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(54) Watercraft provided with a rigid, transparent bottom

(57) A craft or generally a boat, motorized or not, which is provided with a rigid, transparent bottom (2) capable to ensure a perfect visibility through the water under the boat. The section of said rigid, transparent bottom (2) may be shaped according to the use of the boat, i.e. it may be a V-shaped bottom provided with stabilizing fins and stiffening frames (Fig. 2), a flat bottom (Fig. 3), a gull wing bottom (Fig. 4), a catamaran bottom (Fig. 5), and finally a circular or round bottom (Fig. 6).

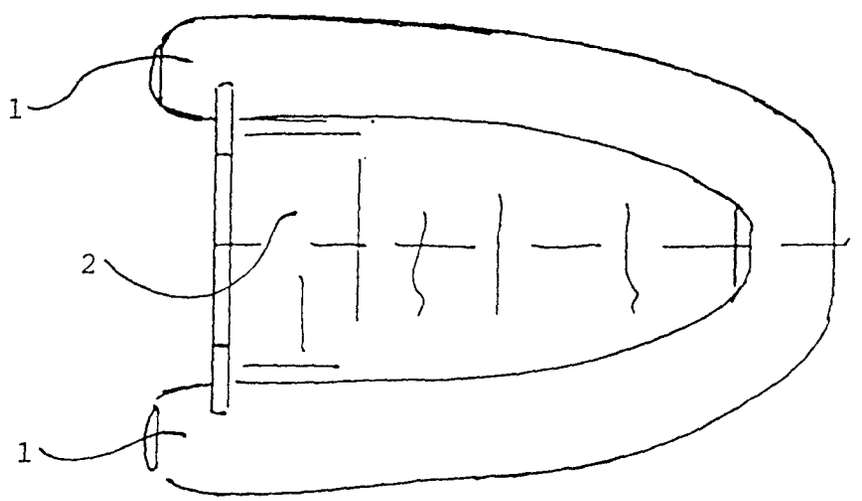

FIG. 1

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Description

The present invention relates to the nautical field and particularly the bottom of boats and crafts such as the rubber dinghies motorized or not.

Several materials for the bottom of the hull of such crafts are known, however, all of them have the drawback of being not completely transparent and having poor mechanical strength such as not to be able to ensure the rigidity and the impact strength in order to comply with the safety rules in force. For such reasons there are hitherto provided only crafts having hulls made of conventional materials and provided with a transparent bottom windows of restricted area.

The present invention seeks to solve the above-mentioned problems and to provide a boat which assures the maximum safety to passengers and allows the latter to see through the bottom of the boat without leaning out of the boat's sides.

This is achieved by the use, which is unusual in the nautical field, of a thermoplastic material such as a transparent polycarbonate known under the trademark LEXAN®. Such a material used in the industrial manufacturing since 1980 is characterized by excellent mechanical strength, high resistance to weather conditions, and very good optical, acoustical, thermoinsulating, and self-extinguishing characteristics. LEXAN® is transparent as the glass, tough as a metal, abrasionproof, colourless, unbreakable, weatherproof, and self-extinguishing according to the rules BS 2782, method 508A. Such characteristics allow LEXAN® to be used as material for the bottom of a boat.

The present finding will be more readily understood from the following detailed description with reference to the accompanying drawings which show, only by way of a not limiting example, some preferred embodiments thereof. In the drawings:

Fig. 1 shows a plan view of a rubber dinghy provided with a rigid, transparent bottom according to the invention;

Figs. 2 to 6 are elevation side and rear views of some embodiments of the invention, respectively;

Figs. 7 to 18 shows several ways of securing the bottom of the invention to the inflatable tube forming the hull.

The use of crafts of any type, motorized or not, for scenic, archaeological, documentary excursions in order to watch the sea flora and fauna and/or for fishing purposes is well known. For all such sporting and/or amateur activities and many others, among which assistance, rescue and salvage stand out in importance, it is very useful to see through the water not only around the boat but also under the same.

The present invention finds application in all of the above activities due to its peculiar characteristic of providing a transparent-bottom boat without any limitation in shape and size and without any problem of deformation, heating and/or heat transmission etc.

As mentioned above, the disclosed bottom of the present invention is made of a thermoplastic polycarbonate material known under the trademark of LEXAN®.

With reference to the annexed drawings it is seen that the shaping of sheets of LEXAN® allows bottoms of any type to be provided, and namely: a rigid, transparent V-shaped bottom provided with stabilizing fins and stiffening frames (Fig. 2); a flat bottom (Fig. 3); a gull wing bottom (Fig. 4); a catamaran bottom (Fig. 5); and finally a circular or round bottom (Fig. 6).

All such exemplary shapes of a rigid, transparent bottom prove the versatility of the disclosed invention and allow the application of the latter for any use and performance.

The thickness of the material forming the rigid, transparent bottom is preferably varying from 8 to 9,5 mm according to the size of the craft.

The present invention finds its specific application in the rubber dinghies where a rubber tube of large diameter, which improves the stability, the comfort and the protection from the water sprays, is joined to the already described rigid, transparent bottom. The connections are double and airtight. The fabrics are high-technology textiles preferably of PVC treated with resin and plasticized with any thermally weldable material for nautical application which are inputrescible and easy to be repaired by a suitable mono- or two-component adhesive. The rigid, transparent bottom 2 of the rubber dinghy may be secured to the tube 1 by a number of ways, and namely:

- by means of fabric strips 3 coated with elastomers and/or plastomers or by means of moulded or extruded flanges 5 glued by polychloroprene, polyurethane, acrylic, cyanoacrylic or epossidic adhesives 4 (Figs. 7-10);
- by means of mechanical fastening elements such as screws, rivets, nails to be riveted (Figs. 11-13);
- by thermal and/or high-frequency welding of tube 1 to fabric strips 3 and/or to moulded or extruded elements 5 glued or secured to bottom 2 (Figs. 7-10);
- by securing or gluing the tube 1 to rigid or elastic elements 8 of wood, metal, PRFV plastomers or elastomers synthetic resins stiffened or not (Figs. 14-16);
- by inserting the bottom 2 into guides and/or lines, pockets, sheaths, seats secured to tube 1 (Figs. 17-18).

Irrespective of the way of securing the rigid, transparent bottom 2 to tube 1 or the hull of the boat, it should be appreciated that the great utility of the disclosed invention is due to the use of LEXAN® as material for the rigid, transparent bottom 2 having the following advantageous features besides those described above:

- excellent light transmission;
- optimum impact strength in a wide temperature range;
- low specific weight;
- fitting up simplicity;
- working and assembling easiness;
- previous use in the transportation;
- high weatherability and resistance to sea.

As far as the materials of the boat accessories and the whole construction is concerned, plastic materials, resins, PVC and polycarbonates may be used.

It should be appreciated that the rigid, transparent bottom has the further advantage of increasing the safety of the passengers who can see the sea bottom under the boat, thus avoiding any obstacle which can cause stranding.

Another advantage is given by the use of such a bottom for lifeboats in which the sight of the sea bottom makes the search and the location of people and/or objects to be recovered more effective.

The present invention is described and illustrated according to preferred embodiments thereof, however, it should be understood that anyone skilled in the art can make modifications and/or equivalent replacements without departing from the scope of the present industrial invention.

Claims

1. A craft or boat, motorized or not, wherein it is provided with a rigid, transparent bottom (2) having impact strength and being antiscratching, indeformable, and capable to ensure a perfect visibility of the sea bottom under the boat.

2. The craft or boat of claim 1, characterized in that said rigid, transparent bottom (2) having impact strength and being antiscratching and indeformable is made of a thermoplastic polycarbonate material known under the trademark of LEXAN®.

3. The craft or boat of the preceding claims, characterized in that the section of said rigid, transparent bottom (2) may have several different shapes according to the use of the craft.

4. The craft or boat of claim 3, characterized in that said rigid, transparent bottom (2) has a V-shaped section with stabilizing fins and stiffening frames.

5. The craft or boat of claim 3, characterized in that the section of said rigid, transparent bottom (2) is a flat section.

6. The craft or boat of claim 3, characterized in that the section of said rigid, transparent bottom (2) has the shape of a gull wing.

7. The craft or boat of claim 3, characterized in that the section of said rigid, transparent bottom (2) has the shape of a catamaran.

8. The craft or boat of claim 3, characterized in that the section of said rigid, transparent bottom (2) has a circular or round shape.

9. The craft or boat of the preceding claims, characterized in that said rigid, transparent bottom (2) is secured to the hull (1) of the boat by mechanical elements (6) such as screws, rivets, nails to be riveted.

10. The craft or boat of the preceding claims, characterized in that said rigid, transparent bottom (2) is secured or glued to the hull (1) of the boat by the intermediary of rigid or elastic elements (8) of wood, metal, PRFV plastomers or elastomers, synthetic resins stiffened or not.

11. The craft or boat of the preceding claims, characterized in that said rigid, transparent bottom (2) is secured to the hull (1) of the boat by thermal or high-frequency welding by the intermediary of fabric strips (3) coated with elastomers and/or plastomers or by means of moulded or extruded flanges (5) glued by adhesives (4).

12. The craft or boat of claim 11, characterized in that said adhesives are polychloroprene, polyurethane, acrylic, cyanoacrylic or epossidic adhesives or any suitable adhesive.

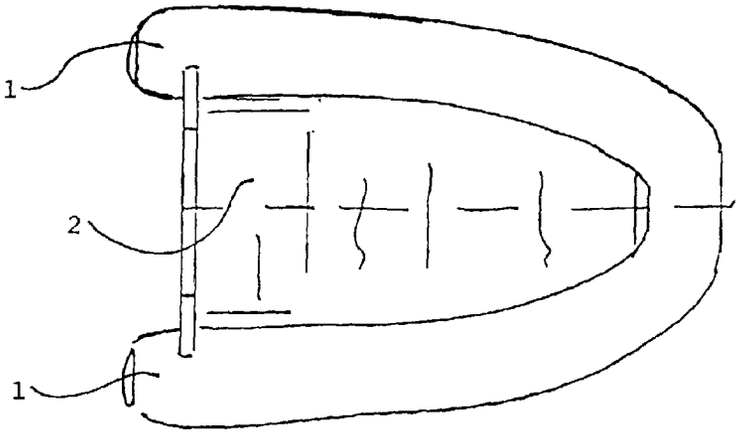

FIG. 1

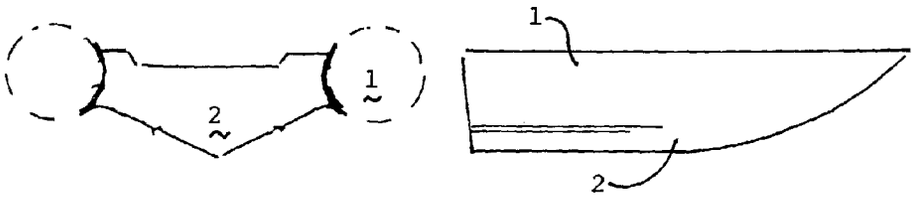

FIG. 2

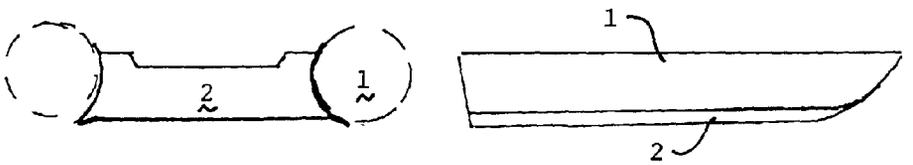

FIG. 3

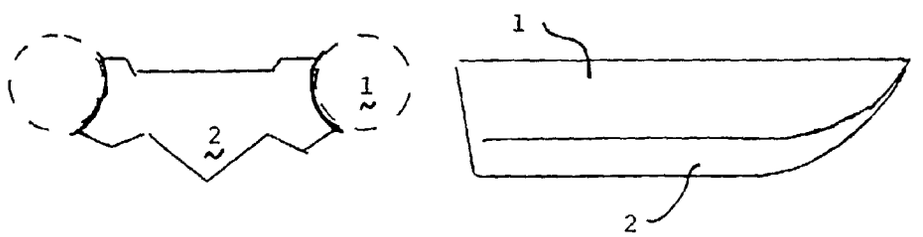

FIG. 4

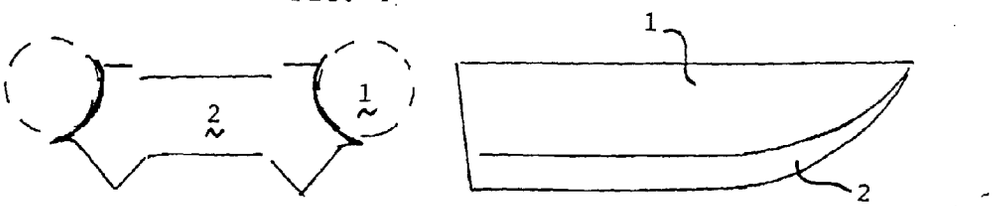

FIG.5

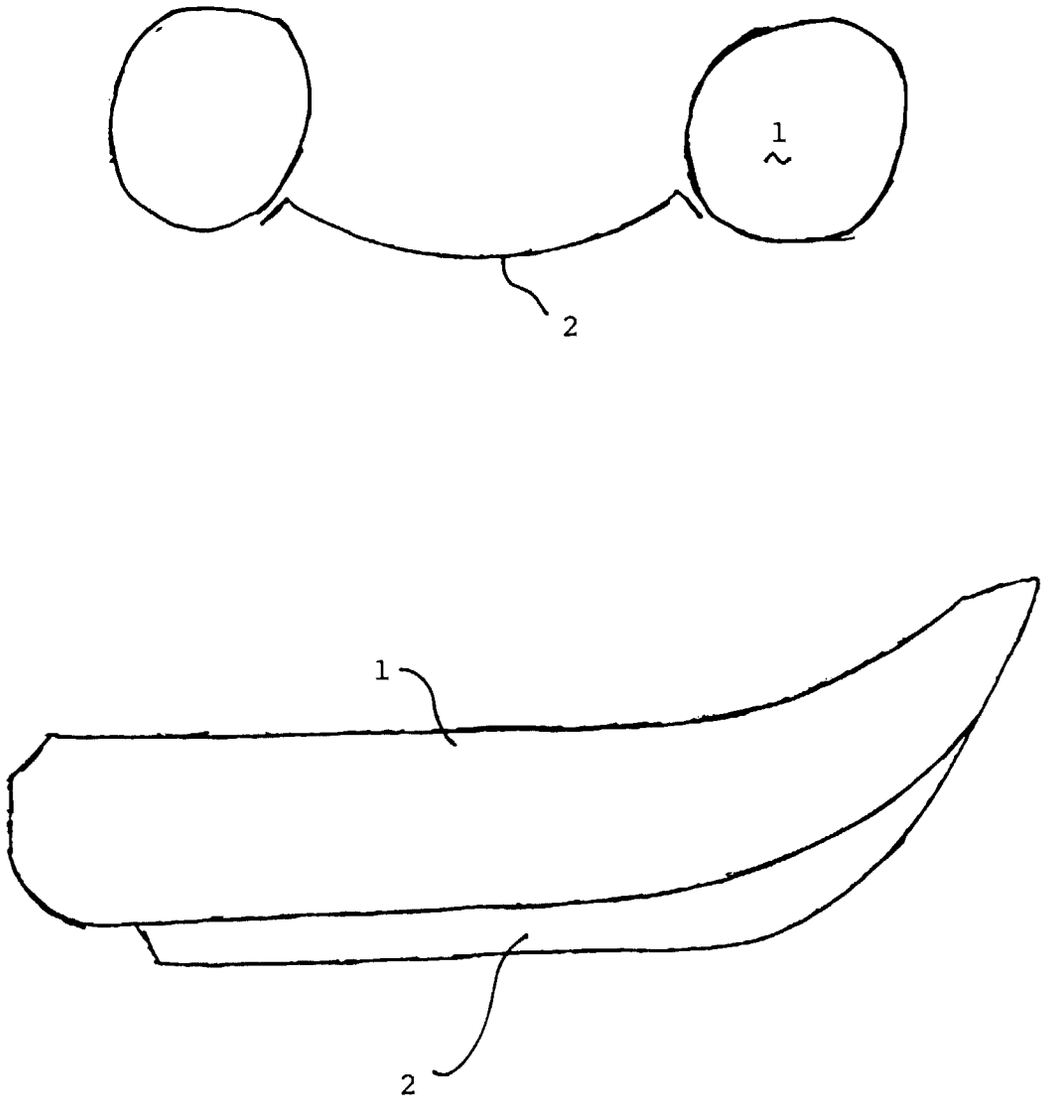

FIG. 6

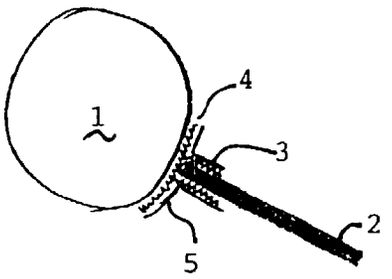

FIG. 7

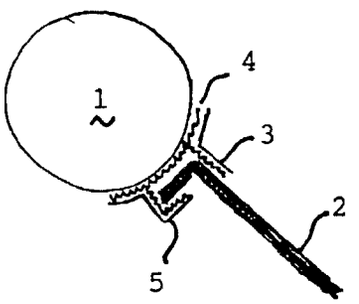

FIG. 8

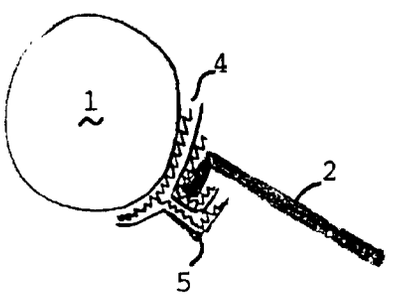

FIG. 9

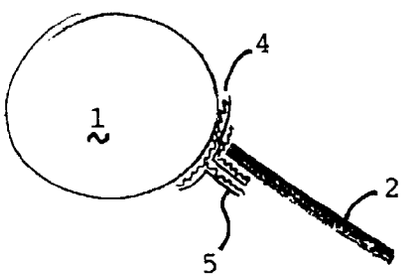

FIG. 10

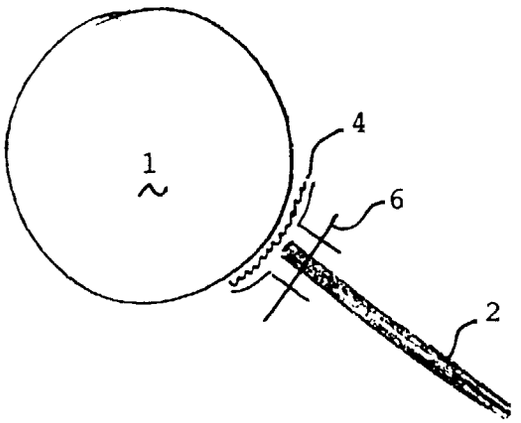

FIG. 11

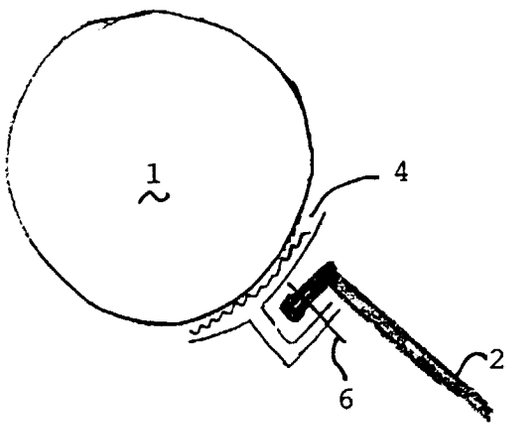

FIG. 12

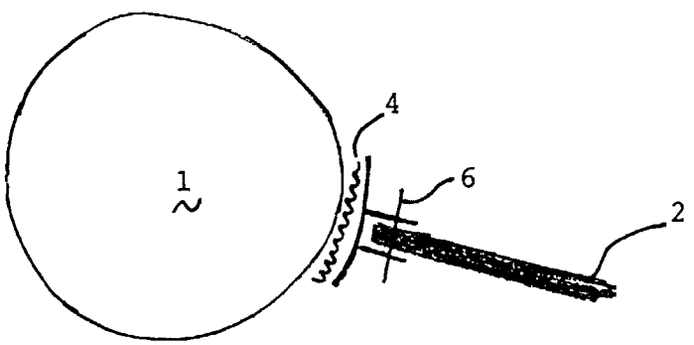

FIG. 13

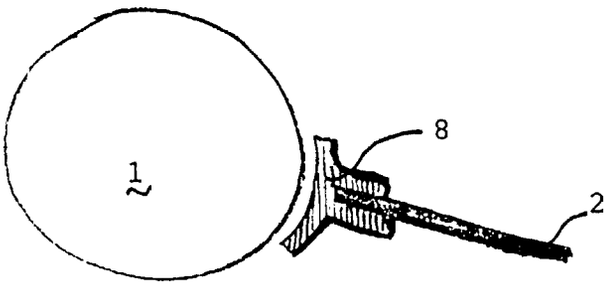

FIG. 14

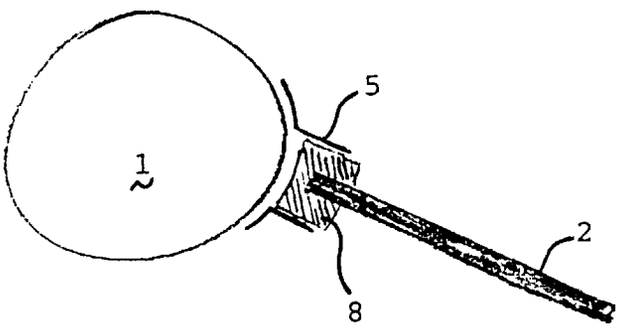

FIG. 15

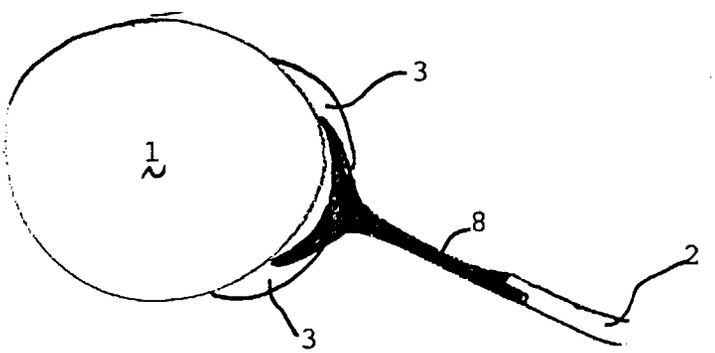

FIG. 16

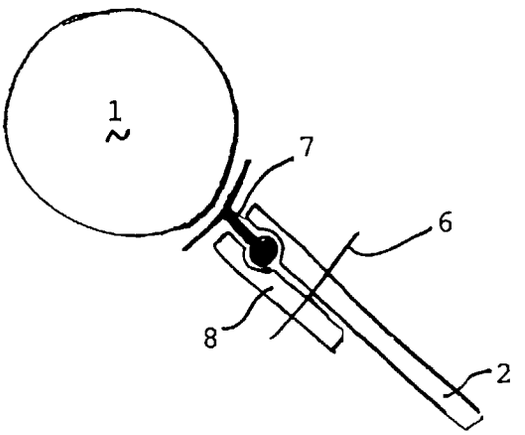

FIG. 17

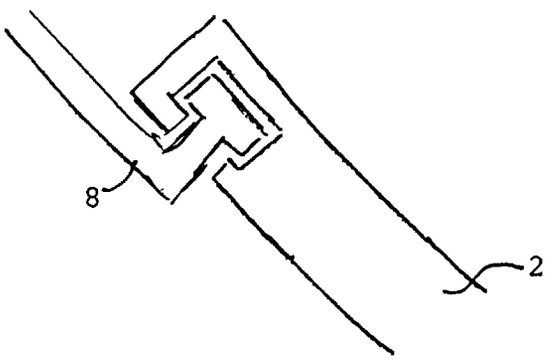

FIG. 18

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 96 83 0415

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	US-A-5 000 106 (RHENEY) * the whole document * ---	1-4,9-12 6,7	B63C11/48
X Y	GB-A-2 227 468 (MITSUI ENGINEERING AND SHIPBUILDING CO.) * figure 3 * ---	1 7	
X	GB-A-1 397 456 (ROSS WARMAFOAM LTD) * figures 1-4 * ---	1,8	
X	FR-A-2 544 685 (ALBA) * the whole document * ---	1,3,5	
X A	GB-A-1 171 591 (NORBURY AND ROWLAND) * figures 1-5 * ---	1 8	
Y	US-A-4 565 145 (MAYALL ET AL) * figure 2 * -----	6	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

B63C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 October 1996	DE SENA, A

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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