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(54) **SHARK AVOIDANCE SYSTEM AND METHOD**

SYSTEM UND VERFAHREN ZUR VERMEIDUNG VON HAIEN

SYSTÈME ET PROCÉDÉ D'ÉVITEMENT DE REQUINS

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Description

FIELD OF THE INVENTION

[0001] This invention relates to a kit of parts according to claim 1.

BACKGROUND OF THE INVENTION

[0002] A problem exists with regard to the issue that arises when a person is in open water. The issue is sharks. People and sharks are naturally wary of each other and it is an ongoing and age old fear to get bitten by sharks. Thus many shark repellents, gadgets and suggestions have been created and made. The objective and function of a proper shark repellent is to do two things: keep a person safe based on its protection effect and encourage the shark to move on, or to not be interested in the person in the first place. Since the mid 70s when "Jaws" came alive on the big screen, people of the Western hemisphere started to live in fear when entering the water. During that time (70's) basically two gadgets were available for commercial use: the "shark chaser" and the "bang stick." The latter was a stick with an explosive head, that detonated on contact with the shark. This device, although somewhat popular, required a person to shoot an animal thus a person had to get close to one. Further, this device needed to be reloaded after each explosion. Furthermore, a shark that was not immediately killed could attract other sharks through its struggle (sounds produced) which then created another more dangerous scenario that could not be controlled anymore. So after a kill, the person's best bet was to immediately leave the water. But the problem left after that was what if the person could not leave the water? What if a person was in the water after a ship was wrecked and the person was floating in open water? The shark problem would remain. Beside that is also the practical side: a repellent should be small enough that it would easily fit together with other devices e.g. life jackets, be easily stored (and forgotten until needed), and be part of personal rescue equipment on airplanes etc. Poles with explosives are not so easily stored and used.

[0003] Another prior art device was the "shark chaser", a blue powder, made of a copper acetate-negrosine dye mixture, that could be released into the water once sharks showed up. This product was produced on a big scale. The main buyer, the US Navy, believed in its effectiveness. However, the substance was dropped after a few years since an effect could never be established. The only positive effect of this powder was a psychological one since seamen believed they could now repel a shark and thus were less nervous. But even if the dye had an effect, how would a situation with sharks and the person develop once the effect was gone as in diluted by too much current for example?

[0004] Both of these "repellents" - the bang stick and the shark chaser - focused on the immediate situation,

completely ignoring that the after-effect is important as well and ignoring the possible solution of not getting in contact with a shark in the first place.

[0005] In the 90s other forms of repellents came on the market, electrical gadgets, like the "shark pod," which operates by creating an electrical field surrounding a diver. Although this research is encouraging, the current devices are clumsy, expensive and might not work properly if not constantly maintained or charged. Furthermore it entails the use of electrical parts in water that can corrode or burn the diver should it be in contact with the person's skin.

[0006] Shark repellents have focused on the very moment a shark appears and how the animal can be repelled. But that is not sufficient for a repellent. A repellent also needs to offer a solution when a shark does not leave after initial contact as described above.

[0007] One shark repellent that was patented in the mid 70s, the so called "shark screen," (US Patent No. 3428978) offered a workable idea but focused on capturing human fluids, as it was believed back then that human fluids was what would attract sharks, and not the emission of sound (far distance, also called "far-field"), and water pressure (close distance, also called "near-field"). The "shark screen" was basically a sac that a person could get into while being at sea, and keep afloat through an inflatable ring at the top. Although it did not do much, a person felt safer and more relaxed since human fluids were trapped.

[0008] Another very similar device with similar limitations was patented for a thin film bag with a closeable top designed to hide its occupant. (US Patent No. 3,986,220). It should be noted that both patented devices have inflatable top sections but neither is buoyant with out inflation. Thus, if a person can not inflate the top section the devices will collapse around them. Further, a user of these prior art devices is left to float within the device without aid. That is, there is nothing to assist a person in centering or holding himself within the device once inside it.

[0009] In another recently issued patent (US Patent No. 9,150,293), a similar bag, called an ocean survival system, uses camouflage color on its exterior in an effort to make the person "invisible" to sharks by mimicking the surrounding waters. As an expert in this field, Applicant observes that there are several problems and/or non-workable aspects to this prior art device:

incoming sharks are not guided by vision but by sound so that even though the shark may not find its "search image" (e.g. a person's sound pattern may imitate the sound of a struggling fish) it will investigate further. Thus, even a sack that matches the surrounding colors will be found and explored. Likewise, the invention's ability to contain human body fluids is not a valid "improvement" since Applicant understands that they are not shark attractants ; camouflage coloring obviously will have no effect at

night and therefore would be useless half of the time; and

no material exists that can imitate the surrounding waters for every given color, shade and patterns caused by wave action nor account for brighter above water background and it is observed that sharks will approach at an angle that uses the brighter above water background to make it stand out better.

[0010] In another patent (US Patent No. 9,616,979), it is disclosed an improved shark avoidance device. In particular, it is disclosed an improved shark avoidance system consisting of an open ended enclosure with a top, sides, and a bottom, where the sides and the bottom form an interior enclosed space.

[0011] Thus, there is a need in the art for a device to allow a person to avoid an encounter with a shark that does not entail electronics, does not require maintenance, and is able to be stored until use. Further, an effective shark repellent or shark avoidance device must be effective in several scenarios: it should not attract a shark, if it comes too close, and it should not attract more sharks after use, and it should make the person "unattractive" regarding the sensory system of sharks. Furthermore, if a person can not leave the water, the "repellent" must also work at night when a shark is not seen.

SUMMARY OF THE INVENTION

[0012] In an aspect, a kit of parts comprising a shark avoidance system is provided as set forth in the appended claims.

DESCRIPTION OF THE DRAWINGS

[0013] Other objects, features and advantages of the present invention will become more fully apparent from the following detailed description of the preferred embodiment, the appended claims and the accompanying drawings in which:

FIGURE 1 is a perspective view of the shark avoidance system of the present invention;

FIGURE 2 is an enlarged view of the construction of the flexible side wall of the shark avoidance system of Figure 1;

FIGURE 3 is a side view of the shark avoidance system of Figure 1 with a person inside the interior space;

FIGURE 4 is a perspective view of the shark avoidance system of Figure 1 contained within a bag; and
FIGURE 5 is a front view of the bag of Figure 4 attached to a life vest.

DETAILED DESCRIPTION OF THE INVENTION

[0014] 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 description and should not be regarded as limiting.

[0015] 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 invention be regarded as including equivalent constructions to those described herein insofar as they do not depart from the scope of the present invention.

[0016] For example, the specific sequence of the described process may be altered so that certain processes are conducted in parallel or independent, with other processes, to the extent that the processes are not dependent upon each other. Thus, the specific order of steps described herein is not to be considered implying a specific sequence of steps to perform the process. In alternative embodiments, one or more process steps may be implemented by a user assisted process and/or manually. Other alterations or modifications of the above processes are also contemplated.

[0017] In addition, features illustrated or described as part of one embodiment can be used on other embodiments to yield a still further embodiment. Additionally, certain features may be interchanged with similar devices or features not mentioned yet which perform the same or similar functions. It is therefore intended that such modifications and variations are included within the totality of the present invention.

[0018] It should also be noted that a plurality of hardware devices, as well as a plurality of different structural components, may be utilized to implement the invention. Furthermore, and as described in subsequent paragraphs, the specific configurations illustrated in the drawings are intended to exemplify embodiments of the invention and that other alternative configurations are possible.

[0019] A preferred embodiment of the shark avoidance system of the present invention is illustrated by way of example in Figures 1-5. With specific reference to Figure 1, shark avoidance system 10 includes an open ended enclosure 12 with a top 14, sides 16 and bottom 18. Together the sides 16 connect to the top 14 and to the bottom 16 to form an interior enclosed space 20. Any form of open ended enclosure 12 is included within the scope of the present invention in that it may be tubular shaped, as shown, with a wider diameter at the top 14 tapering to a narrower diameter at the bottom 18. Certainly, it may also be perfectly cylindrical and, further, the sides 16 may come together such that there is no bottom 18 per se but

only conjoined sides 16, not shown, and by way of example only and not by limitation.

[0020] Buoyant device 22 and inflatable device 24 are provided in combination and the combination is connected with and/or at the top 14 of open ended enclosure 12. Preferably, as illustrated, the combination is connected to the top 14 by buoyant device 22. This leaves inflatable device 24 above the buoyant device 22, as shown. By means of this structure, Applicant's invention is immediately buoyant at the top 14 without need for a user to be able to inflate it at all, thus overcoming a long felt need and serious deficiency in the art. Again, preferably, more than one inflatable device 24 is provided with additional inflatable devices 24 connected to other inflatable devices 24 as illustrated. By this means an above the water surface barrier may be created, as may be deemed useful by the user.

[0021] In one aspect of the invention, inflatable device(s) 24 are separated into several sealed sections 26 by dividers 28. This structure ensures that should one section 26 be ruptured, the inflatable device 24 still remains mostly inflated. Still further, according to one aspect, an inflation tube 30 is provided such that a user may manually inflate the inflatable device 24. Inflation tube 30 may be self sealing such that air pressure on a seal prevents air introduced into the inflatable device 24 from escaping or inflation tube 30 may include a stopper (not shown) to prevent air from escaping, all as may be deemed most useful.

[0022] Referring now to Figure 2, an enlarged view of a section of side 16 is illustrated. Side 16 forms a flexible "wall" around the interior enclosed space 20. Preferably, side 16 includes a combination of at least three layers, a first, outer, layer 32, a second, middle, layer 34 and a third, inner, layer 36. The third layer 36 is connected to the second layer 34 and the second layer 34 is connected to the first layer 32. The connection may be by gluing or heat treating or by any means now known or hereafter developed. Preferably, the first layer 32 is a water impervious layer, the second layer 34 is a bioelectrical blocking layer and the third layer 36 is a sound emission blocking layer as described above. In a preferred embodiment, a fourth, innermost, layer 38 is provided where the fourth layer 38 is connected to the third layer 36. Again, preferably, fourth layer 38 is similar to first layer 32 and is a water impervious layer. Certainly, more of each type of layer may be added as desired or deemed useful and the layers may be attached in varying orders with the second layer 34 on the outside, for example only and not by limitation.

[0023] Referring now to Figure 3, shark avoidance system and method 10 is illustrated with a person 40 inside interior enclosed space 20 and holding onto handle(s) 42 located on the inside of open ended enclosure 12 as illustrated. Handle(s) 42 allow a person 40 to steady himself within the open ended enclosure 12 without having to grab onto the top 14 or sides 16 or rest on the bottom 18 and thereby reduces the amount of bioelectric signals

and sounds transferred to and from the open ended enclosure 12 which is a key important feature of the present invention as will be described more fully hereafter.

[0024] By way of further explanation, Applicant, as a shark behaviorist, specializes in shark-human interaction with a focus on shark attacks and their analyses. Applicant has studied what triggers a shark bite, or more importantly what lures a shark in, and what can be recommended to prevent such an incident altogether. Importantly by way of research and experimentation, Applicant has determined that pretty much every situation involving an encounter with a shark comes down to two things: sounds produced and water pressure, not as the prior art surmised human blood or urine. Neither human blood nor human urine have ever been shown to be an attractant to shark. Applicant has confirmed that it is the human sound and water pressure that act as the main trigger to attracting sharks. And the more non-rhythmical the more interested a shark gets. Sound carries a long distance in water, especially the low frequencies which can be best heard by a shark, with a spread much faster than any substance. Thus Applicant has determined that the priority in a repellent or avoidance system should be to eliminate the transmission of any human sounds into the water. Water pressure comes into play when a shark is about two body lengths away from a person. It is in a shark's nature to try to understand its environment and any unknown "thing", as a person would represent, triggers its curiosity. So a shark thus compares any unfamiliar feature with known ones to get a "better picture" of what humans represent. Water motion (pressure) suggests propulsion (equals the tail of the familiar object) and that is why a shark aims for legs or arms (should they move around quickly). As a result of his research, Applicant has determined that it is crucial that neither sounds (detected by their ears) and water pressure (detected by their lateral line system) created by a person in the water be transmitted to the water so that they do not trigger a reaction from a shark.

[0025] Again repellents can be divided into chemical, mechanical and electrical devices, active and passive ones, and must be effective in several scenarios: repel a shark, if it comes too close, should not attract more sharks after the initial repel of the first animal was made, and make the person "unattractive" regarding the sensory system of sharks. Furthermore, if a person can not leave the water, the "repellent" must also work at night when a shark is not seen.

[0026] Shark repellents have typically focused on the very moment a shark appears and how the animal can be repelled. But that is not sufficient for a repellent. A repellent also needs to offer a solution when a shark does not leave after initial contact as described. As mentioned, the main purpose of an effective shark avoidance/repellent device Applicant has determined is to eliminate human sounds and water pressure. The present invention, as no other, accomplishes that by absorbing these emissions within the open ended enclosure 12 of the present

invention such that they are not transmitted beyond the system 10.

[0027] By way of the present invention, to eliminate sound produced, air, for example, is distributed throughout the third inner layer 36 of the flexible wall of side 16. This can be best accomplished through a layer 36 of material with small adjacent air pockets. A usable material would be e.g., AEROLAN-air bubble films that offer small scale air bubbles, with individual chambers of 0.4 X 1mm, for example only and not by way of limitation. Water pressure is eliminated through the flexibility of the side/wall material. The outside layer 32 preferably is made out of non-destructible, waterproof material. Again, the middle layer 34 eliminates bioelectric signals and is preferably made of rubber.

[0028] Additionally, the Applicant has determined that the material color preferably should not be dark- as was used for the "shark screen" - to reduce visibility during daytime hours. Thus, a light blue is preferred although it may be that a dark blue or even black could be deemed useful in some circumstances. The inflatable rings 24 (one or more in total) at the top 14 of the bag, open ended enclosure 12, may be made of PVC and polyester, with a non-puncturable outer layer to guarantee that the enclosure surrounds the person properly. The inflatable device(s) 24 are inflatable through a mouth piece, inflation tube 30, in one aspect. Further buoyant device 22 is buoyant on its own and needs no inflation.. The shark avoidance system 10 of the present invention can be folded down to a small size, easily fitting with life jackets on a boat.

[0029] Of course, popular belief is still hung up on human blood and urine as an attractant to sharks. Since both fluids would be trapped within the present invention, a person that is not aware that neither fluid is an attractant, would feel safer and so naturally keep a lower sound profile.

[0030] In sum, advantages of the present invention include but are not limited to:

- easy to get into
- eliminates sounds and water pressure, the most attractive components for any shark's interest in a human being
- eliminates bioelectrical fields, an attractant when a shark is in close vicinity to a person
- prevents human blood or urine from getting into the open water (to calm down individuals per popular belief)
- works day and night
- requires no electrical or chemical components
- requires no maintenance
- easy storage.

[0031] By way of continued description, Applicant has found that an essential element of the invention is a device for deploying a shark avoidance system, especially a system as claimed and as described before, that allows

the system to be easily portable as well as accessible. In this regard, Applicant has determined that a bag 44 as illustrated in Figure 4 is, by way of example only and not by limitation, a bag with at least one access panel 46. Bag 44 is configured to receive and retain any shark avoidance system, especially a system 10 as described before and shown in figures 1 to 3, and access panel 46 keeps shark avoidance system 10 clean and ready for use. Importantly, access panel 46 is easily opened and shut by use of connection device 48. Connection device may be a combination of hook and loop material 50 or strap and buckle combination 52 or any connection device now known or hereafter developed that allows quick access to shark avoidance system 10 in bag 44. To protect the content of bag 44 and simultaneously allow an easy removal of the system 10 the opening of the pouch in form of the bag 44 that can be closed by panel 46 may provide also at its edges, especially side and front edges, additional closing means like hook and loop devices.

[0032] According to one embodiment bag 44 is made of water impervious material such as the type of material described herein for use in first outer layer 32. Further, in one aspect, bag 44 includes at least one gas filled pocket 54. Gas pocket 54 may be incorporated with bag 44 such that bag 44 is ensured to float in liquid. More than one gas pocket, as shown in Figure 4, and/or different forms and sized of gas pockets may be used as deemed useful. The dimensions of the bag 44 depends on different parameters, like the size of the system 10, the material used for bag 44, especially its thickness, whether or not a gas pocket is incorporated and/or the type of the connecting device to secure a safe handling of the bag 44 and system 10 by a user.

[0033] Referring now to Figure 5, a shark avoidance system, especially a shark avoidance system 10 as described above, is shown sealed within bag 44 and bag 44 is removably attached with a life vest 56. In Figure 5 a back side of a life vest 56 having arm openings 57 is shown. Life vest 56 has especially straps 58 to fix the vest 56 around the waist of a user, especially by way of a closure buckle system connected to and/or including the straps 58. Life vest 56 may be any life vest and/or buoyancy compensator device (BCD) device now known or hereafter developed and may come with bag 44 or bag 44 may be an after market add on element.

[0034] According to the invention, bag 44 is removably connected with life vest 56 with a release device 59. According to the invention, release device 59 is a rip cord device 60. Pulling of rip cord device 60 releases bag 44 from attachment with life vest 56. Figure 5 illustrates that, once released, bag 44 may include more than one access panel 46 (two are shown in Figure 5 for example only) such that when urgent access to shark avoidance system 10 is needed, multiple access points are available.

[0035] Also the dimensions of the area of the life vest 56 to which the bag 44 is removably attached depends on different parameters, like the size of the bag 44, the size of the system 10, the material used for bag 44, es-

pecially its thickness, whether or not a gas pocket is incorporated and/or the type of the connecting device to secure a safe handling of the bag 44 and system 10 by a user.

REFERENCE SIGN LIST

[0036]

10	Shark avoidance system
12	Open ended enclosure
14	Top
16	Sides
18	Bottom
20	Interior enclosed space
22	buoyant device
24	inflatable device
26	section
28	deviders
30	inflation tube
32	layer
34	layer
36	layer
38	layer
40	person
42	handle
44	bag
46	access panel
48	connection device
50	hook and loop material
52	strap and buckle
54	Gas pocket
56	life vest
57	arm opening
58	straps
59	release device
60	rip cord device

Claims

1. A kit of parts comprising a shark avoidance system (10), a bag (44) with at least one access panel (46) and a life vest (56) or buoyancy compensator device (56), wherein the bag (44) is configured to receive and retain the shark avoidance system (10), wherein the bag (44) is removably connected with the life vest (56) or buoyancy compensator device (56) with a release device (59) in the form of a rip cord device (60), such that pulling of the rip cord device (60) releases the bag (44) from attachment with the life vest (56) or buoyancy compensator device (56), and wherein the shark avoidance system comprises:

a.) at least one open ended enclosure (12) with at least a top (14), sides (16), and at least one bottom (18), wherein especially said sides (16) and said bottom (18) forming at least one interior

enclosed space (20); and

b.) at least one buoyant device (22) and at least one inflatable device (24), wherein said buoyant device (22) and said inflatable device (24) are connected to form a combination and/or wherein said combination is connected with said top (14) of the open ended enclosure (12);

c.) wherein said sides (16) connect said top (14) and said bottom (18), wherein said sides (16) form at least one flexible wall and wherein said flexible wall comprises and/or consists of a combination of at least three layers (32, 34, 36), at least one first, preferably outer, layer (32), at least one second, preferably middle, layer (34) and at least one third, preferably inner, layer (36), especially said third layer (36) connected to said second layer (34) and/or said second layer (34) connected to said first layer (32), wherein one of said layers (32, 34, 36) is a water impervious layer, wherein one of said layers (32, 34, 36) is a bioelectrical blocking layer and/or wherein one of said layers (32, 34, 36) is a sound emission blocking layer.

2. The kit of parts of claim 1, wherein in the shark avoidance system

(i) said combination is connected to said top with said buoyant device and/or wherein the sound emission blocking layer is and/or comprises at least partly a layer of sealed gas, the water impervious layer is and/or comprises at least partly a polyester layer and/or the bioelectrical blocking layer is and/or comprises at least partly a rubber layer,

(ii) the system further includes more than one inflatable device, and/or

(iii) said buoyant device comprises at least one buoyant polyethylene foam and/or consists of at least one buoyant polyethylene foam.

3. The kit of parts of one of the preceding claims, wherein in the shark avoidance system

(i) said inflatable device includes more than one segregated inflatable section such that each section is independently inflatable,

(ii) the system further includes at least one inflation tube, preferably connected with said inflatable device and/or

(iii) said first layer at least partly is and/or comprises polyester, said second layer at least partly is and/or comprises rubber and/or said third layer at least partly is and/or comprises sealed gas.

4. The kit of parts of one of the preceding claims, the shark avoidance system further including at least one fourth layer, especially connected with said third

layer, wherein said fourth layer at least partly is and/or comprises at least one water impervious layer, wherein optionally said fourth layer at least partly is and/or comprises polyester.

5. The kit of parts according to claim 1, wherein in the shark avoidance system the at least one open ended enclosure has at least one top, sides and at least one bottom, wherein especially said sides and said bottom forming an interior enclosed space; and

a.) the system comprises at least two inflatable devices, wherein said buoyant device and said two inflatable devices are connected to form a combination and/or wherein said combination is connected with said top of the open ended enclosure;

b.) wherein said sides and said bottom form the at least one flexible wall and wherein said flexible wall consists of and/or comprises a combination of at least four layers, the at least one first, preferably outer, layer, the at least one second, preferably middle, layer, the at least one third, preferably inner, layer, and a fourth, preferably innermost, layer, especially said fourth layer connected to said third layer, wherein said first layer is a water impervious layer, wherein one of said layers is a bioelectrical blocking layer, wherein one of said layers is a sound emission blocking layer and wherein said fourth layer is a water impervious layer.

6. The kit of parts of claim 5, wherein in the shark avoidance system

(i) said combination is connected to said top with said buoyant device and/or wherein the sound emission blocking layer is and/or comprises at least partly a layer of sealed gas, the water impervious layer is and/or comprises at least partly a polyester layer and/or the bioelectrical blocking layer is and/or comprises at least partly a rubber layer,

(ii) said inflatable devices includes more than one segregated inflatable section, preferably such that each section is independently inflatable,

(iii) the system further includes inflation tubes, preferably connected with said inflatable devices, and/or

(iv) said first layer is polyester, said second layer is rubber, said third layer is sealed gas and/or said fourth layer is polyester.

7. The kit of parts of one of the claims 5 to 6, wherein in the shark avoidance system said first layer is colored, wherein preferably said color is selected from a group consisting of: dark blue, light blue and black,

and/or the system further includes at least one pair of oppositely positioned handles, preferably located in said interior enclosed space.

8. The kit of parts according to one of the preceding claims wherein the bag is usable in a shark avoidance method comprising:

a.) providing at least one open ended enclosure with at least one top, sides, at least one bottom, said sides and said bottom forming an interior enclosed space; and at least one buoyant device and at least one inflatable device, wherein said buoyant device and said inflatable device are connected to form a combination and/or wherein said combination is connected with said top of the open ended enclosure; wherein said sides connect said top and said bottom, wherein said sides form at least one flexible wall and wherein said flexible wall consists of and/or comprises a combination of at least three layers, a first, preferably outer, layer, a second, preferably middle, layer and a third, preferably inner, layer, especially said third layer connected to said second layer and/or said second layer connected to said first layer, wherein one of said layers is a water impervious layer, wherein one of said layers is a bioelectrical blocking layer and wherein one of said layers is a sound emission blocking layer; and

b.) a user placing said enclosure at least partly in water and then entering at least partly the interior enclosed space through the top of the open ended enclosure such that the open ended enclosure at least partly surrounds the user.

9. The kit of parts of claim 8, wherein the method further includes the step of inflating the inflatable device and/or wherein the sound emission blocking layer is and/or comprises at least partly a layer of sealed gas, the water impervious layer is and/or comprises at least partly a polyester layer and/or the bioelectrical blocking layer is and/or comprises at least partly a rubber layer.

10. The kit of parts of claim 8 or 9, wherein in the shark avoidance system said first layer is polyester, said second layer is rubber and/or said third layer is sealed gas.

11. The kit of parts of one of the claims 8 to 10, the shark avoidance system further including at least one fourth layer, preferably connected with said third layer, wherein especially said fourth layer is and/or comprises at least one water impervious layer.

12. The kit of parts of one of the preceding claims, wherein said bag is at least partly comprised of at least one

water impervious material.

13. The kit of parts of one of the preceding claims, wherein

(i) said bag includes at least one gas pocket with gas, preferably such that said gas pocket floats said bag when said bag is in liquid, and/or
(ii) said access panel includes at least one access panel connection device wherein preferably said connection device is configured to removably attach said access panel with said bag.

14. The kit of parts of alternative (ii) of claim 13, wherein said connection device is selected from a group consisting of: hook and loop tabs and straps and buckles.

Patentansprüche

1. Teilesatz, der ein Hai-Vermeidungssystem (10), einen Beutel (44) mit mindestens einer Zugangspaneele (46) und eine Rettungsweste (56) oder Auftriebskompensationsvorrichtung (56) umfasst, wobei der Beutel (44) so konfiguriert ist, dass sie das Hai-Vermeidungssystem (10) aufnimmt und festhält, wobei der Beutel (44) mit der Rettungsweste (56) oder der Auftriebskompensationsvorrichtung (56) mit einer Lösevorrichtung (59) in Form einer Reißleinenvorrichtung (60) lösbar verbunden ist, so dass ein Ziehen an der Reißleinenvorrichtung (60) der Beutel (44) aus der Befestigung mit der Rettungsweste (56) oder der Auftriebskompensationsvorrichtung (56) löst, und wobei das Hai-Vermeidungssystem umfasst:

a.) mindestens eine offene Umhüllung (12) mit mindestens einer Oberseite (14), Seiten (16) und mindestens einer Unterseite (18), wobei insbesondere die Seiten (16) und die Unterseite (18) mindestens einen inneren geschlossenen Raum (20) bilden; und

b.) mindestens eine schwimmfähige Vorrichtung (22) und mindestens eine aufblasbare Vorrichtung (24), wobei die schwimmfähige Vorrichtung (22) und die aufblasbare Vorrichtung (24) miteinander verbunden sind, um eine Kombination zu bilden und/oder wobei die Kombination mit der Oberseite (14) der offenen Umhüllung (12) verbunden ist;

c.) wobei die Seiten (16) die Oberseite (14) und die Unterseite (18) verbinden, wobei die Seiten (16) mindestens eine flexible Wand bilden und wobei die flexible Wand eine Kombination aus mindestens drei Schichten (32, 34, 36) umfasst und/oder daraus besteht, mindestens eine erste, vorzugsweise äußere Schicht (32), mindestens

eine zweite, vorzugsweise mittlere Schicht (34) und mindestens eine dritte, vorzugsweise innere Schicht (36), insbesondere die dritte Schicht (36), wobei insbesondere die dritte Schicht (36) mit der zweiten Schicht (34) verbunden ist und/oder die zweite Schicht (34) mit der ersten Schicht (32) verbunden ist, wobei eine der Schichten (32, 34, 36) eine wasserundurchlässige Schicht ist, wobei eine der Schichten (32, 34, 36) eine bioelektrische Sperrschicht ist und/oder wobei eine der Schichten (32, 34, 36) eine Schallemissionssperrschicht ist.

2. Teilesatz nach Anspruch 1, wobei in dem Hai-Vermeidungssystem

(i) die Kombination mit der schwimmfähigen Vorrichtung mit dem Oberteil verbunden ist und/oder wobei die Schallemissionssperrschicht zumindest teilweise eine Schicht aus versiegeltem Gas ist und/oder umfasst, die wasserundurchlässige Schicht zumindest teilweise eine Polyesterschicht ist und/oder umfasst und/oder die bioelektrische Blockierschicht zumindest teilweise eine Gummischicht ist und/oder umfasst,

(ii) das System ferner mehr als eine aufblasbare Vorrichtung umfasst und/oder

(iii) die schwimmfähige Vorrichtung zumindest einen schwimmfähigen Polyethylenschaum umfasst und/oder aus zumindest einem schwimmfähigen Polyethylenschaum besteht.

3. Teilesatz nach einem der vorhergehenden Ansprüche, wobei in dem Hai-Vermeidungssystem

(i) die aufblasbare Vorrichtung mehr als einen getrennten aufblasbaren Abschnitt enthält, so dass jeder Abschnitt unabhängig aufblasbar ist, (ii) das System ferner mindestens einen Aufblas Schlauch enthält, der vorzugsweise mit der aufblasbaren Vorrichtung verbunden ist, und/oder

(iii) die erste Schicht zumindest teilweise aus Polyester besteht und/oder dieses umfasst, die zweite Schicht zumindest teilweise aus Gummi besteht und/oder dieses umfasst und/oder die dritte Schicht zumindest teilweise aus abgedichtetem Gas besteht und/oder dieses umfasst.

4. Teilesatz nach einem der vorhergehenden Ansprüche, wobei das Hai-Vermeidungssystem ferner mindestens eine vierte Schicht umfasst, die insbesondere mit der dritten Schicht verbunden ist, wobei die vierte Schicht mindestens teilweise eine wasserundurchlässige Schicht ist und/oder umfasst, wobei optional die vierte Schicht mindestens teilweise

Polyester ist und/oder umfasst.

5. Teilesatz nach Anspruch 1, wobei in dem Hai-Vermeidungssystem die mindestens eine Umhüllung mit offenem Ende mindestens eine Oberseite, Seiten und mindestens eine Unterseite aufweist, wobei insbesondere die Seiten und die Unterseite einen inneren umschlossenen Raum bilden; und

a.) das System mindestens zwei aufblasbare Vorrichtungen umfasst, wobei die schwimmfähige Vorrichtung und die beiden aufblasbaren Vorrichtungen verbunden sind, um eine Kombination zu bilden und/oder wobei die Kombination mit der Oberseite der Umhüllung mit offenem Ende verbunden ist;

b.) wobei die Seiten und die Unterseite die zumindest eine flexible Wand bilden und wobei die flexible Wand aus einer Kombination von mindestens vier Schichten besteht und/oder diese Kombination umfasst, die mindestens eine erste, vorzugsweise äußere, Schicht, die mindestens eine zweite, vorzugsweise mittlere, Schicht, die mindestens einer dritte, vorzugsweise innere, Schicht und eine vierte, vorzugsweise innerste Schicht, wobei insbesondere die vierte Schicht mit der dritten Schicht verbunden ist, wobei die erste Schicht eine wasserundurchlässige Schicht ist, wobei eine der Schichten eine bioelektrische Sperrschicht ist, wobei eine der Schichten eine Schallemissionssperrschicht ist und wobei die vierte Schicht eine wasserundurchlässige Schicht ist.

6. Teilesatz nach Anspruch 5, wobei in dem Hai-Vermeidungssystem

(i) die Kombination mit der schwimmfähigen Vorrichtung mit dem Oberteil verbunden ist und/oder wobei die Schallemissionssperrschicht zumindest teilweise eine Schicht aus versiegeltem Gas ist und/oder umfasst, die wasserundurchlässige Schicht zumindest teilweise eine Polyesterschicht ist und/oder umfasst und/oder die bioelektrische Sperrschicht zumindest teilweise eine Gummischicht ist und/oder umfasst,

(ii) die aufblasbaren Vorrichtungen mehr als einen getrennten aufblasbaren Abschnitt umfassen, vorzugsweise so, dass jeder Abschnitt unabhängig aufblasbar ist,

(iii) das System ferner Aufblasschläuche umfasst, die vorzugsweise mit den aufblasbaren Vorrichtungen verbunden sind, und/oder

(iv) die erste Schicht Polyester ist, die zweite Schicht Gummi ist, die dritte Schicht versiegeltes Gas ist und/oder die vierte Schicht Polyester ist.

7. Teilesatz nach einem der Ansprüche 5 bis 6, wobei in dem Hai-Vermeidungssystem die erste Schicht gefärbt ist, wobei die Farbe vorzugsweise aus einer Gruppe ausgewählt ist, die aus dunkelblau, hellblau und schwarz besteht, und/oder das System ferner mindestens ein Paar gegenüberliegend angeordneter Griffe umfasst, die vorzugsweise in dem inneren umschlossenen Raum angeordnet sind.

8. Teilesatz nach einem der vorhergehenden Ansprüche, wobei der Beutel in einem Hai-Vermeidungsverfahren verwendbar ist, umfassend:

a.) Bereitstellen mindestens einer Umhüllung mit offenem Ende mit mindestens einer Oberseite, Seiten, mindestens einer Unterseite, wobei die Seiten und die Unterseite einen inneren umschlossenen Raum bilden; und mindestens einer schwimmfähigen Vorrichtung und mindestens einer aufblasbaren Vorrichtung, wobei die schwimmfähige Vorrichtung und die aufblasbare Vorrichtung verbunden sind, um eine Kombination zu bilden und/oder wobei die Kombination mit dem Oberteil der Umhüllung mit offenem Ende verbunden ist; wobei die Seiten die Oberseite und die Unterseite verbinden, wobei die Seiten mindestens eine flexible Wand bilden und wobei die flexible Wand aus einer Kombination von mindestens drei Schichten besteht und/oder eine Kombination von mindestens drei Schichten umfasst, einer ersten, vorzugsweise äußeren, Schicht, einer zweiten, vorzugsweise mittleren, Schicht und einer dritten, vorzugsweise inneren, Schicht, wobei insbesondere die dritte Schicht mit der zweiten Schicht verbunden ist und/oder die zweite Schicht mit der ersten Schicht verbunden ist, wobei eine der Schichten eine wasserundurchlässige Schicht ist, wobei eine der Schichten eine bioelektrische Blockierschicht ist und wobei eine der Schichten eine Schallemissionsblockierschicht ist; und

b.) einen Benutzer, der die Umhüllung zumindest teilweise in Wasser legt und dann zumindest teilweise in den inneren eingeschlossenen Raum durch die Oberseite der Umhüllung mit offenem Ende eintritt, so dass die Umhüllung mit offenem Ende den Benutzer zumindest teilweise umgibt.

9. Teilesatz nach Anspruch 8, wobei das Verfahren ferner den Schritt des Aufblasens der aufblasbaren Vorrichtung umfasst und/oder wobei die Schallemissionssperrschicht zumindest teilweise eine Schicht aus abgedichtetem Gas ist und/oder umfasst, die wasserundurchlässige Schicht zumindest teilweise eine Polyesterschicht ist und/oder umfasst und/oder die bioelektrische Sperrschicht zumindest teilweise eine Gummischicht ist und/oder umfasst.

10. Teilesatz nach Anspruch 8 oder 9, wobei in dem Hai-Vermeidungssystem die erste Schicht aus Polyester, die zweite Schicht aus Gummi und/oder die dritte Schicht aus versiegelttem Gas besteht. 5
11. Teilesatz nach einem der Ansprüche 8 bis 10, wobei das Hai-Vermeidungssystem ferner mindestens eine vierte Schicht aufweist, die vorzugsweise mit der dritten Schicht verbunden ist, wobei insbesondere die vierte Schicht mindestens eine wasserundurchlässige Schicht ist und/oder umfasst. 10
12. Teilesatz nach einem der vorhergehenden Ansprüche, wobei der Beutel zumindest teilweise aus mindestens einem wasserundurchlässigen Material besteht. 15
13. Teilesatz nach einem der vorhergehenden Ansprüche, wobei 20
- .(i) der Beutel mindestens eine Gastasche mit Gas enthält, vorzugsweise so, dass die Gastasche den Beutel schwimmen lässt, wenn sich der Beutel in Flüssigkeit befindet, und/oder
- (ii) die Zugangspaneele mindestens eine Verbindungsvorrichtung für die Zugangspaneele enthält, wobei die Verbindungsvorrichtung vorzugsweise so konfiguriert ist, dass sie die Zugangspaneele abnehmbar mit dem Beutel verbindet. 25 30
14. Teilesatz nach Alternative (ii) von Anspruch 13, wobei die Verbindungsvorrichtung ausgewählt ist aus der Gruppe bestehend aus: Klettverschlusslaschen und Riemen und Schnallen. 35

Revendications

1. Un kit de pièces comprenant un système d'évitement des requins (10), un sac (44) avec au moins un panneau d'accès (46) et un gilet de sauvetage (56) ou un dispositif compensateur de flottabilité (56), dans lequel le sac (44) est configuré pour recevoir et retenir le système d'évitement des requins (10), dans lequel le sac (44) est relié de manière amovible au gilet de sauvetage (56) ou au dispositif compensateur de flottabilité (56) avec un dispositif de libération (59) sous la forme d'un dispositif à cordelette (60), de sorte que la traction du dispositif à cordelette (60) libère le sac (44) de la fixation avec le gilet de sauvetage (56) ou le dispositif compensateur de flottabilité (56), et dans lequel le système d'évitement des requins comprend : 40 45 50
- a.) au moins une enceinte à extrémité ouverte (12) avec au moins un sommet (14), des côtés (16), et au moins un fond (18), dans laquelle

spécialement lesdits côtés (16) et ledit fond (18) forment au moins un espace intérieur fermé (20) ; et

b.) au moins un dispositif flottant (22) et au moins un dispositif gonflable (24), dans lequel ledit dispositif flottant (22) et ledit dispositif gonflable (24) sont reliés pour former une combinaison et/ou dans lequel ladite combinaison est reliée audit sommet (14) de l'enceinte à extrémités ouvertes (12) ;

c.) dans laquelle lesdits côtés (16) relient ledit sommet (14) et ledit fond (18), dans laquelle lesdits côtés (16) forment au moins une paroi flexible et dans laquelle ladite paroi flexible comprend et/ou consiste en une combinaison d'au moins trois couches (32, 34, 36), au moins une première couche (32), de préférence extérieure, au moins une deuxième couche (34), de préférence médiane, et au moins une troisième couche (36), de préférence intérieure, en particulier ladite troisième couche (36), en particulier ladite troisième couche (36) reliée à ladite deuxième couche (34) et/ou ladite deuxième couche (34) reliée à ladite première couche (32), dans lequel l'une desdites couches (32, 34, 36) est une couche imperméable à l'eau, dans lequel l'une desdites couches (32, 34, 36) est une couche de blocage bioélectrique et/ou dans lequel l'une desdites couches (32, 34, 36) est une couche de blocage d'émission sonore.

2. Kit de pièces selon la revendication 1, dans lequel, dans le système d'évitement des requins,
- (i) ladite combinaison est reliée audit sommet avec ledit dispositif flottant et/ou dans lequel la couche de blocage des émissions sonores est et/ou comprend au moins partiellement une couche de gaz scellée, la couche imperméable à l'eau est et/ou comprend au moins partiellement une couche de polyester et/ou la couche de blocage bioélectrique est et/ou comprend au moins partiellement une couche de caoutchouc,
- (ii) le système comprend en outre plus d'un dispositif gonflable, et/ou
- (iii) ledit dispositif flottant comprend au moins une mousse de polyéthylène flottante et/ou consiste en au moins une mousse de polyéthylène flottante.
3. Kit de pièces de l'une des revendications précédentes, dans lequel, dans le système d'évitement des requins, 55
- (i) ledit dispositif gonflable comprend plus d'une section gonflable séparée de telle sorte que chaque section est gonflable indépendamment,
- (ii) le système comprend en outre au moins un

- tube de gonflage, de préférence relié audit dispositif gonflable et/ou
- (iii) ladite première couche est au moins partiellement et/ou comprend du polyester, ladite deuxième couche est au moins partiellement et/ou comprend du caoutchouc et/ou ladite troisième couche est au moins partiellement et/ou comprend un gaz étanche.
4. Kit de pièces de l'une des revendications précédentes, le système d'évitement des requins comprenant en outre au moins une quatrième couche, spécialement reliée à ladite troisième couche, dans lequel ladite quatrième couche est au moins partiellement et/ou comprend au moins une couche imperméable à l'eau, dans lequel éventuellement ladite quatrième couche est au moins partiellement et/ou comprend du polyester.
5. Kit de pièces selon la revendication 1, dans lequel, dans le système d'évitement des requins, la au moins une enceinte à extrémités ouvertes a au moins un sommet, des côtés et au moins un fond, dans lequel notamment les dits côtés et ledit fond forment un espace intérieur fermé; et
- a.) le système comprend au moins deux dispositifs gonflables, dans lequel ledit dispositif de flottaison et lesdits deux dispositifs gonflables sont reliés pour former une combinaison et/ou dans lequel ladite combinaison est reliée à ladite partie supérieure de l'enceinte à extrémités ouvertes;
- b) dans lequel les dits côtés et ledit fond forment l'au moins une paroi flexible et dans lequel ladite paroi flexible consiste en et/ou comprend une combinaison d'au moins quatre couches, l'au moins une première couche, de préférence extérieure, l'au moins une deuxième couche, de préférence médiane, l'au moins une troisième couche, de préférence intérieure, et une quatrième couche, de préférence la plus intérieure, en particulier ladite première couche, de préférence la plus interne, en particulier ladite quatrième couche reliée à ladite troisième couche, dans laquelle ladite première couche est une couche imperméable à l'eau, dans laquelle l'une desdites couches est une couche de blocage bioélectrique, dans laquelle l'une desdites couches est une couche de blocage d'émission sonore et dans laquelle ladite quatrième couche est une couche imperméable à l'eau.
6. Kit de pièces selon la revendication 5, dans lequel, dans le système d'évitement des requins,
- (i) ladite combinaison est reliée audit sommet avec ledit dispositif flottant et/ou dans lequel la
- couche de blocage des émissions sonores est et/ou comprend au moins partiellement une couche de gaz scellé, la couche imperméable à l'eau est et/ou comprend au moins partiellement une couche de polyester et/ou la couche de blocage bioélectrique est et/ou comprend au moins partiellement une couche de caoutchouc,
- (ii) lesdits dispositifs gonflables comprennent plus d'une section gonflable séparée, de préférence telle que chaque section est gonflable indépendamment,
- (iii) le système comprend en outre des tubes de gonflage, de préférence reliés auxdits dispositifs gonflables, et/ou
- (iv) ladite première couche est en polyester, ladite deuxième couche est en caoutchouc, ladite troisième couche est en gaz étanche et/ou ladite quatrième couche est en polyester.
7. Kit de pièces de l'une des revendications 5 à 6, dans lequel, dans le système d'évitement des requins, ladite première couche est colorée, ladite couleur étant de préférence choisie dans un groupe constitué de : bleu foncé, bleu clair et noir, et/ou le système comprend en outre au moins une paire de poignées positionnées de manière opposée, de préférence situées dans ledit espace intérieur fermé.
8. Kit de pièces selon l'une des revendications précédentes, dans lequel le sac est utilisable dans une méthode d'évitement des requins comprenant :
- a.) fournir au moins une enceinte à extrémité ouverte avec au moins un sommet, des côtés, au moins un fond, lesdits côtés et ledit fond formant un espace intérieur fermé ; et au moins un dispositif flottant et au moins un dispositif gonflable, dans lequel ledit dispositif flottant et ledit dispositif gonflable sont reliés pour former une combinaison et/ou dans lequel ladite combinaison est reliée audit sommet de l'enceinte à extrémité ouverte ; dans laquelle lesdits côtés relient ledit haut et ledit bas, dans laquelle lesdits côtés forment au moins une paroi flexible et dans laquelle ladite paroi flexible consiste en et/ou comprend une combinaison d'au moins trois couches, une première couche, de préférence extérieure, une deuxième couche, de préférence médiane, et une troisième couche, de préférence intérieure, en particulier ladite troisième couche reliée à ladite deuxième couche et/ou ladite deuxième couche reliée à ladite première couche, dans laquelle l'une desdites couches est une couche imperméable à l'eau, dans laquelle l'une desdites couches est une couche de blocage bioélectrique et dans laquelle l'une desdites couches est une couche de blocage de l'émission de sons ; et

- b.) un utilisateur plaçant ladite enceinte au moins partiellement dans l'eau et entrant ensuite au moins partiellement dans l'espace clos intérieur par le haut de l'enceinte à extrémités ouvertes de sorte que l'enceinte à extrémités ouvertes entoure au moins partiellement l'utilisateur. 5
9. Kit de pièces selon la revendication 8, dans lequel le procédé comprend en outre l'étape consistant à gonfler le dispositif gonflable et/ou dans lequel la couche de blocage de l'émission sonore est et/ou comprend au moins partiellement une couche de gaz scellé, la couche imperméable à l'eau est et/ou comprend au moins partiellement une couche de polyester et/ou la couche de blocage bioélectrique est et/ou comprend au moins partiellement une couche de caoutchouc. 10 15
10. Kit de pièces selon la revendication 8 ou 9, dans lequel, dans le système d'évitement des requins, ladite première couche est en polyester, ladite deuxième couche est en caoutchouc et/ou ladite troisième couche est en gaz étanche. 20 25
11. Kit de pièces de l'une des revendications 8 à 10, le système d'évitement des requins comprenant en outre au moins une quatrième couche, de préférence reliée à ladite troisième couche, dans lequel notamment ladite quatrième couche est et/ou comprend au moins une couche imperméable à l'eau. 30
12. Kit de pièces de l'une des revendications précédentes, dans lequel ledit sac est au moins partiellement constitué d'au moins un matériau imperméable à l'eau. 35
13. Kit de pièces de l'une des revendications précédentes, dans lequel 40
- (i) ledit sac comprend au moins une poche de gaz avec du gaz, de préférence telle que ladite poche de gaz fait flotter ledit sac lorsque ledit sac est dans un liquide, et/ou 45
- (ii) ledit panneau d'accès comprend au moins un dispositif de connexion de panneau d'accès, dans lequel de préférence ledit dispositif de connexion est configuré pour attacher de manière amovible ledit panneau d'accès avec ledit sac. 50
14. Kit de pièces de l'alternative (ii) de la revendication 13, dans lequel ledit dispositif de connexion est choisi dans un groupe constitué par : des languettes à crochets et à boucles et des sangles et boucles. 55

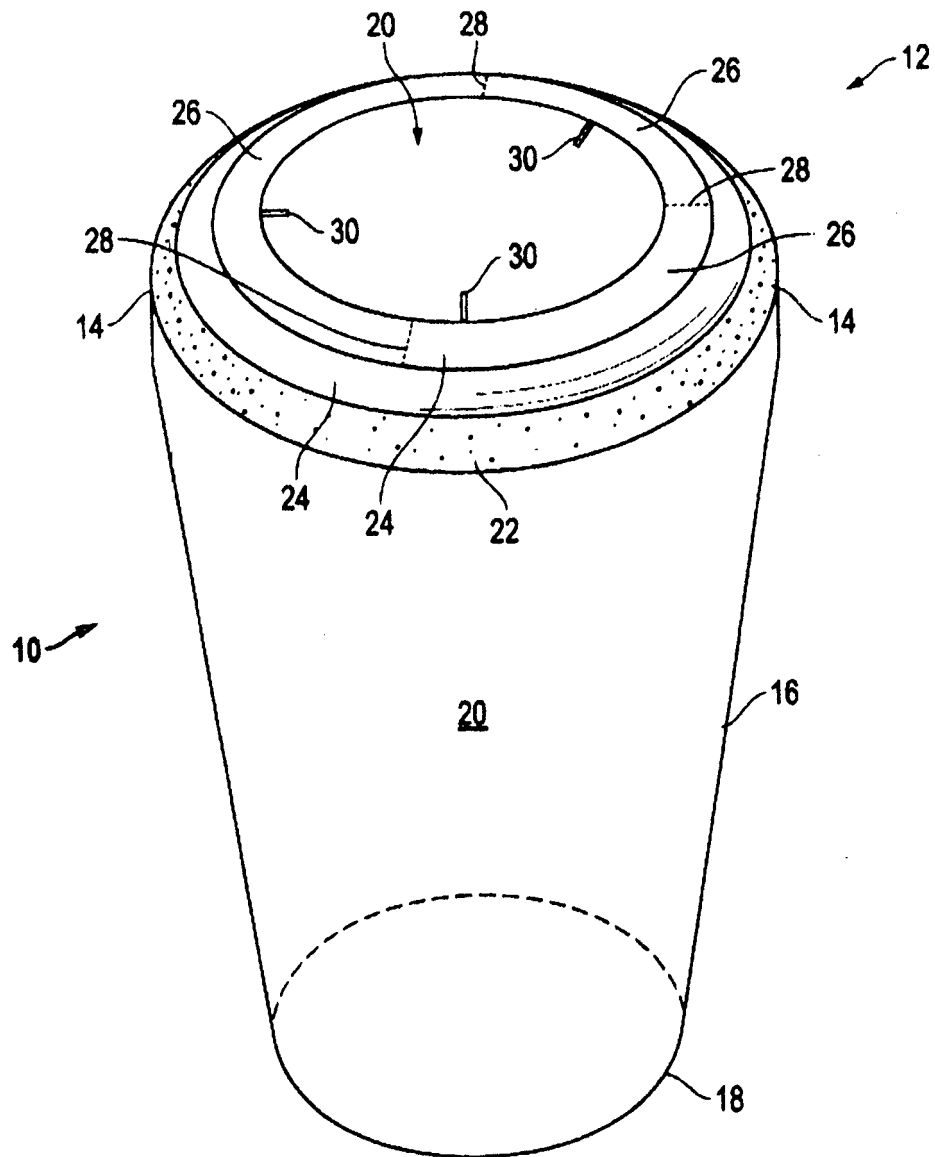


FIG. 1

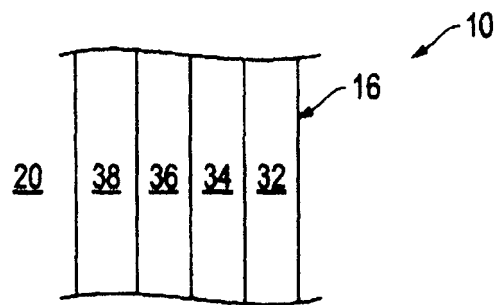


FIG. 2

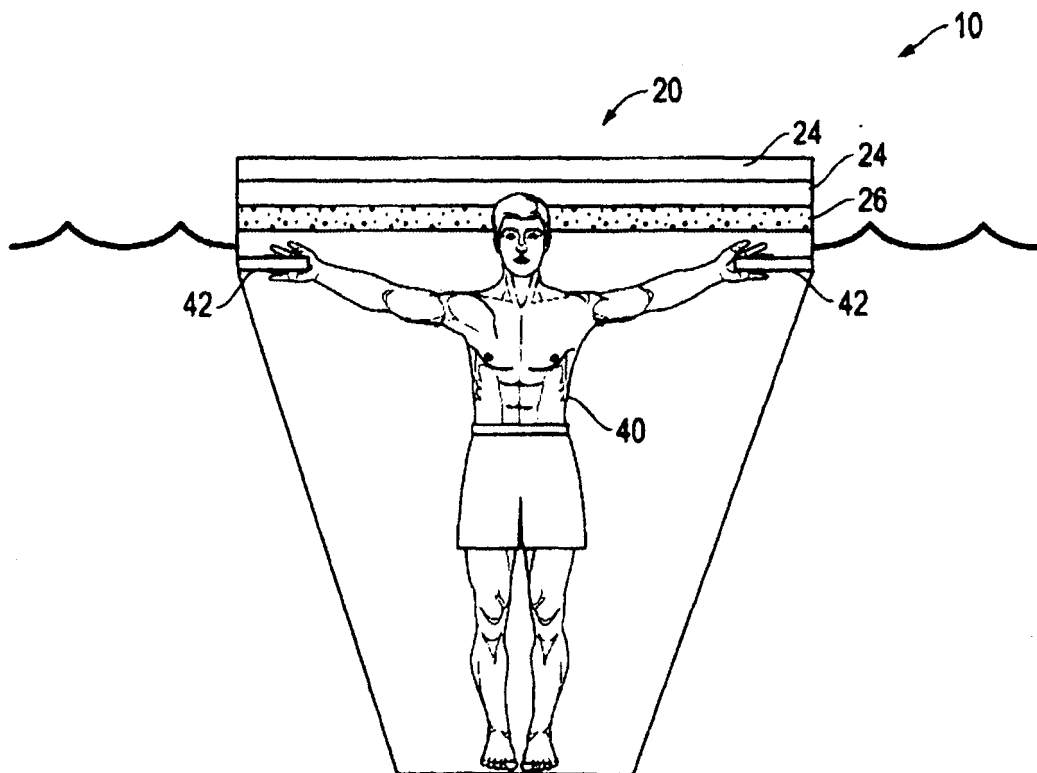


FIG. 3

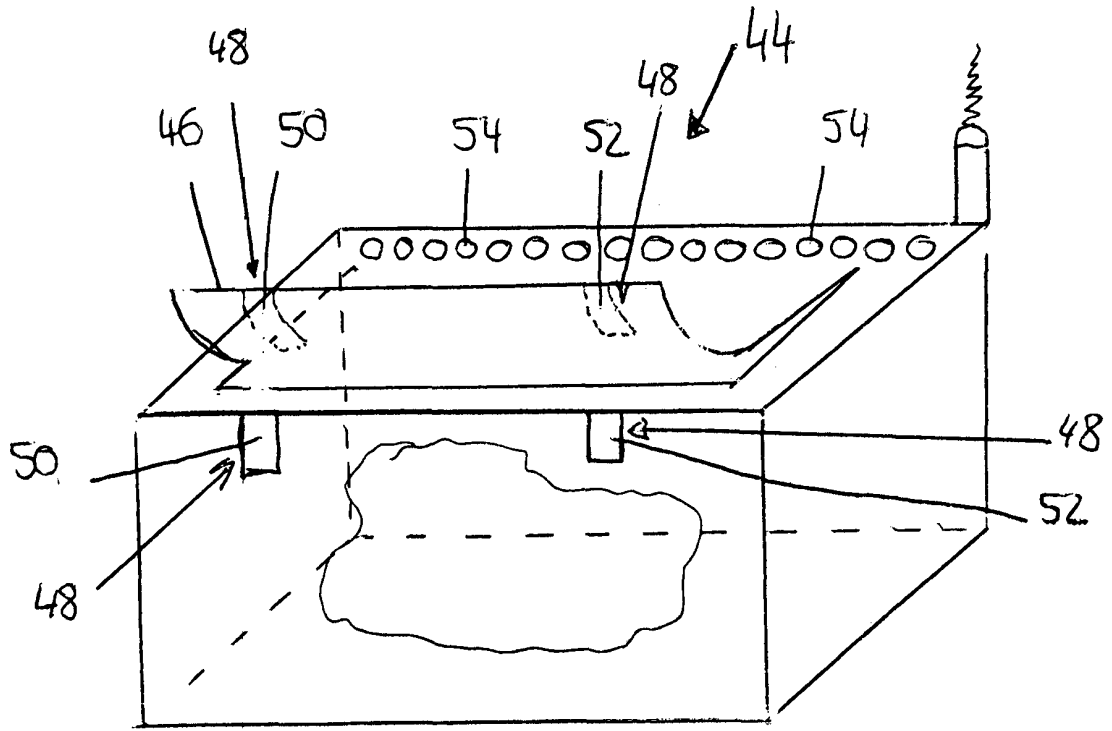


Fig. 4

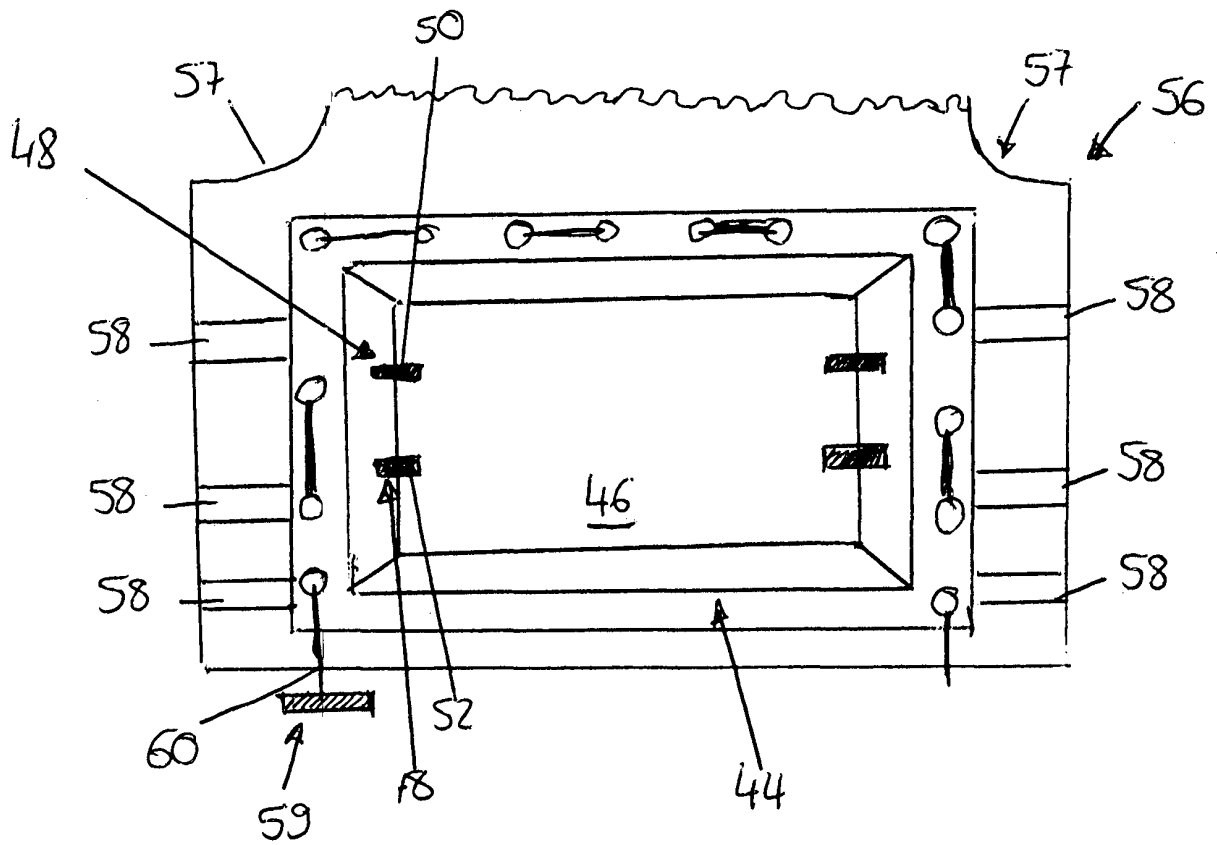


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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