(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 038 764 A1

(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 158(3) EPC

(43) Date of publication:
27.09.2000 Bulletin 2000/39

(21) Application number: **98947562.9**

(22) Date of filing: **19.10.1998**

(51) Int. Cl.[7]: **B63H 21/21**

(86) International application number:
PCT/ES98/00282

(87) International publication number:
WO 99/21759 (00.00.0000 Gazette 1999/18)

(84) Designated Contracting States:
BE DE DK FI FR GB GR IE IT NL PT SE

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(54) **DEVICE FOR CONTROLLING THE OPERATION OF A MOTOR-REDUCER INVERTER UNIT FOR SPORT AND/OR FISHING WATER-CRAFTS**

(57) Device for controlling the operation of a motor-reducer inverter unit for sport and/or fishing water-crafts comprising a frame in the front face which appears an actuation lever mounted in a jacketed axis where a spring is also arranged; on said axis a lever of different lengths is mounted with respect to the rotation axis presenting at its extremities two protuberances, one of which is coupled in an opening of an eccentric mounted in parallel axis with respect to the former and of which the opening is aligned with the axis. There are also mounted on said axis an accelerator element and an extremity sliding plate, the free end of the axis being coupled into one of the openings of the sliding plate, said plate having also other openings to receive slidingly one of the pegs of the cam; in one of the other two openings the coupling of a positioning and regulating screw belonging to the accelerator member is selected; it has extreme drilled holes wherein is fixed the respective end of the accelerator cable, whereas the extremity of the inverter cable is fixed in a protuberance of the eccentric; when actuating the lever, the eccentric can take three positions which determine a forward, reverse of neutral function of the reducer-inverter.

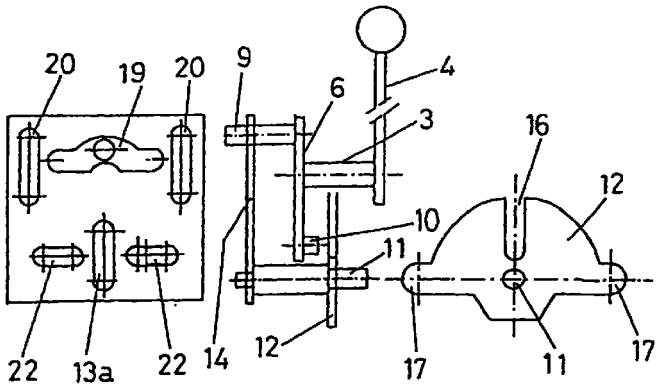

Fig.3

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Description

[0001] The purpose of the present invention is an operation control device in an engine reversion-reduction unit for sporting and/or fishing boats.

[0002] As State of the Art we nay mention devices of the same which are constituted by several components related with an injected aluminium structure, the inconvenient being their short life-time in marine environments, as well as the lack of robustness of the equipment, which is due to the fact that the material they are made of, aluminium, is not the most suitable because of its easy oxidation and also because this aluminium structure serves as a support for the transmission, which is entirely made from steel and at most galvanised steel, so that in marine environments the steel accelerates the oxidation of aluminium.

[0003] There are also plastic devices, but the lack of robustness makes theses devices little reliable for the function they are meant for.

[0004] In order to resolve all these problems, the device subject of the invention has been designed built entirely in stainless steel and bronze, achieving a reliable, sure unit, which is hardwearing in the marine environments where it will work. At the same time the mechanical structure is tougher and more durable.

[0005] According to the invention the device is constituted by a housing that covers the mechanical elements themselves to achieve the following functions by operating a lever: clutching, declutching, reversion and regulation of the revolutions of the engine, as a lever is moved in one direction or another and its longer or shorter range.

[0006] Along its shift the lever has got perfectly defined movements, in front as well as behind. In first place his has a shift until the order reversion clutch is carried out, and from this point onward begins the action on the regulator or the injection pump of the boat engine, thus changing the revolutions of the engine and consequently the speed of the same.

[0007] Another function of the device consists in effectuating a motor test without the need of using the driving system of the reverser-reductor, i.e. when the boat is laid up the engine is tested without being driven by the propeller.

[0008] In order to understand more easily not only the construction but also the proper use of the device subject of the invention, in the following a practical example of realisation, being this execution merely enunciate and in no case limited to the same, as shown on the joint drawings; where:

Figure 1.- Shows an elevation view of the device subject of the invention.

Figure 2.- Shows a side view of figure 1.

Figure 3.- Shows a view with the constituent parts of the cam, eccentric and lever, as well as the connection between these elements.

[0009] The device comprises a frame 1, on the facing side of which there is a plate with a pawl 2 near to the lined shaft 3 of an actuating lever 4 of the device.

[0010] The shaft is mounted and positioned in relation to an inner spring 5, that presents and facilitates the acceleration function without declutching, as will be described later.

[0011] The inner mechanism of the device comprises the fitting on the shaft 3 of a cam 6 with different lengths 7 and 8 with relation to the shaft, and on these there are mounted the final clickers 9 and 10.

[0012] On the frame another shaft 11 is available, on which there are fitted: an eccentric 12, a flat 13 and a final slide plate 14 through a vertical gap 13A made on this plate, topping the mentioned shaft at its free final threaded area with a ring and a binding nut that defines the centre of the eccentric and the flat 13 called accelerator, the position of which can also be modified.

[0013] The eccentric 12 presents at its lower end a trapezoid form 15, which is defined by the correspondent sides shown in figure 1. The eccentric is provided of a final gap 16 adjusted to the centre and two opposite side lobes 17 where the reversion cable is duly fixed.

[0014] The slide 14 also presents a gap 19 for fitting of the clicker 9 and other side gaps 10 to glide on the frame through this half-shaft fitted by nuts 21.

[0015] The slide 14 also disposes of two gaps 22 through which the positioning and regulating screw 23 that belongs to the flat 13 is coupled.

[0016] The flat 13 also presents final drills 24 which allow fitting and/or regulating the end of the cable 25 of the accelerator.

[0017] The device also presents a lower part 26 where two bolts 27 are provided in the opening 28 with a safety catch 29 which determine the three positions of the eccentric together with the spring 30.

[0018] Furthermore, the lower part 26 presents at its open end a right angle bracing 31 with some opening or gaps where the cables of the reverse and accelerator a guided.

[0019] The operating device of the reversion-reduction motor of the invention, in spite of its single lever operation, presents a series of working and disposition peculiarities that are detailed as follows.

[0020] The movement of the lever is transmitted through a lined shaft to a cam with two clickers, one of these clickers transmitting the movement to the eccentric that pivots and has assigned three positions depending on the reductor-reverser, ahead, aback or declutching. These three positions are determined by the design of the lower part and by the teeming of the eccentric, and with the pressure of a spring, that is transmitted through a catch which causes the movements of the lever and the eccentric to be perfectly notorious and defined.

[0021] The eccentric itself and through a bronze bolt not shown on the drawings, and normalised cables transmits the movement of the operating lever of the unit to the reductor-reverser. This system, due to its design, has the advantage that it carries out the two possible functions in operation of a reductor-reverse, i.e. it is able to "push" or "pull", due to the two connections provided to the sliding plate. This disposition has the advantage that it is able to adapt the movement of the lever in the desired order and the direction of movement of the lever in the desired order, and the sense of the boat whatever the position of the control is, thus achieving a logical operation.

[0022] When the position of the order clutch-reversion in the desired sense of the boat is reached, the lever still disposes of a run that enables it to act on the revolution regulating cable of the engine transmitting the movement of the lever to the acceleration slide and from there to the accelerator where the cable is connected by means of the correspondent positioning screw. Furthermore, the acceleration mechanism disposes through the slide of a system which enables it to use the movement of the same either to push the cable or to pull it, changing the position of the correspondent positioning and regulation screw, thus adapting all systems existing on the market. The shift of the cable is also controllable thanks to the two clickers provided at the end of the accelerator for admission of a bronze bolt not shown on the drawings.

[0023] In case that the operator wants to revert the sense of the boat the only thing he has to do is to move the lever in the opposite direction of where it is at the time and regulate the revolution rate of the boat.

[0024] As has been mentioned before, when the operating lever is declutched or freed with relation to the reductor-reverser, the engine can be tested at different revolutions, while the lever only remains connected to the accelerator. During this operation the paw mentioned in the description acts directly keeping the lever disconnected from the eccentric.

Claims

1. Operation control device in an engine reversion-reduction unit for sporting and/or fishing boats; characterised because it comprises a frame on the front side of which appears an operation lever mounted on a lined shaft where a spring is also available; on that shaft there is mounted a cam with different lengths with regard to the rotation axis presenting at its ends two lobes or clickers one of which is coupled in an opening of an eccentric mounted in a parallel axis to the previous one and the opening of which is aligned with the shaft, and on this shaft there also mounted the accelerating place and a final slide plate, being coupled to the free end of the shaft in one of the openings which the slide plate presents, this plate presenting also other openings in one of which is coupled with shifting power one of the clickers of the cam and in one of the other two openings the coupling of a positioning and regulating screw is selected which belongs to the accelerator plate, provided with two final drills where the respective end of the accelerator cable is fixed, while on the eccentric there is also fixed on a lobe the end of the reversion cable; at the operation of the eccentric lever there are three positions available which determine the function of the reductor-reverser ahead, aback and declutch.

2. Device according to claim 1 characterised because, in order to determine the three positions of the eccentric intervenes the pressure a spring transmits to a safety catch which makes that the movements of the lever and the eccentric are perfectly defined.

3. Device according to claim 1 characterised because, when the lever is declutched at every operation with regard to the reductor-reverser, the engine is tested at different revolutions connecting the lever to the accelerator, and furthermore the lever is also connected to a near pawl which disconnects the lever from the eccentric.

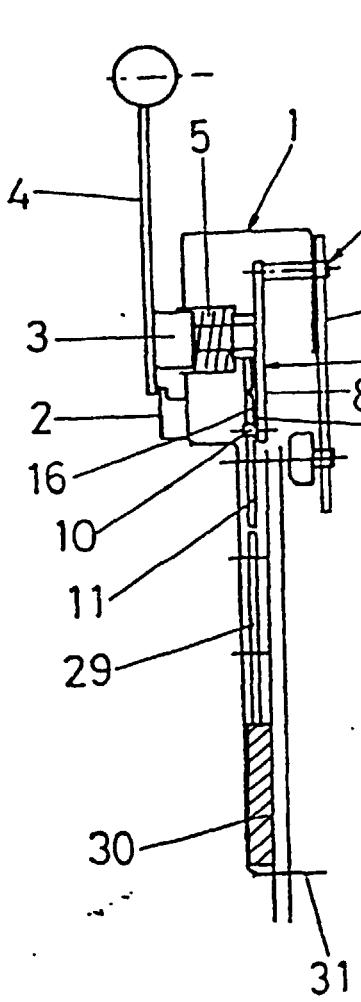
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Fig.2

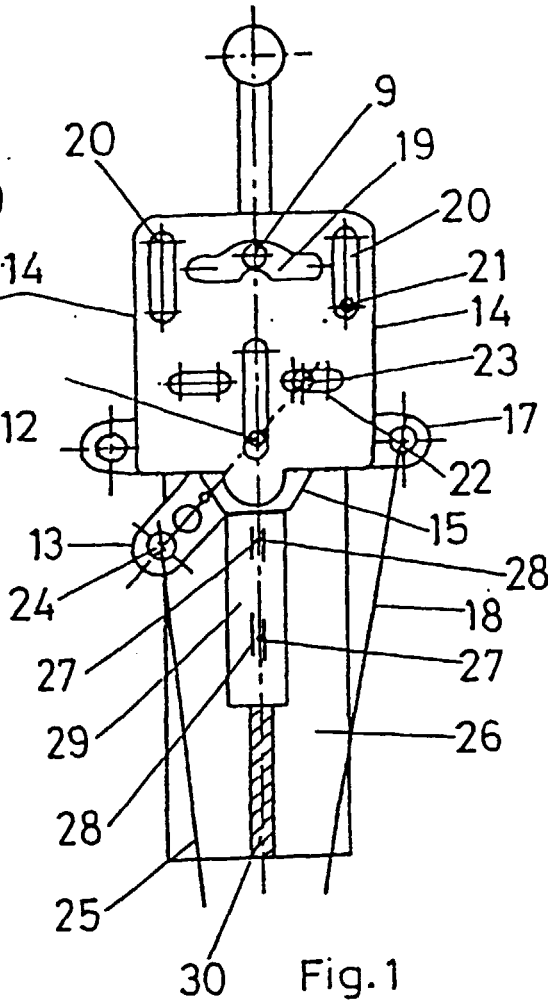
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Fig.1

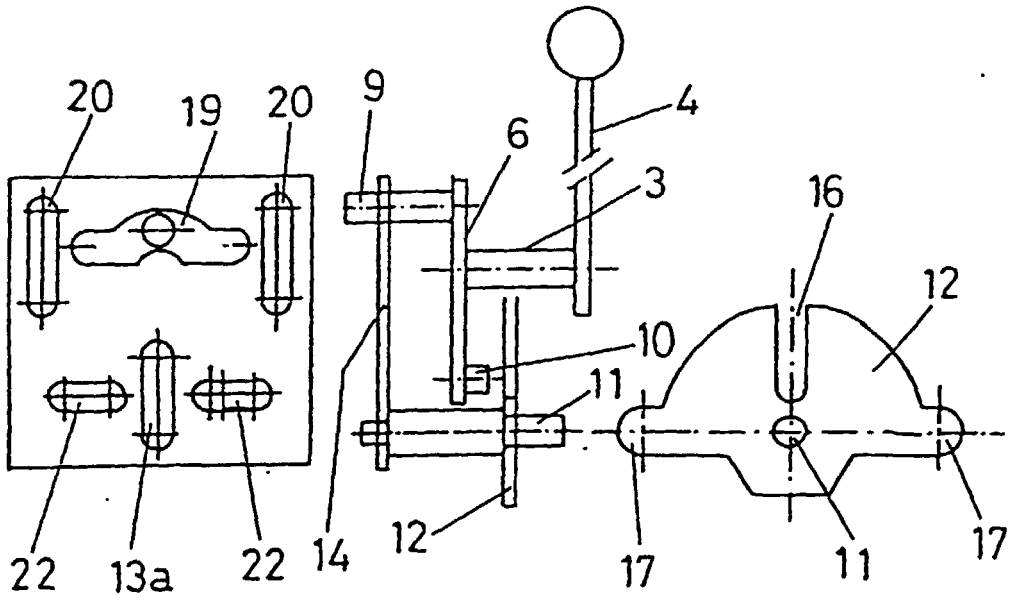

Fig.3

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ES 98/00282

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4951520 A	28.08.1990	US 5188206 A	23.02.1993
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Form PCT/ISA/210 (patent family annex) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 98/ 00282

A. CLASSIFICATION OF SUBJECT MATTER [6]:
IPC6 B63H21/21

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)
IPC6 B63H

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 practicable, search terms used)
EPODOC, CIBEPAT, WPI, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4951520 A (PRINCE) 28 August 1990 (28.08.90) See the whole document	1-3
X	US 4144956 A (BABA) 20 March 1979 (20.03.79) See the whole document	1-3
A	US 4648497 A (PRINCE) 10 March 1987 (10.03.87) See the whole document	1-3
A	US 4898045 A (BABA) 6 February 1990 (06.02.90)	

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 February 1999 (19.02.99)	24 February 1999 (24.02.99)
Name and mailing address of the ISA/ S.P.T.O Facsimile No.	Authorized officer Telephone No.

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