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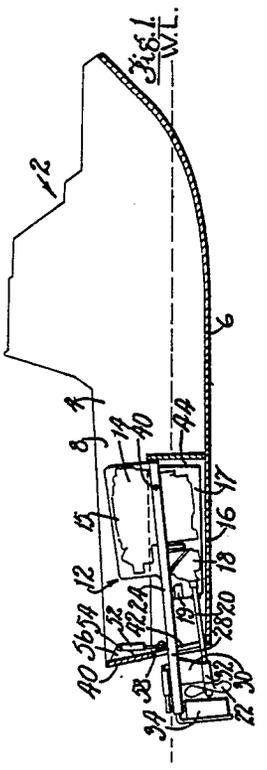
(54) A power-driven boat.

(57) A power-driven boat has a hull (4), a propulsion unit (12) having a frame (24), an engine (14) mounted on the frame (24), a propeller shaft (20) rotatably supported on the frame (24), and a gearbox (18) coupling the engine (14) and the propeller shaft (20). The engine (14) and gearbox (18) are encased in a water-tight housing (15). The propulsion unit (12) is pivotally mounted in a compartment in the hull and the compartment (44) is connected to a hole (42) in the hull, through which the propeller shaft passes. The propulsion unit (12) is pivoted about that pivotal mounting (40, 50) by a hydraulic piston-cylinder (52) to adjust the position of the propeller shaft (20) projecting through the hole (42) in the hull (4), through which hole water can, in use, freely flood the propulsion unit compartment (44).



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A Power-Driven Boat.

This invention relates to power-driven boats and is particularly, though not exclusively concerned with boats having a propeller driven by an inboard internal combustion engine.

Power boats of this type are well-known and generally have, mounted within the hull, an engine, gearbox, propeller shaft. This so-called propulsion unit is generally located on seatings and resilient mountings which are fabricated within the hull. The propeller shaft passes through a sealed bearing in the transom and in order that the propeller may be raised above the level of the water line, to allow beaching, a system of constant velocity joints is included in the drive shaft.

The installation of such engines within the hull is a labour intensive operation and demands some considerable expertise from the boat builder. It has been found that in some parts of the world maintenance and repair facilities are insufficient or non-existent and skilled labour is often not available.

According to one aspect of the invention there is provided a power-driven boat comprising: a hull with a transom, a compartment within the hull, a hole in the transom communicating with the compartment below the water line of the boat, and a propulsion unit mounted in the compartment, and having a propeller shaft extending through the hole in the transom, so that even with the shaft in the hole, the compartment is freely floodable through the hole when the boat is in the water.

According to a second aspect of the invention there is provided a power-driven boat, comprising: a hull; a propulsion unit having a frame, an engine mounted on the frame, a propeller shaft rotatably supported on the frame, and a gearbox coupling the engine and the propeller shaft, and the engine and gearbox being encased in a water-tight housing; a compartment in the hull in which the propulsion unit is pivotally mounted, and the compartment being connected to a hole in the hull, through which the propeller shaft can pass, and means for pivoting the propulsion unit about that pivotal mounting to adjust the position of the propeller shaft projecting through the hole in the hull, through which hole water can, in use, freely flood the propulsion unit compartment.

According to a further aspect of the invention there is provided a power-driven boat comprising: a hull, a propulsion unit having a propeller shaft; a compartment within the hull, in which the propulsion unit is pivotally mounted, with the propeller shaft projecting outboard through the hull; means for pivoting the propulsion unit to adjust the position of the propeller shaft.

A preferred embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, wherein:

Figure 1 is a longitudinal section view of a power boat and propulsion unit, according to the embodiment of the invention, with inessential detail omitted;

Figure 2 is a plan view of the boat of Figure 1;

Figure 3 is a longitudinal sectional view of the hull of the boat with the propulsion unit removed;

Figure 4 is a view similar to Figures 1 and 3 illustrating the method of inserting the propulsion unit into its operative position in the hull of the boat; and

Figure 5 is a perspective view of a frame of the propulsion unit.

As seen in the drawings a boat 2 comprises a hull 4 having a base or bilge 6, side walls 8 and transom 10. For supplying the power to drive the boat there is provided a propulsion unit generally indicated by the reference numeral 12. The propulsion unit 12 is supported in a free full flooding compartment 44 built into the hull 4, as will be described hereafter in detail.

The propulsion unit has an engine 14 connected by a flexible coupling 16 to a gearbox 18, from which extends a propeller shaft 20 carrying a propeller 22. The engine and gearbox are resiliently mounted within a frame 24 which is seen in plan view (Figure 2) to have a part rectangular section 26 and a single projecting arm 28. Depending downwardly from the arm 28 is a bracket 30 which carries a bearing 32 for the propeller shaft 20. The engine and gearbox units are enclosed by means of an upper watertight casing 15 and a lower watertight casing 17 fixed respectively to the upper and lower surfaces of the frame 24. A battery 19 is contained within the lower casing 17.

At the extreme end of the arm 28 is mounted a conventional rudder 34 operatively connected to a lever 38 and a hydraulic piston cylinder unit 36 cooperates with lever 38 to turn the rudder as required. The frame 24 has protruding from each side a short pivot shaft 40.

Built into the hull 4 is the open topped free-flooding compartment 44 formed by side walls 46, and an end wall 48 fixed in sealing relation to the bilge and the transom. The side walls 46 are each provided the location slots 50 seen clearly in Figure 3, and the pivot shafts 40 fit snugly within those slots. The top of the compartment 44 is above the water line indicated as WL. The transom 10 is formed with a slot 42 just slightly wider than the width of the arm 28 of the frame 24. The arm

28 and propeller shaft 20 pass freely through the slot 42 as seen in Figures 1 and 2.

In order that the attitude of the propeller may be controlled so that it can be fully immersed, as seen in Figure 1, operate as a surface propeller, or be raised above the level of the bottom of the boat for operation in shallow water or for beaching, there is provided a hydraulic piston- cylinder unit 52. The cylinder is pivotally mounted on a pin 54 fast in a bifurcated lug 56 formed on the transom, and the end of the piston is pivotally connected at 58 to a lug on the arm 28.

Thus to adjust the height of the propeller the piston cylinder unit 52 may be actuated, so the entire propulsion unit will pivot about the axis of the pivot shafts 40 in slots 50.

To assemble a propulsion unit within the hull of a boat the following sequence of operation is followed. First, the engine, gearbox, battery and propeller shaft are mounted within the frame 24 and the casings 15 and 17 are assembled to cover the unit. This may be done on site in the boatyard, or the entire fully assembled unit may be erected complete and supplied as such by the engine manufacturer. It will be noted that before assembly within the hull, the rudder and propeller are removed. The propulsion unit 12 is then hoisted above the compartment 44 by means of a crane and then tilted and lowered to guide the arm 28, propeller shaft 20 and bracket 30 through the slot 42 in the transom. The unit is further lowered by the crane until the pivot shafts 40 are located in the slots 50. Next, the pivotal connection 58 is made between the piston-cylinder unit 52 and the arm 28. The rudder and propeller are then assembled and the piston-cylinder unit 36 is connected to the lever 38. Thus the propulsion unit is readily and simply assembled within the hull.

Brush type seals may be fitted to close the slot 42 in the transom to reduce the movement of water within the free flooding enclosure 44. In order to minimise the loss of buoyancy due to the amount of water in the free flooding box, any large areas between the walls of the compartment 44 may be filled with buoyant material, e.g. expanded polystyrene, as indicated by the reference numeral 58 in Figure 2.

It has been found that by using the system as described the propulsion unit allows the installation details of the engine to be controlled by the engine manufacturer and permits the construction to be carried out in a factory rather than inside the boat's hull. The propulsion unit therefore, finds attraction where maintenance and repair facilities are lacking.

As the engine is contained within the casings 15, 17 and at least the lower part is surrounded by water in the compartment 44, a very high standard of noise insulation is provided.

Claims

1. A power-driven boat comprising: a hull (4) with a transom (10), a compartment (44) within the hull (4), a hole (42) in the transom (10) communicating with the compartment (44) below the water line of the boat, and a propulsion unit (12) mounted in the compartment (44), and having a propeller shaft (20) extending through the hole (42) in the transom, so that even with the shaft (20) in the hole (42), the compartment (44) is freely floodable through the hole (42) when the boat is in the water.

2. A power-driven boat, comprising: a hull (4); a propulsion unit (12) having a frame (24), an engine (14) mounted on the frame (24), a propeller shaft (20) rotatably supported on the frame (24), and a gearbox (18) coupling the engine (14) and the propeller shaft (20), and the engine (14) and gearbox (18) being encased in a water-tight housing (15); a compartment in the hull in which the propulsion unit (12) is pivotally mounted, and the compartment (44) being connected to a hole (42) in the hull, through which the propeller shaft passes, and means (52) for pivoting the propulsion unit (12) about that pivotal mounting (40, 50) to adjust the position of the propeller shaft (20) projecting through the hole (42) in the hull (4), through which hole water can, in use, freely flood the propulsion unit compartment (44).

3. A power-driven boat comprising: a hull (4), a propulsion unit (12) having a propeller shaft (20); a compartment (14) within the hull, in which the propulsion unit (12) is pivotally mounted, with the propeller shaft (20) projecting outboard through the hull; means (52) for pivoting the propulsion unit (12) to adjust the position of the propeller shaft (20).

4. A power-driven boat as claimed in claim 1, wherein the propulsion unit (12) is pivotally mounted within the compartment (44) to allow adjustment to the position of the propeller shaft (20).

5. A power-driven boat as claimed in claim 4, wherein there is means (52) for pivoting the propulsion unit (12).

6. A power-driven boat as claimed in claim 2, 3, or 5, wherein the means for pivoting the propulsion unit (12) includes a hydraulic piston-cylinder (52).

7. A power-driven boat as claimed in any preceding claim, wherein the compartment (44) is formed on one side by the hulls transom (10).

8. A power-driven boat as claimed in any preceding claim wherein the compartment (44) is partly filed with buoyant material (58).

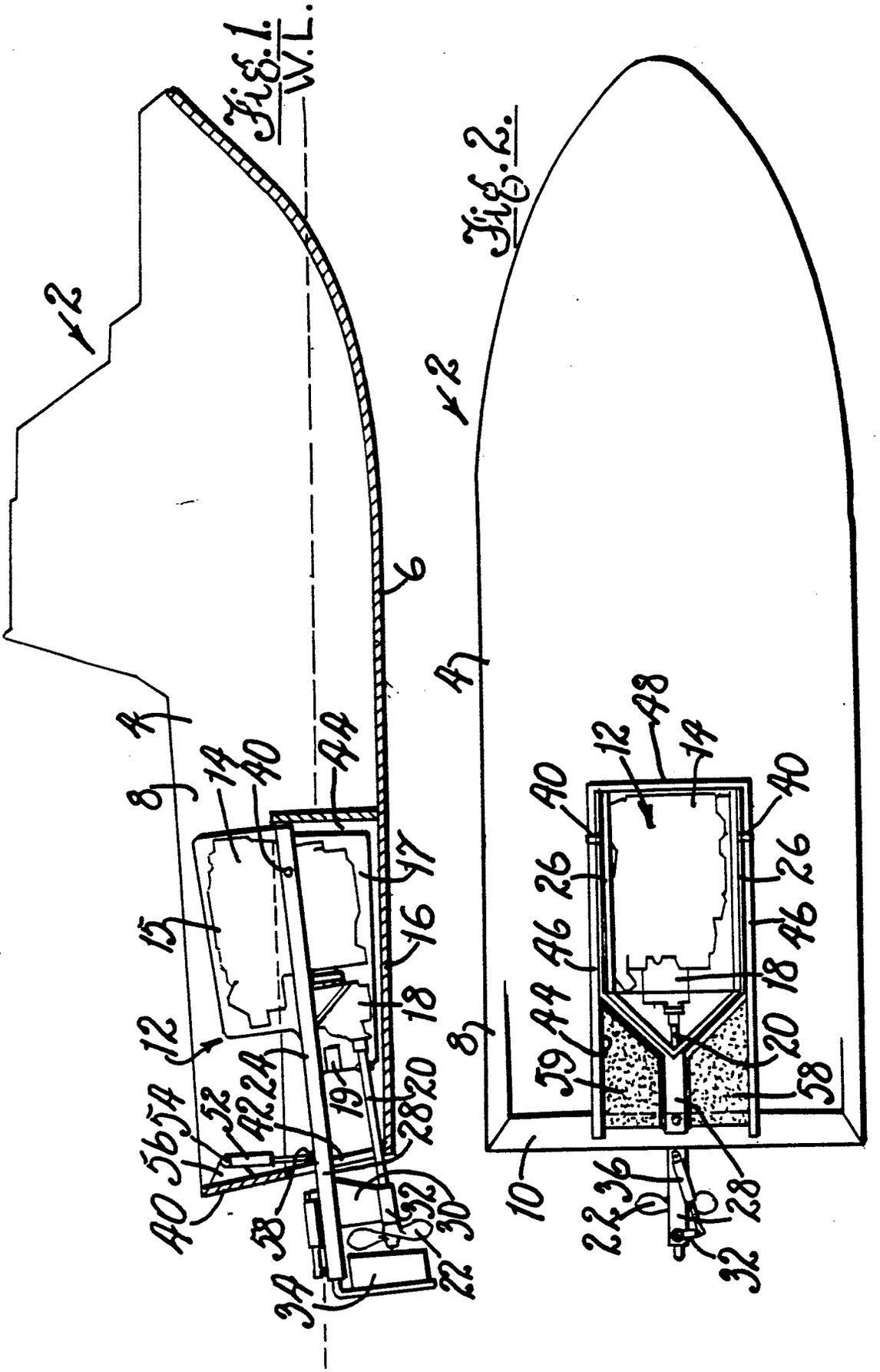


Fig. 3.

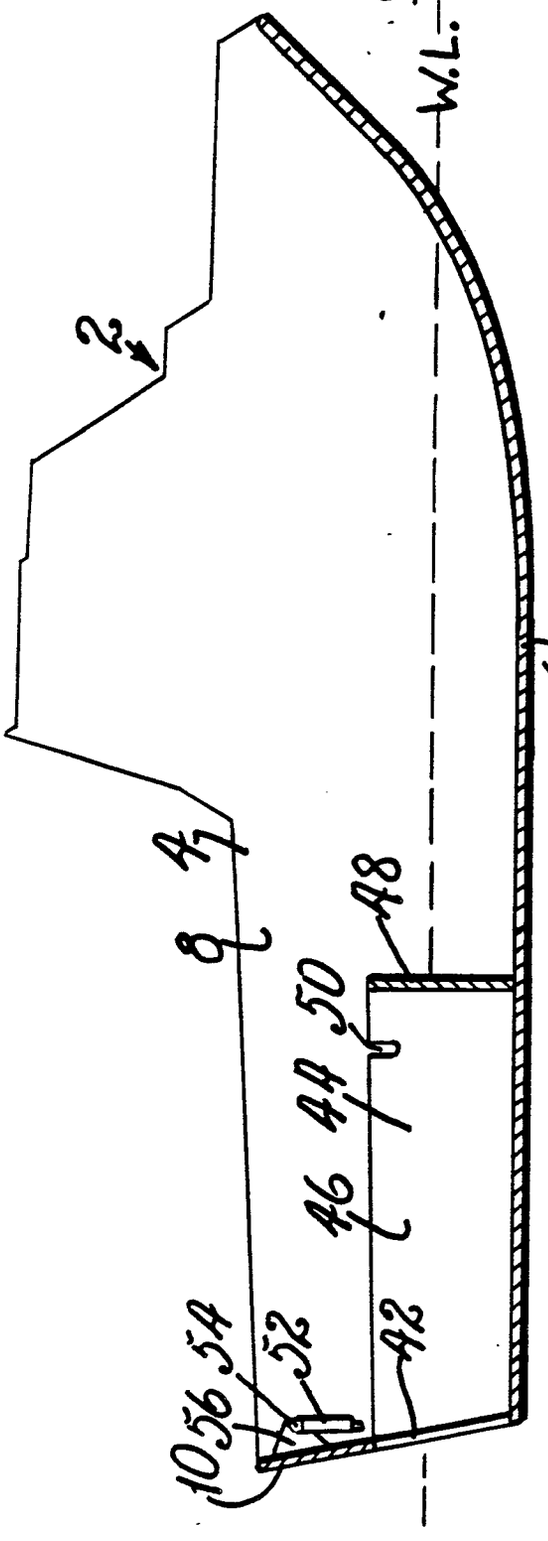
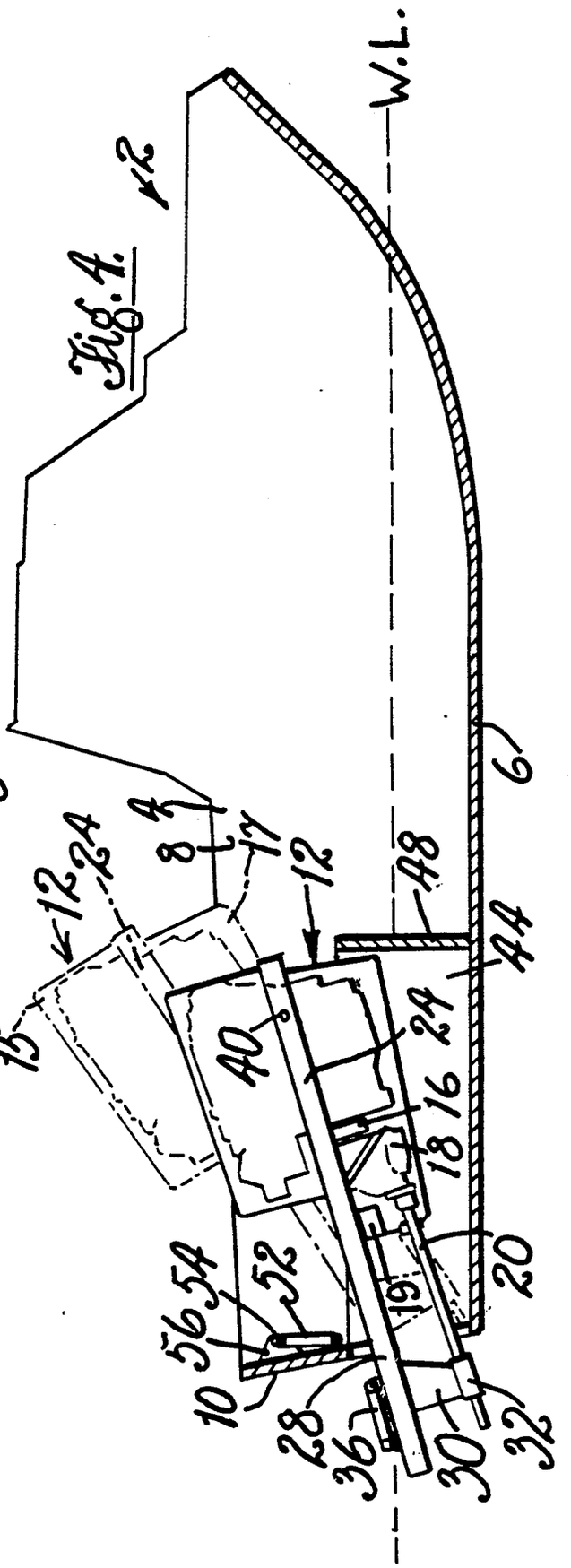


Fig. 4.



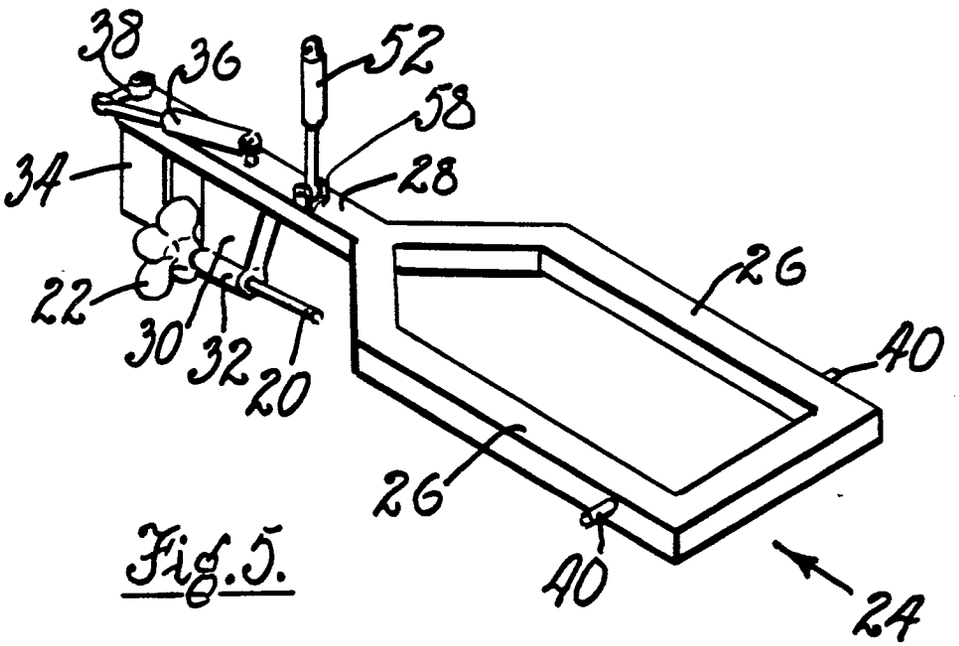


Fig.5.

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EUROPEAN SEARCH REPORT

. Application number

EP 88305636.8

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 4)
A	GB - A - 1 114 794 (BIRCH, SCOTT) * Totality * --	1-4	B 63 H 21/30
A	US - A - 3 382 839 (KIEKHAEFER) * Fig. 1-3 * --	1-4	
A	DE - A1 - 3 013 609 (KANZAKI KOGYU-KOKI MANUFACTURING CO. LTD.) * Fig. 1 * --	1,2,7	
A	DE - B2 - 2 310 912 (ERIKSSON) * Totality * ----	1,2,7	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 63 H
B 63 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	13-09-1988	SCHMICKL

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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