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(54) **AN INFLATABLE LIFE RAFT**

AUFBLASBARES RETTUNGSFLOSS

RADEAU DE SAUVETAGE PNEUMATIQUE

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Description

Technical field of the invention

[0001] The present invention relates to an Inflatable liferaft comprising at least an Inflatable first flotation tube, an inflatable second flotation tube; said first and second flotation tubes being adapted to be arranged substantially above each other, said first and second flotation tubes extending circumferentially for providing a substantially ring-shaped area; and a bottom element which is adapted to provide a bottom to the substantially ring-shaped area, which is detachably connected to the first and second flotation tubes.

[0002] The term "ring-shaped area" is in this context to be construed as the tubes defining the outer periphery of the liferaft, i.e. the hull sides. The ring-shaped area is the area wherein the evacuated people are located while they are present in the liferaft. The configuration of the ring-shaped area may be round, elliptic, rectangular, pentagonal, hexagonal, octagonal, or the others as long as the flotation layers completely surround the ring-shaped area.

Backaround art

[0003] When the known inflatable liferafts are being manufactured, the different parts of the liferaft are cut out of different pieces. Afterwards, they are assembled by welding or gluing into the elements, for instance tubes, hereinafter all the elements are being assembled into the liferaft by welding and/or gluing the separate elements together. Especially this last process is very time-consuming, as the connection or assembly is very difficult to perform. One of the most time-consuming processes in the assembly of the liferaft has been found to be the connection of the over and under flotation tubes. This is caused by the configuration of the tubes, which most often are round, and by the fact that that it is difficult to weld or glue two round tubes and their curved outer surfaces to each other. Furthermore, the working positions used by the persons connecting the tubes together are very demanding and ergonomically incorrect. There is thus a need for providing an inflatable liferaft which facilitates the manufacturing as well as the assembly processes.

[0004] Furthermore, the range of inflatable liferafts, due to the many sizes in view of the capacity of the liferafts, which the manufacturer and supplier have to have in their product programme; is very high. Thus, the manufacturers and suppliers have to have many processes for manufacturing and assembling the different sizes of liferafts, which makes the manufacturing time-consuming and expensive.

[0005] In US 4,828,520 an inflatable liferaft is described, wherein the canopy, canopy support, floor pads, boarding ramp and at least one ballast are detachably attached to the hull of the liferaft and floor assembly. The hull of the liferaft consists of a plurality of generally ver-

tically stacked inflatable tubular members and the floor is attached to the lowermost tubular member for preventing entry of water into the liferaft. However, the vertically stacked tubular members and the floor are mutually securely connected by means of known vulcanization or cementation techniques, thus, the liferaft is exhibiting the same disadvantages as explained above.

[0006] Another inflatable raft is known by EP 0 849 163.

Summary of the invention

[0007] An object of the present invention is to wholly or partly overcome the above disadvantages and drawbacks of the prior art. More specifically, it is an object to provide an inflatable liferaft which is easy to manufacture and assemble.

[0008] Another object of the present invention is to provide an inflatable liferaft which is built-up of modules.

[0009] The above objects, together with numerous other objects, advantages and features, which will become evident from the below description, are accomplished by a solution in accordance with the present invention by said first and second flotation tubes being arranged separately substantially above each other, and said first and second flotation tubes mainly being detachably connected via said bottom element.

[0010] Hereby is obtained that the time-consuming and difficult mutual assembly of the first and second flotation tubes is avoided. The present invention breaks with many years understanding of how an inflatable liferaft is to be assembled.

[0011] The matter is that during the assembly of the different elements in a liferaft, the two inflatable flotation tubes are not connected by using welding or gluing as the case is in the prior art. Furthermore, the construction of the liferaft according to the invention facilitates the inspection of the tubes, especially between the tubes. Also, it is obtained that repair of leaky areas/spots between the tubes is easily performed.

[0012] The term "mainly" is in this context to be construed as the connection between the flotation tubes essentially is performed by the bottom element, and this connection is the only connection necessary. However, besides the connection by use of the bottom element, additional connection reinforcement means may be incorporated for strengthen the connection between the flotation tubes. Furthermore, the flotation tubes may as well be connected by other means, such as accessories to the inflatable liferaft, for instance straps, ladders, slides, ramps, mooring systems, towing systems, ballast systems or the like.

[0013] According to the invention, the bottom element may be detachable or securely connected to the first and second flotation tubes.

[0014] The term "detachable" is in this context to be construed as the fact that the separate elements of the liferaft, i.e. bottom element, first and second flotation tubes, etc., may be separated after they have been as-

sembled and subsequently be attached again.

[0015] The term "securely" is in this context to be construed as the fact that the separate elements of the liferaft, i.e. bottom element, first and second flotation tubes, etc., are attached and connected to each other and that no subsequent detachment is possible without damaging the elements.

[0016] According to the invention, the bottom element may comprise a floor part and a side part so that the bottom element has a configuration substantially as a vessel. By incorporating the side part, which is extending upwards from the floor part, in the bottom element, so that the bottom element has a configuration substantially as a vessel, it is secured that no water can leak into the ring-shaped area between the separate first and second flotation tubes.

[0017] According to the invention, the first and second flotation tubes are detachably connected and mutually fixated via the bottom element.

[0018] According to the invention, the first and second flotation tubes as well as the bottom element may comprise corresponding connection means. Hereby an easy way to assembly of the liferaft is obtained.

[0019] According to the invention, the connection means may be zips, groove/flange connection, frapping, he/she connections or the like.

[0020] According to the invention, the connection means may be securely attached after the connection.

[0021] According to the invention, the connection means may be sealed after the connection so that the connection is tightly dosed and leakage of water through the connection means is avoided.

[0022] According to the invention, the connection means of the first and second flotation tubes may be arranged on their insides and the corresponding connection means of the bottom element may be arranged on its outside.

[0023] The term "outside" is in this context to be construed as the side of the flotation tubes which is opposite the ring-shaped area.

[0024] The term "inside" is in this context to be construed as the side of the flotation tubes which is nearest the ring-shaped area.

[0025] According to the invention, the connection means of the first and second flotation tubes may be arranged on their outsides and the corresponding connection means of the bottom element may be arranged on its inside.

[0026] According to the invention, the bottom element may extend between the first flotation tube and the second flotation tube.

[0027] According to the invention, the connection means of the first flotation tube may be arranged on its inside, the connection means of the second flotation tube may be arranged on its outside and the corresponding connection means of the bottom element may be arranged on the outside of the first flotation tube and on the inside of the second flotation tube.

[0028] According to the invention, a third or more flotation tube(s) may be arranged above the second flotation tube, or in relation to the first and second flotation tubes, said third or more flotation tube(s) comprising connection means, which are adapted to be connected with corresponding connection means arranged on the bottom element.

[0029] According to the invention, the liferaft may comprise a plurality of modules. The term "modules" is in this context to be construed as separate elements which when assembled constitute the liferaft.

[0030] According to the invention, each flotation tube may comprise at least one module; said module comprising at least one tube part.

[0031] According to the invention, each flotation tube may comprise two or more modules; said modules (each) comprising at least one tube part.

[0032] According to the invention, a capacity of the liferaft may be adjusted by the number of modules incorporated into said flotation tubes.

[0033] According to the invention, the modules in each flotation tube may be mutually detachable or securely connected.

[0034] According to the invention, the bottom element may comprise two or more modules; said modules being detachable or securely connected.

[0035] According to the invention, the connection(s) of the modules of the bottom element may be sealed so that water cannot leak into the liferaft via the connections of the bottom element.

[0036] According to the invention, one or more inflatable reinforcement members may be arranged, said reinforcement members extending in a lateral and/or longitudinal direction of the liferaft.

[0037] The term "lateral" is in this context to be construed as the direction of the shortest side of the liferaft.

[0038] The term "longitudinal" is in this context to be construed as the direction of the longest side of the liferaft.

[0039] According to the invention, said reinforcement member(s) may be detachable or securely connected to the liferaft.

[0040] According to the invention, one or more inflatable canopy support members may be arranged.

[0041] According to the invention, the canopy support members may be detachable or securely connected to the liferaft.

[0042] According to the invention, a canopy may be adapted to cover the liferaft.

[0043] Furthermore, according to the invention, the flotation tubes, the bottom element, the reinforcement members, the canopy support members and/or the canopy may be made of a polymeric material, such as natural rubber (NR), polyurethane (PU), thermoplastic polyurethane (TPU), butyl rubber (BR), polyvinylchloride (PVC), polychloroprene (CR), polyethylene (PE), or a combination thereof.

Brief description of the drawings

[0044] The invention and its many advantages will be described in more detail below with reference to the accompanying schematic drawings, which for the purpose of illustration show some non-limiting embodiments and in which

Fig. 1 shows schematically an inflatable liferaft,

Fig. 2 shows schematically a cross sectional view the liferaft shown in Fig. 1,

Fig. 3 shows schematically a bottom element according to the invention,

Figs. 4-11 show schematically different embodiments of the connection between the flotation tubes and the bottom element in a cross-sectional view,

Figs. 12-13 show schematically different embodiments of the connection between three flotation tubes and the bottom element in a cross-sectional view,

Figs. 14-15 show schematically different embodiments of the corner connection in the inflatable liferaft between the flotation tubes and the bottom element,

Fig. 16 shows one embodiment of a modular liferaft according to the invention in exploded top view,

Figs. 17-24 show different modules which can be incorporated into the modular liferaft according to the invention, and

Figs. 25-26 show additional embodiments of the modular liferaft according to the invention having different capacities.

[0045] All the figures are highly schematic and not necessarily to scale, and they show only parts which are necessary in order to elucidate the invention, other parts being omitted or merely suggested.

Description of preferred embodiments

[0046] In Fig. 1 an inflatable liferaft 1 is shown schematically. Said liferaft is in this embodiment shown without a canopy. The inflatable liferaft 1 comprises an inflatable first flotation tube 2 and an inflatable second flotation tube 3. The first and second flotation tubes 2, 3 are adapted to be arranged above each other, and they are extending circumferentially for providing a substantially ring-shaped area 4. The inflatable liferaft 1 also comprises a bottom element 5 which is adapted to provide a bottom to the substantially ring-shaped area 4. According

to the inventive idea, the first and second flotation tubes 2, 3 are arranged separately above each other, and the first and second flotation tubes 2, 3 mainly being connected via the bottom element 5. The liferaft 1 according to the invention is adapted to be stored and housed in a container in deflated state.

[0047] Fig. 2 shows a cross-sectional view taken along A-A in Fig. 1. In Fig. 2 it is easily deducible that the second flotation tube 3 is arranged above the second flotation tube 2. Furthermore, the bottom element 5 is shown as a vessel, which will be further described in relation to Fig. 3 below.

[0048] In Fig. 3, the bottom element 5 is shown. The bottom element 5 comprises a floor part 6, which is substantially horizontal, and side part 7, which extends from the floor part 6 upwards in a substantially vertical direction so that the bottom element 5 has a configuration substantially as a vessel. Preferably, the bottom element is made of a flexible material, i.e. a material which enables the folding and packing of the entire liferaft 1 so that it may be housed and stored in a container.

[0049] Figs. 4-11 show different embodiments of the connection between the flotation tubes 2, 3 and the bottom element 5 in a cross-sectional view. According to the invention, the first and second flotation tubes 2, 3 as well as the bottom element 5 may comprise corresponding connection means (not shown). In Fig. 4, the connection means of the first and second flotation tubes 2, 3 are arranged on their insides and the corresponding connection means of the bottom element 5 is arranged on its outside. The connection 8 between the two flotation tubes 2, 3 and the bottom element 5 may according to the invention be a detachable or secure connection.

[0050] The detachable connection means may for instance be zips, groove/flange connection, frapping, he/she connections or the like and the secure connection means may be welding or gluing.

[0051] In Fig. 5, the connection means of the first and second flotation tubes 2, 3 are arranged on their outsides and the corresponding connection means of the bottom element 5 is arranged on its inside. In this embodiment, the first and second flotation tubes are arranged inside the bottom element 5.

[0052] In Fig. 6, the bottom element 5 extends between the first flotation tube 2 and the second flotation tube 3. In this embodiment, the connection means of the first flotation tube 2 is arranged on its inside or at the top, the connection means of the second flotation tube 3 is arranged on its outside and the corresponding connection means of the bottom element 5 are arranged on the outside for the first flotation tube 2 and on the inside for the second flotation tube 3.

[0053] In Fig. 7, an additional embodiment is shown. In this embodiment, the bottom element 5 has a T-shape seen in a cross-sectional view. Furthermore, the connections 8 are here shown on the inside, however, the connections 8 could also be placed on the outside so that the bottom element 5 may extend between the two flo-

tation tubes 2, 3.

[0054] In Figs. 8 and 9, the bottom element 5 has an L-shape and Y-shape, respectively, seen in a cross-sectional view.

[0055] In Fig. 10, the second flotation tube 3 is shown displaced in relation to the first flotation tube 2. The matter is that the second flotation tube 3 is providing a larger ring-shaped area than the first flotation tube 2 so that a substantially funnel shaped configuration, seen in a cross-sectional view, of the inflatable liferaft is provided. In this embodiment, the first flotation tube 2 may, for instance, be used as a seat for the evacuated persons, and the second flotation tube 3 as a back rest. Obviously, the first flotation tube 2 may provide a larger ring-shaped area than the second flotation tube 3, so that an inverted funnel shape is provided, as shown in Fig. 11. The configuration shown in Fig. 11 provides additional floor space to the liferaft.

[0056] In all the show embodiments, in Figs. 4-11, the first and second flotation tubes 2, 3 are separate and are connected and mutually fixated mainly via the bottom element 5. However, additional connection reinforcement means (not shown) may be used and incorporated for strengthening the connection between the flotation tubes. The connection reinforcement means may for instance be placed on the opposite side of the flotation tubes in relation to the bottom element, and may extend vertically, horizontally, inclinedly or a combination thereof between the flotation tubes. Furthermore, the flotation tubes may also be connected by other means (not shown), such as accessories to the inflatable liferaft, for instance straps, ladders, slides, ramps, mooring systems, towing systems, ballast systems, canopy attachment systems or the like. Still, the connection of the flotation tubes via the bottom element is the primary connection.

[0057] Furthermore, a third flotation tube 9 may be arranged above the second flotation tube 3 and/or in relation to the first and second flotation tube, said third flotation tube 9 also comprising connection means which are adapted to be connected with corresponding connection means arranged on the bottom element 5 as shown in Fig. 12. Within the inventive idea additional flotation tubes may be arranged in connection with the two or three flotation tubes.

[0058] Furthermore, the flotation tubes may also be arranged outside or inside the first and second flotation tubes 2, 3. In Fig. 13, a third flotation tube 9 is arranged on the outside of the first and second flotation tubes 2, 3. The three flotation tubes 2, 3, 9 are according to the inventive idea connected via the bottom element 5. The third flotation tube 9 may provide additional buoyancy to the liferaft as well as protection against puncture of the first and second flotation tubes 2, 3.

[0059] Furthermore, the bottom element 5, along its circumference, may be fully or partly connected to the flotation tubes. Also, the bottom element 5 may be fully connected along its circumference to the first flotation

tube and only partly to the second flotation tube or vice versa. Hereby it is obtained that the opening between the first and second flotation tubes 2, 3 may be used as ventilation or it will be possible to tie a tow line around the first flotation tube, the second flotation tube or both. In Fig. 14 one embodiment is shown wherein the bottom element 5 is partly connected to the second flotation tube 3. Also, according to the inventive idea, the bottom element may not be connected to either of the flotation tubes in specific areas and with a predetermined extension, whereby it is possible to pull the bottom element away from the flotation tubes in these areas. Hereby it is obtained that access to the area between the flotation tubes and the bottom element is provided. The part of the bottom element which is not connected to the flotation tubes may, however, be fixated to the flotation tubes by using hooks/loops attachments.

[0060] In Fig. 15, a corner of a liferaft is shown. In this embodiment, the first flotation tube 2 has a more obtuse angle than the above second flotation tube 3 so that an area 10 is created in the corner. This area may also be used for ventilation or a tow line, or it may be used for personal hygiene and/or fishing.

[0061] In Fig. 16, an exploded top view of a modular inflatable liferaft 1 according to the invention is shown. The modular liferaft 1 comprises several modules, for instance two end modules 11, two side modules 12, two end bottom elements 13 and one middle bottom element 14. In Fig. 16, only one layer of inflatable flotation tubes is shown. Within the inventive idea at least two separate layers of flotation tubes are arranged substantially above each other and the separate layers of flotation tubes are connected via the bottom elements.

[0062] Hereby it is possible for the manufacturer and supplier of inflatable liferafts to have a range of different standard modules, which may be composed to provide a liferaft with the intended capacity. In Figs. 17-24, different embodiments of the standard modules are shown. These standard modules may for instance be bottom elements in different sizes, flotation tubes, laterally and longitudinal reinforcement members, supports to the canopy, the canopy, boarding slides.

[0063] Advantageously, the end modules may be identical for all capacities of the liferaft, so that for obtaining the intended capacity of a specific liferaft it is only the side modules, reinforcement members as well as the bottom elements which need to be incorporated. In Figs. 25 and 26, two liferafts are shown in exploded top view having different capacities.

[0064] The matter is that the present invention provides better utilisation of the production facilities, machines, labour, better use of material; it is possible to manufacture to stock, whereby a shorter delivery time of the liferafts is obtainable, the assembly of the liferafts become less time-consuming due to the assembly of the liferaft being more "standard work" than the prior art. Furthermore, the working positions for the persons assembling the liferafts are considerably improved compared

to the prior art and has a more ergonomically correct position. Also, the production may be optimized in view of the standard modules, said standard modules being joined in view of the intended capacity of the liferaft.

[0065] Furthermore, when high capacity liferafts in the prior art are being assembled, they occupy a lot of space at the production facilities of the manufacture. By using the present invention it is obtained that the different modules of the liferafts may be assembled apart and only to the end all the modules are being assembled to the final liferafts.

[0066] Furthermore, according to the invention, the flotation tubes, the bottom element, the reinforcement members, the canopy support members and/or the canopy may be made of a polymeric material, such as natural rubber (NR), polyurethane (PU), thermoplastic polyurethane (TPU), butyl rubber (BR), polyvinylchloride (PVC), polychloroprene (CR), polyethylene (PE), or a combination thereof.

[0067] Although the invention above has been described in connection with preferred embodiments of the invention, it will be evident for a person skilled in the art that several modifications are conceivable without departing from the invention as defined by the following claims.

Claims

1. An inflatable liferaft (1) comprising at least an inflatable first flotation tube (2), an inflatable second flotation tube (3), said first and second flotation tubes (2, 3) being adapted to be arranged substantially above each other, said first and second flotation tubes (2, 3) extending circumferentially for providing a substantially ring-shaped area (4); and a bottom element (5) which is adapted to provide a bottom to the substantially ring-shaped area (4), wherein said first and second flotation tubes (2, 3) are arranged separately substantially above each other, and said first and second flotation tubes (2, 3) mainly being connected via said bottom element (5), **characterised in that** the bottom element (5) is detachably connected to the first and second flotation tubes (2, 3).
2. An inflatable liferaft (1) according to claim 1, wherein the first and second flotation tubes (2, 3) as well as the bottom element (5) comprise corresponding connection means.
3. An inflatable liferaft (1) according to claim 2, wherein the connection means are zips, groove/flange connection, frapping, he/she connections or the like.
4. An inflatable liferaft (1) according to any of the preceding claims, wherein the bottom element (5) comprises a floor part (6) and a side part (7) so that the bottom element (5) has a configuration substantially as a vessel.
5. An inflatable liferaft (1) according to any one of the preceding claims, wherein the first and second flotation tubes (2, 3) are connected and mutually fixated via the bottom element (5).
6. An inflatable liferaft (1) according to claim 2, wherein the connection means of the first and second flotation tubes (2, 3) are arranged on its inside and the corresponding connection means of the bottom element (5) is arranged on its outside.
7. An inflatable liferaft (1) according to any one of the claims 2 or 6, wherein the connection means of the first and second flotation tubes (2, 3) are arranged on its outside and the corresponding connection means of the bottom element (5) is arranged on its inside.
8. An inflatable liferaft (1) according to any one of the claims 1 to 7, wherein the bottom element (5) extends between the first flotation tube (2) and the second flotation tube (3).
9. An inflatable liferaft (1) according to claim 8, wherein the connection means of the first flotation tube (2) is arranged on its inside, the connection means of the second flotation tube (3) is arranged on its outside and the corresponding connection means of the bottom element (5) are arranged on the outside of the first flotation tube (2) and on the inside of the second flotation tube (3).
10. An inflatable liferaft (1) according to any one of the preceding claims, wherein a third or more flotation tube(s) is/are arranged above the second flotation tube (3) and/or in relation to the first and second flotation tubes (2, 3), said third or more flotation tube(s) comprising connection means, which are adapted to be connected with corresponding connection means arranged on the bottom element (5).
11. An inflatable liferaft (1) according to any one of the preceding claims, wherein the liferaft (1) comprises a plurality of modules.
12. An inflatable liferaft (1) according to claim 11, wherein each flotation tube comprises at least one module, said module comprising at least one tube part.
13. An inflatable liferaft (1) according to claim 11 or 12, wherein each flotation tube comprises two or more modules, said modules comprising at least one tube part.
14. An inflatable liferaft (1) according to any one of the

claims 11 to 13, wherein a capacity of the liferaft is adjusted by the number of modules incorporated into said flotation tubes.

15. An inflatable liferaft (1) according to any one of the claims 11 to 14, wherein the modules in each flotation tube are mutually detachable or securely connected.
16. An inflatable liferaft (1) according to any one of the claims 11 to 15, wherein the bottom element (5) comprises two or more modules, said modules being detachable or securely connected.
17. An inflatable liferaft (1) according to claim 16, wherein the connection(s) of the modules of the bottom element (5) is/are sealed.

Patentansprüche

1. Aufblasbares Rettungsfloß (1), enthaltend wenigstens einen aufblasbaren ersten Schwimmschlauch (2), einen aufblasbaren zweiten Schwimmschlauch (3), wobei der erste und der zweite Schwimmschlauch (2, 3) dazu eingerichtet sind, im wesentlichen übereinander angeordnet zu werden, und sich der erste sowie der zweite Schwimmschlauch (2, 3) in Umfangsrichtung erstrecken, um einen im wesentlichen ringförmigen Bereich (4) zu erzeugen; und ein Bodenelement (5), das dazu eingerichtet ist, einen Boden für den im wesentlichen ringförmigen Bereich (4) bereitzustellen, wobei der erste und der zweite Schwimmschlauch (2, 3) separat im wesentlichen übereinander angeordnet sind und der erste sowie der zweite Schwimmschlauch (2, 3) hauptsächlich über das Bodenelement (5) verbunden sind, **dadurch gekennzeichnet, dass** das Bodenelement (5) lösbar mit dem ersten und dem zweiten Schwimmschlauch (2, 3) verbunden ist.
2. Aufblasbares Rettungsfloß (1) nach Anspruch 1, bei dem der erste und der zweite Schwimmschlauch (2, 3) wie auch das Bodenelement (5) einander entsprechende Verbindungseinrichtungen enthalten.
3. Aufblasbares Rettungsfloß (1) nach Anspruch 2, bei dem die Verbindungseinrichtungen Reißverschlüsse, eine Rillen-/Flansch-Verbindung, Zurrgurte, Stecker-/Buchsen-Verbindungen oder dergleichen sind.
4. Aufblasbares Rettungsfloß (1) nach einem der vorhergehenden Ansprüche, bei dem das Bodenelement (5) einen Bodenteil (6) und einen Seitenteil (7) enthält, so dass das Bodenelement (5) im wesentlichen die Ausbildung eines Bootes hat.
5. Aufblasbares Rettungsfloß (1) nach einem der vor-

hergehenden Ansprüche, bei dem der erste und der zweite Schwimmschlauch (2, 3) über das Bodenelement (5) verbunden und aneinander befestigt sind.

6. Aufblasbares Rettungsfloß (1) nach Anspruch 2, bei dem die Verbindungseinrichtungen des ersten und des zweiten Schwimmschlauches (2, 3) auf deren Innenseite und die entsprechenden Verbindungseinrichtungen des Bodenelementes (5) auf dessen Außenseite angeordnet sind.
7. Aufblasbares Rettungsfloß (1) nach einem der Ansprüche 2 oder 6, bei dem die Verbindungseinrichtungen des ersten und des zweiten Schwimmschlauches (2, 3) auf deren Außenseite und die entsprechenden Verbindungseinrichtungen des Bodenelementes (5) auf dessen Außenseite angeordnet sind.
8. Aufblasbares Rettungsfloß (1) nach einem der Ansprüche 1 bis 7, bei dem sich das Bodenelement (5) zwischen dem ersten Schwimmschlauch (2) und dem zweiten Schwimmschlauch (3) erstreckt.
9. Aufblasbares Rettungsfloß (1) nach Anspruch 8, bei dem die Verbindungseinrichtungen des ersten Schwimmschlauches (2) auf dessen Innenseite angeordnet sind, die Verbindungseinrichtungen des zweiten Schwimmschlauches (3) auf dessen Außenseite angeordnet sind und die entsprechenden Verbindungseinrichtungen des Bodenelementes (5) auf der Außenseite des ersten Schwimmschlauches (2) und auf der Innenseite des zweiten Schwimmschlauches (3) angeordnet sind.
10. Aufblasbares Rettungsfloß (1) nach einem der vorhergehenden Ansprüche, bei dem ein dritter oder mehrere Schwimmschläuche über dem zweiten Schwimmschlauch (3) und/oder im Bezug zu dem ersten und dem zweiten Schwimmschlauch (2, 3) angeordnet ist/sind, wobei der dritte Schwimmschlauch oder die mehreren Schwimmschläuche Verbindungseinrichtungen enthält/enhalten, die dazu eingerichtet sind, mit entsprechenden Verbindungseinrichtungen verbunden zu werden, die auf dem Bodenelement (5) angeordnet sind.
11. Aufblasbares Rettungsfloß (1) nach einem der vorhergehenden Ansprüche, wobei das Rettungsfloß (1) eine Vielzahl von Modulen enthält.
12. Aufblasbares Rettungsfloß (1) nach Anspruch 11, bei dem jeder Schwimmschlauch wenigstens ein Modul enthält, wobei das Modul wenigstens einen Schlauchteil enthält.
13. Aufblasbares Rettungsfloß (1) nach Anspruch 11 oder 12, bei dem jeder Schwimmschlauch wenigstens zwei Module enthält, wobei diese Module we-

nigstens einen Schlauchteil enthalten.

14. Aufblasbares Rettungsfloß (1) nach einem der Ansprüche 11 bis 13, bei dem eine Kapazität des Rettungsfloßes durch die Anzahl von Modulen eingestellt ist, die in den Schwimmschläuchen enthalten sind. 5
15. Aufblasbares Rettungsfloß (1) nach einem der Ansprüche 11 bis 14, bei dem die Module in jedem Schwimmschlauch voneinander lösbar oder sicher miteinander verbunden sind. 10
16. Aufblasbares Rettungsfloß (1) nach einem der Ansprüche 11 bis 15, bei dem das Bodenelement (5) wenigstens zwei Module enthält, wobei die Module lösbar oder sicher miteinander verbunden sind. 15
17. Aufblasbares Rettungsfloß (1) nach Anspruch 16, bei dem die Verbindung(en) der Module des Bodenelementes (5) abgedichtet ist(sind). 20

Revendications

1. Radeau de sauvetage pneumatique (1) comprenant au moins un premier tube de flottaison gonflable (2), un deuxième tube de flottaison gonflable (3), lesdits premier et deuxième tubes de flottaison (2, 3) étant adaptés pour être agencés sensiblement l'un au-dessus de l'autre, lesdits premier et deuxième tubes de flottaison (2, 3) s'étendant de manière circonférentielle pour fournir une zone de forme sensiblement annulaire (4) ; et un élément formant fond (5) qui est adapté pour fournir un fond à la zone de forme sensiblement annulaire (4), dans lequel lesdits premier et deuxième tubes de flottaison (2, 3) sont agencés séparément sensiblement l'un au-dessus de l'autre, et lesdits premier et deuxième tubes de flottaison (2, 3) étant principalement raccordés via ledit élément formant fond (5), **caractérisé en ce que** l'élément formant fond (5) est raccordé de manière détachable aux premier et deuxième tubes de flottaison (2, 3). 25 30 35 40
2. Radeau de sauvetage gonflable (1) selon la revendication 1, dans lequel les premier et deuxième tubes de flottaison (2, 3) ainsi que l'élément formant fond (5) comprennent des moyens de raccordement correspondants. 45 50
3. Radeau de sauvetage gonflable (1) selon la revendication 2, dans lequel les moyens de raccordement sont des zips, un raccordement à rainure/rebord, servant à générer ses raccordements ou similaires. 55
4. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications précédentes, dans le-

quel l'élément formant fond (5) comprend une partie de plancher (6) et une partie latérale (7) de sorte que l'élément formant fond (5) a une configuration ressemblant sensiblement à un bateau.

5. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications précédentes, dans lequel les premier et deuxième tubes de flottaison (2, 3) sont raccordés et mutuellement fixés via l'élément formant fond (5).
6. Radeau de sauvetage gonflable (1) selon la revendication 2, dans lequel les moyens de raccordement des premier et deuxième tubes de flottaison (2, 3) sont agencés sur leur intérieur et les moyens de raccordement correspondants de l'élément formant fond (5) sont agencés sur son extérieur.
7. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications 2 ou 6, dans lequel les moyens de raccordement des premier et deuxième tubes de flottaison (2, 3) sont agencés sur leur extérieur et les moyens de raccordement correspondant de l'élément formant fond (5) sont agencés sur son intérieur.
8. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications 1 à 7, dans lequel l'élément formant fond (5) s'étend entre le premier tube de flottaison (2) et le deuxième tube de flottaison (3).
9. Radeau de sauvetage gonflable (1) selon la revendication 8, dans lequel les moyens de raccordement du premier tube de flottaison (2) sont agencés sur son intérieur, les moyens de raccordement du deuxième tube de flottaison (3) sont agencés sur son extérieur et les moyens de raccordement correspondants de l'élément formant fond (5) sont agencés sur l'extérieur du premier tube de flottaison (2) et sur l'intérieur du deuxième tube de flottaison (3).
10. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications précédentes, dans lequel un troisième tube de flottaison ou plus est/sont agencé(s) au-dessus du deuxième tube de flottaison (3) et/ou par rapport aux premier et deuxième tubes de flottaison (2, 3), lesdits troisième tube de flottaison ou plus comprenant des moyens de raccordement qui sont adaptés pour être raccordés avec des moyens de raccordement correspondants agencés sur l'élément formant fond (5).
11. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications précédentes, dans lequel le radeau de sauvetage (1) comprend une pluralité de modules.

12. Radeau de sauvetage gonflable (1) selon la revendication 11, dans lequel chaque tube de flottaison comprend au moins un module, ledit module comprenant au moins une partie de tube. 5
13. Radeau de sauvetage gonflable (1) selon la revendication 11 ou 12, dans lequel chaque tube de flottaison comprend deux modules ou plus, lesdits modules comprenant au moins une partie de tube. 10
14. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications 11 à 13, dans lequel une capacité du radeau de sauvetage est ajustée par le nombre de modules incorporés dans lesdits tubes de flottaison. 15
15. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications 11 à 14, dans lequel les modules de chaque tube de flottaison sont mutuellement détachables ou raccordés de manière fixe. 20
16. Radeau de sauvetage gonflable (1) selon l'une quelconque des revendications 11 à 15, dans lequel l'élément formant fond (5) comprend deux modules ou plus, lesdits modules étant détachables ou raccordés de manière fixe. 25
17. Radeau de sauvetage gonflable (1) selon la revendication 16, dans lequel le (les) raccordement(s) des modules de l'élément formant fond (5) est/sont scellés. 30

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Fig. 1

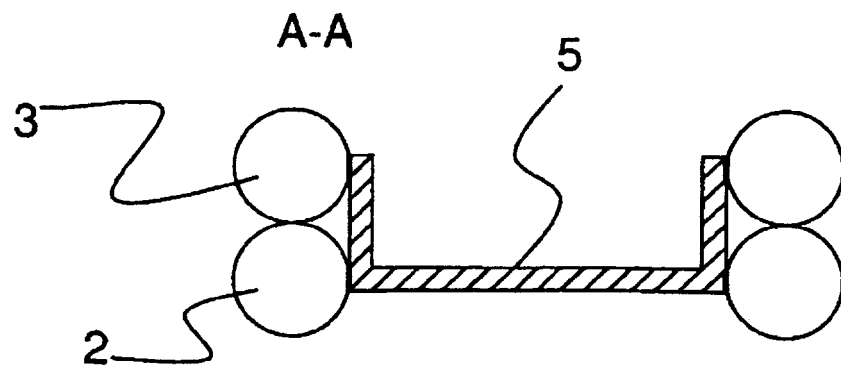
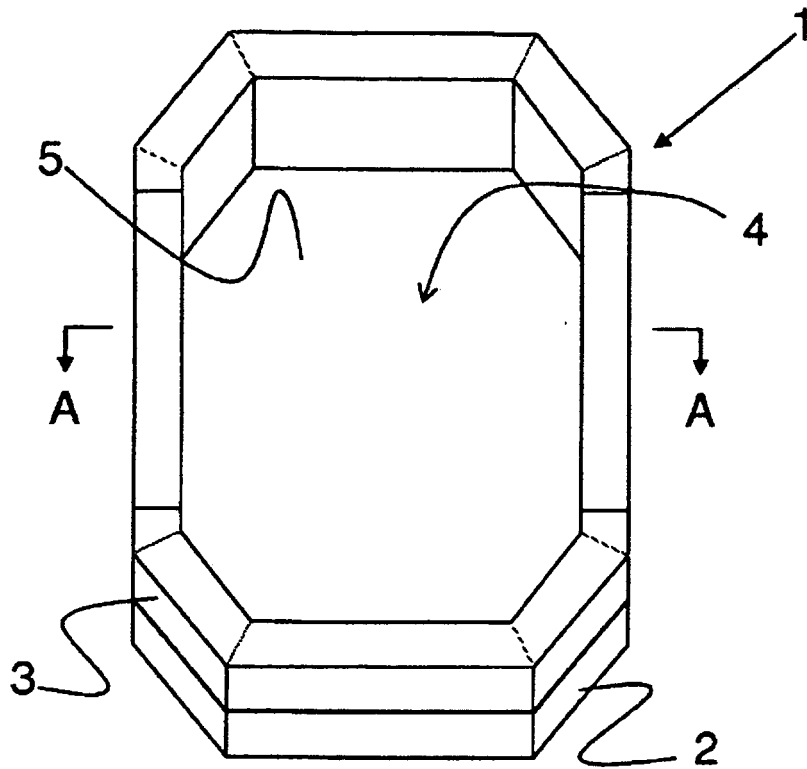


Fig. 2

Fig. 3

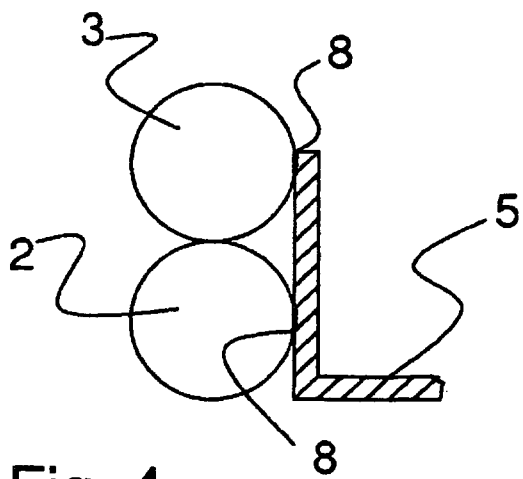
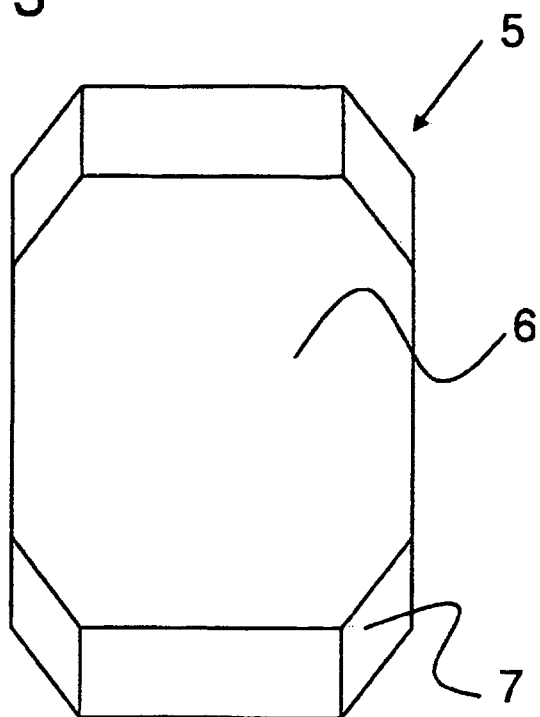


Fig. 4

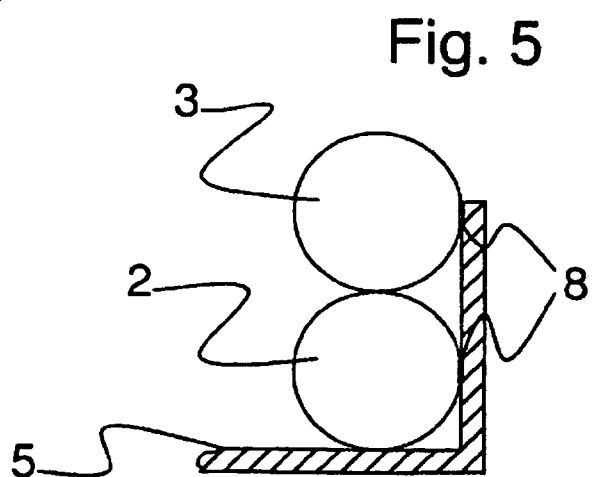


Fig. 5

Fig. 6

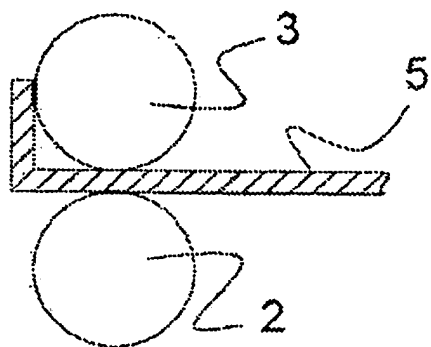


Fig. 7

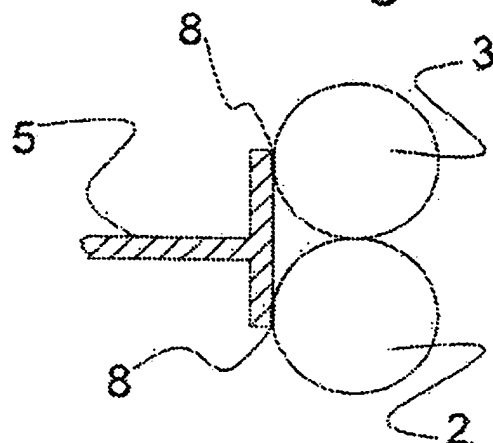


Fig. 8

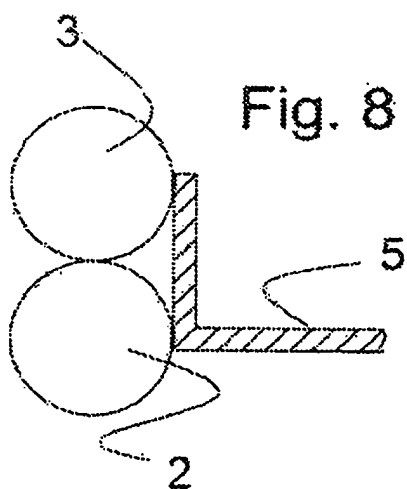


Fig. 9

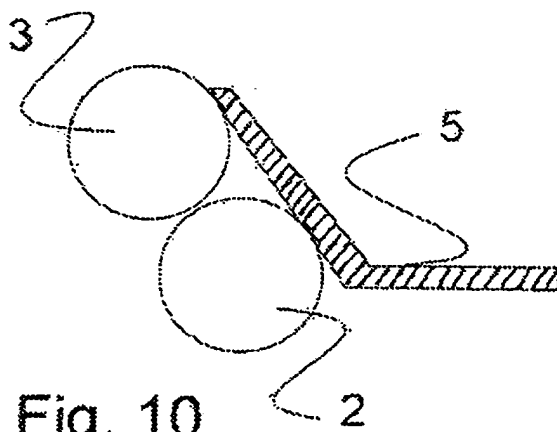
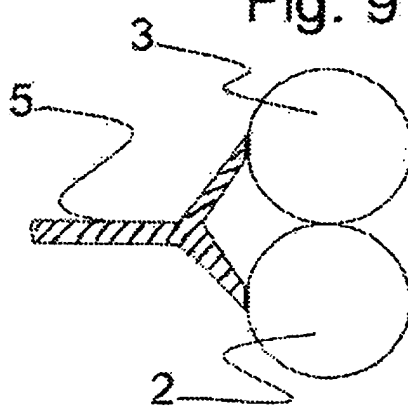


Fig. 10

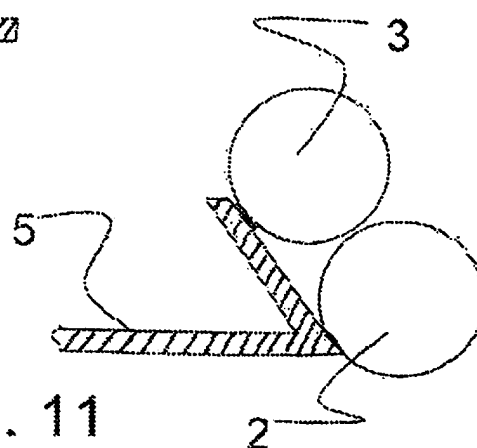


Fig. 11

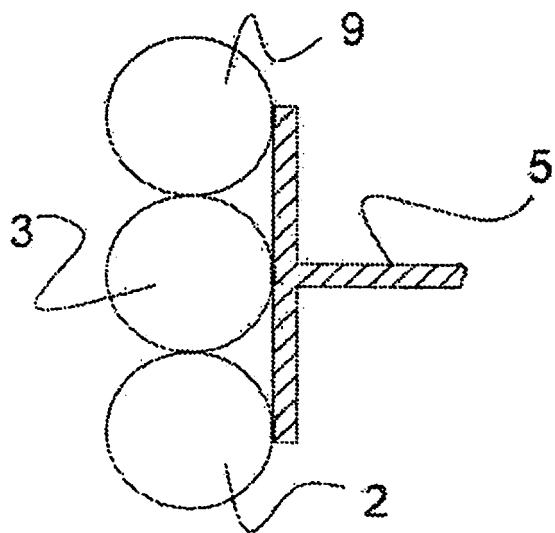


Fig. 12

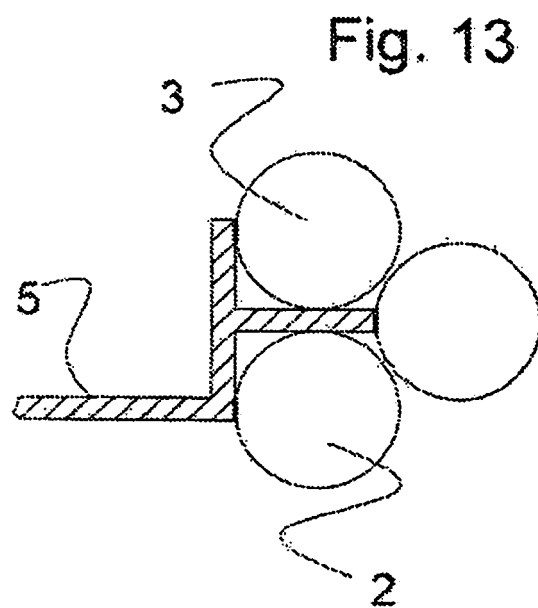


Fig. 13

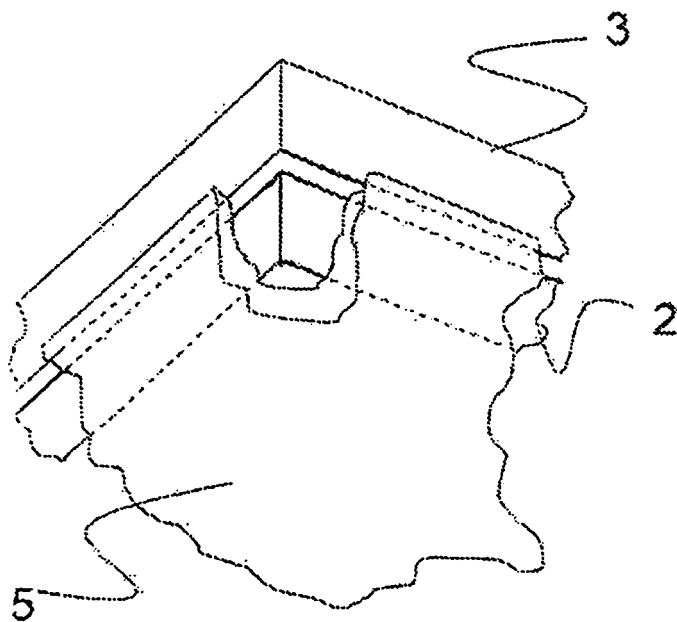


Fig. 14

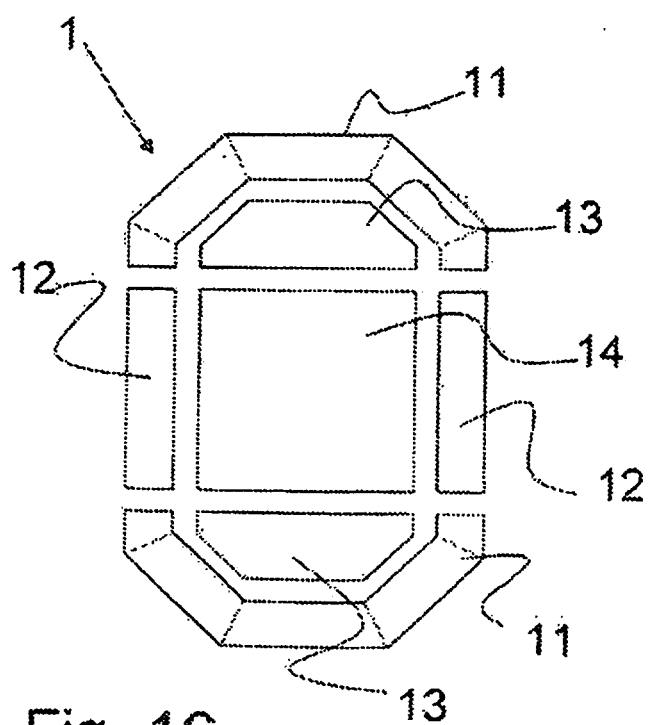
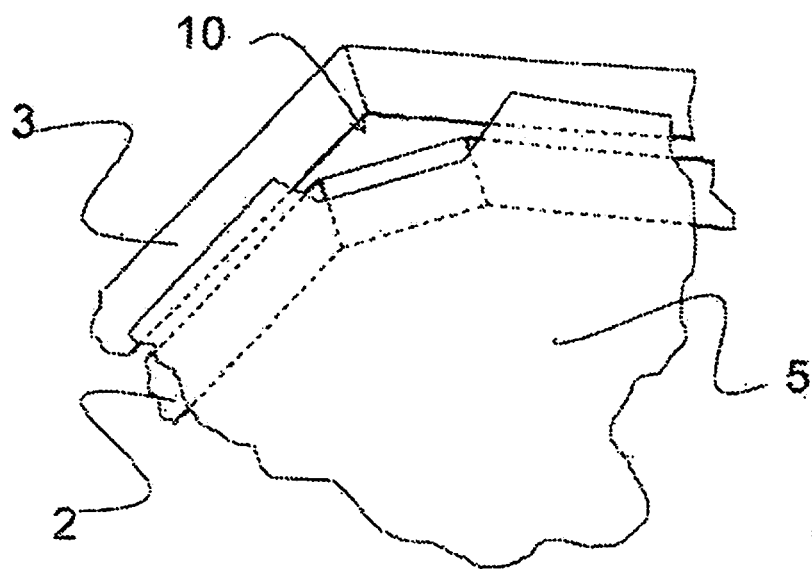




Fig. 17

Fig. 20

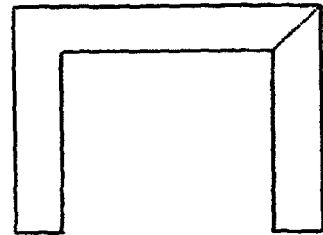


Fig. 19



Fig. 18

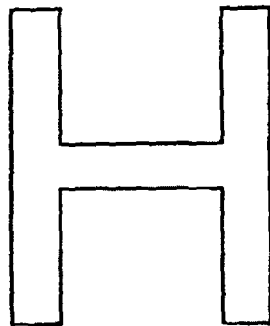


Fig. 21



Fig. 22



Fig. 23

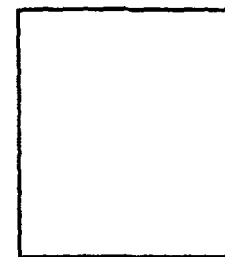


Fig. 24

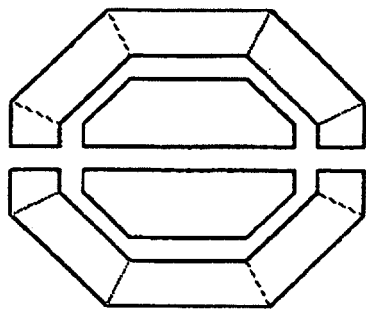


Fig. 25

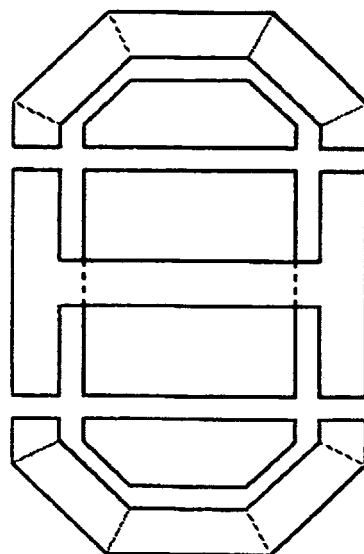


Fig. 26

REFERENCES CITED IN THE DESCRIPTION

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