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(54) **Personal swimming assistance device in the form of a wearable article**

(57) The present invention relates to a personal swimming and floatation assistant in the form of a personal equipment designed to be used in close/safe waters as well as sites that are especially visited with the aim of swimming, cooling off and/or having fun and probably where stayed voluntarily in water for hours. The present invention features a personal swimming assistant device with gas bags (11) such that said personal swimming and floatation equipment does not gain buoyancy until a dangerous situation is encountered. Said bags in unbouyant (passive) state does not decrease user's swimming speed and capacity and does not restrict tricks that the user can perform in water.

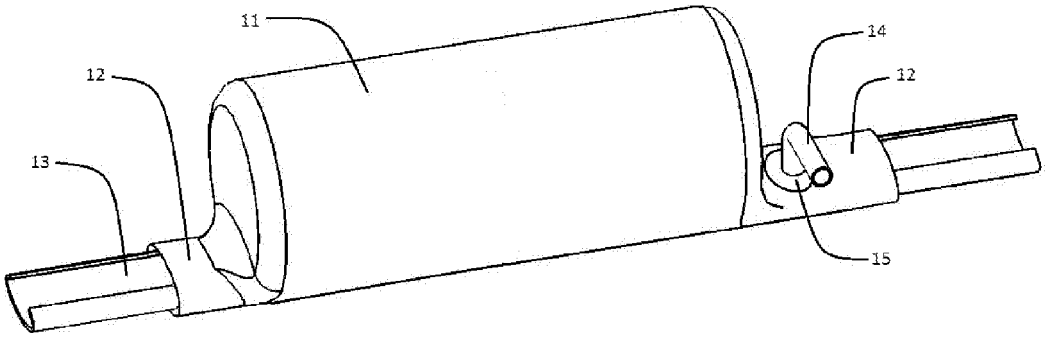


Fig. 1

EP 2 559 615 A1

Description

Technical Field of the Present Invention

[0001] The present invention relates to a personal swimming and floatation assistant in the form of a personal equipment designed to be used in close/safe waters as well as sites that are especially visited with the aim of swimming, cooling off and/or having fun and probably where stayed voluntarily in water for hours.

Technical background of the Invention

[0002] Form and specification of life jackets that have been subject of relevant standards are imposed by the IMO (International Maritime Organization). Furthermore, quality requirements of all equipments within the same product class in the subgroup of "personal life saving equipment" were also determined in a detailed manner in the standard of SOLAS, which stands for International Convention for the Safety of Life at Sea.

[0003] Above-mentioned standards were specified considering open sea conditions under which weather conditions might be very severe and conditions where a given person in need of immediate assistance had to wait for rescue for a prolonged time period.

[0004] According to said standards, a life vest must be equipped with a bulb, which is connected to a seawater battery and illuminates for 8 hours, a signal pipe, light reflecting stripes (reflector) and a hook bound to a halyard (a thin rope used to raise or lower a flag) to facilitate rescue operations.

[0005] Buoyancy force of the life vests, which must be made available in commercial vessels, must be at least 150 N according to these standards. Despite this, a passenger or a member of crew wearing this vest may have to jump or fall into sea and hit his head against something and may become unconscious. Therefore, a life vest, which conforms to SOLAS standards, must have sufficient balance and buoyancy force to turn even an unconscious person's body from any position to a position so that his mouth gets out of the water in 5 seconds. Also, it was foreseen that a life vest must have at least 150 N of buoyancy force to perform the mentioned function.

[0006] Approximately 55 % of an adult's body consists of water and this part has no gravity. It also contains fat at significant ratio and fat is lighter than water. Similarly, density of air in lungs is thousand fold less than water. Therefore, weight of a man, which is 100 kg in air, is approximately 5 kg in the water and 150 N accounts for three-fold of the buoyancy force, which can keep a 100-kg man on surface of the water (10 Newton can keep 1 kg on surface of the water).

[0007] On the other hand, life vests with certificates of TS EN ISO 12402-3 1207, TS EN ISO 12402-4 1207 and 12402-9 1207 are available to be used only in relatively safe waters because they are not equipped with signal pipes and lights (or their housings are available but should be supplied from outside) and they have smaller reflecting stripes. Their buoyancy force ranges between 100-150 N. Similarly, "personal life saving equipments" with certificates of TS EN ISO 12402-5 1207 are available for the use of people dealing with water sports and activities like small boats, canoes, windsurfs, sailing boats, rafting, sportive or professional angling as well as children. Their buoyancy force is below 100 N and they can be used only in safe or relatively safe waters. These products are mentioned as "personal floatation devices" in TSE (Turkish Standards Institution) registrations and as assistant for floatation or floatation vest in the market.

[0008] Many life vests made of various materials are available in the market. Outer surfaces of most of them are made of durable nylon (PVC, soft PVC or polyethylene) and their inner parts, which provide buoyancy force, are made of polyurethane, soft PVC foam or closed cell polyethylene plates.

[0009] In addition, life vests, life buoys and floatation assistants are available, those incorporating air chambers/inflatable pouches inside them. They are filled with air by mouth or using a pump or compressed air cylinders to acquire buoyancy force before introduced into the water.

[0010] Furthermore, there also exist life vests or floatation assistants equipped with a small compressed air cylinder. They are filled with air manually by removing a pin or pushing a button in case of danger or automatically upon contact with water or exposed to pressure. In such products, small CO_2 cylinders are mostly used to expand air cells.

[0011] Furthermore, life buoys, armlets, belts and beach wears are available to keep the user's head over the water by making less effort. They are equipped with the materials having buoyancy force.

[0012] Although many "personal life saving devices for use in the water", aiming at preventing interruption of airflow to the nose and mouth, as many as approximately 140,000 persons drown to death every year according to the data obtained from WHO (World Health Organization).

[0013] This figure accounts for 8.4 per hundred thousands of all death cases. Thus, drowning is one of the most frequent cause of death. It is the second most frequent cause of death among adults, whose ages range between 12 and 44 across the world. Another interesting datum according to the statistics is the fact that most of drowning cases occur not at open sea under bad weathering and helpless conditions but in public beaches, private pools, lakes, irrigation channels and rivers on clear and warm summer days. In other words, drowning mostly occur not in dangerous water or during water sports with high risk but in places to which people go for cooling, enjoying and sunbathing. Although almost no adult wearing life vest or floatation assistant is encountered in such places, it is not possible to explain why drowning cases keep top ranks in statistics with insufficient precautions, unawareness or unaffordable life saving devices to min-

imize the risk for drowning because affordable products are available in the market and many adults buy them for their children although they do not use them.

[0014] Furthermore, it is seen that they do not allow their children entering into water without wearing such equipments even if their children are very well swimmers. Statistics about accidents show that only half of the victims did not know swimming. Even this example alone is enough to evidence that in fact, most of adults are aware of the fact that being in the water brings various risks even for those swimming well.

[0015] Despite this awareness, the basic reason for the fact that 94% of drowning cases occur in safe waters/near to the coasts is that qualifications and designs of "personal life saving equipments" are not in conformance with purposes of people to be in such places and such disharmony forces people to make a choice between comfort and precautions.

[0016] Considering the aforementioned qualifications, life vests or floatation assistants may be gathered in three main groups. They are those, which have the capacity for floatation, as soon as they are manufactured due to the materials used in manufacturing; those, which acquire floatation ability after filled with air by mouth, using a pump or compressed air cylinders and those, which are equipped with small cylinders under pressure to be filled with air manually or automatically in case of danger to acquire the required floatation capacity. The devices, which are included by the first two groups, push the user upward/over the water against the tendency for diving/moving towards bottom of the water due to the materials, which bring buoyancy force for them, or air filling the pouches inside, them. However, they reduce swimming speed of the user because their volumes are high due to these materials or air inside them and as a result, they increase the resistance caused by the water against the user. In short, they, including in the form of swimming wear, are designed to ensure that the user can keep his mouth and nose over the water by making less effort and they are functional for this purpose. However, they restrict movements, which can be made in the water. This is one of their characteristics forcing people to make a choice between comfort and precaution.

[0017] Life vests or floatation assistants, which are equipped with small cylinders under pressure to be filled with air manually or automatically in case of danger to acquire the required floatation capacity, do have smaller volumes while inflatable pouches inside them are empty. Therefore, they do not restrict movements/attractions, which can be made in the water as much as the others do at least until the pouches are filled with water.

[0018] However, the volume expands towards not the sides but inside and outside when air is filled into the inflatable pouches. Therefore, there is almost no difference, with respect to the surface area embracing the user, between before and after the pouches begin to be filled with air. Furthermore, their outsides are in attractive colors just like the others are. The purpose for coating the devices with attractive colors is to make the users easily visible in case of an accident to minimize loss of life. However, this detail prevents sunlight from contact with the skin under it and causes unbalanced suntan although it is useful in life saving. In addition, as known well, suntan is very popular today due to esthetical considerations. Furthermore, sunbathing is the primary purpose of some people. As a result, many people consider outsides of life vests in attractive colors as a restricting factor for their personal comforts because they cause improper suntan on visible parts of their skin.

[0019] People, who choose comfort, may encounter cramps during swimming, may go far unintentionally or through strong streams from the coast and may fail to find the required power to go back. Waves come into being at open sea and rise by combining the water mass in front of them into their bodies toward shallow waters and take people standing on feet in shallow waters toward open sea while they are rising. In addition, sudden variations in direction of water or bottom of the sea may occur near natural or manmade wave-breakers or depth may change suddenly while one is walking on soft and slippery sea floor. Subsequent tumbles may cause loss of the sense of balance and the swimmer may miss where he is going and may swim towards open sea. These cases may cause a natural panic and the swimmer attempts to control his breathing strongly while he is trying to reach the surface or stay at the surface.

[0020] After a while, carbon dioxide ratio increases and oxygen ratio decreases in the blood (hypercarbia). Then arresting the breath becomes impossible and water is swallowed in various amounts due to unintentional breathing. The swallowed water causes edema formation and persistent damages (sequels) mainly in lungs and other tissues of the body. In 10-15% of the cases, dry drowning occurs. In such cases, arresting breath for a long time causes unconsciousness and the victim has swallowed a bit or no water. However, the main factor causing loss of life or persistent damages in both of dry and wet drowning cases, even if the efforts for making the victim survive yield result, is death of tissues of the body due to lack of oxygen as a result of breathing and cardiac arrest.

[0021] On the other hand, it is possible to minimize the aforementioned social costs by designing a different type of "personal floatation device", which does not restrict movements of the body and does not cause unbalanced suntan. Also, although the design features existing in the available "personal floatation devices" are required at open sea/in dangerous waters to maximize safety, they are not functional in places to which people go for swimming, enjoying and sunbathing. In short, eliminating the results, which cause people to enter into water without wearing "personal floatation devices" does not mean sacrificing priority of safety.

[0022] The aim of the floatation assistant, which is the subject of the invention, is to ensure that people wear a floatation device for entering into the water near to the

coast in the places to which people go for swimming, entertainment and sunbathing because, everybody is aware of the risks of entering into the water without wearing a "personal floatation device"; however, unfortunately, they mostly prefer the comfort rather than precautions when they have to choose one.

[0023] The present invention features a personal swimming assistant device with gas bags such that said personal swimming and floatation equipment does not gain buoyancy until a dangerous situation is encountered. Said bags in unbouyant (passive) state, does not decrease user's swimming speed and capacity and does not restrict tricks that the user can perform in water.

[0024] Further, the device according to the present invention is also advantageous in that it eliminates or minimizes tanning in different shades in the form of visible body parts, which is generally perceived as a cosmetic issue by most people.

[0025] The invention also proposes a device which is further advantageous in that skin irritation caused by a foreign object rubbing against the body or discomfort resulting from the stimulation of many nerve endings and increasing with longer contact duration is minimized thanks to the fact that all sorted elements are soft device and comprise a reduced contact surface.

[0026] According to the present invention, a carrier means of the device ensures that flexibility is very limited and inflation of inflatable bags within said carrier means is unidirectional. This in turn has the effect that the bags only expand/inflate upward (in the direction of user's head), downward (toward user's belly and waist) and forward (away from the user's bod).

[0027] The design according to the invention reduces investment and production costs through preparing fewer model molds for different chest circumferences measured at the armpits as well as minimizing the idle time during the transition of production line from one model to the other.

[0028] Furthermore, it enables distribution to more point of sales, product to be more accessible by means of reducing the number of models that small businesses in the marketing network should keep, hence reducing the capital, storage and exhibition/shelf space allocation requirement for each product.

[0029] Besides, it increases attractiveness by tolerating the relative changes in the ultimate user's/end user's chest circumference measurements that may arise over time and clearing the way for the same personal swimming and floatation equipment's rotational use by more than one person.

[0030] Thus, if the users know their own body size or have the opportunity to measure, they will be able to tailor the personal swimming and floatation equipment specific to their body size without the trial and error means.

[0031] Because deformation and breakage of pawls, hooks and similar thin protruding parts in a short period of time is inevitable, the present invention provides a swimming assistance device designed to be much more durable.

Summary of the Invention

[0032] The present invention relates to a personal swimming and floatation assistant in the form of a personal equipment designed to be used in close/safe waters as well as sites that are especially visited with the aim of swimming, cooling off and/or having fun and probably where stayed voluntarily in water for hours. The present invention features a personal swimming assistant device with gas cylinders in communication with inflatable bags such that said personal swimming and floatation equipment does not gain buoyancy until a dangerous situation is encountered. Said bags in unbouyant (passive) state does not decrease user's swimming speed and capacity and does not restrict tricks that the user can perform in water.

Short Description of the Figures

[0033] The figures whose brief explanations are herewith provided are solely intended for providing a better understanding of the present invention and are as such not intended to define the scope of protection or the context in which said scope is interpreted in the absence of the description.

Figure 1 demonstrates a perspective view of the inflatable bag in manufacturing stage according to the present invention.

Figure 2 demonstrates a lateral cross-sectional view of the inflatable bag in manufacturing stage according to the present invention.

Figure 3 demonstrates a lateral cross-sectional view of the inflatable bag having a double-cell structure according to the present invention.

Figure 4 demonstrates a perspective view of the carrier means according to the present invention.

Figure 5 demonstrates an alternative fastener structure according to the present invention.

Figure 6 demonstrates a perspective view of a male fastener with pawls according to the present invention.

Figure 7 demonstrates a perspective view of a female fastener attachable to a male fastener with pawls according to the present invention.

Figure 8 demonstrates a perspective view of a male fastener with button according to the present invention.

Figure 9 demonstrates a perspective view of a connection element attachable to a male fastener with button allowing connection to an end of the carrier means according to the present invention.

Figure 10 demonstrates a perspective view of a female fastener attachable to a male fastener with button according to the present invention.

Figure 11 demonstrates a perspective view of the carrier means with fasteners according to the present invention.

Figure 12 demonstrates a perspective view of an armpit device for fasteners according to the present invention.

Figure 13 demonstrates another view of the armpit device alternative of Fig. 12 according to the present invention.

Figure 14 demonstrates a perspective view of an armpit device for compressed gas storage and infiltrator mechanism body according to the present invention.

Figure 15 demonstrates a partial view of a gas storage mechanism according to the present invention.

Figure 16 demonstrates a partial view of the infiltrator mechanism according to the present invention.

Figure 17 demonstrates a partial perspective view of a gas storage and infiltrator mechanism body according to the present invention.

Figure 18 demonstrates a carrier hose connection to the bags according to the present invention.

Figure 19 demonstrates an alternative compressed gas armpit device structure according to the present invention.

Figure 20 demonstrates an armpit device with the gas storage and infiltrator mechanism body according to the present invention.

Figure 21 demonstrates a sleeve structure according to the present invention.

Figure 22 demonstrates components of a sleeve structure according to the present invention.

Figure 23 demonstrates components of a sleeve structure alternative with grabber and grabbed elements according to the present invention.

Figure 24 demonstrates a personal swimming device in use according to the present invention.

Detailed Description of the Invention

[0034] According to the present invention, a personal floatation assistance device comprising at least one gas bag (11) is provided. The size and number of cells, i.e. an individual compartment within a bag (11), can vary depending on the criteria such as the user's gender and body weight. That is to say, a single cell bag or a double cell bag may be employed depending on specific needs.

[0035] According to the preferred embodiment of the present invention, a floating assistance device comprise two bags (11), one of which disposed during use at the chest level and the other at the shoulder blades level in the back area. The approximate length of them will be equal to the distance between a user's two armpits.

[0036] The bags (11) and the connection surface that will be bonded to one of its two abruptly narrowing edge portions (12) provided by hot press and similar methods, an carrier means portion (13) as well as a protective sleeve (18) into which said bags are secured in the final stages of the manufacturing process are all soft, transparent, flexible and high-strength device such as "super tough vinyl" as defined in material science.

[0037] Moreover, carrier hoses (14) bonded again to a connection surface (15) trough a pair of bearings (62, 63) or a sleeve coupling (64) either by a method such as hot press during the production stage or installed later/by the user through screw-nut means and that will enable compressed gas to reach to said bags (11) through a gas exit (65), are also soft, transparent device or silicone.

[0038] The distal edge portions (12) of the bags (11) are bonded to said carrier means (13) whereas the larger middle portion is enclosed within a protective sleeve (18) by being folded in such a way that the width of the bag (11) will be equal to said width of the carrier means (13).

[0039] Because the portion of said carrier means (13) remaining between the two bags (11) will be fixed to an armpit device (41) through holes (17) made on it, the part extending outward from the bags (11) will be fixed to fasteners (24), again through the holes (17) and the fasteners (24) will be fixed to the other armpit device (41).

[0040] The carrier means (13) passing through an armpit with said fasteners (24) being attached to its ends and locking to each other in the other armpit will take the form of a belt with bags (11) and sleeves (18) placed on it. Thus, said carrier means' (13) flexibility is very limited when the bags (11) start to inflate. Therefore, the bags (11) should only expand/inflate upward (in the direction of user's head), downward (toward user's belly and waist) and forward (away from the user's bod). The carrier means (13) will prevent contact of the bags (11) with the user and no pressure on the user will be exerted as said carrier means will guide expansion direction to the outside.

[0041] In fact, the bags (11) will also expand inward (in the direction of chest and shoulder blades) unless exter-

nal surface of the middle portion between the two edge portions (12) that will be bonded to the carrier means (13) follow a linear line from one end to the other in uninflated state. Otherwise, this would both make user's breathing more difficult with bags (11) exerting pressure in the chest and back area directions and lead to incomplete unfolding of the bags (11) by body's chest and back areas applying pressure on the bags (11). Even formation of ruptures in the bags (11) is likely by the forcing of the gas coming from the carrier hose (14).

[0042] Here, keeping the height of the edge portions (12) of the bags (11) from said carrier means (13) outer surface shorter than that of the middle section, both sections intersecting at a straight line eliminated all these risks by ensuring that the expansion is only upward, downward and outward.

[0043] Lateral/cross-sectional height of the edge portions (12) of the bag (11) being shorter than the middle section provides that the bonding process to the carrier means (13) minimizes the volume loss in the bags (11). Because during said process lateral cross-sectional dimensions of said edge portions (12) of the bag (11) will fall to the wall thickness of the carrier means (13), the internal volume of the bags (11) during the first stage of the production will become smaller.

[0044] The possibility of bonding process blocking the hose (14) opening due to adhesive accumulation and interfering with the action of gas reaching the bags (11) is also avoided by placing channels (16) in the inner side of the bag (11) surface.

[0045] The carrier means (13) prevents unnecessary increase of bag (11) wall thickness as well. Because, in an application where the edges of the bags (11) are kept longer and the fasteners fixed directly to the edge portions, the edge portions remaining between these two fasteners might be exposed to mechanical stress especially during strike out movement. Furthermore, in the event that the wall thickness of bags (11) is increased to bear said load, their lateral/cross-sectional width will substantially increase due to their placement in the sleeve (18) after being folded several times. Alternatively, only the portions of the bags (11) in contact with the two fasteners must be thick and the other portions must be thin. Besides, producing a bag (11) having the same wall thickness is easier.

[0046] Nevertheless, same result can be achieved by keeping the bag (11) wall thickness low and placing inside a carrier means (13) which is several times thicker. This method increases the lateral/cross-sectional width of the bags (11) including the sleeves (18) by only around 20-30% and it reaches a maximum level of 2-3 mm in total.

[0047] Because the garden/family pools, produced with the same material of the bags (11) and the carrier means (13), having a wall thickness of 0.23 mm can hold 713 liters of water at fullness ratio of 80% and the ones having a wall thickness of 0.36 mm can hold 1.540 liters of water at fullness ration of 60%. In addition, there is no internal reinforcement and external sleeve in any of these products whose surface width and surface tension both increase when inflated.

[0048] Bearing in mind that a person weighing 100 kg weighs only 5 kg in water, it is obvious that even if the wall thickness of the two bags (11), with carrier means (13) inside them folded several times and surrounded by a sleeve (18), -besides that will only inflate in case of a danger- is 0.15 mm, it can easily carry this load. Likewise, even though it is produced from the vinyl of the same wall thickness with the other products without the carrier means (13) and sleeve (18), it is evident that the personal swimming and floatation equipment will be safer than them.

[0049] The armpit device fasteners (24), formed by two pieces according to the invention, are one of the alternatives providing link between the carrier means (13) and the armpit device (41). Their bodies are rigid and preferably transparent plastic. They will be fixed to the armpit device (41) by inserting them to the channel on the bottom surface of the T-shaped protrusion that will be created on the top surface of the armpit device (41) to be produced specifically for this alternative.

[0050] According to this alternative, when the moving part (22) of the armpit device fastener (19) is lifted up, the carrier means (13) is pushed into the opening formed between a squeezing edge and the fixed part (20) having a channel (21) and when the moving part (22) with a squeezing edge (23) is lowered, the carrier means (13) is trapped between two parts (therefore, in this armpit device fastener alternative (Fig. 5), there is no need for holes on the carrier means (13)). Whenever taking the personal swimming and floatation equipment out, either the carrier means (13) is pulled out by lifting the moving surface of the fastener up or the fastener is freed from the T-shaped protrusion entering the channel on the bottom surface.

[0051] Likewise, it is again the user's choice to determine how much of the carrier means (13) will be pushed through the gap. More precisely, it depends on the user's body size. Then the length of carrier means (13) that is pushed through the gap changes the total length of the personal swimming and floatation equipment when it takes the shape of a belt.

[0052] The design according to the invention therefore reduces investment and production costs through preparing fewer model molds for different chest circumferences measured at the armpits as well as minimizing the idle time during the transition of production line from one model to the other.

[0053] Furthermore, it enables distribution to more point of sales, product to be more accessible by means of reducing the number of models that small businesses in the marketing network should keep, hence reducing the capital, storage and exhibition/shelf space allocation requirement for each product.

[0054] Besides, it increases attractiveness by tolerating the relative changes in the ultimate user's/end user's

chest circumference measurements that may arise over time and clearing the way for the same personal swimming and floatation equipment's rotational use by more than one person.

[0055] The locking fasteners (24) according to the invention feature male pawls (25) and female openings (26). Alternatively, the button (29) and the button slot (30) fastener (24) according to the invention enter into each other/interlock and hence the two ends of the carrier means (13) are fixed to the armpit device (41) through the fastener (24) pairs. In other words, the fastener body pairs in Fig. 6 and 7 and in Fig. 8 and 10 fulfill the same function.

[0056] The function of the housings of the both locking fastener (24) pair, each fastener composed of two wings, is again the same. More precisely, it allows the user to tailor the length of carrier means (13), hence the length of personal swimming and floatation equipment specific to their body size.

[0057] Further, there are male ends (27) on the inner surface of one of the wings where carrier means' (13) holes (17) will be fit and there are respective slots (28), which enclose the upper end of these male ends (27) and allowing the carrier means (13) to be trapped within the housing when the wings are coupled, on the inner surface of the other one. Plus, the length of the personal swimming and floatation equipment may vary depending on the holes (17) that the user will place on the male ends (27) since the edge portions of the carrier means (13) extending outward from the bags (11) are kept longer than the housing wings.

[0058] The male fastener (24) with button (29) features a channel (31) instead of the hollow and solid ends (27) on the inner surfaces of the housing wings and there is a hook (32) on the back surface joining the wings. One of the wing edges is not reflected in Fig. 8 for the hook to be seen more clearly. A singular protrusion (35) on the bottom surface of a separate part (33) indicated in Figure 9 penetrates into one of the wing channels.

[0059] The female fastener (24) with button hole (30) provides that the holes (17) of the carrier means (13) are fitted on the cylindrical parts (27) on the top surface of the same part. Then a salt water resistant rubber (36) is stretched between said housing hook (32) and male ends (27) and wings are joined together. Since the carrier means (13) will be extending below the rubber (36) in this application, it will also be provided that the function of the slots (28), which are present in the other alternative according to the invention is fulfilled.

[0060] User performs this process just once while adjusting the carrier means (13) length according to their body size. However, this alternative provides a more comfortable usage since the part (33) seen in Figure 9 is independent of the housing and the singular protrusion (35) on one of the surfaces is able to move along the wing channel (31).

[0061] Yet, the carrier means (13) mustn't be either as tight to stick to the body or as loose to fall down from the chest level. Plus, even though the length of it can be changed within a range of less than 1 cm thanks to the holes on it, the extension/shortening contribution that will be provided by the rubber (36), stretched between the housing hook (32) and either male ends (27) on the button slot fastener (Fig. 10) or notches (34) on the separate part (33) being fastenable to said button fastener (Fig. 8), will bring a softer touch to the body with it.

[0062] Reinforcement tape/silicone rubber can be used in this application. Or silicone or soft device coated springs can be used to prevent it from being affected by the water.

[0063] The two parallel lines (40), which are seen near the carrier means (13) holes (17), indicating the positioning with regard to locking fasteners (24) attached to the ends of the carrier means (13) in the form of numbers, are intended for assisting the user in making the length adjustment more easily. Because these lines (40) indicate the length that the personal swimming and floatation equipment will reach in total depending on the hole (17) fitted on the housing rods (27).

[0064] Thus, if the users know their own body size or have the opportunity to measure, they will be able to tailor the personal swimming and floatation equipment specific to their body size without the trial and error means. Even if they don't know it, they will still be able to set the length easily by guessing the number of the rows they must shift the holes (17) on the carrier means (13) from the distance or looseness remaining between the fastener pairs in their first trial.

[0065] Besides, disappearance of indicator signs over time can be avoided by keeping the carrier means' (13) width in excess, subsequently folding it and bringing to its normal size through hot press and similar methods, printing the respective indicators on the layer that will be inside and protruding therefrom.

[0066] Again, there are flanges extending from both sides of the housing wings to the other wing and there are channels (38) and protuberances (39) on the flange surfaces. These protuberances (39) and channels (38) ensure that the housing wings don't separate from each other after the user places the carrier means (13) holes (17) to respective male ends (27) suitable for their body size in both of the housings with rubber (36) and without it.

[0067] The reason that the wings are brought together by the protuberances (39) on the flanges of the wing entering/fitting to the channels (38) on the flanges of the other wing and not by the pawls, pins, screws, hooks and similar means is that the locking fastener pairs are semi-rigid flexible plastic.

[0068] This is because deformation and breakage of pawls, hooks and similar thin protruding parts in a short period of time is inevitable. The application where the wings are fixed together by screws requires that the user has a tool such as screwdriver with them for the separation process. Wearing of the screw threads and/or chased threads for the housing over time is also possible.

[0069] On the other hand, the protuberances (39) pro-

ceed in the form of a long line on the wing flange. Their height is also relatively low and they penetrate/sit in a channel (38) larger than them. Moreover, since the flanges on the wings will stretch during this process, wearing of them is extremely difficult even if the channels (38) and the protuberances (39) are coupled and separated a thousand times.

[0070] Each of the emptied edge portions seen in Fig. 8 serve as a holding/grip area and enables the housing wings to separate easily from each other. In short, protuberances (39), channels (38) and emptied edge portions extend the life of the personal swimming and floatation equipment and facilitate its utilization.

[0071] In the locking fastener of Fig. 7, the rods (27), where carrier means (13) holes (17) will be fitted, and channels (38) are provided on the fixed wing whereas said slots (28) and protuberances (39) are provided on the moving wing. However, the locations of these elements (can be changed and both of the wings can be moving since the wing on which they are placed doesn't have any importance in terms of utilization.

[0072] On the other hand, it is obvious that protuberances (39) and channels (38) coupling without difficulty are also easily separated. Nevertheless the function of protuberances (39) and channels (38) are anyway only limited with holding the wings together even if the fasteners (24) are taken out from the armpit device (41) by separating the locking edge portions. More precisely, it is limited to preventing release of the carrier means (13) from said male ends (27) and enabling the user avoiding adjustment of the personal swimming and floatation equipment according to his/her body size every time he or she wants to go in the water. The actual thing that will prevent the wings from opening during utilization is the armpit device (41) with retainer housing slots (42). Said armpit device (41) with a belt (46) comprises small holes (47) on the back face thereof for connection with the mechanism body (50).

[0073] The principal item that will avoid the separation of locking fastener (24) wings from each other when the personal swimming and floatation equipment is on the user is the armpit device (41) indicated in Figures from 12 to 14. Rather, housing slots (42) are the ones that will completely surround the housing wings when the fastener (24) pairs interlock.

[0074] Both of the armpit devices (41) with fastener slots (42) and gas storage mechanism belt (46), are soft and flexible. For instance, aforementioned reinforcement tape/silicone rubber that doesn't contain carcinogen and unhealthy components such as sulfur, arsenic, formaldehyde and lead and is made of (anti-allergic) transparent polyurethane components that don't cause burning, itching, and redness can be used.

[0075] Or they can be produced from polyethylene plastazote material which is so soft and flexible that it will not disturb the user even after the prolonged contact with the body, has anti-allergic and anti-bacterial properties, and is used in orthopedics, especially in situations that require the support of the neck. Plastazote is not clear and it prevents the sunlight from reaching the part of the body remaining under the armpit device (41).

[0076] However, sunlight doesn't reach directly to the large parts of the body, especially the armpit, of a person in the water; rather it reaches in refracted and reflected form. Therefore, even the people just with beach wear and not using "Personal Flotation Equipment" spend some of their time taking a sun bath on the beach in order to tan their body evenly. And a plastazote armpit device (41) will barely affect this time.

[0077] Armpit device (41), by interrupting the contact of rigid and semi-rigid materials such as pressurized bottle (49), belt (46) that safely keeps said mechanism body (50), warning whistle and fasteners (24) with the body, also perform the function of preventing the skin friction/irritation of these caused by the body movements. Besides, as can be seen from the figures, the armpit device (41) does not give sensations of discomfort to the user since the bottom part of their soft bodies are curved/ergonomic just like the armpit area that they will be in contact with.

[0078] The personal swimming and floatation equipment according to the present invention also contributes to feeling of less weight in the water because Plastazote are produced in densities such as 1/100, 1/400 and so on. Air bubbles can be left in the reinforcement tape during production. Some air will already remain in the hose (14) and bags (11). Thus, the weight felt in the water will be close to zero.

[0079] In fact, since the length of the armpit device (41) with fastener (24) is smaller than the one with the belt (46), more air can be trapped in it by slightly extending it downward from the housing slot and/or pouch and bringing its height to the same level with the housing slot and sinking of the personal swimming and floatation equipment can be avoided.

[0080] Thus, with a slight possibility, even if the personal swimming and floatation equipment fall down below the chest circumference level or the fasteners open up during the utilization; its floatation is ensured. Furthermore, although personal swimming and floatation equipment can be thrown to a drowning person after it gains buoyancy force, it gives the opportunity to be thrown to the accident victim when the bags (11) are empty since it is very difficult to be thrown far once its bags (11) are inflated. Same result can also be achieved by attaching a small buoy to one of the armpit device (41) pair.

[0081] Flexibility of the armpit device (41) combined with a protrusion part (43) positioned closer to one of the fastener slots (42) also turns into an additional advantage. Because, said fasteners in Figures 7 and 10 will be passed through the fastener slot (42) with the protrusion (43) and said armpit device (41) needs to be stretched as in Figure 13 to realize this process. Since the armpit device (41) will be released and take its former shape when the protrusion (43) enters in the cavity (37) in the fasteners (24) with or without button slot (30), it is impos-

sible that said female fasteners are dislodged unless the armpit device (41) is stretched once again.

[0082] Thus, once the length of the carrier means (13) is adjusted according to the body size, there is no need to release/remove the female fastener (24) from the armpit device (41) unless there is a considerable change in the body size of the user or somebody else's utilization is in question. The user can wear and take off the personal swimming and floatation equipment by releasing only the male fastener (24) from locking position.

[0083] Likewise, since the housings of the fastener pairs and fastener slots (42) on the armpit device (41) rubber are in the same dimensions, other fastener pairs can also be interlocked by being inverted. In the other locking or squeeze fastener applications, it is sufficient that the user visually interlocks the same faces (bottom or top) of the button (29) and slot (30) or movable and fixed parts to the two ends of the carrier means (13). Thus, the user doesn't have to pay attention to bottom-top aspects when coupling the respective parts and avoids wasting time due to incorrect arrangement.

[0084] Apart from this, they minimize the possibility of the parts placed on them getting caught to somewhere during utilization and the damage to the object that it got caught, user or to the part itself with the advantage that it is located in the armpit area, which is already the body's most sheltered region and least exposed to the external contact. For instance, when the personal swimming and floatation equipment is on the user, it is almost impossible that an object reaching and pushing the male fastener pawl (25) or button (29) inward and disrupting the coupling position.

[0085] In summary, the armpit device (41), having features like avoiding the contact of rigid parts with the body, protecting from the external influences, not causing allergies, preventing the opening of the housing wings with its body design that is compatible with the ergonomics of armpit despite having an extremely simple structure, light and soft, is an ideal solution for bringing the parts of the personal swimming and floatation equipment together. It is a special design that can even be used in other products having the fastener pairs.

[0086] Figures 12 and 13 demonstrate only two of the possible forms of the armpit device (41) to be fitted with fasteners.

[0087] Fitting of the armpit device (41) with the gas storage and infiltrator mechanism's body (50) is realized easily as shown in Fig. 20 as in the case with the armpit device (41) with fastener (24) slots (42). The holes (17) of said carrier means (13), remaining between the two bags (11) are placed on the male ends that will remain at the back face of the armpit device (41) with said belt (46).

[0088] Figure 15 demonstrates the gas storage and infiltrator mechanism with two bottles (49) in it. The internal elements of same double bottle structure include the mechanisms (inflator) that will provide the release of the pressurized gas by piercing these bottles.

[0089] In fact, most of the existing products in the relevant group of products have a single aluminum or steel body external/changeable bottle in which varying amounts (from 12 to 60 grams) of carbon dioxide (CO_2) is stored according to the intended use and the user's body weight. Besides, when 12 grams of carbon dioxide (CO2), stored under high pressure, is released it produces almost twice as much buoyancy than the level enough to keep mouth and nose of a person weighing 100 kg above the water.

[0090] Thus, even single bottle of 12 grams can be used safely in the personal swimming and floatation equipment produced for using in areas where coast/land is very close.

[0091] The length of the bottles with internal volume in the range of 30-38 grams are about 12.5-16.5 cm whereas the length of the 12 grams bottles are about 10.5 cm (diameter and length may vary according to the manufacturer). The threaded necks of the bottles are mounted to mechanisms (inflator). And the length of the armpit device (41), where the mechanism will be fitted, becomes at least 15 cm even if a 12 grams bottle (49) is mounted to the tip of the shortest mechanism on the market.

[0092] Therefore, it is a more reasonable option that two shorter bottles from the ones being already used in other areas and with an internal volume of 12 or 16 grams, three or four of the 8 gram-bottles are present in the personal swimming and floatation equipment instead of a single bottle in a way to meet the buoyancy force calculated with respect to user's body weight. Besides the armpit area has dimensions and ergonomics that can accommodate the armpit device (41), in which several bottles with specified volumes can be placed side by side.

[0093] The gas storage and infiltrator mechanism's body (50) can be produced from transparent plexiglass (acrylic), polycarbonate, PVC (polyvinyl chloride) components or different materials such as cestamide-castamide-cast polyamide, delrin, Teflon.

[0094] Each mechanism is composed of a spring (51), a centerpiece (52), part of which enters into the spring (51) and has a sharp endthat will pierce the bottle (49) on its top surface, a wedge (53) stuck into the side surface of the centerpiece, a tube (54) surrounding the spring (51) and having an L-shaped channel on it for the wedge (53). Mechanism elements are metal .

[0095] Said spring (51) is inserted/compressed into the tube (54); the wedge (53) in the centerpiece (52) is fitted to the lower end of the channel. In other words, mechanism is set as seen in Fig. 16 when the personal swimming and floatation equipment is passive.

[0096] Gas tunnels (55), a one-way/check-valve (56) inside the body (50), a sliding bar (57) crossing said body (50) from one end to the other such that the tip portion thereof running over the body (50) with U-shaped inclined plates (58) connected to the sliding bar (57) are shown in Fig. 17.

[0097] The tip of the sliding bar (57) running over the body (50) is attached to the pulling cord (59), which is

seen in Figure 15 and has an anchor like device on its tip. It can also be attached to a pin (61) or to a receiver kit. The sliding bar (57) is moved by these when the personal swimming and floatation equipment is desired to be activated. In this case, the plates (58) also move together with the sliding bar (57) and the edge portions of it set the wedges (53) remaining in front of said plates (58) free from the ends of said L-shaped channels where they are fitted. Alternatively, providing that the wedges (53) extend to the outside of the body (50) is also possible by placing flexible/sealed gaskets on the side surface of said body.

[0098] So the kinetic energy accumulated in the spring (51) is released when the wedges (53) are displaced and it enables the sharp endto pierce the bottle (49) by rapidly pushing the centerpiece (52) upward. Then the spring (51) and the centerpiece (52) drop down due to their own weight and the gas in the bottles (49), pressure of which drops by spreading leaves the body (50) and reaches the carrier hoses (14) and then to the bags (11).

[0099] Said pin (61), which will be attached to the tip of the sliding bar (57) or the cord (59) with a catch (60) allow the user directly to activate the mechanisms, to release the gas by pulling the pin (61) or the cord (59).

[0100] A receiver kit provides the activation of the mechanism by pressing the button on the external transmitter. In other words, it allows the realization of the operation of giving buoyancy to the personal swimming and floatation equipment of the accident victim, who encounters an unexpected situation and can not pull the pin/cord (61, 59) due to panic or any other reason, by the signal/command that will reach from the "external transmitter" found with the friends/parents.

[0101] In fact, a receiver-transmitter kit application is not an alternative of the pin (61) or the cord (59). Either pin (61) or pulling cord (59) will be provided with the same personal swimming and floatation equipment.

[0102] Because the young people, who are in the first place in the drowning statistics, often goes to these places in groups and again children under 14 going into the water are mostly accompanied by their parents. This makes the receiver-transmitter kit application an additional and a functional security measure in terms of the two user groups that are especially exposed to danger.

[0103] Said transmitter-receiver kits run at different frequencies to prevent all the personal swimming and floatation equipment within the range gaining buoyancy when the button on the transmitter is pushed. Likewise, since it doesn't have physical connection to other parts, hence can be easily lost, there is a pocket or slot where the transmitter kit is placed in each of the armpit device (41) with fasteners (24) or buoy of the personal swimming and floatation equipment. And the users going to respective places in groups can interchange their transmitters with those of the group members with whom they will go into water.

[0104] In the existing single bottle products, in the case that the bottle is not pierced or there is a hole in the bag, the product doesn't gain buoyancy or bags deflate quickly even if the mechanism works correctly. Likewise for double-bottle products, each of the bottles inflates a separate bag. For example, one of them inflate the bag in front of the body and the other the one in the back.

[0105] This brings along the risk that the single bag inflated with gas, in the event that one of the bottles becomes functionless, disrupting the balance of user in the water or pressing the head forward or backward, becomes a factor making the victims' job more difficult instead of providing advantage to them.

[0106] In the design that is particular/unique to the personal swimming and floatation equipment according to the present invention, both of the bags (11) on the chest and on the shoulder blades inflate whether the gas is released from one bottle or from two of them and the balance of the user in water is not disrupted since the gas reaches to each of the two separate bags (11) from both compartments of the mechanism body (50).

[0107] In fact, when a hose (14) is fitted to each of the cells of the double-cell bags (11), shown in cross-section in Figure 3 and without the passage of gas in between them, the user is not affected even if an object with a sharp end, passing through the sleeve pierces one of the cells of the bag (11).

[0108] The reason for that is that the gas discharged from each of the bottles (49) is split into one of the cells of the bags (11) in the chest and back area thanks to the gas tubes. In other words, gas reaches to the two cells, independent of each other, of the two separate bags (11) from the bottles (49) in both of the two compartments of the mechanism body (50).

[0109] And, even if one of the cells of the bag (11) is punctured, only one quarter of the gas in the bottles (49) is released from that cell to the air while the other three cells inflate completely since the tubes (49) with one-way/check-valve doesn't permit the passage of the gas when there is no pressure.

[0110] Besides, at least 5 layers of device including the sleeves must be punctured to be able to pierce both of the cells of the bags (11), which are in folded state in passive situation. It is almost a zero probability event where the user can not notice the hole that will be opened in the bag (11) and will go down at least 5 layers deep.

[0111] Briefly, multi-bottle and double-cell bag (11) option, just like the parachute bags containing two parachutes, the principal and the spare one, protects the victim by gaining sufficient buoyancy and brings the possibility of backing up the buoyancy even if one of the bottles becomes functionless or one of the cells is punctured.

[0112] Another benefit of the cell bag (11) application is to limit the expansion of the bag in the downward/user's belly direction. Because when the bottles are pierced, the released carbon dioxide (CO_2) will gain a lot of volume. Plus, according to the general characteristic of the design, the length of the bag (11) must be up to the distance between the two the armpits.

[0113] Moreover, total internal volume of the bags (11)

must be even greater than that of the gas in double tubes when it is released since the excess surface tension of the inflated bags (11) will increase the probability of being damaged when coming into contact with ring, necklace and similar materials that may be found on the user.

[0114] Therefore, it is more preferred according to the invention to use double cell bags (11) instead of two single cell bags (11) in the models that gain high amount of buoyancy and be produced especially for female users.

[0115] The reason for that is that the bags (11) in folded state are just above their breasts. The user's chin is 10-15 cm above the bags (11). Thus, the volume increase in the bags (11) in the downward/breast direction as well as in the upward/chin direction leads to trouble.

[0116] Besides, as can be seen in Figure 3, in this application the carrier means (13) that the fasteners (24) will be fixed to is just passing through one of the cells and thanks to the portion between the two cells without the passage of gas, when the cell without the carrier means starts to inflate it comes close/parallel to the other. Hence, majority of the expansion in the bags (11) is away from the body of the user.

[0117] Personal swimming and floatation equipment of the invention does not lose its function when it gains buoyancy. It can still be used after removing the gas in the bags (11), folding and placing it in the sleeve (18) again and replacing the pierced bottles (49) with the new ones. Discharge stage can be realized with two different methods.

[0118] Reducing the width of the armpit device (41) with said mechanism body (50) is possible by minimizing its size difference with the fastener (24). More precisely, it is to store the pressurized gas in the bodies that are flat with support beams (66) on the inner surface such as some lighters filled with liquid/liquefied propane or butane gas, as demonstrated in Figure 19.

[0119] Since the lateral height (diameter), aspect ratio may be changed as desired in this application; it brings freedom to the design. Obviously, materials with a high tensile strength and tensile modulus shall be used in the production of the body since pressurized carbon dioxide (CO_2) or mixture of gases, such as the air being breathed will be stored in it. In addition to the normal storage pressure, a certain factor of safety must also be added and resistance to deformation under load must be taken into account.

[0120] For example, high-performance polymers such as poly(etheretherketone), polyphenylene, poly(amide-imide) can be used in this application. Their tensile strengths can surpass 100MPa and even 150MPa in some formulations. Tensile modulus of polyphenylene, poly(amide-imide), and PEEK are around 5GPA, 4GPa, and 3.5GPa, respectively. However, these polymers are difficult to find and they are expensive resins.

[0121] Therefore, it can also be carbon, kevlar, or aramid fiber reinforced high-density polyethylene (HDPE). It is easier to find the HDPE. However, due to the cost of fibers the total price of the composite material may go up to the same level as high performance plastics. Another solution might be the glass-fiber reinforced polycarbonate. Tensile strength of such composites are lower and can exceed 130MPa depending on the glass fiber used, arrangement of the fibers and formulation of polycarbonate.

[0122] Figure 12 demonstrates an armpit device (41), produced to incorporate a mechanism body (50) as a one-piece body after being assembled. The process of fitting those is performed by stretching the armpit device (41).

[0123] The carrier means (13) can be fixed to the mechanism body (50) by way of fitting the holes (17) of the carrier means (13) remaining between the two bags (11) to the cylindrical parts in Figure 19. It maintains its position as long as the armpit device (41) is not stretched again.

[0124] Clearly, the sleeves (18) protecting the bags (11) and reducing the contact surface, must be opened easily until the bags (11) are inflated. Otherwise, the pressurized gas that is released and has no place to go other than the bags (11) can damage the bags (11). Here, the sleeves (18) indicated in Figures 4 with dashed lines along the whole length are one of the arrangements that allow opening easily when the bags (11) start to inflate.

[0125] The reason for that is that said dashed lines specify the actual cuts (67) made on the sleeves (18) that enclose the bags (11), said sleeves being produced as cylinders. And they will enable the sleeves (18) to tear open when the gas reaches the bags (11).

[0126] However, the sleeves (18) with cuts (67) lose their function once they tear. And it is a fact that when the products, having replacement or alternative parts, are taken out of the packaging and started to be used, these parts often get lost and where they are placed is also forgotten.

[0127] Therefore, although replacement cylinder sleeves (18) can be put in the packaging of the device, it is more convenient to use square sleeves with endings that can couple and separate, especially in the applications where its bottles are changeable.

[0128] Figure 21 is one of the sleeves (18) having this feature. To this end, initially parts are taken/cut from both edgings of the protective sleeve (18) with a certain separation and in a way to correspond to each other. Then, flaps (70) are obtained by folding the cut pieces inward, after two thin rods (71) are passed through the flaps (70) on the two edgings, the same flaps (70) are bonded again to the sleeve (18) by hot press and similar means.

[0129] Obviously, the thin rods (71) have the strength to resist the tendency of being opened given that the folded bags (11) tend to open up and force the sleeve (18) edgings to become separated by tensing them up. However, at the same time they are also as flexible to be released from the flaps (70), where they are fitted, when the bags (11) start to inflate.

[0130] According to Figure 22, a long rod (72) is trapped in the flaps (70) on one of the edgings before the

flaps (70) created on both edgings of the sleeve (18) are again bonded to the sleeve (18). As the L-form short rods (73) on the long rod (72) enter the flaps (70) created on the other edging, the two sides of the rectangle join together. And again because of the tendency to open up, the small rods (73) can not leave the flaps (70), where they are fitted, on their own.

[0131] On the other hand, said tendency of opening up is not a factor setting hurdles to pull the string (75), as one end thereof is tied to a ring (74) at the tip of said long rod (72) and the other end is tied to the pull cord (59) or the pin (61). The long rod (72) can be moved easily even when a child pulls the pull cord (59) or the pin (61) and it causes the short rods (73) to leave the flaps (70).

[0132] The half ring (76) demonstrated near the pin (61) in Figure 20 becomes important at this stage. The reason for that is that the user will pull the pull cord (59) or the pin (61) away from their chest or downward. And, in the event that the string (75) tied to the sleeve (18) on their chest is not passed first through the ring (74) on the mechanism body (50), the edgings of the sleeve in the front will not open up even if the cord or the pin (61) is pulled.

[0133] This problem is resolved with the half ring (76) fitted on the mechanism body (50) such that said short rods (73) in both of the two sleeves (18) leave the flaps (70) with that short distance that the cord (59) or the pin (61) travel and inflation of the bags (11) without being damaged is ensured.

[0134] Again, multi-use sleeves (18), having edgings that can couple and separate can be obtained by bonding "interpenetrating" grabbing (68) and grabbed (69) elements similar to zip lock bags on opposing two sides of the sleeve (18).

[0135] Both the grabbing and grabbed (68, 69) elements, long and short rods (72, 73) and sleeves (18) are transparent plastic. And, all of the rectangular shaped sleeves (18) will be bonded to the bags (11) by hot press and similar means for not being lost when the bags (11) inflate or even if they open up due to some other reason. It is sufficient to bond only a small portion of the sleeve (18) to the surface that will be outside when the bags (11) are folded.

[0136] The warning whistle in a pocket (44) retained in place by a barrier (45) can also be used in spite of the fact that an activated personal swimming and floatation equipment keep the user's mouth and nose above the water level without any extra effort, there are two reasons why the warning whistle is also included.

[0137] The first reason is to enable the victims for notifying the other people around them in the events such as blood pressure drop/rise, having a cramp, entering the drift and so on that restrict the use of physical force or incapacitate. In other words, it is for allowing the victims, who cannot reach the land/coast by themselves, to ask for help and immediate intervention in case of a health problem. It also provides psychological support to the victims in cases such as hoarseness due to fear and being mute since birth.

[0138] Again, the barrier (45) indicated in Figure 12 is for keeping the whistle with a cylindrical body in the pocket, inside or outside the water. It can also be in the form of referee whistle and so on and it can be tied to the armpit device (41) or the buoy that will float personal swimming and floatation equipment with a string.

[0139] Keeping the personal swimming and floatation equipment from sliding downward the chest level when it is on the user will be provided by soft, transparent, device tapes or fishing line like strings. In Figure 24, demonstrating the passive form of personal swimming and floatation equipment, all parts of which are assembled and has taken the form of a belt, on the user, a strap (77) hanging around user's back of the neck and going down the shoulders and associated with the two extensions on the chest is seen.

[0140] But as with most of the bras, two straps , one associated with the part of the carrier means (13) behind the fastener (24) pair, the other with the part outside the body (50), that are shorter in length can also be used.

[0141] It is unlikely that the equipment slides downward freeing itself from the chest since the total length of the personal swimming and floatation equipment can be changed by small units and the length measured by the chest of the most adult female and male is greater than the one measured by the armpit. In spite of this, shoulder straps are included in the design considering the existence of children who haven't completed their physical development and slim adult users.

[0142] Likewise, this is because of the men are distant to the short strap option on the account of the fact that men associate the short strap alternative with bra although one long strap and two short straps serve for the same purpose. Moreover, fish line like thin and transparent strings that are not present in the figures are included considering the fact that it would appeal the male users. There are device rings with certain separation on the said strings and the hook is passed through these rings.

[0143] Therefore, it would be more appropriate to include both of the short and long straps or string in the personal swimming and floatation equipment packaging and leave the decision up to the user.

Claims

1. A personal floatation assistance device comprising at least two bags (11) within a protective sleeve (18) in folded state such that the width of a bag (11) equals to the width of a continuously extending longitudinal carrier means (13) to which said bags (11) are attached in a spaced manner, said carrier means' (13) two ends being attachable to a pair of male and female fasteners (24), the latter attachable to each other to form a belt-like structure, said floatation device further comprising two armpit devices (41), one being provided in between said bags (11) and equipped

with a mechanism body (50) of compressed gas cylinders (49) in communication with said bags (11) and an infiltrator mechanism (53) such that said body's (50) movement is restricted within said armpit device (41) and the other armpit device (41) attachable to said fastener (24) pair when they are in fastened form, said personal floatation assistance device being **characterized in that** said armpit devices (41) and said bags (11) are disposed alternatingly on said carrier means (13) and **in that** the distance between said armpit device (41) attachable to said fastener (24) pair in fastened form and said bags (11) is adjustable.

2. A personal floatation assistance device as set forth in Claim 1 wherein said bags' (11) external surface at the middle portion between edge portions (12) bonded to the carrier means (13) follow a linear line from one end to the other in uninflated state.

3. A personal floatation assistance device as set forth in Claim 2 wherein said device comprises two gas cylinders (49) in fluid communication with two cells, each of said two cells belonging to either a front side or a back side bag (11), said front side bag (11) cells and said back side bag (11) cells having no fluid communication.

4. A personal floatation assistance device as set forth in Claim 1 wherein portions at which said compressed gas cylinders (49) are connected to said bags (11) through hoses (14) comprises channels (16) extending in the inner side of the bag (11) surface.

5. A personal floatation assistance device as set forth in Claim 1 wherein said male fasteners (24) comprise pawls (25) attachable to a female fastener (24) and male ends (27) on a wing in said fastener housing, said ends (27) being attachable to said carrier means' (13) holes (17) such that slots (28) on the other wing of said fastener (24) enclose the upper end said male ends (27) trapping said carrier means (13) within said fastener housing.

6. A personal floatation assistance device as set forth in Claim 1 wherein said male fasteners (24) comprises a buton (29) attachable to a female fastener (24) and a channel (31) into which a singular protrusion (35) of a separate connection element (33) is engaged.

7. A personal floatation assistance device as set forth in Claim 6 wherein said separate connection element (33) comprises notches (34) such that an elastic annular element (36y) is stretched between said notches (34) and a hook (32) on the back surface joining the wings of said male fastener into said channel (31) of which said separate connection element (33) is engaged.

8. A personal floatation assistance device as set forth in Claim 1 wherein said female fastener (24) with a buton slot (30) comprises cylindrical parts (27) attachable to said carrier means (13) through holes (17) thereon such that an elastic annular element (36y) is stretched between a hook (32) on the back surface joining the wings of said female fastener (24) and said cylindrical parts (27).

9. A personal floatation assistance device as set forth in Claim 1 wherein said male and female fasteners (24) comprises flanges (41) extending from both sides of the housing wings to the other wing such that channels (38) and protuberances (39) on the flange surfaces interlock with each other.

10. A personal floatation assistance device as set forth in Claim 1 wherein said armpit device (41) comprises a retainer housing slots (42) such that housing wings of said male and female fastener (24) pairs are completely surrounded in interlocked position.

11. A personal floatation assistance device as set forth in Claim 1 wherein said mechanism body (50) comprises a compressed gas bottle (49), a coaxially extending hellical spring (51), a coaxially extending centerpiece (52) part of which entering into said spring (51) and having a sharp endfor piercing said gas bottle (49) and a wedge (53) stuck into the side surface of said centerpiece (52) and extending to an L-shaped channel (57) provided on a tubular body (54) surrounding said spring (51).

12. A personal floatation assistance device as set forth in Claim 11 wherein said a sliding bar (57) displaces plates (58) being movable together with said sliding bar (57) and the edge portions of said plates set the wedges (53) remaining in front free from the ends of said L-shaped channels (57) by way of pulling a pin (61) or a pull cord (59).

13. A personal floatation assistance device as set forth in Claim 1 or 11 wherein said mechanism body (50) comprises a receiver kit providing the activation of said mechanism by pressing the button on an external transmitter.

14. A personal floatation assistance device as set forth in Claim 1 wherein said protective sleeve (18) comprises an opening mechanism in the form of a first longitudinal edge having a long rod (72) trapped in flaps (70) on the reciprocating longitudinal edge such that L-form short rods (73) connected to said long rod (72) enter said flaps (70) created on the other edging,

15. A personal floatation assistance device as set forth in Claim 14 wherein said mechanism body comprises a string (50) associated with said opening mechanism passing first through a ring (74) associated said cord (59) or said pin (61) whereby pulling said cord (59) or said pin (61) also activates opening of said opening mechanism of said sleeve (18).

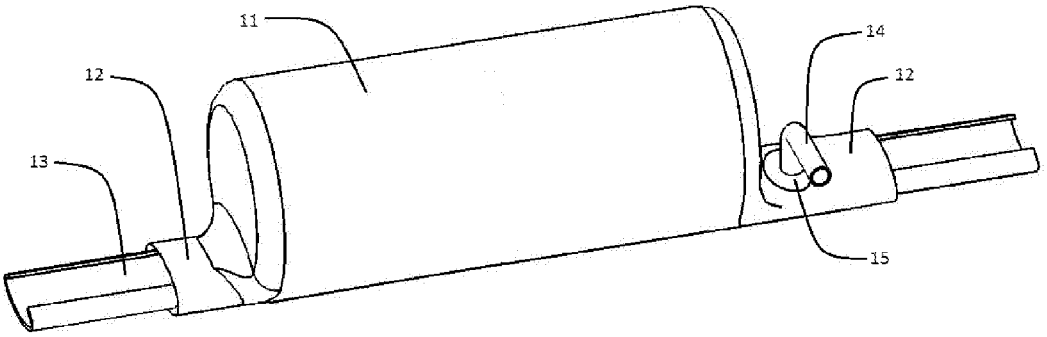


Fig. 1

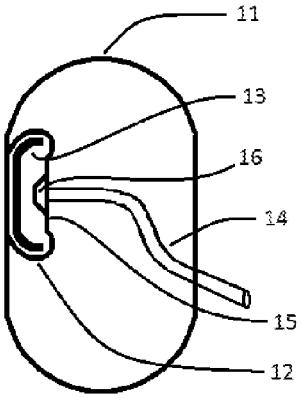
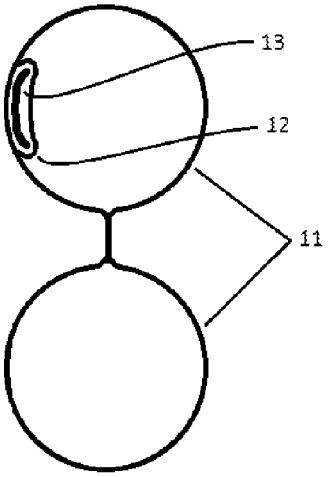


Fig. 2



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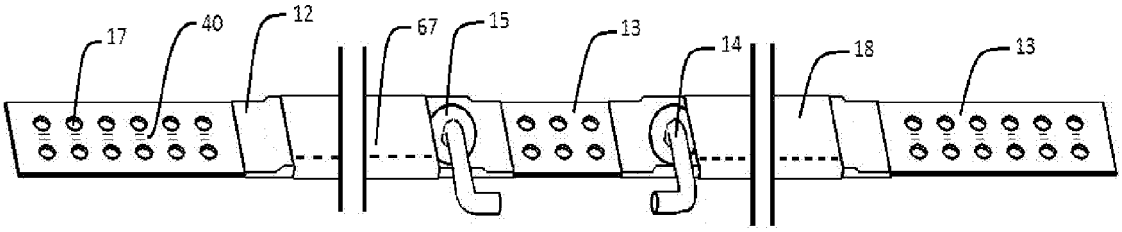


Fig. 4

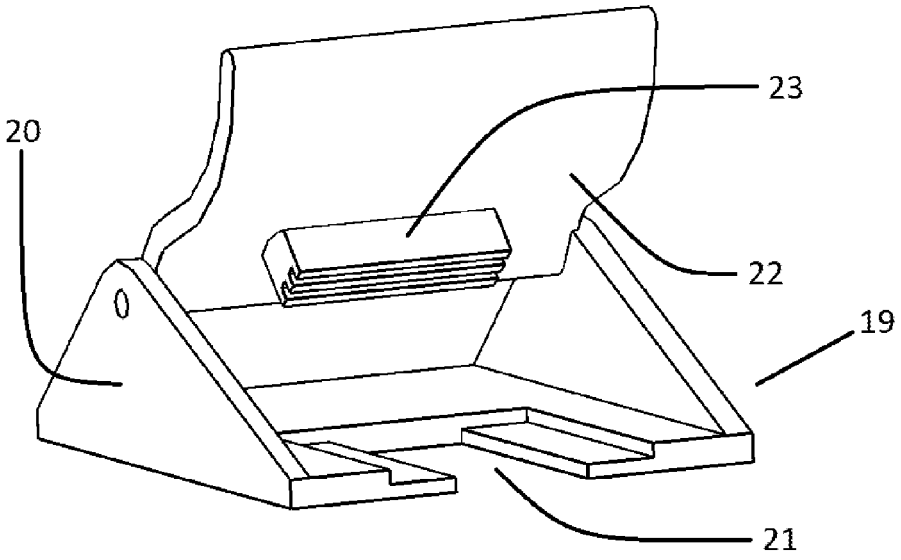
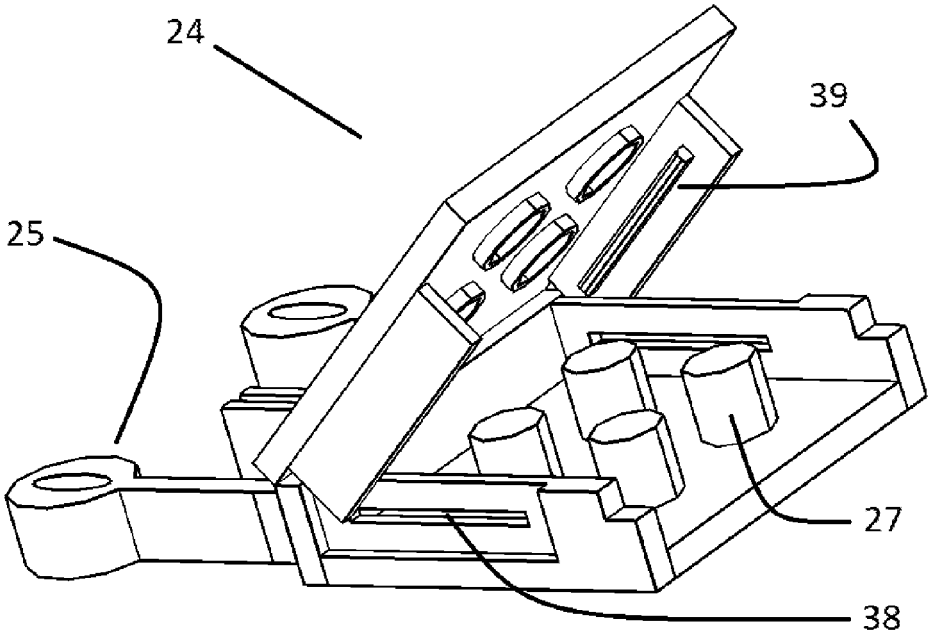


Fig. 5



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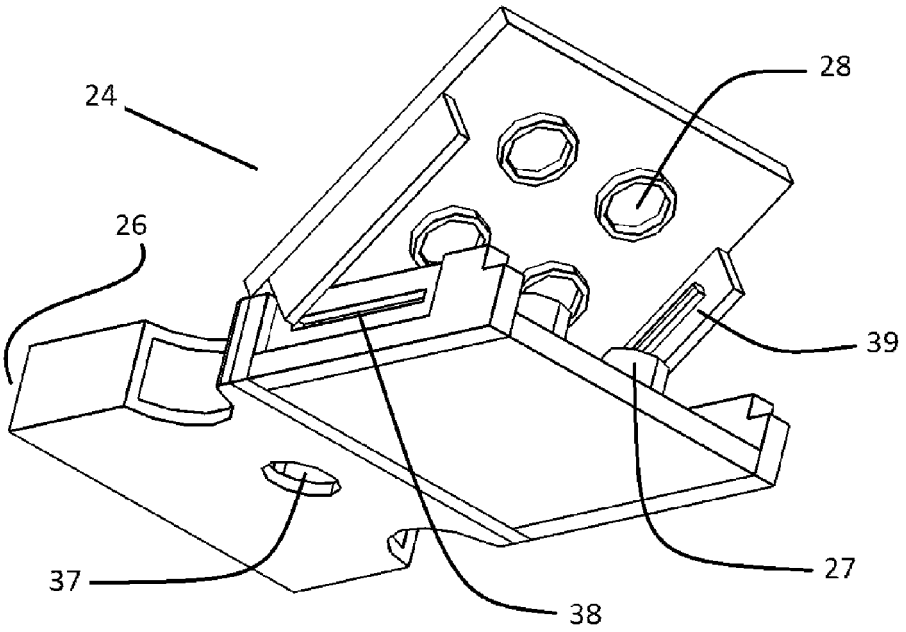

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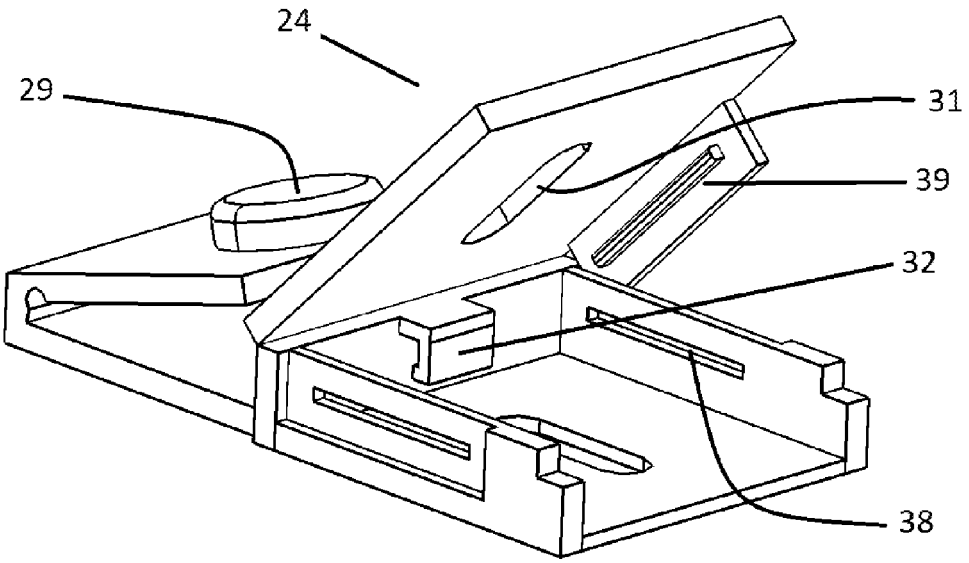

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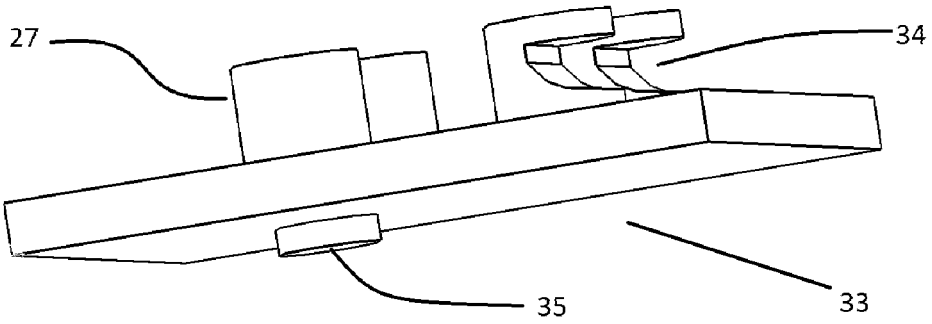

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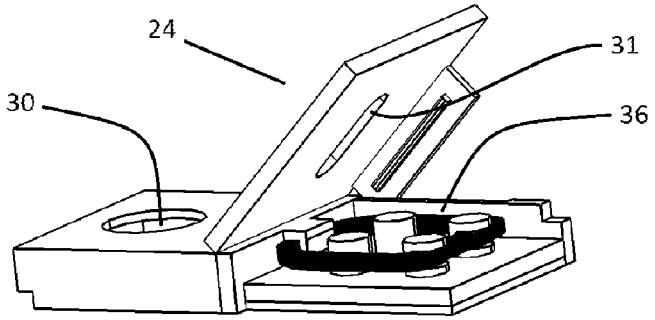

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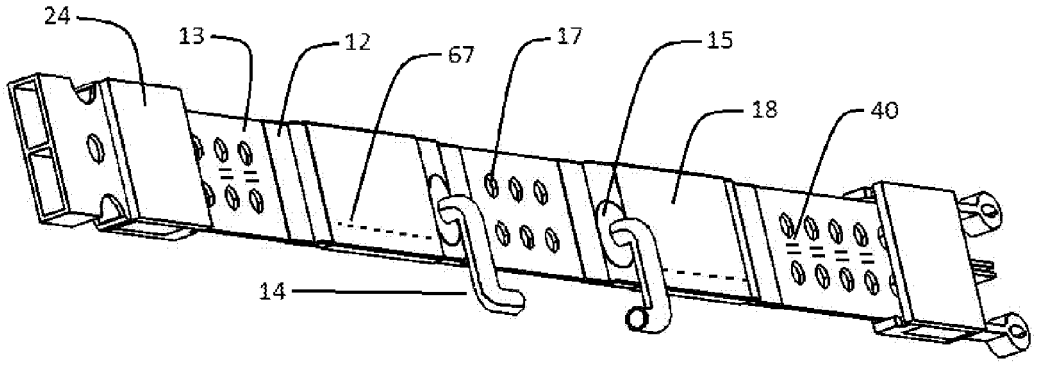


Fig. 11

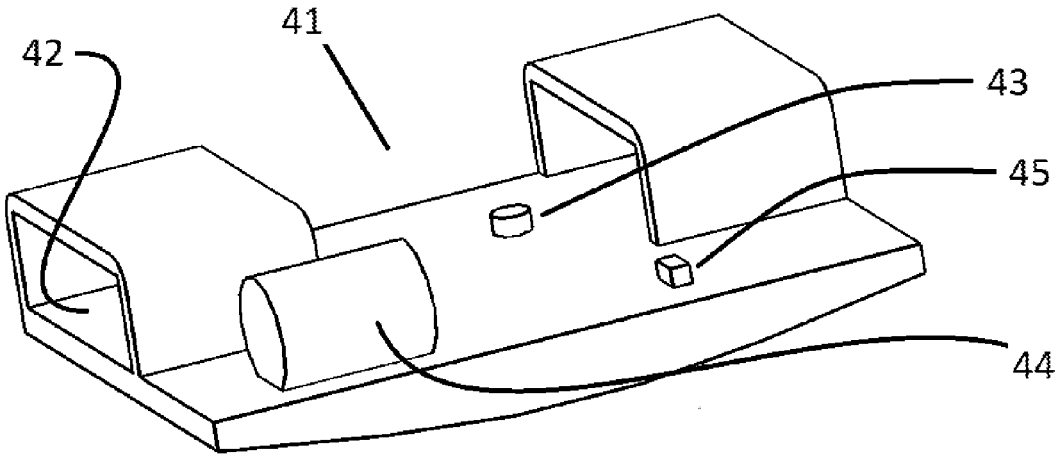


Fig. 12

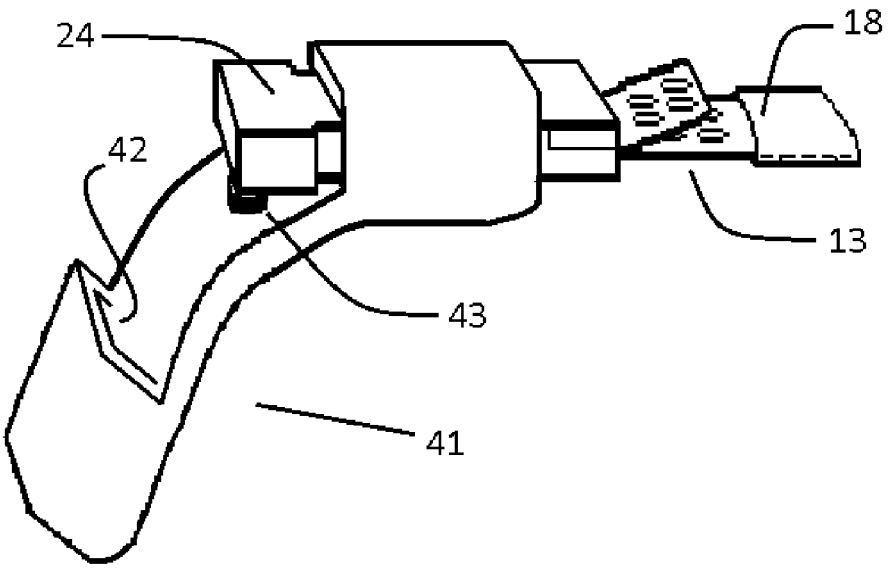


Fig. 13

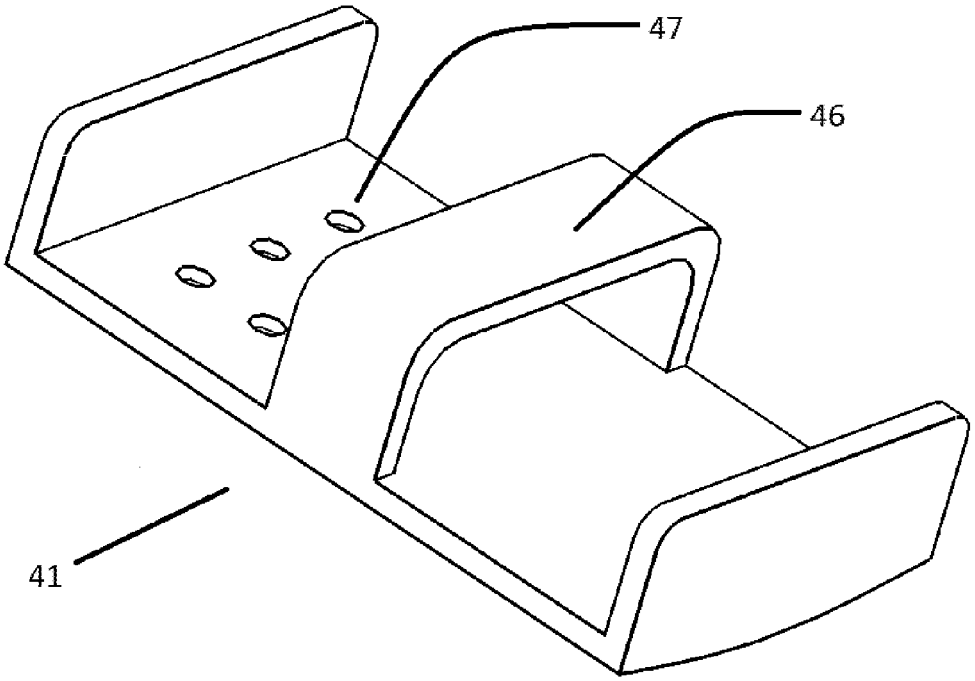
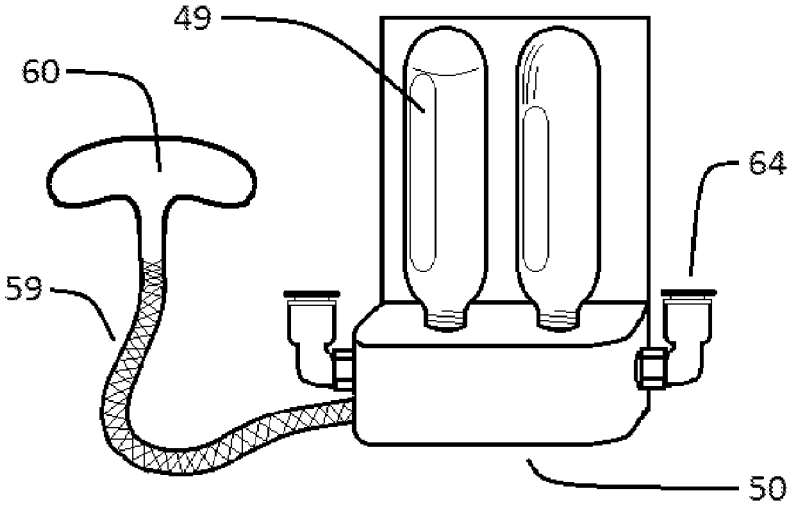


Fig. 14



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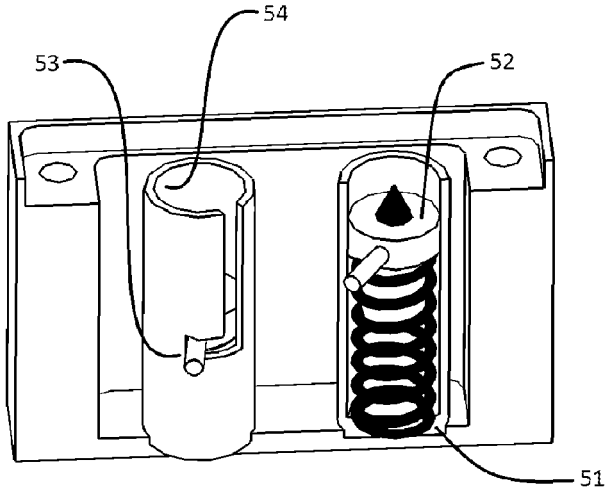
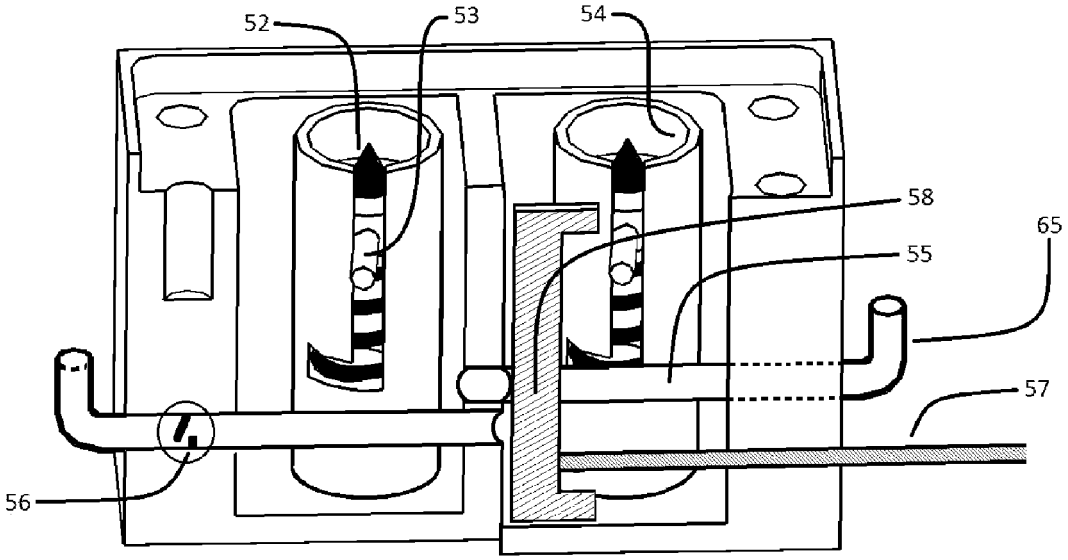


Fig. 16



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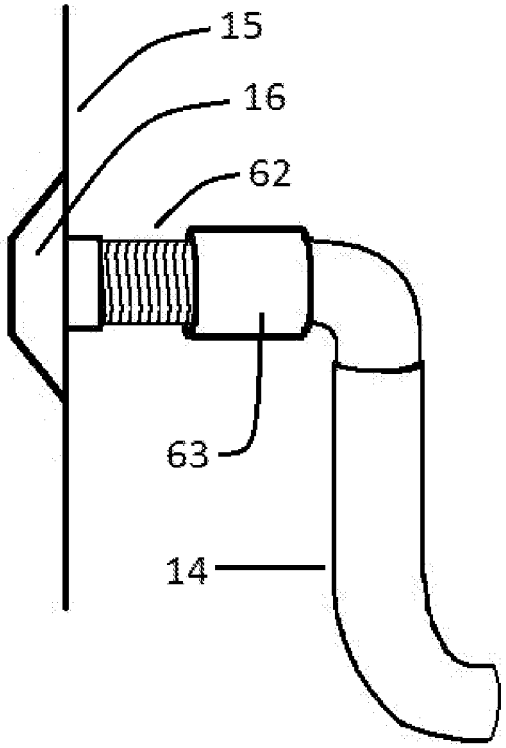

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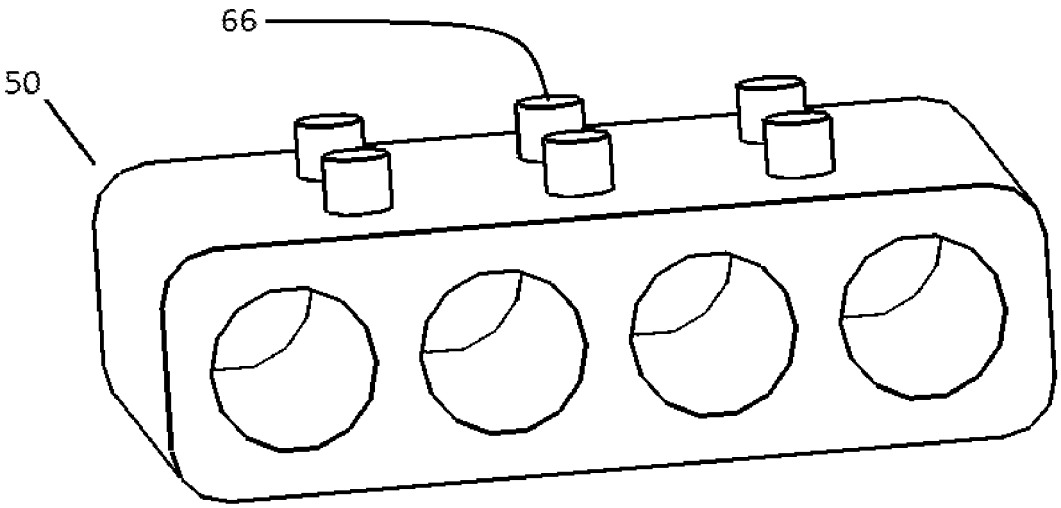

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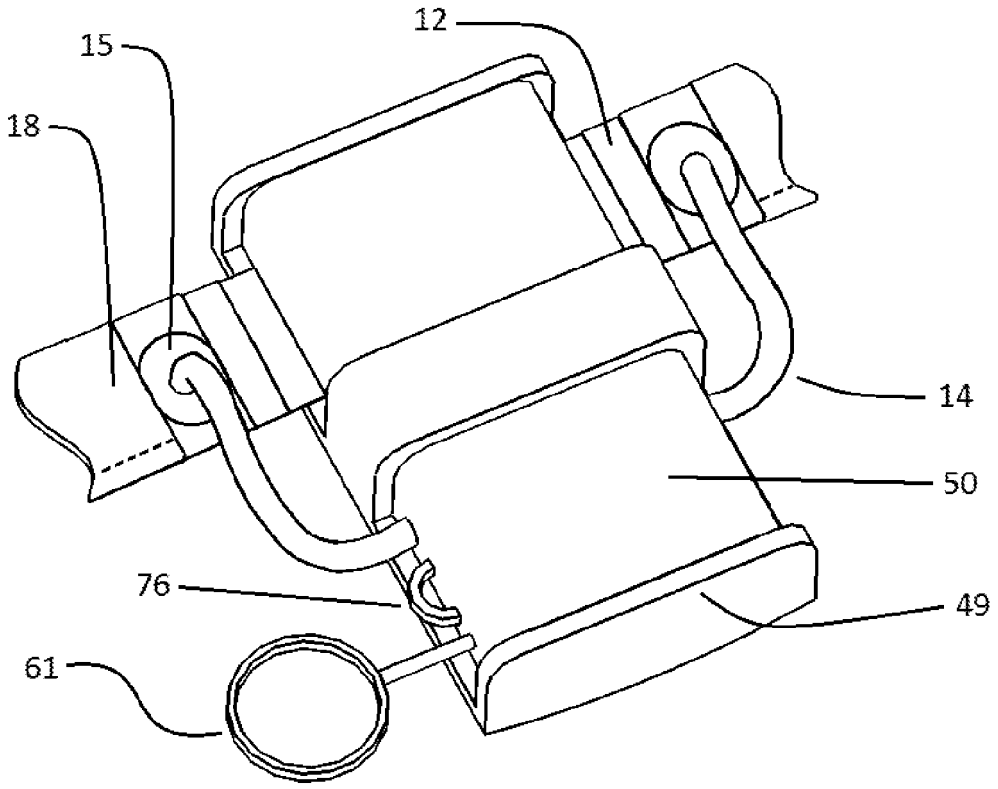

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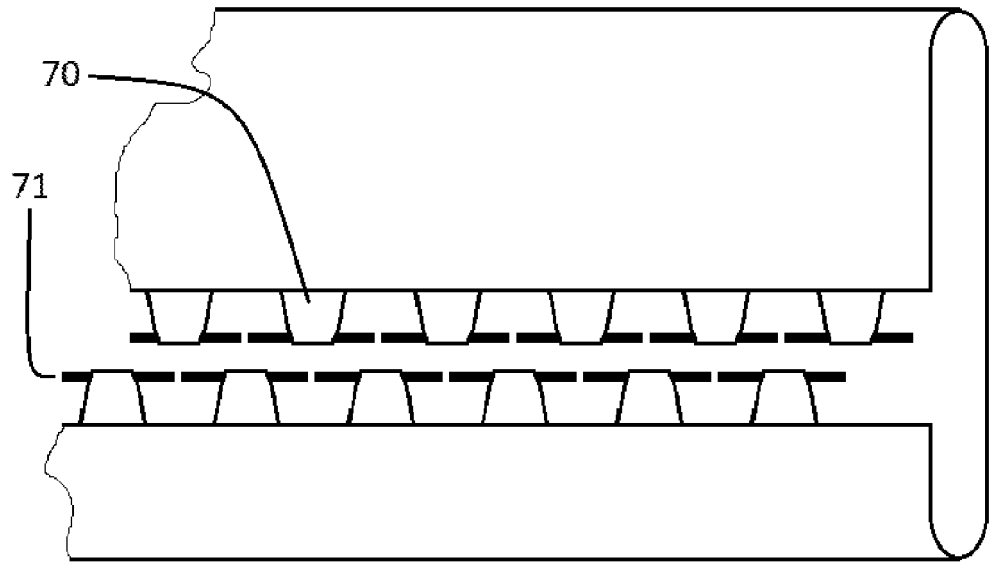

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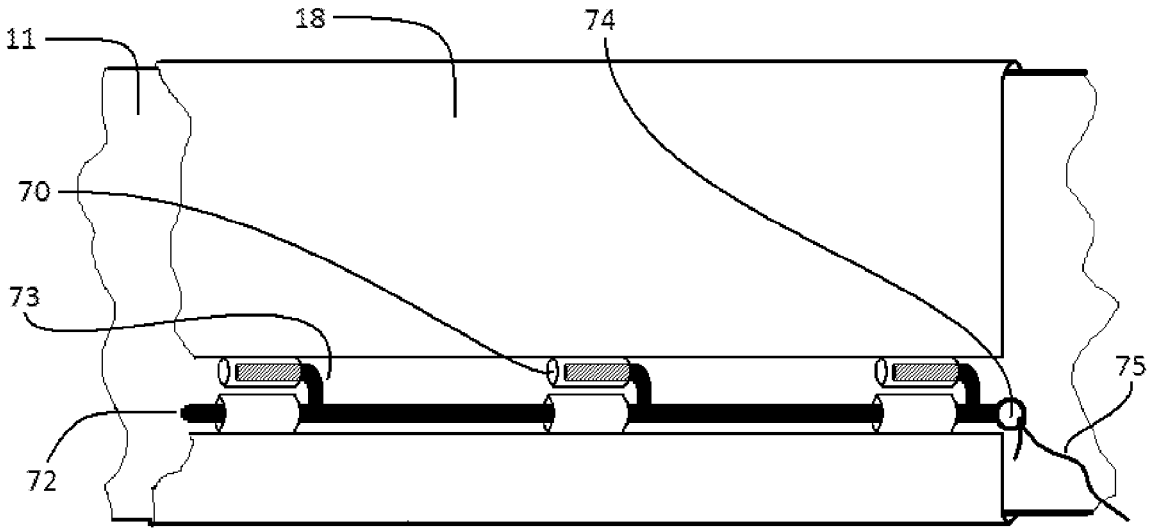

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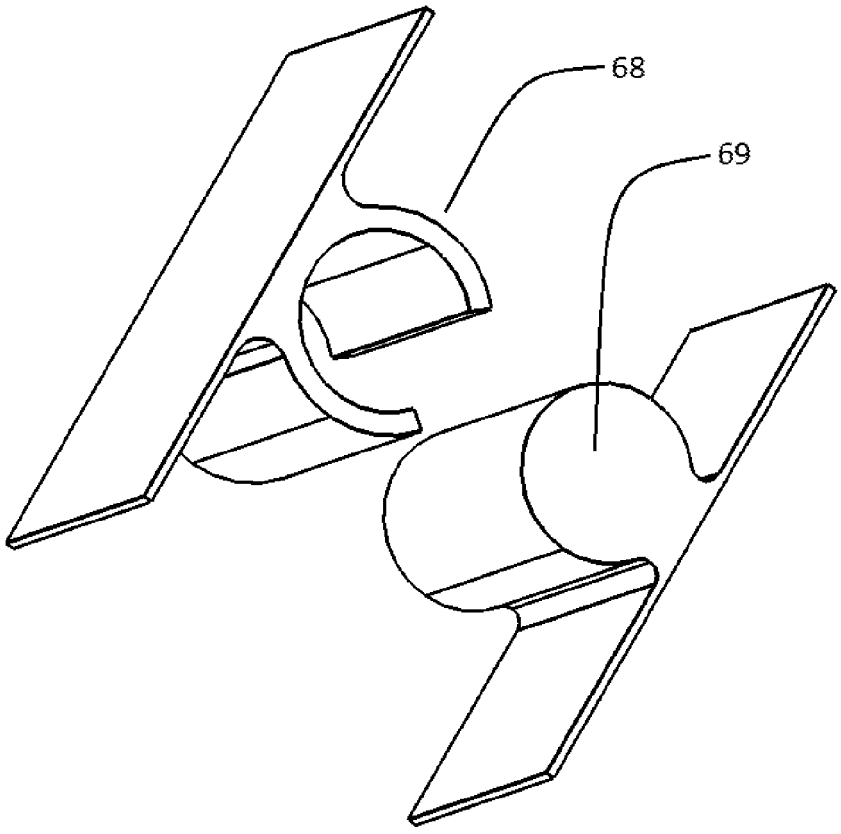

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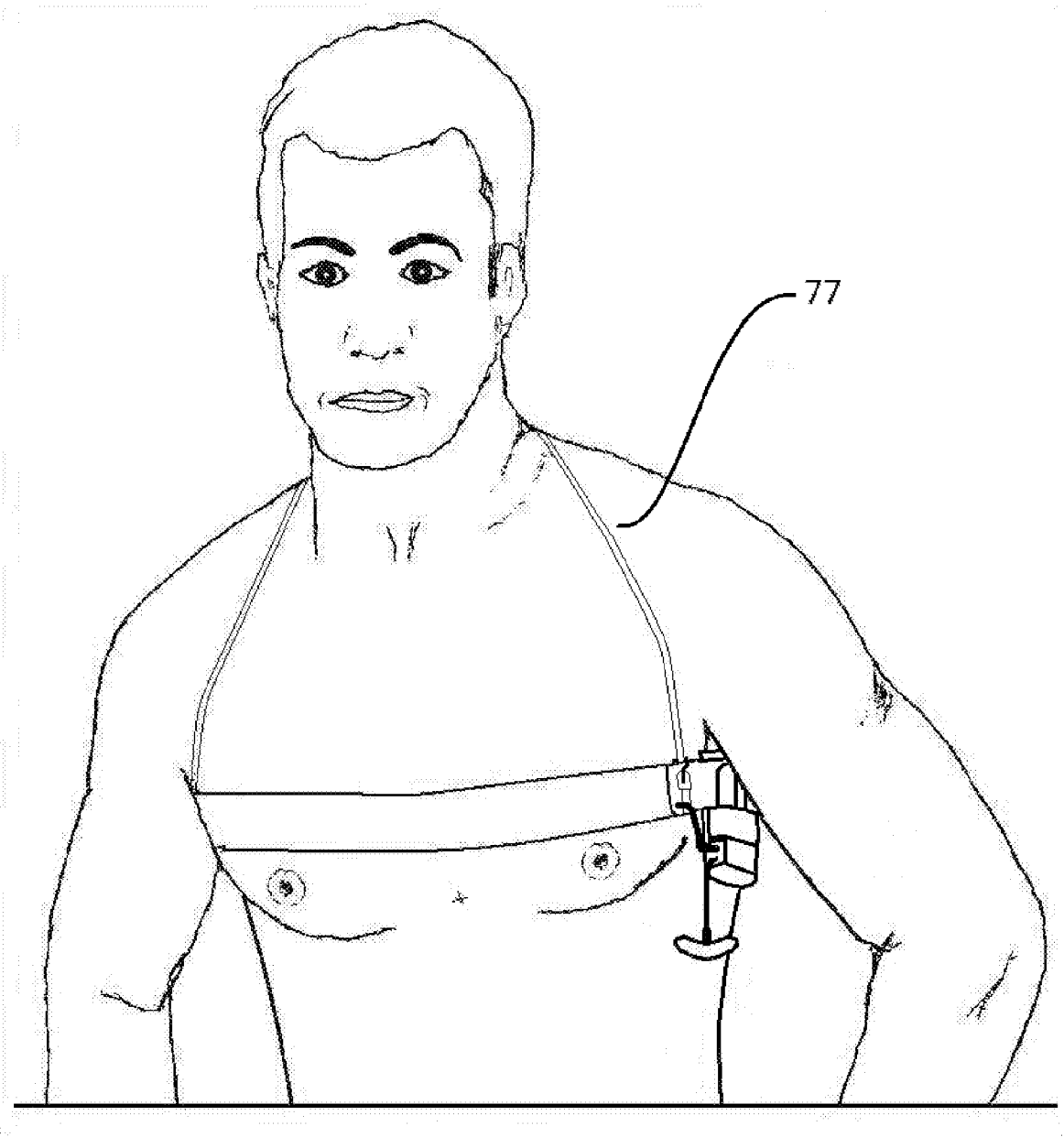

Fig. 24

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European Patent Office
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EUROPEAN SEARCH REPORT

Application Number
EP 11 17 7632

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 5 022 879 A (DIFORTE MARIO P [US]) 11 June 1991 (1991-06-11) * the whole document *	1-14	INV. B63C9/15
A	US 7 104 858 B1 (YONOVER ROBERT N [US]) 12 September 2006 (2006-09-12) * the whole document *	1-14	
A	US 5 180 321 A (BROWN DENNIS [US]) 19 January 1993 (1993-01-19) * the whole document *	1-14	

TECHNICAL FIELDS SEARCHED (IPC)

B63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	20 January 2012	De Sena Hernandorena

CATEGORY OF CITED DOCUMENTS

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20-01-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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US 7104858 B1	12-09-2006	NONE	
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82