area.

[0013] U.S. Pat. No. 5,044,021(granted Sep. 3, 1991 to Murdock) discloses a swim-in-place pool that comprises a swim area having two opposing side walls and a plurality of turning vanes in the return water paths. The turning vanes at the rear of the swim area direct the water into the return channels while the turning vanes at the front of the swim area direct the water into the main swim area. Dual impellers, one in each return channel, operate to circulate the water around the pool.

[0014] U.S. Pat. No. 5,315,720 (granted May 31, 1994 to Lior) discloses a swim-in-place pool that comprises an inner horizontal waterway and an outer circulating waterway. A plurality of impeller blades are advanced in unison through the outer waterway to thereby provide a constant flow of water through the swim area.

[0015] U.S. Pat. No. 5,787,519 (granted Aug. 4, 1998 to Smith) discloses a free-standing swim-in-place pool that includes a gutter for catching and retaining water that spills over the lip of the pool. The water from the gutter is emptied into drain pipes leading to a pump which recirculates the water back into the pool. Baffles located deep within the pool absorb waves caused by the swimming motion of a user.

[0016] In the previously available devices, there is also known a device as the Endless Pool®. This device includes a propulsion assembly that propels water against a swimmer. The propulsion assembly may be adjusted as needed to increase or decrease the strength of the flow current. Water return channels are located underneath benches aligned along the sidewalls of the pool. This device may also be used as a trainer and a hot-tub spa.

[0017] Another previously available device is known as the Swim Spa™. This device may also double as both a swim-in-place pool and a spa. This device includes swim jets to provide a water flow against a swimmer.

[0018] Each of the previously available apparatuses disclosed above has a distinct disadvantage due to either a lack

of flow inducing features, or an inefficiency of flow inducing features incorporated into the design of the pools. First, in the above described devices, the circulating water does not correctly simulate real water flow as would be experienced by a swimmer swimming in a large body of water. The water flow is often turbulent or unnatural, which is discomforting to a swimmer. Next, the mechanical devices require a significant amount of energy in order to circulate the water. Finally, if users desire to use the swim-in-place pool as both a trainer and a hot-tub spa, they must repeatedly heat and cool the water to enable the cooler temperature for a workout, and the warmer temperature for hot-tub spa use.

[0019] The prior art is thus characterized by several disadvantages that are addressed by the present disclosure. The present disclosure minimizes, and in some aspects eliminates, the above-mentioned failures, and other problems, by utilizing the methods and structural features described herein.

[0020] The features and advantages of the disclosure will be set forth in the description which follows, and in part will be apparent from the description, or may be learned by the practice of the disclosure without undue experimentation. The features and advantages of the disclosure may be realized and obtained by means of the instruments and combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The features and advantages of the disclosure will become apparent from a consideration of the subsequent detailed description presented in connection with the accompanying drawings in which:

[0022] **FIG. 1** is a schematic view of one exemplary embodiment of the present disclosure;

[0023] **FIG. 2** is a top view of the exemplary embodiment shown in **FIG. 1**;

[0024] **FIG. 3** is a cross-sectional view of the exemplary embodiment shown in **FIG. 2**, taken along section B-B;

[0025] **FIG. 3A** is a cross-sectional view of another exemplary embodiment;

[0026] **FIG. 4** is a cross-sectional view of the exemplary embodiment shown in **FIG. 2**, taken along section A-A;

[0027] **FIG. 5** is a view of an exemplary adjustable tether support;

[0028] **FIG. 5A** is a view of another embodiment of a tether support;

[0029] **FIG. 6** is a view of an exemplary embodiment of a swim-in-place trainer with removable and adjustable flow directing walls;

[0030] **FIG. 6A** is a view of another embodiment of a swim-in-place trainer;

[0031] **FIG. 7** is a top plan view of one exemplary embodiment of the present disclosure;

[0032] **FIG. 8** is a view of one exemplary embodiment of the present disclosure with modular construction;

[0033] **FIG. 9** illustrates an exemplary embodiment of a swim-in-place trainer module placed in a larger pool; and

[0034] **FIG. 10** is a block diagram of a feature of the present invention.

[0035] It is to be understood that any proportions, shapes or dimensions depicted in any of the drawings are options and not requirements.

DETAILED DESCRIPTION

[0036] For the purposes of promoting an understanding of the principles in accordance with the disclosure, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the disclosure is thereby intended. Any alterations and further modifications of the inventive features illustrated herein, and any additional applications of the principles of the disclosure as illustrated herein, which would normally occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the disclosure claimed.

[0037] It must be noted that, as used in this specification and the appended claims, the singular forms "a,""an," and "the" include plural referents unless the context clearly dictates otherwise. In describing and claiming the present disclosure, the following terminology will be used in accordance with the definitions set out below.

[0038] As used herein, the terms "comprising,""including,""containing,""characterized by," and grammatical equivalents thereof are inclusive or open-ended terms that do not exclude additional, unrecited elements or method steps.

[0039] Applicant has discovered, inter alia, a swim-in-place trainer that utilizes a pool having flow directing features incorporated into its design to thereby improve water circulation and reduce water turbulence. The flow directing features reduce and in some cases eliminate the need for mechanical water propulsion devices. The flow directing features channel water displaced by a swimmer to circulate more evenly to create a swimming environment that feels more natural to the swimmer. Another aspect of the present disclosure includes a swim-in-place trainer that incorporates adjustable flow directing features to thereby control the water flow for any particular swimmer or condition. These and other features of the present disclosure will be further addressed below.

[0040] Referring now to **FIG. 1**, there is shown a swim-in-place trainer **20** pursuant to one embodiment of the present disclosure. The swim trainer **20** comprises a pool **22** of sufficient size to accommodate a user **50** to swim-in-place. The pool **22** may be free standing as shown if **FIG. 1** for above ground installation or the pool **22** may also be installed in ground (not shown) as is well known in the art to thereby allow installation in almost any setting. When free standing, the pool **22** may be housed in a support structure **24** such as those structures utilized for free standing hot tubs and spas and the like. The support structure **24** for the pool **22** may comprise an access door **26** to allow access to any internal workings, such as pumps, motors, filters and heating systems.

[0041] The swim trainer **20** may be optionally disposed next to a detachable spa section **28**. It will be appreciated that the separation of the swim trainer **20** from the spa section **28** is advantageous due to the fact that the water in

the spa section **28** and the swim trainer **20** may be maintained at different temperatures.

[**0042**] The pool **22** itself may optionally be constructed in several modular pieces, as shown in **FIG. 8**, or as a single unit as shown in **FIG. 1**. Ideally, the pool **22** is formed using molds for fiberglass or vacuum forming. The pool **22** may also be formed using more traditional pool construction materials, such as cement. The pool **22** may also be formed of metal. Thus, it will be appreciated by those skilled in the art that the pool **22** may be constructed of various materials, and is not limited to any one particular composition.

[**0043**] The pool **22** may have a filtration system (not shown) as is standard in most pools and spas. The filtration system may serve to remove debris from the pool. The pool **22** may also have a heating system (not shown) to heat the water as desired. The heating and filtration systems may be shared in common with the adjacent spa **28**. As mentioned above, it should be noted that it may be preferable to maintain the water temperature in the pool **22** at a temperature lower than that in the spa **28**. This is due to the fact that some people may prefer a cooler water temperature in the pool **22** while exercising as opposed to that in the spa **28**. As will be explained in further detail below, the pool **22** may also include a water circulation system such as an electric motor coupled to a water pump or an impeller (not shown). A control panel **108** may be used to control any attached systems, such as the heating system or the water circulation system, if present.

[**0044**] The pool **22** may comprise a swim area through which water may flow from a front portion **34** of the swim area to a rear portion **36** of the swim area. The swim area may be further defined by a pair of flow directing walls **38** disposed on either side of the swim area. The flow directing walls **38** may extend in an upward direction from the bottom of the pool **22** to a height sufficient to be near to or exceed the expected water level in the pool **22**. The flow directing walls **38** may also extend in a longitudinal direction from about the front portion **34** of the pool **22** to about the rear portion **36** of the pool **22**.

[**0045**] The flow directing walls **38** may be permanently affixed as shown in **FIG. 1** or, as shown in **FIGS. 6 and 6**A, the flow directing walls **38**A may be removably attached to the bottom of a swim-in-place trainer **20**A or to a cross member across the top of the pool. In **FIG. 6**, the flow directing walls **38**A may each comprise a pair of downwardly extending posts **40**. The posts **40** may be received into one of a set of front holes **42** and one of a set of rear holes **44**. The front set of holes **42** and the rear set holes **44** are arranged such that the width between the flow directing walls **38**A may be varied. In addition, the front holes **42** and the rear holes **44** may allow the flow directing walls **38**A to be adjusted forward or rearwards in relation to the swim area.

[**0046**] The front set of holes **42** and the rear set of holes **44** may also allow the flow directing walls **38**A to be positioned in a non-parallel orientation with respect to each other. The flow directing walls **38**A may also be interchangeable with other flow directing walls of different sizes and shapes. The removable flow directing walls **38**A may also allow the swim trainer **20**A to be used as both a swim trainer and a spa. When configured as a swim trainer, the flow directing walls **38**A may be installed, and when in the spa configuration, the walls **38**A may be removed.

[**0047**] Referring now back to **FIG. 1**, a tether **46** and tether support **48** may be used to maintain the user **50** in the swim area while the user **50** is swimming. It will be appreciated that the tether **46** and the tether support **48** constitute one type of restraint device. One end of the tether **46** may be attached to the user **50** or to a harness **52** worn by the user **50**. The other end of the tether **46** may be attached to the tether support **48**. The length of the tether **46** may be adjustable. Also, the tether **46** may optionally comprise a load sensor **54**, the function of which will be described in detail further below.

[**0048**] **FIG. 5** illustrates the tether support **48** in more detail. The tether support **48** includes a pair of vertical members **58** spanned by a cross bar **60**. A lower portion of each of the vertical members **58** may be pivotally mounted on a shaft **66** extending through both a vertical plate **64** and the vertical member **58**. The pivotal mount of each of the vertical members **58** allows the tether support **48** to be angularly adjusted. Pins **68** may be inserted into holes **70** on each of the vertical plates **64** and through a hole **72** in each of the vertical members **58** to thereby lock the tether support **48** at discrete angles. The overall height of the cross bar **60** may also be increased or decreased by adjusting the individual height of each of the vertical members **58**. The width of the cross bar **60** may also be varied. One method of accomplishing the above is to construct the vertical members **58** and the cross bar **60** such that they are telescopically adjustable as is known by those skilled in the art.

[**0049**] The tether support **48** may also be adjusted forward or rearward with respect to the swim area by the use of holes **56** located in the top of each of the flow directing walls **38** (see **FIGS. 1 and 2**). This may be accomplished by installing a post **62** into corresponding holes **56** located in the top of the flow directing walls **38**.

[**0050**] Adjusting the tether **46** and the tether support **48** either individually or in combination may produce advantageous feature over the prior art. In particular, the pivotal attachment of the tether support **48** allows the angle between tether support **48** and the surface of the water in the pool **22** to be varied. A height adjustment of the tether support **48** may accomplish the same result. For beginning swimmers, the angle of the tether support **48** can be adjusted to provide more upward support for the swimmer. For more advanced swimmers, the angle can be adjusted and the tether **46** lengthened to provide less upward support for the swimmer. One embodiment of the present disclosure provides for the use of a flow meter to evaluate and display the estimated distance swam by the user **50**.

[**0051**] Another embodiment of a tether support bar **48**A is shown in **FIGS. 5A and 6A**. The tether support bar **48**A includes a cross member **150** having a top piece **152**. The tether support bar **48**A has two pieces as shown, but could be comprised of a single piece. The cross member **150** further comprises a first set of holes **158** for mounting the cross member **150** to a swim-in-place trainer **20**B using holes **160**. The holes **160** may allow the cross member **150** to be adjustably positioned forward or rearward with respect to the swim area of trainer **20**B. The cross member may comprise a second set of holes **156** for attaching flow directing walls **38**B. The second set of holes **156** may allow the flow directing walls **38**B to be laterally adjustable with respect to the swim area of trainer **20**B. The top piece **152**

may also comprises a third set of holes **154** for providing variable anchor points for a tether **46**. It should also be noted that the tether support bar **48**A may be attached to the swim-in-place trainer **20**B using any suitable means for attaching as is known to one skilled in the art.

[**0052**] One of the primary benefits of the present disclosure includes the flow directional features incorporated into the design of the swim trainer **20**. These flow directional features improve water flow and allow for a more natural feeling to the user **50**. These flow directional features further greatly reduce and in some cases eliminate the need for a mechanical propulsion device, such as a pump or propeller. In the event that a mechanical propulsion device is employed, it will require less power because the flow directional features produce a smoother and less turbulent water flow. The flow directional features described in further detail below may be used separately or in combination with each other.

[**0053**] Referring now to **FIGS. 2, 3** and **4**, a flow directional hump **80** may be disposed in approximately the middle of the swim area. The flow directional hump **80** may extend laterally across the swim area from one of the flow directing walls **38** to the other flow directing walls **38**. The flow directing hump **80** may separate the front portion **34** of the swim area from the rear portion **36** of the swim area as best seen in **FIG. 3**.

[**0054**] An apex **82** of the flow directional hump **80** is shallower than either the front portion **34** or the rear portion **36** of the pool **22**. The hump **80** should not interfere with the swimming motions of the user **50** due to the fact that it should be located at about the waist of the user **50**. It will also be appreciated that the front portion **34** of the pool **22** is deeper that the rear portion **36** of the pool **22**. The deeper front portion **34** allows the user **50** to utilize the full range of motion of his or her arms while swimming, even when utilizing what is commonly referred to as a "front crawl" stroke and also the "butterfly" stroke. The rear portion **36**, while shallower that the front portion **34**, may be of sufficient depth to allow the user **50** the full range of movement of his or her legs while kicking. The motion of the user's **50** arms and legs is typically sufficient to create a current through which the user **50** may swim without the use of a mechanical propulsion device.

[**0055**] A front ridge **84** may bisect the front portion **34** of the pool **22** as seen in **FIGS. 2, 3** and **4**. The front ridge **84** may separate the front portion **34** into a left side and a right side. The depth of the front ridge **84** may be shallower than the depth of the left and right sides of the front portion **34**, but deeper than the depth of the apex **82** of the hump **80**. The front ridge **84** may extend from a front merge point **90** to about the rising slope of the hump **80**. A rear ridge **92** may extend from a rear merge point **94** towards the hump **80**.

[**0056**] **FIG. 3A** illustrates another embodiment of the present disclosure. In **FIG. 3A**, there is no flow directional hump separating the front and rear portions. Instead, there is a smooth transition between the front and rear portions. It should also be noted that any size or shape of a flow directional hump may be used with the present disclosure, including humps having any radius or vertical rise.

[**0057**] A pair of water return channels **96** are each formed between an outer pool sidewall **98** and one of the flow directing walls **38**. Each of the water return channels **96** forms a path to allow water to be returned from the rear portion **36** to the front portion **34** of the pool to thereby create a circulating current through which a user **50** may swim.

[**0058**] It should be noted that the outer pool sidewall **98** is also smoothly contoured to optimize the circulation of water. In particular, the outer pool wall **98** is rounded at the ends to direct the water appropriately into or out of one of the water return channels **96**. The front ridge **84** and the rear ridge **92** may facilitate the merging or separation of the water flow, respectively.

[**0059**] The flow directing walls **38** may each comprises an inner front portion **104** and an inner rear portion **106**. Referring now more particularly to **FIG. 2**, each inner front portion **104** may comprise an arcuate surface and taper inward to thereby narrow a water entrance **73**. The inner rear portions **106** of the flow directing walls **38** extend relatively parallel to the swim area to a water exit **74**.

[**0060**] Disposed within each of the water return channels may be jets **100** and inlets **101**. The inlets **101** may supply a pump or impeller driven by a motor, neither explicitly shown, to create a water stream exiting through jets **100**. The positioning of the inlets **101** and the jets **100** may be such to aid water circulation in the pool **22**.

[**0061**] Jets **100** may comprise variable nozzles **102** and the output of the pump and motor may also be variable as will now be explained. The output of the jets **100** may be controlled by varying the nozzles **102** or the output from the motor running the pump or impeller (not shown). The swim trainer may comprise a control panel **108** and position sensors **110** as shown in **FIG. 1**. The position sensors **110** may include infrared, optical, laser or any other device known to those skilled in the art capable of determining the position of the user **50** in the pool **22**.

[**0062**] The block diagram in **FIG. 10** illustrates how the control panel **108**, load sensor **54**, and position sensor **110** may each control the water flow in the trainer **20**. The control panel **108**, load sensor **54** and position sensor **110** are all in communication with controller **112** which may control a variable speed motor **114** driving a pump or impeller **116**. The controller may also control servos **118** which vary the output of nozzles **120**.

[**0063**] In the case of the manual control panel **108**, the user may select a flow rate or a preprogrammed routine. In the case of the load sensor **54**, the water flow is determined by the load on the sensor **54**. In the case of the position sensor **110**, the position of the user **50** in the pool **22** determines the water flow generated by the pump **116** and/or nozzles **120**. For example, in the event that the user **50** is moving rearwards in the swim area, the water flow may decrease in order to allow the user to return to an optimum position. In the event that the user **50** is moving forward in the swim area, the water flow may increase. In addition, information from the load sensor **54** may be fed to an electrical device such as a computer to record the workout. The load sensor **54**, may for example, be able to measure and determine the swimmer's power.

[**0064**] As may be seen in **FIG. 7**, the flow lines show the flow of the water in the pool **22**. As the user **50** begins swimming, the water is moved over the hump **80** and into the

rear portion **36** of the pool **22**. The rear ridge **92** directs the water into one of the water return channels **96**. If present, the inlets **101** and jets **100** assist the flow of water through the water return channels **96** and into the front portion **34** of the pool.

[**0065**] The water enters the front portion **34** of the swim area from the water return channels **96**. Some of the water from each of the water return channels **96** converges at the front merge point **90** and at the front ridge **84**. These features direct the flow of water towards the swim area.

[**0066**] Small vortexes represented by the flow lines marked with the reference numeral **114** may form next to each of the inner front portions of the flow directing walls **38**. These vortexes create an additional current to overcome friction losses and thereby contribute to the overall water flow. Once past the vortexes, the water then flows through the swim area and is recirculated. As best seen in **FIG. 2**, a rear portion **38**A of each of the flow directing walls **38** may be wider than a front portion **38**B of the flow directing walls **38**. In one embodiment, the rear portion **38**A is 50% wider than the front portion **38**B.

[**0067**] The flow of the water through the swim area and around the water return channels **96** is further facilitated by a contoured bottom of the pool **22**. Each water return channel **96** may be less than or equal to 50% of the width of the swim area. As shown in **FIGS. 1-4**, the front portion **34** of the swim area is deeper than the rear portion **36** of the swim area. The contoured bottom in the front portion **34** is further divided into two sides by the ridge **84** protruding from the bottom. These features, in conjunction with the flow directing hump **80**, improve the natural flow of water in the pool **22**. It will be appreciated that the contoured bottom pursuant to the present disclosure may be of any shape that improves the flow of water through the swim area.

[**0068**] In one exemplary embodiment, the pool **20** may have dimensions of 13'×10'×3'6" (3.96 meters by 3.05 meters by 1.07 meters). The depth of the apex of the flow directional hump **80** may be about 2' (0.60 meters) while the maximum depth of the front portion **34** and the rear portion **36** may be about 3'6" (1.07 meters) and 2'6" (0.76 meters), respectfully.

[**0069**] As previously mentioned, a swim trainer **20**C pursuant to the present disclosure may be of modular design as shown in **FIG. 8**. Each of the modular pieces may include a flanged portion **130**. When assembled, each of the flanged portions **130** be held together with a bolt and nut assembly. A gasket material (not shown) may be interposed between each of the flanged portions **130** to create a water tight seal.

[**0070**] In a separate embodiment shown in **FIG. 9**, a swim trainer **20**D may comprise a removable insert module **120** that can be placed in a larger swimming pool as shown in **FIG. 9**. The removable insert module **120** may include weights or underwater tubes for holding the swim trainer **20**D in place. Ports may allow water from the pool to enter the swim trainer **20**D. The insert module **120** may also include leveling pads to level the swim trainer **20**D in the pool.

[**0071**] It should also be noted that a swim-in-place trainer pursuant to the present disclosure may also comprise a flow meter for determining a distance swam by a swimmer. The flow meter may be disposed in the swim area or optionally in the water return channels. The present disclosure may also comprise a method to a method for exercising, comprising the steps of (a) determining a number of average strokes required by a particular swimmer to swim a given distance; (b) counting the strokes made by the swimmer while said swimmer is swimming in place; and (c) determining an equivalent workout, defined by a swim distance, simulated by the work performed by the swimmer while swimming in place, based on the number of strokes made by the swimmer while swimming in place.

[**0072**] It is to be understood that the above-described arrangements are only illustrative of the application of the principles of the present disclosure. Numerous modifications and alternative arrangements may be devised by those skilled in the art without departing from the spirit and scope of the present disclosure and the appended claims are intended to cover such modifications and arrangements. Thus, while the present disclosure has been shown in the drawings and described above with particularity and detail, it will be apparent to those of ordinary skill in the art that numerous modifications, including, but not limited to, variations in size, materials, shape, form, function and manner of operation, assembly and use may be made without departing from the principles and concepts set forth herein.

1. A pool for allowing a user to swim-in-place, said pool comprising:

a swim area having a front portion and a rear portion; and

a bottom extending from the front portion of the swim area to the rear portion of the swim area, the bottom comprising a contoured portion;

wherein the contoured portion is configured and dimensioned to improve water flow from the front portion of the swim area to the rear portion of the swim area while the user is swimming.

2. The pool of claim 1 further comprising at least one water return path to allow water to flow from the rear portion of the swim area to the front portion of the swim area.

3. The pool of claim 1 further comprising a restraint device to maintain the user in the swim area while the user is swimming.

4. The pool of claim 3 wherein the restraint device comprises a tether attached to a support.

5. The pool of claim 4 wherein the support is adjustable in a vertical direction with respect to the swim area.

6. The pool of claim 4 wherein the support is adjustable in a longitudinal direction with respect to the swim area.

7. The pool of claim 4 wherein the support is disposed in a pivotable orientation with respect to the swim area.

8. The pool of claim 3 wherein the restraint device comprises a sensor to measure a first parameter of the user's swimming ability, the sensor outputting a signal having information regarding the first parameter to an electrical device.

9. The pool of claim 1 further comprising a left interior wall and a right interior wall.

10. The pool of claim 9 further comprising an outer sidewall and wherein the left interior wall and the outer sidewall delimit a first water return path and the right interior wall and the outer sidewall delimit a second water return path.

11. The pool of claim 9 wherein the left interior wall and the right interior wall are removably attached to the bottom.

12. The pool of claim 1 further comprising a water propulsion device for circulating water from the rear portion of the swim area to the front portion of the swim area.

13. The pool of claim 12 wherein the water propulsion device has a variable output.

14. The pool of claim 13 wherein the variable output of the water propulsion device is determined by the user's location in the swim area.

15. The pool of claim 1 wherein the pool is comprised of at least two modular sections.

16. A pool for allowing a user to swim-in-place, said pool comprising:

a swim area having a front portion and a rear portion;

a bottom extending from the front portion of the swim area to the rear portion of the swim area, the bottom comprising a flow directing hump separating the front portion and the rear portion of the swim area; and

wherein the flow directing hump is configured and dimensioned for improving water flow from the front portion of the swim area to the rear portion of the swim area while the user is swimming.

17. The pool of claim 16 wherein the flow directing hump extends laterally across the swim area.

18. The pool of claim 16 wherein the flow directing hump is shallower than both the front portion and the rear portion of the swim area.

19-30. (canceled)

31. A pool for allowing a user to swim-in-place, said pool comprising:

a swim area having a front portion and a rear portion;

a bottom extending from the front portion of the swim area to the rear portion of the swim area, the bottom comprising a flow directing ridge extending upwardly from the bottom and running longitudinally through at least a portion of the swim area; and

wherein the flow directing ridge is dimensioned and configured to improve water flow from the front portion of the swim area to the rear portion of the swim area while the user is swimming.

32-102. (canceled)

103. A swim-in-place trainer for allowing a user to exercise, said swim-in-place trainer comprising:

a pool having a swim area, said swim area having a front portion and a rear portion, the front portion having a depth greater than that of the rear portion;

a bottom extending from the front portion of the swim area to the rear portion of the swim area;

a pair of flow directing walls disposed on opposing sides of the swim area and removably attached in a fixed orientation with respect to the pool;

a pair of water return paths, each of the water return paths in communication with the front portion of the swim area and the rear portion of the swim area and passing between one of the flow directing walls and a sidewall of the pool;

a flow directing hump extending laterally on the bottom across the swim area, the flow directing hump separating the front portion and the rear portion of the pool;

a flow directing ridge extending longitudinally on the bottom in the front portion of the swim area; and

a restraint device for holding the user in place while the user is swimming, the restraint device comprising a support and a tether, a first end of the support being attached to one of the flow directing walls and a second end of the support being attached to the other flow directing wall,

wherein the flow directing walls, the flow directing hump and the flow directing ridge are each configured and dimensioned for improving water circulation inside the pool.

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