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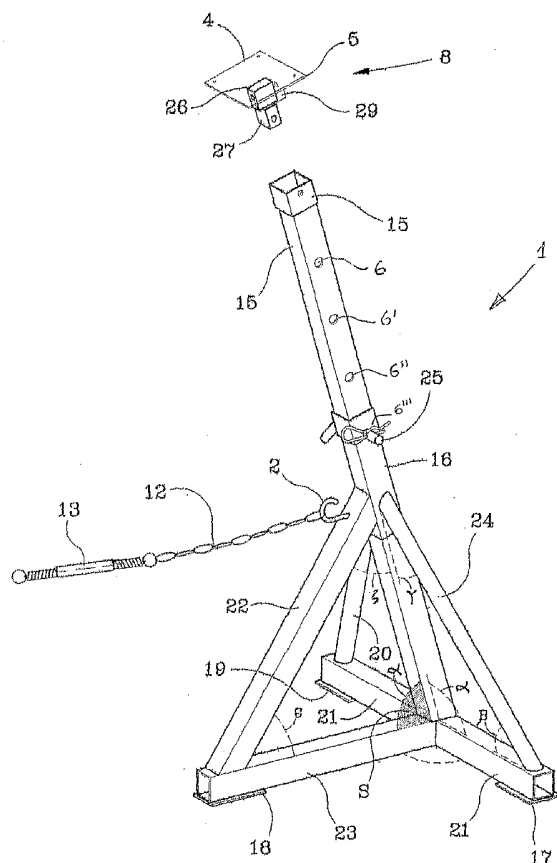
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(54) Title: STAND FOR BOATS



(57) Abstract: A stand (1) used to support stored boats, characterised in that it is utilised in combination with an identical, facing stand (1'), said stands (1 and 1') being collapsible (foldable), demountable, and adjustable in height, and being connected to each other by means of at least one chain which is tensioned by a screw coupler (13).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Description

Stand for boats

Technical Field

The present invention relates to nautical accessories and in particular to a stand or frame used for storing boats.

5 Background Art

Medium-sized boats used for recreation or work are commonly stored for long periods in the winter in large open areas or inside shipyards. The operations of displacement and keel blocking, for the boats to be stored, are always very complex and extremely critical. Especially the propping operation of the boat on the ground,
10 besides being expensive, is extremely critical, since it may damage the hull in combination with undesirable falls of the boat on the ground, unless this operation is carried out with expertise and carefully. Moreover, gusts which are typical of the winter months hit the boats stored in the open areas and cause their violent vibrations. These shakes or jerks, which are particularly violent in the case of sailing-boats due
15 to the friction caused by the wind on the mast, could cause, little by little, the displacement and sliding of the props (supports) on which the keel blocking was performed. This displacement forces the skilled workers of the shipyard to secure the props again, in order to prevent the wind force from irremediably opening them wide apart and the boat from falling on the ground, which circumstance would have
20 ruinous consequences. Some manufacturers, in order to avoid this worrying situation, have decided to sell, together with the boat, its saddle-shaped supports onto which the boat is laid when it is stored out of water. However, the costs of these tailor-made storage facilities is high, and additionally it is even necessary to pay for their storage in the periods of time when they are not used, since they are very cumbersome, due to

the fact that they are applicable only to a single, specific boat type, and not to others. To overcome these problems, the present invention provides a new, innovative keel blocking system for boats, which is inexpensive and can be quickly applied, and moreover, which is versatile, reliable, and easy to store when it is not used.

5

Disclosure of invention

The present invention attains its objects by providing a stand or frame to be used for supporting stored boats, which is characterised in that that it is used in combination with an analogous, oppositely positioned stand, said stands being connected to each other by means of at least one chain, which is tensioned by means of a screw coupler, each stand having an upper support plate or plane and a base structure formed by box-like sections subtending the angles beta, gamma, epsilon and zeta which are respectively comprised in the intervals from 58 to 64 degrees, from 26 to 32 degrees, from 54 to 58 degrees, and from 47 to 51 degrees, whereas the angles alpha and delta are respectively of 90 and 75 degrees.

10

Some particular embodiments result from the dependent claims.

Brief Description of Drawings

Figure 1 is a view of the stand or frame 1 according to the present invention, showing the attachment means 2 for the chain 12 used for realising the connection with an analogous stand or frame 1' (not shown), and showing also the support feet 17, 18, 19, the water drainage holes 7 and 7', and the articulated joint 8. This figure also shows the angles alpha, beta, gamma, delta, epsilon, and zeta, which determine the slanting angles for the three versions of the stand or frame 1.

20

Figure 2 is a schematic, enlarged illustration of the support joint 8 allowing a free rotation of the support plate 4.

Figures 3 and 4 are illustrations of the support joint 8, after assembling its lower side onto the box-shaped section bar 15 and its upper side to the support plane 4.

Figure 5 is a schematic drawing of the support plane 4, showing the holes 34 and 34' obtained on the box-shaped section bar which will receive the upper end of the parallelepiped 35.

Figure 6 is a general illustration of the articulated connection joint 9 which is to be hinged, on its upper part, to the support plane 4, and at its lower end on the box-like section 15, thereby allowing only a longitudinal rotation of the support plane 4.

Figure 7 is a complete representation of the stand or frame according to the present invention, in its version with detachable parts, showing the seats A, B, and C suited to respectively receive the ends 63 and 64 of the box-shaped section bars 22 and 23 which will be mutually fitted to each other by means of the U-shaped bracket 66, the latter being welded onto an end 65 of the box-shaped section bar 23.

Figure 8 is a front view of the stand including a telescopically adjustable system for the box-like section bar 22, this figure showing a box-like section bar 60 that allows the rotation of the box-like section 23 in the rear-forward directions by virtue of two projections 61 and 62 which are respectively hinged (pivoted) to corresponding brackets 56 and 57 by means of pins 58 and 59.

Figure 9 is a side view of the stand, provided with the telescopically adjustable system for the box-like section 22 consisting of the half-units 22a and 22b, this figure showing also the rotation joints formed by the brackets 49, 50, and 56, 57 welded on the box-like section bar 21, and by the pins 51, 52, 58 and 59, which allow

the rotation of the box-like section bar 16 in the forward-rearward directions.

Disclosure of some Preferred Embodiments

The present invention aims at disclosing a practical and quick system for the “keel
5 blocking” of boats used for recreation or work purposes and whose total length does
not exceed twenty-five metres. This system has the peculiarity of employing at least
a pair of stands (frames) 1 which are connectable to each other by tensioning a chain
12. This “binary” system can be used both for sailboats and motorboats and it is
formed by two separate stands or frames 1, which are identical to each other, and
10 which are used in a symmetrical, coupled arrangement so as to take advantage of the
intrinsic structural symmetry of the underbody of any boat. This is achieved by
positioning each single pair of stands below the underbody of the boat to be stored,
in such a way that each stand or frame is associated to an exactly oppositely
positioned identical frame, arranged symmetrically below the opposite side of the
15 underbody. In this manner, a binary (or two-part) stable support is obtained, which
will include a plurality of such pairs of stands corresponding in number to the
extension (length) of the boat to be stored. A single pair of stands is conceptually
structured so as to realise a “rigid” system suited to support any kind of boat, in any
meteorological condition, without the need of additional checking and adjusting
20 operations. This binary, “rigid” system, can be obtained by connecting the two
lateral, opposite stands 1 and 1', by means of a chain 12 equipped with a screw
coupling 13 that directly couples the two separate stands 1, 1'. This pair of stands or
frames 1, 1', after they have been rendered operative simply by unhooking the boat
from the crane which allowed its haulage, will be secured to each other by tightening
25 the screw coupler 13, and this, in turn, will tension the chain 12 and consequently
will fix (immobilise) the couple of stands 1 and 1' in the transversal direction. The
very weight of the boat, in combination with the tensioning of the chain 12, will
prevent any additional movement of the support stands 1 and 1' in presence of forces

due to atmospheric agents and accidental collisions. The number of said pairs of stands will increase proportionally with the length and size of the boat to be stored, and this number will in any case be comprised - for a single boat - between a minimum of one pair and a maximum of six pairs. Each stand 1 realised according to the present invention is provided with an upper support plane or plate 4, capable of rotating in all directions by virtue of the articulated joint 8, so as to perfectly lie on the outer surface of any kind of underbody. The rotation angle of said support plate 4, with respect to its central axis, will however be restricted to no more than 60°. This limitation of the rotation angle is introduced in order to prevent a possible transversal orientation of the support plane 4, that is, with an angle of 90° with respect to the ideal plane defined by the underbody of the boat to be stored, in which case the underbody could be damaged along the edge 5 of contact with the support plate 4, that - in this situation - corresponds to the very thickness of the support plate itself. The articulated joint 8 is realised by hinging the box-like section 29 (which is welded to the underside of the support plate 4), to the upper one (26) of two superimposed metallic parallelepipeds 26 and 27, which in turn are welded together perpendicularly, reaching a total height of 10 cm; these parallelepipeds are then connected to the box-like section bar 15 by means of a pin traversing this box-like section at the location of the holes 33 and 33'; on the other hand, they are connected to the box-like section 29 by means of a pin traversing the latter through the holes 34 and 34'. One pin (not shown) will pass through the box-like section bar 15 and through the parallelepiped 27 due to the presence of the holes 28 and 33, 33' which are obtained respectively on the parallelepiped 27 and on the end part of the box-like section bar 15. Moreover, the greater side of the two parallelepipeds 26 and 27 will be slightly smaller than the side of the box-like section bar 15, which in turn is similar to the side of the box-like section 29. Besides by the pair of stands 1, which constitute the subject of the present invention, the hull stored in accordance with the present invention must also be stabilised by laying the lower side of the keel of the

boat onto a plurality of blocks of common wood, like that used for sailboats, or onto lifting cubes and blocks like those used for other typologies of boats, thereby transmitting to them a large amount of the total weight of the boat and leaving to the lateral stands a marginal percentage of the total weight besides the essential task of

5 maintaining the stability and safety of the stored boat. Moreover, a forward stand and a stand placed astern, may also be positioned in such away that the boat, besides being laterally stabilised by the above pairs of lateral stands, is also stabilised longitudinally. However, this latter pair of stands will be provided with a support joint 9 (Figure 6) having only a longitudinal rotational degree of freedom. A

10 transversal movement of the articulated joint 9 is absent in order to prevent an accidental lateral sliding of the boat. This is achieved by introducing only the parallelepiped 35 into the upper end of the box-like section bar 15. This metallic parallelepiped will have a height equal to 90 millimetres and a shorter edge slightly shorter than the inner width of the box-like section bar 15. The body of the

15 parallelepiped 35 is traversed by two holes 36 and 37 which allow to hinge it – by means of pins - to the respective box-like sections 15 and 29, so as to permit only a longitudinal oscillation. The structure of the stand 1 according to the present invention is formed by a metallic box-like structure 1 whose upper end 15 is telescopic. This mechanism is realised using a metallic box-like section bar 15

20 having a cross section which is slightly smaller than the cross-section of the outer skirt 16, so that the telescopic section 15 will be able to slide easily inside the metallic box-like section bar 16. Depending on the draught of the boat to be stored, the length of the box-like section 15 will vary in proportion thereto, so as to entirely compensate for the height variation of the underbody to be stored, with respect to the

25 ground. After appropriately adjusting the extension of the box-like section bar 15, the latter may be fixed at a precise height by utilising a series of holes 6, 6', 6'', 6''' obtained on the internal box-like section 15 and on the external one 16, that is, thereafter, the proper extension can be fixed simply by introducing a pin 25 between

the correspondingly aligned holes. The projection length of said telescopic section bar 15 can vary from a minimum value of 5 cm to a maximum of 135 cm. To insure an enhanced stability of the whole frame 1, there are provided three support feet 17, 18 and 19 located below the respective outer vertices of the triangles formed by the section 16 in combination with the sections 20 and 21, 22 and 23, and finally by 24 and 21. These support feet 17, 18 and 19 also allow the insertion of a lifting plate of a motorised trolley, or of a conveying bucket, underneath the lower section bar, in order to permit the lifting of the stand 1 and to facilitate its transportation and displacement. The metallic section bar 16 "intersects" the section bar 21 exactly at the centre of its total length. At the intersection point between these two metallic sections, there are provided two holes 7 and 7', which allow the rapid downflow of rainwater entering from the upper, open side of the box-like section 16, thereby avoiding accumulation of water inside. The section bar 16, which extends to the point where it intersects the section bar 21, also has a safety function. In fact, in case of a possible sudden retraction of the section bar 15 - if not locked at the desired height by the pin 25 - this section bar is prevented from accidentally hitting the operator's feet with its lower part. The triangle formed by the section bars 16, 22 and 23 of the stand 1 is oriented towards its analogue (opposite) one, or in other words towards the inner part of the hull to be stored. This measure will allow the stand 1 to leave the section bar 21 on the outer side, and the latter will not present any kind of protrusions on that side. The arrangement of all pairs of stands in accordance with the above scheme will permit the access of trolleys, or of other vehicles, to an area located underneath the stored boats, since by virtue of the above arrangement the stands will not project from the hull. The angles formed by the section bars are respectively comprised in the following ranges: $\alpha = 90^\circ$, β between 58° and 64° , γ between 26° and 32° , $\delta = 75^\circ$, ϵ between 54° and 58° , ζ between 47° and 51° .

Alternatively, as shown in Fig. 7, the stand of the present patent application may

include detachable (demountable) box-like section bars 22 and 23, by virtue of three seats A, B, C which receive and lock therein, by suitable nuts and bolts introduced in corresponding through holes, the upper end 63 of the box-like section 22 and the end 64 of the box-like section 23. On the other end 65 of the section bar 23, that is, on the
5 end opposite to the end 64 received inside the box-shaped seat B, there is welded an U-shaped bracket suited to receive and lock therein, by a nut-and- bolt arrangement, the lower end of the box-like section bar 22, after the upper end 63 of the latter has been fixed inside the seat A, using the respective pin. In this case, the three seats A, B and C have a cross section suited to perfectly lodge the ends of the section bars 22
10 and 23 which have - in these ends - through holes allowing the tightening of the section bars 22 and 23 inside the respective seats A, B and C by means of nuts and bolts.

A further development of the invention provides for the use of the above stand for supporting boats so that, at the same time, the stand can be disassembled, to facilitate
15 transportation and storage, and is adjustable in height and inclination. This particular, improved embodiment of the invention, which is graphically presented in Figs. 8 and 9, is practically realisable because the three section bars 24, 16 and 20, which are directly welded on the box-section 60, which in turn is parallel to the lower section bar 21, are in this case movable and adjustable, and consequently can be completely
20 folded (are collapsible). The box-like section 60 is connected with the lower box-like section 21 by means of two movable joints 41 and 42 which allow the brackets 56 and 57 to respectively rotate around the pins 58 and 59 which in turn are connected, by passing through through-holes, to the box-like structures 61 and 62 welded on the lower side of the box-like structure 60. This movable connection makes the entire
25 upper part of the stand completely collapsible (foldable). The box-like section bar 22 projecting below the underbody is formed by the two half-units 22a and 22b and is in turn provided with two movable connections realised by means of the brackets 49 and 50 and respectively welded to the box-like sections 23 and 16, thereby allowing

the vertical rotation of the individual section bars 22a and 22b around the pins 51 and 52 when the two sections 22a and 22b are disconnected from each other. The two section bars 22a and 22b are telescopically connected and rendered adjustable in length by virtue of the introduction of a pin 47 into one of the holes 48, 48', 48'', 48''', 48^{IV}, ... obtained along the free ends of the two section bars 22a, 22b; the latter, therefore, are simply introduced into each other by virtue of the different diameters of these section bars and allow to noticeably vary the total length of the section bar 22 formed by the two telescopically connected section bars 22a, 22b. The total length of the box-like section 22, which is obtained simply by adjusting the superposition of the two section bars 22a, 22b, modifies in turn the angle δ which is delimited in the lower part, by the section bar 23 projecting below the underbody 23, and vertically, by the section bar 16, so as to modify the angle of inclination of the section bar 16 with respect to the support surface (5), depending on the type of boat to be stored. The box-like section 16 is in turn telescopically adjustable in combination with the box-like section bar 15, and the latter can be completely inserted telescopically within the section bar 16. These box-like "telescopic extensions" allow to extend (vary) the total length of the box-like section 16 up to about 3 metres, maintaining at the same time an optimum angle of contact with respect to the underbody of the boat, by virtue of an optimisation of the angle δ . In all of the above embodiments, reinforcing collars are provided to stiffen the terminal part of the telescopic box-like section bars, to render them less deformable and to provide improved seats for the pins and nuts used for fastening the various section bars. On the lower side of box-like section bar 16, and precisely at the intersection point between the box-like section bar 16 and the box-like section bar 23, there is a slit (not shown) allowing the downflow of water which inevitably enters inside the box-like section 16 when the latter is exposed to the inclemency of the weather.

Embodiments of the Invention

Example 1. The stand 1 according to the present invention may be specifically realised for a particular use, that is, for the storage of motorboats, corresponding to underbodies with a modest draft, such that the height of the boat from the ground - during the storage period - is limited. Then, the stand or frame has a geometry and angles (of its base) respectively equal to 90, 58 and 32 degrees, for the angles alpha, beta and gamma, and respectively of 75, 54 and 51 degrees, for delta, epsilon and zeta. The degree of projection of the box-like section bar 15, along its axis, varies between 5 and 75 centimetres, reaching a total, maximum height above the ground equal to 156 centimetres. The above angles of the base structure may have a tolerance of about 2 degrees with respect to the nominal values.

Example 2. A second, specific use of the stand 1 according to the present invention may regard the storage of boats with a noticeable draft, such as sailboats. Due to the presence of the bulbous bow and of the helm, sailboats are stored at a considerable height above the ground. In this case, the stand 1 according to the present invention will have geometries of the base angles characterised by values of the angles alpha, beta and gamma, respectively equal to 90, 64 and 26 degrees, while the angles delta, epsilon, and zeta will correspond to 75, 58 and 47 degrees. In this case the projection (extension) of the telescopic box-like section 15 in the direction of its axis is comprised between 5 and 135 centimetres, which corresponds to a height (from the ground) of 289 centimetres. The above angles of the base structure may have tolerances, with respect to the nominal values, of about 2 degrees.

Example 3. It is possible to realise a stand, as described herein, having an intermediate height. It is ideal for displacement hulls, that is, for hulls having an intermediate draft and therefore requiring an intermediate height from ground, between those of the two above embodiments. In this third case, the optimum angles formed by the intersections of the box-like sections which make up the support structure are respectively: angle alpha = 90°; angle beta 61°, and angle gamma 29°. The angles delta, epsilon and zeta will be respectively equal to 75°, 54° and 51°. In

this case, the extension (projecting length) of the telescopic box-like section 15 in the direction of its axis varies between 5 centimetres and 105 centimetres, with a maximum height from the ground equal to 220 centimetres. The above angles of the base structure may have a tolerance from the nominal values within 2°.

- 5 Example 4. A further realisation of the stand according to the present patent application may be obtained with the box-like sections 22 and 23 which are in this case detachable (dismountable) by virtue of the three seats A, B and C which are capable of receiving and locking, by suitable nuts and bolts, the upper end 63 of the box-like structure 22 and the end 64 of the box-like structure 23.
- 10 On the other end of the box-like structure 23, the one opposite to the end inserted into the box-shaped seat B, there is welded an U-shaped bracket suited to receive and lock, by means of an adequate nut-and-bolt-arrangement, the lower end of the box-like structure 22 after the upper end 63 of the same has been fixed inside the seat A by means of the corresponding pin. In this case, the three seats A, B and C have a
- 15 cross-section suited to accurately receive the ends of the section bars 22 and 23 which, at these ends, have through holes that allow the tightening or locking of the box sections 22 and 23 inside the respective seats A, B and C, to be performed by means of the bolts and nuts.

Example 5.

- 20 A further development of the present invention regards the use of a stand, as herein described, for the support of boats, which is at the same time dismountable, in order to facilitate its transportation and storage, and height-adjustable. This particular, improved embodiment of the invention, is practically realisable because the three section bars 24, 16 and 20, which are directly welded on the box-section 60, which in
- 25 turn is parallel to the lower section bar 21, are in this case movable and adjustable, and consequently can be completely folded (are collapsible). The box-like section 60 is connected with the lower box-like section 21 by means of two movable joints 41 and 42 which allow the brackets 56 and 57 to respectively rotate around the pins 58

and 59 which in turn are connected, by passing through through-holes, to the box-like structures 61 and 62 welded on the lower side of the box-like structure 60. This movable connection makes the entire upper part of the stand completely collapsible (foldable). The box-like section bar 22 formed by the two half-units 22a and 22b is in
5 turn provided with two movable connections, realised by means of the brackets 49 and 50, respectively welded to the box-like sections 23 and 16, thereby allowing the vertical rotation of the individual section bars 22a and 22b around the pins 51 and 52. The two section bars 22a and 22b are telescopically connected and rendered adjustable in length by virtue of the introduction of a pin into one of the holes 48,
10 48', 48'', 48''', 48^{IV}, ... obtained along the free ends of the two section bars 22a, 22b; the latter, therefore, are simply introduced into each other by virtue of the different diameters of these section bars and allow to noticeably vary the total length of the section bar 22 formed by the two telescopically connected section bars 22a, 22b.

Claims

1. A stand (1) for supporting stored boats, characterised in that it is used in combination with an analogous, oppositely positioned stand (1'), said stands (1 and 1') being connected to each other by means of at least one chain, which is tensioned by means of a screw coupler (13), each stand having an upper support plate (4) and a
5 base structure formed by box-like sections subtending the angles beta, gamma, epsilon and zeta which are respectively comprised in the intervals from 58 to 64 degrees, from 26 to 32 degrees, from 54 to 58 degrees, and from 47 to 51 degrees, whereas the angles alpha and delta are respectively of 90 and 75 degrees.
- 10 2. A stand according to claim 1, wherein a telescopic box-like section (15), connected by means of an articulated joint (8; 9) to the support plate (4), is inserted inside a stationary box-like section (16) and is telescopically extendable by virtue of a series of adjusting means (6, 6', 6'', 6''') which are distributed along a length comprised in the interval from 105 cm to 135 cm, thereby allowing to reach a
15 maximum height above ground equal to 289 cm.
3. A stand according to the preceding claims, wherein the box-like section (16) extends downwards until it intersects a lower, horizontal box-like section (21).
- 20 4. A stand according to the preceding claims, wherein the articulated joint (8) is formed by two parallelepipeds (26 and 27) which are superimposed, welded perpendicularly to each other, and perforated in such a way as to be hinged respectively to said telescopic box-like structure (15) and to a box-like structure (29) welded below the support plate (4), by virtue of the holes (32, 28, 34, 34', 33 and
25 33') realised respectively on the parallelepipeds (26 and 27) and on the box-like structure (29) welded below the upper support plate (4), and also on the upper end of

the telescopic box-like structure (15), so that said parallelepipeds (26 and 27) may be connected by pins (30 and 31) to the respective metallic box like structures (29 and 15).

5 5. A stand according to claims 2 and 3, wherein the articulated joint (9) connects the telescopic box-like section (15) to a box-like section (29) welded below the upper support plate (4) and is movable only longitudinally by being formed by a single parallelepiped (35), the latter is crossed by two holes (36 and 37) which allow to hinge it, by means of pins, respectively to the box-like structure (29) of the support
10 plate (4) and to the telescopic box-like structure (15).

6. A stand according to the preceding claims, wherein the base structure rests on three support plates (17, 18 and 19).

15 7. A stand according to any of the preceding claims, wherein the box-like structure (16) is provided at its lower part with at least two holes (7 and 7') to permit the natural downflow of rainwater.

8. A stand according to the preceding claims, wherein the two box-like structures
20 (22 and 23) which project below the boat's underbody, are detachable by virtue of the presence of three seats (A, B and C) which are capable of receiving and locking, by means of suitable nuts and bolts, respectively the upper end (63) of a box-like structure (22) and the end (64) of another box-like structure (23), wherein, on the other end (65) of the box-like structure (23), the one opposite to the end lodged
25 inside one seat (B), there is welded an U-shaped bracket (66) apt to receive and lock, by a lock-and-nut arrangement, a lower end of the box-like structure (22) after the upper end (63) of the same has been fixed, by means of an apposite pin, inside a seat (A); wherein, the three seats (A, B and C) have in this case a cross-section

dimensioned to receive accurately the ends of the box-like sections (22 and 23) extending below the boat's underbody and which present at their ends through holes that allow the tightening, by means of nuts and bolts or by any other mechanical system, inside the respective seats (A, B and C), of the box-like structures (22 and 5 23) extending below the boat's underbody.

9. A stand according to any of the preceding claims, wherein the three box-like sections (24, 16 and 20) are welded to a second, horizontal box-like section (60); the second, horizontal box-like section (60) is connected to a lower, horizontal box-like 10 section (21) by means of at least two movable joints (41 and 42) which allow the free rotation of brackets (56 and 57) respectively around pins (58 and 59) which, in turn, are connected, by virtue of the presence of through holes, to box-like sections (61 and 62) welded on a lower surface of said second, lower horizontal box-like section (60); wherein, one box-like section (22) extending below the boat's 15 underbody is formed by two half-sections (22a and 22b) and is provided with two movable attachment members, the latter being formed by additional brackets (49 and 50) respectively welded to the stationary section (16) and to a second box-like section (23) extending below the boat's underbody, thereby allowing the vertical rotation of individual half-sections (22a and 22b) around pins (51 and 52); said two 20 half-sections (22a and 22b) being telescopically connected and consequently adjustable in length, by virtue of a pin (47) introduced into one hole of a plurality of holes (48, 48', 48'', 48''', 48^{IV}) obtained on the free ends of the two half-sections (22a and 22b).

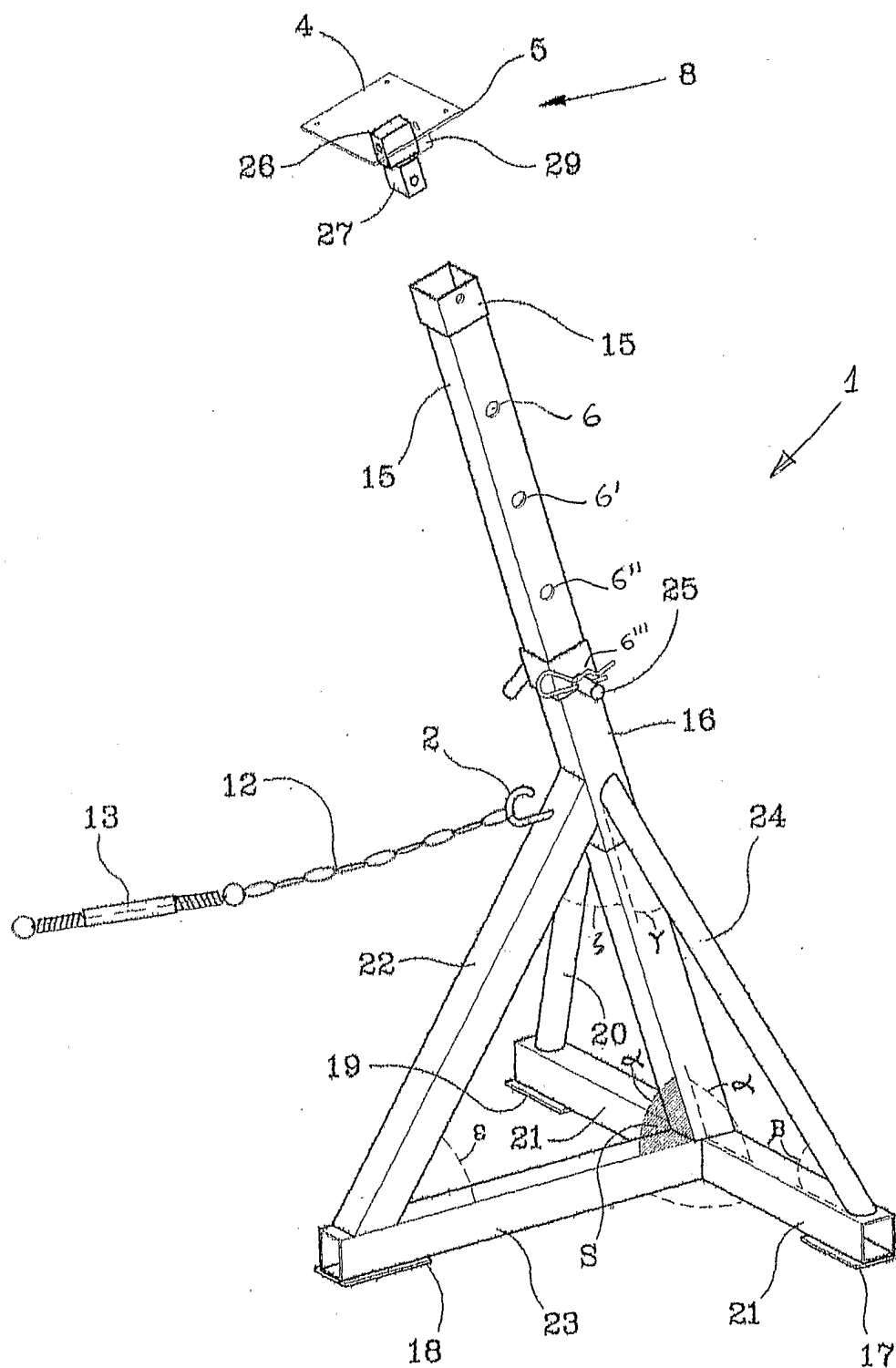


FIG. 1

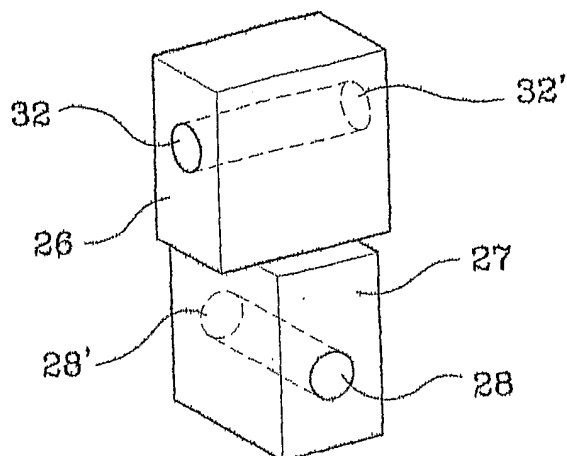


FIG. 2

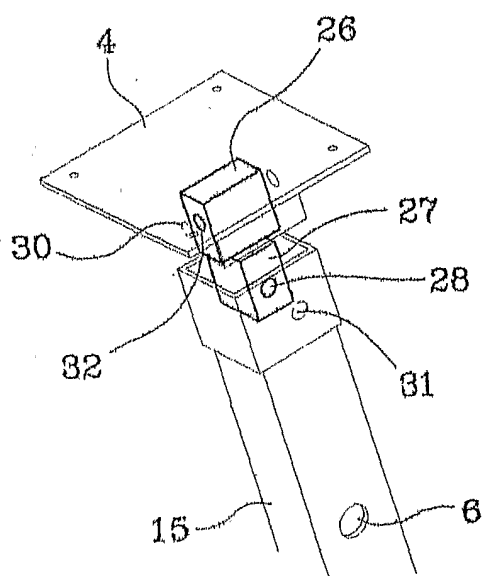


FIG. 3

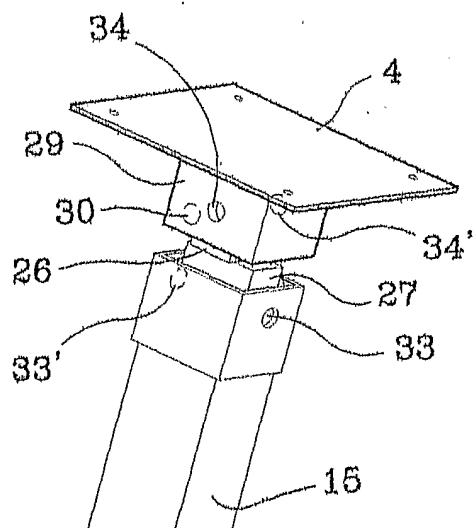


FIG. 4

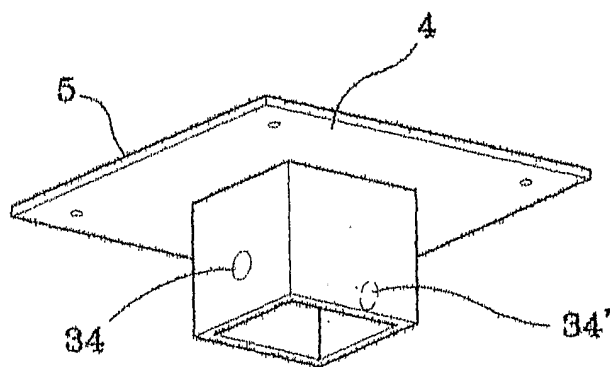


FIG. 5

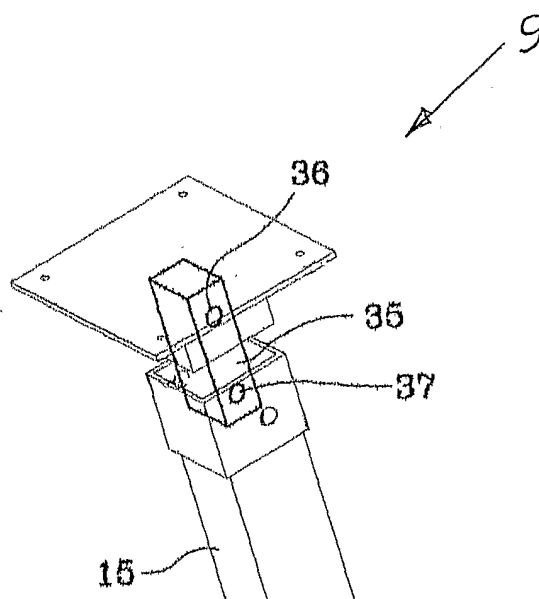


FIG. 6

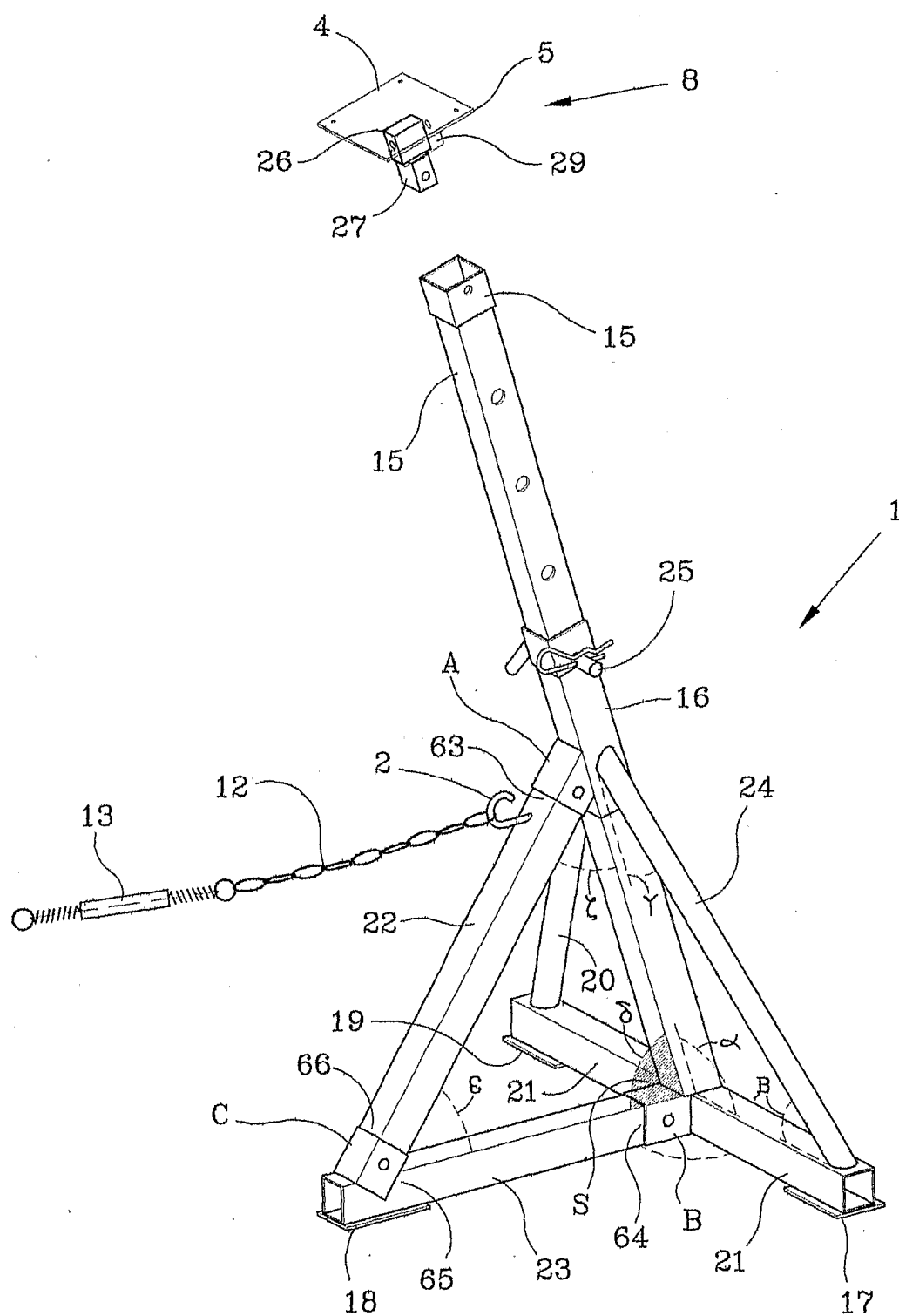


FIG. 7

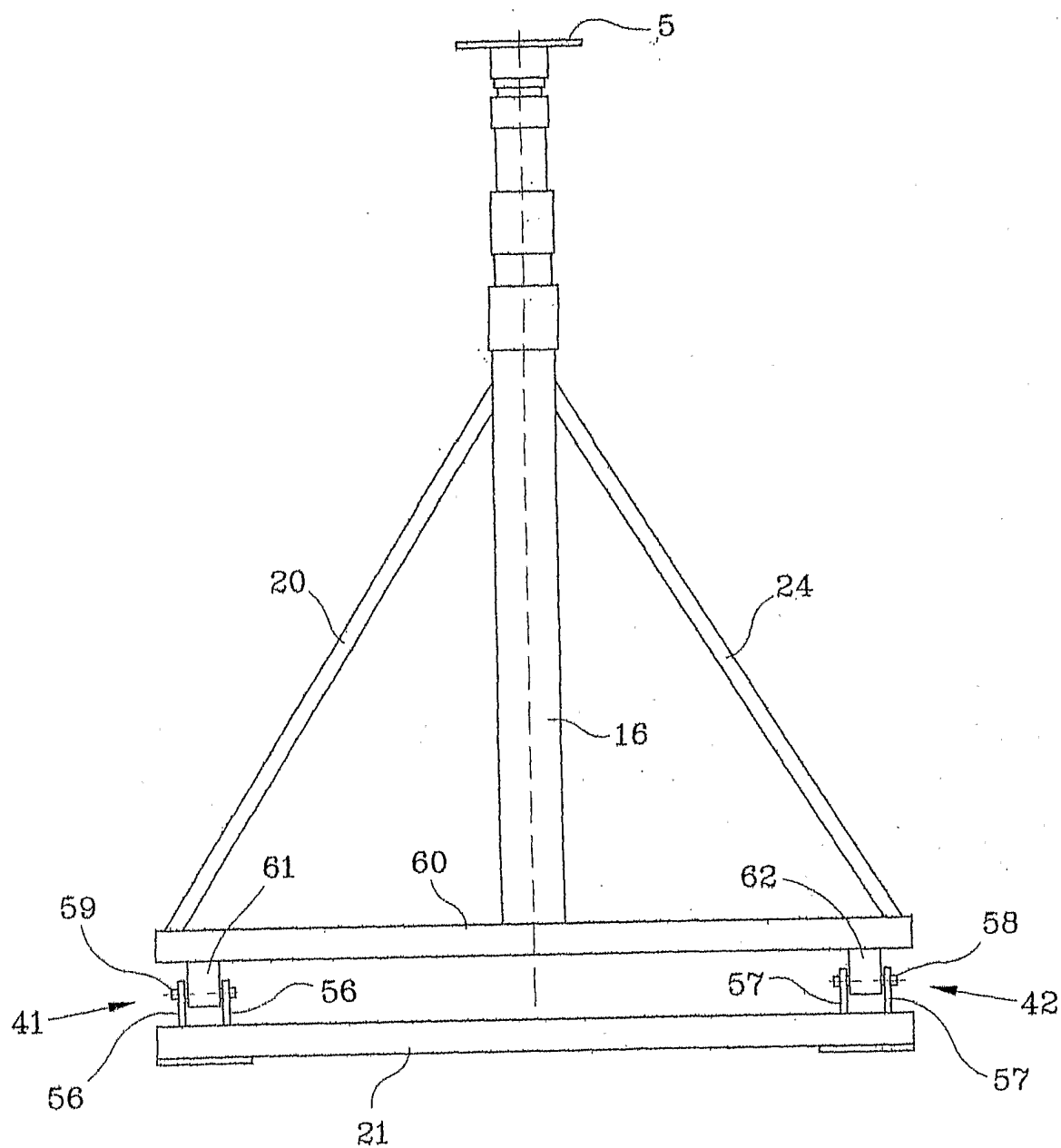


FIG. 8

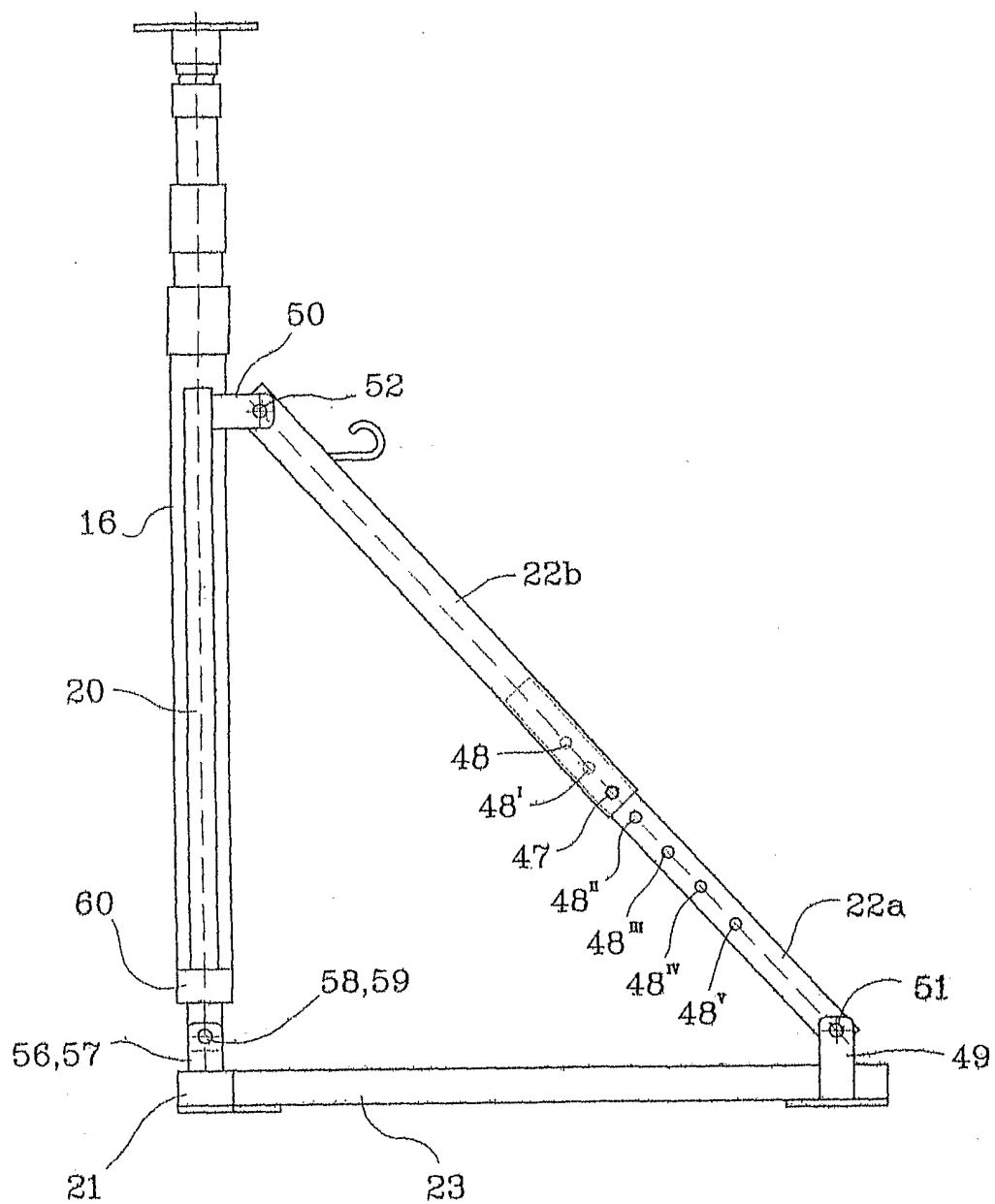


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000253

A. CLASSIFICATION OF SUBJECT MATTER
INV. B63C5/02 B63C15/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B63C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 92/10399 A (TENNAMAST SCOTLAND) 25 June 1992 (1992-06-25) page 3, line 24 - page 7, line 22; figures 3,4	1-3,6,7
Y	FR 2 755 939 A (HASNE PHILIPPE) 22 May 1998 (1998-05-22) the whole document	1-3,6,7
Y	EP 1 266 822 A (L.M.P. S.A.S. DI GIOTTO VITTORIO & C. LAVARAZIONI MECCANICHE PREALPINE) 18 December 2002 (2002-12-18) paragraph [0049]; figures 5,6	1-3,6,7
A	FR 2 534 351 A (LEGRELLE ALAIN) 13 April 1984 (1984-04-13) abstract; figures	8,9
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☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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Date of the actual completion of the international search

31 July 2006

Date of mailing of the international search report

07/08/2006

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INTERNATIONAL SEARCH REPORT

International application No
PCT/IT2006/000253

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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A	US 3 430 911 A (ROBERT T. OLSON) 4 March 1969 (1969-03-04) figures -----	1
A	GB 2 314 815 A (HENRY GEORGE * IVES). 14 January 1998 (1998-01-14) abstract; figures -----	1-9

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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