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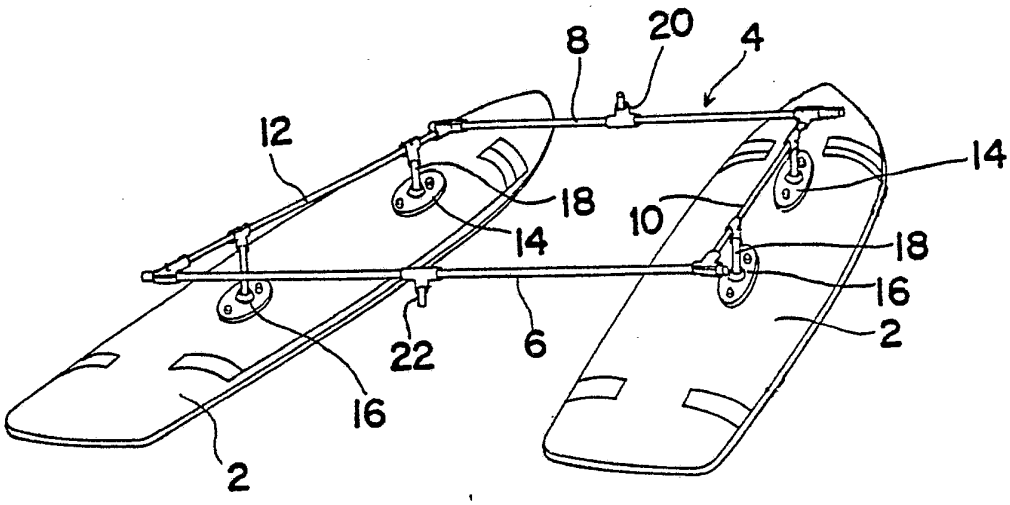
(54) Title: A RACK STRUCTURE FOR CONNECTION WITH AT LEAST ONE FLOAT MEMBER, IN PARTICULAR A SURFBOARD



(57) Abstract

A rack structure for connection with at least one surfboard (2) includes a frame structure and a set of fittings to connect the frame structure with each surfboard. The frame structure includes a main frame (4) composed by at least two transverse frame members (6, 8) which are connected or connectable with at least two longitudinal frame members (10, 12). The set of fittings includes a mast-hole fitting (14) and a support fitting (16) for each surfboard (2), each mast-hole fitting including at least one plug for insertion into the usual mast-hole of the surfboard, and the support fitting (16) is adapted for attachment to the top surface of the surfboard at the area aft of the mast-hole fitting. Accordingly, usual surfboards can be used to provide e.g. a catamaran vessel which can be provided with a deck so that several persons can sail together. Moreover, the rack structure may quickly and easily be changed for use as a roof luggage rack for transport of surfboards, masts and sails.

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TITLE: A rack structure for connection with at least one float member, in particular a surfboard.

The present invention relates to a rack structure for connection with at least one elongated float member, in particular a surfboard, the rack structure comprising a frame structure including at least two longitudinal frame members connected or connectable with at least two transverse frame members to provide a main frame, and leg structures for supporting and connecting said main frame to each of the float members.

It has already been suggested to use such a rack structure to provide a catamaran-like vessel which comprises as its float members two usual surfboards which are coupled together side by side by means of the rack structure. A sheet of cloth such as canvas may be distended in the main frame of the rack structure to provide a deck for the vessel.

Inherently, rack structures for the above purpose should be a simple construction which is easy to connect with and disconnect from the surfboards without the necessity of making excessive changes in the structure and shape of usual surfboards. On the other hand, when connected to the surfboards, the rack structure shall provide a safe and sufficiently stable construction or vessel. Another basic requirement is that the rack structure should be easy to transport, e.g. on the roof of a car together with surfboards, masts and sails.

The rack structure previously suggested fails to fulfil these basic requirements to a satisfactory extent.

It is, accordingly, an object of the present invention to provide an improved rack structure of the type mentioned above which is particularly simple in construction and easy to connect with and disconnect from float members such as surfboards.

Another object of the invention is to provide a rack structure of the type contemplated which is particularly easy to transport on the roof of a car.

These and other objects and advantages are attainable with the rack structure of the invention, the basic characteristic features

thereof being that each of the leg structures comprises a free end which is provided with means for removably connecting an attachment fitting to the free end. The rack structure of the invention may, accordingly, rapidly and easily be connected with or disconnected from appropriate float members by means of attachment fittings. Depending on the type of float members, the attachment fittings can be permanently or removably mounted on the float members. However, in particular in connection with usual surfboards, it is preferred that the attachment fittings are easy to remove from each surfboard which thereby still can be used for wind surfing in the usual manner.

Another and very important advantage of the rack structure of the invention is, however, that the attachment fittings for connecting the rack structure to float members rapidly and easily can be replaced by appropriate clamp fittings for connection with edges on a car roof. Thereby, the rack structure in itself can serve or be used directly as a roof luggage rack for transport of float members or surfboards, sails and masts.

Preferably, the attachment fittings for removable connection with the free ends of the leg structures are parts or accessories to the rack structure. In a particularly simple embodiment each attachment fitting comprises a foot plate for removable connection with the free end of the leg structure. The underside of the foot plate which is to rest against the upper surface of a float member, can appropriately be provided with a friction increasing layer or coating. The upper side of the foot plate includes connector means for receiving or connection with the free end of a leg structure.

In a preferred embodiment, which is specifically designed for removable connection with at least one surfboard, the rack structure further comprises a set of attachment fittings, the set including for each surfboard a mast-hole fitting and a support fitting, said mast-hole fitting including at least one plug for insertion into a mast-hole of the surfboard and said support fitting being adapted to be attached to the upper surface of the surfboard at an area aft of said mast hole.

The support fitting of this preferred embodiment may appropriately be designed as the simple embodiment just mentioned having

a footplate which may stand freely on the upper surface of the surfboard. However, if desired, the support fitting can be secured to the surfboard, e.g. by means of screws or by tightening one or more appropriate straps around the surfboard. The mast-hole fitting of the preferred embodiment may also include a footplate with the masthole plug of the mast-hole fitting projecting from the underside of the footplate.

The leg structures of the rack structure of the invention may be defined by end portions of the longitudinal or transverse frame members which have been bent down to provide legs with a free end. Preferably, however, each leg structure comprises a separate leg member, one end thereof being adjustably connected or connectable with a frame member while the opposite free end thereof includes said connecting means for connection with said attachment fitting. Thereby each leg structure can be displaced or adjusted along a frame member to which the structure is connected and the leg structures can be locked in desired positions.

This adjustability of the leg structures along a frame member of the rack structure is particularly useful when the rack structure is used as roof luggage rack on a car.

Another appropriate possibility of adjustment is obtained, if the longitudinal frame members are adjustable to provide a main frame having longitudinal frame members which are transversely adjustable and displaceable in parallel to each other. In accordance with the invention, the latter possibility of adjustment is preferably obtained by having the ends of the longitudinal frame members displaceably, but lockably connected with the respective transverse frame members. However, a similar possibility of adjustment can also be obtained by providing each of the transverse frame members with a tubular central portion and two end portions, each end portion having one end telescopically inserted into the central portion, while the opposite end of each end portion is connected with a longitudinal frame member.

Embodiments of the invention will now be described by way of examples and with reference to the accompanying drawings, wherein

Figure 1 schematically illustrates a first embodiment of the rack structure of the invention connected with two surfboards to

provide a catamaran structure;

Figure 2 schematically illustrates another embodiment of the rack structure of the invention connected with a single surfboard and provided with buoyancy members for laterally stabilizing the surfboard;

Figure 3 is a sectional view schematically illustrating a particular mast-hole fitting which can be part of the rack structure of the invention;

Figure 4 illustrates an embodiment corresponding to that in Figure 1, but provided with a special deck of cloth material;

Figure 5 is a schematical view of an example of a water cycle frame which can be part of the rack structure of the invention;

Figure 6 is a schematical view illustrating a special fitting for clamping around a usual surfboard mast;

Figure 7 illustrates a clamp fitting removably connected with a leg member in connection with use of the rack structure of the invention as a roof luggage rack.

Reference is now made to Figure 1 of the drawings showing two usual surfboards 2 which are arranged side by side and in parallel to each other. The two surfboards have been connected with a rack structure according to the invention which includes a main frame 4 assembled by two transverse frame members 6, 8, and two longitudinal frame members 10, 12. The main frame 4 is attached to the two surfboards by means of a mast-hole fitting 14 and a support fitting 16 arranged aft of the mast-hole fitting of each surfboard.

Thereby the two surfboards 2 have been coupled together into a catamaran structure which can be provided with mast, sail and rigging e.g. by means of a mast-foot fitting 20 mounted to the foremost transverse frame member 8 and, moreover, the catamaran structure can be provided with a rudder by means of a rudder fitting 22 mounted to the rearmost transverse frame member 6. Furthermore, the main frame 4 can be provided with or carry a deck, e.g. of a sheet of cloth material which is mounted by means of an appropriate lashing e.g. in a similar manner as the cloth in a trampoline.

Figure 2 shows another embodiment wherein a rack structure

according to the invention and including a main frame corresponding to frame 4 in Figure 1, has been connected to one single surfboard 2. The two longitudinal frame members 10, 12 have, moreover, been combined with schematically shown buoyancy members 24 which, preferably, are located at a somewhat higher level than the surfboard 2 so that the buoyancy members only get in contact with the water, when the surfboard heels over laterally. This embodiment is particularly useful for unskilled windsurfers who at the first instance can concentrate on maneuvering mast and sail which can be mounted in the fitting 20. For both embodiments apply that the longitudinal frame members 10, 12, are laterally adjustable on the two transverse frame members 6, 8 so that the spacing between the two surfboards of Figure 1, respectively between the two buoyancy members or pontoons 24 in Figure 2, can be adjusted as desired.

In both embodiments, there is used mast-hole fittings 14 and support fittings 16 which include or whereto it belong, leg members 18, one end thereof being connected with one of the frame members for support thereof. Each mast-hole fitting 14 includes at least one plug for insertion into the usual mast-hole of the surfboard, and each support fitting 16 may stand freely on the uppor surface of the surfboard. Alternatively, each support fitting 16 can be secured to the surfboard by means of screws or by tightening one or more straps around the surfboards. Such straps can also extend over the frame members and thereby laterally stabilize the entire rack structure.

Figure 3 illustrates schematically an example of a mast-hole fitting 14 for use on a surfboard with two mast-holes. The fitting includes a footplate 26 which, at the underside thereof, carries two parallelly projecting mast-hole plugs 32, 34. One, 34, of these plugs is mounted adjustably and displaceably in parallel in a slot in the footplade 26. On the upper side the footplate has a socket 28 which, in the embodiment shown, is removably attached by means of a threaded plug or pin 30. One end of a leg member 18 is retained in the socket 28, while the other end of the leg member 18 is provided with a fitting which has two portions that simultaneously can be clamped around the leg member 18 and one of the frame members.

As an alternative to the structure shown in Figure 3, the mast-hole fitting may also include only one projecting plug which may be mounted in alignment with the leg member 18.

The support fittings 16 may be designed in a corresponding manner, but without projecting plugs corresponding to plugs 32 and 34 in Figur 3.

The frame members 6, 8 and 10, 12 in Figures 1 and 2 may, moreover, be connected at the corners of the main frame by means of clamp fittings as that shown in the upper part of Figure 3.

With mast-hole fittings and support fittings of the type mentioned above, the rack structure according to the invention can quickly be mounted to and disassembled from one or more surfboards 2. The footplate belonging to the support fittings 16 may be permamently mounted on each surfboard 2, since the leg member 18 can be unscrewed from the footplate.

As an alternative to the threaded plug or pin 30 in Figure 3, the socket 28 may also be replaced by or designed as a snap coupling wherein the free end of the leg member 18 quickly and easily can be inserted and removed.

As a further alternative pin 30 can also be a screw for insertion from the underside of plate 26 through a hole therein. In this case the connection means would also comprise an internally threaded bore in the end of the leg member 18. The socket 28 on the foot plade 26 may also be replaced by a flange or collar of similar shape on the end of the leg member 18.

With sockets 28 or similar means which quickly and easily can be removed from the footplates associated therewith, a rack structure according to the invention can also be used as a roof luggage rack, since suitable clamp fittings quickly and easily can be attached to each socket instead of a footplate.

Figure 7 shows an example of a clamp fitting 20 which may be part of or accessories for the rack structure of the invention. The fitting 20 shown comprises a shaft 20a and a threaded pin 20b for removable connection with an internally threaded bore in the end of leg member 18. The same internally threaded bore can be used for connecting an attachment fitting for connection with a surfboard, such as a mast-hole fitting as that shown and described in connec-

tion with Figure 3 or a support fitting as fitting 16 shown in Figures 1 and 2. As an alternative to pin 20b and the threaded bore in the end of leg member 18, the clamp fitting shaft 20a can also be provided with appropriate snap coupling member which matches with a corresponding coupling member provided at the end of leg member 18 and which is used as means for connecting an attachment fitting.

As mentioned, the rack structure of the invention and in particular the main frame 4 in Figure 1 may appropriately be provided with a deck. Figure 4 shows a special design of such a deck which by means of two struts can be errected to provide a windscreen or a tent which can be used at sea and on the beach as well.

Figure 5 shows an example of a water cycle framework which may belong to or be part of the frame structure of the rack structure of the invention.

The framework can be removably mounted to the main frame of the rack structure and the framework includes stems 40 for mounting of pedal drives, and cross bars 42 on which a suitable seat can be suspended. In the rear part of the framework, a paddle wheel can be mounted on a cross bar 44 and the paddle wheel can be connected with the pedal drives by means of belt or chain transmissions.

The frame structure in the rack of the invention is, preferably, built of tube pieces which suitably can be coupled together by means of clamp fittings so that the structure is quick and easy to disassemble and to adjust as needed. In praxis, the frame structure can appropriately be provided with suitable reinforcements and staying. In particular, it will be expedient to provide embodiments as that in Figure 2 with suitable struts in the transverse direction.

As mentioned above a usual surfboard sail can be used in a holder or fitting 20. Thereby, outrigger embodiments as that shown in Figure 2 can be used to practice the windsurfing technique. The buoyancy members 24 may be built into or define the longitudinal frame members 10, 12 which, thereby, can be shaped as pontoons. Alternatively, the buoyancy members may be separate units which are attached to the frame members as needed and in a desired number.

However, a surfboard mast or a special mast with sail can also be mounted in the holder 20 by means of suitable wires or lines. Figure 6 shows a special fitting, whereby such wires can be connected with a usual surfboard mast without the necessity of performing changes in the structure of the mast, e.g. by drilling holes therein.

Other float members than usual surfboards can be used in connection with the rack structure of the invention to build outriggers, catamarans, trimarans or other types of vessels. However, the rack structure of the invention provides a substantial extension of the possibilities of use of usual surfboards. Thus, e.g. a boat hirer-out can, with limited costs of materials, have a very flexible equipment with which usual surfboards, outriggers, catamarans or water bicyles can be assembled and hired out in accordance with instantaneous customers' demands. To be able to do so only requires a certain number of surfboards with masts and sails and a number of rack structures according to the invention.

A basic aspect of the invention resides in the fact that one or more usual surfboards can be connected with a rack structure and thereby be made laterally stable. Simultaneously the rack structure gives the possibility of mounting a deck so that several persons can sail together. The rack structure is rapid and simple to mount, in particular if the rack structure is assembled in advance and has been used as a roof luggage rack for transport of surfboards etc.

Although the present invention has been described in terms of preferred embodiments it is intended that the invention as set forth in the following claims, also includes equivalent structures, some of which may be immediately apparent and others of which may be apparent only after som study.

PATENT CLAIMS

1. A rack structure for connection with at least one elongated float member, in particular a surfboard (2), said rack structure comprising

a frame structure including at least two longitudinal frame members (10, 12) connected or connectable with at least two transverse frame members (6, 8) to provide a main frame (4), and

leg structures (18) for supporting and connecting said main frame (4) to each of said float members,

CHARACTERIZED in that each of said leg structures comprises a free end which is provided with means for removably connecting an attachment fitting to said free end.

2. A structure as defined in claim 1, CHARACTERIZED in that each attachment fitting comprises a foot plate for removable connection with said free end of said leg structure.

3. A structure as defined in claim 1 or 2 for removable connection with at least one surfboard (2), CHARACTERIZED by further comprising a set of attachment fittings, the set including, for each surfboard, a mast-hole fitting (14) and a support fitting (16), said mast-hole fitting including at least one plug for insertion into a mast-hole of the surfboard, and said support fitting being adapted to stand on or be attached to the upper surface of the surfboard at an area aft of said mast-hole.

4. A structure as defined in claim 2 and including at least four leg structures, CHARACTERIZED in that said set of attachment fittings further comprises a clamp fitting for removable connection with said free end of each leg structure.

5. A structure as defined in any of claims 1-4, CHARACTERIZED in that each of said leg structures comprises a separate leg member (18), one end thereof being adjustably connected or connectable with a frame member, while the opposite, free end thereof includes said connecting means for connection with said attachment fitting.

6. A structure as defined in any of claims 1-5, CHARACTERIZED in that said longitudinal frame members are adjustable to provide a main frame having longitudinal frame members which are transversely adjustable and displaceable in parallel to each other.

7. A structure as defined in any of claims 1-6, CHARACTERIZED in that said frame structure further comprises a water cycle frame for removably mounting to said main frame (4).

8. A rack structure for connection with at least one surfboard (2), said rack structure comprising a frame structure including at least two longitudinal frame members (10, 12) connected or connectable with at least two transverse frame members (6, 8) to provide a main frame (4), and at set of attachment fittings for supporting and connecting said main frame (4) to each surfboard, CHARACTERIZED in that said set of attachment fittings includes, for each surfboard, a mast-hole fitting (14) and a support fitting (16), said mast-hole fitting including at least one plug for insertion into a mast-hole of the surfboard, and said support fitting being adapted to stand on or be attached to the upper surface of the surfboard at an area aft of said mast-hole.

9. A rack structure as defined in claim 8, CHARACTERIZED in that each of said mast-hole fittings and support fittings comprises a leg member (18) having one end which is adjustably connected or connectable with one of said frame members to provide support of said main frame (4).

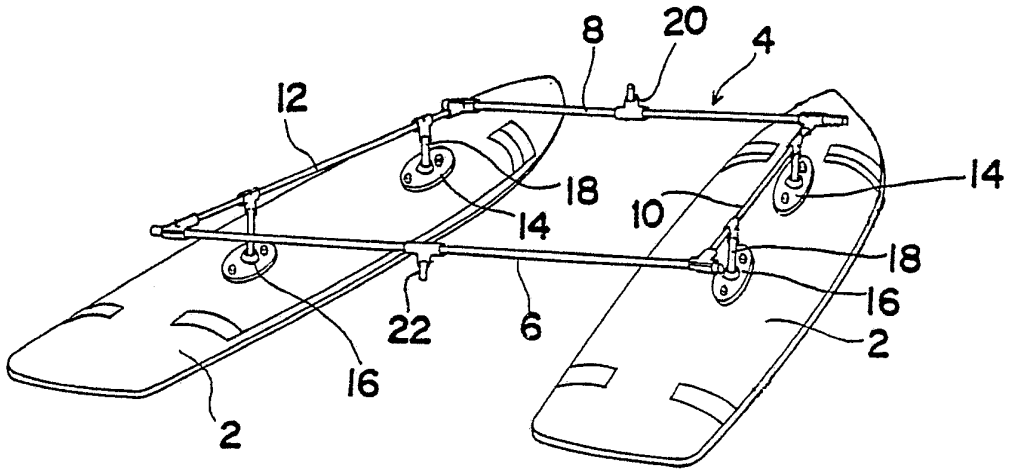

Fig. 1

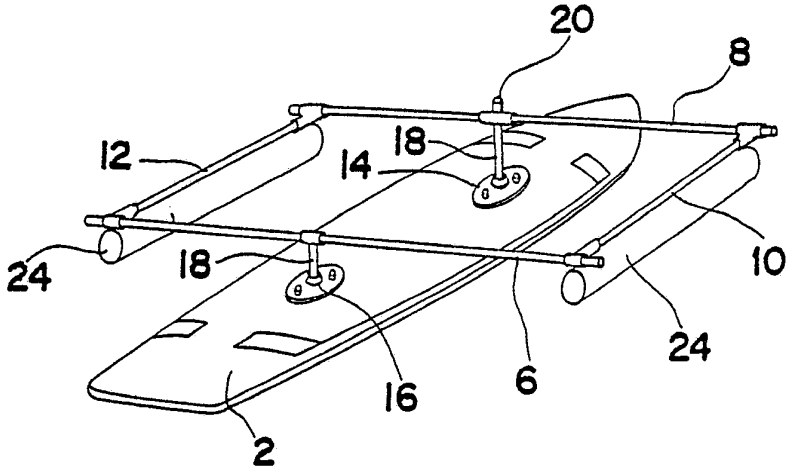

Fig. 2

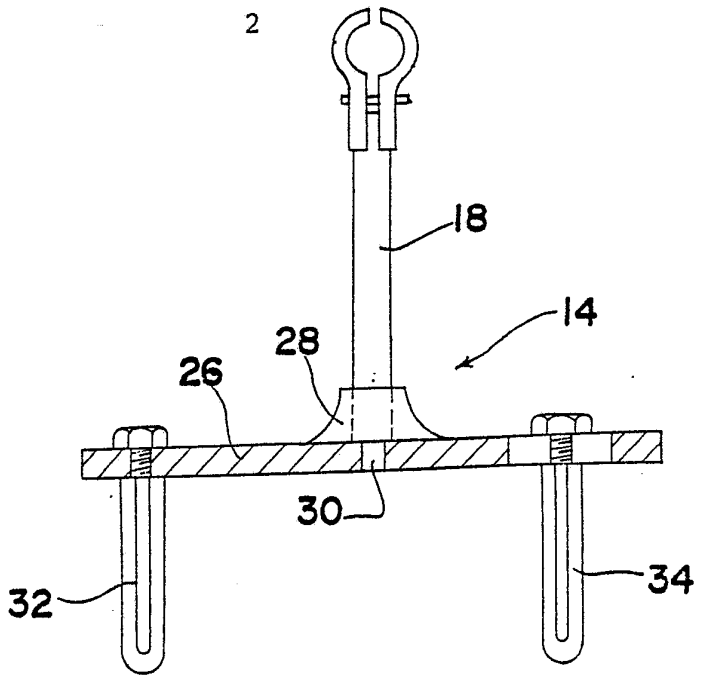

Fig. 3

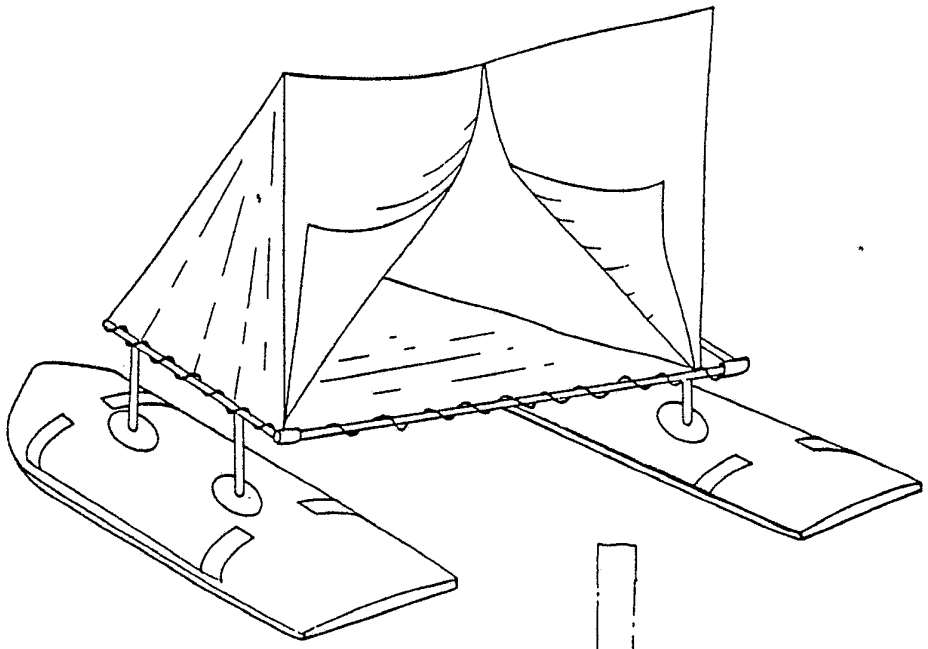

Fig. 4

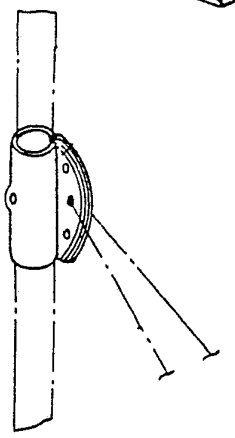

Fig. 6

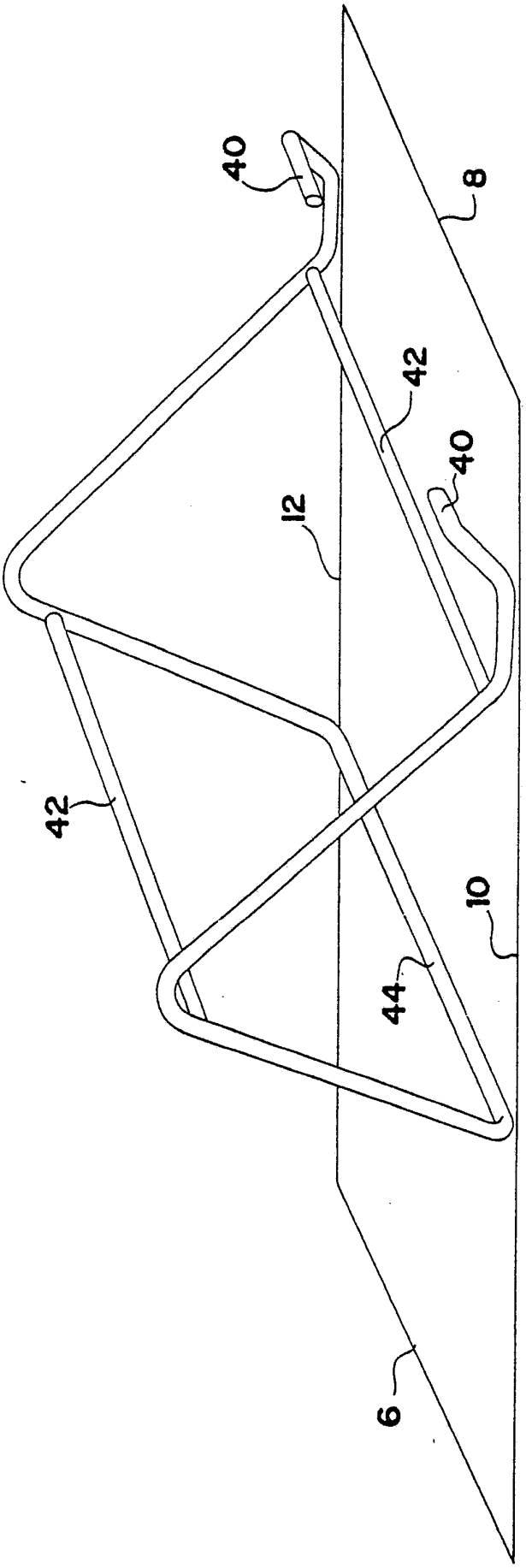

Fig. 5

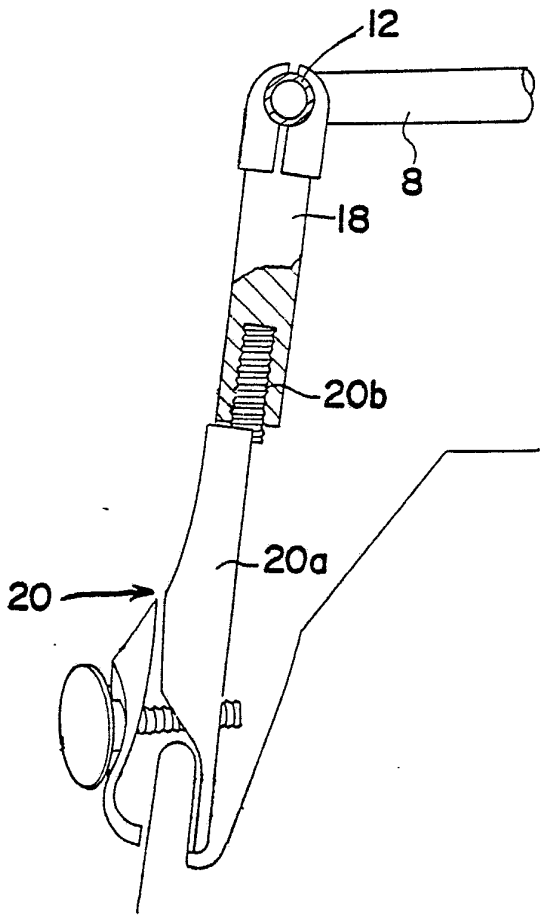

Fig. 7

INTERNATIONAL SEARCH REPORT

International Application No PCT/DK83/00068

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC 3

B 63 B 35/72

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
IPC 2,3	B 63 B 1/10,12,14, 35/38,72
Nat Cl	65a[1]:13
US Cl	9:1.1; 114:39, 61

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category [6]	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X	EP, A1, 0 032 698 (F M STEIFENSAND) 29 July 1981 & DE, 3 001 528	1 - 9
X	FR, C, 1 266 279 (M L LARREY) 5 August 1963	1 - 9
P	FR, A3, 2 506 254 (J LEMBEZAT, LORTELLI) 26 November 1982	1-3,5,8,9
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X	DE, A1, 2 938 211 (W REDLINGER) 2 April 1981	1 - 9
X	DE, A1, 2 747 995 (G HAMANN) 2 May 1979	1
X	DE, C, 844 872 (E RIJKEN) 24 July 1952	7
X	US, A, 3 877 406 (M DAVIS) 15 April 1975	1

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IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
1983-09-23	1983 -10- 04
International Searching Authority [1]	**Signature of Authorized Officer [20]**
Swedish Patent Office	Christer Jönsson

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

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X	US, A, 3 796 175 (F S FORD JR) 12 March 1974 & FR, 2 154 233 DE, 2 236 879 GB, 1 347 200 CA, 952 378 US, 3 871 316 AU, 46846/72 AU, 455 436	1,2,4-6,8,9
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