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**(54) Vorrichtung zur Substitution von Gegenschwimmanlagen, insbesondere als Trainingsgerät für den Sportschwimmbetrieb**

(57) Die vorliegende Erfindung betrifft das technische Gebiet der Trainingsgeräte und Apparaturen zur Stärkung der Muskeln durch Überwindung einer Gegenkraft, insbesondere eine solche Vorrichtung für das Schwimmen, die eine Gegenschwimmanlage entbehrlich macht.

Der Erfindung liegt die Aufgabe zu Grunde, eine Vorrichtung zu schaffen, die es in erster Linie ermöglicht, mit geringen Aufwendungen die Wirkung des Gegenstromschwimmens mittels Gegenschwimmanlagen in kleinen Wasserbecken für sehr starke Schwimmer, Sportschwimmer und Schwimmer, die auf den Trainingseffekt von Schwimmpads nicht verzichten möchten, zu imitieren.

ren. Weiterhin ist es Aufgabe der Erfindung, eine solche Vorrichtung auch zur Rehabilitation von Querschnittsgelähmten in physiotherapeutische Schwimmbecken und für weitere physiotherapeutische Zwecke einsetzen zu können.

Erfindungsgemäß wird diese Aufgabenstellung dadurch erreicht, dass diese Vorrichtung unter anderem aus einem Seilrückhaltesystem besteht, wobei beim fortcierten Schwimmen mit kontinuierlichem Vortrieb durch die Schwimmbewegung (Freistil, Rückenschwimmen) ein Gleichgewicht zwischen Zug und Gegenzug an elastischen und nicht elastischen Elementen sowie dem Schwimmer bewirkt wird.

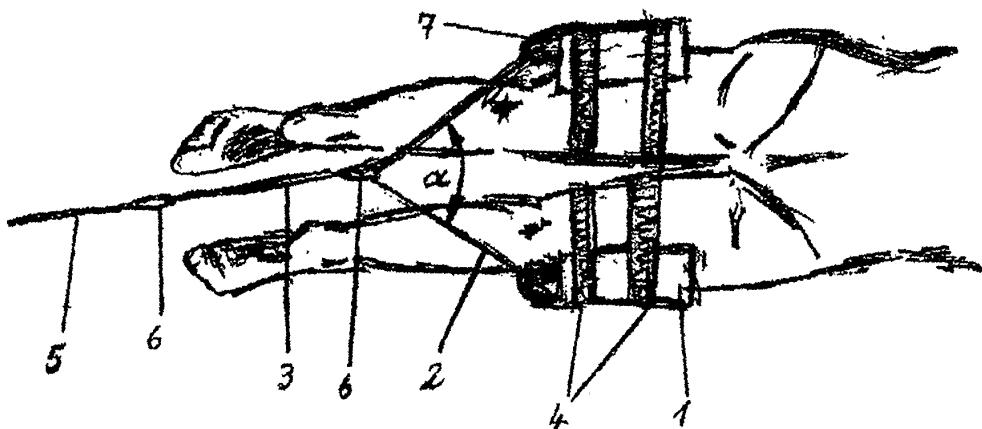


Fig. 3

## Beschreibung

**[0001]** Die vorliegende Erfindung betrifft das technische Gebiet der Trainingsgeräte und Apparaturen zur Stärkung der Muskeln durch Überwindung einer Gegenkraft, insbesondere eine solche Vorrichtung für das Schwimmen, die eine Gegenschwimmanlage entbehrlich macht.

**[0002]** Im Zuge von Muskeltrainingsmaßnahmen event. auch physiotherapeutischer Krankenbe- und/oder -nachbehandlungsmaßnahmen oder beim Behinderten-sporttraining kann es notwendig sein, Schwimmbe-wegungen in Gegenstromanlagen/-becken, Swimming-pools oder physiotherapeutischen Wasserbecken, sämt-lich räumlich begrenzte Schwimmanlagen, durchzufüh-ren, bei denen es darauf ankommt gegen fließendes oder stehendes Wasser anzuschwimmen ohne insbesondere den vorausliegenden Beckenrand, ggf. auch die anderen Beckenränder, zu erreichen bzw. zu berühren. Medizini-sche, sportmedizinische oder physiotherapeutische Hintergründe beschreiben zahlreiche Dokumente des Stan-des der Technik/Medizin in ausreichendem Maße, so dass es entbehrlich ist, an dieser Stelle, zumal dies nicht Schwerpunkt dieser Erfindung ist, im Weiteren darauf einzugehen. Um diese eingangs genannte Zweckbe-stimmung zu erreichen, ist es notwendig, entweder den Schwimmvorgang in technisch und insbesondere ener-getisch aufwendigen Gegenschwimmanlagen mit ho-hem Wartungsaufwand oder eben an und in Einrichtun-gen, die diese in ihrer Wirkungsweise ersetzen, durch-zuführen.

**[0003]** Die Kritik zum Stande der Technik soll nicht die v.g. Gegenschwimmanlagen erfassen, sondern vorbe-kannte Einrichtungen, die diese ja ersetzen sollen. Diese Mittel des Standes der Technik sind z.B. Seilanlagen mit bestimmten Anordnungen in ihrer Raumform und mit ih-rem Anordnungselementen.

**[0004]** Die DE 20 2006 011 958 U1 beschreibt ein Rückhaltesystem und dabei im Hauptmerkmal lediglich einen speziellen Haltepunkt am Beckenrand und in der weiteren Ausgestaltung eine Gummileine, die vermittels eines Hüftgurts, befestigt an der Hüfte des Schwimmers, dort angebracht ist. Die DE 20 2006 013 802 U1 be-schreibt in Weiterentwicklung der technischen Lösung nach DE 20 2006 011 958 U1 einen extrem kleinen Swim-mingpool als Becken mit Halterungen für die technische Lösung nach DE 20 2006 011 958 U1. In DE 203 19 932 U1 wird gleiche Vorrichtung, ein Haltepunkt am Rand des Wasserbeckens, ein Gummiseil (zwischen Hal-tepunkt und Hüftgurt am Schwimmer) und ein Hüftgurt, angebracht am Schwimmer, die alle miteinander verbun-den sind, beschrieben. DE 100 52 618 A1 beschreibt eine Vorrichtung zur Bestimmung des passiven Schlepp-widerstands bei einem durch das Wasser gezogenen Schwimmer. Diese Quelle zum Stand der Technik ist als nicht naheliegend zum nachfolgenden Erfindungsge-genstand zu bewerten. Der Gebrauchsmuster-Patentan-melde-Komplex DE 20 2004 000 811 U1, DE 20 2004

010 434 U1, DE 10 2004 032 354 A1 mit Prioritätsbe-zugnahmen beschreibt eine technische Lösungen, die einerseits zur Schwimmunterstützung von Personen dienen und andererseits das Wegtreiben von Schwimmern verhindern sollen und aus Standmast mit Fundamentie- rung und Bodensockel, Seilen, diversen Verbindungs-elementen und einem Gürtel, der an Hüfte oder Brustkorb des Schwimmers anzulegen ist, besteht.

**[0005]** Alle vorgenannten technischen Lösungen sind nicht geeignet, die Wirkungsweise einer Gegenstroman-lage zu ersetzen, wobei ein starker Schwimmer bzw. Sportschwimmer unter sehr starkem Kraft- und Ge-schwindigkeitseintrag in das umgebende Wasser einen Schwimmvorgang ortsunveränderlich bzw. auf der Stelle schwimmend, d.h. ohne Relativbewegung zum vorderen Beckenrand durchführt. Insbesondere sind die eingangs beschriebenen technischen Lösungen nicht in der Lage einen erhöhten Kraft- und Geschwindigkeitseintrag in das umgebende Wasser, insbesondere unter Verwen-dung von Schwimmpads auszugleichen und dabei die Stabilität des Gesamtsystems zu erhalten. Ohne auf die jeweils einzelnen Details eingehen zu müssen, liegt dies insbesondere an der jeweiligen Geometrie und Raum-ordnung sowie den Anlenkpunkten der einzelnen Vor-richtungselemente v. g. technischer Lösungen, so z. B. auch am Ort der Vorrichtungsbefestigung am Körper des Schwimmers.

**[0006]** Von diesem Stand der Technik und seinen Mängeln ausgehend, liegt der Erfindung die Aufgaben- und Zielstellung zu Grunde, eine Vorrichtung zu schaf-fen, die es in erster Linie ermöglicht, mit geringen Auf-wendungen die Wirkung des Gegenstromschwimmens mittels Gegenschwimmanlagen in kleinen Wasserbek-ken, so auch häuslichen Pools, für sehr starke Schwim-mer, Sportschwimmer und Schwimmer, die auf den Trai-nungseffekt von Schwimmpads nicht verzichten möchten, zu imitieren. Weiterhin ist es Aufgabe der Erfindung, eine solche Vorrichtung auch zur Rehabilitation von Quer-schnittsgelähmten In physiotherapeutische Schwimm-becken und für weitere physiotherapeutische Zwecke einsetzen zu können. Diese Vorrichtung soll im übrigen einen geringen Investitionsaufwand und nahezu frei von Wartungsaufwand und völlig frei von Energieaufwand sein.

**[0007]** Erfindungsgemäß wird diese Aufgaben- und Zielstellung durch die im Schutzzanspruch dargestellte Merkmale zur Gestaltung der Anordnungselemente und der Raumform der erfindungsgemäßigen Vorrichtung ge-löst.

**[0008]** Die erfindungsgemäße Vorrichtung zur Substi-tution von Gegenschwimmanlagen, insbesondere als Trainingsgerät für den Schwimmbetrieb bei Sport-schwimmern aber auch für den Home-Betrieb in kleinen Pools und die vorteilhaften Wirkungen dieser techni-schen Lösung ergeben sich aus u.a. folgendem.

**[0009]** Diese Vorrichtung besteht unter anderem aus einem Seilrückhaltesystem. Beim forcierten Schwimmen mit kontinuierlichem Vortrieb durch die Schwimmbewe-

gung (Freistil, Rückenschwimmen) entsteht ein Gleichgewicht zwischen Zug und Gegenzug an elastischen und nicht elastischen Elementen sowie dem Schwimmer, das aufgrund des wesentlich stärkeren Vortriebs und Auftriebs im Oberkörper dazu führt, dass sich der Schwimmer von der horizontalen in eine entsprechend seines ausgeübten Vortriebs nach oben geneigte bis fast vertikale Position aufrichtet, da der Auftrieb der Beine selbst unter Benutzung von Flossen nicht ausreicht. Unter anderem führt auch dieser Umstand zu gravierenden Mängeln des eingangs beschriebenen Standes der Technik, die teilweise zur Funktionslosigkeit vorbeschriebener technischer Lösungen führen. Dies wird durch die nachfolgend noch zu benennenden Auftriebskörper an den Beinen, angeordnet in der Befestigungseinrichtung, verhindert. Wie andere derartige Vorrichtungen besteht diese erfindungsgemäße Vorrichtung zunächst auch aus einem Seil, welches am Becken zu befestigen ist. Im Unterschied zur herkömmlichen Technik wird aber kein Gummiseil, sondern aus Gleichgewichts- und Lagesabilitätsgründen ein nichtelastisches/nichtdehnbares Seil variabler Länge eingesetzt und somit werden unbeabsichtigte Ortsveränderungen (Erreichen des Vorderrandes des Beckens durch Überdehnungen des Gummiseils bei zu starkem Krafteinsetz) des Schwimmers im eng begrenzten Becken verhindert. Dieses Seil soll eine solche Länge aufweisen, die derart an die Länge des Wasserbeckens und des Schwimmers angepasst ist, dass der Schwimmer bei angelegter Vorrichtung noch genügend Freiraum zwischen den Fußsohlen, gegebenenfalls den Zehenspitzen, und dem hinteren Beckenrand einerseits und genügend Freiraum zwischen den Fingerspitzen und dem vorderen Beckenrand andererseits besitzt. Dieses nichtelastische Seil variabler Länge ist im rückwärtigen Beckenbereich je nach Erfordernis über oder unter dem Schwimmerniveau angebracht, wobei auch die Schwimmart, Freistil oder Brustschwimmen, eine Rolle spielen kann. In der weiteren Fortfolge ist ein Verbindungsglied, ein weiteres kurz gehaltenes elastisches/dehnbares Seil, vorzugsweise als Gummiseil und in einer Länge, die etwa der Oberschenkellänge des Schwimmers entspricht, ausgebildet, welches lediglich zum Ausgleich von Diskontinuitäten (Ruckelbewegungen), vorgesehen, und ein weiteres Verbindungsglied angeordnet. An diesem Verbindungsglied sind in einer ersten Variante der Gesamtvorrichtung zwei bei der Anbringung der Vorrichtung am Körper des Schwimmers sich in einem Winkel  $\alpha$  auseinander spreizende elastische/dehbare Seile angebracht, die zum Verbindungs-element an der jeweiligen Befestigungseinrichtung führen. Alternativ kann an dieser Stelle auch ein doppelt so langes Seil als einziges Seil in eine Öse dieses Verbindungsglieds eingehangen sein, welches sich dann auch entsprechend der zwei Seile im Winkel  $\alpha$  aufspreizt, wenn die Anbringung am v. g. Verbindungselement der jeweiligen Befestigungseinrichtung erfolgt. Diese sich auseinander spreizenden elastischen Seile sollen eine Länge aufweisen, die zwischen etwa einer Oberschen-

kellänge bis etwa einer Beinlänge des Schwimmers be-messen ist, wobei diese Seile vorzugsweise als Gummiseile ausgebildet sein sollen. Zur Anbringung der erfin-dungsgemäßen Vorrichtung ist eine Befestigungsvor-richtung vorgesehen. Sie besteht aus einem aus nach-giebigen, formbaren Material bestehenden Auftriebskörper und flexiblen Befestigungsbändern, vorzugsweise zwei Bänder mit Klettverschluss, wobei beides vermittels von Kunststoffschauben oder Schrauben aus anderem 5 nicht korrodierenden Material miteinander verbunden ist und diese des weiteren v.g. Verbindungselement, vor-zugsweise als Gummischlaufe am Auftriebskörper befe-stigt, trägt, in welches die elastischen Seilen eingehan-gen sind. Die Auftriebskörper sind vorzugsweise als fle-xibler PE-Schaumstoffkörper mit gummiert und aufge-rauter Innenseite ausgebildet. Die Befestigungseinrich-tung ist je nach Erfordernis mit oder ohne Auftriebsan-körperteil an den Oberschenkeln oder an den Unter-schenkeln des Schwimmers angebracht ist. Der o.g. 10 Mangel des Aufrichtens des Körpers des Schwimmers in eine nach oben geneigte oder fast vertikale Position wird durch die Anordnung der Auftriebskörper an den Beinen des Schwimmers verhindert, insbesondere durch eine relativ tiefe Befestigung der Auftriebskörper am un-teren Oberschenkel und die gespreizte Anordnung der 15 zur Befestigungseinrichtung führenden Seile. Zweckmäßigerweise sind die Auftriebskörper seitlich am Ober-schenkel zu befestigen. Durch die Verwendung und An-ordnung der Gummiseile ist eine Kräfteteilung und damit 20 eine weit fußwärts liegende Aufhängung in Schwimm-richtung gewährleistet" die umso größer wird, je kräftiger der Vortrieb des Schwimmers ist. Somit wird der Negati-veffekt des Aufrichtens im Becken beim forcierten kon-tinuierlichen Schwimmen kompensiert. Gleichzeitig ent-25 steht beim Freistil- oder Rückenschwimmen durch das unter Zug stehende Gummiseil mit der Überwindung des elastischen Widerstandes ein erwünschter Trainingseffekt für die Oberschenkel und Beckenmuskulatur. Bei diskontinuierlichen Schwimmbewegungen, speziell 30 beim Brustschwimmen, ist der Auftriebskörper auch bei sehr forcierten Schwimmbewegungen nicht zwingend er-forderlich. Allerdings führt der elastische Widerstand durch die sich im Winkel  $\alpha$  aufspreizenden Gummiseile zu einem deutlichen Trainingseffekt im Bereich der Bein-35 abspreizmuskulatur und durch die Vergrößerung der Flä-chen am Oberschenkel mittels Auftriebskörper zu einem geringen Trainingseffekt der Beinschließmuskulatur, der allerdings durch eine zusätzliche Vergrößerung der Flä-chen noch deutlich gesteigert werden kann. Für das Brust-40 schwimmen ist eine Alternative der erfindungsgemäßen Vorrichtung vorgesehen, die darin besteht, dass nach dem nichtelastischen/nichtdehnbaren Seil variabler Län-ge, dem Verbindungsglied dem weiteren kurz gehal-te-nen elastischen/dehnbaren Seil und dem weiteren Ver-45 bindungsglied eine Befestigungseinrichtung, bestehend aus je zwei Gurten mit Polsterung folgt, die am Schwim-mer über die Schultern eingehangen ist und deren Pol-50 sterung flexibel aber nicht gummidehnbar ausgebildet 55

ist. Die Gurte ermöglichen so eine dem sportlichen Brustschwimmen annähernd adäquate Bewegung, d. h. eine zwischen einer leicht aufgerichteten und einer zur Wasseroberfläche flachen Haltung des Schwimmerkörpers. Durch den elastischen Widerstand des kurz gehaltenem elastischen/dehnbaren Seil zwischen den beiden Verbindungsgliedern erfolgte außerdem mit jedem Schwimmzug eine zusätzliche Konditionierung der Bauchmuskulatur. Wird die erfundungsgemäße Vorrichtung mittels eines Saugnapfes am Boden des Wasserbeckens befestigt, wird mit jedem Aufrichten des Körpers des Schwimmers eine Stärkung der Rückenmuskulatur erreicht.

**[0010]** Nachfolgendes Ausführungsbeispiel zeigt, jedoch nicht abschließend, einen Weg zum Ausführen der beanspruchten Erfindung im einzelnen.

**[0011]** Anhand des in den Zeichnungen, hierzu Fig. 1 bis 10, jedoch nicht abschließend dargestellten Ausführungsbeispiels ist eine Vorrichtung zur Substitution von Gegenschwimmanlagen, insbesondere als Trainingsgerät für den Sportschwimmbetrieb mit seinen erfundungswesentlichen Merkmalen dargestellt.

- |               |  |
|---------------|--|
| Fig. 1        | zeigt die Befestigungseinrichtung  |
| Fig. 2 und 3  | zeigt die Raumform der erfundungsgemäßen Vorrichtung, angebracht an den Oberschenkeln  |
| Fig. 4 und 5  | zeigt die Raumform der erfundungsgemäßen Vorrichtung, angebracht an den Unterschenkeln querschnittsgelähmter Patienten   |
| Fig. 6 und 7  | zeigt die Raumform der erfundungsgemäßen Vorrichtung, angebracht an den Oberschenkeln, mit der schwimmenden Person   |
| Fig. 8 bis 10 | zeigt die Raumform der erfundungsgemäßen Vorrichtung, mit zweiter Alternative der Befestigungseinrichtung für das Brustschwimmen, nichtelastisches/nichtdehnbares Seil variabler Länge über und unter der Beckenoberkante angebracht |

**[0012]** Die Vorrichtung besteht aus einem nichtelastischen/nichtdehbaren Seil 5 variabler Länge und einem Durchmesser von 5 mm, welches am Wasserbecken befestigt ist und auf der Seite des Schwimmers ein Verbindungsglied 6 in Form eines Karabinerhakens trägt. Daran angeschlossen ist ein weiteres kurzes gebündeltes Gummiseil 3, bestehend aus 4 Parallelseilen mit den Durchmessern von 4 mm und der Länge von 750 mm. Daran schließt sich ein weiterer Karabinerhaken 6 an. In diesen Karabinerhaken 6 sind zwei gleichfalls gebündelte Gummiseile 2 einer Länge von 750 mm (alternativ dazu 1 Seil doppelter Länge) mit den Durchmessern der Einzelseile von 4 mm eingehangen, die ihrerseits in die Gummischlaufen 7 aus 50 x 120 mm - Gummiband am Auftriebskörper 1 der Befestigungseinrichtung 10 einge-

hangen sind. Die Befestigungseinrichtung 10 besteht aus dem v. g. Auftriebskörpern 1 aus PE Schaumstoff, Innenseite gummiert und aufgerauht, mit den Abmessungen 210 mm x 260 mm x 25 mm, an die mittels Kunststoffschrauben 9 zwei flexible Bänder 4 mit Klettverschluss befestigt sind. Diese Befestigungseinrichtung 10 wird um Ober- oder Unterschenkel gebogen und anliegend verschlossen. Alternativ für Brustschwimmer ist in den schwimmerseitigen Karabinerhaken 6 eine Befestigungseinrichtung 10 eingehangen, die aus zwei Gurten 8 mit Polsterung, flexibel aber nicht gummidehnbar, ausgebildet sind, eine Länge von 750 mm aufweisen und beim Schwimmer über die Schultern eingehangen sind.

**[0013]** Mit dieser Vorrichtung können Schwimmer zeitlich und räumlich uneingeschränkt auf der Stelle schwimmen und vorteilhaft ihre Muskulatur trainieren.

**[0014]** Diese Anordnung eignet sich auch dafür, unter Aufsicht eines Physiotherapeuten ebenfalls zur Rehabilitation von querschnittsgelähmten Patienten, deren Lähmung unterhalb der thorakalen Segmente liegt. Allerdings sollten in diesem Fall die Auftriebskörper am Unterschenkel platziert werden.

**[0015]** Vorrichtung zur Substitution von Gegenschwimmanlagen, insbesondere als Trainingsgerät für den Sportschwimmbetrieb mit folgenden Merkmalen:

#### Patentansprüche

1. sie besteht unter anderem aus einem Seilrückhaltesystem

2. sie besteht aus einem nichtelastischen/nichtdehbaren Seil (5) variabler Länge, in der weiteren Fortfolge aus einem Verbindungs glied (6), einem weiteren kurz gehaltenem elastischen/dehbaren Seil (3), einem weiteren Verbindungs glied (6), aus einer elastischen/dehbaren Seilverbindung (2), die sich bei der Anbringung der Vorrichtung am Körper des Schwimmers in einem Winkel  $\alpha$  auseinander spreizt

und aus jeweils einer an jedem dieser beiden Seile (2) über ein Verbindungselement (7) angeordneten Befestigungseinrichtung (10), bestehend aus je zwei Bändern und einem Auftriebskörper (1), wobei

2.1 das nichtelastische Seil (5) variabler Länge eine solche aufweist, die derart an die Länge des Wasserbeckens und des Schwimmers angepasst ist, dass der Schwimmer bei angelegter Vorrichtung noch genügend Freiraum zwischen den Fußsohlen, gegebenenfalls den Zehenspitzen, und dem hinteren Beckenrand einerseits und genügend Freiraum zwischen den Fingerspitzen und dem vorderen Beckenrand andererseits besitzt und das nichtelastische Seil (5) variabler Länge im rückwärtigen Beckenbereich

|  |    |   |
|--|----|---|
| je nach Erfordernis über oder unter dem Schwimmerniveau angebracht ist,  |    | zen, und dem hinteren Beckenrand einerseits und genügend Freiraum zwischen den Fingerspitzen und dem vorderen Beckenrand andererseits besitzt,  |
| 2.2 das Verbindungsglied (6) vorzugsweise als Karabinerhaken ausgebildet ist,  | 5  | 3.2 das Verbindungsglied (6) vorzugsweise als Karabinerhaken ausgebildet ist,   |
| 2.3 das kurz gehaltene elastischen Seil (3) eine Länge aufweist, die etwa der einer Oberschenkellänge des Schwimmers entspricht und dieses Seil (3) vorzugsweise als Gummiseil ausgebildet sein soll,  | 10 | 3.3 das kurz gehaltene elastischen Seil (3) eine Länge aufweist, die etwa der einer Oberschenkellänge des Schwimmers entspricht und dieses Seil (3) vorzugsweise als Gummiseil ausgebildet sein soll,         |
| 2.4 die sich auseinander spreizende elastische Seilverbindung (2) eine Länge aufweist, die zwischen etwa einer Oberschenkellänge bis etwa einer Beinlänge des Schwimmers bemessen ist und aus zwei in das Verbindungsglied (6) eingehangenen Seilen oder aus einem durch eine Öse des Verbindungsglieds (6) hindurchgeföhrten dann doppelt so langem Seil besteht und diese/dleses Seile/Seil (2) vorzugsweise als Gummiseile ausgebildet sein sollen/soll,  | 15 | 3.4 die Befestigungseinrichtung (10) am Schwimmer über die Schultern eingehangen ist,   |
| 2.5 die Befestigungseinrichtung (10) aus einem aus nachgiebigen, formbaren Material bestehenden Auftriebskörper (1) mit flexiblen Befestigungsbändern (4), vorzugsweise Bänder mit Klettverschluss, besteht und beides vermittels Kunststoffschauben oder Schrauben aus anderem nicht korrodierenden Material miteinander verbunden ist und die Befestigungseinrichtung (10) ein Verbindungselement (7), vorzugsweise als Gummischlaufe am Auftriebskörper (1) befestigt, trägt, in welches die elastischen Seilen (2) eingehangen sind, | 20 | 3.5 die zwei Gurte (8) mit Polsterung flexibel aber nicht gummidehnbar ausgebildet sind,  |
| 2.5.2 wobei der Auftriebskörper (1) vorzugsweise als flexibler PE-Schaumstoffkörper mit gummierter und aufgerauter Innenseite ausgebildet ist,   | 25 | wobei der Oberbegriff durch das Merkmal 1 gebildet ist und die Merkmale 2 und 3 die kennzeichnenden Hauptmerkmale und die übrigen untergliederten Merkmale die vorteilhaften ausgestaltenden Merkmale bilden. |
| 2.5.3 wobei die Befestigungseinrichtung (10) je nach Erfordernis mit oder ohne Auftriebsankörperteil (1) an den Oberschenkeln oder an den Unterschenkeln des Schwimmers angebracht ist   | 30 |   |
| 3. sie besteht aus einem nichtelastischen/nichtdehbaren Seil (5) variabler Länge, in der weiteren Fortfolge aus einem Verbindungsglied (6), einem weiteren kurz gehaltenem elastischen/dehbaren Seil (3), einem weiteren Verbindungsglied (6) und aus einer an diesem Verbindungsglied (6) angeordneten Befestigungseinrichtung (10), bestehend aus je zwei Gurten (8) mit Polsterung, wobei   | 35 |   |
| 3.1 das nichtelastischen Seil (5) variabler Länge eine solche aufweist, die derart an die Länge des Wasserbeckens und des Schwimmers angepasst ist, dass der Schwimmer bei angelegter Vorrichtung noch genügend Freiraum zwischen den Fußsohlen, gegebenenfalls den Zehenspit-   | 40 |   |
|  | 45 |   |
|  | 50 |   |
|  | 55 |   |

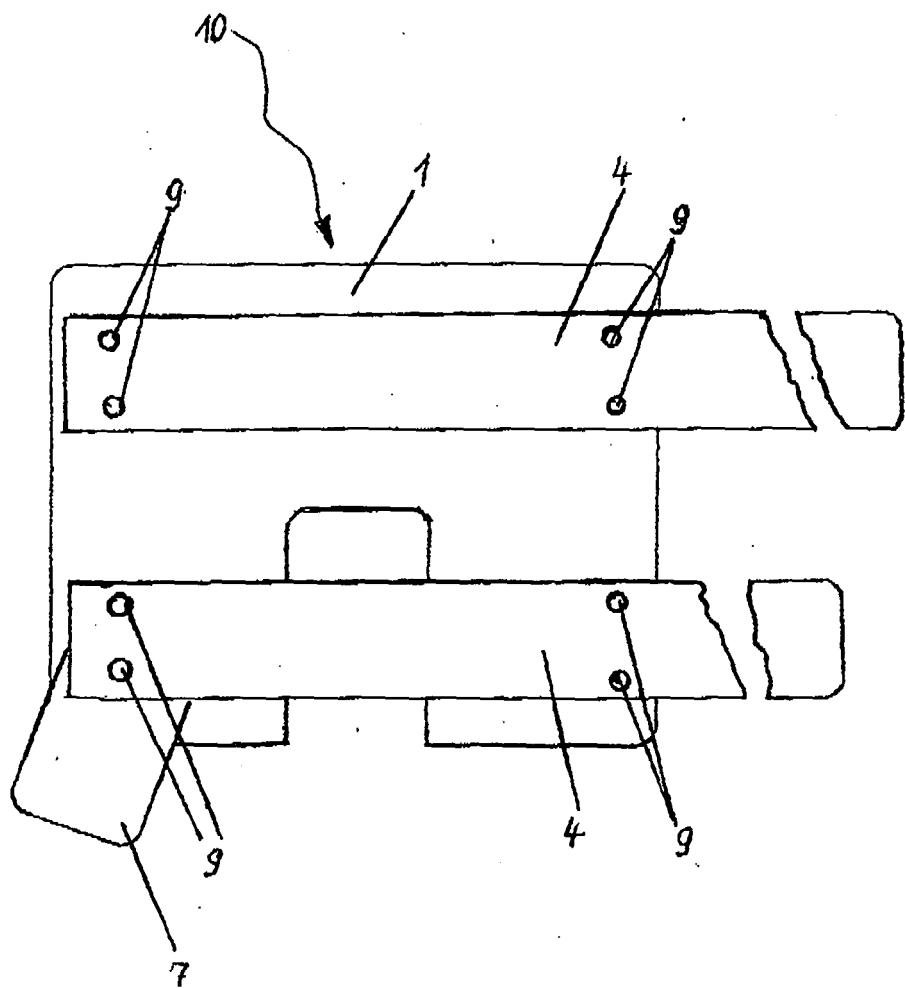


Fig. 1

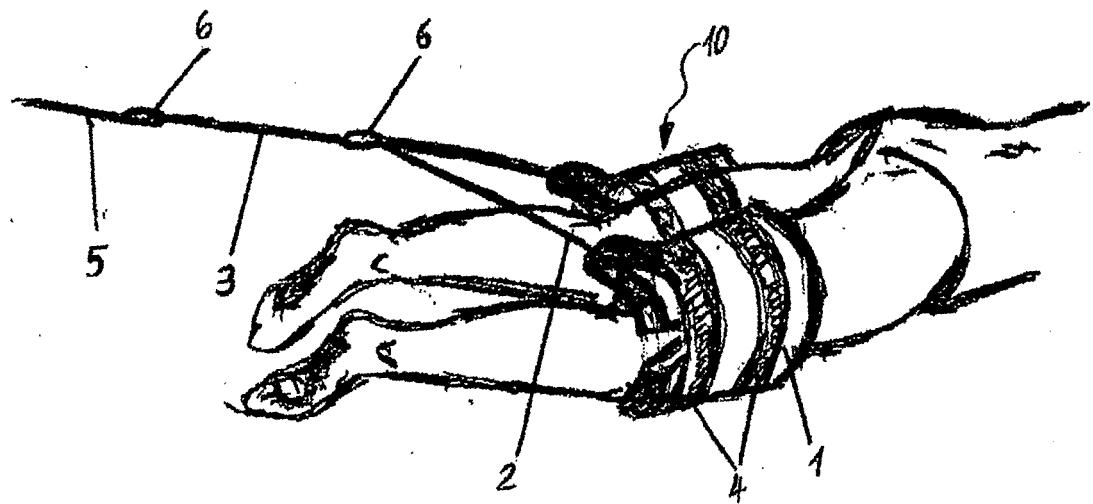


Fig. 2

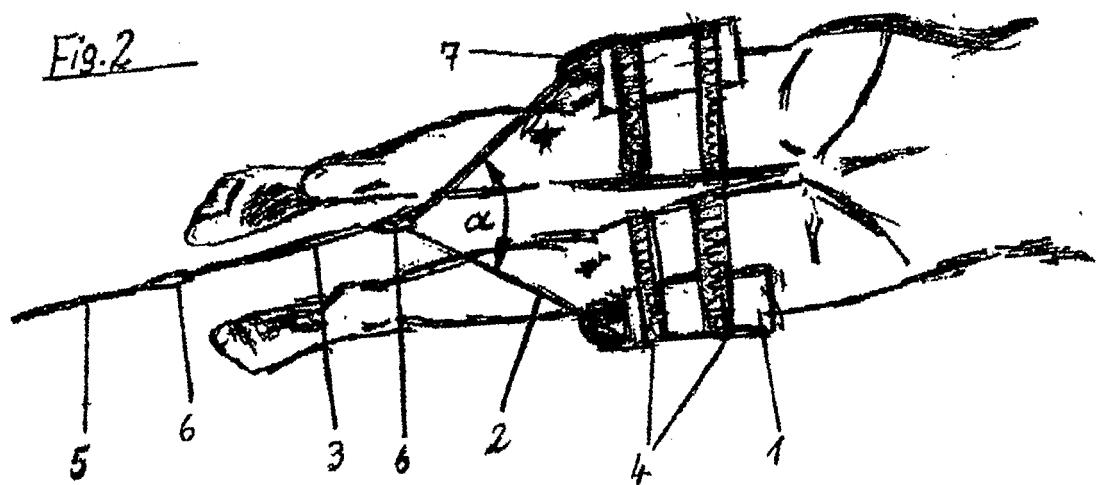


Fig. 3

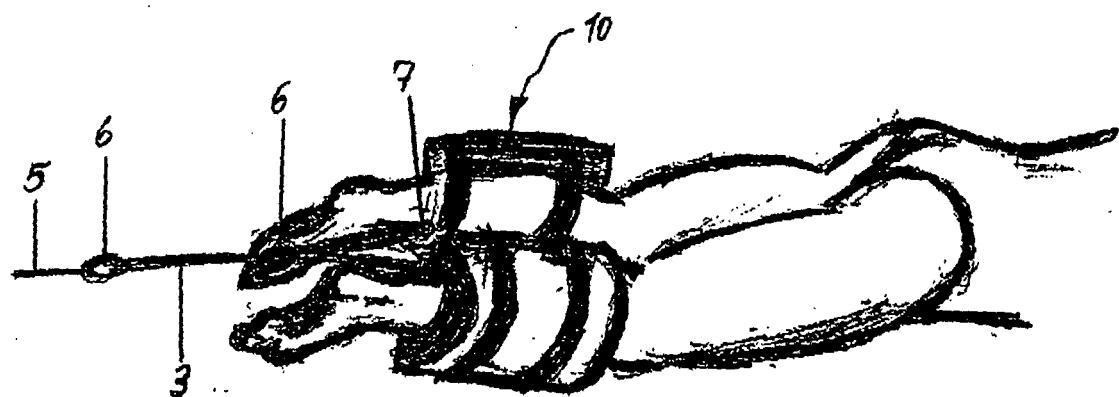


Fig. 4

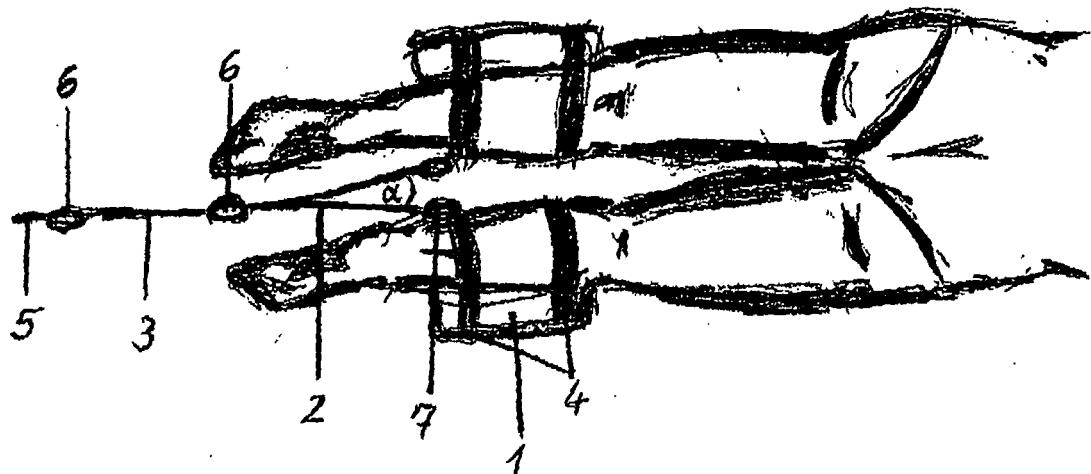
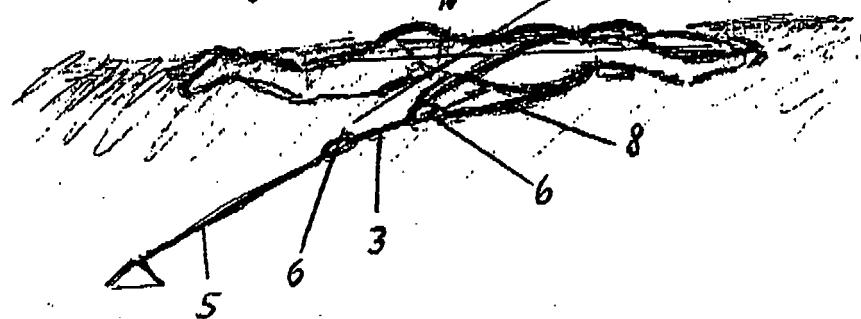
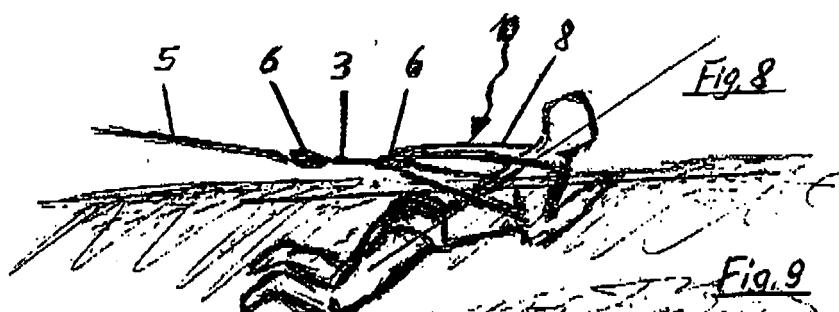
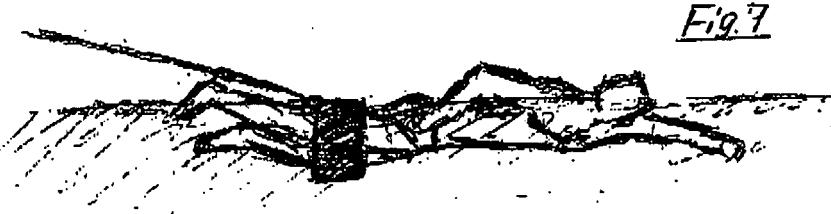
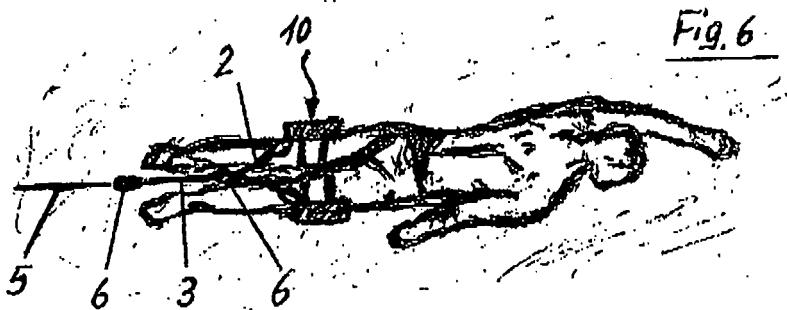


Fig. 5





## EUROPÄISCHER RECHERCHENBERICHT

Nummer der Anmeldung  
EP 08 01 9175

| EINSCHLÄGIGE DOKUMENTE   |  |  |   |
|--|--|--|---|
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| X : von besonderer Bedeutung allein betrachtet<br>Y : von besonderer Bedeutung in Verbindung mit einer anderen Veröffentlichung derselben Kategorie<br>A : technologischer Hintergrund<br>O : nichtschriftliche Offenbarung<br>P : Zwischenliteratur   |  |  |   |
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**ANHANG ZUM EUROPÄISCHEN RECHERCHENBERICHT  
ÜBER DIE EUROPÄISCHE PATENTANMELDUNG NR.**

EP 08 01 9175

In diesem Anhang sind die Mitglieder der Patentfamilien der im obengenannten europäischen Recherchenbericht angeführten Patendifikumente angegeben.

Die Angaben über die Familienmitglieder entsprechen dem Stand der Datei des Europäischen Patentamts am  
Diese Angaben dienen nur zur Unterrichtung und erfolgen ohne Gewähr.

26-03-2009

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EPO FORM P0461

Für nähere Einzelheiten zu diesem Anhang : siehe Amtsblatt des Europäischen Patentamts, Nr.12/82

**IN DER BESCHREIBUNG AUFGEFÜHRTE DOKUMENTE**

*Diese Liste der vom Anmelder aufgeführten Dokumente wurde ausschließlich zur Information des Lesers aufgenommen und ist nicht Bestandteil des europäischen Patentdokumentes. Sie wurde mit größter Sorgfalt zusammengestellt; das EPA übernimmt jedoch keinerlei Haftung für etwaige Fehler oder Auslassungen.*

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⑯ BUNDESREPUBLIK  
DEUTSCHLAND



DEUTSCHES  
PATENT- UND  
MARKENAMT

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⑯ DE 197 41 309 A 1

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A 63 B 31/00

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⑯ Offenlegungstag: 25. 3. 99

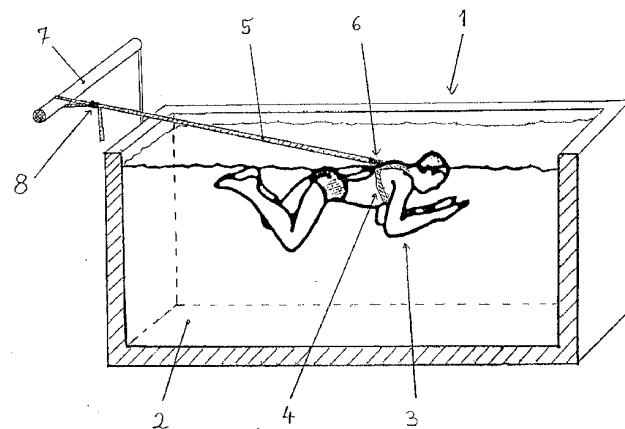
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- ⑯ Erfinder:  
gleich Anmelder
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**Die folgenden Angaben sind den vom Anmelder eingereichten Unterlagen entnommen**

⑯ Schwimmhilfe

⑯ Die Erfindung betrifft eine Schwimmhilfe zur Benutzung in einem Schwimmbecken (1), wodurch die Schwimmhilfe aus einem Gurt (5) besteht, der mit einem Ende am Rand oder außerhalb des Schwimmbeckens (1) festlegbar ist, mit dem anderen Ende am Benutzer (3) des Schwimmbeckens (1) vermöge eines an Brust und Schultern angreifenden Befestigungsmittels (4) lösbar ist und die Länge des Gurtes (5) oder sein Festlegungspunkt so gewählt ist, daß der Gurt (5) dann straff gespannt ist, wenn der Benutzer (3) sich schwimmend vom Festlegungspunkt des Gurt (5) entfernt und sich im Abstand zu allen Schwimmbeckenrändern befindet.



DE 197 41 309 A 1

## Beschreibung

Die Erfindung betrifft eine Schwimmhilfe zur Benutzung in einem Schwimmbecken.

An heißen Sommertagen ist es sehr beliebt sich im kühlen Wasser eines Schwimmbeckens Bewegung und gleichzeitig Abkühlung zu verschaffen. Daher finden sich Schwimmbecken zunehmend auch in Gärten von Privathäusern wo sie es ihren Besitzern gestatten, in der Abgeschiedenheit des eigenen Gartens, in Reichweite der Annehmlichkeiten der eigenen Wohnung nicht nur die Sonne zu genießen, sondern auch auf Wunsch jederzeit Abkühlung im eigenen Schwimmbecken zu finden.

Aufgrund der Beschränktheit des in Privatgärten für den Bau eines Schwimmbeckens zur Verfügung stehenden Platzes, sowie den nicht unerheblichen Kosten, die mit Bau und Betrieb einer solchen Anlage verbunden sind, sind private Schwimmbecken im allgemeinen wesentlich kleiner als die Schwimmbecken in öffentlichen Schwimmbädern. Zum ausdauernden Schwimmen ist aber zumindest eine Bahnlänge erforderlich, die ein mehrfaches der Länge eines Menschen, in der beim Schwimmen üblichen horizontalen Körperhaltung von etwa zwei Metern, beträgt. Daher sind die meisten privaten Schwimmbecken zum ausdauernden Schwimmen nicht geeignet.

Schwimmen ist aber eine der gesündesten Sportarten überhaupt, es stärkt Herz und Kreislauf, kräftigt die gesamte Muskulatur und trainiert die Ausdauer ohne dabei Gelenke und Wirbelsäule zu belasten. Gerade an heißen Tagen ist Schwimmen die gesündeste Art der Bewegung, da das Wasser des Schwimmbeckens eine wirksame Kühlung des Körpers gewährleistet, so daß keine Gefahr der Überhitzung besteht.

Vor diesem Hintergrund hat sich die vorliegende Erfindung die Aufgabe gestellt, eine Schwimmhilfe anzugeben, die ein ausdauerndes und der Gesundheit förderliches Schwimmen auch in kleinen Schwimmbecken erlaubt.

Diese Aufgabe wird erfindungsgemäß dadurch gelöst, daß die Schwimmhilfe aus einem Gurt besteht, der mit einem Ende am Rand oder außerhalb des Schwimmbeckens festlegbar ist, mit dem anderen Ende am Benutzer des Schwimmbeckens, vermöge eines an Brust und Schultern angreifenden Befestigungsmittels, lösbar befestigt ist und die Länge des Gurtes oder sein Festlegungspunkt so gewählt ist, daß er dann straff gespannt ist, wenn der Benutzer sich schwimmend vom Festlegungspunkt des Gurtes entfernt und sich im Abstand zu allen Schwimmbeckenrändern befindet.

Der Kerngedanke der Erfindung ist es, den Schwimmer gegen einen Widerstand anschwimmen zu lassen, der dafür sorgt, daß der Schwimmer ortsfest bleibt und nicht den gegenüberliegenden Beckenrand erreicht. Hierzu dient eine aus einem Gurt bestehende Schwimmhilfe am Schwimmer selbst und deren anderes Ende am Beckenrand oder außerhalb des Beckens befestigt wird. Die Anbringung des Gurtes am Schwimmer erfolgt dabei zweckmäßiger Weise so, daß die zurückhaltenden Kräfte im Bereich von Brust und Schultern angreifen, wo sie ihm beim Schwimmen nicht ernsthaft behindern. Dabei muß die Gurtlänge oder die Lage seines Befestigungspunktes so gewählt werden, daß er bei Entfernung des Schwimmers vom Befestigungspunkt des Gurtes sich dann strafft und den Schwimmer zurückhält, wenn sich dieser in einem hinreichend großen Abstand zu allen Schwimmbeckenrändern befindet. Mit einer derartigen erfindungsgemäßen Schwimmhilfe ist es möglich auch in sehr kleinen Schwimmbecken, deren Länge nicht mehr als drei Meter beträgt, über längere Zeiten ausdauernd zu schwimmen und auf diese Weise Herz und Kreislauf zu stär-

ken und die Ausdauer sowie die gesamte Muskulatur zu trainieren.

Die erfindungsgemäße Schwimmhilfe soll an verschiedenenartigen Schwimmbecken, mit jeweils unterschiedlichen

- 5 Abständen von vorhandenen Befestigungshilfen zum Bekkenrand, einsetzbar sein. Um dies zu erleichtern, wird in einer vorteilhaften Weiterbildung der Erfindung vorgeschlagen, den Gurt mit einer Einrichtung zur Längenverstellbarkeit auszustatten, die es ermöglicht, ihn flexibel an die je-
  - 10 weiligen räumlichen Gegebenheiten anzupassen.

Besteht der Gurt der erfundungsgemäßen Schwimmhilfe aus einem unelastischen Material, so erfährt der Benutzer in dem Augenblick wo der Gurt sich spannt einen harten Ruck, der als unangenehm empfunden wird. Um dies zu vermei-

- 15 den, soll der Gurt in einer bevorzugten Ausbildung der Erfindung aus einem elastischen Material bestehen, so daß der Schwimmer beim Straffen des Gurtes weich abgebremst wird. Die Befestigung des Gurtes der erfundungsgemäßen Schwimmhilfe am Benutzer erfolgt, in einer vorteilhaften
  - 20 Weiterbildung der Erfindung, über eine Art Brustgeschirr, das aus mehreren Riemen besteht, die Brust, Rücken und Schultern des Benutzers umgeben und in ihrer Länge an ihn anpaßbar sind. Mit einem derartigen Brustgeschirr lassen sich die bei Benutzung der Schwimmhilfe auftretenden
  - 25 Kräfte besonders großflächig und schonend auf den Benutzer übertragen und somit die Störung durch die Schwimmhilfe minimieren.

Weiterhin wird vorgeschlagen, daß Befestigungsmittel, also beispielsweise das Brustgeschirr am Gurt, mit einer lösbarer Verbindung zu befestigen, wofür beispielsweise ein Karabinerhaken in Verbindung mit einer entsprechenden Öse in Frage kommt. Hierdurch wird es möglich das Befestigungsmittel auszutauschen und somit beispielsweise für Erwachsene und Kinder jeweils unterschiedliche, jeweils in der Größe angepaßte Befestigungsmittel zu verwenden.

- In weiterer Ausbildung der Erfindung wird vorgeschlagen, den Gurt an seinen am Rand oder außerhalb des Schwimmbeckens gelegten Ende mit einer Aufwickelvorrichtung auszustatten, die aus einer Rolle besteht, von der  
40 der Gurt für den Gebrauch entgegen der Kraft einer Feder abgewickelt und mit einer Arretierung festgelegt wird. Nach Gebrauch der Schwimmhilfe kann dann die Arretierung gelöst werden, so daß sich der Gurt durch die Federkraft auf der Rolle wieder automatisch aufwickelt. Auf die Weise läßt  
45 sich eine sichere Unterbringung des Gurtes, außerhalb seiner Nutzungszeiten, gewährleisten.

Weitere Einzelheiten, Merkmale und Vorteile der Erfindung sind dem nachfolgenden Beschreibungsteil zu entnehmen, in dem anhand einer Zeichnung ein Ausführungsbeispiel der Erfindung näher erläutert ist. Sie zeigt in perspektivischer Darstellung einen Vertikalschnitt durch ein Schwimmbecken mit einer erfindungsgemäßen Schwimmhilfe.

- In der Abbildung ist ein Schwimmbecken (1) zu sehen,  
55 daß mit Wasser (2) gefüllt ist, in dem der Benutzer (3) des  
Schwimmbeckens schwimmt. Der Benutzer (3) trägt um  
Brust und Schultern ein Befestigungsmittel (4) in Form ei-  
nes Brustgeschirrs. Der elastische Gurt (5), der erfindungs-  
gemäßen Schwimmhilfe, ist mit einem Karabinerhaken (6),  
60 in einer dafür vorgesehenen Öse, am Brustgeschirr (4) ein-  
gehakt. Das andere Ende des Gurtes (5) ist außerhalb des  
Schwimmbeckens (1) an einem Holm (7) festgelegt, wobei  
die Lage der Schnalle (8) so gewählt ist, daß eine Länge des  
Gurtes (5) resultiert, bei der der Benutzer (3), der erfin-  
65 dungsgemäßen Schwimmhilfe, beim Wegschwimmen vom  
Holm (7) etwa mittig im Schwimmbecken (1) festgehalten  
wird, wo er von den Schwimmbeckenrändern beim  
Schwimmen nicht behindert wird. Durch die Elastizität des

Gurtes (5) wird sichergestellt, daß der Benutzer (3) bei Erreichen dieser Position und Spannen des Gurtes (5) nicht abrupt abgestoppt wird, sondern vielmehr gegen einen mit zunehmender Gurtspannung anwachsenden Widerstand an schwimmt, der ihn weich abbremst.

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Im Ergebnis erhält man eine preiswerte Schwimmhilfe, mit der ein, die Gesundheit förderndes, ausdauerndes Schwimmen auch in kleinen Schwimmbecken ab einer Länge von ca. drei Metern ohne weiteres möglich ist.

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#### Patentansprüche

1. Schwimmhilfe zur Benutzung in einem Schwimmbecken (1), **dadurch gekennzeichnet**, daß
  - die Schwimmhilfe aus einem Gurt (5) besteht,
  - der mit einem Ende am Rand oder außerhalb des Schwimmbeckens (1) festlegbar ist,
  - mit dem anderen Ende am Benutzer (3) des Schwimmbeckens (1) vermöge eines an Brust und Schultern angreifenden Befestigungsmittel (4) lösbar ist und
  - die Länge des Gurtes (5) oder sein Festlegungspunkt so gewählt ist, daß der Gurt (5) dann straff gespannt ist, wenn der Benutzer (3) sich schwimmend vom Festlegungspunkt des Gurts (5) entfernt und sich im Abstand zu allen Schwimbekkenrändern befindet.
2. Schwimmhilfe nach Anspruch 1, gekennzeichnet durch eine Längenverstellbarkeit des Gurtes (5)
3. Schwimmhilfe nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Gurt (5) aus einem elastischen Material besteht.
4. Schwimmhilfe nach einem der Ansprüche 1 bis 3, gekennzeichnet durch ein Befestigungsmittel (4), das aus Riemen besteht, die Brust, Rücken und Schultern des Benutzers (3) umgeben und in ihrer Länge einstellbar sind.
5. Schwimmhilfe nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß der Gurt (5) am Befestigungsmittel (4) lösbar befestigt ist.
6. Schwimmhilfe nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß der Gurt (5) an seinem am Rand oder außerhalb des Schwimmbeckens (1) festgelegten Ende mit einer Rolle ausgestattet ist, von der er bei Gebrauch entgegen einer Federkraft abgewickelt ist.

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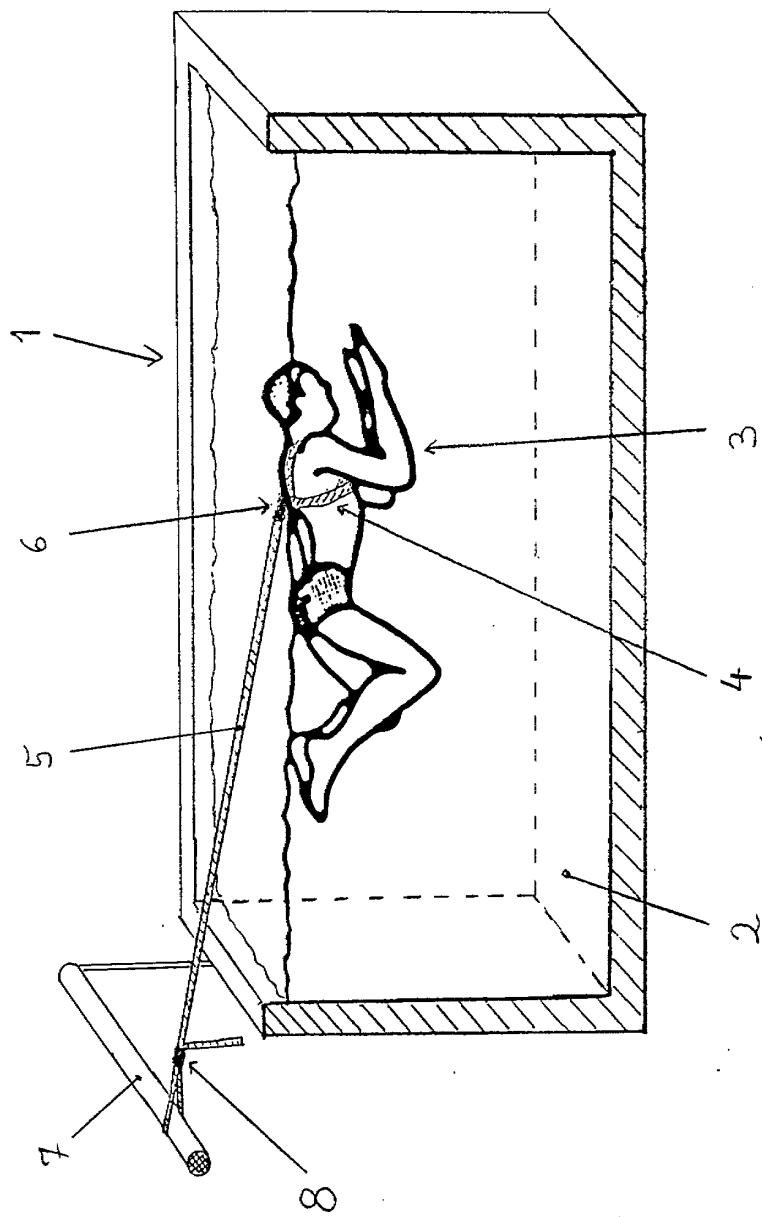
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US005236404.A

# United States Patent [19]

MacLennan

[11] Patent Number: 5,236,404  
[45] Date of Patent: Aug. 17, 1993

## [54] SWIMMER TRAINING DEVICE

[76] Inventor: Robert MacLennan, 13716 Puerto St., Ocean Springs, Miss. 39564

[21] Appl. No.: 785,500

[22] Filed: Oct. 31, 1991

[51] Int. Cl.<sup>5</sup> ..... A63B 31/00

[52] U.S. Cl. ..... 482/55; 434/254

[58] Field of Search ..... 482/55, 43; 434/254

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Primary Examiner—Richard J. Apley

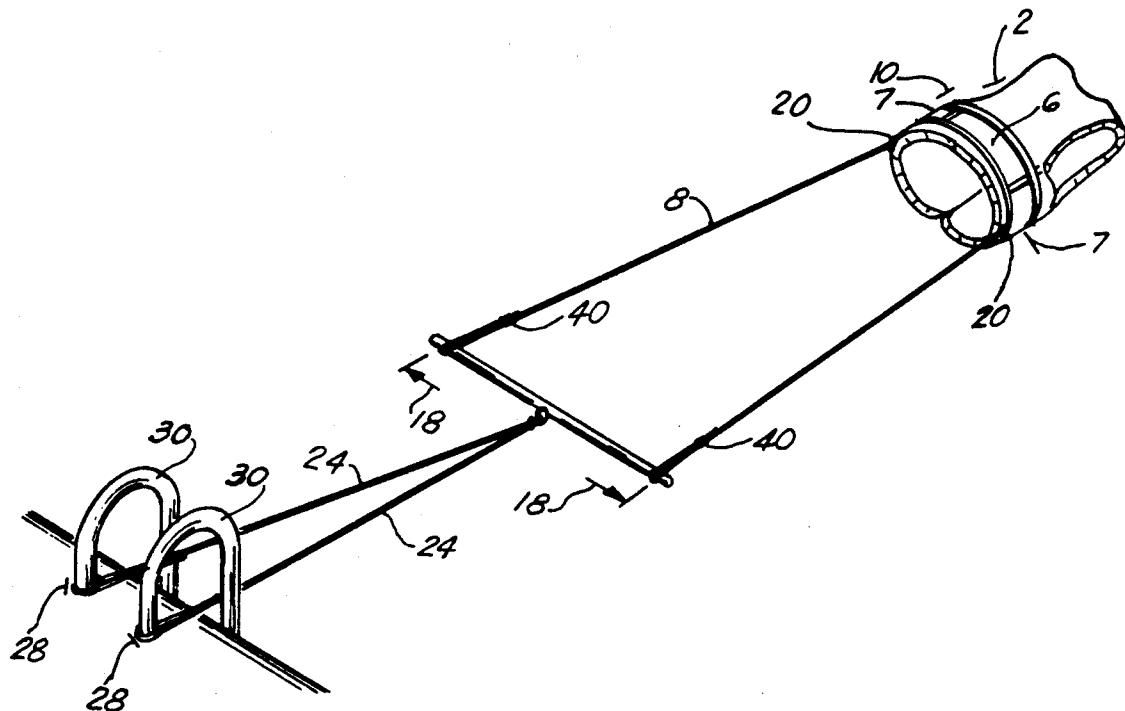
Assistant Examiner—Lynne A. Reichard

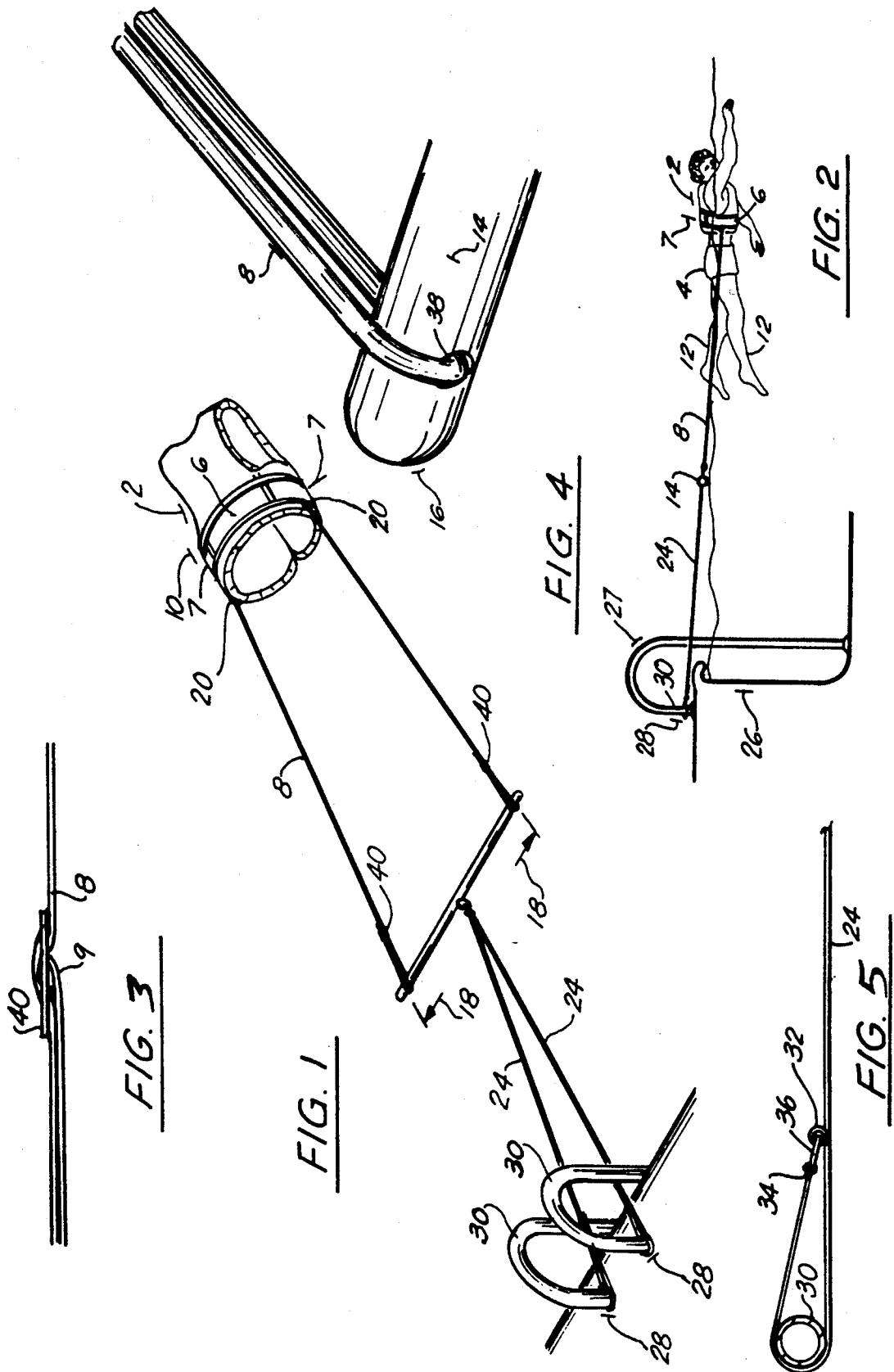
Attorney, Agent, or Firm—Alexander Norcross

## [57] ABSTRACT

A device for swim training, for a swimmer in a stationary pool, which is attached to a float vest or belt. The belt has two sides; on each of these sides a strap is stitched or attached. These two straps extend, nearly parallel to each other, below the belt and interconnect the belt to a cross bar located behind the feet of a horizontal swimmer wearing the vest. Two lines interconnect the center of the cross bar to two separated points of attachment on the side of a pool. The cross bar separates the straps as they stream below the vest, spacing these straps so that they are clear of the feet of the swimmer. The cross bar in turn forms a point of attachment for connecting the apparatus to the side of the pool.

5 Claims, 1 Drawing Sheet





**SWIMMER TRAINING DEVICE****BACKGROUND OF THE INVENTION**

This patent relates to the field of swimmer training devices, for permitting exercise in restricted spaces in swimming pools.

Such devices in the prior art include:

A number of devices consist of cables attached at one end to the waist of the swimmer and at the other end to the wall of a pool, or to a device fixed to the side of the pool.

Soviet Patent 636001, with an English abstract, discloses a swimming device in which the feet are suspended on fixed rods angled at each other. The rods apparently contain instrumentation to determine the power with which the swimmer swims. The feet are engaged by the apparatus and are not free to move.

U.S. Pat. No. 4,551,108 discloses a device attached at two points to a flotation vest and attached at opposite ends of the pool to prevent motion in any direction (FIG. 4). This is an exercise device for weight reduced running; it does not promote swimming.

German Patent 1,190,849 shows a swim training device attached to a belt around the waist. There appears to be no flotation. The swimmer is attached to a belt which passes over a pulley then back to a weight so that the force of the swimmer apparently pulls against the weight to provide resistance. There appear to be two stabilizing lines attached to two points on the wall of the pool.

An extract from a Sports Illustrated article of Sep. 17, 1984 apparently describes a tether attached to a swimmer which appears to rise vertically from the pool, where it is attached to an overhead pole in order to be free of the swimmer's legs.

U.S. Pat. No. 4,948,117 discloses a form of tether which attaches to the ankles of the swimmer. Two such tethers are required but they are apparently moored to a single point.

German Patent 197806 discloses an apparatus for measuring the tractive effort of a swimmer in which a single tether to a swimmer runs over a pulley to a spring scale. The device also has a timer so as to measure the force exerted during a period of time.

German Patent 2821-029 discloses another form of such device in which a single tether passes through a pulley against a spring to vary the resistive force against which the swimmer must exercise.

U.S. Patent 4,247,096 discloses a portable swim trainer device which has a frame fixedly attached to the side wall of a pool, extending to a point above the level of the water. The swimmer is suspended by a spring or bungee cord, a single cable running from the frame to a waist belt worn by the swimmer.

**SUMMARY OF THE INVENTION**

A device for swim training, for a swimmer in a stationary pool, which is attached to a float vest or belt. The vest has two sides; straps are stitched or attached to each of these sides. These two straps extend, nearly parallel to each other, below the vest and interconnect the vest to a cross bar located behind the feet of a horizontal swimmer wearing the vest. Two lines interconnect the center of the cross bar to two separated points of attachment on the side of a pool.

The cross bar separates the straps as they stream below the vest, spacing these straps so that they are

clear of the feet of the swimmer. The cross bar in turn forms a point of attachment for connecting the apparatus to the side of the pool.

In use, the swimmer dons the apparatus and then proceeds to swim in a normal manner against the restraining force of the straps and the vest. The swimmer obtains the advantage of swimming exercise, including a fully aerobic workout, without requiring a large pool or special flowing water apparatus to hold him stationary. The device thus permits full exercise swim training in a relatively small pool.

It is an object of the invention to show a swimmer training apparatus which permits full swimming motion while restraining the swimmer to a single location in a pool.

It is a further object of the invention to show a swimmer training apparatus which permits full swimming motion by a swimmer in a small or restricted space.

It is a further object of the invention to show a swimmer training apparatus which permits full swimming motion by a swimmer in a restrained space without requiring installation of supports above the swimming pool.

It is a further object of the invention to show a swimmer training apparatus which permits full swimming motion by a swimmer in a restricted space, the apparatus being easily disassembled and carried by the swimmer.

It is a further object of the invention to show a swimmer training apparatus which permits full swimming motion by a swimmer in a restricted space with minimum obstruction to activities of others in the same pool.

These and other objects of the invention may be seen from the detailed description which follows.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1 is a view of the invention attached to the side of a pool.

FIG. 2 is a side view of a swimmer exercising, restrained by the invention.

FIG. 3 is a detail view of an adjustment means for the strap of the invention.

FIG. 4 is a view of an end of the separator bar of the invention.

FIG. 5 is a detail view of the connection of a line from the invention to a pool side fitting.

**DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

This invention relates to swim training devices and exercise devices for persons who wish to engage in swimming, yet are restricted in terms of the size of the pool in which they swim or in terms of their ability to move freely about in the water while swimming.

It is well known that swimming is an exercise that strengthens and tones all the major muscles of the body and has beneficial cardiovascular effects. It is considered by some to be more beneficial as an aerobic exercise than running or jogging because swimming involves no impact to the body and thus the swimmer avoids, even with strenuous exercise, any significant risk of joint damage or muscular strains.

However, to be effective as an aerobic exercise, the swimmer must in fact engage in full stroke swimming, utilizing coordinated movements of both the arms and the legs, moving through the water.

With the ever increasing popularity of aquatic sports, it has become increasingly difficult for a person desiring to swim to find an open body of water of sufficient size that one can actually swim for a distance or do laps in the water. Even in swimming pools that may be designed with lanes to allow such swimming, the number of swimmers or persons in the pool often precludes a swimmer from having a free and open area in which to swim over a distance or for repeated laps. More often, the space requirements expense of operating a large swimming pool means that only small amounts of water or small pools are available for a person who wishes to exercise in the water. This is especially a factor for travelers, who must contend with small hotel type pools designed more for relaxed floating than for serious swimming.

In the background of the invention we have shown various artifacts or restraints that have been proposed to restrain a person exercising in the water so that they can fully exercise without moving through the water, and thus supposedly can exercise in a relatively small body of water or in a restricted space. A disadvantage of substantially all of these exercise devices is that they either interfere with free swimming motion or, alternatively, they are themselves so bulky or expensive as to preclude ready availability and use.

The prime example of an expensive solution is the swimming pool which is provided with pumped, free flowing water so as to provide a current past the swimmer to hold him in a fixed position. This is a specialized pool, quite evidently non-portable, and requiring even more cost and expense than a standard swimming pool.

Those devices which attempt to physically restrain the swimmer but allow free motion of the hands and arms now involve elaborate physical structures which have to be mounted over the swimmer or over the swimming pool, and which are fixed into position. Inasmuch as such structures must resist the weight and motion of the swimmer, they tend to be bulky, expensive and interfere with other uses of the pool.

The invention, therefore, as disclosed in the figures, is of a swimmer restraining device which is portable, easily put on and removed, that will successfully restrain a swimmer within a fixed space within a swimming pool, yet permit the swimmer full and complete swim motions including coordinated motions of both the arms and the legs.

Referring to FIG. 1, I show, as part of the invention, a body restraining fitting 2 which is usually in the form either of a swim vest or of a waist belt worn about the swimmer 4. It may optionally be desirable to make this body restraining fitting 2 as a vest 2 or belt with some degree of floatation such as a standard non-inflatable life jacket, if this will aid the swimmer 4. In the embodiment shown in the figures the body restraining fitting 2 is a foam floatation life jacket with a reinforced waist belt.

However as a bulky jacket would interfere with the free motions of the swimmer, a full flotation jacket is not probably appropriate; a foam jacket 2 or belt having some floatation but otherwise not interfering with the motions of the swimmer 4 may be a preferred form of body restraining fitting 2 if floatation is desired.

A belt 6 or reinforced circular web around the waist of the swim jacket may be provided. To the two sides of the jacket 2 are attached two bridle straps 8 so as to provide for an even symmetrical restraint on both the left side 10 and the right side 12 of the jacket 2.

FIG. 2 shows a swimmer 4, wearing the invention, doing a horizontal stroke such as is commonly called a crawl.

As can be seen, the bridle straps 8 in this position restrain the swimmer 4 against a forward motion and thus extend horizontally from the waist 7 of the swimmer 4, from their point of attachment to the jacket 2, streaming back, substantially parallel to the swimmer's legs 12. Two bridle straps 8 are therefore provided, and are spaced a distance apart by a cross bar or separator bar 14. The separator bar 14 has two ends 16, and a bridle strap 8 is attached to each of the two ends 16. The distance 18 between these ends of the bridle strap 8, where they are attached to the separator bar 14, is greater than the distance between the ends 20 of the bridle straps 8 that are attached to the jacket 2, so as to cause the bridle straps 8 to be spaced a wider distance apart in the vicinity of the swimmer's legs 12 and feet.

The separator bar 14 is in turn attached, from a mid point 22 on the bar, preferably by two lines or cables 24, to any available object on the side of the pool 26. Most typically it will be found that ladders 27 or similar structures are spaced along the side of a pool 26 and such constructions provide a convenient point of attachment 28 of the restraining lines 24.

It is desired that the restraining lines 24 be attached to the separator bar 14 at the center 24 of the bar, balancing the bar 14 against the pull on each end 16 imparted by the two bridle straps 8. Using two lines 24 permits the separator bar 14 to be attached to two separated points of attachment 28 on the side of the pool 26, and reduces any tendency of the apparatus to sway from side to side under the pull of swimming. These points of attachment 28 need not be widely separated, and in particular, they should not be on opposite sides of the pool 26. A preferred attachment is to the two side rails 30 of a pool side ladder 27. There will thus be little interference with other's use of the pool even with two lines attaching the apparatus to the pool side.

FIG. 5 shows a preferred method of such connection, in which small rings 32 are woven or spliced into the restraining lines 24 near the free ends 34 of the line 24. A snap hook 36 or clip is fastened to the free end 34 of each line 24. The line 24 can then be easily fastened to any suitable object at pool side, such as a boarding ladder 27, by passing the line free end 24 around the object and fastening the snap hood 36 to the ring 32, enclosing the pool side object in a closed loop of the restraining line 24.

Each bridle strap 8 should be the same length as the other bridle strap so that the separator bar 14 is maintained in a substantially transverse direction to the pull of the swimmer 4 while swimming. It is preferable that the bridle straps 8 be adjustable in length to insure that this configuration can be maintained, and this may be readily accomplished either by tying the straps 8 to the ends 16 of the separator bar 14 or by providing holes 38 in each end of the separator bar 14 through which the bridle strap 8 may be passed and looped back upon itself, its length adjusted by any of a number of sliding clamps 40 to permit the length of each bridle strap 8 to be readily adjusted.

Such clamps 40 are well known in the art of ropes and fastenings and any suitable clamp may be used. For example, in FIG. 3 I show a strap adjustment in which the strap 8 and the end 9 of the strap 8 are passed through a buckle 40 having two holes so that tension on the strap 8 pulls the strap 8 and strap end 9 tightly to-

gether; this device is widely known and seen in luggage and on camping equipment for strap length adjustment. Other equally effective methods of such adjustment are known and will be apparent to those skilled in the art.

It is also apparent that the bridle strap 8 may be made from a rope equally as well as from webbing. The word strap is not intended to restrict the material from which the bridle strap 8 is made or to designate its shape, but merely to distinguish between the identification of the bridle straps 8 and the restraining lines 24, both of which may be made of the same materials. The strap should be of a material, such as nylon or the like, which is resistant to water but which has sufficient strength to resist the forward motion and pull of an active swimmer.

The restraining lines 24 or cables may likewise be made of an identical strapping material or of a rope. By affixing one end of the restraining lines 24 to the exact center 22 of the separator bar 14, a symmetrical pull is imposed upon the separator bar 14, retaining it in a transverse position against the motion of the swimmer 4.

In use, a swimmer 4, desiring the beneficial exercise of swimming but restricted because of the size of the pool or the crowdedness of the pool from actually having enough free space to swim, would still be able to enjoy the exercise by donning the belt or jacket 2 of the invention and entering the water, and fastening the restraining cables 24 to a convenient point 28 on the side of the pool 26, such as to the vertical supports of a boarding or pool entrance ladder 27.

The swimmer 4 then can actively swim using a crawl or any of a number of strokes which normally impart forward motion. The force of the swimmer's forward motion is exerted against the jacket or belt 2 and coupled through the bridle straps 8 to the separator bar 14. The separator bar 14, being under tension, pulls on the bridle straps 8, holding them straight; at the same time the separator bar 14 separates the bridle straps 8 so that the feet and legs 12 of the swimmer are completely free of the bridle straps 8 and are not interfered with during the swimming motion. The balance provided by having two bridle straps 8 of equal length maintains the separator bar 14 substantially transverse to the direction of the swimmer 4. All the force of the swimmer is concentrated in and restrained by the restraining cable 24 which runs from the separator bar 14 to the point of attachment 28 at the side of the pool 26.

The restraining lines 24 preferably should be attached to the separator bar 14 by a swivel at the midpoint of the separator bar 14. The separator bar 14 can then rotate about the restraining lines 24 without twisting them, and this permits the swimmer 4 turn in the water, switching between swimming on his back and face down.

No structure hangs over the pool and no permanent structure needs to be affixed to the side of the pool.

As a result, the invention may readily be carried by a traveller who wishes to swim at pools he may visit, and substantially no setup and take down time is required. The apparatus will not interfere with other person's enjoyment of the pool and thus is particularly suited for use in a crowded or public swimming pool by one who desires swimming exercise without interfering with the play activities of others.

As it can be seen from the description there are numerous small variations especially in the type of material and/or strapping used for the bridle and restrainer

line and in the exact method of affixing the bridle lines to the vest or belt and to the separator bar so as to permit easy adjustment of the length of the bridle to fit varying sized swimmers.

Thus the invention extends beyond the specific embodiment shown in the figures to that wider range of equivalents as are inherent in the art.

I claim:

1. An apparatus for restraining a swimmer's position in a pool, while swimming, comprising:  
means for attachment of the apparatus around the waist of a swimmer, defining two sides thereof;  
a first strap, extending from a first end affixed to a first side of said means for attachment, extending to and affixed at a second end to a first end of a separator bar;  
a second strap, extending from a first end affixed to a second side of said means for attachment, extending to and affixed to a second end to a second end of said separator bar;  
said separator bar holding said second ends a spaced distance apart;  
means for pool side support, adapted for removable attachment to a side of a pool;  
said means for pool side support further comprising:  
at least one line extending from a point in the middle of said separator bar to the point of connection on the side of the pool;  
said separator bar being intermediate said point of connection and said means for attachment of the apparatus around the waist.

2. The apparatus of claim 1, said line further comprising:

a ring spliced into said line at a point intermediate the separator bar and the free end of said line;  
a snap hook attached to said free end, said line being affixed to said point of connection by looping said line about the point of connection and fastening said snap hook to said ring.

3. An apparatus for restraining a swimmer's position in a pool, while swimming, comprising:

means for attachment of the apparatus around the waist of a swimmer, defining two sides thereof;  
a first strap, extending from a first end affixed to a first side of said means for attachment, extending to and affixed at a second end to a first end of a separator bar;

a second strap, extending from a first end affixed to a second side of the waist belt, extending to and affixed at a second end to a second end of said separator bar;

means, for removably attaching said separator bar to a side of a pool;

said means for removably attaching said separator bar further comprising:

a first and a second line, each extending from a point in the middle of said separator bar, each extending to differing points of connection on the side of the pool, such that side to side sway of the apparatus is limited.

4. The apparatus of claim 3, further comprising:  
said lines being affixed to said point in the middle of said separator bar by a swivel, such that the swimmer may turn in the water while swimming without tangling said lines.

5. An apparatus for restraining a swimmer's position in a pool, while swimming, comprising:

means for attachment of the apparatus around the waist of a swimmer, defining two sides thereof; a first strap, extending from a first end affixed to a first side of said means for attachment, extending to a second end and affixed at a second end to a first end of a separator bar; a second strap, extending from a first end affixed to a second side of said means for attachment, extending to a second end of a separator bar;

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ing to and affixed at a second end to a second end of said separator bar; said separator bar holding said straps free of the swimmer's feet and legs while swimming; a first and a second line, each extending from a point in the middle of said separator bar, each extending to differing points of connection on the side of the pool, such that side to side sway of the apparatus is limited.

\* \* \* \* \*



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(54) Título: **Dispositivo nadador estático.**

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## DESCRIPCIÓN

Dispositivo nadador estático.

### Objeto de la invención

La presente invención, según se expresa en el enunciado de esta memoria descriptiva, se refiere a un dispositivo nadador estático que tiene como cometido permitir a un usuario practicar la natación sin desplazarse por el agua, pudiendo realizar cómodamente los distintos movimientos de brazos y piernas, así como del resto del cuerpo permaneciendo el usuario amarrado por sus pies a un punto fijo mediante el dispositivo de la invención.

Partiendo de esta premisa, el objetivo de la invención es mejorar la sujeción de los pies del usuario, siendo también otro objetivo de la invención poder conectar o enganchar el dispositivo de la invención a distintos puntos, tales como por ejemplo las escaleras de la piscina, tapa del espumador o equipo de filtración (skimmer), piedra de coronación, rebosadero perimetral o cualquier punto fijo en la piscina o cercano a esta, como una ventana o puerta del recinto donde se encuentra la piscina, etc.

### Antecedentes de la invención

En la actualidad existen dispositivos nadadores estáticos que consisten en acoplar a un nadador un cinturón que se encuentra enganchado a un mástil con un abrazo que llega hasta la ubicación del nadador.

Estos dispositivos conocidos presentan el inconveniente de que la fijación del referido mástil es relativamente costosa, e impide algunos de los movimientos del entrenamiento en la natación, como por ejemplo el cambio de estilos, no pudiéndose aplicar en gran cantidad de casos. Además, estos sistemas conocidos son excesivamente complejos e incómodos.

Por otro lado, es conocido el Modelo de Utilidad nº 200402013 referido a un dispositivo de natación estática que resuelve en principio los problemas citados anteriormente.

Tal Modelo de Utilidad se caracteriza porque cuenta con unos medios de anclaje a piscina o similar que conectan con un conjunto mosquetón fijo/giratorio que a su vez conecta con un cable elástico en cuyos dos extremos se disponen unos medios de fijación a los pies del usuario.

No obstante, este Modelo de Utilidad presenta limitaciones en cuanto a los puntos de anclaje, así como una sujeción a los pies del usuario que se pueden soltar de forma involuntaria.

### Descripción de la invención

Con el fin de alcanzar los objetivos y evitar los inconvenientes mencionados en los apartados anteriores, la invención propone un dispositivo nadador estático al cual se amarran los pies del usuario, a la vez que se ancla en un punto fijo, con lo cual el usuario puede realizar cómodamente todos los movimientos de natación, pero sin avanzar, precisamente debido al amarre de sus pies al citado punto fijo.

El dispositivo de la invención, en principio cuenta con unos medios de anclaje a una piscina o similar, que conectan con un conjunto de mosquetón posterior, el cual conecta a su vez con un cable elástico por una zona central del mismo dando lugar a dos ramales en cuyos extremos se disponen unos medios de fijación a los pies del usuario.

Los medios de anclaje consisten en un medio de enganche anclado a ras o por encima del correspondiente nivel del agua en una realización preferente.

Además, en dicho ejemplo, el referido medio de enganche puede consistir en un gancho encastrado en la pared de la piscina, un gato sujeto al borde de la piscina, una ventosa con enganche fijada a la parte de la piscina, una piqueta clavada en terreno próximo a la piscina, un mosquetón enganchado a la rejilla de desagüe de la piscina o un enganche en la escalerilla de la piscina.

Por otra parte, en el ejemplo referido, los medios de fijación a los pies del usuario consisten en la colocación de unos ganchos terminales en los dos extremos del cable elástico, generar sendos bucles o nudos en los extremos del cable elástico, elementos que se unen a respectivos mosquetones anteriores conectados a su vez a sendas abrazaderas tipo muñequera.

Se caracteriza porque incorpora un cordón adicional vinculado a los medios de fijación de los pies del usuario, de manera que tal cordón adicional constituye una importante mejora que permite asegurar la sujeción a modo de talonera, regulable para cualquier dimensión del pie del usuario. Esta mejora aporta la seguridad necesaria a la abrazadera para que esta no se escape del pie.

Otra mejora de la invención es que los medios de anclaje del dispositivo se complementan con una cuerda en combinación con un gancho universal, el cual puede permitir la sujeción del dispositivo sobre cualquier elemento, que no sea un gancho de la propia piscina, sino que pueda ser por ejemplo sobre una escalerilla de la misma, tapa del espumador o equipo de filtración, piedra de coronación, rebosadero perimetral o sobre un elemento externo a ésta, como una ventana o puerta del recinto. Como se puede variar la longitud de la cuerda, podemos conseguir su adaptación a cualquier elemento de sustentación que esté a una distancia mayor que el propio gancho del borde de la piscina.

A continuación para facilitar una mejor comprensión de esta memoria descriptiva y formando parte integrante de la misma se acompañan unas figuras en las que con carácter ilustrativo y no limitativo se ha representado el objeto de la invención.

### Breve descripción de los dibujos

Figura 1.- Muestra una vista en perspectiva del dispositivo nadador estático, objeto de la invención.

Figura 2.- Muestra una vista esquemática del dispositivo nadador estático aplicado a un usuario que se encuentra nadando dentro de una piscina sin desplazarse ni trasladarse por la misma.

### Descripción de la forma de realización preferida

Considerando la numeración adoptada en las figuras, el dispositivo nadador estático se determina a partir de un cable elástico 1 por cuyo centro se asocia a un mosquetón posterior 2 para sujetarse a un elemento fijo de sustentación por mediación de una cuerda 3 en combinación con un gancho universal 4 que permite la sujeción del dispositivo sobre cualquier elemento fijo de sustentación incluido un gancho encastrable 5 de la piscina representado en la figura 2.

La sujeción mediante el gancho universal citado 4 también puede realizarse sobre una escalerilla de la piscina, tapa del espumador, piedra de coronación, rebosadero perimetral o sobre un elemento externo a ésta, como una ventana o puerta del recinto donde se encuentra la piscina, etc.

Como se puede variar la longitud de la cuerda 3, podemos conseguir su adaptación a cualquier elemen-

to fijo de sustentación que esté a una distancia mayor que el propio gancho encastrable citado 5 del borde de la piscina.

Por otro lado, los extremos del cable elástico 1 finalizan en la colocación de unos ganchos terminales 6' en los dos extremos del cable elástico 1 ó unos bucles cerrados 6, elementos 6, 6' donde se conectan unos mosquetones anteriores 7 y sobre éstos unas abrazaderas 8 tipo muñequera para adaptarse a los pies 9 del usuario 10 abrazando a los mismos para sujetarlos y poder mantenerse así el usuario 10 nadando sin desplazarse ni trasladarse por la piscina. Los ganchos 6' y bucles cerrados 6 se pueden vincular a las

abrazaderas 8 por mediación de unas piezas corredera 13 (Figura 2).

Tales abrazaderas 8 se complementan con un cordón adicional 11 que permite reforzar y asegurar la sujeción de los pies 9 del usuario 10 por sus talones abrazando a los mismos.

El cordón adicional citado 11 se conecta por sus extremos libres sobre las abrazaderas 8 tipo muñequeras, a la vez que tal cordón adicional 11 incorpora un dispositivo regulable convencional 12 para adaptar el abrazo del cordón adicional 11 al tamaño del talón del pie del usuario. Preferentemente el citado cordón adicional 11 tendrá una estructura elástica.

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## REIVINDICACIONES

1. Dispositivo nadador estático, que estando destinado para permitir nadar al usuario sin desplazamiento por el agua de una piscina, e incluyendo un cable elástico con medios de anclaje a un elemento fijo de sustentación, e incluyéndose además en correspondencia con los extremos del cable elástico medios de fijación de los pies del usuario donde participan unas abrazaderas tipo muñequera que abrazan a los pies del usuario para impedir su desplazamiento por la piscina cuando practica la natación, se **caracteriza** porque los medios de anclaje del cable elástico (1) a un elemento fijo de sustentación comprenden dichos medios de anclaje la combinación de un mosquetón posterior (2), un gancho universal (4) y una cuerda intermedia (3) que asocia dicho gancho universal (4) y el citado mosquetón posterior (2).

2. Dispositivo nadador estático, según la reivindicación 1, **caracterizado** porque los medios de fijación de los pies (9) del usuario (10) incorporan unos cordones adicionales (11) que abrazan a los talones de

los pies (9) del usuario (10) a la vez los extremos de tales cordones adicionales (11) conectan con las abrazaderas (8) tipo muñequera.

3. Dispositivo nadador estático, según la reivindicación 2, **caracterizado** porque el cordón adicional (11) incorpora un dispositivo convencional regulable (12) que asocia los dos ramales de cada cordón adicional (11) para poder regular la amplitud del abrazo de los talones de los pies (9) del usuario (10).

4. Dispositivo nadador estático, según una cualquiera de las reivindicaciones 2 ó 3, **caracterizado** porque el cordón adicional (11) comprende una estructura elástica.

5. Dispositivo nadador estático, según una cualquiera de las reivindicaciones anteriores, **caracterizado** porque los extremos del cable elástico (1) están unidos solidariamente a unos ganchos terminales (6').

6. Dispositivo nadador estático, según la reivindicación 5, **caracterizado** porque los ganchos terminales (6') se vinculan a las abrazaderas (8) tipo muñequera mediante unas piezas corredera (13) acopladas en dichas abrazaderas (8).

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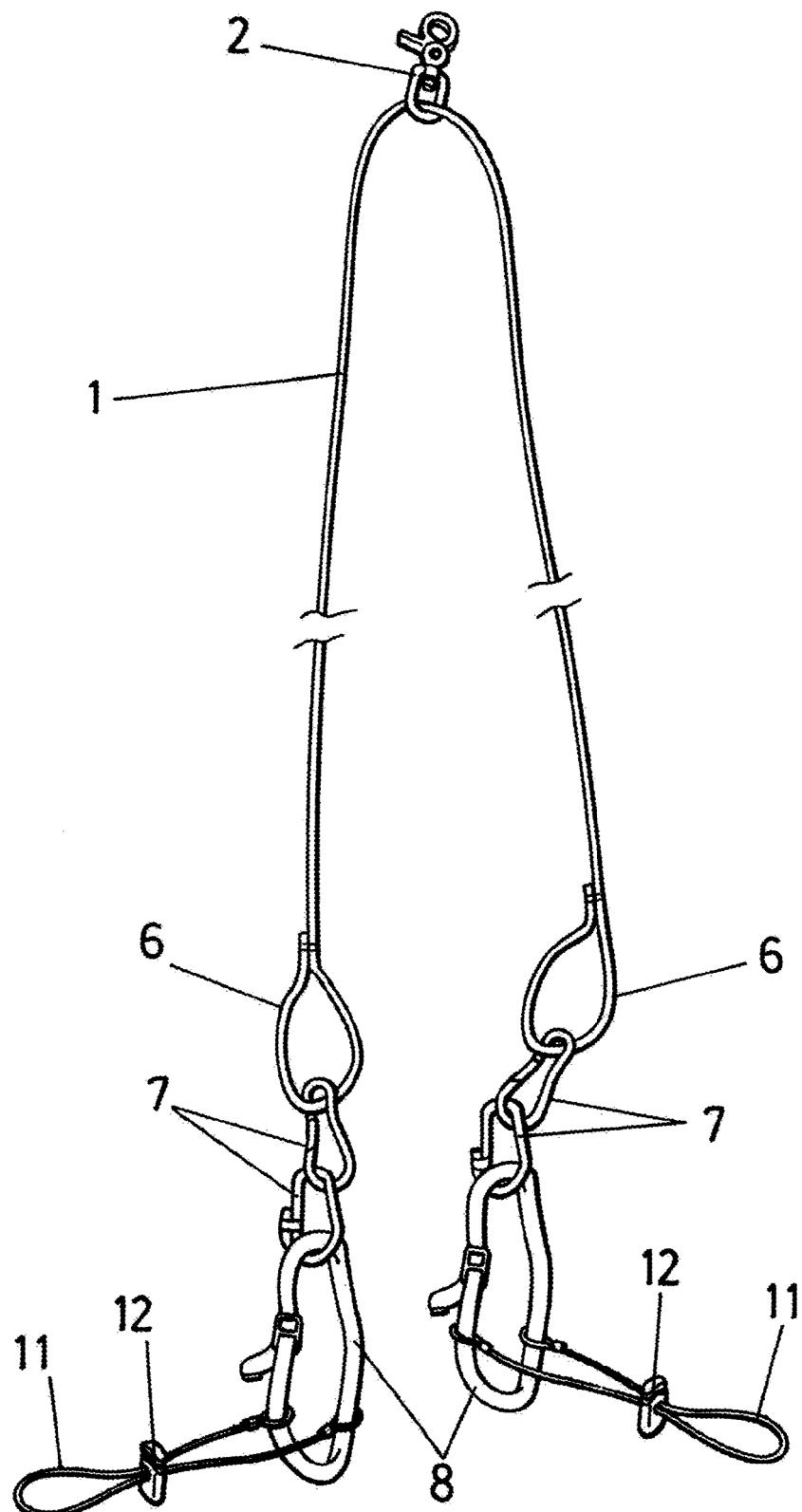
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**FIG.1**

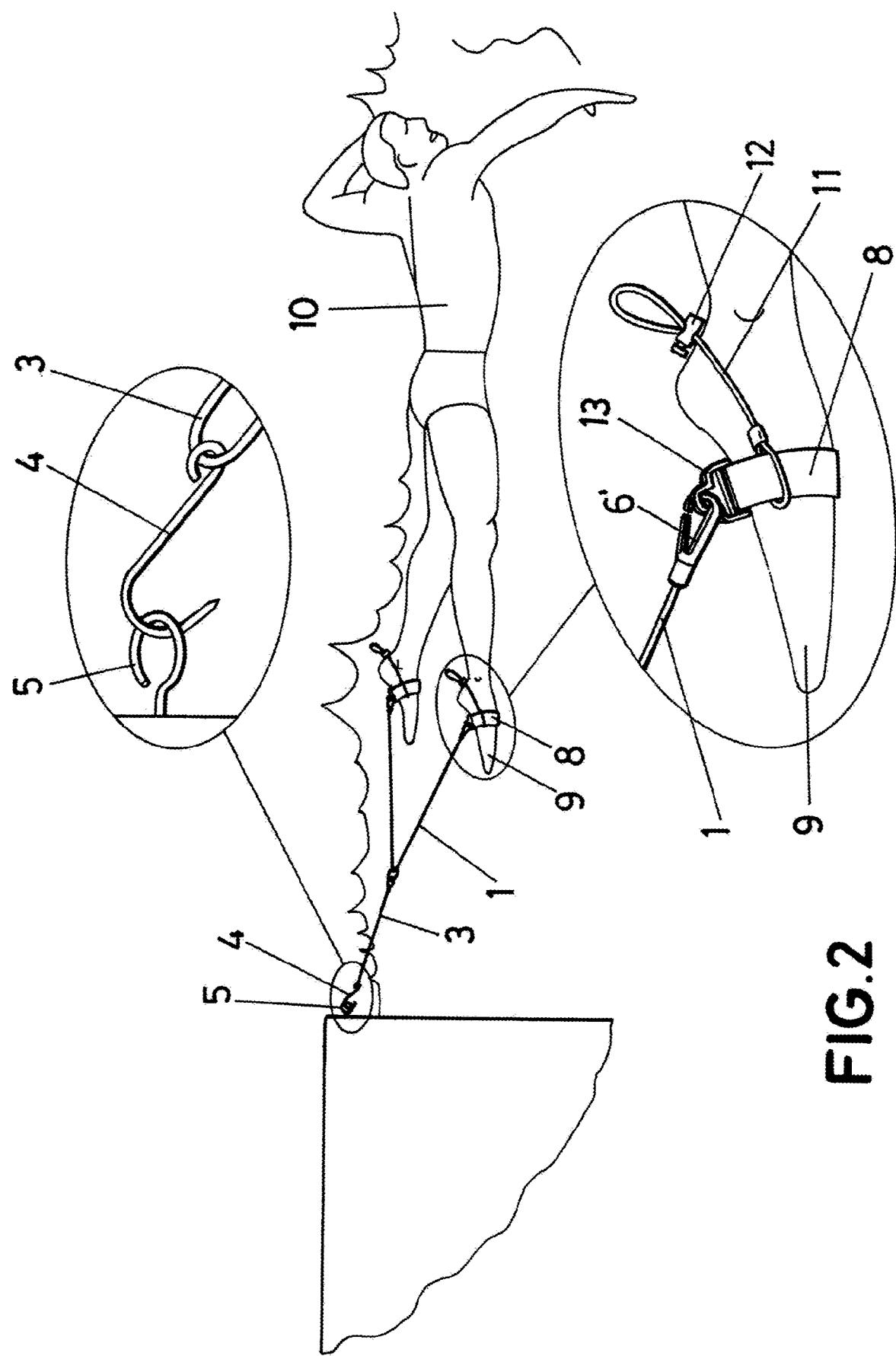


FIG. 2

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## DEMANDE DE BREVET D'INVENTION

A1

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(71) Demandeur(s) : AMIC PHILIPPE — FR.

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(72) Inventeur(s) : AMIC PHILIPPE.

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(56) Liste des documents cités dans le rapport de recherche préliminaire : Ce dernier n'a pas été établi à la date de publication de la demande.

(60) Références à d'autres documents nationaux apparentés :

(73) Titulaire(s) :

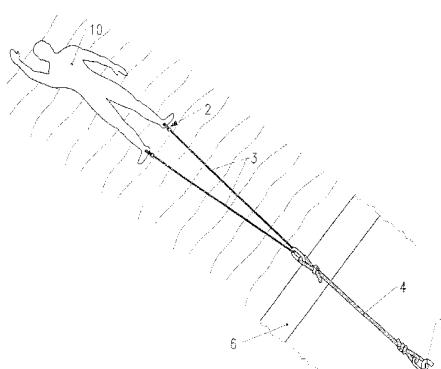
(74) Mandataire(s) : ROMAN MICHEL.

(54) DISPOSITIF DE NATATION EN PISCINE.

(57) La présente invention a pour objet un dispositif de natation en piscine.

Il consiste en un sandow (3) double prolongé par une drisse (4) se fixant à un système d'ancrage (7) au sol, les deux extrémités dudit sandow étant reliées à une paire de bottillons, ou protections de chevilles, comportant chacun une attache (2) disposée de façon à se trouver dans le prolongement de la jambe de l'utilisateur (10), l'ensemble pouvant être commercialisé sous forme d'emballages comprenant en plus un masque sous-marin et un tube respiratoire connu sous le nom de tuba.

Le dispositif se rapporte d'une manière générale au domaine industriel et commercial de la fabrication et de la diffusion d'équipements de natation destinés à faciliter l'entraînement sportif en bassin.



FR 2 900 831 - A1



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La présente invention a pour objet un dispositif de natation en piscine.

Elle se rapporte d'une manière générale au domaine industriel et  
10 commercial de la fabrication et de la diffusion d'équipements de natation destinés à faciliter l'entraînement sportif en bassin.

Actuellement, pour améliorer les performances et le style de natation en piscine, on a généralement recours à la nage à contre-courant qui s'apparente  
15 au tapis d'entraînement utilisé pour la course à pieds et permet, en demeurant sur place d'obtenir les mêmes effets qu'en enchaînant de nombreux allers-retours.

Toutefois, cette pratique nécessite l'installation d'un équipement coûteux apte à générer, à la surface du bassin, un courant d'eau suffisamment puissant pour exiger du nageur des efforts conséquents. Cet appareil est bruyant et  
20 générateur de turbulences et très peu de piscines en sont équipées.

Pour pratiquer la natation en restant sur place, on connaît également des ceintures équipées d'un élastique accroché au bord de la piscine, mais l'utilisation de cet accessoire est peu confortable et limite de façon importante les  
25 mouvements du nageur qui, par exemple, ne peut pas, sans modifier la fixation de la ceinture, se retourner pour passer de la nage sur le ventre à la nage sur le dos.

Le dispositif selon la présente invention a pour objectif de remédier à cet état de choses. Il permet en effet, pour un investissement modéré, de  
30 développer la natation en piscine et de favoriser la musculation par des exercices d'amélioration de la technique et de l'efficacité de nage.

Il est utilisable dans des petits bassins et ne nécessite pas d'installation coûteuse, ce qui rend possible de l'utiliser facilement dans plusieurs

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piscines.

Il consiste en un système d'ancrage au sol, permettant de fixer une drisse se prolongeant par un sandow double dont les deux extrémités sont reliées 5 à une paire de bottillons, ou protections de chevilles, comportant chacun une attache disposée de façon à se trouver dans le prolongement de la jambe de l'utilisateur, l'ensemble pouvant avantageusement être commercialisé sous forme d'empaquetages, ou "kits", comprenant en plus un masque sous-marin et un tube respiratoire connu sous le nom de tuba.

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Sur les dessins annexés, donnés à titre d'exemple non limitatif d'une forme de réalisation conforme à la présente demande :

la figure 1 représente, vu de dessus, un nageur utilisant le système selon l'invention,

15

les figures 2 à 4 montrent trois variantes de bottillons,

la figure 5 est une vue agrandie d'un disque faisant partie du système d'attache du sandow au bottillon visible sur la figure 4 et

la figure 6 est une coupe transversale suivant les flèches F1 du disque de la la figure 5.

20

Le dispositif, figures 1 à 6, est constitué d'une paire de bottillons 1, ou protections de cheville, avec éléments d'attache 2 permettant de fixer un sandow 3 (ou élastique) double accroché à l'une des extrémités d'une drisse 4 (ou corde) dont l'autre extrémité est retenue au sol du bord 6 du bassin au moyen d'un système 25 d'ancrage tel qu'un piquet, un piton ou un crochet 7.

30

Les bottillons 1 sont des éléments souples en titanium, lycra, néoprène ou matériau similaire recouvrant la cheville, le bas de la jambe 8 et une partie du pied 9 du nageur 10 et pourvus d'une semelle 11 en matériau plus rigide. L'élément d'attache 2 est constitué d'un anneau 12 fixé par une lanière 13 et passant par l'axe vertical de la cheville. Cette lanière pourra comporter une boucle 14 passant autour de la cheville (figure 2) ou être fixée directement sur le bottillon 1 (figure 3). Elle pourra également être fixée à des éléments d'accrochage 15 de deux

-3-

disques 16 situés sur les faces interne et externe du bottillon et maintenus au moyen de bandelettes 17 passant par des fentes 18 prévues à cet effet (figures 4 à 6).

Les bottillons seront avantageusement multi-tailles et présenteront  
5 dans ce but une partie avant 19 ouverte. Afin de faciliter leur mise en place et leur retrait, ils pourront être fendus sur toute leur longueur et être fermés au moyen de sangles 20 (figure 3) ou d'une fermeture souple à glissière 21 ou "fermeture Eclair"  
(figure 4).

10 Le sandow 3 et la drisse 4, de préférence en polypropylène, auront tous deux une longueur de l'ordre de 5 mètres.

Un masque et un tuba seront avantageusement ajoutés dans le paquetage commercial de distribution. Ces accessoires agrémentent le confort en  
15 crawl, mais ne sont pas indispensables pour la brasse.

Pour utiliser le dispositif, il suffit de trouver un point fixe, solide dans l'axe médian de la piscine. La drisse 4 est disposée entre ce point fixe et le bord de la piscine et accrochée au sandow 3, lui-même attaché aux bottillons 1.

20 Le sandow élastique procure la souplesse d'utilisation et renforce le travail des membres inférieurs sans entraver leurs mouvements ].

Le positionnement des divers éléments constitutifs donne à l'objet de l'invention un maximum d'effets utiles qui n'avaient pas été, à ce jour, obtenus par  
25 des dispositifs similaires.

## REVENDICATIONS

5                   1°. Dispositif de natation en piscine, ayant pour objet de faciliter  
l'entraînement sportif d'un nageur en bassin sans nécessiter d'installation coûteuse,  
                      caractérisé par la combinaison d'un sandow (3) double retenu au sol  
du bord (6) du bassin au moyen d'une drisse (4) se fixant à un système d'ancrage  
tel que piquet, piton ou crochet (7) et d'une paire de bottillons (1), ou protections de  
10 chevilles, comportant chacun un élément d'attache (2) disposé de façon à se trouver  
dans le prolongement de la jambe (8) de l'utilisateur (10).

15                  2°. Dispositif selon la revendication 1, se caractérisant par le fait que  
l'élément d'attache (2) est constitué d'un anneau (12) fixé par une lanière (13) sur  
le bottillon (1).

                      3°. Dispositif selon la revendication 2, se caractérisant par le fait que  
la lanière (13) est fixée directement sur le bottillon (1).

20                  4°. Dispositif selon la revendication 2, se caractérisant par le fait que  
la lanière (13) comporte une boucle (14) passant autour de la cheville de l'utilisateur  
(10).

25                  5°. Dispositif selon la revendication 2, se caractérisant par le fait que  
la lanière (13) est fixée à des éléments d'accrochage (15) de deux disques (16)  
situés sur les faces interne et externe du bottillon et maintenus au moyen de  
bandelettes (17) passant par des fentes (18) prévues à cet effet sur les disques.

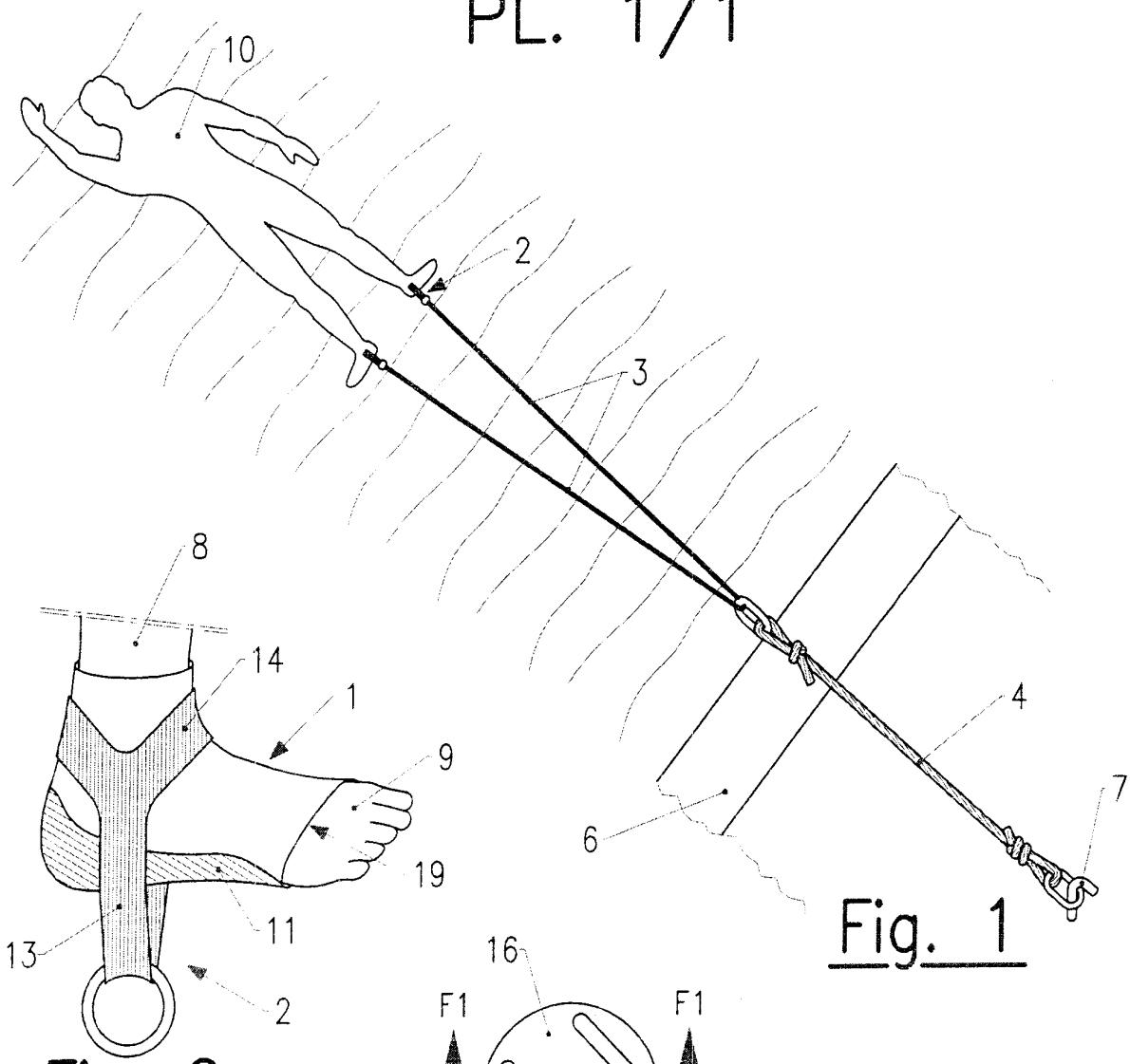
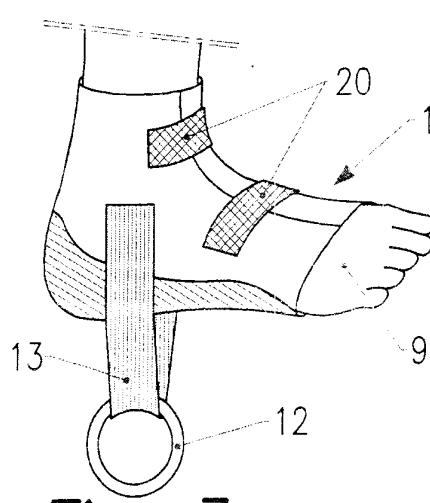
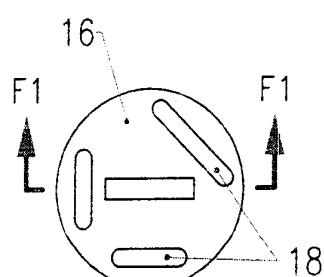
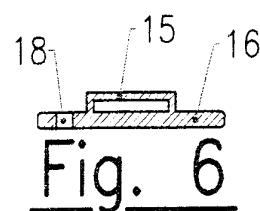
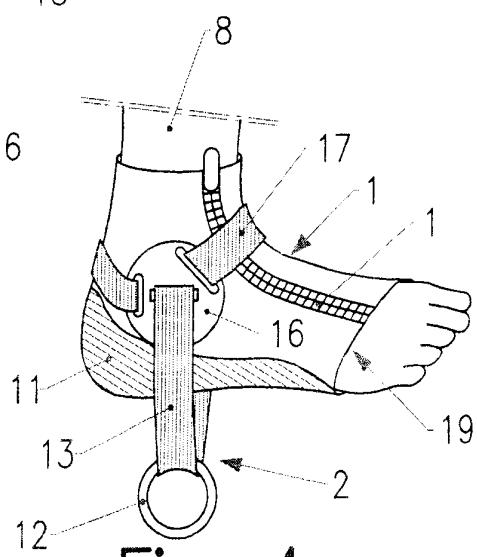
30                  6°. Dispositif selon l'une quelconque des revendications  
précédentes, se caractérisant par le fait que chaque bottillon (1) est un élément en  
titanium, lycra, néoprène ou matériau similaire recouvrant la cheville, le bas de la  
jambe (8) et une partie du pied (9) de l'utilisateur (10).

7°. Dispositif selon la revendication 6, se caractérisant par le fait que les bottillons (1) sont pourvus d'une semelle 11 en matériau plus rigide.

8°. Dispositif selon l'une quelconque des revendications 6 et 7, se caractérisant par le fait que les bottillons (1) sont multi-tailles et présentent dans ce but une partie avant (19) ouverte.

9°. Dispositif selon l'une quelconque des revendications 6 à 8, se caractérisant par le fait que, pour faciliter leur mise en place et leur retrait, les bottillons (1) sont fendus sur toute leur longueur et fermés au moyen de sangles (20) ou d'une fermeture souple à glissière (21) de type "fermeture Eclair".

PL. 1/1

Fig. 2Fig. 3Fig. 5Fig. 6Fig. 4



US005344373A

# United States Patent [19]

Greene

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[45] Date of Patent: Sep. 6, 1994

[54] STATIONARY SWIMMING APPARATUS

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[21] Appl. No.: 910,668

[22] Filed: Jul. 8, 1992

[51] Int. Cl.<sup>5</sup> A63B 31/00

[52] U.S. Cl. 482/55; 482/121;  
482/124

[58] Field of Search 128/DIG. 15; 482/124,  
482/55

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Primary Examiner—Richard J. Apley

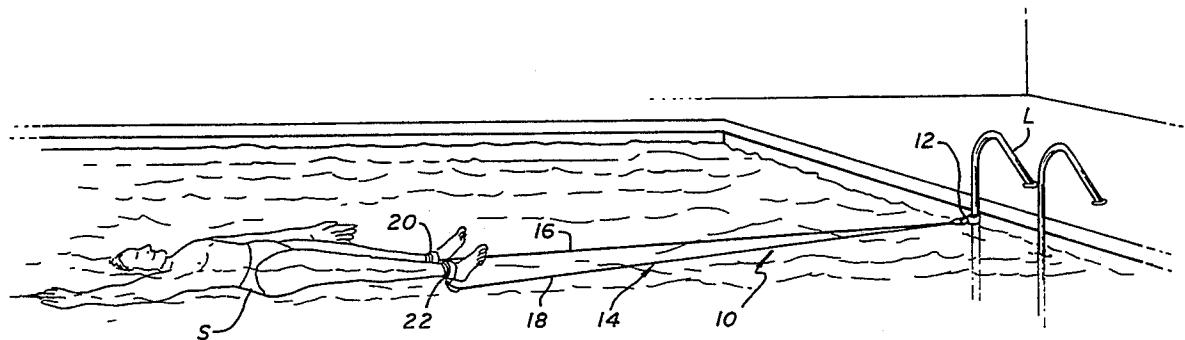
Assistant Examiner—Jerome Donnelly

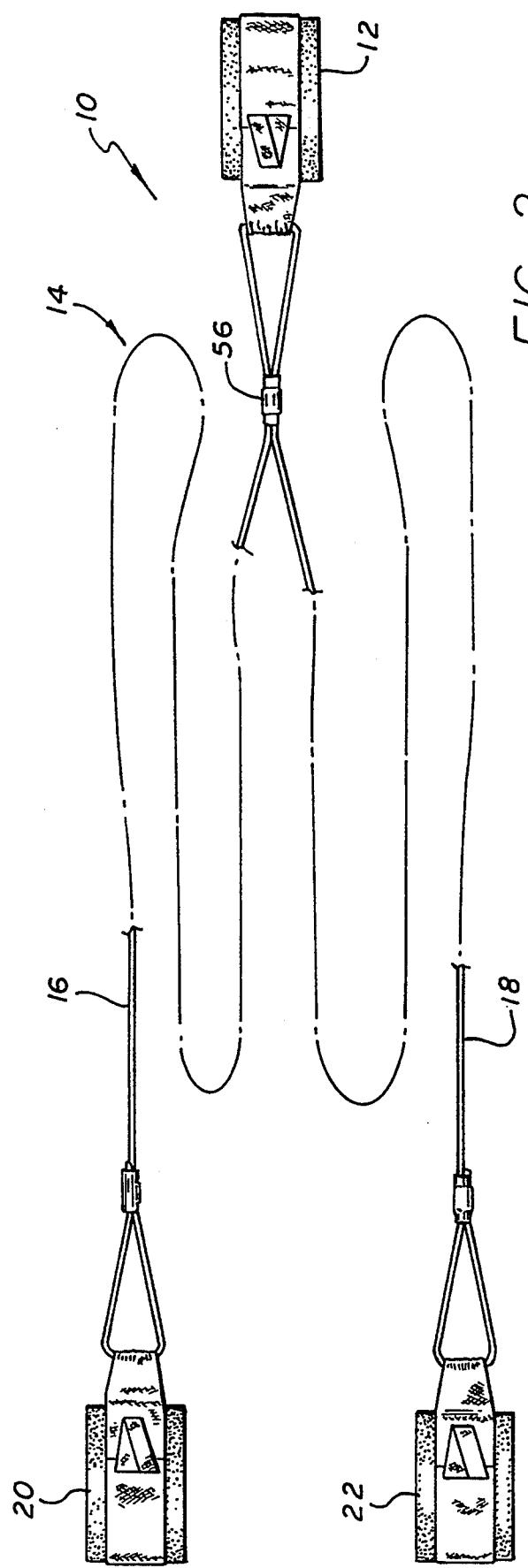
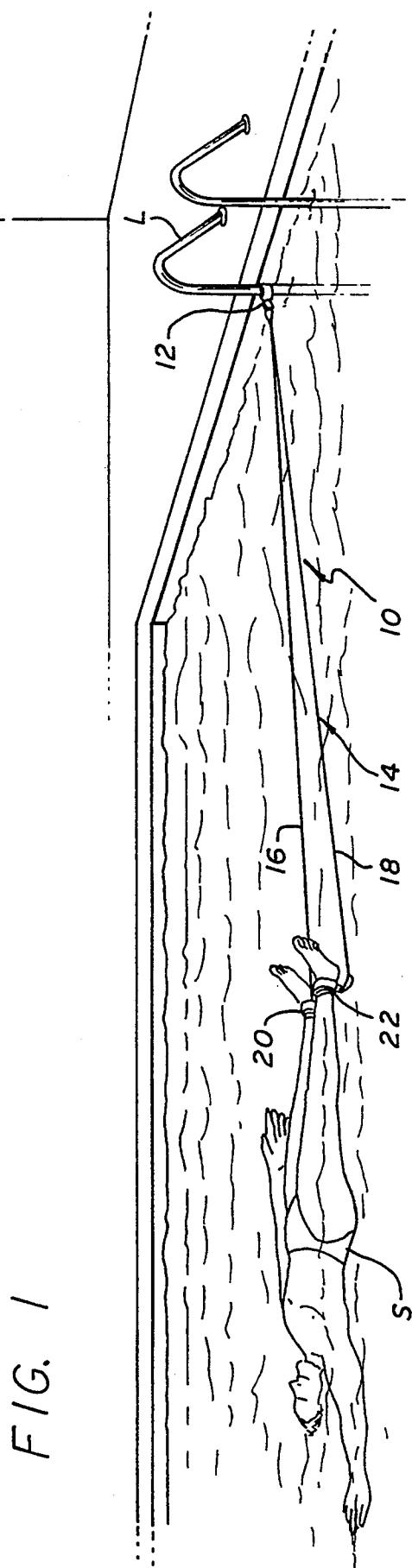
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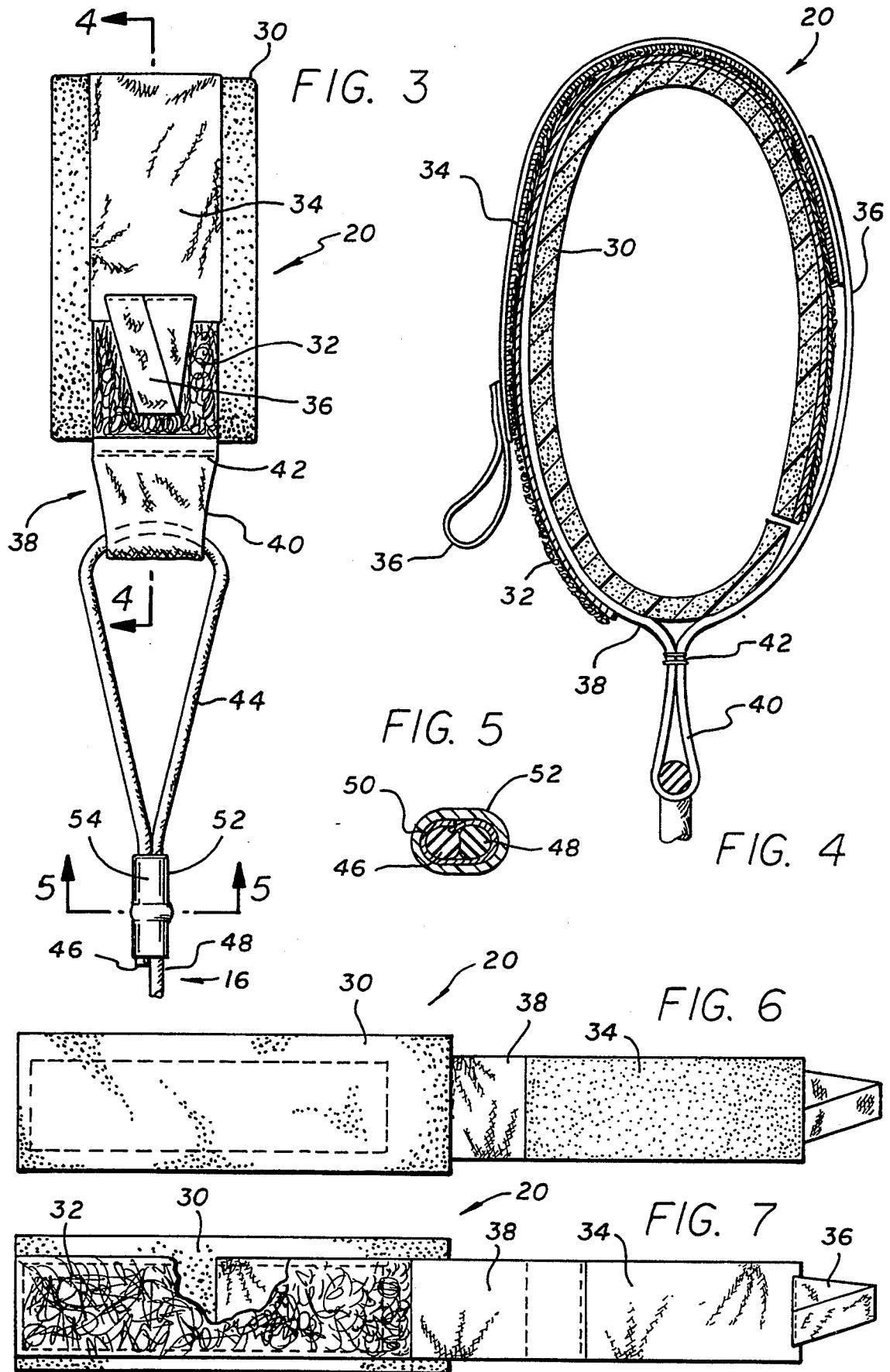
## ABSTRACT

A device for pool use that holds a swimmer stationary. A base strap attaches to a stationary poolside object. Two ankle straps are directly connected to said base strap by two elastic cords, respectively. The ankle straps are attached to a swimmer's ankles. The swimmer can then engage in continuous swimming exercise in a small pool as the stationary swimming apparatus holds the swimmer stationary with respect to the poolside object.

4 Claims, 2 Drawing Sheets







## STATIONARY SWIMMING APPARATUS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to swimming devices and more particularly to a swimming device that allows the swimmer to swim in the water while preventing the swimmer from traveling through the water.

#### 2. Description of the Related Art

Numerous devices have been invented and produced for swimming and related recreational water activities. Rafts, swim masks, and various other toys are all known in the art.

Swimming is considered to be one of the best exercises available, better even than that of running or jogging, as swimming is a low impact sport. Swimming exercises both sets of the swimmer's extremities and provides the highly aerobic activity that running does without the destructive impacts that are continually placed upon the joints of a runner.

Recently, and with the increased interest in better health through physical fitness, devices have appeared on the market that allow a person to exercise in the water to take advantage of the drag inherently present with any motion through the water. One such device is a set of water dumbbells that substitutes the drag of the water for the force previously provided by weights. A second device is a flotation device that wraps around a person's midsection to allow the person to float safely upright in the water while engaging in the same physical motion runners or joggers perform while running or jogging. For both devices, the drag of the water provides a resistive force that not shock or jar the person's body. Further, the drag of the water is continuous and so exercises any muscle or muscle group continually throughout the entire articulation of that muscle or muscle group.

Both of these devices provide exercise and develop the muscles of their users, but they do not provide the same rigorous exercise as does swimming. Consequently, while these devices have their place, they do not replace swimming as one of the most, if not the most, desirable exercises for improving health through physical activity.

While swimming is good exercise, not all people are able to engage in swimming activity. There are several possible reasons. A swimming pool or facility may not be available. A pool or facility may be available, but it may be too small for a swimmer to engage in the continuously repetitive swimming strokes that require a pool of some size. With a small pool, a swimmer may be able to cover the longest length of the pool in only a few strokes, forcing the swimmer to reverse direction several times a minute. Swimming under such circumstances in a small pool forces the swimmer to concentrate on his or her position in the pool rather than on the swimming strokes. Further, the enjoyable aspects of swimming derived from the ongoing rhythmic activity are completely disrupted by having to stop and turn every ten or twelve strokes. While a small pool is not preferable when swimming for exercise, such a pool might be readily available, especially to the many people living in apartment complexes that have a small pool available for the tenants. For some areas, above-ground pools are common and may be readily available.

Large swimming pools or facilities are expensive and are only infrequently constructed for private use, even

by wealthy individuals. Such larger facilities also require major upkeep with its accompanying inconveniences. While a large swimming pool is probably the best place to engage in swimming, such facilities are not privately available to most people.

However, public swimming facilities on a large scale may be available to the public in general. In most metropolitan areas, public swimming facilities are provided that would allow a person to engage in swimming for exercise. While these public facilities do provide a place where people may swim for exercise, such facilities may be crowded. It is difficult to make the long pool-length courses desirable when swimming for exercise when the path is littered by other individuals having fun and otherwise using the public pool as is proper.

Swimming for exercise programs may be available at certain times of the day at certain swimming facilities. Organizations such as the YMCA, YWCA, or other similar organizations may have programs that allow a swimmer to use a pool for exercise swimming. Of course, it then becomes necessary for the swimmer to fit his or her schedule to one that is imposed by the program or organization. If the swimmer's schedule does not mesh with that of the program, it may not be possible for the swimmer to take advantage of the program.

For both the public swimming facility and a swimming facility provided by a non-public organization, some travel may be required of the swimmer in order to use the pool. Such travel can cramp an otherwise busy schedule and can reduce the amount of time available to engage in exercise swimming.

In order to engage in exercise swimming, it would be very helpful to combine the convenience of a small pool with the travel length of a big pool. One solution to this problem is to create a current of flowing water in a small pool that runs counter to the direction of the swimmer's travel. Such pools have been previously advertised in magazines. The installation of such a countercurrent pool, or the modification of an existing pool to perform as a counter-current pool, can only be made at a significant expense and subsequently requires significant upkeep that can be inconvenient.

U.S. Pat. No. 4,948,117 issued to Burke on Aug. 14, 1990 discloses a swim band that allows a swimmer to use almost any swimming pool to engage in continuous exercise swimming. By releasably attaching harnesses to the swimmer's legs and then by attaching the harnesses to the swim band, a swimmer is tethered in place so that he or she can swim without moving relative to the point of attachment. While the Burke device represents some improvement over the prior art, some drawbacks remain that detrimentally affect the use and manufacture of the Burke swim band.

The primary problem with the Burke swim band is the use of harnesses to attach the swim band to the swimmer's lower extremities. While providing an effective means of attachment to the swimmer, Burke's harnesses are not as effective as other configurations might be and hinder the swimmer's physical activity in the water.

As can be seen from the drawings in the Burke patent, the harness requires two points of attachment to the belt that wraps around the swimmer's lower extremity. Having two points of attachment at least doubles the potential interference the harness will have with the swimmer's foot. It is much more advantageous to have but a single point of attachment between the swimmer's

foot and a device holding the swimmer stationary in the water. With but a single point of attachment, the cord holding the swimmer in place is more easily avoided and less effort must be made by the swimmer to avoid the attachment and the cord. Even greater advantages would be presented to the swimmer if the single point of attachment were adjustable so that for whatever stroke the swimmer engages in, the best and least entangling position is attained for the point of attachment.

In attaching the belts to the swimmer's lower extremities, Burke does not provide easy means by which the swimmer may disengage from the swim band. It may become necessary, especially in the case of an emergency, for the swimmer to disengage from the Burke swim band. The belts in Burke do not provide easy means for disengagement and those belts may be difficult to pull apart or otherwise uncouple. Further, the harnesses in Burke are not easily disengaged from the swim band as the spring-biased keeper must be found not only for one, but for both harnesses. Under the stress of an urgent situation it may be difficult to disengage the harnesses from the swim band and/or the belts from the swimmer.

The Burke harness also requires directional biasing of the flexible fabric strap (reference number 34). The directional biasing of the flexible fabric strap may work adequately for freestyle or Australian crawl swimming. However, such directional biasing of a loop would not work adequately for other swimming strokes such as the backstroke, the butterfly stroke, or the breast stroke.

These swimming strokes call for different motions of the swimmer's feet than is performed for the Australian crawl. For these other swimming strokes with their different foot motions, the directionally biased loop provides many more opportunities for the swimmer's foot to become entangled with the harness. Further, the directionally biased loop can only be attached to the foot in one of two ways in order for the swimmer's foot to fit within the loop. This lack of adjustability of Burke's harness makes entanglement of the swimmer's foot by the harness more probable.

Burke's detachable harnesses may also encumber the swimmer's feet at the point the swim band attaches to the harness. Additional and potentially encumbering structures are present in the Burke swim band in order to allow the harnesses to detach from the swim band. Whatever form taken by these means of detachment, they can only detract from the integrity and effective use of the swim band. Further, allowing the harnesses to detach from the swim band requires greater effort and expense in order to make and manufacture a Burke swim band. Also, if one of the detachable harnesses were to be misplaced, the Burke swim band would be rendered useless as the swimmer would not be able to enjoy a balance of forces used to restrain the swimmer and maintain him or her in place. If only one harness attached one leg of the swimmer to the swim band, the swimmer would be restrained in an unbalanced way that would greatly detract from the effective use and enjoyment of Burke's swim band.

Further manufacturing difficulty and expense is required by a Burke swim band at the buckle and the anchor strap due to the variety of materials demanded by the Burke design.

It can readily be seen that there is a need for a stationary swimming device that potentially entangles the swimmer to the least possible extent, that allows the engagement by the swimmer in the greatest number of

swimming strokes, that allows the point of attachment to the swimmer to be adjusted to the greatest possible extent, that minimizes the risk imposed by misplaced parts, and that can be manufactured in an inexpensive way that requires a minimum of different materials.

#### SUMMARY OF THE INVENTION

The present invention resides in a stationary swimming device that is easy to use effectively with any swimming stroke and that is readily manufactured using a limited number of easily obtained materials.

VELCRO hook and loop fasteners provide means of attachment to a stationary poolside object and to the ankles of the swimmer. Nylon straps are securely connected to the VELCRO fasteners and provide loops through which a Bungee cord can be passed so that the VELCRO fasteners are securely attached to the Bungee cord. A significant length of Bungee cord separates the base strap from the ankle straps so that the swimmer may put some distance between himself and the base. Neoprene rubber or the like cushions the attachment between the swimmer and the ankle straps and reduces any friction therebetween.

By attaching the base strap to a stationary poolside object and by attaching the ankle straps to himself, the swimmer can inexpensively and easily engage in the beneficial, low-impact sport of continuous exercise swimming without requiring a large, private pool facility or a small, counter-current pool.

#### OBJECTS OF THE INVENTION

It is an object of this invention to provide means by which a swimmer can engage in continuous swimming.

It is an object of this invention to provide means by which a swimmer can engage continuously in any of several swimming strokes.

It is an object of this invention to provide means by which a swimmer can engage in continuous swimming by holding the swimmer stationary in the water.

It is an object of this invention to provide stationary swimming means that are adjustable.

It is an object of this invention to provide stationary swimming means that enable the swimmer to engage in any of several swimming strokes with the least encumbrance or entanglement.

It is an object of this invention to provide stationary swimming means that are manufactured easily and inexpensively.

It is an object of this invention to provide stationary swimming means that are not rendered useless by misplacing or losing a part or component by providing an integral device.

These and other objects and advantages of the present invention will be apparent from a review of the following specification and accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a swimmer performing the backstroke using the stationary swimming device of the present invention.

FIG. 2 is a plan view of the present invention.

FIG. 3 is a plan view of the ankle strap of the present invention, showing its attachment to the elastic cord.

FIG. 4 is a cross-sectional view of the ankle strap of FIG. 3 taken generally along line 4-4.

FIG. 5 is a cross-sectional view of the securing means for the elastic cord shown in FIG. 3 taken generally along line 5-5.

FIG. 6 is a plan view of the interior of the ankle strap of FIG. 3.

FIG. 7 is a plan view of the exterior of the ankle strap of FIG. 3.

#### DESCRIPTION OF THE PREFERRED EMBODIMENT(S)

Referring to FIGS. 2-7, the stationary swimming device 10 of the present invention has a base strap 12, an elastic cord 14 having two extensions thereof 16, 18 and two ankle straps 20, 22. The base strap 12 is similar in construction to the two ankle straps 20, 22 and the ankle straps 20, 22 are both similar in construction to each other. A description of the construction of one ankle strap 20 well describes the construction of the other ankle strap 22 and the base strap 12. One difference between the construction of the ankle straps 20, 22 and the base strap 12 that cushioning or padding is not necessary for the base strap 12.

As shown in FIGS. 3-7, the ankle strap 20 is layered. The inner layer is neoprene rubber 30 or other cushioning material. The neoprene layer 30 protects the swimmer's ankle from the other layers of the ankle strap 20, these other layers being durable and strong. The neoprene layer 30 is sewn or otherwise attached to one of two strips 32, 34 of hook and loop fastener, such as that marketed under the name VELCRO. Preferably, the neoprene layer 30 is sewn to the back side of loop portion 32 of the fastener, with the hook portion 34 forming the other half of the ankle strap 20.

The two portions 32, 34 of the hook and loop fastener are approximately two inches wide with the loop portion 32 approximately seven and one-half inches long and the hook portion 34 approximately six inches long. The neoprene layer 30 is approximately nine and one-half inches long. The loop portion 30 of the hook and loop fastener runs the length of the neoprene layer 30, with the excess portion of the neoprene layer 30 serving to provide some overlap to protect the swimmer's ankle.

At the end of the hook portion 34 is a detachment loop 36. The detachment loop 36 is a short length of strong material that is sewn to the end of the hook portion 34. When the ankle strap 20 is attached to the swimmer S, the detachment loop 36 is readily available and accessible by the swimmer S so that the ankle strap 20 may be easily and quickly detached from the swimmer S.

The hook portion 34 and the loop portion 32 of the hook and loop fastener are connected to one another by a strap of material 38, preferably Cordura nylon. One end of the strap 38 travels between the neoprene layer 30 and the loop portion layer 32 approximately three and one-half inches and is sewn or otherwise attached to the other layers. The other end of the strap 38 travels along the exterior of the hook portion 34 of the hook and loop fastener approximately one inch and is sewn or otherwise securely attached to the hook portion 34. Both the loop portion 32 and the hook portion 34 extend out and further from the end of the strap 38. The strap 38 is approximately eleven inches long and provides structural integrity to the ankle strap 20.

Approximately six and one-half inches of strap 38 material lies between the closest connection of the strap 38 with the hook portion 34 and the loop portion 32. Adjacent to the loop portion 32, a loop 40 of strap 38 material is formed by sewing the strap 38 to itself. The loop 40 is approximately one and one-half inches long.

The loop 40 is formed by the sewn seam 42 that serves to hold in place a loop 44 formed from the elastic cord 16. The excess portion of neoprene material from the neoprene layer 30 is increased near the seam 42 and extends along the hook portion side of the strap 38 approximately one inch to provide a protecting overlap of neoprene material for the swimmer's ankle.

The ankle strap loop 40 entraps a corresponding loop 44 formed from the elastic cord 16. The cord loop 44 is approximately five and one-half inches long. The end 46 of the cord 16 is tightly held against another portion 48 of the cord 16 to form the cord loop 44. The cord end 46 is held tightly against the other cord portion 48 by means of one or more clips 50 or other means that force and maintain the cord end 46 against the other cord portion 48. In the art, such clips 50 may be known as "hog clips" and are short pieces of metal that are bent into a tight circle by a pair of special pliers. The entire structure of the cord and clips are enshrouded by shrink wrap 52 to protect the cord 16 and the clips 50. The junction 54 so formed provides a secure means by which the elastic cord 16 and the ankle strap 20 may be attached to one another.

Each Bungee cord extension 16, 18 is approximately six feet long. The two cord extensions 16, 18 may be individual cords, or may be the ends of a centrally fixed single elastic cord. Preferably, the cord extensions 16, 18 are the ends of a single elastic cord that is centrally attached to the base strap 12 by means similar to that used to attach the cord 16 to the ankle strap 20. As is shown in FIG. 2, the cord 14 is fixed at a central cord junction 56. The base strap 12 is similar in construction to the ankle strap 20 save that the neoprene layer 30 used in the ankle strap 20 need not be present.

To use the stationary swimming apparatus of the present invention, the swimmer attaches the base strap 12 to a stationary poolside object such as a pool ladder L as shown in FIG. 1. The ankle straps 20, 22 are then attached to the swimmer's ankles in a snug fashion. The strap loops 40 are typically best situated so that they extend out and away from the swimmer S. When swimming then, the swimmer's feet may come together more closely without interference from the strap loops 40. For the breast stroke, the swimmer may find it more advantageous to locate the strap loops 40 towards the inside of the ankle. For any swimming stroke, the swimmer is enabled by the single attachment of the cord extensions 16, 18 to their respective ankle straps 20, 22 to adjust the point of attachment where the cord extensions 16, 18 attach to the swimmer S anywhere around the swimmer's ankle.

The cord extensions 16, 18 should not be entangled with one another or another object and have the tendency to remain unencumbered once clear of all entanglements. When the swimmer begins to swim, the slack is removed from the cord extensions 16, 18 and the swimmer stretches the elastic cord 14 by swimming until the restraining force of the stationary swimming device balances the forward force of the swimmer in the water. Due to the elastic nature of the cord 14, the paddling movements of the swimmer's feet are not greatly hindered.

The detachment loop 36 present on the ankle strap 20 provides a significant advantage and increases the margin of safety in the stationary swimming device 10 of the present invention. Whenever people are around water, there is always the chance that tragedy may strike and injury occur. The greatest danger is of drowning. The

stationary swimming device 10 of the present invention is designed to restrict the motion of the swimmer relative to the device 10. As the swimmer's motion is restricted, circumstances may arise where it is important, or even crucial, for the swimmer to free him or herself from the stationary swimming device 10.

Typical hook and loop fasteners are intended to fit closely and tightly with each other's counterpart. While this creates an effective means for securing the two portions of the hook and loop fastener to one another, it provides certain difficulties when the two portions of the hook and loop fastener should be disengaged. These certain difficulties are heightened and increased when circumstances are strained and the stress of the moment requires quick and effective action. 15

Beyond the tightness of the hook and loop fastener when the two corresponding portions are engaged, it is sometimes difficult to find an edge where either the hook portion or the loop portion may be grasped so that it may be disengaged from its counterpart. The snug fit 20 by which the two portions engage themselves serve to prevent quick and easy disengagement.

In order to quickly and easily disengage the hook and loop portions 32, 34 of the ankle strap 20, the detachment loop 36 is provided so that not only can a convenient "edge" be found so that the hook portion 34 can be pulled away from the loop portion 32, but also to provide leverage against the adhesion between the hook portion 34 and the loop portion 32 and to provide an easily graspable means for doing so. The detachment 30 loop 36 is one of only two extensions present on the exterior of the ankle strap 20. The other extension is the strap loop 40 with the connected elastic cord extension 16.

Should an emergency or urgent situation arrive such 35 that it is imperative that the swimmer disengage from the stationary swimming device 10, the swimmer can do so easily as the swimmer will know the location of the strap loop 40 and cord extension 16 by feel. The detachment loop 36 can easily be found by the swimmer S by 40 reaching for his ankle. No harnesses are present to entangle or impede the disengagement and only a quick, strong yank on the detachment loop 36 is necessary to free the swimmer's ankle from the ankle strap 20.

In the water, the design of the present invention provides significant advantages. There are no detachable parts to be lost or misplaced. The present device can be adjustably attached to the swimmer's ankle to provide the best or most comfortable fit. The present device can be easily stored, easily manufactured, and easily used 50 with a minimum of inconvenience. With the added safety of the detachment loops 36, the stationary swimming device 10 of the present invention provides excellent means to achieve the beneficial exercise of continuous swimming in readily available pools. 55

While the present invention has been described with regards to particular embodiments, it is recognized that additional variations of the present invention may be devised without departing from the inventive concept.

What I claim is:

1. A stationary swimming apparatus comprising:  
first and second ankle straps, each of said first and second ankle straps including:

an elongated flexible ankle strap element having a substantially uniform width, said ankle strap element including a first end portion, a central portion and a second end portion, said central portion being longitudinally folded and secured to itself 65

along a transverse seam so as to define an attachment loop;

a first elongated flexible fastening strap element having an associated width generally equal to the width of said ankle strap element, said first fastening strap element including first and second ends with the first end thereof overlying and being fixedly secured to the first end portion of said ankle strap element and the second end thereof extending longitudinally away from said ankle strap element, said first fastening strap element carrying a plurality of hook-type fastening elements that project from one side thereof;

a second elongated flexible fastening strap element having an associated width generally equal to the width of said ankle strap element, said second fastening strap element including a first end fixedly secured to and entirely overlying the second end portion of said ankle strap element and a second end that extends longitudinally away from said ankle strap element, said second fastening strap element carrying a plurality of loop-type fastening elements that project from one side thereof; and an elongated cushioning element having an associated width that is greater than the width associated with said second fastening strap element, said cushioning element being positioned along a side of said second fastening strap element opposite the side of said second fastening strap element that carries said plurality of loop-type fastening elements, said cushioning element being securely attached to said second fastening strap element with the second end portion of said ankle strap element sandwiched therebetween, said cushioning element including first and second ends that extend longitudinally beyond the first and second ends of said second fastening strap element respectively;

an elastic cord having a first end portion, a central portion and a second end portion, each of said first and second end portions of said elastic cord defining loop that is interengaged with the attachment loop formed in a respective one of said ankle strap elements; and

releasably attachable base strap means to which the central portion of said elastic cord is attached, said base strap means being selectively, releasably attachable to a fixed poolside structure such that, when the stationary swimming apparatus is used in a pool with each of said first and second ankle straps being wrapped about a respective ankle of a user and secured by interengaging the plurality of hook-type fastening elements of said first fastening strap element with the plurality of loop-type fastening elements of said second fastening strap element and said base strap means is releasably attached to a poolside object, the user can practice various swimming strokes without traveling through the water.

2. Stationary swimming apparatus of claim 1, and in which said releasably attachable base strap means includes hook and loop-type fastener means and is comprised by

an elongated flexible base strap element having a first end and a second end;

an elongated flexible base strap hook element comprising a first element of said base strap hook and loop-type fastener means and having a width selected so as to be generally coextensive with the

width of said base strap element and of a pre-selected length, said base strap hook element having a first end and a second end;

means for fixing said base strap hook element first end to said base strap element so as to overlie and extend beyond said first end thereof and be in longitudinal alignment with said base strap element so as to extend away from said base strap element second end;

an elongated flexible base strap loop element comprising a second element of said base strap hook and loop-type fastener means and having a width selected so as to be generally coextensive with the width of the base strap hook element and of a pre-selected length, said base strap loop element having a first end and a second end;

means for fixing said base strap loop element second end to said base strap element so as to overlie and extend beyond said second end thereof and be in longitudinal alignment therewith so as to extend away from said base strap element first end; and

base strap loop means formed on the base strap element between the first end and the second end thereof so as to form a loop which extends transversely across the width of the base strap element and engages a loop formed in the elastic cord intermediate the ends thereof to attach the base strap to the elastic cord.

3. The stationary swimming apparatus of claim 2, and in which a selected one of said ankle strap hook element and said ankle strap loop element for each of said first and second ankle strap means has a detachment loop fixed thereto so as to extend longitudinally away from the end thereof which is not attached to the ankle strap element.

4. The stationary swimming apparatus of claim 1, and in which a selected one of said ankle strap hook element and said ankle strap loop element for each of said first and second ankle strap means has a detachment loop fixed thereto so as to extend longitudinally away from the end thereof which is not attached to the ankle strap element.

\* \* \* \* \*

# United States Patent [19]

Burke

[11] Patent Number:

4,948,117

[45] Date of Patent:

Aug. 14, 1990

## [54] SWIM BAND

[76] Inventor: Douglas L. Burke, 133 Syracuse Walk, Long Beach, Calif. 90803

[21] Appl. No.: 312,688

[22] Filed: Feb. 21, 1989

[51] Int. Cl.<sup>5</sup> ..... A63B 21/00

[52] U.S. Cl. ..... 272/71; 272/136

[58] Field of Search ..... 272/71, 136, 139, 900, 272/125, 137, 138; 114/215, 55

## [56] References Cited

### U.S. PATENT DOCUMENTS

4,544,155 10/1985 Wallenbrock et al. ..... 272/136  
4,685,671 8/1987 Hagerman et al. ..... 272/139

### FOREIGN PATENT DOCUMENTS

0529810 of 1956 Canada ..... 272/900

Primary Examiner—Stephen R. Crow

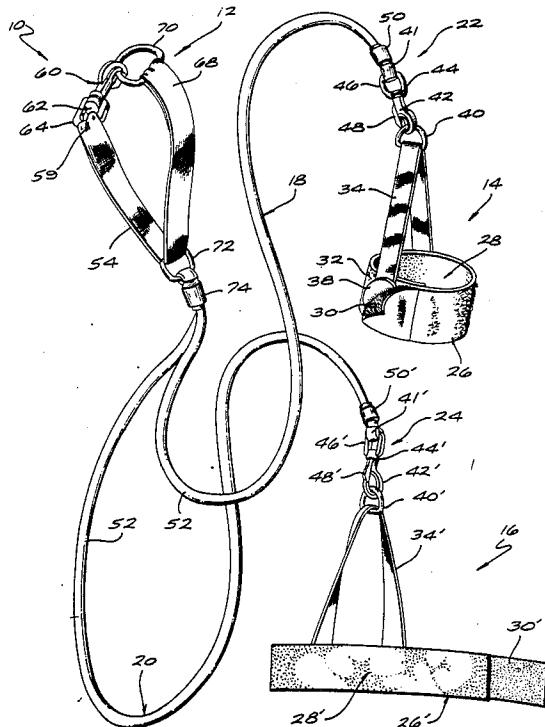
Attorney, Agent, or Firm—Kelly, Bauersfeld & Lowry

[57]

## ABSTRACT

A swim band is provided for tethering a swimmer in a substantially stationary location within the water while swimming. The swim band utilizes two harnesses which attach the swim band to the swimmer's lower extremities in a releasable and an adjustable fashion. Each harness comprises a flexible belt having a coupling ring attached thereto by a strap. The harnesses are detachably connected to clasps attached at opposite ends of an elongated elastic tubing. The elastic tubing is secured to an anchor strap which is utilized to connect the swim band to a stationary point within or located outside of the water.

19 Claims, 2 Drawing Sheets



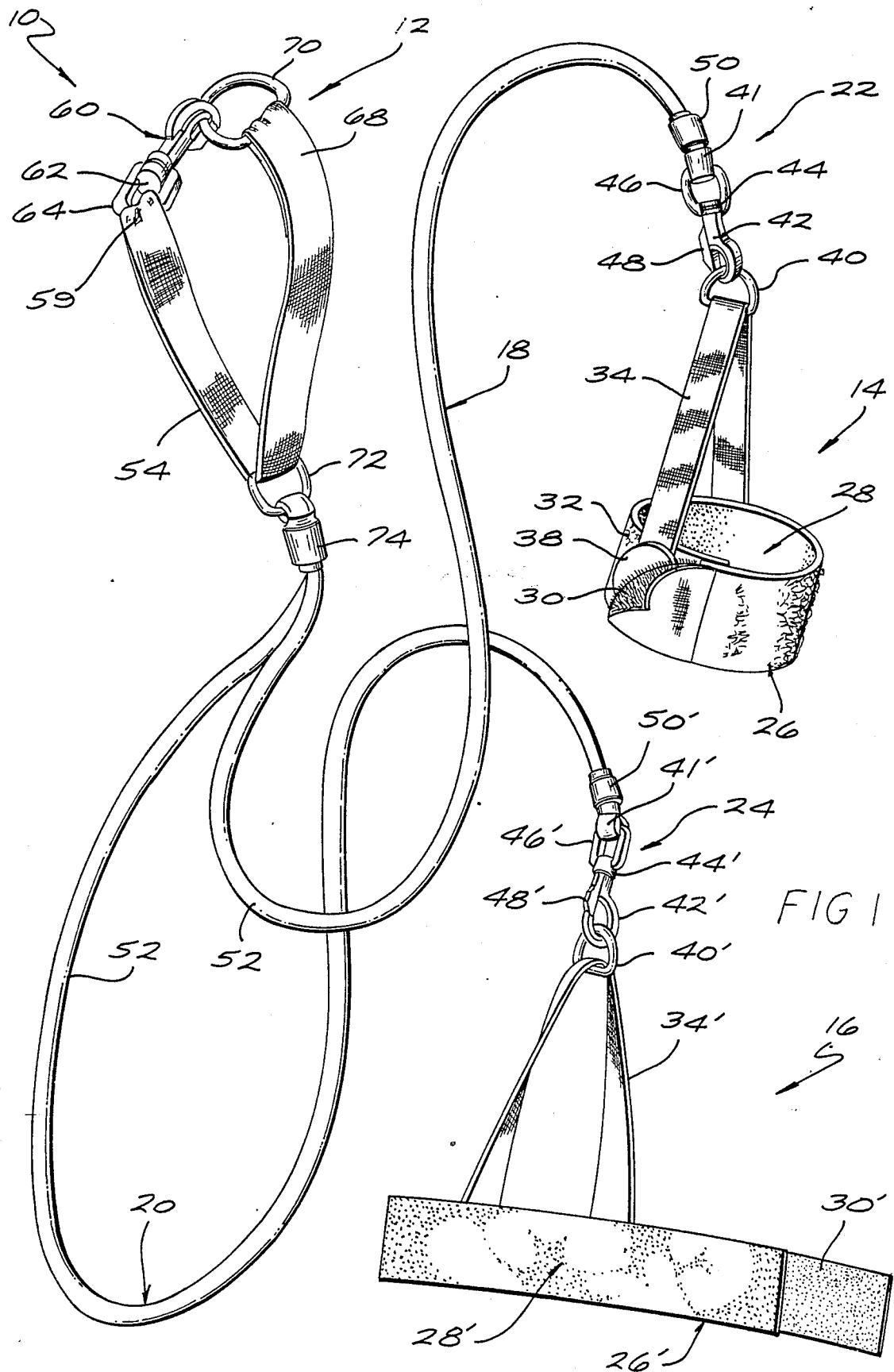


FIG. 2

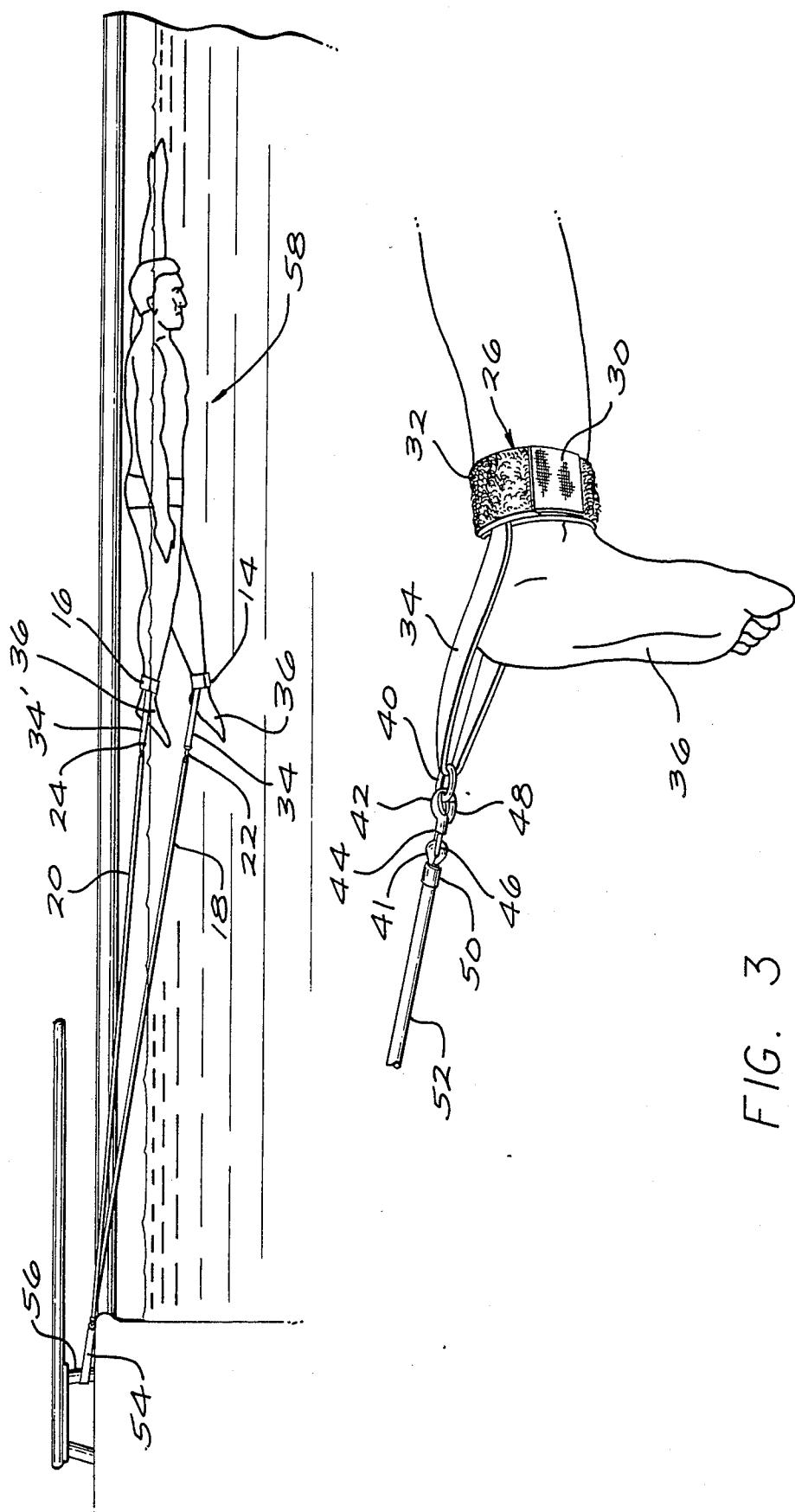


FIG. 3

## SWIM BAND

## BACKGROUND OF THE INVENTION

This invention relates generally to an exercising and training aid for swimmers. More particularly, this invention relates to an improved device for maintaining a swimmer substantially in place within the water while allowing the freedom of movement necessary for executing normal swimming strokes.

A common difficulty encountered by swimmers trying to develop endurance, speed and swimming rhythm, is that many swimming areas are inadequate for proper training and exercise. Small home swimming pools of a length less than 25 feet are difficult to practice in because the restricted size of such pools requires the swimmer to turn and change direction too often. Larger public pools are usually crowded, thereby presenting the drawback that the swimmer in training must worry about hitting other swimmers rather than being able to fully concentrate upon the improvement of stroke mechanics, swimming speed, etc. The use of natural bodies of water as training areas is also less than ideal because current flow introduces a drifting effect whereby the swimmer is carried downstream. In short, in order for a swimmer to properly train and exercise while avoiding the above-mentioned drawbacks, a relatively large, dedicated swimming/training area is necessary. Unfortunately, most homeowners lack either the yard space or the financial resources necessary to accommodate such a large pool.

In order to enable a swimmer to get a vigorous workout in a pool which is otherwise inadequate for training exercises, devices have been invented for in-place swimming, whereby the swimmer is restrained to remain relatively stationary within the water while swimming. In-place swimming apparatus for use in existing pools are shown, for example, in U.S. Pat. Nos. 4,544,155; 4,109,905; 4,524,711 and 4,577,859. Many such in-place swimming devices are less than ideal because they either hinder the use of normal swimming strokes, do not adequately provide for the swimmer's comfort, are mechanically complicated, or are not portable.

Generally, prior in-place swimming devices commonly utilize a ring-like harness attached around the swimmer's waist or mid-section to hold the swimmer in place. However, the use of a waist or mid-section harness to restrain the swimmer often disadvantageously affects the swimmer's posture in the water or interferes with the normal breathing movements of the swimmer's diaphragm. Moreover, if the swimmer attempts a strength workout by straining against the harness to add the resistance of the harness to the resistance of the water, thereby presenting a greater force challenging the swimmer's muscles, prior waist or mid-section harnesses will often cut uncomfortably into the swimmer's midriff.

There exists, therefore, a need for an improved device for in-place swimming which maintains the swimmer in a substantially stationary position within the water without hindering the normal breathing and stroking movements of the swimmer. Additionally, an improved in-place swimming device is needed which does not attach around the swimmer's mid-section and that is relatively inexpensive, easy to use and highly portable. Finally, an improved in-place swimming device is needed which comfortably enables a training swimmer to get a heightened workout by straining

against the resistance of restraint means as well as against the resistance offered by the water. The present invention fulfills these needs and provides other related advantages.

## SUMMARY OF THE INVENTION

In accordance with the invention, an improved swim band is provided which enables a swimmer to remain substantially in-place while swimming, while avoiding the noted drawbacks of prior devices. The swim band generally comprises two harnesses that releasably attach to the swimmer in a manner which will not impede execution of normal swimming strokes, and elongated, elastic tethering means or bands for connecting each harness to anchoring means which are secured to a stationary point located adjacent to the swimming area.

The improved swim band of the present invention advantageously enables a swimmer to exercise in a relatively limited swimming area, such as a small or crowded pool, and further provides means for the swimmer to remain anchored to a spot located externally of a river or other flowing body of water, thereby allowing one to swim in-place without drifting downstream. Yet another advantage of the improved swim band is the training benefit derived when the swimmer pulls against the tension of the elastic tethering means, thereby attempting to overcome a greater resistance than that presented by the water alone. As a result, after training with the swim band, when one swims without being restrained by it, the swimmer's pulling stroke will appear lighter and easier. Further advantages of the swim band are found in utilization of the harnesses which will not chafe the swimmer's skin, interfere with the normal breathing movements of the swimmer's diaphragm, nor interfere with the normal stroke movements of the swimmer's limbs.

Thus, a device for in-place swimming is provided which is ideal for exercise, rehabilitation, training and relaxation. The swim band also provides an excellent aid in the teaching of proper stroke mechanics by enabling a novice swimmer to practice in-place adjacent a swimming instructor.

In accordance with a preferred form of the invention, first and second harnesses are provided for removably and adjustably attaching the swim band to the lower extremities of the swimmer, such as around the swimmer's ankles, feet, calves, thighs, etc. Each harness comprises a flexible belt having hook and loop tape for fastening the belt snugly around the swimmer. The belt of each harness has a flexible fabric strap attached thereto. A ring member is retained on each flexible fabric strap in a manner allowing the ring members to freely slide along their respective strap.

The first and second harnesses are tethered by first and second elongated elastic bands, respectively, to the means for anchoring the swim band to a stationary point. The first elastic band has a first clasp at one end for detachably engaging the ring member of the first harness. The first clasp comprises a hook-like member having a base portion and a spring biased keeper that releasably closes the hook-like member around the ring member. The hook-like member is rotatable relative to its base portion. The second elastic band has a similar second clasp for detachably engaging the ring member of the second harness.

The base portion of the first clasp is configured with a ring-like portion. One end of the first elastic band

passes through the ring-like portion of the first clasp and is doubled back upon itself to form a loop within which the ring-like portion is captured. The loop is secured by inner and outer elastomeric skin shrouds which tightly bind around a portion of the doubled back first elastic band. In this manner the first elastic band is connected to the first clasp. In a similar arrangement, an end of the second elastic band is connected to the second clasp.

Both the first and second elastic bands are connected to the anchoring means for the swim band. Preferably, the first and second elastic bands comprise a length of latex tubing having one end connected to the first clasp and the opposite end connected to the second clasp. The mid-point of the tubing is coupled to the anchoring means such that first and second harnesses are each tethered to the anchoring means by substantially equal lengths of tubing. Alternatively, separate pieces of elastic tubing can be utilized as the first and second elastic bands.

The means for anchoring the swim band comprises a flexible fabric strap, preferably Nylon, having coupling means located at opposite ends of the strap. One end of the strap is configured as a loop within which a ring is retained, and the other end of the strap provides a hook-like member similar to that described above in conjunction with the first and second clasps. The anchoring means is wrapped around a stationary point such as a diving board support or pool ladder, and then its hook-like member is releasably closed around the ring retained at one strap end. A buckle encircling the strap of the anchoring means and being freely slidably thereon, is used for attaching the elastic tubing to the anchoring means. In the preferred form of the invention wherein a single elongated piece of tubing is used as the first and second elastic bands, this tubing passes through the buckle and is doubled back upon itself in a manner forming a loop within which the buckle is captured. One or more elastomeric skin shrouds snugly bind the doubled back portion of the tubing.

In use, the anchoring means is first secured to a stationary point conveniently located adjacent to the swimming area. Next, the first and second harnesses are attached to the swimmer, and then both harnesses are tethered to the anchoring means by engaging the first and second clasps with their respective harnesses. At that point, the swimmer is ready to begin in-place swimming.

Other features and advantages of the present invention will become apparent from the following more detailed description, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

#### BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings illustrate the invention. In such drawings:

**FIG. 1** is a perspective view of a swim band embodying the invention;

**FIG. 2** is a perspective view of a swimmer being maintained in-place while swimming, also illustrating the anchoring means attached around a diving board support; and

**FIG. 3** is a fragmented perspective view illustrating a harness attached around an ankle of the swimmer.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

As shown in the drawings for purposes of illustration, the present invention relates to an improved swim band 10 for maintaining a swimmer substantially in-place while allowing relatively free movement for the execution of normal swimming strokes. The swim band 10 generally comprises anchoring means 12 (FIG. 1) for securing the swim band to a stationary point located adjacent to a swimming area, and first and second harnesses 14 and 16 which are removably attachable to a swimmer and are tethered to the anchoring means 12 by first and second elongated elastic bands 18 and 20, respectively. Use of the swim band of the present invention to remain substantially stationary within the water during swimming is ideal for exercise, rehabilitation, training, relaxation and the teaching of novice swimmers.

The improved swim band 10 enables a swimmer to train or exercise in a relatively limited swimming area while avoiding the necessity of having to repeatedly turn and change direction. It also beneficially provides means for anchoring a swimmer within a flowing body of water, thereby permitting in-place swimming without becoming subject to current-induced drift. Yet another advantage of the present invention is that it enables one to remain substantially stationary while vigorously working out within a crowded pool, thus greatly alleviating a training swimmer's concerns about colliding with another. Further advantages of the improved swim band 10 of the present invention include its utility as a training aid for improving one's swimming action, whereby a novice swimmer can practice adjacent a swimming instructor while being maintained relatively in-place, rather than moving around the pool and requiring the instructor to follow along. The present invention is also inexpensive, highly portable, and easy to use.

A significant training advantage derived from use of the improved swim band is the strengthening of the swimmer's muscles brought about by continued exertion of the swimmer against the tension of the first and second elastic tethering means, as well as against the normal resistance presented by water. The resultant effect is that upon swimming without the restraint of the swim band, one's pulling stroke, previously trained to overcome the challenging combined resistance of both the water and the stretchable swim band, will be excellently prepared for knifing through water alone. Moreover, the present invention eliminates problems commonly found in prior in-place swimming devices, such as interference with the swimmer's normal stroke or breathing movements, or chafing of the swimmer's skin.

In accordance with a preferred form of the present invention, the first harness 14 is identical to the second harness 16, with FIG. 1 illustrating the former in a fastened configuration and the latter in an open position. Because of their similarity, the following discussion of the first harness 14 applies equally to the second harness 16. In FIG. 1, identical elements of the first and second harnesses 14 and 16 have been designated with the same reference numerals, with the elements of the second harness being differentiated by the inclusion of a prime symbol (') with their corresponding reference numerals. This practice has also been observed in the description included herein of the identical first and second clasps 22 and 24.

The first harness 14 includes a flexible fabric backed foam rubber belt 26 having a Neoprene layer 28 that comprises the inner surface of the belt which contacts the swimmer. The Neoprene layer 28 is smooth and soft, thereby preventing chafing of the swimmer's skin during use of the swim band 10. Hook and loop tape is included for fastening the belt 26. Preferably, hook and loop fastening means are provided by a VELCRO strips 30. The use of VELCRO fastening means beneficially enables one to adjust the tightness of the belt for a comfortable fit.

A flexible fabric strap 34 has each of its ends attached to the outer surface 32 of the belt 26 such that the strap 34 forms a loop extending relatively perpendicular to the belt. This provides a directionally biased loop. The strap 34, which is preferably Nylon, is of a length which is sufficient to create a loop large enough to accommodate one of the swimmer's feet 36, as shown in FIG. 3. Preferably, the ends of the strap 34 are stitched to the outer belt surface 32, with circular foam rubber portions 38 being stitched atop each strap end. A hard plastic ring member 40 encircles the flexible strap 34 and is slidably retained thereon.

The ring member 40 serves as a coupling element in the joining of the first harness 14 to the first elastic band 18. The first clasp 22 is connected to one end 41 of the first elastic band 18 for releasably engaging with the ring member 40. The first clasp 22 comprises a non-metallic, non-corrosive hook-like member 42 having a base portion 44 and a ring portion 46. The hook-like member 42 is rotatable relative to the base portion 44, thereby compensating for rolling movements of the swimmer's lower limb to which the first harness is attached. A spring biased keeper 48 releasably closes the hook-like member 42 around the ring member 40, thereby attaching the first harness 14 to the first elastic band 18.

The end 41 of the first elastic band 18 passes through the ring portion 46 of the hook-like member 42 and is doubled back upon itself in a manner forming a loop within which the ring portion is captured. An inner elastomeric skin shroud (not visible) and an outer elastomeric skin shroud 50 are stretched over a doubled back portion of the end 41 to provide a friction fit hold. Preferably, the inner and outer elastomeric skin shrouds are of a latex material.

As noted above, the second harness 16 is similarly connected to the second elastic band 20 using the second clasp 24. The connection of the second clasp 24 to the second elastic band 20 is also done in the same manner described above.

The first and second elastic bands preferably comprise an elongated continuous length of stretchable surgical tubing 52 having the first clasp 22 connected to one end 41, and the second clasp 24 connected to the opposite end 41'. Alternatively, two separate pieces of tubing 52 can be used as the first and second elongated elastic bands. The stretchable tubing 52 comes in various resistances so that the swim band 10 can be designed to provide a selected one of a variety of different tensions for the swimmer to strain against during a strength workout.

The first and second elastic bands 18 and 20 tether the first and second harnesses 14 and 16 to the anchoring means 12. The anchoring means 12 comprises a flexible anchor strap 54, which is preferably Nylon, having coupling means attached at each of its opposite ends. Various coupling means can be utilized so long as one is

able to fasten the anchor strap 54 to a stationary point, such as a diving board support 56 (FIG. 2).

The coupling means at an end 59 of the anchor strap 54 comprises a hard plastic, hook-like member 60 which is identical in nature to the hook-like member 42 previously described. Specifically, the hook-like member 60 similarly includes a base portion 62, a ring portion 64 and a spring biased keeper 66. The end 59 of the strap 54 passes through the ring portion 64, doubles back upon itself in a manner forming a loop within which the ring portion is captured, and is stitched together in this configuration. The other end 68 is stitched together in an identical loop configuration about a coupling ring 70. Fastening the anchoring means 12 in place is done by wrapping the anchor strap 54 around a fixed point adjacent to the swimming area 58 and engaging the hook-like member 60 with the coupling ring 70.

A buckle 72 encircles the flexible anchor strap 54 and is slidably movable thereon. This buckle 72 should be sized such that it is retained on the flexible strap 54 by the hook-like member 60 at one end and by the coupling ring 70 at the opposite end. The buckle 72 provides a point of attachment for connecting the first and second elastic bands 18 and 20 to the anchoring means 12. This connection is made by passing the stretchable tubing 52 through the buckle 72 and doubling the tubing back upon itself in a manner forming a loop within which the buckle 72 is captured. An inner elastomeric skin shroud (not visible) and an outer elastomeric skin shroud 74 bind the doubled back portion of the tubing adjacent the buckle 72. These shrouds are preferably comprised of a latex material. In an alternative form of the invention, wherein two separate pieces of tubing are utilized as the first and second elastic bands, each piece of tubing is connected individually to the buckle 72 using hook-like members or the like.

In use, the anchoring means 12 is first fastened to a stationary spot located adjacent to the swimming area 58. The harnesses are then fastened around the swimmer's lower extremities. Preferably, the harnesses are attached to the ankles or feet of the swimmer, however the swimmer's calves or thighs could also be used as attachment locations by providing suitably sized belts 26. Finally, the first and second clasps 22 and 24 are used to connect the harnesses 14 and 16 to the tubing which comprises the first and second elastic bands 18 and 20. The swimmer is then ready to begin in-place swimming.

From the foregoing, it will be appreciated that the swim band 10 allows a swimmer to exercise in a relatively stationary area within the water while being restrained in a comfortable manner which does not hinder normal stroking or breathing movements. Further, the swim band is inexpensive, portable and can be adapted to with very little practice. Moreover, the in-place swimming workouts achievable with use of the present invention advantageously enable one to avoid the drawbacks generally associated with swimming in small or crowded pools, or in a flowing body of water. Finally, the stretchable swim band helps to develop a swimmer's muscles by providing additional resistance for the swimmer to overcome during a strength workout.

While a particular form of the invention has been illustrated and described, it will be apparent that various modifications can be made without departing from the spirit and scope of the invention. Accordingly, it is not intended that the invention be limited, except as by the appended claims.

I claim:

1. An apparatus for in-place swimming whereby a swimmer is tethered to a stationary point located adjacent to a swimming area, the apparatus comprising:

a first harness removably attachable to the swimmer at a first location on one lower extremity of the swimmer, wherein the first harness comprises first belt means adapted to be releasably secured around the swimmer at the first location, the first belt means having a first flexible strap attached thereto and supporting a first ring-like member;

a second harness removably attachable to the swimmer at a second location on the other lower extremity of the swimmer, wherein the second harness comprises second belt means adapted to be releasably secured around the swimmer at the second location, the second belt means having a second flexible strap attached thereto and supporting a second ring-like member;

means for anchoring the apparatus to the stationary point located adjacent to the swimming area;

a first elongated elastic band having attached at an end thereof a first clasp for detachably engaging the first harness, wherein the first clasp comprises a first hook-like member in releasable engagement with the first ring-like member, the first hook-like member being attached to a base portion of a third ring-like member, the third ring-like member provided means for joining the first clasp to the first elastic band;

a second elongated elastic band having attached at an end thereof a second clasp for detachably engaging the second harness, wherein the second clasp comprises a second hook-like member in releasable engagement with the second ring-like member, the second hook-like member being attached to a base portion of a fourth ring-like member, the fourth ring-like member providing means for joining the second clasp to the second elastic band; and

means for connecting the first and second elastic bands to the anchoring means.

2. An apparatus as set forth in claim 1, wherein the first and second belt means include fastening means comprising hook and loop tape.

3. An apparatus as set forth in claim 1, wherein the first and second locations are the ankles of the swimmer.

4. An apparatus as set forth in claim 1, wherein the first hook-like member includes a spring biased keeper for closing the first hook-like member around the first ring-like member, and the second hook-like member includes a spring biased keeper for closing the second hook-like member around the second ring-like member, and wherein the first and second hook-like members are each rotatable relative to the base portion attached thereto.

5. An apparatus as set forth in claim 1, wherein the means for anchoring comprises a flexible strap having cooperating coupling means.

6. An apparatus as set forth in claim 5, wherein the first and second elastic bands comprise a continuous length of tubing having one end connected to the first clasp and the opposite end connected to the second clasp.

7. An apparatus as set forth in claim 6, wherein the means for connecting the first and second elastic bands to the anchoring means comprises a buckle through which the flexible strap and the tubing passes.

8. An apparatus as set forth in claim 7, wherein at least one elastomeric skin shroud binds the tubing adjacent the buckle, the tubing being bound in a configuration whereby said tubing is doubled back upon itself to form a loop within which the buckle is captured.

9. An apparatus as set forth in claim 8, wherein the tubing and the at least one elastomeric skin shroud are comprised of a latex material.

10. An apparatus as set forth in claim 1, wherein the first and second flexible straps are attached, respectively, to the first and second harnesses to provide directionally biased loop means for preventing the flexible straps from interfering with articulation of the swimmer's lower extremities.

11. A device for maintaining a swimmer substantially in-place while allowing the swimmer relatively free movement for executing normal swimming strokes, the device comprising:

means for anchoring the device adjacent to a swimming area;

a first harness removably attachable to the swimmer at a first location on one lower extremity of the swimmer, the first harness comprising first belt means which wrap around the swimmer at the first location, the first belt means including means for fastening the first belt means around the swimmer in a releasable and adjustable fashion;

a second harness removably attachable to the swimmer at a second location on the other lower extremity of the swimmer, the second harness comprising second belt means which wrap around the swimmer at the second location, the second belt means including means for fastening the second belt means around the swimmer in a releasable and adjustable fashion;

a first elongated elastic band having located at an end thereof a first clasp for detachably engaging the first harness means; and

a second elongated elastic band having located at an end thereof a second clasp for detachably engaging the second harness, wherein the first and second elastic bands are connected to the anchoring means;

wherein the first harness further includes a first flexible strap attached to the first belt means, the first flexible strap being adapted for coupling with the first clasp, the second harness further including a second flexible strap adapted for coupling with the second clasp, wherein the first clasp includes a hook-like member connected to a base portion of a first ring-like member, the first elastic band being doubled back upon itself at one end in a manner forming a loop within which the first ring-like member is captured, wherein a doubled back portion of the first elastic band is snugly surrounded by an inner elastomeric skin shroud and an outer elastomeric skin shroud, and wherein the second clasp includes a hook-like member connected to a base portion of a second ring-like member, the second elastic band being doubled back upon itself at one end in a manner forming a loop within which the second ring-like member is captured, wherein a doubled back portion of the second elastic band is snugly surrounded by an inner elastomeric skin shroud and an outer elastomeric skin shroud.

12. A device as set forth in claim 11, wherein the anchoring means comprises a flexible fabric strap having a ring member attached at one end and a hook-like

member attached at the opposite end, wherein the hook-like member is adapted to be releasably closed about the ring member.

13. A device as set forth in claim 11, wherein the first and second locations are the feet of the swimmer. 5

14. An apparatus as set forth in claim 12, wherein the first and second flexible straps are attached, respectively, to the first and second harnesses to provide directionally biased loop means for preventing the flexible straps from interfering with articulation of the swimmer's lower extremities. 10

15. A swim band for enabling a swimmer to remain substantially in-place while swimming, the swim band comprising:

a first harness including first belt means having VEL-

CRO portions thereon for releasable and adjustable fastening of the first belt means around the swimmer, the first harness also including a first strap member wherein a first coupling member is slidably retained on the first strap member;

20 a second harness including second belt means having VELCRO portions thereon for releasable and adjustable fastening of the second belt means around the swimmer, the second harness also including a second strap member wherein a second coupling member is slidably retained on the second strap member;

25 means for anchoring the swim band adjacent to a swimming area, wherein the anchoring means comprising a flexible anchor strap having a first end which is doubled back upon itself to form a loop within which a ring-like member is captured, and a second end which is doubled back upon itself to form a loop within which a ring portion of a hook-like member is captured, wherein the hook-like 30

35 member is adapted for releasable engagement with the ring-like member and includes a spring biased keeper closing the hook-like member around the ring-like member, and wherein the ring portion is rotatable relative to a hook portion of the hook-like member; and

10 member is adapted for releasable engagement with the ring-like member and includes a spring biased keeper closing the hook-like member around the ring-like member, and wherein the ring portion is rotatable relative to a hook portion of the hook-like member; and

an elongated, elastomeric tubing having a first clasp located at one end for detachably engaging the first coupling member, and a second clasp located at an opposite end for detachably engaging the second coupling member, wherein the tubing is connected to the anchoring means such that the first and second harnesses are each tethered to the anchoring means by substantially equal length tubing portions.

16. A swim band as set forth in claim 15, wherein the first and second belt means are comprised of fabric having a Neoprene layer thereon.

17. A swim band as set forth in claim 16, Wherein the first and second strap members and the flexible anchor strap are comprised of Nylon and wherein the tubing is comprised of a latex material.

18. A swim band as set forth in claim 16, wherein the first and second coupling members, the first and second clasps, the ring-like member and the hook-like member are all comprised of a nonmetallic, non-corrosive material.

19. A swim band as set forth in claim 16, wherein the first and second flexible strap members are attached, respectively, to the first and second harnesses to provide a directionally biased loop means for preventing the flexible straps from interfering with articulation of the swimmers lower extremities.

\* \* \* \* \*

UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION

PATENT NO. : 4,948,117

DATED : August 14, 1990

INVENTOR(S) : Douglas L. Burke

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Abstract, line 9, delete the word "elongated" and insert therefor --elongated--.

In Column 9, line 6, delete "12" and insert therefor --11--.

In Column 10, line 29, delete "16" and insert therefor --15--.

Signed and Sealed this

Twenty-fifth Day of February, 1992

*Attest:*

HARRY F. MANBECK, JR.

*Attesting Officer*

*Commissioner of Patents and Trademarks*



US005846167A

# United States Patent [19]

Liu et al.

[11] Patent Number: 5,846,167

[45] Date of Patent: Dec. 8, 1998

## [54] SWIMMING EXERCISE METHOD AND TETHER THEREFOR

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[52] U.S. Cl. 482/55; 482/111

[58] Field of Search 482/55, 54, 111

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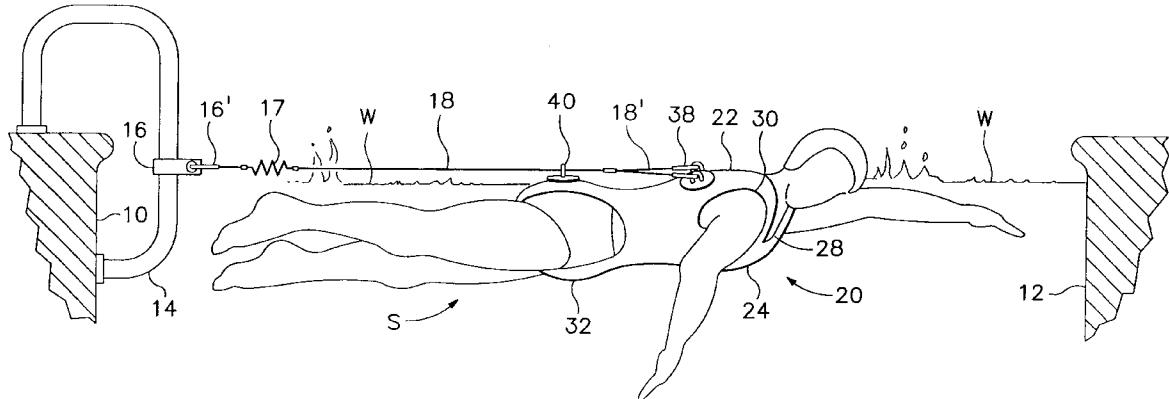
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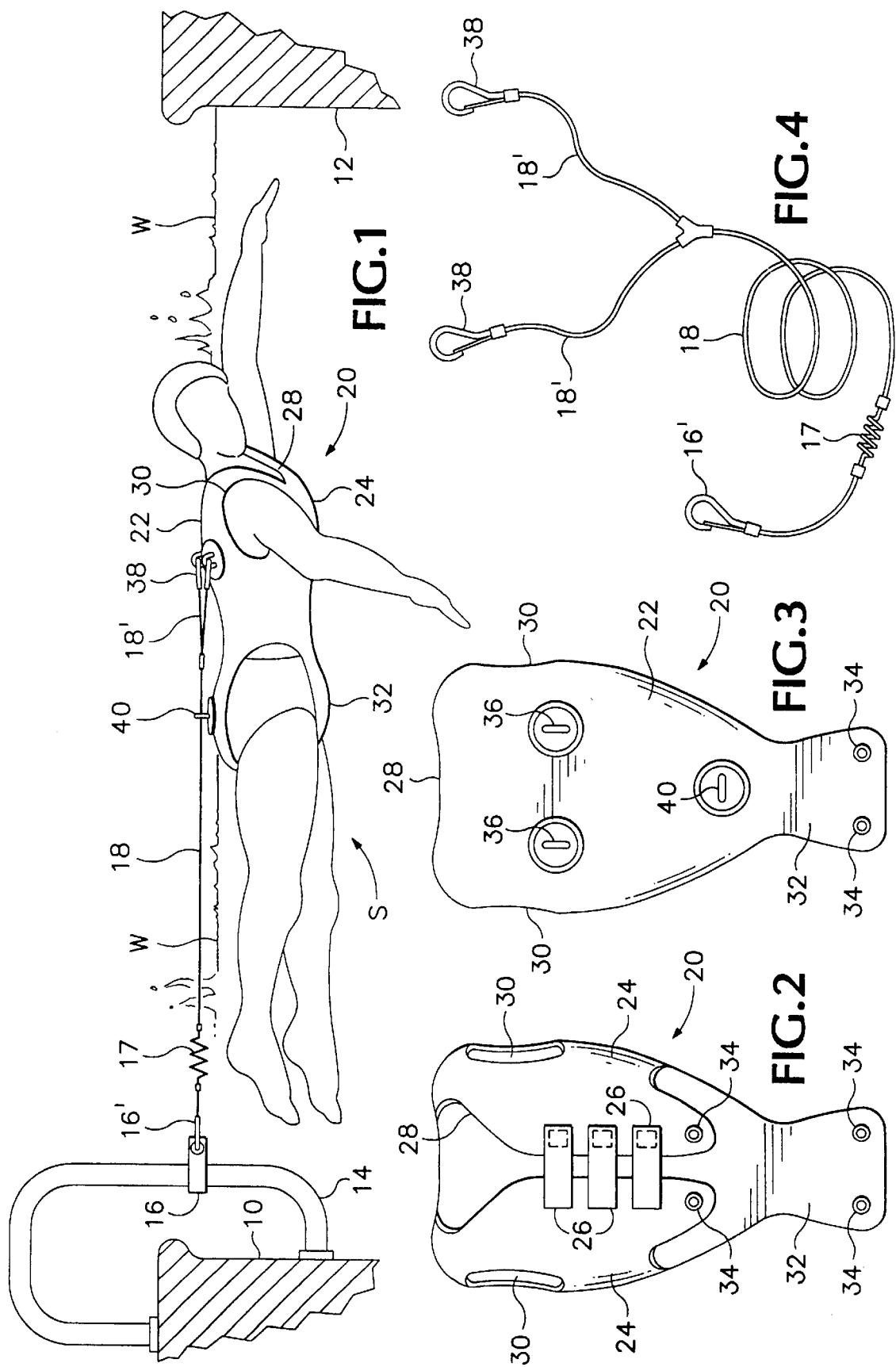
Primary Examiner—Lynne A. Reichard  
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## [57] ABSTRACT

A swimming exercising and training tether device includes an elongated tether line connected at one end preferably through a coil spring or other elastic, shock-absorbing member, to an anchor adjacent a wall of a swimming pool and at the opposite end detachably to the back panel of a harness worn by a swimmer. The attachment to the back panel is in the area intermediate the shoulders of the swimmer. Intermediate the ends of the tether line it extends freely through a loop or ring secured to the back panel of the harness in the area intermediate the hips of the swimmer. The loop or ring functions to raise the hips of the swimmer to the level promoting most efficient swimming posture in the water.

6 Claims, 1 Drawing Sheet





## 1

## SWIMMING EXERCISE METHOD AND TETHER THEREFOR

### BACKGROUND OF THE INVENTION

This invention relates to swimming exercising and training, and more particularly to a tether device and method by which such exercising and training may be accomplished in a confined pool of water.

Various types and forms of tether devices have been proposed heretofore for enabling swimming in confined spaces. Typical of these are the tethers disclosed in U.S. Pat. Nos. 4,530,497; 4,527,795; and 4,247,096. All of these are characterized by the attachment of one end of a tether to a location on a swimmer that inhibits positioning of the swimmer's body in proper orientation in the water for efficient swimming.

### SUMMARY OF THE INVENTION

The swimming tether device and method of this invention involves a harness component configured to be worn by a swimmer and provided with a tether anchor on the backside of the harness adjacent the shoulders of the swimmer and a tether guide ring on the backside of the harness adjacent the hips of the swimmer through which the elongated tether component extends to a tether anchor adjacent the confined body of water in which a swimmer may train or exercise.

It is the principal objective of this invention to provide a swimming tether and method by which a swimmer may exercise and train in a confined pool of water while maintaining proper posture for most efficient swimming.

Another objective of this invention is to provide a swimming tether of the class described in which the harness is in the form of a swimsuit having neck and arm openings.

A further objective of this invention is the provision of a swimming tether of the class described in which the tether may be of any length desired to accommodate swimming pools and other bodies of water of any dimension.

The foregoing and other objects and advantages of this invention will appear from the following detailed description taken in connection with the accompanying drawings of a preferred embodiment.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a person swimming in a small swimming pool and employing a swimming tether device embodying the features of this invention.

FIG. 2 is a perspective view of the front side of a harness component of the swimming tether device of this invention.

FIG. 3 is a perspective view of the backside of the harness component of FIG. 2.

FIG. 4 is a perspective view of an elongated tether component of the swimming tether device of this invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 of the drawings shows a swimmer S disposed in a small swimming pool of water W in ideal posture for efficient swimming. The body of water is shown to be restricted in length between the walls 10 and 12 of the swimming pool.

An anchor 14 at wall 10 serves to secure a strap connector 16 with hook 16' to one end of an elongated, shock-absorbing coil spring 17. The opposite end of the spring is coupled to one end of an elongated flexible tether line 18.

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The opposite end of the tether line is connected to a harness 20 worn by the swimmer.

In the embodiment illustrated, the harness is configured as a swimsuit having a back panel 22 joined to front panels 24 which are secured together by such connector means as straps 26. Between the back and front panels are formed a neck opening 28 and arm openings 30. Extending from the lower end of the back panel is an elongated crotch strap 32 configured to extend forwardly through the crotch of a swimmer for detachable connection to the front panels 24 by such means as snap fastener or Velcro pairs 34.

A pair of coupler loops 36 are secured to the back panel 22. They are spaced apart laterally in a transverse plane in the areas of the shoulders, preferably adjacent the bottom ends of the arm openings 30. The loops 36 are arranged for releasable connection of hook members 38 on the ends of the bifurcated sections 18' of the tether line 18 opposite the connector 16.

An important feature of this invention is the hip loop or ring 40 secured to the back panel 22 adjacent the juncture with the crotch strap 32. The tether line 18 extends freely through the hip ring and functions upon tensioning of the tether line to raise the hips of a swimmer to the position required for efficient swimming posture. In the absence of hip ring 40, the hips of a swimmer sag into the water to a depth which inhibits efficient swimming.

It will be appreciated that by use of the tether device of this invention, swimming exercising and training may be conducted in any body of water that needs only to be slightly longer than the swimmer. Thus, the tether device may be anchored to one side or end wall of a swimming pool; it may be anchored to a post in a lake or river; and it may be anchored to a side wall of a spa.

It also will be appreciated that the harness 20 may take many forms. For example, the swimsuit may terminate at the waist and provide only the base for the connector loops 36. The hip ring 40 may be provided by swim trunks or by a waste belt.

Although the connection of the tether line 18 to the back panel 22 of the harness preferably is made by the hook members 38 on the bifurcated section 18' of the tether line, a single connector may be employed by centering a single connector loop 36 on the back panel intermediate the arm openings 30 and by terminating the tether line in a single loop member 38.

The coil spring 17 and tether line 18 may be provided in any length desired, commensurate with the length of the body of water W in which it is to be used. Indeed, the tether line may be provided as a length of rubber or other elastic material, thereby eliminating spring 17.

The foregoing and other modifications and changes in the size, shape, type, number and arrangement of components of the tether device may be made, as desired, without departing from the spirit of this invention and the scope of the appended claims.

We claim:

1. A method of tethering a swimmer for swimming in a confined body of water, comprising:
  - a) securing one end of a tether line to a fixed support adjacent a swimming area of a body of water,
  - b) securing the opposite end of the tether line to the back of a swimmer in the area between the shoulders, and
  - c) extending an intermediate portion of the tether line freely through a ring secured to the back of the swimmer in the area between the hips.

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2. The method of claim 1 including providing a harness for wearing by a swimmer, and securing the said opposite end of the tether line to the harness in the area between the shoulders, and securing the said ring to the harness in the area between the hips.

3. A swimming exercising and training tether device, comprising:

- a) an elongated flexible tether line,
- b) first connector means on one end of the tether line for securing said end to an anchor adjacent a body of water,
- c) second connector means on the opposite end of the tether line,
- d) second connector coupler means configured for support on a swimmer in the area of the back between the shoulders and arranged for coupling the second connector means thereto, and
- e) tether line guide ring means configured for support on a swimmer in the area of the back between the hips for

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slidably receiving the tether line intermediate the first and second connector means.

4. The tether device of claim 3 including a harness adapted for wearing by a swimmer and having a back panel, the second connector coupler means being secured to the back panel in the area between the shoulders of a swimmer, and the guide ring means being secured to the back panel in the area between the hips of a swimmer.

5. The tether device of claim 4 wherein the harness includes front and back panels and a crotch strap extending from the back panel for releasable connection to the front panel.

10 6. The tether device of claim 5 wherein the front panel includes a pair of lateral panels having interengaging connector means for releasably securing said front panels together at the front of a swimmer.

\* \* \* \* \*



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Milton

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(54) **ELASTIC SWIMMING EXERCISE DEVICE**

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(52) U.S. Cl. ..... **482/55; 482/56; 434/254**

(58) Field of Search ..... **482/111, 124,  
482/105, 55, 74, 56, 148; 434/254**

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Primary Examiner—Glenn E. Richman

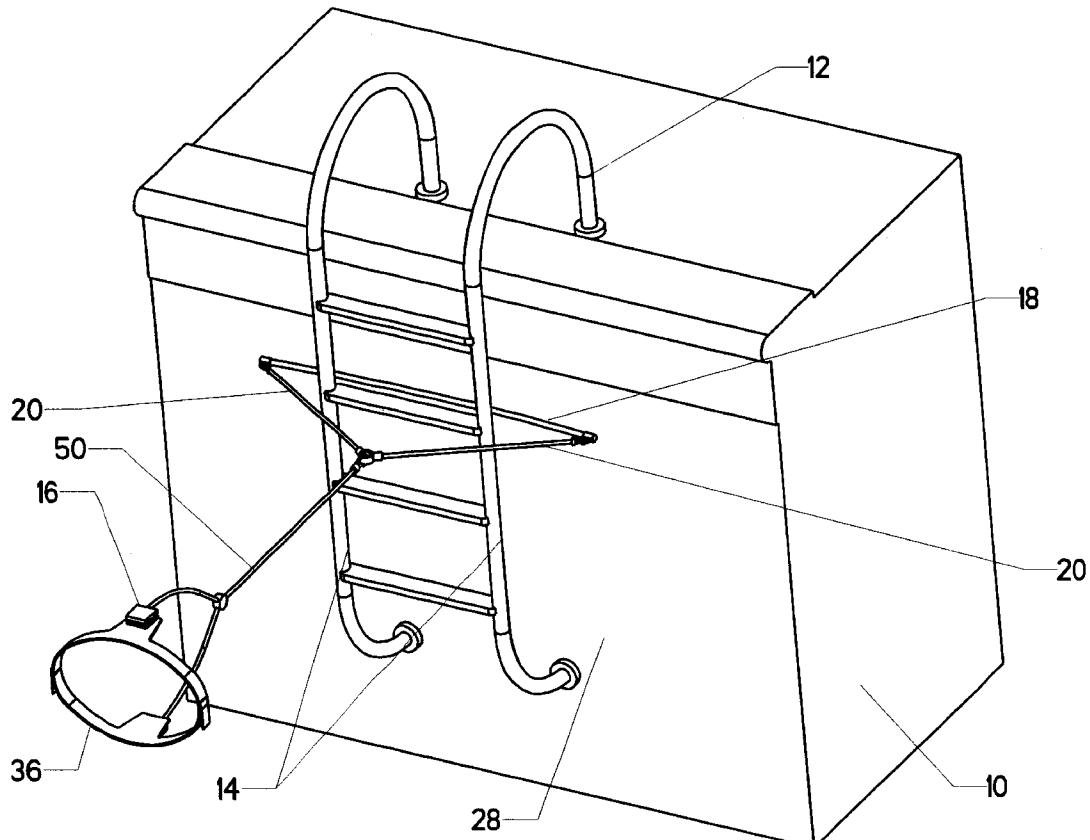
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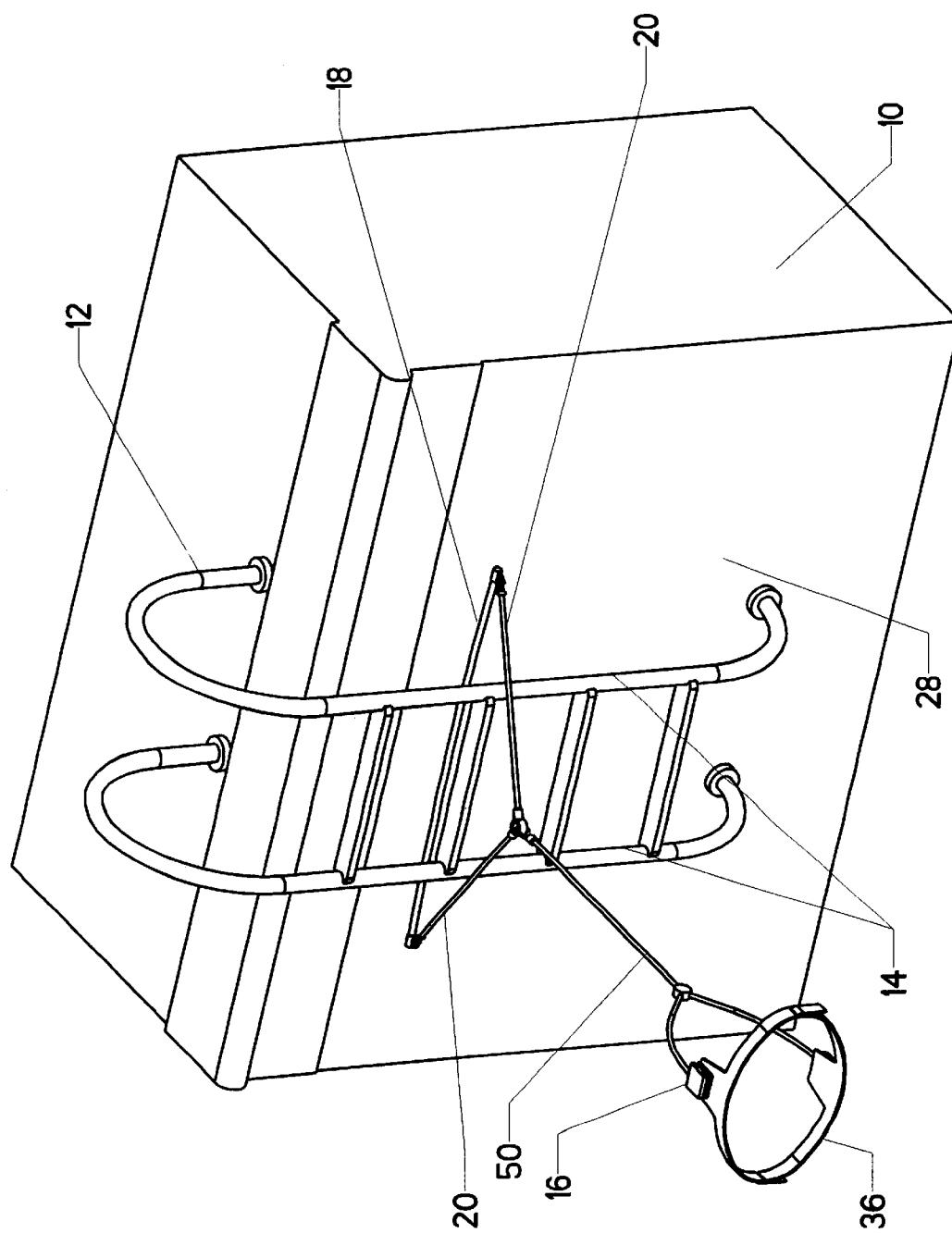
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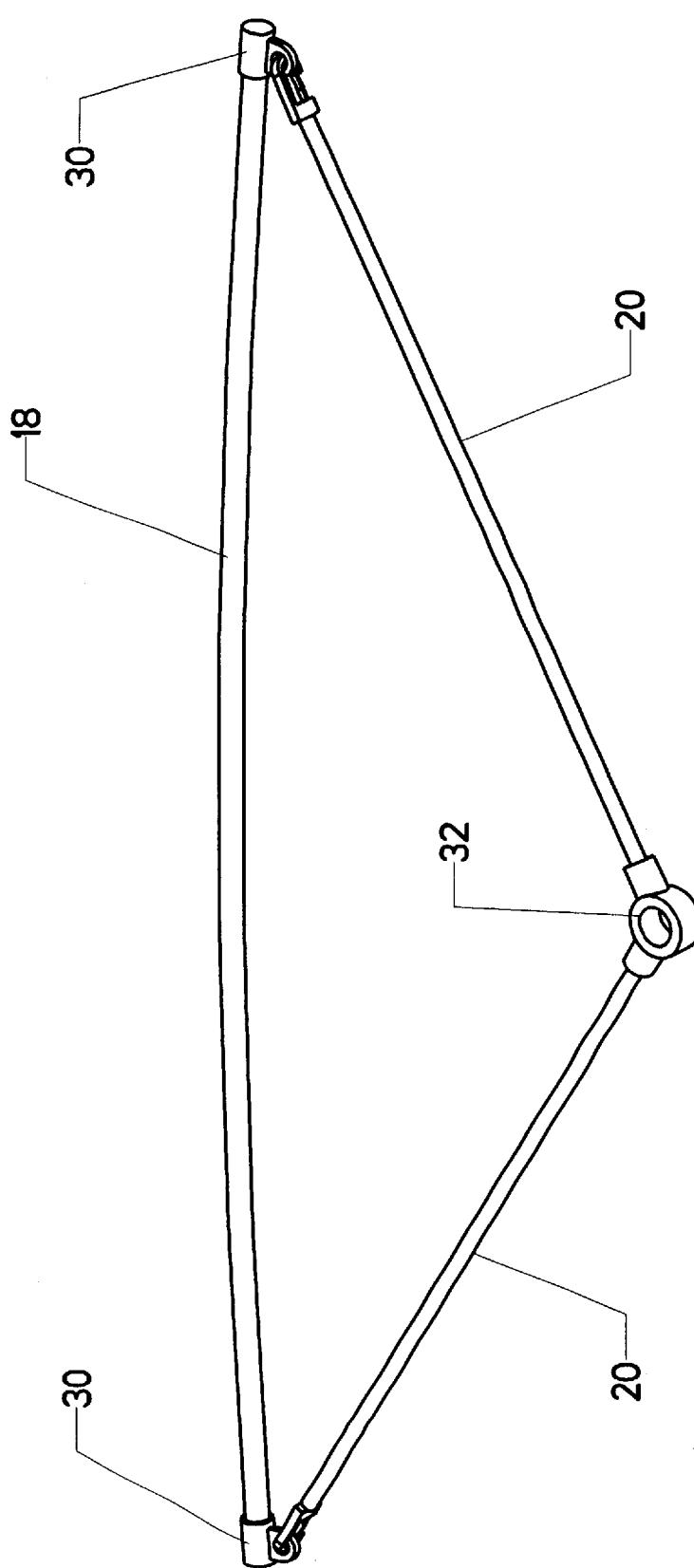
**ABSTRACT**

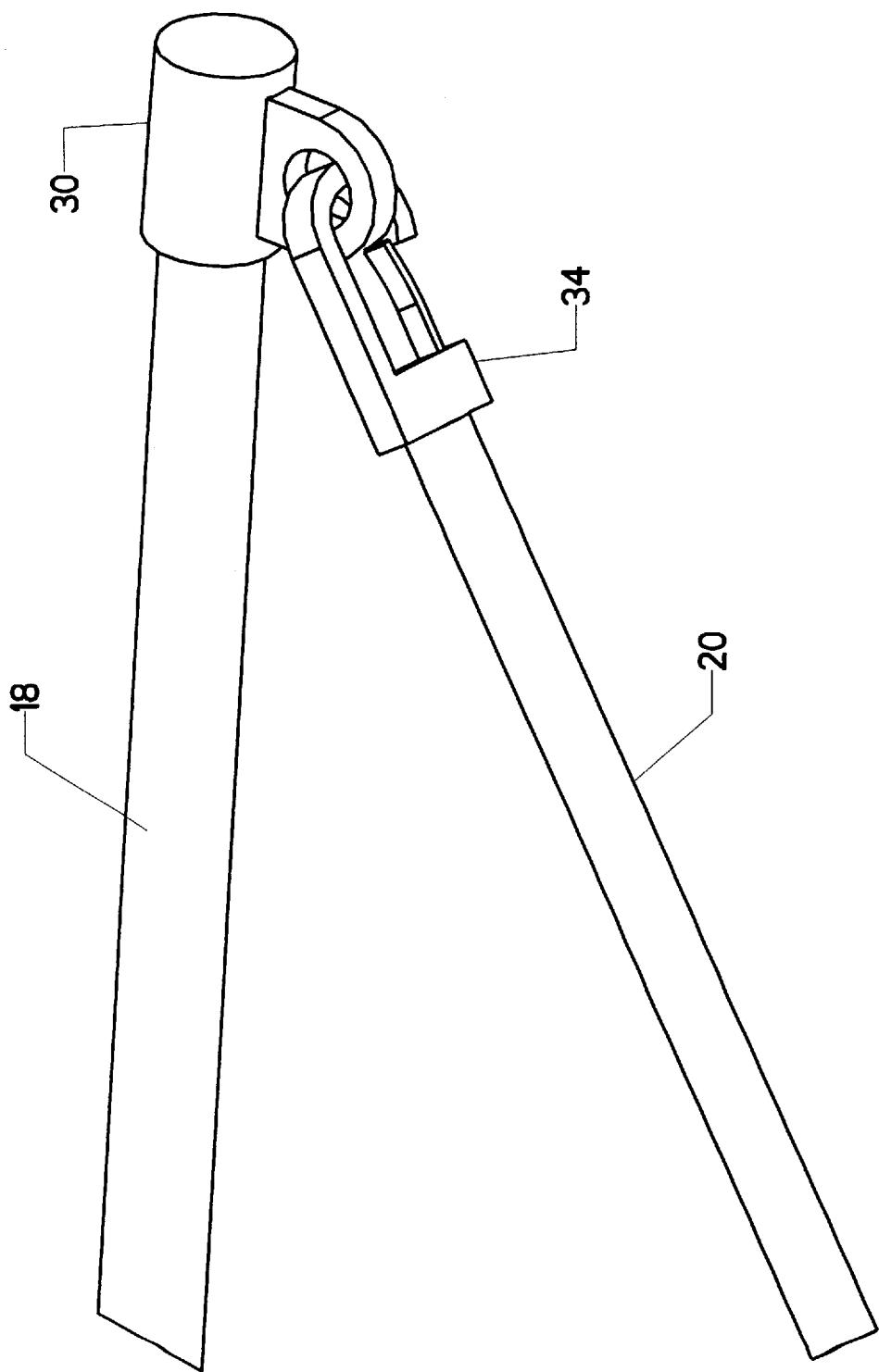
A device for maintaining a relatively fixed position of a person exercising in a pool. The device uses a flexible rod which deforms elastically as the swimmer exercises. In this fashion, the swimmer is given feedback as to how strenuously he or she is exercising. The device can be anchored to a conventional pool ladder. In addition, for those pools without a ladder, a separate anchor frame is disclosed. The anchor frame allows the device to be used in virtually any pool. It also allows the device to be used on a dock or on a boat.

**6 Claims, 6 Drawing Sheets**

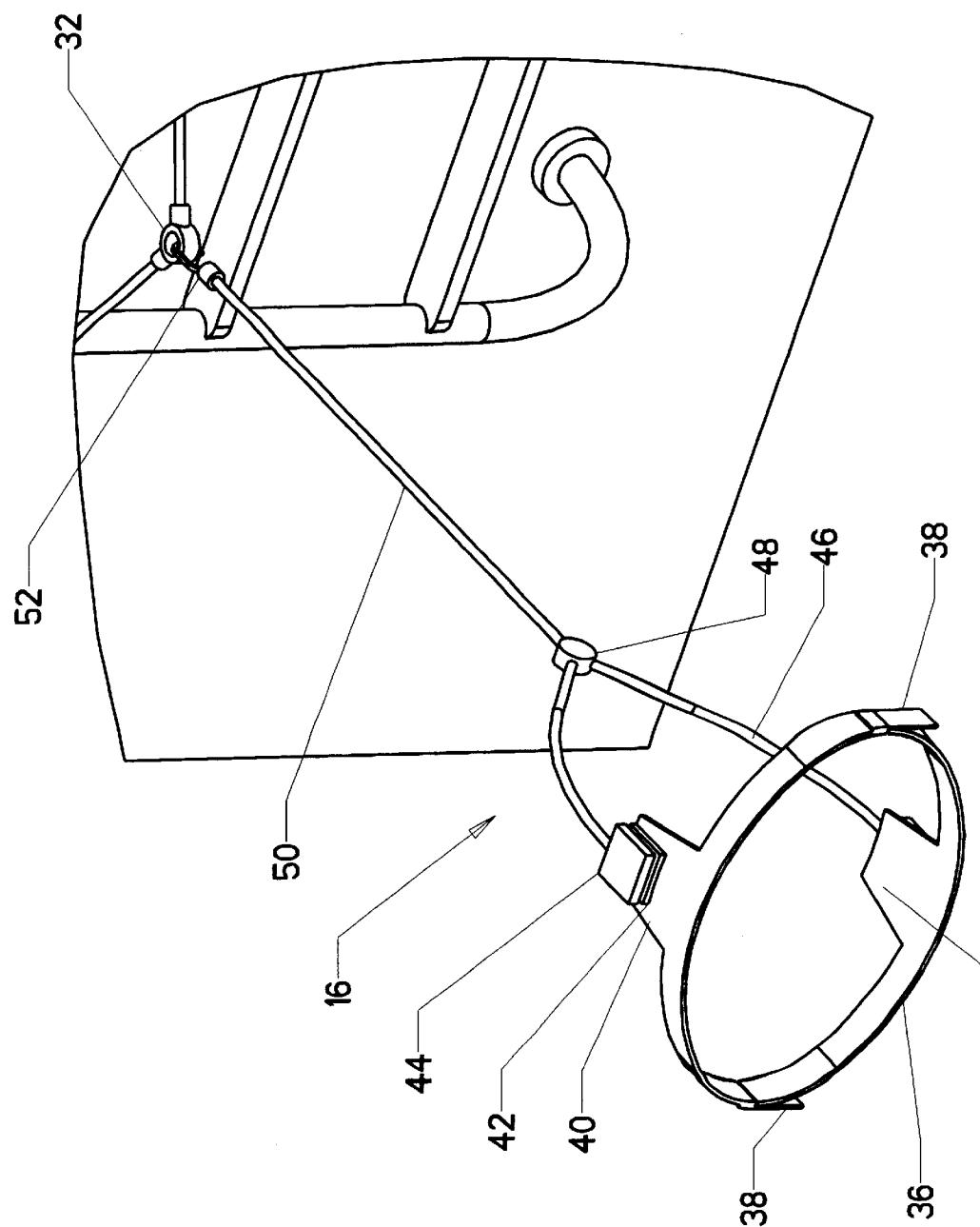


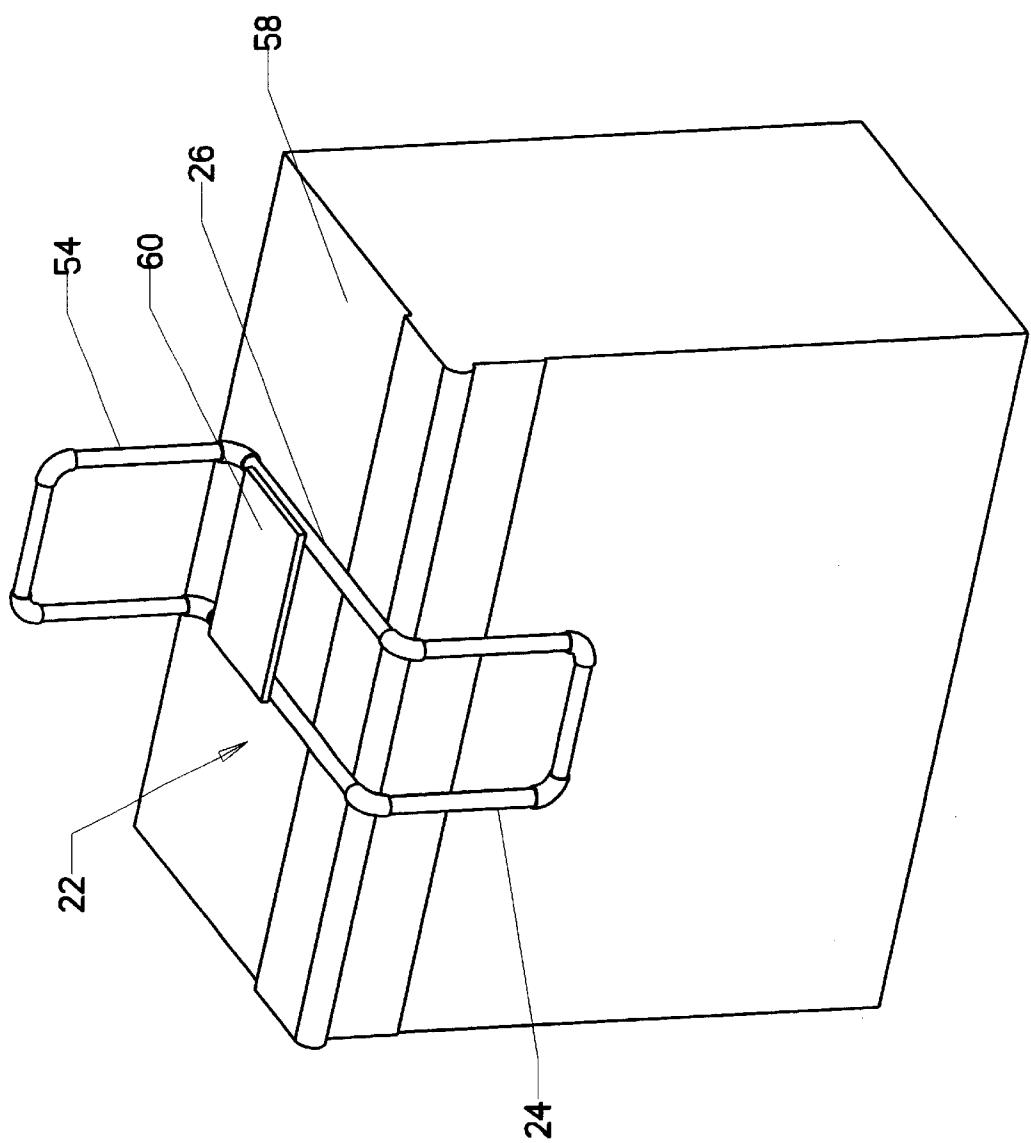
**FIG. 1**

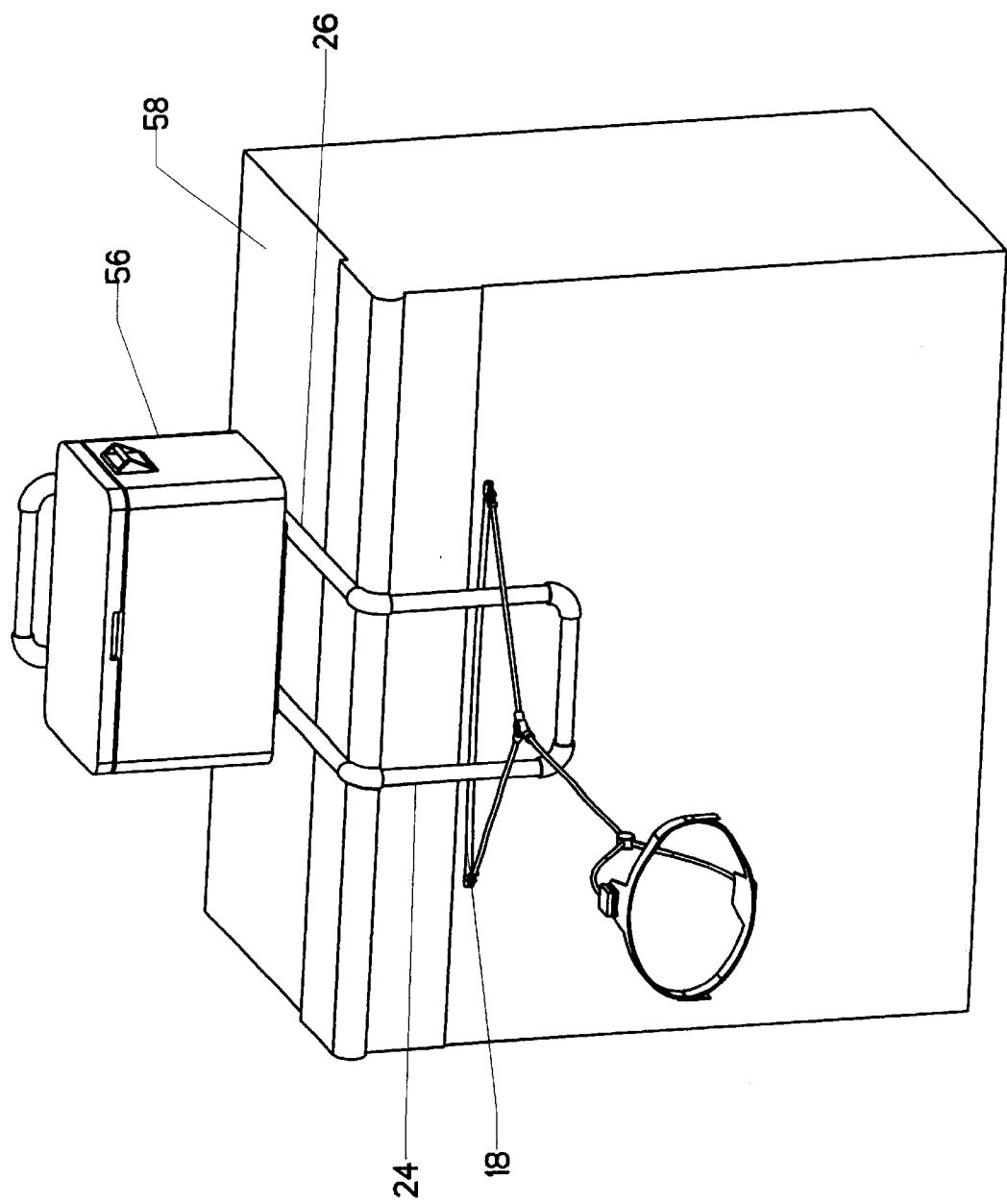
**FIG. 2**



**FIG. 3**

**FIG. 4**

**FIG. 5**



**FIG. 6**

**1****ELASTIC SWIMMING EXERCISE DEVICE****BACKGROUND—FIELD OF INVENTION**

This invention relates to the field of swimming exercise devices. More specifically, the invention comprises a restraining harness which allows the user to perform swimming strokes in a pool without moving significantly.

**BACKGROUND—DESCRIPTION OF PRIOR ART**

Swimming restraint harnesses have been in use for some time. U.S. Pat. No. 3,988,020 to Carter (1976) discloses a belt harness intended to be anchored to the side of a pool. The harness has two inelastic cords attached to fixed anchor points. These anchor points must be drilled into the concrete near the edge of the pool. While effective in restraining the swimmer, the Carter device does require disfiguring the pool by installing two permanent anchor points. In addition, the harness assembly is substantially rigid. With a substantially rigid harness, it is difficult for the swimmer to know how much energy he or she is exerting. A preferable arrangement is to have an elastic member in the harness, so that as the swimmer strokes more vigorously, some forward progress is noted.

An elastic harness is disclosed in U.S. Pat. No. 4,109,905 to Meier (1978). The Meier device has a short elastic section near the anchor point which does allow some stretching of the harness. Unfortunately, however, the Meier device also requires a fixed anchor point. Additionally, the harness disclosed is rudimentary and impractical.

A more sophisticated harness is disclosed in U.S. Pat. No. 5,236,404 to MacLennan (1993). The MacLennan device uses a vest type life jacket as a harness, thereby distributing the load on the swimmer's body in a different fashion. The MacLennan invention also provides for attaching the harness to a pool ladder, eliminating the need for dedicated anchor points. The MacLennan device does not, however, have any elastic members in the harness. An additional drawback is that many pools do not have ladders, making it impossible to attach the device. Finally, the use of a vest type life jacket as a harness significantly restricts many swimming strokes.

U.S. Pat. No. 5,601,514 to Horn (1997) addresses the attachment problem with suction cups. This device uses two large suction cups on a substantially rigid plastic frame. The device is intended to work in compression though; i.e., the swimmer is trying to force his way toward the attachment point. This approach would not work if the swimmer swims in the other more conventional direction.

Finally, U.S. Pat. No. 5,816,982 to Croushmore (1998) discloses a radical approach to the anchoring problem. The Croushmore device discloses a collapsible bag used as an anchor. The swimmer fills the bag with water and then drags it up on the side of the pool. The bag anchors a mesh to which is attached the swimming harness. Of course, a swimmer can exert considerable force while exercising. Thus, the bag will need to be quite heavy in order to be an effective anchor. This fact means that the user will have to fill the bag with many pounds of water, making it quite difficult to drag up and over the side of the pool.

The known devices for restraining a swimmer while exercising are therefore limited in that they:

1. Do not provide sufficient elastic extension of the harness in order to allow the swimmer to gauge his or her level of exertion,

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2. Require the placement of permanent anchor points in the pool;
3. Require the presence of a pool ladder;
4. Encumber the user in the swimming exercise; and
5. Require the lifting of a heavy bag or other type of anchor.

**OBJECTS AND ADVANTAGES**

Accordingly, several objects and advantages of the present invention are:

1. To provide sufficient elastic extension of the harness in order to allow the swimmer to gauge his or her level of exertion;
2. To eliminate the need for permanent anchor points in the pool;
3. To eliminate the need for a pool ladder;
4. To not encumber the user in the swimming exercise; and
5. To eliminate the need for an inordinately heavy anchor.

**DRAWING FIGURES**

FIG. 1 is an isometric view, showing the proposed invention in a swimming pool.

FIG. 2 is a close-up view of the flex bow shown in FIG. 1.

FIG. 3 is a close-up view of the attachment point on the flex bow.

FIG. 4 is a close up view of the belt harness;

FIG. 5 is an isometric view of the anchor frame.

FIG. 6 is an isometric view of the anchor frame with a cooler in place for added weight.

**REFERENCE NUMERALS IN DRAWINGS**

|    |                  |    |                       |
|----|------------------|----|-----------------------|
| 10 | pool             | 12 | ladder                |
| 14 | upright leg      | 16 | belt harness          |
| 18 | flex bow         | 20 | flexible line         |
| 22 | anchor frame     | 24 | anchor leg            |
| 26 | anchor runner    | 28 | pool side             |
| 30 | attach point     | 32 | collector ring        |
| 34 | line clip        | 36 | belt                  |
| 38 | adjustment clasp | 40 | trailing flap         |
| 42 | VELCRO panel     | 44 | VELCRO harness attach |
| 46 | trailing line    | 48 | harness union         |
| 50 | harness leader   | 52 | harness clip          |
| 54 | stop leg         | 56 | cooler                |
| 58 | pool apron       | 60 | anchor platform       |

**DESCRIPTION OF THE INVENTION**

FIG. 1 depicts a conventional pool 10, having ladder 12 attached to its side. Ladder 12 has two upright legs 14, standing a small distance off of pool side 28. In one embodiment, the present invention utilizes ladder 12 to anchor an exercising swimmer in place.

Flex bow 18 is placed between pool side 28 and upright legs 14. Flex bow 18 is typically oriented horizontally, as shown. Flex bow 18 is in the form of an elastically deformable elongated rod. It has attach points 30 at either end. When force is placed on attach points 30, flex bow 18 will bow in the same fashion as an archer's bow; i.e., it will store energy by elastically deflecting. When force is removed from flex bow 18, it resumes its straight resting position.

Two flexible lines 20 are attached to flex bow 18, one at either end. Belt harness 16 is provided for attachment to the

swimmer. Belt harness 16 includes harness leader 50, which joins belt harness 16 to the two flexible lines 20. In the configuration shown, the swimmer would have belt harness 16 cinched tightly about his or her waist, and would be performing a swimming stroke—such as the breast stroke or free-style. The reader will appreciate that as the swimmer attempts to swim away from ladder 12, the force produced by the swimmer is transmitted to belt harness 16, through harness leader 50, and on to flexible lines 20. Flexible lines 20, in turn, pull flex bow 18 against upright legs 14 and begin to bow flex bow 18. The swimmer is thus restrained.

However, the reader should appreciate that while restrained, the swimmer can make some forward progress due to the deflection of flex bow 18. The harder the swimmer strokes, the more deflection results in flex bow 18. Consequently, the more tension is placed on harness leader 50. It is this energy storage mechanism that provides the swimmer with feedback on how much he or she is exerting. It is true that a purely static line will also increase in tension as the swimmer increases his or her exertion. However, the use of an energy storage device such as flex bow 18 actually allows the swimmer to move forward, and this has been found to provide much better feedback.

FIG. 2 depicts flex bow 18 and flexible lines 20 in greater detail. Flexible lines 20 are joined by collector ring 32, which provided an attaching point for harness leader 50. FIG. 3 shows attach point 30 in more detail. Attach point 30 is permanently attached to the end of flex bow 18. The reader will observe that it has a ring structure ideal for attaching clips and the like.

Flexible line 20 terminates in line clip 34. Line clip 34 may be easily attached or removed from attachment point 30. This feature allows the user to slip flex bow 18 behind ladder 12, and then attach flexible lines 20. Flex bow 18 is generally held in place by the fact that it floats on the surface of the water. It may optionally be attached to ladder 12 by using bungee cords or the like.

FIG. 4 shows more features of belt harness 16. Belt 36 is configured to pass around the swimmer's waist. Two adjustment clasps 38 are provided so that the circumference of belt 36 can be altered to fit a wide variation in waist sizes. An adjustment on each side of belt 36 is needed to ensure the symmetry of the harness attachment points.

Two trailing flaps 40 are provided, typically being formed integrally with the material of belt 36. Each trailing flap 40 has a large VELCRO panel 42. This is provided for attachment to the balance of the harness assembly, as will be explained shortly. In the illustrated orientation, belt 36 would be used for performing a swimming stroke in which the swimmer's body is horizontal, with the chest facing either up or down. For a side stroke, belt 36 would be rotated through 90 degrees. Those skilled in the art will appreciate that the harness illustrated easily allows the swimmer's body to rotate while performing a number of different swimming strokes.

Some water exercises also require the swimmer to stand upright—such as walking or running in the pool. Additional VELCRO attachment points can be provided around belt 36 to accommodate this option. Alternatively, the user can simply rotate belt 36 90 degrees around the body. By doing so, trailing flaps 40 are rotated so that they are proximate the user's hips.

Two trailing lines 46 are joined in harness union 48. Each trailing line 46 terminates in a VELCRO harness attach 44. VELCRO harness attaches 44 are configured to attach to VELCRO panels 42 on trailing flaps 40, thus linking belt 36 to harness union 48.

Harness leader 50 emerges from the other side of harness union 48. It reaches for several feet, giving the swimmer ample clearance from ladder 12. Harness leader 50 terminates in harness clip 52, which removably attaches harness leader 50 to collector ring 32. Thus, the reader will appreciate that the disclosed apparatus attaches the swimmer to flex bow 18, which is held in place by ladder 12. This is the preferred embodiment of the invention.

Of course, not all pools are equipped with a ladder. It is therefore necessary to have an alternate method of anchoring the apparatus. FIG. 5 discloses one such alternate apparatus. Anchor frame 22 is provided for the attachment of flex bow 18. Anchor frame 22 has two anchor legs 24 extending downward into pool 10. It also has two anchor runners 26, extending along pool apron 58. At the point furthest from pool 10. Anchor frame 22 has two upright stop legs 54. Anchor frame 22 can be made from many different materials.

The particular embodiment illustrated is made from 2 inch PVC piping. The pipe may be joined together using pipe cement and PVC elbows. However, it is also possible to omit the pipe cement. PVC segments are typically slip-fit into each other. There is sufficient friction in the slip fit to avoid the need for using pipe cement. Thus, anchor frame 22 may be employed without cementing the pieces together. This embodiment has the added benefit of portability. Once the user is finished with anchor frame 22, he or she can quickly disassemble the components and place them in a storage bag. The disassembled version is obviously much more convenient to transport and store.

Turning now to FIG. 6, the use of anchor frame 22 will be explained. Anchor frame 22 is placed on the side of pool 10 as shown. Flex bow 18 is placed between anchor legs 24 and pool side 28, in much the same fashion as with ladder 12. The remainder of the swimmer harnessing apparatus is identical to the previous disclosure. The reader will readily appreciate, however, that the swimmer would easily drag anchor frame 22 into the pool unless it is held in place by significant weight. It is therefore necessary to place weight on anchor frame 22 to lock anchor runners 26 against pool apron 58. Many different objects could be used for weight. In this particular illustration, cooler 56 has been used—since coolers are often found near pools. Two stop legs 54 are provided to bear against cooler 56, or other objects used.

Turning back to FIG. 5, anchor platform 60 is provided to evenly distribute the load of an object placed on anchor frame 22. Using anchor frame 60, it is also easy and convenient for a second person to stand upon anchor frame 22 in order to hold it in place. This option is particularly suited to a coaching situation where a swimming coach wishes to observe the technique of a student.

Those skilled in the art will realize that many types of objects can be used to hold anchor frame 22 in place. Thus, anchor frame 22 allows the invention to be used in virtually any type of pool. No particular anchor point or fixture within the pool is needed. In addition, anchor frame 22 also allows the device to be used on a dock, such as would commonly be found in a river or pond. The device may also be used on certain types of boats.

Returning now to FIGS. 1 through 3, the particular materials used in the construction of the components will be discussed. The material selected for flex bow 18 is obviously important. It must be capable of repeatedly flexing without undergoing plastic deformation. It must also be capable of withstanding pool chemicals. Many types of flex bows are presently in use—such as those found on strength training

equipment. These are suitable for use in the present situation. A hollow PVC tube has also been found to be satisfactory. A thick-walled schedule of PVC tubing is preferable, in order to prevent buckling. This PVC tube is capable of deflecting significantly without buckling, thereby allowing the swimmer to advance a significant distance before reaching the point where he or she can stretch the system no further.

Flexible lines 20 can be made of elastic or inelastic materials. Making this component from an elastic material, such as rubber tubing, allows the entire system to stretch even further. The same can be said of harness leader 50. If it is made of an elastic material as well, the system can stretch even further.

Belt 36 must be comfortable for the swimmer to wear, yet still be capable of transmitting significant loads. Nylon webbing has been found suitable for this component. Several molded plastic components are utilized. These are: harness union 48, harness clip 50, collector ring 30, and line clips 34. Many different types of molding plastics may be used for these components. However, it should be kept in mind that the material must be capable of withstanding prolonged exposure to sunlight, it must be capable of withstanding prolonged exposure to pool chemicals, and it must resist excessive water absorption.

#### Summary, Ramifications, and Scope

Accordingly, the reader will appreciate that the proposed invention allows a swimmer to exercise within a pool without moving significantly, yet still allows the swimmer to gauge his or her level of exertion. The invention has further advantages in that it:

1. Eliminates the need for permanent anchor points in the pool;
2. Eliminates the need for a pool ladder;
3. Does not encumber the user in the swimming exercise; and
4. Eliminates the need for an inordinately heavy anchor.

Although the preceding description contains significant detail, it should not be construed as limiting the scope of the invention but rather as providing illustrations of the preferred embodiments of the invention. For example, many different types of attaching devices could be substituted for line clips 34 and harness clip 50, different attachment devices could be substituted for VELCRO panels 42, etc. Thus, the scope of the invention should be fixed by the following claims, rather than by the examples given.

Having described my invention, I claim:

1. A swimming exercise apparatus intended to maintain a swimmer relatively stationary in a pool by linking said swimmer to the upright legs of a ladder on the side of said pool, comprising:

- a. a belt harness attached to said swimmer around said swimmer's waist;
- b. a flex bow, having a first end and a second end, and being placed between said upright legs of said ladder and said side of said pool;
- c. a first flexible line, having a first end and a second end, wherein said first end is attached to said first end of said flex bow and said second end is attached to said belt harness; and
- d. a second flexible line, having a first end and a second end, wherein said first end is attached to said second end of said flex bow and said second end is attached to

said belt harness, so that as said swimmer attempts to swim away from said ladder said first and second flexible lines are placed in tension, said flex bow is drawn against said upright legs, and said flex bow begins to bow.

2. The device as recited in claim 1, wherein said flex bow is a long slender rod, capable of bending substantially without undergoing plastic deformation.

3. The device as recited in claim 1, wherein said belt harness further comprises:

- a. a collector ring, joining said second end of said first flexible line together with said second end of said second flexible line;
- b. a harness union;
- c. a harness leader, removably connecting said harness union to said collector ring;
- d. a belt, adjustably attached to the waist of said swimmer; and
- e. detachable and adjustable means for connecting said belt to said harness union.

4. A swimming exercise apparatus intended to maintain a swimmer relatively stationary in a pool by linking said swimmer to the side of said pool, comprising:

- a. a belt harness attached to said swimmer around said swimmer's waist;
- b. an anchor frame, having at least one anchor leg descending into said pool adjacent said side of said pool and at least one anchor runner running along said apron of said pool so as to frictionally hold said anchor frame in place;
- c. a flex bow, having a first end and a second end, and being placed between said anchor leg of said anchor frame and said side of said pool;
- d. a first flexible line, having a first end and a second end, wherein said first end is attached to said first end of said flex bow and said second end is attached to said belt harness; and
- e. a second flexible line, having a first end and a second end, wherein said first end is attached to said second end of said flex bow and said second end is attached to said belt harness, so that as said swimmer attempts to swim away from said anchor frame and said first and second flexible lines are placed in tension, said flex bow is drawn against said anchor leg and said flex bow begins to bow.

5. The device as recited in claim 4, wherein said flex bow is a long slender rod, capable of bending substantially without undergoing plastic deformation.

6. The device as recited in claim 4, wherein said belt harness further comprises:

- a. a collector ring, joining said second end of said first flexible line together with said second end of said second flexible line;
- b. a harness union;
- c. a harness leader, removably connecting said harness union to said collector ring;
- d. a belt, adjustably attached to the waist of said swimmer; and
- e. detachable and adjustable means for connecting said belt to said harness union.



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(54) **ELASTIC SWIMMING EXERCISE DEVICE**

**Publication Classification**

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

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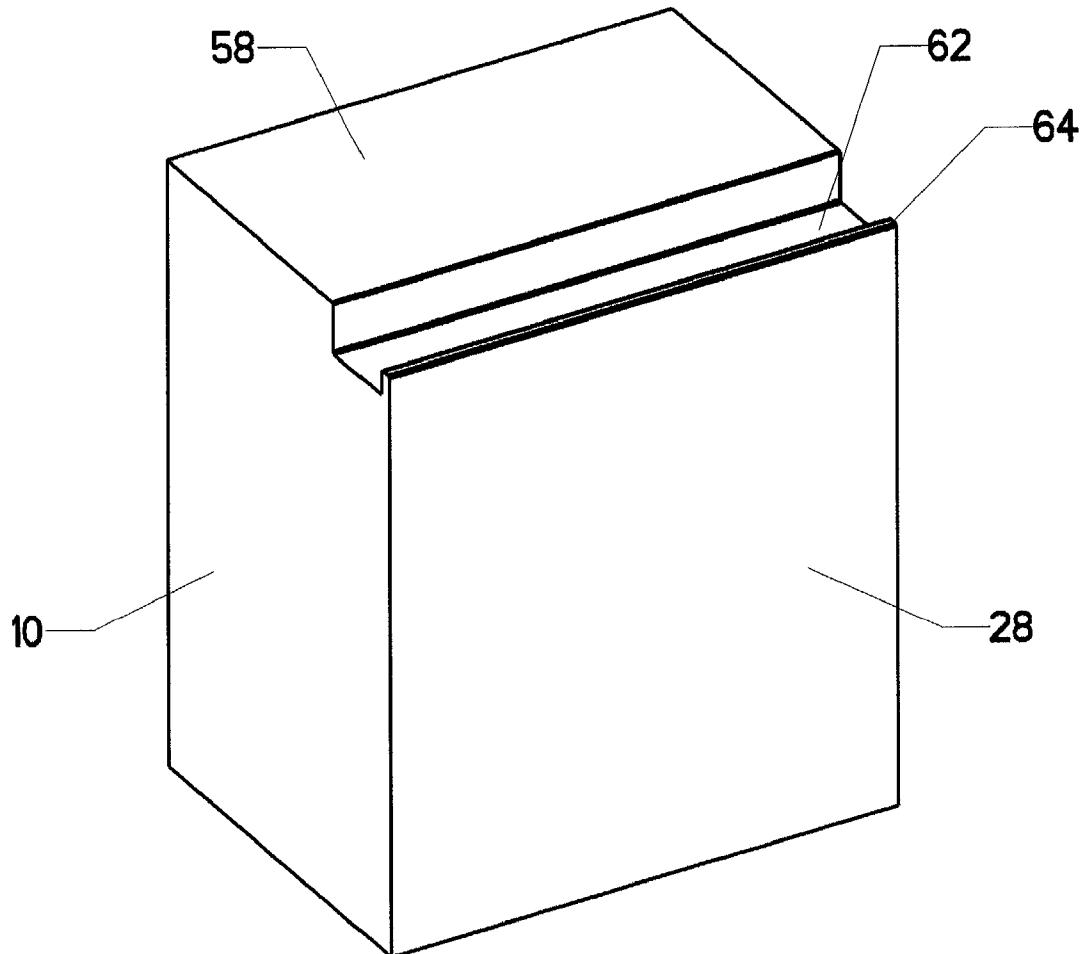
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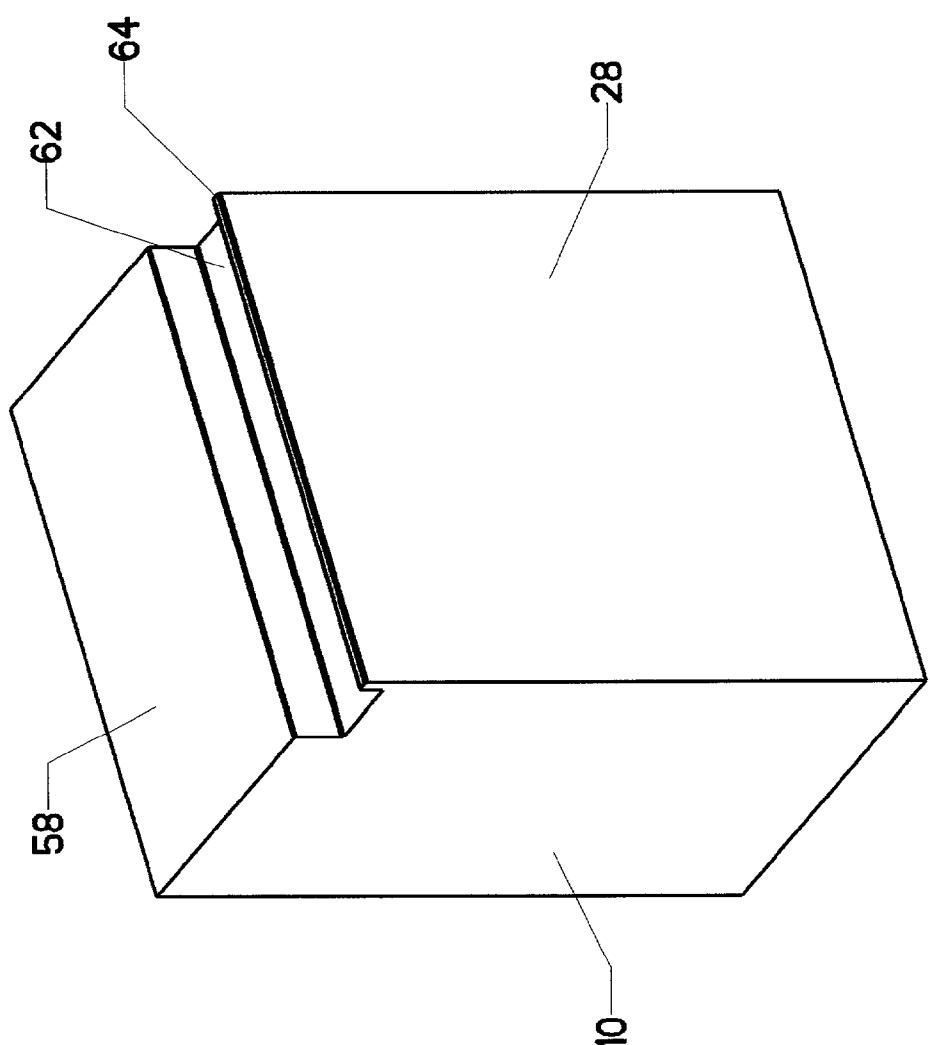
**ABSTRACT**

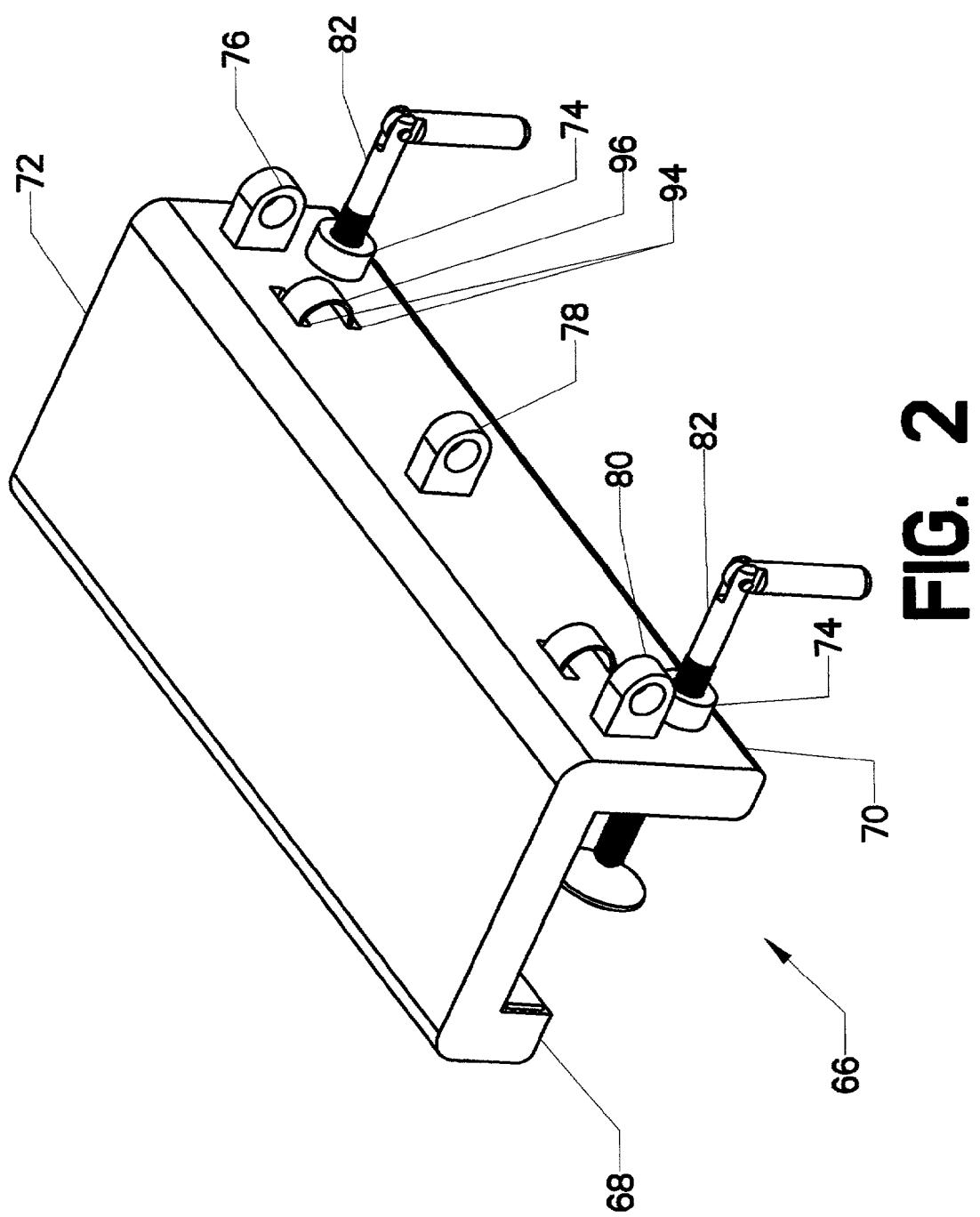
A device for allowing a swimmer to exercise in a pool while remaining approximately in place. The device includes an adjustable belt which fits around the swimmer's waist. An elastic harness connects this belt to an anchor bracket which is fixed to the side of the pool. The harness elastically deforms as the user exerts greater swimming force, thereby indicating to the user his or her level of exertion. The anchor bracket is configured to attach to a pool incorporating a skim gutter.

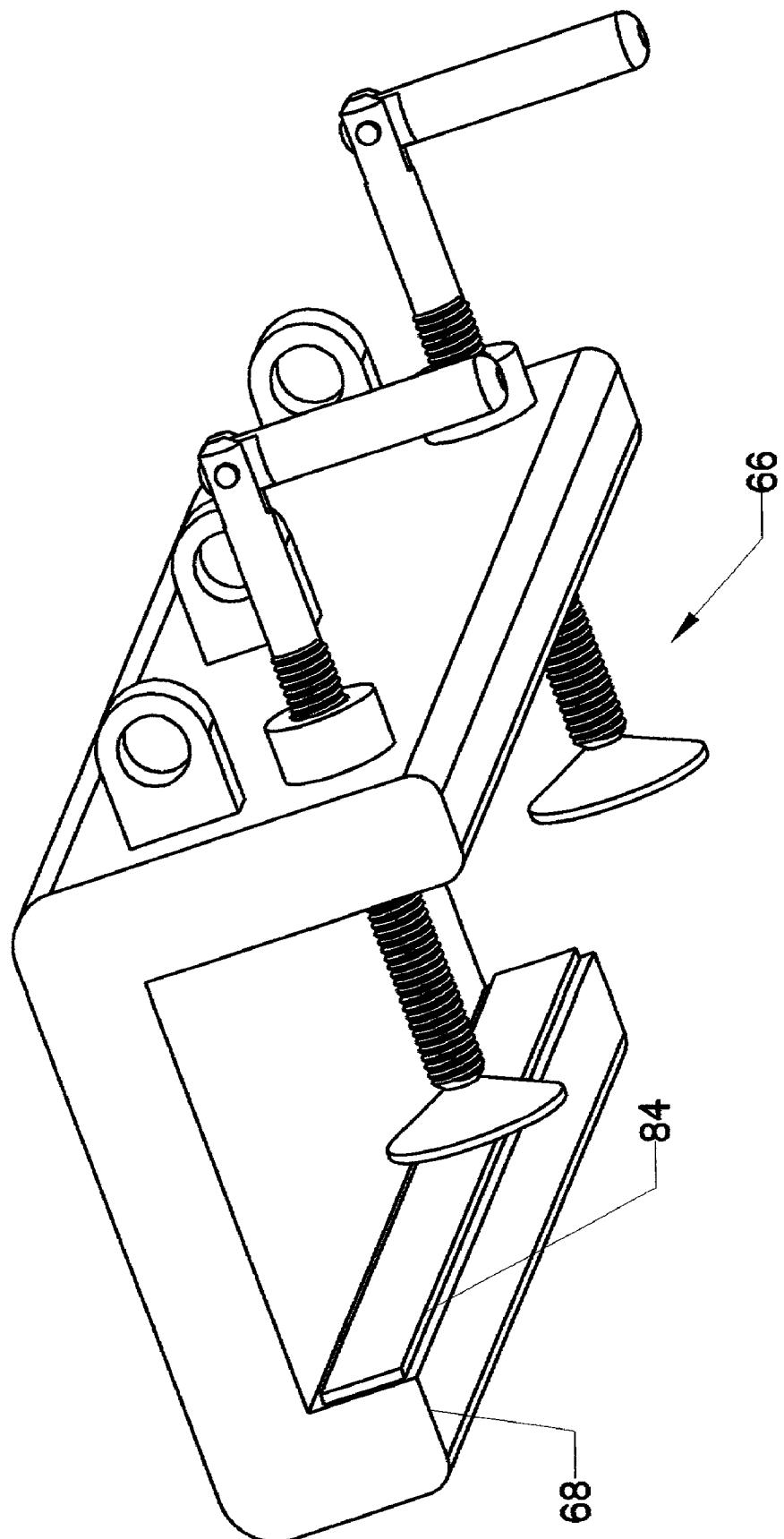
(21) Appl. No.: **10/083,287**

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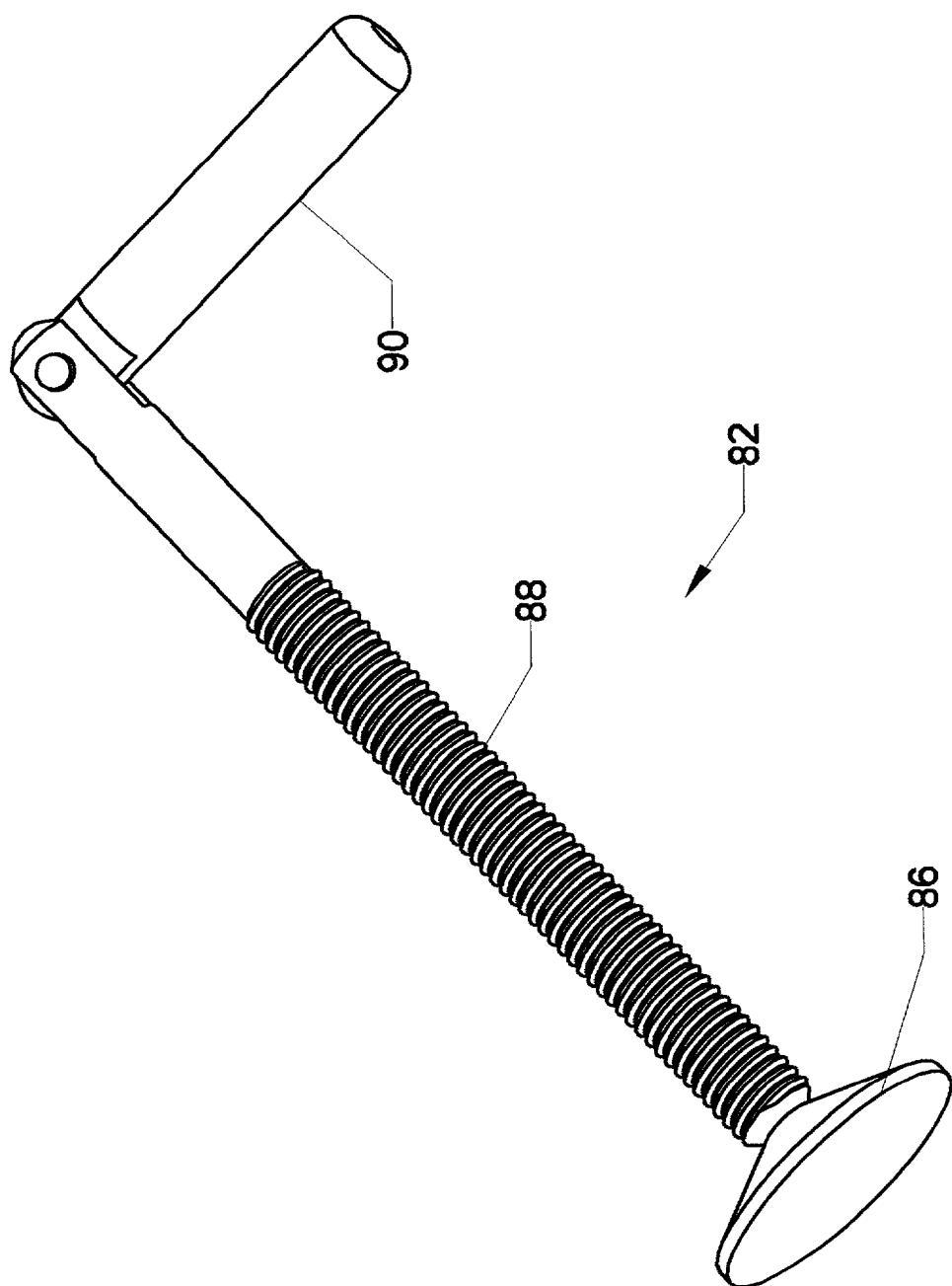


**FIG. 1**

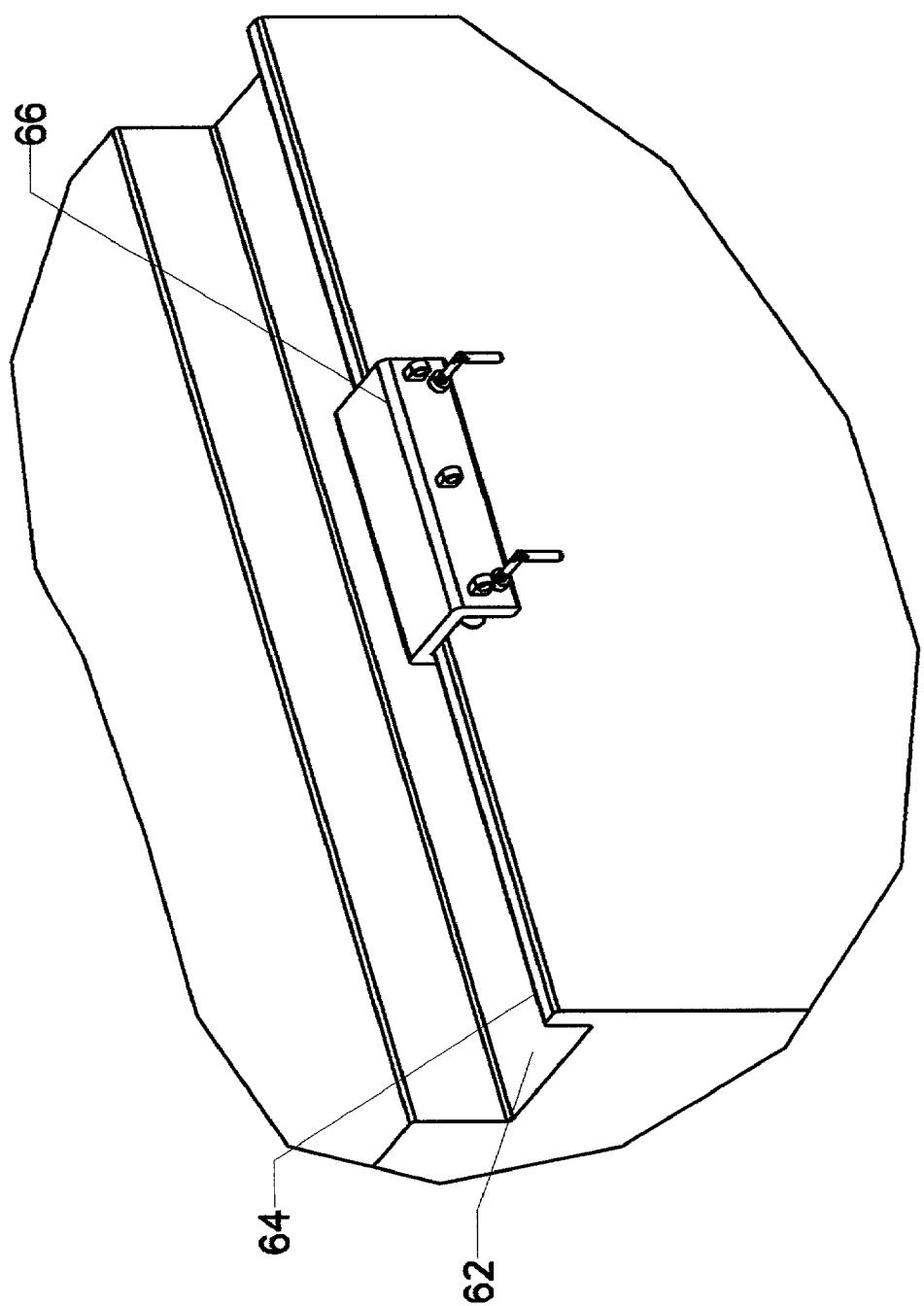




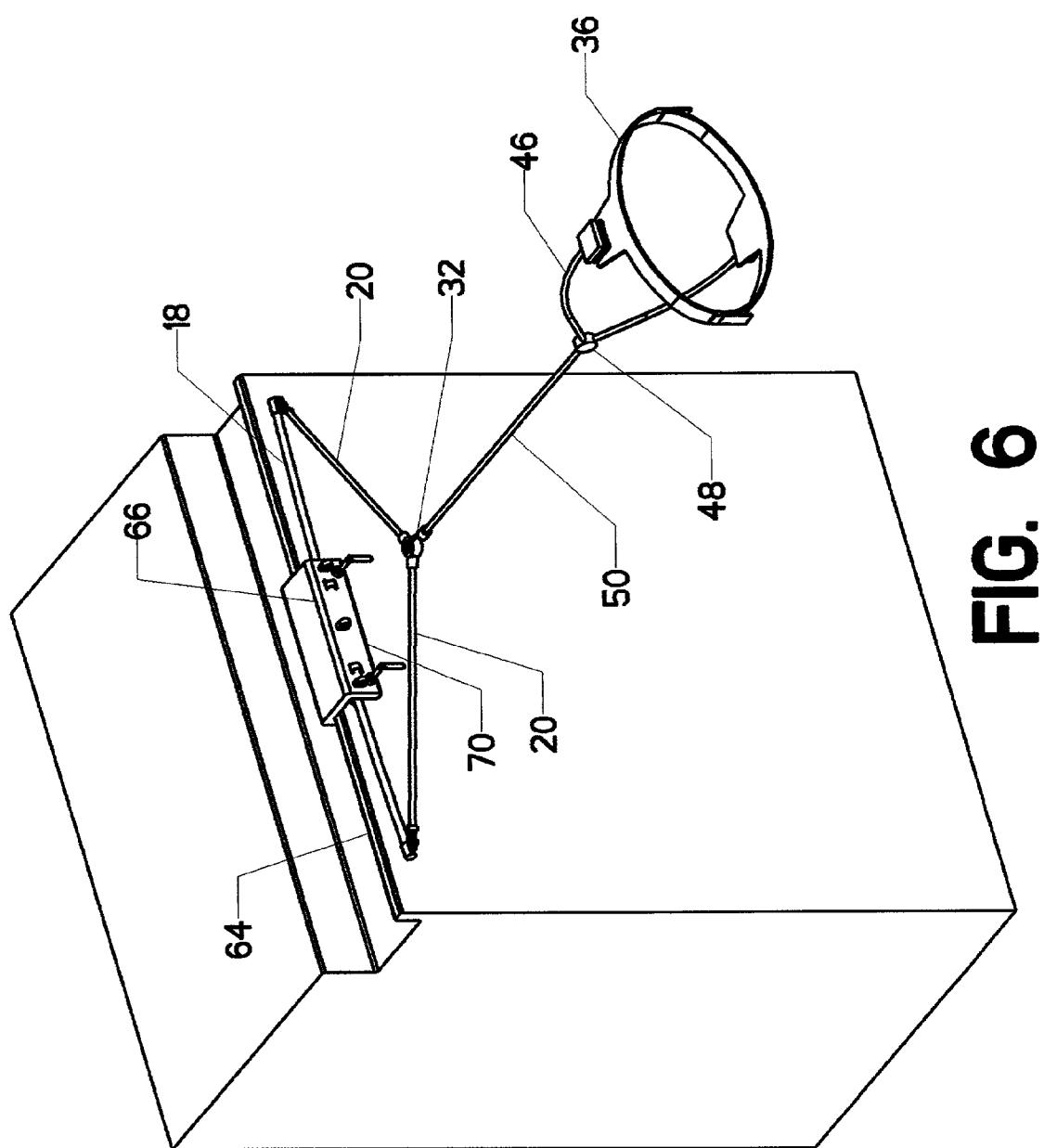
**FIG. 3**

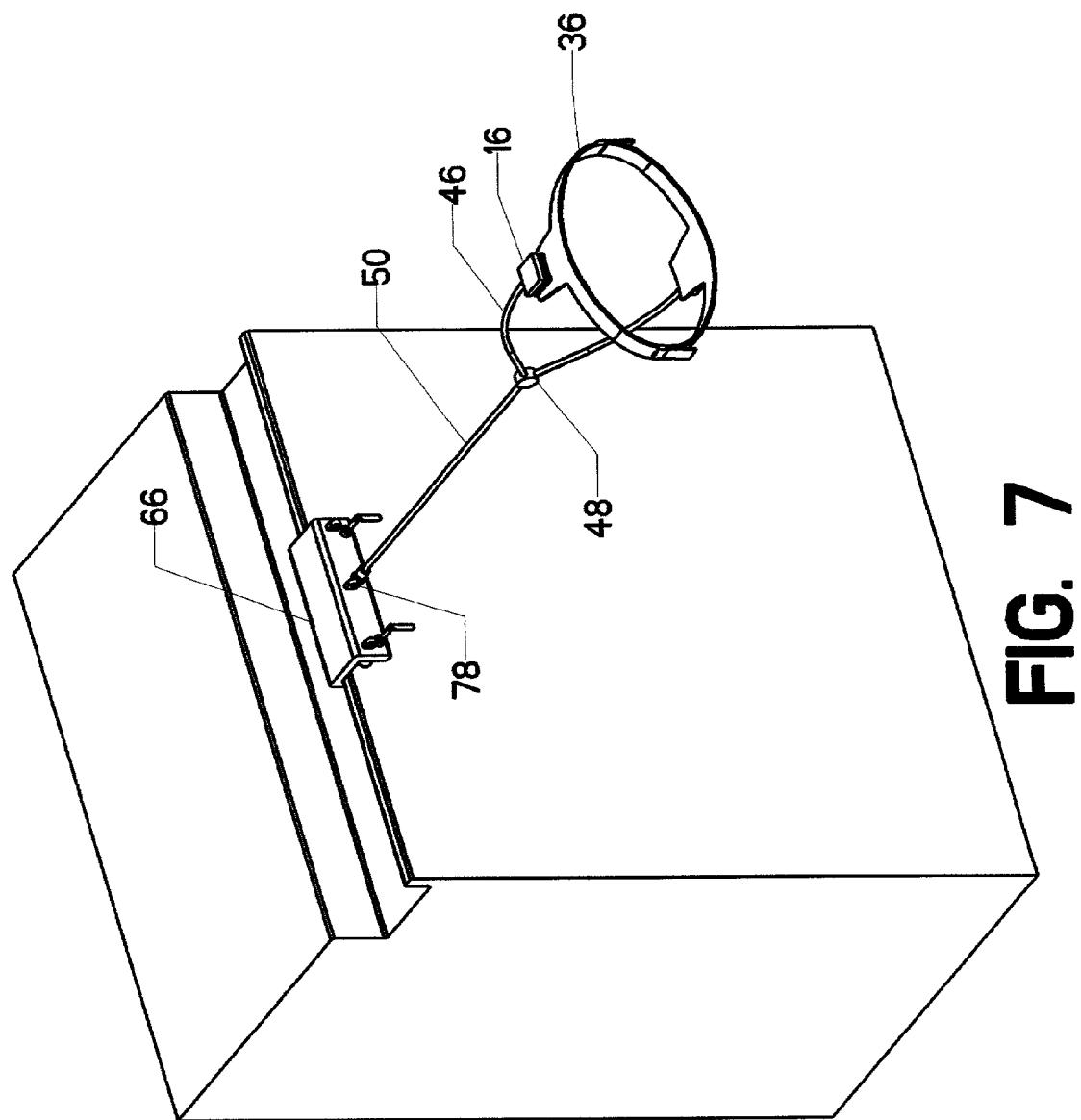


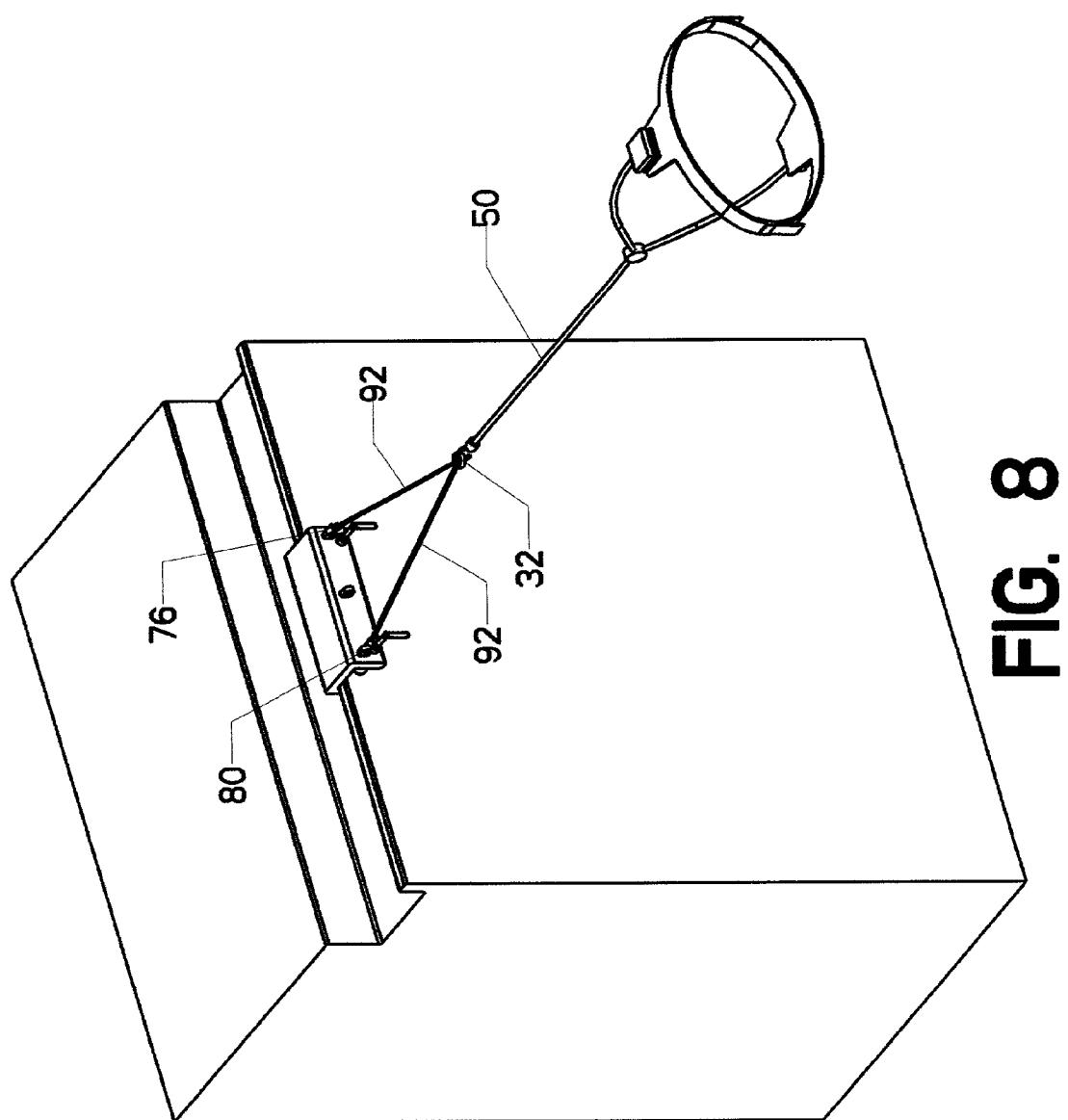
**FIG. 4**



**FIG. 5**







**ELASTIC SWIMMING EXERCISE DEVICE****CROSS-REFERENCES TO RELATED APPLICATIONS**

[0001] Not Applicable

**STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT**

[0002] Not Applicable

**MICROFICHE APPENDIX**

[0003] Not Applicable

**BACKGROUND OF THE INVENTION**

[0004] 1. Field of the Invention

[0005] This invention relates to the field of swimming exercise devices. More specifically, the invention comprises a restraining harness which allows the user to perform swimming strokes in a pool without moving significantly, and a mounting bracket allowing the attachment of the harness to certain types of pools.

[0006] 2. Description of the Prior Art

[0007] This invention represents a refinement of my own prior invention. The prior invention, entitled "Elastic Swing Exercise Device", is the subject of U.S. Pat. No. 6,251,049. This disclosure hereby incorporates by reference U.S. Pat. No. 6,251,049.

[0008] Swimming restraint harnesses have been in use for some time. U.S. Pat. No. 3,988,020 to Carter (1976) discloses a belt harness intended to be anchored to the side of a pool. The harness has two inelastic cords attached to fixed anchor points. These anchor points must be drilled into the concrete near the edge of the pool. While effective in restraining the swimmer, the Carter device does require disfiguring the pool by installing two permanent anchor points. In addition, the harness assembly is substantially rigid. With a substantially rigid harness, it is difficult for the swimmer to know how much energy he or she is exerting. A preferable arrangement is to have an elastic member in the harness, so that as the swimmer strokes more vigorously, some forward progress is noted.

[0009] An elastic harness is disclosed in U.S. Pat. No. 4,109,905 to Meier (1978). The Meier device has a short elastic section near the anchor point which does allow some stretching of the harness. Unfortunately, however, the Meier device also requires a fixed anchor point. Additionally, the harness disclosed is rudimentary and impractical.

[0010] A more sophisticated harness is disclosed in U.S. Pat. No. 5,236,404 to MacLennan (1993). The MacLennan device uses a vest type life jacket as a harness, thereby distributing the load on the swimmer's body in a different fashion. The MacLennan invention also provides for attaching the harness to a pool ladder, eliminating the need for dedicated anchor points. The MacLennan device does not, however, have any elastic members in the harness. An additional drawback is that many pools do not have ladders, making it impossible to attach the device. Finally, the use of a vest type life jacket as a harness significantly restricts many swimming strokes.

[0011] U.S. Pat. No. 5,601,514 to Horn (1997) addresses the attachment problem with suction cups. This device uses two large suction cups on a substantially rigid plastic frame. The device is intended to work in compression though; i.e., the swimmer is trying to force his way toward the attachment point. This approach would not work if the swimmer swims in the other more conventional direction.

[0012] Finally, U.S. Pat. No. 5,816,982 to Croushmore (1998) discloses a radical approach to the anchoring problem. The Croushmore device discloses a collapsible bag used as an anchor. The swimmer fills the bag with water and then drags it up on the side of the pool. The bag anchors a mesh to which is attached the swimming harness. Of course, a swimmer can exert considerable force while exercising. Thus, the bag will need to be quite heavy in order to be an effective anchor. This fact means that the user will have to fill the bag with many pounds of water, making it quite difficult to drag up and over the side of the pool.

[0013] Anchoring issues have been further complicated by the introduction of a new type of pool. Traditional pools have a solid lip running around their perimeters (see FIG. 1 of U.S. Pat. No. 6,251,049). Pool water is pulled into the filtration system through several ports in the side of the pool. More modern pools—particularly larger pools at public facilities—often incorporate a skim gutter running around the entire perimeter. FIG. 1 of the present disclosure illustrates this feature. Pool 10 incorporates skim gutter 16, which is separated from the bulk of the pool by gutter lip 64. The height of gutter lip 64 is set to be just below the water level in the pool. The pool circulation system is configured to pull water from skim gutter 62. As skim gutter 62 constitutes a trip hazard for swimmers entering the pool, it is often covered by a grate.

[0014] Pools employing the configuration illustrated in FIG. 1 present difficulties for the attachment of elastic exercise devices. The known devices for restraining a swimmer while exercising are limited in that they:

[0015] 1. Do not provide sufficient elastic extension of the harness in order to allow the swimmer to gauge his or her level of exertion;

[0016] 2. Require the placement of permanent anchor points in the pool;

[0017] 3. Require the presence of a pool ladder;

[0018] 4. Encumber the user in the swimming exercise;

[0019] 5. Require the lifting of a heavy bag or other type of anchor; and

[0020] 6. Are not adaptable to a pool incorporating a skim gutter.

**BRIEF SUMMARY OF THE INVENTION**

[0021] A system for allowing a swimmer to exercise in a pool while remaining approximately in place. The device includes an adjustable belt which fits around the swimmer's waist. An elastic harness connects this belt to an anchor bracket which is fixed to the side of the pool. The harness elastically deforms as the user exerts greater swimming force, thereby indicating to the user his or her level of exertion. The anchor bracket is configured to attach to a pool incorporating a skim gutter.

[0022] Accordingly, several objects and advantages of the present invention are:

- [0023] 1. To provide sufficient elastic extension of the harness in order to allow the swimmer to gauge his or her level of exertion;
- [0024] 2. To eliminate the need for permanent anchor points in the pool;
- [0025] 3. To eliminate the need for a pool ladder;
- [0026] 4. To not encumber the user in the swimming exercise;
- [0027] 5. To eliminate the need for an inordinately heavy anchor; and
- [0028] 6. To provide a means of attachment to a pool incorporating a skim gutter.

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0029] FIG. 1 is an isometric view, showing a swimming pool incorporating a skin gutter.

[0030] FIG. 2 depicts the anchor bracket employed in the present invention.

[0031] FIG. 3 depicts the anchor bracket from a different perspective.

[0032] FIG. 4 is an isometric view showing a clamp assembly.

[0033] FIG. 5 is an isometric view showing the anchor bracket attached to a pool.

[0034] FIG. 6 is an isometric view showing a first type of exercise device attached to the anchor bracket

[0035] FIG. 7 is an isometric view showing a second type of exercise device attached to the anchor bracket.

[0036] FIG. 8 is an isometric view showing a third type of exercise device attached to the anchor bracket.

#### REFERENCE NUMERALS IN THE DRAWINGS

- [0037] 10 pool
- [0038] 16 belt harness
- [0039] 18 flex bow
- [0040] 20 flexible line
- [0041] 28 pool side
- [0042] 32 collector ring
- [0043] 36 belt
- [0044] 46 trailing line
- [0045] 48 harness union
- [0046] 50 harness leader
- [0047] 58 pool apron
- [0048] 62 skim gutter
- [0049] 64 gutter lip
- [0050] 66 anchor bracket
- [0051] 68 rear wall

- [0052] 70 front wall
- [0053] 72 top wall
- [0054] 74 boss
- [0055] 76 right attach point
- [0056] 78 center attach point
- [0057] 80 left attach point
- [0058] 82 clamp assembly
- [0059] 84 pad
- [0060] 86 base
- [0061] 88 threaded shaft
- [0062] 90 handle
- [0063] 92 split leader
- [0064] 94 slot
- [0065] 96 securing strip

#### DESCRIPTION OF THE INVENTION

[0066] FIG. 1 shows a portion of pool 10. Pool side 28 contains the water within the pool. Pool apron 58 is the area where swimmers walk around prior to entering the pool. The particular type of pool shown incorporates skim gutter 62 running around its perimeter. Skim gutter 62 is bounded on one side by pool apron 58 and on the other side by gutter lip 64. Gutter lip 64 has an inner surface (facing skim gutter 62), a top surface, and an outer surface. Its top surface lies just beneath the water level.

[0067] The pool's fluid circulation pumps draw water from skim gutter 62. Thus, the upper layer of water in the pool tends to flow over the top of gutter lip 64 into skim gutter 62, and from there into the circulation pumps. As skim gutter 62 constitutes a tripping hazard, it is often covered by a grate which lies flush with the top surface of gutter lip 64.

[0068] Attaching an exercise device to the type of pool shown in FIG. 1 can be difficult. The present invention incorporates a device to overcome this difficulty. FIG. 2 depicts anchor bracket 66. It includes rear wall 68, top wall 72, and front wall 70. In operation, top wall 72 fits over the top surface of gutter lip 64. Rear wall 68 is then positioned to bear against the inner surface of gutter lip 64.

[0069] Front wall 70 incorporates two bosses 74. These include female threads for the mounting of two clamping assemblies 82. When anchor bracket 66 is placed over gutter lip 64, the two clamping assemblies 82 are tightened so that they clamp against the outer surface of gutter lip 64, thereby locking anchor bracket 66 in position. Front wall 70 also incorporates additional features for the attachment of swimming exercise devices. Right hand attach point 76, center attach point 78, and left attach point 80 are all available at the user's option.

[0070] FIG. 3 shows anchor bracket 66 from a different perspective. The reader will observe that the inner facing surface of rear wall 68 is covered by pad 84. Pad 84 prevents the marring of gutter lip 64 when the device is locked in place.

[0071] FIG. 4 shows some details of clamp assembly 82. Its primary element is threaded shaft 88. Base 86 is located

on its inward-facing extremity. Base 86 is free to rotate with respect to threaded shaft 88. As threaded shaft 88 is turned within boss 74, base 86 does not rotate. This feature minimizes marring of the outer surface of gutter lip 64 as clamp assembly 82 is tightened. Base 86 is preferably provided with a pad to further minimize marring. Handle 90 is provided so that the user can tighten clamp assembly 82 without the need for tools. FIG. 5 shows anchor bracket 66 clamped in position on gutter lip 64.

[0072] A variety of swimming exercise devices can be attached to anchor bracket 66. FIG. 6 shows an elastic device as previously disclosed in my own U.S. Pat. No. 6,251,049 (2001). In this configuration, flex bow 18 is placed between gutter lip 64 and front wall 70 of anchor bracket 66. Flex bow 18 may also be placed above the two threaded shafts 88, so that it is locked in position. Additional securing means are also preferably provided. Returning now to FIG. 2, the reader will observe that front wall 70 is pierced by two sets of slots 94. An elastic securing strap 96 resides within the slots 94. A loop of each securing strap extends behind front wall 70. These two loops secure flex bow 18 in place. The loops can be provided with an opening (preferably closed by VELCRO) to aid in the installation and removal of flex bow 18.

[0073] As described in my prior patent, flex bow 18 is capable of substantial elastic deformation. Returning now to FIG. 6, the reader will observe that its two ends are attached via two flexible lines 20 to collector ring 32. Collector ring 32 is attached to harness leader 50 which, in turn, attaches to two trailing lines 42. Trailing lines 42 are attached to belt 36, which is affixed around the swimmer's waist. The various lines described can be made of elastic tubing to provide an even greater elasticity in the device as a whole. This elasticity is a desired feature, since it allows the swimmer to gauge his or her level of exertion according to the total elongation of the device.

[0074] The use of anchor bracket 66 allows the use of flex bow 18 in pools that don't have a ladder or other convenient anchoring point for the flex bow. Thus, the configuration shown in FIG. 6 represents the preferred embodiment.

[0075] FIG. 7 illustrates another embodiment in which flex bow 18 is not used. In this embodiment harness leader 50 is simply attached to center attach point 78 on anchor bracket 66. Harness leader 50 is preferably made of elastic material. Although this configuration possesses less elasticity than the embodiment shown in FIG. 6, it is simpler to install.

[0076] FIG. 8 shows another embodiment having more elasticity than the one shown in FIG. 7. Two split leaders 92 are attached to right attach point 76 and left attach point 80, respectively. The two split leaders 92 are then attached to collector ring 32. Provided that elastic materials are used for the split leaders, this configuration provides greater elasticity.

[0077] Accordingly, the reader will appreciate that the proposed invention allows a swimmer to exercise within a pool without moving significantly, yet still allows the swimmer to gauge his or her level of exertion. The invention has further advantages in that it:

[0078] 1. Eliminates the need for permanent anchor points in the pool;

[0079] 2. Eliminates the need for a pool ladder;

[0080] 3. Does not encumber the user in the swimming exercise;

[0081] 4. Eliminates the need for an inordinately heavy anchor; and

[0082] 5. Allows the use of an exercise device in a pool having a skim gutter.

[0083] Although the preceding description contains significant detail, it should not be construed as limiting the scope of the invention but rather as providing illustrations of the preferred embodiments of the invention. Thus, the scope of the invention should be fixed by the following claims, rather than by the examples given.

Having described my invention, I claim:

1. An anchor bracket for attaching a swimming exercise apparatus to a pool, wherein said pool includes a skim gutter and a gutter lip having an inner surface facing said skim gutter and an outer surface facing away from said skim gutter, comprising:

- a. a rear wall, configured to be placed against said inner surface of said gutter lip;
- b. a front wall configured to be placed proximate said outer surface of said gutter lip;
- c. a top wall, attaching said rear wall to said front wall;
- d. clamping means for clamping said rear wall tightly against said inner surface of said gutter lip, so as to secure said anchor bracket to said gutter lip; and
- e. at least one attach point, proximate said front wall, wherein said at least one attach point is configured to allow the attachment of said swimming exercise apparatus to said anchoring device.

2. An anchor bracket as recited in claim 1, wherein said clamping means comprises:

- a. an internally threaded hole passing through said front wall in a direction approximately perpendicular to said front wall; and
- b. a threaded shaft located within said internally threaded hole, wherein said threaded shaft has an inner extremity facing said gutter lip and an outer assembly distal to said gutter lip, so that when said threaded shaft is threaded into said hole said inner extremity bears against said outer surface of said gutter lip, thereby clamping said anchor bracket to said gutter lip.

3. An anchor bracket as recited in claim 2, wherein said threaded shaft further comprises:

- a. a base, attached to said inner extremity and capable of rotational displacement with respect to said threaded shaft; and
  - b. a handle, attached to said outer extremity of said threaded shaft.
4. A swimming exercise apparatus intended to maintain a swimmer relatively stationary in a pool, wherein said pool includes a skim gutter and a gutter lip having an inner surface facing said skim gutter and an outer surface facing away from said skim gutter, comprising:

- a. an anchor bracket, comprising:
  - i. a rear wall, configured to be placed against said inner surface of said gutter lip;

- ii. a front wall, configured to be placed proximate said outer surface of said gutter lip;
  - iii. a top wall, attaching said rear wall to said front wall; and
  - iv. clamping means for clamping said rear wall tightly against said inner surface of said gutter lip, so as to secure said anchor bracket to said gutter lip;
- b. a belt harness attached to said swimmer around said swimmer's waist;
- c. a flex bow, having a first end and a second end, and being placed between said front wall of said anchor bracket and said gutter lip;
- d. a first flexible line, having a first end and a second end, wherein said first end is attached to said first end of said flex bow and said second end is connected to said belt harness; and
- e. a second flexible line, having a first end and a second end, wherein said first end is attached to said second end of said flex bow and said second end is connected to said belt harness, so that as said swimmer attempts to swim away from said anchor bracket said first and second flexible lines are placed in tension, said flex bow is drawn against said front wall of said anchor bracket, and said flex bow begins to bow.
- 5.** The device as recited in claim 6, wherein said flex bow is a long slender rod, capable of bending substantially without undergoing plastic deformation.
- 6.** A swimming exercise apparatus intended to maintain a swimmer relatively stationary in a pool, wherein said pool includes a skim gutter and a gutter lip having an inner surface facing said skim gutter and an outer surface facing away from said skim gutter, comprising:
- a. an anchor bracket, comprising:
    - i. a rear wall, configured to be placed against said inner surface of said gutter lip;
    - ii. a front wall, configured to be placed proximate said outer surface of said gutter lip;
    - iii. a top wall, attaching said rear wall to said front wall;
    - iv. clamping means for clamping said rear wall tightly against said inner surface of said gutter lip, so as to secure said anchor bracket to said gutter lip; and
    - v. a first attach point, affixed to said front wall;
  - b. a belt harness attached to said swimmer around said swimmer's waist; and
  - c. a first harness leader, having a first end and a second end, wherein said first end is attached to said first attach point on said anchor bracket and wherein said second end is connected to said belt harness.
- 7.** A swimming exercise apparatus as recited in claim 6, wherein said anchor bracket further comprises a second attach point affixed to said front wall, and further comprising a second harness leader, having a first end and a second end, wherein said first end is attached to said second attach point on said anchor bracket and wherein said second end is connected to said belt harness.

\* \* \* \* \*



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(12) **United States Patent**  
Reese et al.

(10) **Patent No.:** US 9,265,990 B2  
(45) **Date of Patent:** Feb. 23, 2016

(54) **AQUATIC EXERCISE SYSTEM**

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(22) Filed: Jul. 18, 2014

(65) **Prior Publication Data**

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A63B 21/06 (2006.01)

(52) **U.S. Cl.**

CPC ..... A63B 31/00 (2013.01); A63B 2225/60 (2013.01); A63B 2244/20 (2013.01)

(58) **Field of Classification Search**

CPC ..... A63B 31/00; A63B 2225/60; A63B 2225/105; A63B 2225/107; A63B 2225/10; A63B 21/154; A63B 21/285; A63B 21/28; A63B 21/06; A63B 21/0601; A63B 21/0602; A63B 21/0611; A63B 21/062; A63B 21/15; A63B 21/152; A63B 21/156; A63B 21/153; A63B 2208/03; A63B 2244/20; A63B 2021/0614; A63B 69/12; A63B 69/125; A63B 69/14; A63B 35/00

USPC ..... 482/55, 102, 103  
See application file for complete search history.

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Primary Examiner — Oren Ginsberg

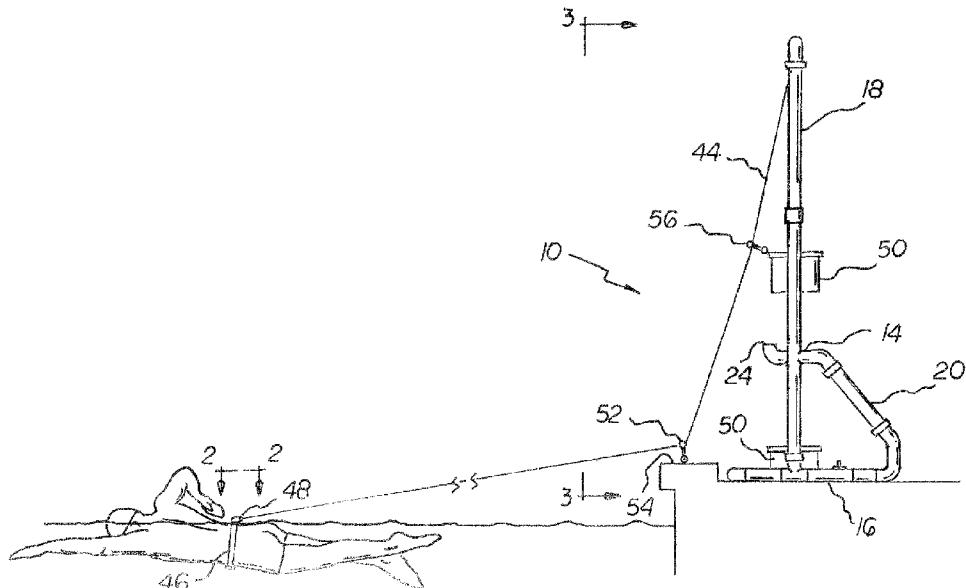
Assistant Examiner — Nyca T Nguyen

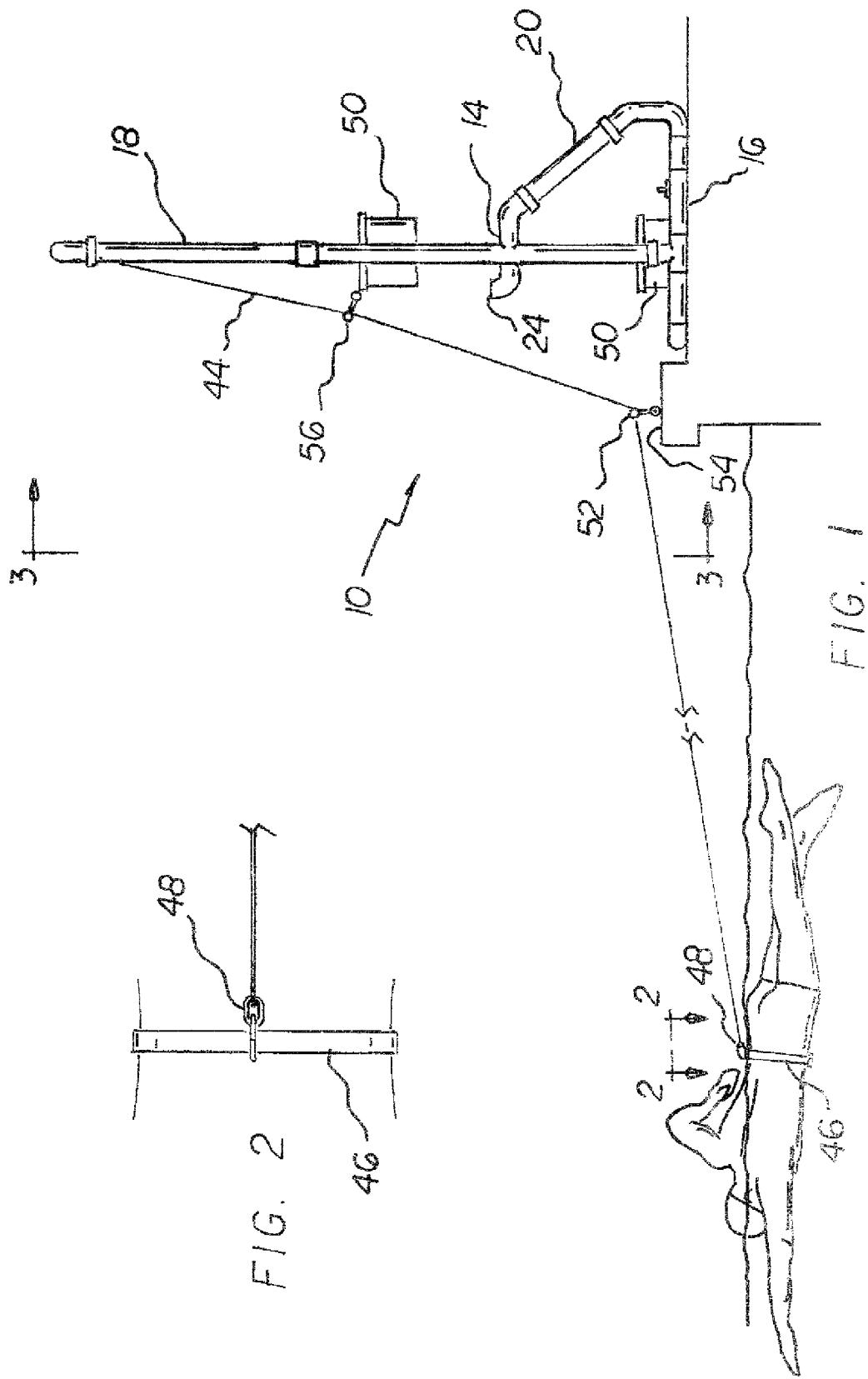
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**ABSTRACT**

A housing assembly includes a plurality of hollow pipes forming a base section horizontally disposed and a support section vertically disposed with a top pipe. An operational assembly includes a plurality of block and tackle subassemblies. Each block and tackle sub assembly includes a fixed block with a plurality of upper pulleys depending from the top pipe. Each block and tackle sub assembly includes a movable tackle with a plurality of lower pulleys. Each movable tackle includes a cord with a fixed end, a movable end, and an intermediate section. The intermediate section winds back and forth between the lower pulleys and the upper pulleys. A belt has a clip attached to the movable end of each cord.

1 Claim, 3 Drawing Sheets





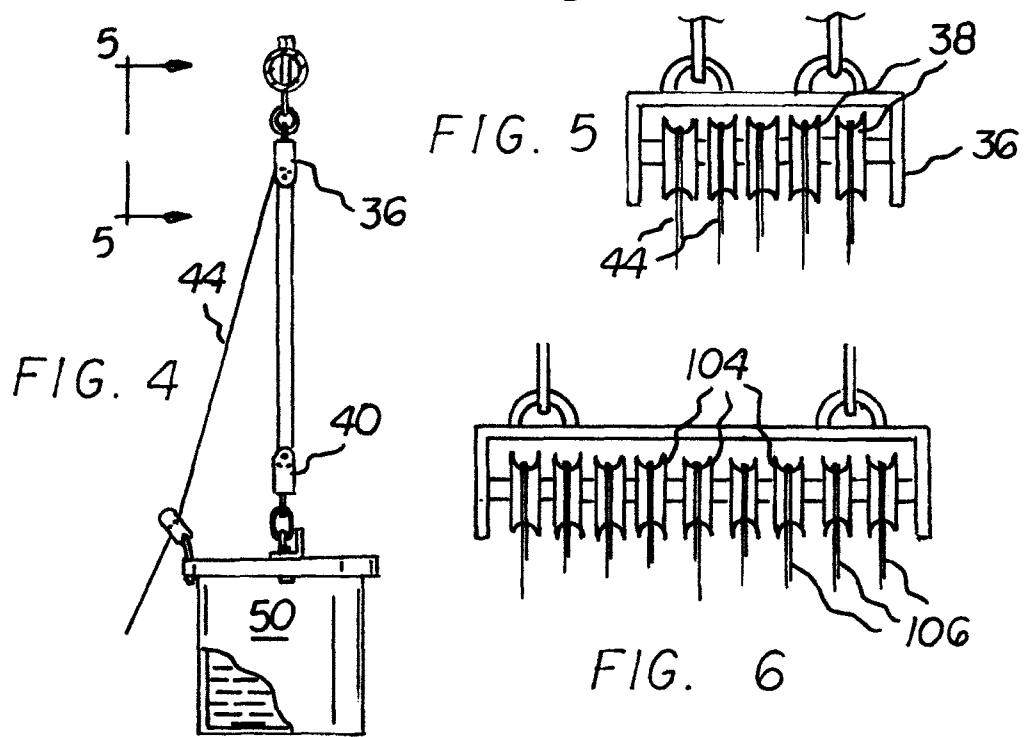
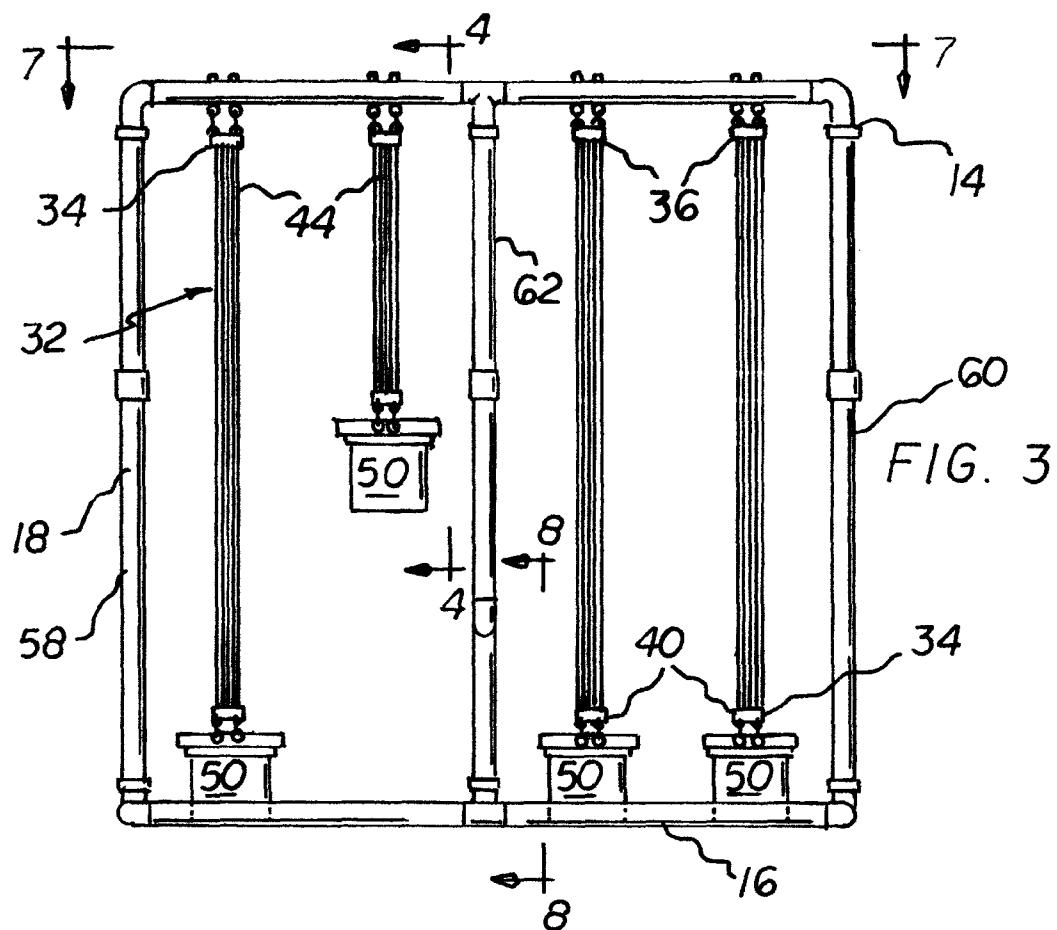


FIG. 7

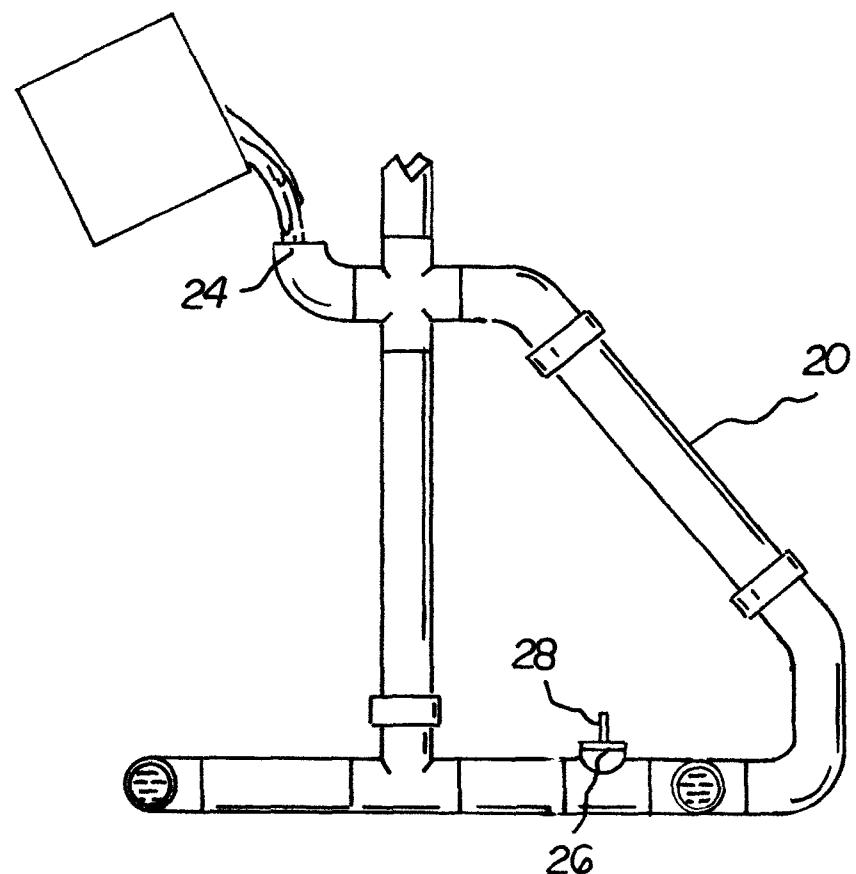
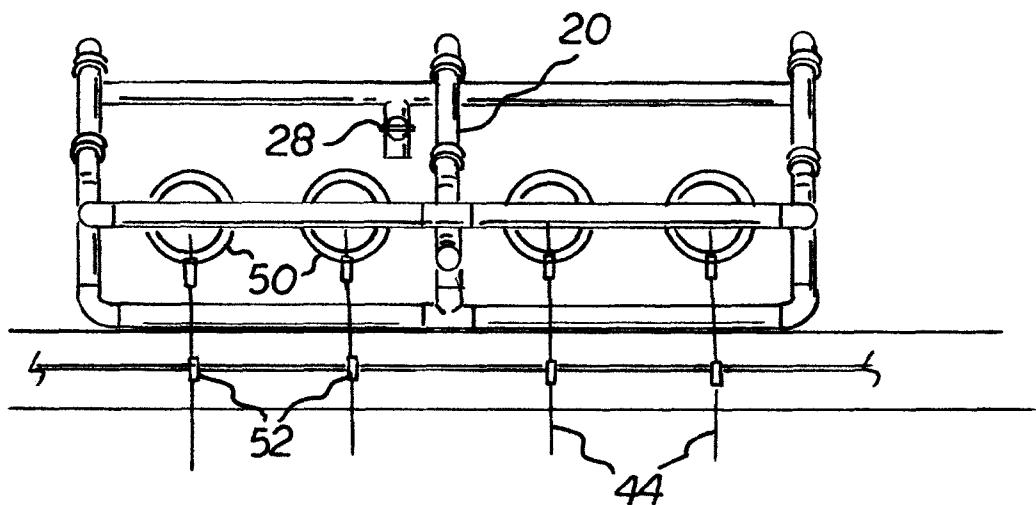


FIG. 8

**1****AQUATIC EXERCISE SYSTEM****BACKGROUND OF THE INVENTION****Field of the Invention**

The present invention relates to an aquatic exercise system and more particularly pertains to applying a resistive force to an exercising swimmer, for extending such resistive force to a number of swimmers, and for varying the number of swimmers to experience such resistive force, the applying and the extending and the varying being done in a safe, convenient, and economic manner.

**SUMMARY OF THE INVENTION**

In view of the foregoing disadvantages inherent in the known types of exercise systems of known designs and configurations now present in the prior art, the present invention provides an improved aquatic exercise system. As such, the general purpose of the present invention, which will be described subsequently in greater detail, is to provide a new and improved aquatic exercise system and method which has all the advantages of the prior art and none of the disadvantages.

To attain this, from a broadest standpoint, the present invention essentially comprises a housing assembly. The housing assembly includes a plurality of hollow pipes forming a base section horizontally disposed and a support section vertically disposed with a top pipe. An operational assembly includes a plurality of block and tackle subassemblies. Each block and tackle sub assembly includes a fixed block with a plurality of upper pulleys depending from the top pipe. Each block and tackle sub assembly includes a movable tackle with a plurality of lower pulleys. Each movable tackle includes a cord with a fixed end, a movable end, and an intermediate section. The intermediate section winds back and forth between the lower pulleys and the upper pulleys. A belt has a clip attached to the movable end of each cord.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject matter of the claims attached.

In this respect, before explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of descriptions and should not be regarded as limiting.

As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the claims be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

It is therefore an object of the present invention to provide a new and improved aquatic exercise system which has all of

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the advantages of the prior art exercise systems of known designs and configurations and none of the disadvantages.

It is another object of the present invention to provide a new and improved aquatic exercise system which may be easily and efficiently manufactured and marketed.

It is a further object of the present invention to provide a new and improved aquatic exercise system which is of durable and reliable constructions.

An even further object of the present invention is to provide a new and improved aquatic exercise system which is susceptible of a low cost of manufacture with regard to both materials and labor, and which accordingly is then susceptible of low prices of sale to the consuming public, thereby making such aquatic exercise system economically available to the buying public.

Lastly, another object of the present invention is to provide an aquatic exercise system for applying a resistive force to an exercising swimmer, for extending such resistive force to a number of swimmers, and for varying the number of swimmers to experience such resistive force, the applying and the extending and the varying being done in a safe, convenient, and economic manner.

These together with other objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure.

For a better understanding of the invention, its operating advantages and the specific objects attained by its uses, reference should be had to the accompanying drawings and descriptive matter in which there is illustrated preferred embodiments of the invention.

**BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

FIG. 1 is a side elevational view of an aquatic exercise system constructed in accordance with the principles of the present invention.

FIG. 2 is a plan view of a portion of the system taken along line 2-2 of FIG. 1.

FIG. 3 is a front elevational view of a portion of the system taken along line 3-3 of FIG. 1.

FIG. 4 is a cross sectional view of a portion of the system taken along line 4-4 of FIG. 3.

FIG. 5 is a front elevational view of a portion of the system taken along line 5-5 of FIG. 4.

FIG. 6 is a front elevational view similar to FIG. 5 but illustrating an alternate embodiment of the invention.

FIG. 7 is a plan view of a portion of the system taken along line 7-7 of FIG. 3.

FIG. 8 is a cross sectional view of a portion of the system taken along line 8-8 of FIG. 3 illustrating the filling of the housing assembly with water for weighting purposes.

The same reference numerals refer to the same parts throughout the various Figures.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

With reference now to the drawings, and in particular to FIG. 1 thereof, the preferred embodiment of the new and improved aquatic exercise system embodying the principles

and concepts of the present invention and generally designated by the reference numeral 10 will be described.

The present invention, the aquatic exercise system 10 is comprised of a plurality of components. Such components in their broadest context include a housing assembly, an operational assembly, and a belt. Such components are individually configured and correlated with respect to each other so as to attain the desired objective.

From a specific standpoint, first provided is a housing assembly 14. The housing assembly includes a plurality of hollow pipes. The hollow pipes are fabricated of polyvinyl chloride. The housing assembly includes a base section 16. The base section is horizontally disposed. The base section is in a rectangular configuration. The housing assembly includes a support section 18. The support section is vertically disposed. The support section is also in a rectangular configuration. The support section has a top pipe. The housing assembly also includes an intermediate section 20. The intermediate section is angularly disposed. The intermediate section couples the base section. The intermediate section further couples the intermediate region of the support section. The housing assembly includes a water inlet port 24. The water inlet is provided adjacent to the intermediate region of the housing assembly. In this manner water is provided below the inlet port as a weight. Further in this manner the housing assembly is stabilized the housing. The housing assembly also includes a water outlet port 26. The water outlet portion has a removable cover 28. In this manner emptying the water from the housing assembly when not in use is facilitated.

An operational assembly 32 is provided. The operational assembly includes four block and tackle subassemblies 34. Each block and tackle subassembly includes a fixed block 36. Each fixed block has a plurality of upper pulleys 38. The upper pulleys depend from the top rail. The upper pulleys are rotatable around a common upper axis. Each block and tackle subassembly includes a movable tackle 40. Each movable tackle has a plurality of lower pulleys. The lower pulleys are rotatable around a common lower axis. Each block and tackle subassembly includes a cord 44. The cord has a fixed end. The cord also has a movable end. The cord further has an intermediate section. The fixed end is attached to an associated block. The intermediate section winds back and forth between the lower pulleys and the upper pulleys. In this manner pulling the movable end of any cord will raise its associated tackle.

Provided last is a belt 46. The belt has a clip 48. The clip is attached to the movable end of each cord. The belt is positionable around a waist of a swimmer during use while swimming for exercise. A water bucket 50 is provided. The water bucket is attached to each tackle. The water bucket depends from each tackle. In this manner an increased resistive force is provided to the swimmer during use. A pool 54 is provided. A fixed eyelet 52 is provided. The fixed eyelet is attached to the pool 54 during use with the cord passing through the fixed eyelet for guiding purposes. A movable eyelet 56 is provided. The movable eyelet is attached to the bucket during use with the cord passing through the movable eyelet for guiding purposes.

The housing assembly has two vertical end pipes 58, 60 and a vertical center pipe 62. The vertical center pipe is equally spaced between the two vertical end pipes. Two operational subassemblies/block and tackle subassemblies are located on each side of the vertical center pipe. The pipes on one side of the vertical central pipe are adapted to be removed along with the respective two operational subassemblies/block and tackle subassemblies. In this manner the system is rendered for use by two swimmers rather than for use by more swim-

mers. The pipes on one side of the vertical central pipe are adapted to be separated. A supplemental vertical central pipe may be added with associated horizontal pipes and supplemental operational subassemblies. In this manner the system is rendered for use by six swimmers rather than for use by fewer swimmers.

An alternate embodiment of the invention is shown in FIG. 5. In this embodiment, five upper pulleys 38 are provided and five lower pulleys are provided. The cord 44 provided is of a length to accommodate a swimmer exercising by swimming 25 meters.

In an alternate embodiment 100 of the present invention, nine upper pulleys 104 are provided and nine lower pulleys are provided. A cord 106 is also provided. The cord is of a length to accommodate a swimmer exercising by swimming 50 meters. Note FIG. 6.

As to the manner of usage and operation of the present invention, the same should be apparent from the above description. Accordingly, no further discussion relating to the manner of usage and operation will be provided.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form, function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention.

What is claimed as being new and desired to be protected by Letters Patent of the United States is as follows:

1. An aquatic exercise system for applying a resistive force to an exercising swimmer, for extending such resistive force to a number of swimmers, and for varying the number of swimmers to experience such resistive force, the applying and the extending and the varying being done in a safe, convenient, and economic manner, the system comprising, in combination:

a housing assembly formed of a plurality of hollow pipes, the hollow pipes being fabricated of polyvinyl chloride, the housing assembly including a base section horizontally disposed in a rectangular configuration, the housing assembly including a support section vertically disposed in a rectangular configuration with a top pipe, the housing assembly including an intermediate section angularly disposed and coupling the base section and an intermediate region of the support section, a water inlet port adjacent to the intermediate section of the housing assembly to provide water below the inlet port as a weight to stabilize the housing assembly, a water outlet port with a removable cover to facilitate emptying the water from the housing assembly when not in use;

an operational assembly formed of four block and tackle subassemblies, each block and tackle subassembly including a fixed block with a plurality of upper pulleys coupled to the top pipe and rotatable around a common upper axis, each block and tackle subassembly including a movable tackle with a plurality of lower pulleys rotatable around a common lower axis, each block and tackle subassembly including a cord with a fixed end and a movable end and an intermediate section, the fixed end

attached to an associated block, the intermediate section of the cord winding back and forth between the lower pulleys and the upper pulleys whereby pulling the movable end of any cord will raise its associated tackle; and a belt with a clip attached to the movable end of each cord, 5  
the belt configured to be positionable around a waist of the exercising swimmer during use while swimming for exercise, a water bucket attached to and coupled to each block and tackle subassembly for providing an increased resistive force to the exercising swimmer during use, a 10  
fixed eyelet attached to a pool during use with the cord passing through the fixed eyelet for guiding purposes, a movable eyelet attached to each water bucket during use with the cord passing through the movable eyelet for 15  
guiding purposes;  
the plurality of hollow pipes including two vertical end pipes, and a vertical center pipe, equally spaced between the two vertical end pipes, two block and tackle subassemblies being located on each side of the vertical center pipe, the 20  
plurality of hollow pipes on one side of the vertical central pipe adapted to be removed along with the respective two block and tackle subassemblies to render the system for use by two swimmers rather than for use by more swimmers. 25

\* \* \* \* \*

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## DEMANDE DE BREVET D'INVENTION

A1

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(56) Liste des documents cités dans le rapport de recherche préliminaire : Se reporter à la fin du présent fascicule

(60) Références à d'autres documents nationaux apparentés :

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(73) Titulaire(s) :

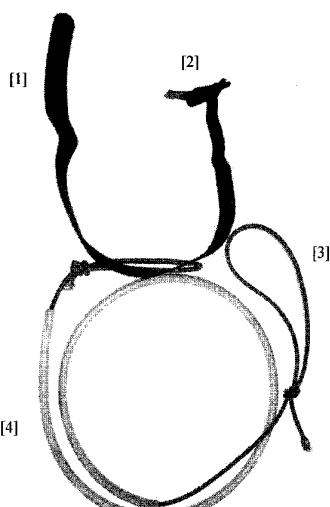
(74) Mandataire(s) :

### (54) DISPOSITIF POUR LA NAGE STATIQUE ET CONTINUE EN PISCINE PARTICULIÈRE.

(57) L'invention concerne un dispositif permettant de nager de manière ininterrompue dans une piscine de faible ou moyenne dimension en évitant le retournement aux extrémités. Il consiste à absorber l'énergie produite par le nageur grâce à l'élasticité d'un tendeur arrimé à point fixe extérieur à la piscine.

Il est constitué par l'assemblage d'une ceinture [1] munie d'une boucle à serrage rapide [2], d'un tendeur élastique [3] gainé d'un tuyau plastique souple [4] pour faciliter l'utilisation.

Le dispositif selon l'invention est particulièrement destiné aux utilisateurs de piscine particulière pour leur permettre une nage statique.



FR 2 908 316 - A1



La présente invention concerne un dispositif permettant de nager en continu dans une piscine quelle que soit sa dimension.

La nage en piscine est conditionnée à la longueur de celle-ci, il est nécessaire de 5 tourner à chaque arrivée au bord.

Pour des piscines de faible longueur (3 à 8 mètres), le retournement est trop fréquent et devient un handicap à la nage. Pour des piscines de longueur moyenne, c'est moins important mais encore gênant.

Le dispositif selon l'invention permet de remédier à cet inconvénient. Il permet, par sa 10 conception, d'absorber l'énergie du déplacement fournie par les mouvements de natation et donc au nageur de se retrouver en position initiale à la fin de chaque mouvement.

Ce dispositif comporte tout d'abord une ceinture large en nylon tressé, munie d'une 15 boucle en plastique dur, permettant le réglage autour de la taille du nageur. A cette ceinture se passe la boucle d'un lien élastique type "sandow" terminé par une deuxième boucle, il est 20 dénommé "tendeur". La position de la boucle du tendeur sur la ceinture est dorsale pour l'utilisateur. Pour éviter toute gêne, le tendeur est enfilé dans une gaine plastique souple. Par sa deuxième boucle, le tendeur est arrimé à un point fixe extérieur à la piscine. Le point d'arrimage se trouve à une distance comprise entre 2m et 3m50 à partir de la ceinture du nageur. La longueur du tendeur est réglée en fonction de l'environnement (dimension piscine). Le tendeur est tendu plus ou moins suivant l'énergie du nageur.

Sur le mouvement de nage le dispositif va se tendre. Cette tension va ramener en arrière le nageur pendant le temps mort qui précède le mouvement suivant, sans qu'il s'en rende compte. Le déplacement produit à chaque mouvement est ainsi annulé par le dispositif.

La photo jointe en annexe permet de voir la constitution du dispositif et l'assemblage 25 des différents éléments :

- une ceinture [1] nylon tressé ou similaire largeur 5 cm munie d'une boucle plastique [2] à serrage rapide
- un tendeur élastique [3] de diamètre 8 mm, de longueur réglable maxi 4 m
- une gaine plastique souple [4] de diamètre intérieur 12 mm, de longueur 2 m

30 Le présent dispositif est destiné à la nage en piscine particulière de dimension réduite ou moyenne.

## REVENDICATIONS

1) Dispositif pour nager en continu en piscine particulière de faible ou moyenne dimension afin d'éviter le retournement à chaque extrémité. Il est caractérisé par l'assemblage d'une ceinture en nylon tressé [1] munie d'une boucle plastique [2] à serrage rapide, à travers de laquelle passe la boucle effectuée sur l'extrémité d'un tendeur élastique [3]. L'autre extrémité terminée aussi en boucle est arrimée sur un point fixe extérieur à la piscine. Ce tendeur est enfilé dans une gaine plastique souple [4]. Il permet d'annuler le déplacement 10 généré par les mouvements de natation. Il crée une opposition souple et renouvelée à chaque mouvement du fait de son élasticité.

2) Dispositif selon la revendication 1 caractérisé par l'adaptation de la ceinture [1] à la taille de l'utilisateur avec une fermeture dite 'boucle rapide' [2] en plastique dur.

3) Dispositif selon la revendication 2 caractérisé par la mise en place d'une gaine de plastique souple [4] de diamètre intérieur 12 mm autour du tendeur [3] et de longueur 2m permettant d'éviter toute gêne lors des mouvements de natation.

ANNEXE 1/1

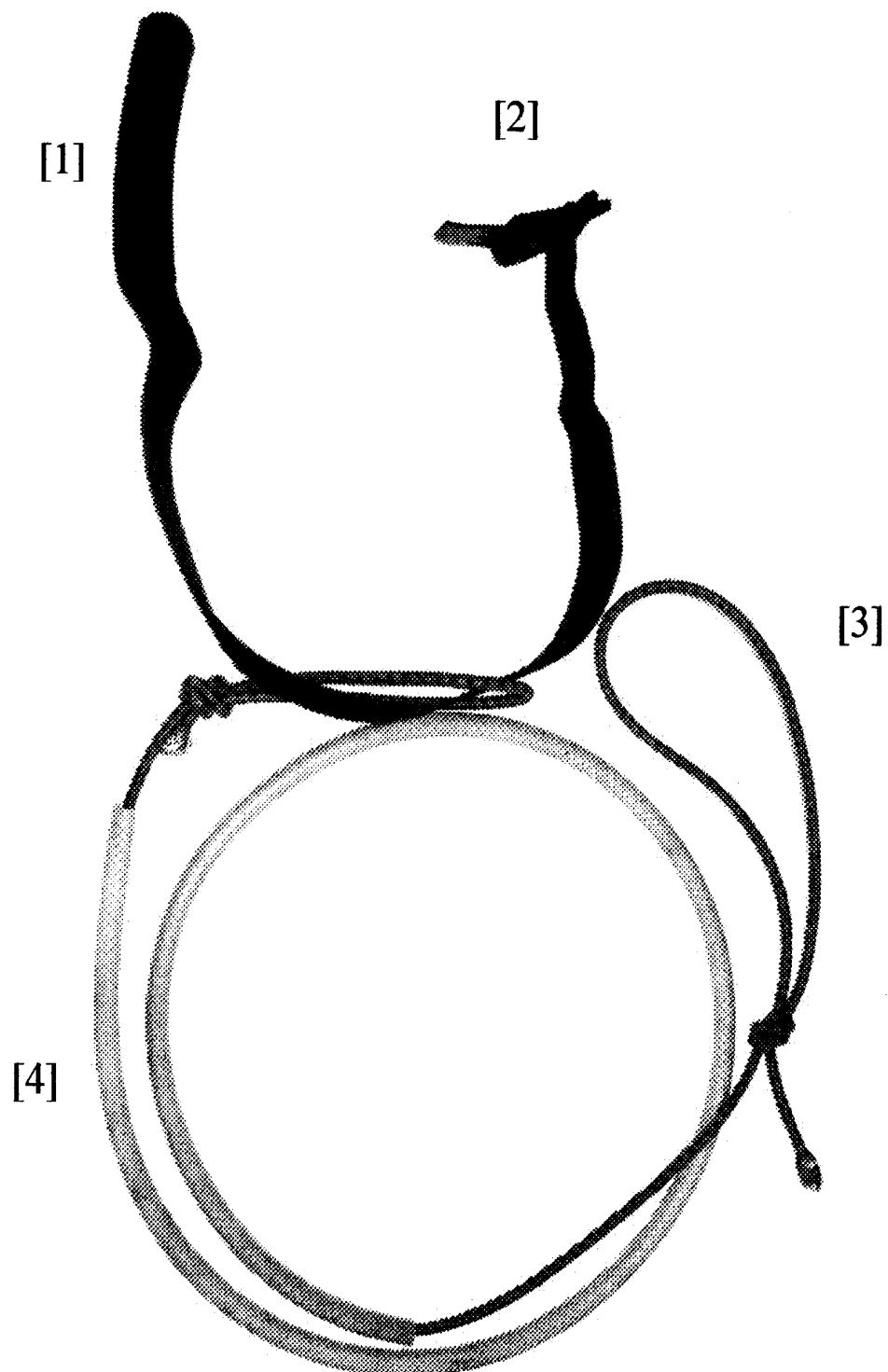


FIG. 1

**RAPPORT DE RECHERCHE  
PRÉLIMINAIRE**
N° d'enregistrement  
nationalFA 689017  
FR 0610003établi sur la base des dernières revendications  
déposées avant le commencement de la recherche

| <b>DOCUMENTS CONSIDÉRÉS COMME PERTINENTS</b> |   | Revendication(s)<br>concernée(s)   | Classement attribué<br>à l'invention par l'INPI |
|--|---|--|---|
| Catégorie                                    | Citation du document avec indication, en cas de besoin,<br>des parties pertinentes  |  |   |
| X  | US 5 083 522 A (ASHROW DAVID P [US])<br>28 janvier 1992 (1992-01-28)<br>* colonne 3, ligne 3 - ligne 24 *<br>* colonne 4, ligne 7 - ligne 27; figures<br>1,3,4,6 *  | 1-3  | A63B31/00                                       |
| X  | -----<br>FR 2 876 595 A (SOUQUIERE STEPHANE JEAN<br>GUY PA [FR]) 21 avril 2006 (2006-04-21)<br>* page 1, ligne 4 - ligne 30; figures 1-3<br>*   | 1-3  |   |
| X  | -----<br>US 5 816 982 A (CROUSHORE BRUCE J [US])<br>6 octobre 1998 (1998-10-06)<br>* colonne 3, ligne 21 - ligne 56; figures<br>1,3 *   | 1-3  |   |
| X  | -----<br>US 4 247 096 A (SCHMITT LARRY)<br>27 janvier 1981 (1981-01-27)<br>* colonne 1, ligne 5 - ligne 24; figures<br>1,3 *  | 1-3  |   |
|  | -----   |  | DOMAINES TECHNIQUES<br>RECHERCHES (IPC)         |
|  |   |  | A63B  |
| 2  | Date d'achèvement de la recherche   | Examinateur  |   |
|  | 4 juin 2007   | Michels, Norbert   |   |
| EPO FORM 1503 12.99 (P04C14)                 | CATÉGORIE DES DOCUMENTS CITÉS   | T : théorie ou principe à la base de l'invention<br>E : document de brevet bénéficiant d'une date antérieure<br>à la date de dépôt et qui n'a été publié qu'à cette date<br>de dépôt ou qu'à une date postérieure.<br>D : cité dans la demande<br>L : cité pour d'autres raisons<br>.....<br>& : membre de la même famille, document correspondant |   |
|  | X : particulièrement pertinent à lui seul<br>Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie<br>A : arrière-plan technologique<br>O : divulgation non-écrite<br>P : document intercalaire |  |   |

**ANNEXE AU RAPPORT DE RECHERCHE PRÉLIMINAIRE  
RELATIF A LA DEMANDE DE BREVET FRANÇAIS NO. FR 0610003 FA 689017**

La présente annexe indique les membres de la famille de brevets relatifs aux documents brevets cités dans le rapport de recherche préliminaire visé ci-dessus.

Les dits membres sont contenus au fichier informatique de l'Office européen des brevets à la date du **04-06-2007**

Les renseignements fournis sont donnés à titre indicatif et n'engagent pas la responsabilité de l'Office européen des brevets, ni de l'Administration française

| Document brevet cité<br>au rapport de recherche | Date de<br>publication | Membre(s) de la<br>famille de brevet(s) | Date de<br>publication |
|---|------------------------|---|------------------------|
| US 5083522 A 28-01-1992                         | AUCUN                  |   |                        |
| FR 2876595 A 21-04-2006                         | WO 2006042964 A1       |   | 27-04-2006             |
| US 5816982 A 06-10-1998                         | AUCUN                  |   |                        |
| US 4247096 A 27-01-1981                         | AUCUN                  |   |                        |

# UK Patent Application

GB 2 250 210 A

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A63B 69/12

(52) UK CL (Edition K)  
A6M M8X

(56) Documents cited  
US 4114874 A

(58) Field of search  
UK CL (Edition K) A6M M8X  
INT CL<sup>5</sup> A63B 31/00 69/12 69/14

## (54) A device for semi-static swimming

(57) A tubular container<sup>1</sup> with pulleys<sup>4</sup> mounted within the tube, holds twice (or three times) its own length of elasticated cord<sup>5</sup>. A swinging link<sup>2</sup> is attached to a solid object outside a swimming pool and the cord loop<sup>3</sup> is attached to a harness belt on the swimmer, with or without an intervening length of rigid cord.

The extensibility of the elasticated cord<sup>5</sup> allows a variable degree of forward movement resulting in semi-static swimming.

The compact unit enables its use in pools down to only 3m in length which size shows large savings in capital and running costs, especially with heated pools. The tube also protects the cord from dirt, sunlight and full immersion in water.

The device is therefore of value for general exercise, swimming training and remedial purposes.

FIG 1

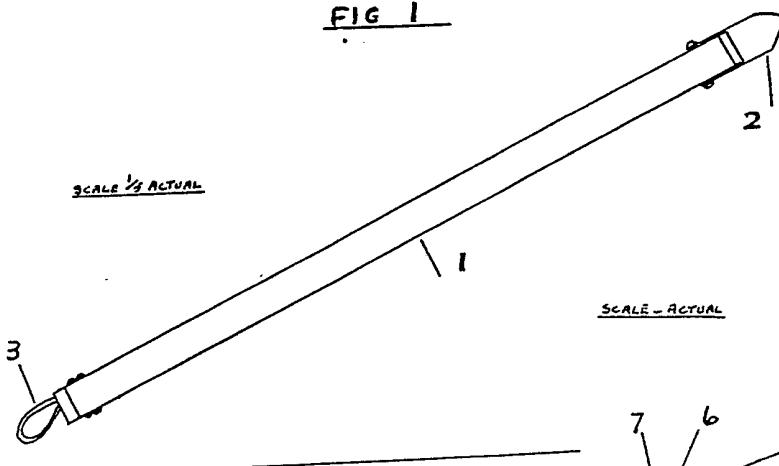
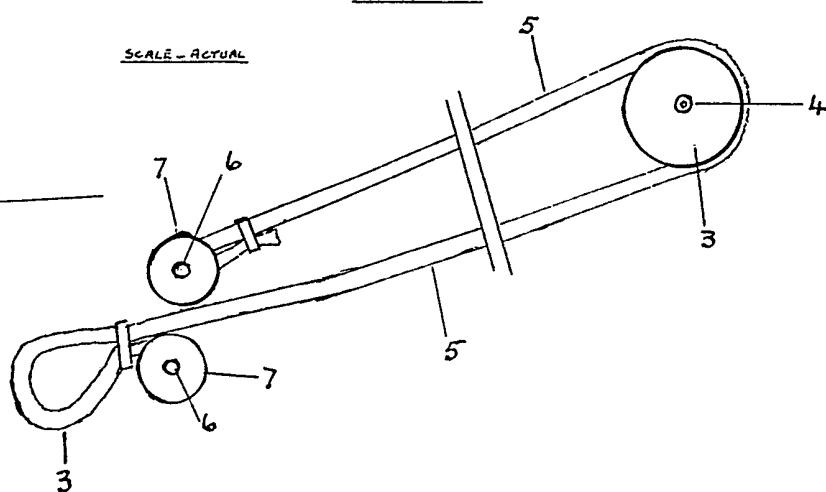


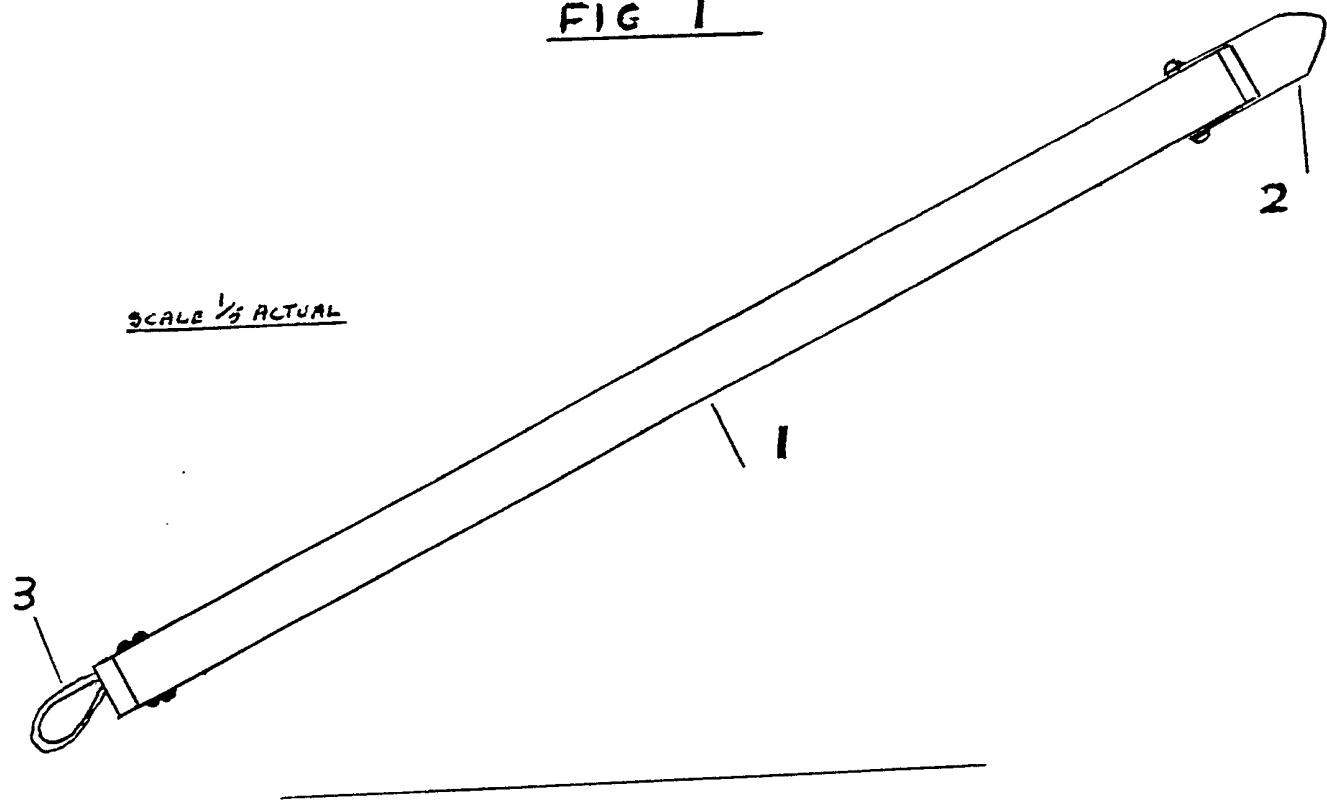
FIG. 2



GB 2 250 210 A

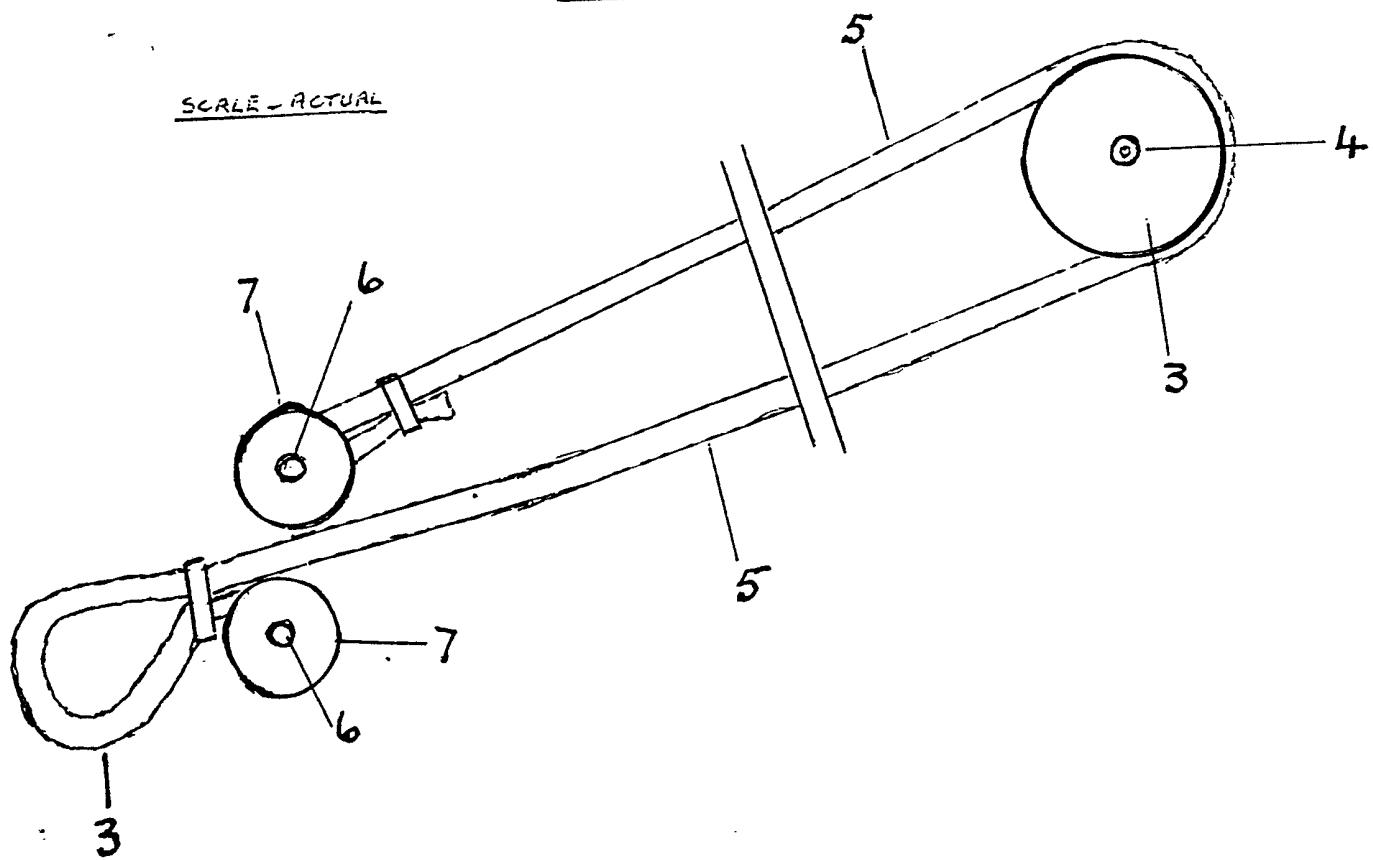
- 111 -

FIG 1



SCALE 1/8 ACTUAL

FIG 2



SCALE = ACTUAL

**A DEVICE FOR SEMI-STATIC SWIMMING**

This invention relates to a device for semi-static swimming for exercise, training or remedial purposes in pools down to only 3m in length.

Physical exercises by means of springs and/or elasticated cords are common practice but their use for swimming has been without conspicuous success due to the long length of extensible cord necessary, making them clumsy and only practical in pools of 6m or longer.

According to the present invention there is provided a tubular container into which is inserted an elasticated cord with an extensibility of 50% - 100% of its length and of tensile strength variable to suit the user.

The elasticated cord is anchored at the front of the tube, runs up to and over a pulley wheel anchored at the back of the tube returning to, and out of the front of the tube. To shorten the tube length further two pulleys, one front one back, can be used.

The anchor points are bolts set transversely across the diameter and through the walls of the tube. Rollers on the bolts at the front of the tube prevent wear and tear of the cord and act as a stop for the cord thus also keeping it in tension when at rest.

The back of the tube has a swinging link which is attached to the pool building wall, a diving board frame or to a post in the ground close to the edge of the pool and well above the water level of the pool. A loop at the front of the cord is attached to a harness belt on the swimmer who can swim forward against the tension of the cord for a distance equal to the extensibility of the cord, the length of which can be optional to suit the pool and the user.

A specific embodiment of the invention will now be described by way of an example with references to the accompanying drawing.

**Figure 1** shows the device in elevation, specifically the container tube 1, the swinging link 2 and the loop end of the elasticated cord, 3.

**Figure 2** shows the side elevation of the back, pulley 3, anchor bolt 4 with the braided elasticated cord 5 in position over the pulley: also the front anchor bolts 6, rollers 7 and cord loop 3. The tube is not shown, nor the full length of cord. The embodiment with two pulleys is not shown.

In this illustration a tube of 90cm in length contains a cord of 190cm which, with an extensibility of 75%, allows a swimmer to advance by up to 1.4m, and when inactive to be drawn back to his/her starting point.

C L A I M S

1. An arrangement of pulley wheels and/or rollers, with an anchor point, set within a tubular container which permits an elasticated cord of twice (or more) the length of the tube to be so contained.
2. A tubular container as claimed in Claim 1 with, at one end, a link for attachment to a rigid object, and at the other end a projecting self-retracting loop of cord for attachment to a harness belt of a swimmer.

Patents Act 1977  
Examiner's report to the Comptroller under  
Section 17 (The Search Report)

Application number

9025914.4

|   |                 |
|---|-----------------|
| Relevant Technical fields                         | Search Examiner |
| (i) UK CI (Edition K ) A6M (M8X)                  | A T BLUNT       |
| (ii) Int CI (Edition 5 ) A63B 31/00, 69/12, 69/14 |                 |
| Databases (see over)                              | Date of Search  |
| (i) UK Patent Office                              | 3 JANUARY 1992  |
| (ii)  |                 |

Documents considered relevant following a search in respect of claims 1,2

| Category<br>(see over) | Identity of document and relevant passages | Relevant to<br>claim(s) |
|------------------------|--|-------------------------|
| A                      | US 4114874 (MATTILA) totality              | 1,2                     |



| Category | Identity of document and relevant passages | Relevant to claim(s) |
|----------|--|----------------------|
|          |  |                      |

#### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).



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PATENTES Y MARCAS  
ESPAÑA



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(54) Título: **EQUIPO PARA DETERMINAR Y MONITORIZAR EL EJERCICIO FÍSICO Y LA TÉCNICA, EN LA NATACIÓN.**

(57) Resumen:

Equipo de medida para determinar y monitorizar el ejercicio físico y la técnica, en la natación, que comprende:

- un traje de baño (2) que incorpora una serie de sensores (3), que captan una serie de parámetros físicos del nadador, y un interfaz (5) que incorpora un transmisor de dichas señales hasta un ordenador (8) de tratamiento y presentación de la información obtenida;
- un conjunto de cámaras (9), que se mueven longitudinalmente, de forma sincronizada con el nadador, transmitiendo las imágenes obtenidas al ordenador de control (8) para su tratamiento y visualización;
- un ordenador o equipo informático (8) que recibe los datos captados por los sensores (3) y las imágenes de las cámaras (9), en el que se procesan los datos para determinar diversas variables relativas al movimiento del nadador; que se muestra en la pantalla asociada conjuntamente con las imágenes del deportista desde distintos ángulos.

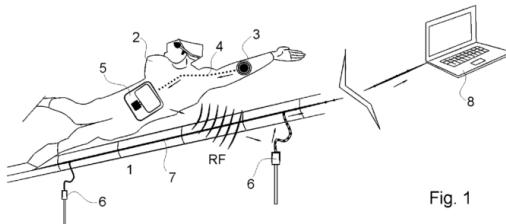


Fig. 1

ES 2 386 945 B1

## DESCRIPCIÓN

Equipo para determinar y monitorizar el ejercicio físico y la técnica, en la natación.

### **Objeto de la invención**

La presente invención, como su propio título indica, se refiere a un equipo para medir y monitorizar el ejercicio físico, a fin de mejorar la eficiencia en el nado, proporcionando a los usuarios y sus entrenadores información sobre los distintos tipos de fuerzas: de flotación, de resistencia y propulsivas, etc., que se observan en los movimientos que ejerce el nadador en el agua, que permitan mejorar su estilo y determinar sus condiciones físicas, así como controlar su rendimiento y nivel de mejora en la práctica deportiva.

La información es proporcionada en tiempo real, a fin de que el binomio entrenador-nadador, pueda corregir errores o hacer propuestas según los resultados que se están produciendo en el momento exacto. Se trata por tanto de monitorizar al nadador en todo momento; no obstante, el seguimiento de las sesiones de control permite determinar el nivel de mejora del nadador, así como la influencia de las medidas correctoras tomadas en el desarrollo de su entrenamiento. La corrección de posturas durante el nado, o en el lanzamiento a la piscina es también posible al monitorizar el ejercicio, para poder hacer un estudio posterior del ángulo de ataque, las fuerzas que ejerce en el agua, el esfuerzo físico a que se ve sometido el nadador, etc.. En general el equipo proporciona una completa información acerca de los movimientos del nadador en el agua, de sus constantes vitales, de sus características hidrodinámicas, etc., todas ellas tendentes a facilitar la mejora técnica en el ejercicio deportivo de la natación.

### **Antecedentes de la invención**

Hoy en día se conocen equipos de medición de diversos parámetros fisiológicos y mecánicos durante el esfuerzo que realiza un deportista, durante la carrera, el pedaleo, etc., en general durante la práctica de deportes al aire libre. Por ejemplo en el documento ES-2170024 se describe un equipo de estas características. Estos equipos incorporan diversos sensores de temperatura, sudoración y ritmo cardiaco, que se colocan en el cuerpo del deportista, en el que también se fija un equipo de transmisión de las señales captadas por los mismos, para su recepción por un equipo informático a través del cual se determina el esfuerzo realizado y cómo ha afectado éste al organismo del deportista.

El traslado de estos métodos a la natación es inviable porque de una parte los cables que conectan los diversos sensores impiden el adecuado movimiento de natación, además ha de existir un cableado para unir físicamente el deportista con el terminal informático, ya que no se conoce ningún medio de transmisión de señales, que sea inalámbrico y que se pueda utilizar bajo el agua. Como consecuencia de ello los métodos disponibles hoy en día no permiten medir de una manera práctica y precisa las fuerzas que intervienen al ejecutar un estilo concreto de nado. Se puede conseguir una medida de la resultante de todas las fuerzas actuantes, pero no una cuantificación de cada una de las componentes.

Además, este seguimiento sólo puede hacerse durante un período corto de tiempo, porque tanto el dinamómetro como la piscina sin fin, no permiten que el nadador utilice el sistema durante períodos largos, porque lo fatigan en exceso: el primero está limitado por el cable que une al nadador con el instrumento de medida y el segundo por la velocidad que lleva el agua, que ha de ser elevada para que el nadador se mantenga inmóvil. Ambas técnicas condicionan la postura habitual del nadador en el agua.

En los documentos US-5005140 y US-5258927 se describe un método y un dispositivo para monitorizar y medir el ejercicio físico de un submarinista en el que se emplean dispositivos hidrodinámicos que efectúan mediciones para detectar cambios de presión en líquidos en los espacios cerrados, que quedan en contacto con una parte de cuerpo de una persona, determinando la diferencia de presión que es transformada en una señal, que se compara con otra señal calibrada para convertirla en una señal digital, de forma que es posible su evaluación por un ordenador, en el que se almacenan los datos corresponden al ejercicio realizado y al nivel de ejercicio realizado. El problema que presenta este dispositivo es el que ya se ha indicado anteriormente: necesidad de cableado entre los sensores y entre el nadador y el equipo de tratamiento de la información.

### **Descripción de la invención**

El sistema que se propone pretende solventar todos estos inconvenientes y permitir a los usuarios que tengan una mayor percepción de lo que está teniendo lugar en el agua. En primer lugar, para no tener las mismas limitaciones que los métodos y dispositivos actuales, se propone un dispositivo libre de cables sobre el cuerpo que limiten la movilidad del nadador. Esta ausencia de cables también afecta a la transmisión de los datos medidos en el cuerpo del nadador hasta el terminal de tratamiento de los mismos, la cual se efectúa por medios inalámbricos a pesar de que el nadador, lógicamente, está dentro del agua. Esta ausencia total de cables permite que el usuario no note la menor diferencia entre su nado habitual y el que realice cuando utilice el dispositivo de la invención, de forma que la transferencia de los experimentos sea máxima.

Según una característica fundamental de la invención, los sensores que miden la presión, temperatura, ritmo cardíaco, etc. van instalados en un traje especialmente concebido para este método, en el que se colocan, o bien fijos sobre dicho traje, o bien formando parte del mismo; independientemente del tipo de sensor que se use, ya que pueden ser como los que se comercializan actualmente, o bien otros que en un futuro se puedan surgir, por ejemplo sensores que usen nanotecnología y que puedan ser aplicados al material del traje, o móviles y unidos al traje mediante una fijación, con lo cual se puede usar con distintos trajes, pudiendo personalizar estos sensores a cada nadador.

El traje incorpora un transmisor a través del cual se envían–de forma inalámbrica las señales captadas por dichos sensores a través del medio acuático, empleando para ello un transmisor de radiofrecuencia y una antena receptora de dicha señal, situada así mismo en el medio acuático, de forma que el dispositivo puede usarse en una piscina equipada con los receptores de ondas. Estudios realizados por el inventor han probado que es posible transmitir una señal electromagnética a través de un medio acuático; aquellas que resultan más idóneas, por la distancia y amplitud de la señal captada, son señales que tienen una longitud de onda en la banda de la radiofrecuencia. Estos estudios se han efectuado dentro de una piscina, desde un transmisor móvil (que sería el nadador) hasta un receptor constituido por una antena introducida en el agua, fijada en uno de los costados de la piscina. En el desarrollo de la invención se prevé colocar más de una antena a lo largo de la piscina a fin de que exista “cobertura” en todo el recinto de nado. También se puede emplear una transmisión utilizando ondas acústicas, en lugar de electromagnéticas, en la banda de los ultrasonidos, por ejemplo.

En aquellos lugares en los que no sea posible instalar un receptor de radiofrecuencia, por ejemplo en el mar, se ha previsto instalar en el traje una memoria flash en la que se almacenen los datos, para posteriormente descargarlos en el ordenador para su procesado.

En cuanto al traje de baño que forma parte de este equipo indicar que se trata preferentemente de un bañador integral de competición, que cubra el cuerpo entero del nadador, incluyendo cabeza, manos y pies. La incorporación de los sensores o elementos de medida y del transmisor en el traje se efectúa de forma que no afecta, ni condiciona la técnica de nado del deportista. Estas prendas presentan una comodidad probada ya que se adaptan perfectamente al cuerpo y los cables entre sensores y el transmisor de RF van integrados en la misma, de forma que no afectan para nada las condiciones de movilidad y adaptabilidad propias de las mismas. Es posible realizar el traje utilizando telas inteligentes que incorporan este “cableado” sobre la propia tela, por medio de una tecnología basada en tintas especiales, que permiten medir diferentes parámetros como presión o temperatura.

Otra característica importante de esta invención consiste en equipar la piscina con un sistema de cámaras robóticas, que proporcionan imágenes del nadador desde distintas vistas. Las cámaras que captan imágenes desde un punto inferior, superior y lateral del nadador se mueven al unísono con él a lo largo de la piscina. Las imágenes captadas por dichas cámaras se tratan también informáticamente para sincronizarlas con los datos suministrados por el traje, proporcionando dicho proceso información sobre aceleraciones, velocidades, trayectorias, ángulos de ataque, fuerzas, etc., La visualización desde diversos ángulos, conjuntamente con los múltiples datos sacados del análisis de estas imágenes, así como los datos suministrados por los sensores del traje, proporcionan una visión de global de los movimientos del nadador en el agua, de sus constantes vitales, de sus características hidrodinámicas, etc., todas ellas tendentes a facilitar la mejora técnica en el ejercicio deportivo de la natación. El visionado de una sesión de nado la efectúa el preparador en tiempo real, el cual está en comunicación con el nadador para transmitirle órdenes a través de los auriculares que éste lleva, que reciben la señal acústica utilizando un canal de retorno de la señal electromagnética captada por los sensores del traje. Cada sesión de nado se graba en el equipo informático correspondiente a fin de que el nadador, una vez terminado su ejercicio pueda visualizar aquellas secuencias que resulten de su interés.

### Descripción de las figuras

Para complementar la descripción que se está realizando y con objeto de facilitar la comprensión de las características de la invención, se acompaña a la presente memoria descriptiva un juego de dibujos en los que, con carácter ilustrativo y no limitativo, se ha representado lo siguiente:

La figura 1 muestra una vista general del equipo de la invención, que incluye una dotación en el nadador y otra dentro de una piscina (1).

La figura 2 representa una vista general de una piscina (1) en la que se observa la disposición y montaje de las cámaras (9) destinadas al seguimiento del nadador.

La figura 3 muestra el traje de baño (2) que forma parte del equipo de la invención.

### Realización preferente de la invención

El equipo para determinar y monitorizar el ejercicio físico y la técnica, en la natación que comprende:

- Un traje de baño (2) integral, que se adapta perfectamente al cuerpo del nadador y que incluye:

- o Una serie de sensores (3) que captan las presiones existentes entre el cuerpo del nadador y el agua del medio en el que se mueve.

- Un interfaz en que se concentra la señal de todos los sensores (3) existentes en el traje (2) que:
  - Se transmite por radiofrecuencia (RF) u ondas acústicas a través de una serie de antenas (6) colocadas en el medio acuático;
  - Se almacenan en una memoria colocada en el propio traje (2), para su posterior tratamiento.

5 - Un conjunto de cámaras (9), situadas en carriles longitudinales de la piscina (1), que se mueven de forma sincronizada con el nadador a lo largo de la piscina, enfocándolo desde arriba (9a), desde abajo (9b) y lateralmente (9c); así como otras dos cámaras (9d-9e) situadas en las cabeceras de la piscina, que graban la fase de viraje desde un plano frontal.

10 Todas estas cámaras transmiten en tiempo real su señal a un centro de control, o equipo informático, capaz de efectuar su tratamiento y, en base a ellas determinar una serie de variables de la acción natatoria que ejerce el deportista. Ya sea exclusivamente en base a la información que ellas facilitan y/o en base a la información que proporcionan los sensores (3) situadas en el traje (2) del nadador.

15 - Un ordenador (8) que presenta unos interfaces a través de los que recibe los datos captados por los sensores (3) y las imágenes captadas por las cámaras (9). En este equipo se ha implementado un software que trata todos estos datos y calcula en fase a diversas fórmulas y programas una serie de variables, como pueden ser: aceleraciones, velocidades, trayectorias, ángulos de ataque, fuerzas, etc., todas ellas relativas al movimiento del nadador. También se extraen datos de las constantes vitales del deportista y, finalmente, se muestran a través de la pantalla de dicho equipo informático las imágenes desde distintos ángulos a fin de que el entrenador tenga una referencia visual informada durante toda la fase de entrenamiento. Este equipo está dotado de una memoria en la que almacena cada sesión de entrenamiento a fin de que también el deportista pueda analizarla después de terminado su ejercicio.

20 La comunicación entre el transmisor (5) existente en el traje (2) y el ordenador (8) se realiza en un primer estadio por medio de señales de radiofrecuencia (RF), que son captadas por alguna de las antenas (6) situadas a lo largo de la piscina (1), las cuales enlazan por medio de un conductor (7) con dicho ordenador (8). La longitud de onda de esta señal, según cálculos realizados que no son objeto de esta memoria, se encuentra en la banda de la radiofrecuencia, en concreto los experimentos previos realizados por el inventor se centraron en una frecuencia de 433Mhz. si bien este valor no se considera limitativo dentro del campo de la invención. La comunicación se efectúa en sentido bidireccional, de forma que el entrenador tiene controlado a su nadador en todo momento y también puede intervenir cuando lo estime oportuno, enviándole por el mismo medio comunicaciones audibles a través de auriculares colocados en los oídos del nadador, o por medio de un display colocado en las gafas del mismo.

25 El traje (2), representado en la figura 3, es un bañador integral de competición. La prenda cubre el cuerpo entero del nadador, incluyendo cabeza, manos y pies y está más que comprobada su comodidad. Así pues, se trata de incorporar los elementos de medida y el transmisor de modo que no dificulten los movimientos del deportista. Los sensores (3) se colocan en lugares estratégicos para medir las fuerzas que se piden. Hay zonas del cuerpo sobre las que sólo actúan cierto tipo de fuerzas (por ejemplo, sobre el tronco o la cabeza, sólo actúan fuerzas resistivas, no propulsivas; en otras sólo se ejercen mayoritariamente fuerzas propulsivas, como son los antebrazos y la zona de las piernas que va desde las rodillas hasta el empeine).

30 El cableado eléctrico (4) que se utiliza en el traje (2) no repercute en la movilidad del nadador; se emplea un cable plano y flexible, que permite una gran variedad de movimientos sin oponer alguna dificultad. Una representación del traje de baño con los sensores de presión incorporados puede verse en la figura 3. Es posible realizar el traje utilizando telas inteligentes que incorporan este "cableado" sobre la propia tela, por medio de una tecnología basada en tintas especiales, que permiten medir diferentes parámetros como presión o temperatura. Además de los sensores (3) se incorpora el transmisor (5), que es lo más pequeño posible. En esta unidad también se incluirá la batería que alimenta a todo el sistema y la lógica de conversión para pasar los datos de los sensores al formato que requiera el transmisor; en aquellos casos en los que no exista tal medio de transmisión, sino que recurra a almacenar los datos en una memoria, dicha memoria estará integrada en esta unidad (5).

35 Una vez descrita suficientemente la naturaleza de la invención, así como un ejemplo de realización preferente, se hace constar a los efectos oportunos que los materiales, forma, tamaño y disposición de los elementos descritos podrán ser modificados, siempre y cuando ello no suponga una alteración de las características esenciales de la invención que se reivindican a continuación:

## REIVINDICACIONES

- 1.- Equipo de medida para determinar y monitorizar el ejercicio físico y la técnica, en la natación, **que comprende**:
- un traje de baño (2), que se adapta perfectamente al cuerpo del nadador, que incluye una serie de sensores (3) que captan las presiones existentes entre el cuerpo del nadador y el agua del medio en el que se mueve, así como otra serie de variables de temperatura, ritmo cardíaco y demás constantes vitales del nadador; también prevé un interfaz (5) en que se concentra la señal de todos los sensores (3) existentes en el traje (2), que incorpora un transmisor de dichas señales hasta un ordenador (8) de tratamiento y presentación de la información obtenida;
  - un conjunto de cámaras (9), situadas en carriles longitudinales de la piscina (1), que se mueven de forma sincronizada con el nadador a lo largo de la misma, enfocándolo desde diversos ángulos, que transmiten las imágenes captadas en tiempo real al ordenador de control (8), a fin de que éste efectúe su tratamiento y, en base a ellas y a las variables captadas por los sensores (3) del traje (2) determinar una serie de parámetros que son función del ejercicio que efectúa el deportista;
  - un ordenador o equipo informático de tratamiento de la información (8) que presenta unos interfaces a través de los que recibe los datos captados por los sensores (3) y las imágenes captadas por las cámaras (9), en el que se ha implementado un software de procesamiento de estos datos y de cálculo de diversas variables, como pueden ser: aceleraciones, velocidades, trayectorias, ángulos de ataque, fuerzas, etc., todas ellas relativas al movimiento del nadador; así como de una serie de constantes vitales del deportista; el cual presenta una pantalla en la que se muestran: las imágenes del deportista en la piscina desde distintos ángulos, conjuntamente con los valores de dichas variables.
- 20 2.- Equipo, según la reivindicación 1, **caracterizado** porque la comunicación entre el transmisor (5) existente en el traje (2) y el ordenador (8) se realiza en un primer estadio por medio de señales electromagnéticas y/o acústicas, que son captadas por alguna de las antenas (6) situadas a lo largo de la piscina (1), las cuales enlazan por medio de un conductor (7) con dicho ordenador (8).
- 25 3.- Equipo, según las reivindicación anterior, **caracterizado** porque la longitud de onda de la señal de transferencia de datos entre el nadador y las antenas (6) existentes en la piscina se encuentra en la gamma de la radiofrecuencia.
- 4.- Equipo, según las reivindicaciones anteriores, **caracterizado** porque la comunicación entre el nadador y el ordenador (8) se efectúa en sentido bidireccional, de forma que el entrenador tiene controlado a su nadador en todo momento y también puede intervenir cuando lo estime oportuno, enviándole por el mismo medio comunicaciones audibles a través de auriculares o un display colocado en las gafas del nadador.
- 30 5.- Equipo, según las reivindicaciones anteriores, **caracterizado** porque el interfaz (5) está dotado de una memoria en la que almacena cada sesión de entrenamiento.
- 6.- Equipo, según las reivindicaciones anteriores, **caracterizado** porque el traje (2) consiste en un bañador integral de competición, que cubre el cuerpo entero del nadador, incluyendo cabeza, manos y pies e incorpora una pluralidad de sensores (3) y el transmisor (5) de modo que no dificulte los movimientos del deportista.

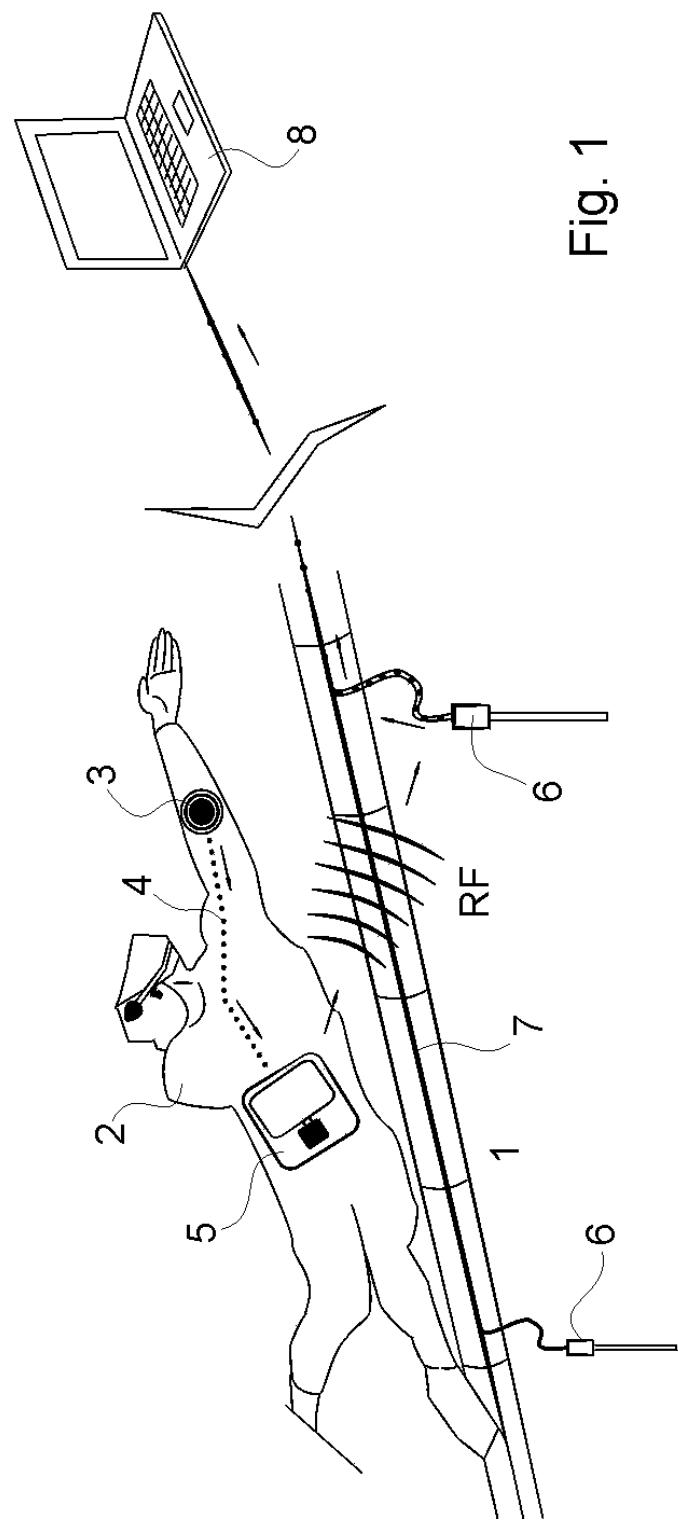


Fig. 1

Fig. 2

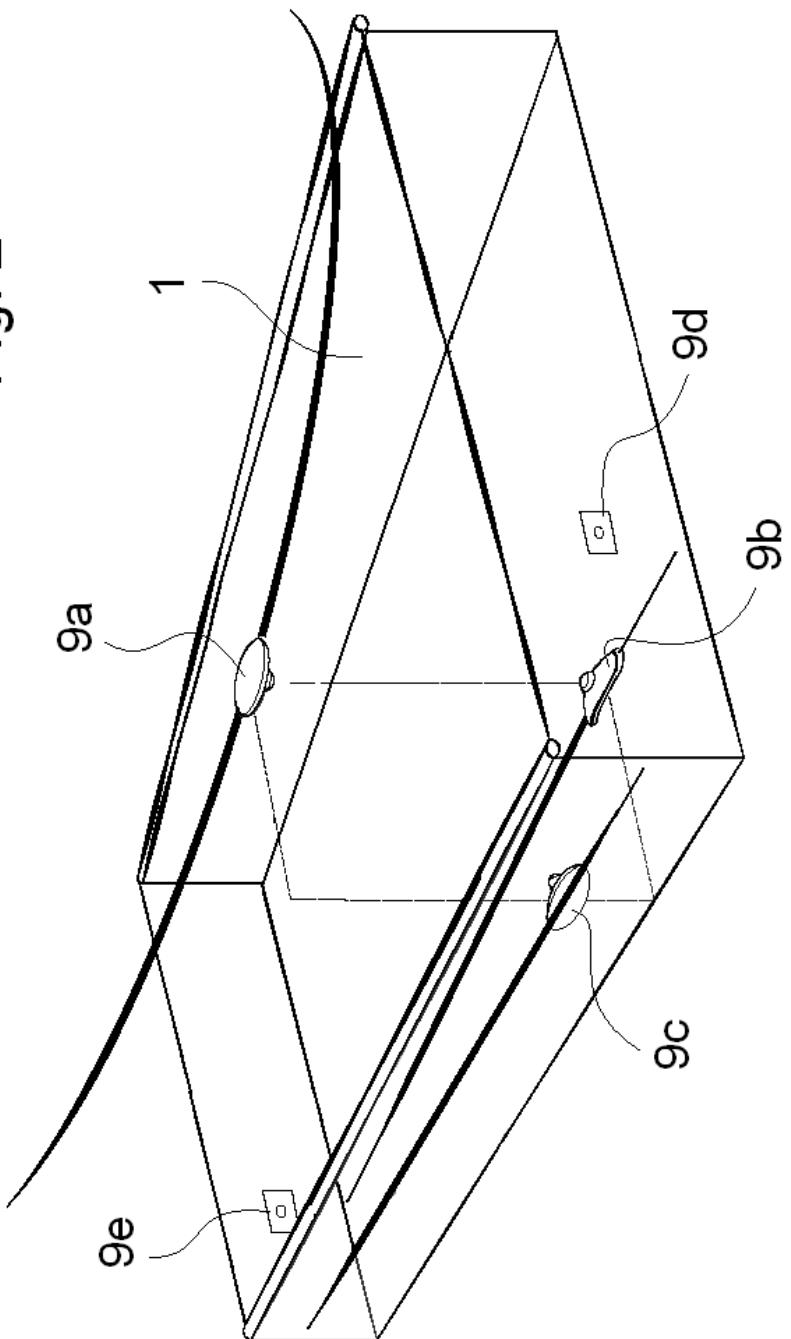
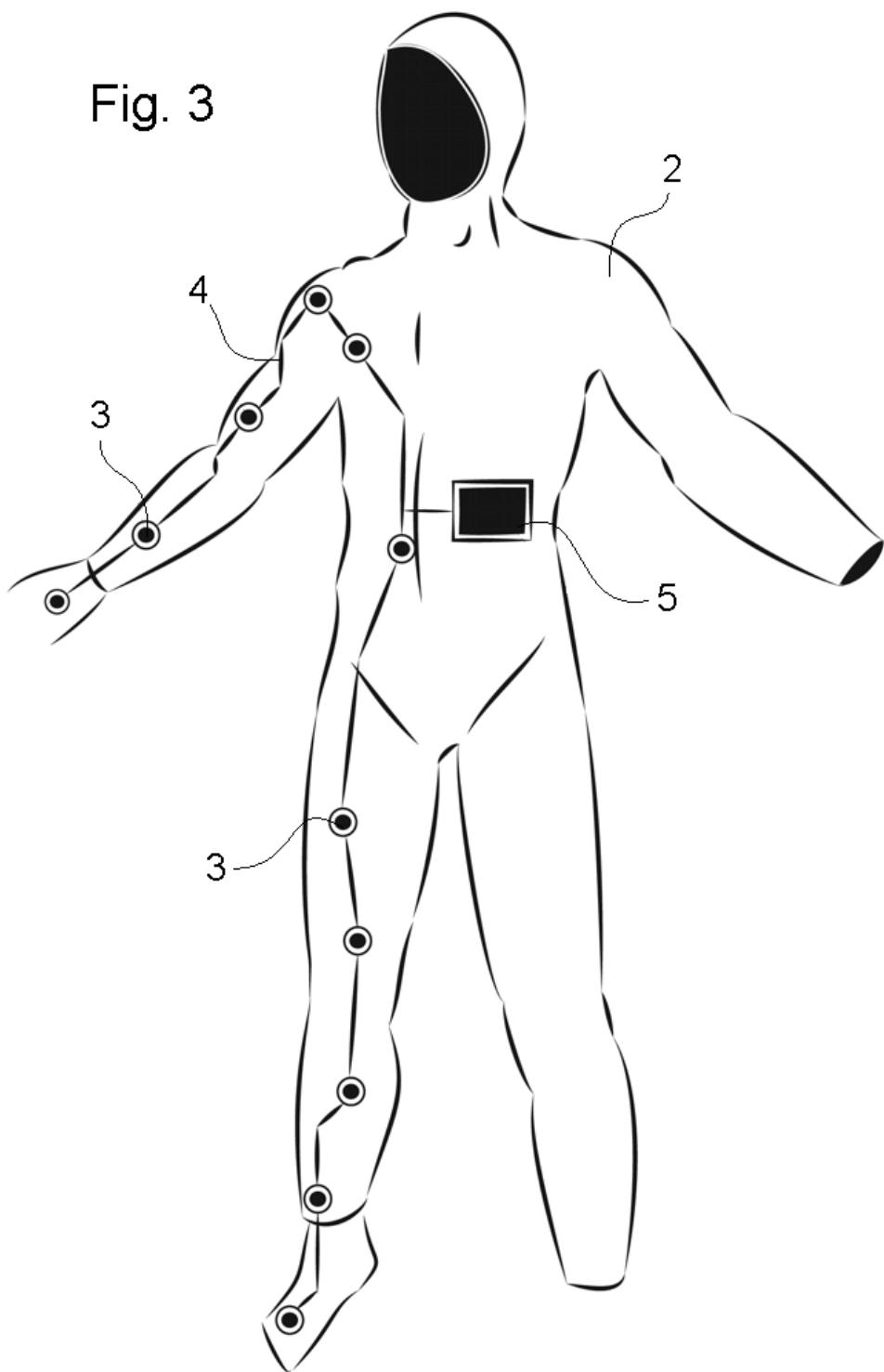


Fig. 3





OFICINA ESPAÑOLA  
DE PATENTES Y MARCAS  
ESPAÑA

(21) N.º solicitud: 201130181

(22) Fecha de presentación de la solicitud: 11.02.2011

(32) Fecha de prioridad:

## INFORME SOBRE EL ESTADO DE LA TECNICA

(5) Int. Cl.: Ver Hoja Adicional

### DOCUMENTOS RELEVANTES

| Categoría | 56   | Documentos citados | Reivindicaciones afectadas |
|-----------|--|--------------------|----------------------------|
| A         | US 3952352 A (WAN LAWRENCE A ET AL.) 27/04/1976, descripción; figuras.   | 1-6                |                            |
| A         | US 2010304934 A1 (WOODSON PETER S) 02/12/2010, descripción; figuras.   | 1-6                |                            |
| A         | JP 7135586 A (VICTOR COMPANY OF JAPAN ET AL.) 23/05/1995, figuras & resumen de la base de datos EPODOC (Recuperado de EPOQUE; AN JP-27955193-A). | 1-6                |                            |
| A         | US 2004201675 A1 ( MURAKOSHI TAKAHIRO ET AL.) 14/10/2004, descripción; figuras.  | 1-6                |                            |
| A         | US 2009030333 A1 ( McDONOUGH DANIEL K) 29/01/2009, descripción; figuras.   | 1-6                |                            |
| A         | US 4654010 A (HAVRILUK ROD) 31/03/1987, descripción; figuras.  | 1-6                |                            |
| A         | US 2008218332 A1 (LYONS MICHAEL) 11/09/2008, descripción; figuras.   | 1-6                |                            |
| A         | US 5907281 A (MILLER JR BENJAMIN K ET AL.) 25/05/1999, descripción; figuras.   | 1-6                |                            |
| A         | US 2009009342 A1 ( KARJALAINEN MARKKU) 08/01/2009, descripción; figuras.   | 1-6                |                            |

#### Categoría de los documentos citados

X: de particular relevancia

Y: de particular relevancia combinado con otro/s de la misma categoría

A: refleja el estado de la técnica

O: referido a divulgación no escrita

P: publicado entre la fecha de prioridad y la de presentación de la solicitud

E: documento anterior, pero publicado después de la fecha de presentación de la solicitud

#### El presente informe ha sido realizado

para todas las reivindicaciones

para las reivindicaciones nº:

|  |                                 |               |
|--|---------------------------------|---------------|
| Fecha de realización del informe<br>24.04.2012 | Examinador<br>I. Rodríguez Goñi | Página<br>1/5 |
|--|---------------------------------|---------------|

## CLASIFICACIÓN OBJETO DE LA SOLICITUD

**A63B31/00** (2006.01)

**A61B5/00** (2006.01)

**A63B24/00** (2006.01)

Documentación mínima buscada (sistema de clasificación seguido de los símbolos de clasificación)

A63B, A61B

Bases de datos electrónicas consultadas durante la búsqueda (nombre de la base de datos y, si es posible, términos de búsqueda utilizados)

INVENES, EPODOC, WPI

Fecha de Realización de la Opinión Escrita: 24.04.2012

**Declaración**

|   |  |          |
|---|--|----------|
| <b>Novedad (Art. 6.1 LP 11/1986)</b>            | Reivindicaciones 1-6<br>Reivindicaciones | SI<br>NO |
| <b>Actividad inventiva (Art. 8.1 LP11/1986)</b> | Reivindicaciones 1-6<br>Reivindicaciones | SI<br>NO |

Se considera que la solicitud cumple con el requisito de aplicación industrial. Este requisito fue evaluado durante la fase de examen formal y técnico de la solicitud (Artículo 31.2 Ley 11/1986).

**Base de la Opinión.-**

La presente opinión se ha realizado sobre la base de la solicitud de patente tal y como se publica.

## 1. Documentos considerados.-

A continuación se relacionan los documentos pertenecientes al estado de la técnica tomados en consideración para la realización de esta opinión.

| Documento | Número Publicación o Identificación           | Fecha Publicación |
|-----------|---|-------------------|
| D01       | US 3952352 A (WAN LAWRENCE A et al.)          | 27.04.1976        |
| D02       | US 2010304934 A1 (WOODSON PETER S)            | 02.12.2010        |
| D03       | JP 7135586 A (VICTOR COMPANY OF JAPAN et al.) | 23.05.1995        |

## 2. Declaración motivada según los artículos 29.6 y 29.7 del Reglamento de ejecución de la Ley 11/1986, de 20 de marzo, de Patentes sobre la novedad y la actividad inventiva; citas y explicaciones en apoyo de esta declaración

El objeto de la invención es un equipo para determinar y monitorizar el ejercicio físico y la técnica, en la natación.

El problema técnico subjetivo que se pretende solucionar es un avance en prestaciones respecto a los equipos conocidos, de manera que se consiga disponer de equipos con sistemas de transmisión inalámbrica que se puedan utilizar bajo el agua, eludiendo de esta manera la necesidad de cableado entre los sensores y el equipo de información.

La solución técnica planteada es un conjunto de transmisor de radiofrecuencia y antenas receptoras situadas en el medio acuático.

Hay que señalar que en el estado de la técnica, aunque ciertamente se percibe como una dificultad el transmitir señales desde dentro del agua hacia el exterior, sí que es conocido que mediante la colocación de una antena subacuática se puede solucionar dicho problema.

No obstante, se puede apreciar en el objeto de la invención una integración de elementos, que si bien por separado son conocidos en el estado de la técnica, su integración en un único equipo no resulta evidente y tiene como efecto proporcionar un equipo de prestaciones superiores a los ya conocidos. Por tanto el problema técnico objetivo sería proporcionar un avance en el estado de la técnica con un equipo con más prestaciones que las conocidas y que se puede considerar como una "integración" no evidente de diversas soluciones.

El objeto de la invención para la reivindicación 1 es un equipo de medida para determinar y monitorizar el ejercicio físico y la técnica, en la natación, que comprende:

### un traje de baño

- que se adapta perfectamente al cuerpo del nadador
- que incluye una serie de sensores
- que captan las presiones existentes entre el cuerpo del nadador y el agua del medio en el que se mueve
- así como otra serie de variables de temperatura, ritmo cardiaco y demás constantes vitales del nadador
- también prevé un interfaz en que se concentra la señal de todos los sensores existentes en el traje
- que incorpora un transmisor de dichas señales hasta un ordenador de tratamiento y presentación de la información obtenida

### un conjunto de cámaras

- situadas en carriles longitudinales de la piscina
- que se mueven de forma sincronizada con el nadador a lo largo de la misma
- enfocándolo desde diversos ángulos
- que transmiten las imágenes captadas en tiempo real al ordenador de control, a fin de que éste efectúe su tratamiento y, en base a ellas y a las variables captadas por los sensores del traje determinar una serie de parámetros que son función del ejercicio que efectúa el deportista

### Un ordenador o equipo informático de tratamiento de la información

- que presenta unos interfaces a través de los que recibe los datos captados por los sensores y las imágenes captadas por las cámaras
- en el que se han implementado un software de procesamiento de esos datos y de cálculo de diversas variables como pueden ser:
  - aceleraciones, velocidades, trayectorias, ángulos de ataque, fuerzas, etc, todas ellas relativas al movimiento del nadador
  - así como de una serie de constantes vitales del deportista
  - el cual presenta una pantalla en la que se muestran las imágenes del deportista en la piscina desde distintos ángulos, conjuntamente con los valores de dichas variables

En el estado de la técnica se conocen documentos como D01, que divulga un equipo de medida para determinar y monitorizar el ejercicio físico en la natación, que comprende:

- Un dispositivo con transductores/sensores que se pone el nadador en su mano/brazo y que capta las presiones existentes entre el cuerpo (mano/brazo) del nadador y el agua del medio en el que se mueve. También prevé un interfaz en que se concentra la señal de todos los sensores/transductores existentes en el dispositivo, que incorpora un transmisor de dichas señales hasta un receptor
- una cámara, que graba, sincronizadamente con el equipo de medida, los movimientos del nadador

El equipo divulgado en D01, si bien resuelve el problema subjetivo planteado por el solicitante, ya que transmite la información del nadador a un equipo receptor, sin cables, presenta muchas diferencias respecto a la reivindicación 1, pues no dispone de un traje de baño monitorizado, sino de un dispositivo que se coloca en la mano/brazo, y además, mientras D01 divulga una cámara estática, en la reivindicación 1 se disponen de un conjunto de cámaras que se mueven sincronizadamente. Así mismo en la reivindicación 1 se dispone de un equipo para el tratamiento de la información, que no se divulga en D01.

En el estado de la técnica también se conoce el documento D02 que divulga un equipo de medida para determinar y monitorizar el ejercicio físico, en el que si bien se disponen sensores en el cuerpo del nadador, se puede enviar la información captada de manera inalámbrica, y se dispone de un equipo de tratamiento de la información, las cámaras de las que también se dispone, son estáticas, y por otro lado, el equipo divulgado no está preparado para la captación de las presiones existentes entre el cuerpo del nadador y el agua del medio en el que se mueve, sino más bien para monitorizar el número de carreras realizado así como variables como el número de pulsaciones del nadador. Los sensores, por otra parte, no se menciona que se dispongan en un traje de baño.

Por último hay que señalar el documento D03 que divulga una cámara que se mueve en el interior de una piscina y dispone de un equipo de tratamiento de la información, pero se trata de unos elementos aislados que no disponen del carácter de sistema que se aprecia en la reivindicación 1, ya que faltan el resto de elementos (sensores, antenas, etc), y se aleja bastante, por tanto, del concepto reivindicado.

Por todo lo expuesto, si bien los elementos reivindicados, tomados de una manera aislada son conocidos en el estado de la técnica, no se trata de una mera adición de los mismos, sino que se integran y complementan, de manera que la invención, tal como está configurada, proporciona un equipo de prestaciones superiores a los ya conocidos, que no resulta evidente del estado de la técnica. Por ello, se considera que la reivindicación 1 es nueva (Art. 6.1 LP 11/1986) e implica actividad inventiva (Art. 8.1 LP 11/1986).

Las reivindicaciones 2 a 6 son dependientes y, por tanto, se considera que son así mismo nuevas (Art. 6.1 LP 11/1986) e implican actividad inventiva (Art. 8.1 LP 11/1986).