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(54) Control panel for a domestic appliance

(57) The invention refers to a control panel for a domestic appliance in which the casing display and control elements are fitted which are mechanically and/or electrically coupled with a printed circuit board in a pick-up casing and/or are mechanically linked. The assembly of the control panel can be greatly simplified by the pick-up casing consisting of two shell parts which are connected on one side by means of tape hinges to form one piece and are closed on the opposite side by means of latching elements, in that the printed circuit board is held in position in the isolating area of the closed shell parts by means of fixing elements and in that in the isolating area there is an additional pick-up for a plug to the printed circuit board.

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Description

[0001] The invention refers to a control panel for a domestic appliance in whose casing are built-in display and control elements which are coupled mechanically and/or electrically and/or are in a linkage line to a printed circuit board in a pick-up casing.

[0002] The control panel of a domestic appliance can be equipped with display and/or control elements depending on the type of use. Only the design of the domestic appliance will be indicated, such as dishwasher, washing machine, tumble dryer, electric oven, microwave oven, refrigerator, freezer and similar. In this, display lamps, program switches, buttons and similar are built into the front panel of the switch panel casing often described as a control panel box, which is coupled in different ways mechanically and/or electrically to a printed circuit board or are in a linkage line. This requires a complicated design and extensive assembly.

[0003] The task of the invention is to reduce the type of outlay required in parts and assembly as mentioned at the start for construction of a control panel of a domestic appliance.

[0004] This task is solved by the invention as the pick-up casing consists of two shell parts which on one side are solidly connected by a tape hinge and on the opposite side are closed using locking elements, the printed circuit board is held in a position in the isolating area of the closed shell parts by means of retaining elements and in addition there is a pick-up for a plug to the printed circuit board in the isolating area.

[0005] To pick up and position the printed circuit board, an additional part is required which is closed after the printed circuit board is brought in. The plug can simply be connected in the isolating area to the printed circuit board and the connection is thus simplified and made easier.

[0006] The pick-up casing in the casing of the control panel is fastened in a known way by there being fixing elements in the casing of the control panel for the pick-up casing with the printed circuit board equipped with reciprocal fixing elements. The pick-up casing thus takes on additional functions which simplify the assembly of the control panel.

[0007] Additional embodiments are used for the same purpose and are identified by the shell part facing the front side of the casing having latch locators for key elements which are adjustably placed in openings in the front side of the casing or by the shell part facing the front side of the casing having shaped guide sleeves for the key plungers of the key elements which are adjustably placed in openings in the front side of the casing and being braced by spring elements in the shell part and working together with momentary contact switches on the printed circuit board, and by the shell part facing the front side of the casing having formed shielding sleeves which protrude into openings in the front side of the casing and hold light emitting diodes which are electrically connected to the printed circuit board.

[0008] The pick-up casing with the two shell parts can be produced economically with a simple tool after being designed if it is planned for both shell parts to be manufactured as a single plastic injection moulded part connected to each other in a stretched open position over a tape hinge and on the free sides of the shell parts facing away from the tape hinges there being formed latch elements designed for each other to close the pick-up casing.

[0009] The invention will be described in closer detail using the embodiments shown in the figures. The figures show the following in section:

Fig. 1 a pick-up casing built fitted into a control panel casing with a printed circuit board, where the closing position in particular of both shell parts of the pick-up casing can be seen

Fig. 2 the fitting position of the pick-up casing in the control panel casing where the connection and the positioning of the printed circuit board in particular can be seen in the pick-up casing and

Fig. 3 the inclusion of additional functions of the pick-up casing of the printed circuit board after fitting the pick-up casing into the control panel casing.

[0010] Only the front cover part of the casing 10 of the control panel is shown which can have a field for lettering 11 on the visible side and can have openings 12 for the necessary display and/or control elements 13.

[0011] As shown in figures 1 to 3, the pick-up casing 30 for a printed circuit board 20 has two shell parts 31 and 32 which are connected to each other as one part by tape hinges 33.

[0012] The tape hinges 33 allow the manufacture of both shell parts 31 and 32 in the open position as a single plastic injection moulded part. If the printed circuit board 20 is inserted, then the shell parts 31 and 32 are clapped together and connected to each other on the free sides opposite to the tape hinges 33 by means of latching elements 34 and 35 designed for each other and aligned with each other so that the pick-up casing 30 can close.

[0013] In addition, known fixing and reciprocal fixing elements can be applied to the casing 10 and the pick-up casing 30 in a known way so that the pick-up casing 30 can be fixed in the casing 10 of the control panel. The design of these fixing and reciprocal fixing elements have the widest range of forms. Thus screw, latch or resilient corrugated packing strip connections or similar can be used.

[0014] As shown in Figures 2 and 3, the printed circuit board 20 is positioned in the area of the isolating level of

both shell parts 31 and 32 of the pick-up casing by retaining elements 37, 38 and 42, 43 so that these occupy a defined position in the pick-up casing 30.

[0015] When closed, the pick-up casing 30 has a pick-up 45 in which a plug 36 is inserted and can thus be connected to the printed circuit board 20. In this position, the printed circuit board has connection contacts. The plug 36 can be additionally held in the pick-up 45.

[0016] As shown in Figure 2, the shell side 31 facing the front side of the casing 10 can take on additional functions to simplify the assembly of the control panel. Thus a key element 14 adjustably inserted in an opening 12 of the casing 10 can be latched into a latch locator 39 in the shell part 31 and thus take over the fixing of this in the control panel.

[0017] If there is a momentary contact switch 40 on the printed circuit board 20, then this can be activated using the key plunger 16 of an additional key element 15. On the shell part 31 there is a formed guide sleeve 41 in which the key plunger 16 is fed. The key element 15 is adjustably guided into an opening 12 in the casing 10 and a spring element 18 slid onto the key plunger 16 braces on the key element 15 and the shell part 31.

[0018] If there is a light emitting diode 17 connected electrically to the printed circuit board 20, then this can be picked up by a shielding sleeve 44 of the shell part 31, which prevents light shining over from adjacent light-emitting diodes or similar optical display elements. The shield sleeve 44 protrudes at least partly into the allocated opening 12 of the casing 10 which can also be transparently covered by the lettering field 11.

[0019] As can easily be deduced, additional functional parts can be formed on the shell parts 31 and 32 of the pick-up casing 30, which simplify the assembly of the control panel. This is promoted by both shell parts 31 and 32 being able to be manufactured in an open position with simple tools.

Claims

1. Control panel for a domestic appliance, in which the casing display and control elements are fitted, which are coupled mechanically and/or electrically with a printed circuit board located in a pick-up casing and/or are mechanically linked,
   characterised in that

   the pick-up casing (30) consists of two shell parts (31, 32) which are connected on one side to form one piece by means of tape hinges (33) and which are closed on the opposite side by means of latching elements (34, 35),
   in that the printed circuit board (20) is held positioned in the isolating area of the closed shell parts (31, 32) by means of fixing elements (37, 38; 42, 43) and in that in the isolating area there is an additional pick-up (45) for a plug (36) to the printed circuit board (20).

2. Control panel according to claim 1
   characterised in that

   in the casing (10) of the control panel there are fixing elements equipped with reciprocal fixing elements for the pick-up casing (30) with the printed circuit board (20).

3. Control panel according to claim 1 or 2,
   characterised in that

   in the shell part (31) facing the front side of the casing (10) there are latch locators (39) for key elements (14) which are adjustably inserted in openings (12) in the front side of the casing (10).

4. Control panel according to one of the claims 1 to 3,
   characterised in that

   in the shell part (31) facing the front side of the casing (10) there are formed guide sleeves (41) for the key plungers (16) of key elements (15) which are adjustably fed through openings (12) in the front side of the casing (10) which are braced by means of spring elements (18) on the shell part (31) and which work together with key momentary contact switches (49) on the printed circuit board (20).

5. Control panel according to one of the claims 1 to 4,
   characterised in that

   on the shell part (31) facing the front side of the casing (10) there are formed shield sleeves (44) which protrude into openings (12) in the front side of the casing (10) and hold light emitting diodes (17) which are electrically connected to the printed circuit board (20).

6. Control panel according to one of the claims 1 to 5,
   characterised in that

   both shell parts (31, 32) are manufactured as one piece connected in an open position by a tape hinge (33) as a plastic injection moulded part and in that on the free sides of the shell parts (31, 32) facing away from the tape hinges (33), there are formed latching elements (34, 35) designed for each other for closing the pick-up casing (30).

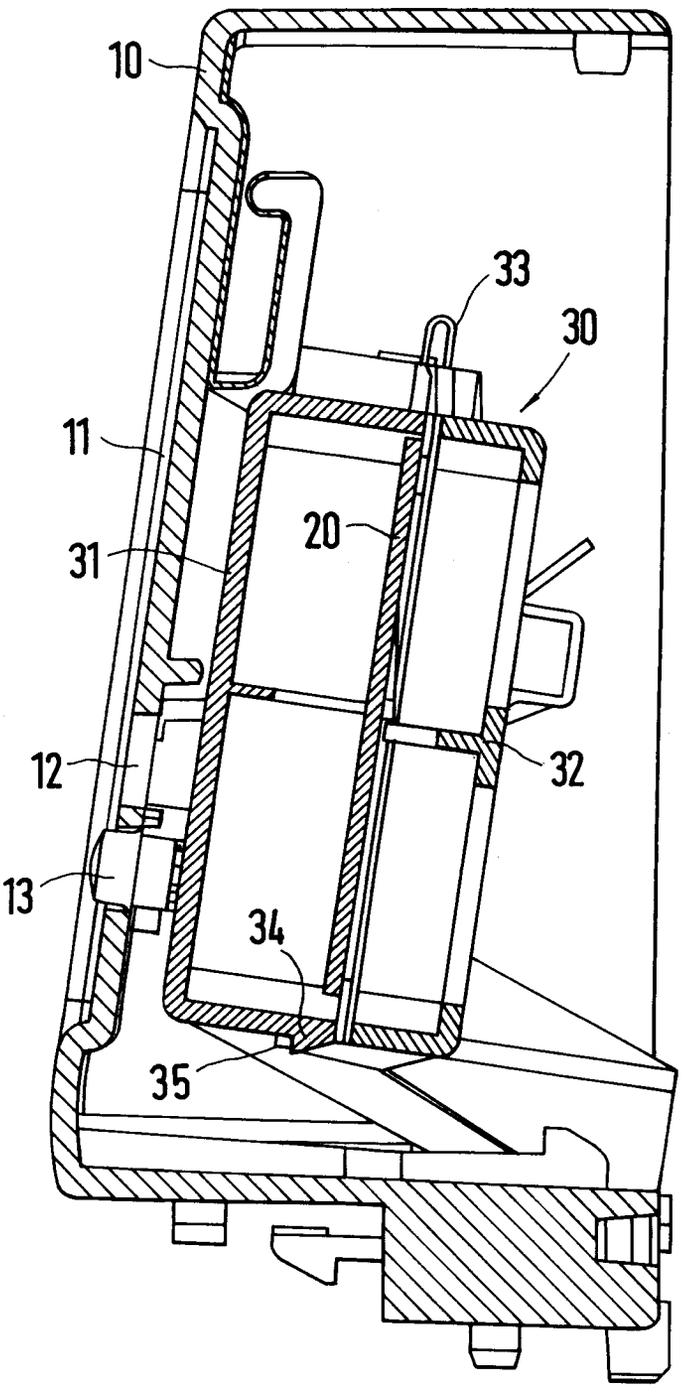

Fig.1

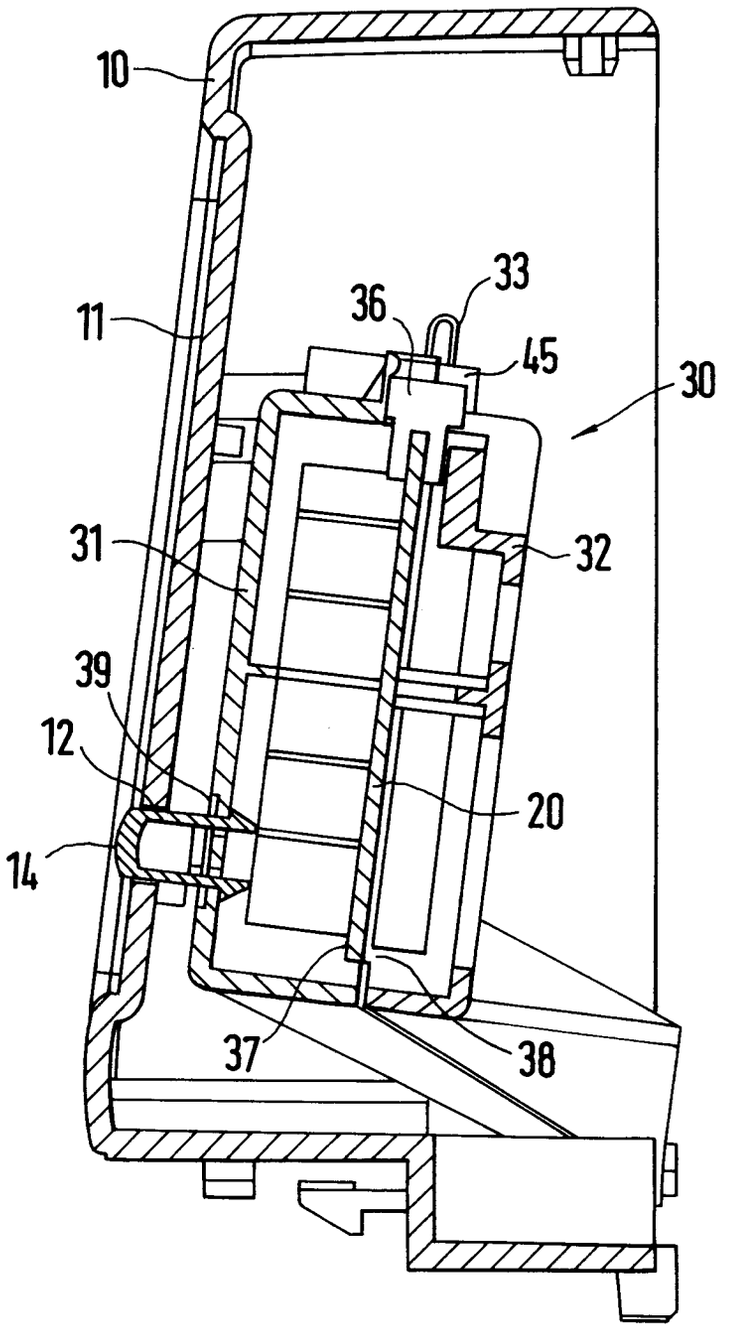

Fig.2

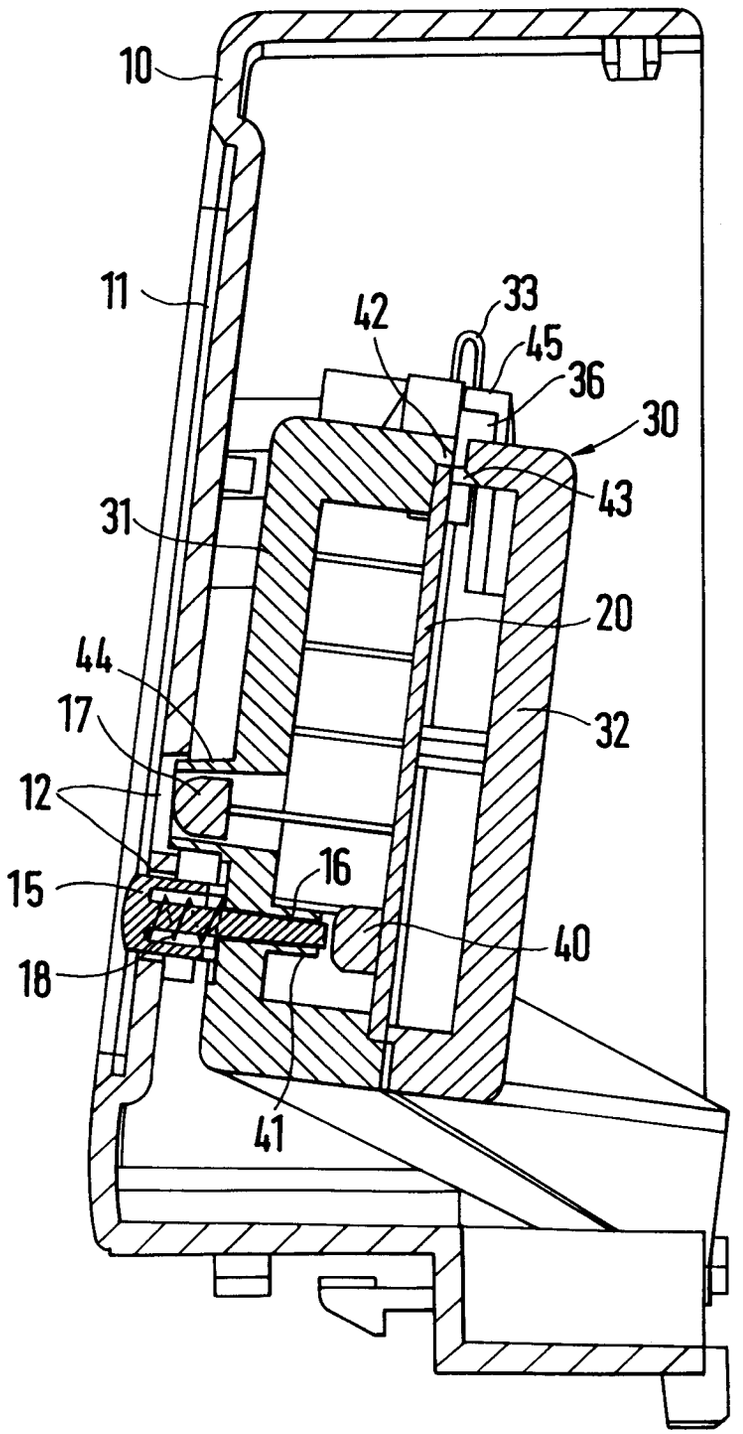

Fig.3

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EUROPEAN SEARCH REPORT

Application Number
EP 99 10 4329

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)
Y	CA 2 168 609 A (GEN ELECTRIC) 5 October 1996 * page 3, line 25 - page 4, line 29; figures 2-5 * ---	1-6	A47L15/42 D06F39/12
Y	US 5 430 612 A (SIMON ERNST-ULRICH ET AL) 4 July 1995 * column 3, line 48-68 * * column 7, line 7-25 * * column 10, line 51-58 * * claims 1,6,7; figures 1,18 * -----	1-6	

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

A47L
D06F
F25D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	12 July 1999	Laue, F

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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12-07-1999

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