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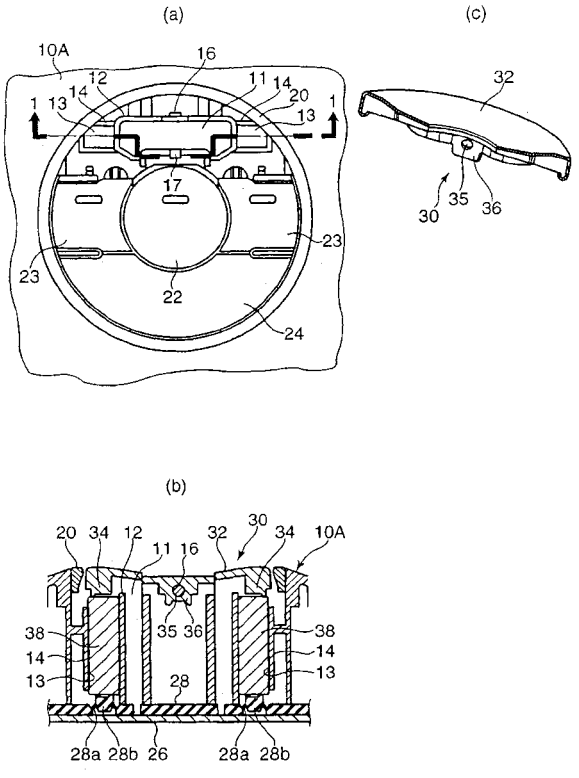
(54) Operating panel and method for manufacturing the same

(57) The invention relates to an operating panel used in vehicles. A first panel (10A) and a second panel (10B) are manufactured using common dies. The first panel (10A) comprises a fit portion for switch operating devices (e.g. buttons) including a rotation support axis (16, 17) substantially parallel to the front surface of the panel. A rotational switch operating device (30) is mounted around the rotation support axis (16, 17) in a rotatable manner. The second panel (10B) comprises a fit portion for mounting a pushing switch control device (40) in a manner slideable in the direction perpendicular to the front surface. The outer shape of the rotational switch operating device (30) and that of the pushing action type switch operating device (40) are unified by forming using common dies. The production costs for the operating panel are thus greatly reduced.

FIG.1



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Description

[0001] The present invention relates to an operating panel and its method of manufacture, the operating panel being of a type used e.g. in vehicle compartment panels or in the switch panels of various items of electronic apparatus.

[0002] The operating panel is equipped with switch operating devices, such as knobs or buttons. Known switch operating devices include a rotational or rocker switch operating device such as disclosed in JP-A-Hei 10-294 041, and a pushbutton. In the former case, at least one end portion is operated by rotating the operating device around an axis disposed substantially parallel to the panel surface, as in the case of a rocker ('seesaw') switch control knob. In the latter case, the pushbutton operating device is operated by pushing in the direction perpendicular to the panel surface (thickness direction of the panel), such that the button slides in that direction.

[0003] The type of switch operating device to be mounted in the operating panel may be partially modified, depending on destination countries (e.g. Japan, Europe), grades, versions etc. of the vehicles to which operating panels are mounted. For instance, a specific location of a panel mounted on a given type of vehicle may have to be equipped with a rotational knob or rocker device, whilst a corresponding location on another type of vehicle may have to be mounted with a pushbutton type switch.

[0004] In the past practice, different types of panel were manufactured using different equipment and different processes, depending on the type of switch operating device to be mounted on the specific location, as mentioned above. Such practice considerably impeded the reduction of production costs.

[0005] To solve such problems, the present invention provides a method of preparing an operating panel comprised of a first panel comprising a fit portion for a rotational action type of switch operating device, such that the latter can be rotated or rocked around an axis placed substantially parallel to the panel surface, and of a second panel comprising a fit portion for a pushing action type of switch operating device, such that the latter can be slid in the direction perpendicular to the panel surface. These first and second panels are formed by common dies, and the fit portions for both switch types of switch operating device thus have a common external shape.

[0006] According to this method, the outer shape of the fit portion for a rotational action type of switch operating device in the first panel and a pushing action type of switch operating device in the second panel are made uniform, so that both panels can be formed by common or same dies. In this manner, production equipment can be rationalized considerably compared to cases where each panel is formed by different dies.

[0007] The first panel and the second panel may have substantially the same forms, but part of the forms may also be differentiated. Even in the latter case, the aforementioned common dies may be used, except that the shapes of internal elements placed into the dies are modified. In this manner, the shape of the fit portion for the rotational action type of switch operating device in the first panel and that of the pushing action type of switch operating device in the second panel can be partially differentiated. In other words, a shape suitable for each panel can be designed by using common dies.

[0008] For instance, by modifying the shape of an internal element in the dies, there can be manufactured, on the one hand, a first panel which contains a rotation axis (e.g. shaft or spindle) in the fit portion for the rotational action type of switch operating device, the rotation axis supporting the rotational action type of switch operating device in a rotatable way and, on the other, a second panel in which at least part of a rotation axis such as used for the first panel is replaced by a tubular portion for leading the light for indicator displays, so as to form a fit portion for the pushing action type of switch operating device. According to this method, the first panel is provided with a rotation axis effective for supporting the rotation or rocking motion of the rotation action type of switch, whereas the second panel is depleted of at least part of the rotation axis that is unnecessary for mounting the pushing action type of switch operating device, and this depleted part can be provided with a tubular portion for leading the light from indicator displays. Thus, the location arranged for the rotation axis is efficiently used for making room to provide the indicator displays.

[0009] The rotational action type of switch operating device mounted in the first panel may have one end held in a rotatable way, and only the other end operated for rotation. Otherwise, a highly operable rocker - or 'seesaw' switch operating device may be installed, in which a substantially central part (fulcrum point) of the knob is held or supported by the first panel in a rotatable way, whilst both ends of the operating device are operated in a balancing manner at this fulcrum point. In this case, the fit portion for the rocker switch operating device in the first panel and the fit portion for the pushing switch knob in the second panel can be respectively provided with a pair of tubular hold portions extending in the direction perpendicular to the panel surface (i.e. thickness direction of the panel). Then, the tubular hold portion may be used, in the fit portion, for the rotational action type of switch operating device, as a support for a transmission member. The latter transmits the pushing operation force, imparted to either of the balancing end portions of the rocker switch operating device, to a switch contact point provided on the rear side (distal from the panel surface) of the first panel. The tubular hold portion may be used, in the fit portion, for the pushing action type of switch operating device, as a guide portion for holding a guided member. The guided member can have an elongate portion and a tip portion, the elongate portion projecting from the internal side (when mounted into the panel) of the plate of the pushing action type of switch operating device in a direction parallel to the sliding direction thereof. In this manner, the holder for holding the transmission member

in the fit portion for the rotational action type of switch operating device in the first panel, and the holder for holding the guided member in the fit portion for the pushing action type of switch operating device in the second panel, can be manufactured as common tubular hold portions. The structures of both panels can thus be simplified.

[0010] As to the pushing action switch operating device, a plurality of guidable members thereof can be guided towards the second panel, so that there is less risk of entanglement. Further, the number of contact points operated by the pushing action type of switch operating device can be made equal to that of the contact points operated by the rocker switch operating device. Both switch operating devices can thus be operated in a similar manner with the same handling sensation.

[0011] The present invention also relates to an operating panel comprising a fit portion for switch operating devices, the fit portion being shaped so that it can be mounted selectively with a rotational action type switch operating device rotatable around an axis substantially parallel to the front surface of the panel, or with a pushing action type of switch operating device slideable in the direction perpendicular to the front surface of the panel.

[0012] According to this operating panel, the fit portion for switch operating devices can be mounted selectively with a rotational action type of switch operating device or a pushing action type of switching device, so that the fit portion can be used for the first panel as well as the second panel.

[0013] In this operating panel, the rotational action type of switch operating device can be held by the operating panel at a substantially central point of the operating panel, so that two end portions of the rotational action type of switch operating device can be operated in a balancing manner (i.e. seesaw switch operating device) to form a rocker switch. The fit portion for switch operating devices can comprise a tubular hold portion that extends in the direction perpendicular to the front surface of the panel. When the rocker switch operating device is mounted in the switch-operating device fit portion, this tubular hold portion can function as a holding portion for holding a transmission member for transmitting the pushing operation force, imparted to the balancing end portions of the seesaw switch operating device, to a switch contact point provided on that rear-side of the first panel distal from the front surface thereof. When the pushing action type switch operating device is mounted on the switch operating device fitting portion, this tubular hold portion can function as a guide portion for holding the guidable member that projects from the internal face (when mounted in the panel) of the front plate of the pushing action type switch operating device in the direction parallel to that in which the pushing switch knob slides. In this manner, the common tubular hold portion can serve for holding a transmission member in the fit portion for the rotational action type of switch operating device, as well as for holding a guidable portion in the fit portion for the pushing action type of pushbutton switch operating device, thereby enabling both switch operating devices to be mounted with a simplified structure.

[0014] Thus, according to the invention, the panel comprising the portion for mounting the rotational action type of switch operating device and the panel comprising the portion for mounting the pushing action type of switch operating device can be manufactured using common dies, which contributes to the reduction of production costs.

[0015] To attain the above objects, there is provided a method for preparing an operating panel, comprising the steps of:

- providing first dies and preparing thereby a first panel comprising a front surface, rotational axes and a first fit portion where a rotational action type switch operating device is mounted so that it can rotate around the rotational axes extending substantially parallel to the front surface of the first panel; and
- providing second dies common to, or same as, the first dies and preparing thereby a second panel comprising a front surface and a second fit portion where a pushing action type switch operating device is mounted so that it can slide in the direction perpendicular to the front surface of the second panel.

[0016] Preferably, the method further comprises the step of:

- providing different internal elements in the common first and second dies, or in the same dies, and preparing thereby the operating panels, whereby the shape of the first fit portion for the rotational action type switch operating device in the first panel and the shape of the second fit portion for the pushing action type switch operating device in the second panel are differentiated.

[0017] Preferably yet, the different-internal-element providing step of the method comprises:

- forming the operating panels separately into a first panel in which the rotation support axes are mounted in the first fit portion, so that the rotational action type switch operating device can rotate around the rotation support axes, and into a second panel in which the second fit portion for the pushing action type switch operating device is provided with rotation support axes, at least one of which is replaced by a light path tubular portion through which light of indicator displays can pass.

[0018] Preferably still, the method further comprises the steps of:

- providing a rocker switch operating device as a rotational action type switch operating device, in which

the rocker switch operating device mounted in the first panel has a substantially middle portion and two end portions, the middle portion being supported by the first panel in a rotatable manner and the two end portions being operated around the middle portion serving as fulcrum;

- providing a pair of tubular hold portions in each of the first fit portion for the rotational action type switch operating device and the second fit portion for the pushing action type switch operating device, so that the pair of tubular hold portions extend in the direction perpendicular to the first panel surface;
- providing switch contact points in the first panel at the side distal from the first panel surface and a pushing action type switch operating device having first and second faces;

whereby the pair of tubular hold portions is used, in the first fit portion, as holding portions for holding a transmission member for transmitting a pushing operation force imparted to any of the two end portions of the rocker switch operating device to switch contact portions;
whereas they are used, in the second fit portion, as guide portions for holding guidable portions that extend from the second face of the pushing action type switch operating device in the direction parallel to that in which the pushing action type switch operating device slides.

[0019] Suitably, the method further comprises the steps of:

- providing a circuit board comprising fixed contact portions and providing movable contact portions on/over the transmission member or the guidable portion, whereby the fixed and movable contact portions are placed into contact by the movement of the rotational action type switch operating device or the pushing action type switch operating device.

[0020] The invention also relates to an operating panel having a front surface, characterized in that the operating panel comprises a fit portion for switch operating devices, the fit portion being configured such that there can be mounted, selectively, a rotational action type switch operating device that is rotatable around an axis placed substantially parallel to the front surface and a pushing action type switch operating device that is slideable in the direction perpendicular to the front surface.

[0021] Preferably, the operating panel further comprises a base placed distal from the front surface, the base comprising switch contact points, the fit portion for switch operating devices comprising a tubular hold portion extending towards the base, further characterized in that:

when the fit portion for switch operating device is mounted with a rotational action type switch operating device, the tubular hold portion serves as a hold portion for holding a transmission member for transmitting an operation force imparted to the rotational action type switch operating device, to the switch contact points;
whereas, when the fit portion for switch operating device is mounted with a pushing action type switch operating device, the tubular hold portion serves as a guide portion for holding a guidable portion that projects from the pushing action type switch operating device towards the base, the guidable portion being used for making contact with the switch contact points.

[0022] Preferably yet, the rotational action type switch operating device of the operating panel is a rocker switch operating device having two end portions and a fulcrum point in a substantially middle portion of the operating device.

[0023] Typically, the rocker switch operating device is supported by the operating panel in a rotatable manner, so that the two end portions can be operated in a balancing manner and the operation force can be imparted to any of the two end portions of the rocker switch operating device.

[0024] The above, and the other objects, features and advantages of the present invention will be made apparent from the following description of the preferred embodiments, given as non-limiting examples, with reference to the accompanying drawings, in which:

Fig.1(a) is a top plan view of a first panel according to an embodiment of the present invention;
Fig.1(b) is a cross-sectional view of the first panel of Fig.1(a), taken along line 1-1;
Fig.1(c) is a perspective view of a rocker ('seesaw') switch operating device to be mounted in the first panel of Fig.1(a);
Fig.2(a) is a top plan view of a second panel according to an embodiment of the present invention;
Fig.2(b) is a cross-sectional view of the second panel of Fig.2(a), taken along line 2-2;
Fig.2(c) is a perspective view of a pushbutton switch knob to be mounted in the second panel of Fig.2(a).

[0025] In illustrated embodiment, a first panel 10A shown in Figs. 1(a) and 1(b) and a second panel 10B shown in Figs.2(a) and 2(b) are prepared by using common dies. The first panel 10A is provided with e.g. a rocker switch ('seesaw' switch) operating device, which operated by a user, (as example of rotational with a user operating device) 30 shown in Fig.1(c). Likewise, the second panel 10B is provided with a pushbutton type operating device 40, which is operated by a user, shown in Fig.2(c).

[0026] The first and second panels of the present invention may have a given thickness, a front surface (top side in Figs.1(b) and 2(b)) and a base (bottom side in the same figures), respectively. The switch operating devices of the invention may comprise a plate having a first face (upper side in Figs.1(c) and 2(c)) and a second face

(lower side in the same figures).

[0027] Both panels 10A and 10B have common structures: the panel per se is provided with a round-shaped hole, viewed from the front surface of the panel, for lodging the switch, and the internal peripheral rim of the hole is fitted with a cover ring 20. The inside of this cover ring 20 contains pushbutton switch elements 22, 23, 24 common to both panels. The first panel 10A and the second panel 10B are provided with the rocker switch operating device 30 and the pushbutton switch operating device 40, respectively.

[0028] The pushbutton switch element 22 has a round form smaller than that of the cover ring 20, and is provided so that it can be installed by pushing in a central position of a circular zone defined by the cover ring 20. The pushbutton switch elements identified by reference numeral 23 are provided at both sides of the pushbutton switch element identified by reference numeral 22, and operate by pushing. The pushbutton switch element identified by reference numeral 24 is provided in a substantially arched area below pushbutton switch elements 22 and 23 (when viewed in Figs.1(a) and 2(a)) and operated by pushing.

[0029] Further, the substantially arched area above pushbutton switch elements 22, 23 (when viewed in Figs. 1(a) and 2(a)) forms a portion for mounting the rocker switch operating device in the case of the first panel 10A, and a portion for mounting the pushbutton switch button 10B in the case of the second panel, respectively.

[0030] The bases of the panels 10A, 10B are provided with circuit boards 26 shown in Fig.1(b) and Fig.2(b), respectively.

[0031] A surface of the circuit board 26 is stuck with a highly insulating rubber sheet 28. The rubber sheet 28 has movable contact portions 28b at appropriate points, e.g. at two different locations inside the area corresponding to the portion for mounting the rocker switch control button in the first panel 10A or the portion for mounting the pushbutton switch control button in the second panel 10B.

[0032] The movable contact portions 28b are detached from the sheet, and connected thereto via thin connecting portions 28a. The tip of the movable contact portions is provided with movable contact points composed of a conductive rubber and/or gilding. These movable contact portions 28b shift in the direction of the sheet's depth, accompanying the flexing deformation of the thin connecting portions 28a, in unison with the operation of the rocker switch operating device 30 or the pushbutton switch operating device 40. The movable contact points of the movable contact portions 28b can thus be placed into contact with, or detached from, the fixed contact points provided on the circuit board 26.

[0033] The fit portion for the rocker switch control button in the first panel 10A and the fit portion for the pushbutton switch operating device button in the second panel 10B are respectively provided with a light path formed by first tubular portion 12 at their centre, and tubular hold portions 14 at both sides thereof. The light path of the first tubular portion 12 contains a light-path hole 11 that leads the light emitted by an illumination source for lighting at night (not shown in the figures), turned towards the front surface of the panel.

[0034] In particular, the first panel 10A comprises rotation support axes 16, 17 that project outwardly from the light path of the first tubular portion 12, in parallel to the front surface of the panel (upwardly and downwardly in Figs.1(a)). These rotation support axes 16, 17 hold the rocker switch operating device 30 substantially parallel to the panel surface, so that the rocker switch operating device 30 can be rotated around these axes (enabling the rocking movement).

[0035] As shown in Fig.1(c), the rocker switch operating device 30 has first and second faces, and comprises a substantially arch-shaped push plate 32 that matches the fit portion for the rocker switch operating device. A pair of support plates 36 project from the second face of the arch-shaped push plate 32, at a substantially central portion in the right-hand to left-hand span of the plate (when viewed in Fig.1(c)). These support plates 36 have through-holes 35, which are fitted with the corresponding rotation support axes 16, 17 from inside of the light-path of the first tubular portion 12. Thus, the rocker switch operating device 30 is supported by the first panel 10A, such that the former can be rotated around the axis linking the rotation support axes 16 and 17, thus enabling the rocking movement.

[0036] The rocker switch control button 30 has thus two end portions that can make balancing (rocking) movements, and these balancing end portions comprise, on their second face side, pushing member portions 34 which project towards the circuit board 26, as shown in Fig.1(b).

[0037] In the first panel 10A shown in Fig.1(b), the tubular hold portion 14 has a through-hole 13, through which a transmission member 38 (e.g. having a cylindrical form) for transmitting the operation force is placed in parallel with the longitudinal direction of the tubular hold portion 14 (thickness direction of the panel) in a slidingly movable state. When one of the pushing member portions 34 is pushed, it pushes a first end portion (first surface side of the panel) of the transmission member 38 and shifts it towards the circuit board 26. A second end portion of the transmission member 38 (circuit board side of the panel) then pushes the movable contact portion 28b near the rubber sheet 28 on the circuit board 26 towards this circuit board 26. The movable contact point on the movable contact portion 28b is thus placed into contact with the fixed contact point on the circuit board 26.

[0038] In other words, the tubular hold portion 14 in the first panel 10A can serve as a hold portion for holding a member 38 for transmitting the operation force imparted to a pushing member portion 34 to a switch contact point at the circuit board side of the panel.

[0039] In the fit portion for mounting the pushbutton switch operating device in the second panel 10B, one

axis 16 (top side in Fig.1(a)) of the two rotation support axes 16, 17 is replaced by a light-path of a second tubular portion 18 for indicator displays which leads the light emitted by the source for indicator-lighting (not shown in the figures) towards the front surface of the panel.

[0040] The pushbutton operating device 40 has first and second faces, and comprises a substantially arch-shaped push plate 42 which matches with the fit portion for mounting the pushbutton operating device 40. The second face of the push plate 42 is provided with a first guidable portion 44 projecting from a substantially middle point thereof, in a direction parallel to that in which the pushbutton switch operating device 40 slides (thickness direction of the panel), and also with second guidable portions 46 projecting from both ends thereof in the same direction. The first and second guidable portions 44, 46 are inserted into the light-path of the first tubular portion 12 and of the tubular hold portion 14 of the second panel 10B, respectively. The pushbutton switch control button 40 is thus held by the second panel 10B such that the slide operation (pushing operation) can be performed in the direction parallel to that in which the first and second guidable portions 44, 46 extend. Likewise, the second guidable portions 46 directly push the movable contact portions 28b, as the pushbutton switch operating device 40 is pushed down.

[0041] Thus, the tubular hold portions 14 of the second panel 10B can serve as guide portions that hold the second guidable portions 46 in their longitudinal direction in a slideable manner, and guide them in the pushing direction.

[0042] The push plate 42 of the pushbutton switch operating device 40 comprises an indicator display window 48 at a position corresponding to the light path of the second tubular portion 18 for leading the indicator light, so that the illumination light guided into the second tubular portion 18 can be emitted to the outside of the panel through the indicator display window 48.

[0043] The functions attributed to the switch control buttons 30, 40 can be chosen appropriately. For instance, when the panels 10A, 10B are used as an air-conditioning panel for vehicles, the rocker switch button 30 can be used as a switch for alternating between a fanned-air-volume adjusting mode and a temperature-adjusting mode, whereas the pushbutton switch button 40 can be used as a switch for alternating between an automatic cooler and an automatic heater.

[0044] The fit portion for mounting the rocker switch operating device of the first panel 10A and that for mounting the pushbutton switch of the second panel 10B have a common shape, so that both panels 10A, 10B can be formed by common dies. Accordingly, production equipment according to the invention can be rationalized considerably, resulting in a lowering of production costs, compared to the case where the panels have to be made by different dies.

[0045] When two panels 10A, 10B are compared, the first panel 10A has rotation support axes 16, 17 at both sides of the light path of the first tubular portion 12, whereas the second panel 10B is devoid of one rotation support axis 16, but has a second tubular portion 18 for leading the indicator light. The partial shape of the panels is thus differentiated, but this differentiation can be dealt with by changing the shape of internal elements inserted in the dies. Thus, though using common dies, structural details of the panels 10A, 10B can be configured differently to be suitable for each panel 10A or 10B.

[0046] Conversely, a panel can be designed so that both rotation support axes 16, 17 shown in Fig.1(a) cannot interfere with the pushbutton switch operating device 40 shown in Fig.2(c). Moreover, the second tubular portion 18 for leading the indicator-display light can be obviated. Then, the shapes of the first panel 10A and the second panel 10B can be made identical. When an operating panel commonly usable for both panels 10A, 10B is prepared in this manner, the production costs and production efficiency for making panels as a whole can be reduced further.

[0047] According to the embodiments in the figures, a tubular hold portion 14 common to both panels 10A, 10B is prepared and used as a holding portion for holding a transmission member 38 for the operation force in the first panel, and as a guide portion for holding a guidable portion 46 of the pushbutton switch operating device 40 in the second panel 10B. Alternatively, the transmission-member holding portion and the guide portion can be equipped in both panels 10A, 10B, and can be used selectively depending on the type of panel used.

[0048] Moreover, when the tubular hold portion 14 is commonly used as the transmission-member holding portion and guide portion, the structures of the panels 10A, 10B can be simplified, and the latter can be manufactured using common dies. Further, such a construct causes less risk of entanglement in the pushbutton switch operating device 40, since a plurality of second guided portions 46 thereof is guided at the side of the second panel 10B.

[0049] When the number of contact points operated by the pushbutton switch operating device 40 and the number of contact points operated by the rocker switch operating device 30 are made equal (number of two in the figures), the ways of manoeuvring (including operational feeling or sensing) for both switch knobs 30, 40 are approached between the two operations. In such case, the operator can recognize the operation by merely sensing a rocker switch operating device handling (i.e. without directly watching the switch).

[0050] The invention can also be carried out differently from the above embodiments, as described hereunder.

[0051] The first panel 10A shown in Figs.1(a) to (c) is provided with a rotational action type of switch operating device, e.g. a rocker switch button type of operating device, in which two ends thereof are operated in a balancing manner. However, the rotational switch operating device mounted in the first panel may be provided with a rotational fulcrum at one end, and only the other end may

be used for rotational operation.

[0052] In the present invention, the shape or structure of each switch operating device is not limited to those described in the above embodiments. For instance, the switch operating device and the fit portion therefor may be round or rectangular when viewed from above (viewed in the figures).

[0053] Likewise, the shape of the operating panel is not limited to those described in the above embodiments. For instance, when a thin panel is used, the tubular hold portion 14 may be obviated, and the push operation portion 34 of the rocker switch knob 30 may be designed such as to directly push the movable contact portion 28b of the rubber sheet 28.

Claims

1. A method for preparing an operating panel, comprising the steps of:

- providing first dies and preparing thereby a first panel (10A) comprising a front surface, rotational axes (16, 17) and a first fit portion where a rotational action type switch operating device (30) is mounted so that it can rotate around said rotational axes (16, 17) extending substantially parallel to said front surface of the first panel; and
- providing second dies common to, or same as, said first dies and preparing thereby a second panel (10B) comprising a front surface and a second fit portion where a pushing action type switch operating device (40) is mounted so that it can slide in the direction perpendicular to said front surface of the second panel.

2. A method for preparing an operating panel according to claim 1, further comprising the step of:

- providing different internal elements in said common first and second dies, or in said same dies, and preparing thereby said operating panels, whereby the shape of said first fit portion for the rotational action type switch operating device (30) in said first panel (10A) and the shape of said second fit portion for the pushing action type switch operating device (40) in said second panel (10B) are differentiated.

3. A method for preparing an operating panel according to claim 2, wherein said different-internal-element providing step comprises:

- forming said operating panels separately into a first panel (10A) in which said rotation support axes (16, 17) are mounted in said first fit portion, so that said rotational action type switch operating device (30) can rotate around said rotation support axes (16, 17), and into a second panel (10B) in which said second fit portion for the pushing action type switch operating device (40) is provided with rotation support axes, at least one of which is replaced by a light path tubular portion (18) through which light of indicator displays can pass.

4. A method for preparing an operating panel according to any one of claims 1 to 3, further comprising the steps of:

- providing a rocker switch operating device as a said rotational action type switch operating device (30), in which said rocker switch operating device mounted in said first panel (10A) has a substantially middle portion and two end portions, said middle portion being supported by said first panel (10A) in a rotatable manner and said two end portions being operated around said middle portion serving as fulcrum;
- providing a pair of tubular hold portions (14) in each of said first fit portion for the rotational action type switch operating device (30) and said second fit portion for the pushing action type switch operating device (40), so that said pair of tubular hold portions (14) extend in the direction perpendicular to said first panel surface;
- providing switch contact points in said first panel (10A) at the side distal from said first panel surface and a pushing action type switch operating device (40) having first and second faces;

whereby said pair of tubular hold portions (14) is used, in said first fit portion, as holding portions for holding a transmission member (38) for transmitting a pushing operation force imparted to any of said two end portions (34) of said rocker switch operating device (30) to switch contact portions (28b);
whereas they are used, in said second fit portion, as guide portions for holding guidable portions (46) that extend from said second face of said pushing action type switch operating device (40) in the direction parallel to that in which said pushing action type switch operating device (40) slides.

5. A method for preparing an operating panel according to claim 4, further comprising the steps of:

- providing a circuit board (26) comprising fixed contact portions and providing movable contact portions (28b) on/over said transmission member (38) or said guidable portion (46), whereby said fixed and movable contact portions are placed into contact by the movement of said rotational action type switch operating device (30) or said pushing action type switch operating device (40).

6. An operating panel having a front surface, **characterized in that** said operating panel comprises a fit portion for switch operating devices, said fit portion being configured such that there can be mounted, selectively, a rotational action type switch operating device (30) that is rotatable around an axis (16, 17) placed substantially parallel to said front surface and a pushing action type switch operating device (40) that is slideable in the direction perpendicular to said front surface.

7. An operating panel according to claim 6 further comprising a base placed distal from said front surface, said base comprising switch contact points, said fit portion for switch operating devices comprising a tubular hold portion (14) extending towards said base, further **characterized in that**:

   when said fit portion for switch operating device is mounted with a rotational action type switch operating device (30), said tubular hold portion (14) serves as a hold portion for holding a transmission member (38) for transmitting an operation force imparted to said rotational action type switch operating device, to said switch contact points;
   whereas, when said fit portion for switch operating device is mounted with a pushing action type switch operating device (40), said tubular hold portion (14) serves as a guide portion for holding a guidable portion (46) that projects from said pushing action type switch operating device towards said base, said guidable portion (46) being used for making contact with said switch contact points.

8. An operating panel according to claim 6 or 7, wherein said rotational action type switch operating device (30) is a rocker switch operating device having two end portions and a fulcrum point in a substantially middle portion of the operating device.

9. An operating panel according to claim 8, wherein said rocker switch operating device is supported by said operating panel in a rotatable manner, so that said two end portions can be operated in a balancing manner and said operation force can be imparted to any of the two end portions of said rocker switch operating device.

FIG.1

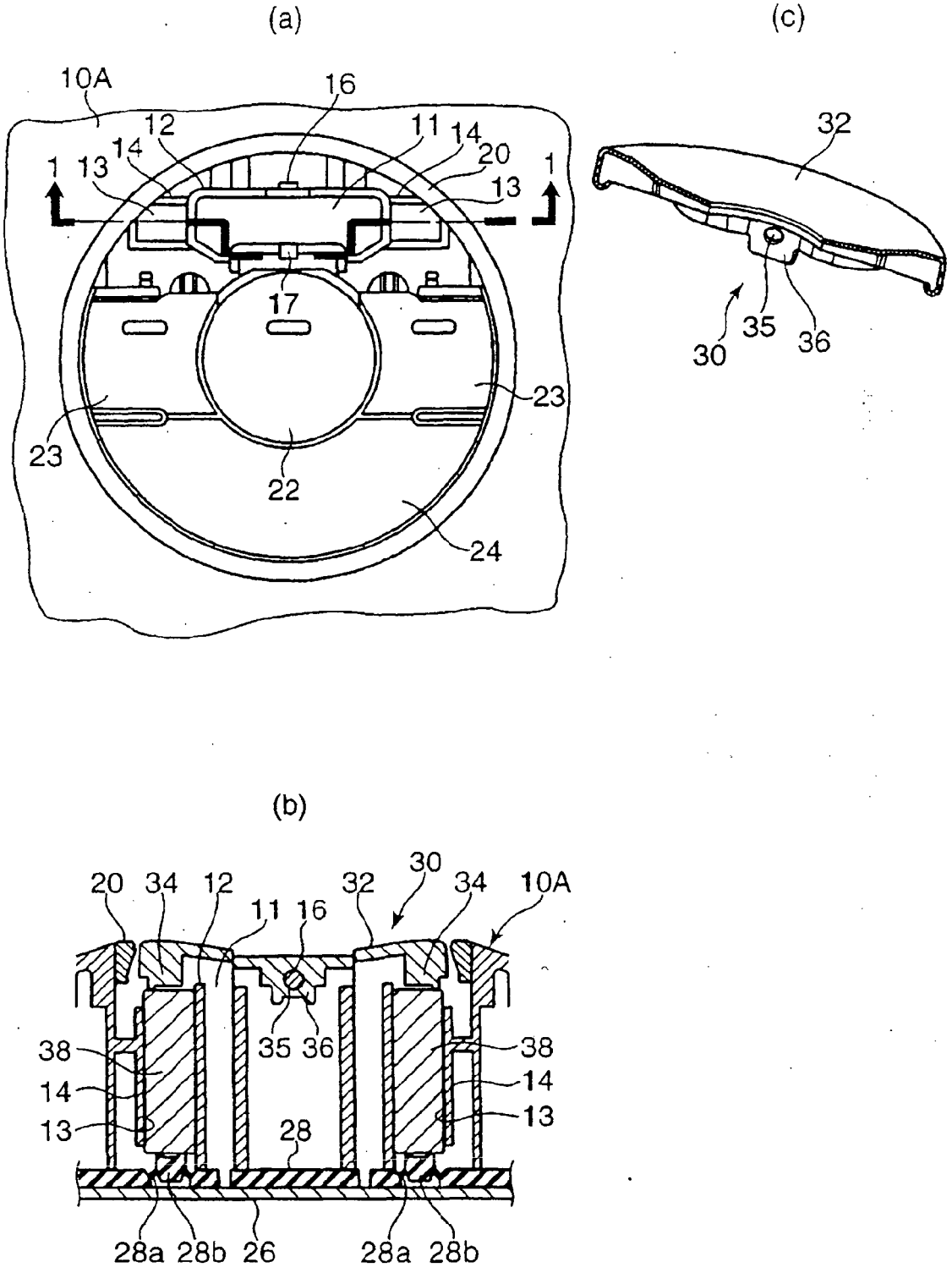
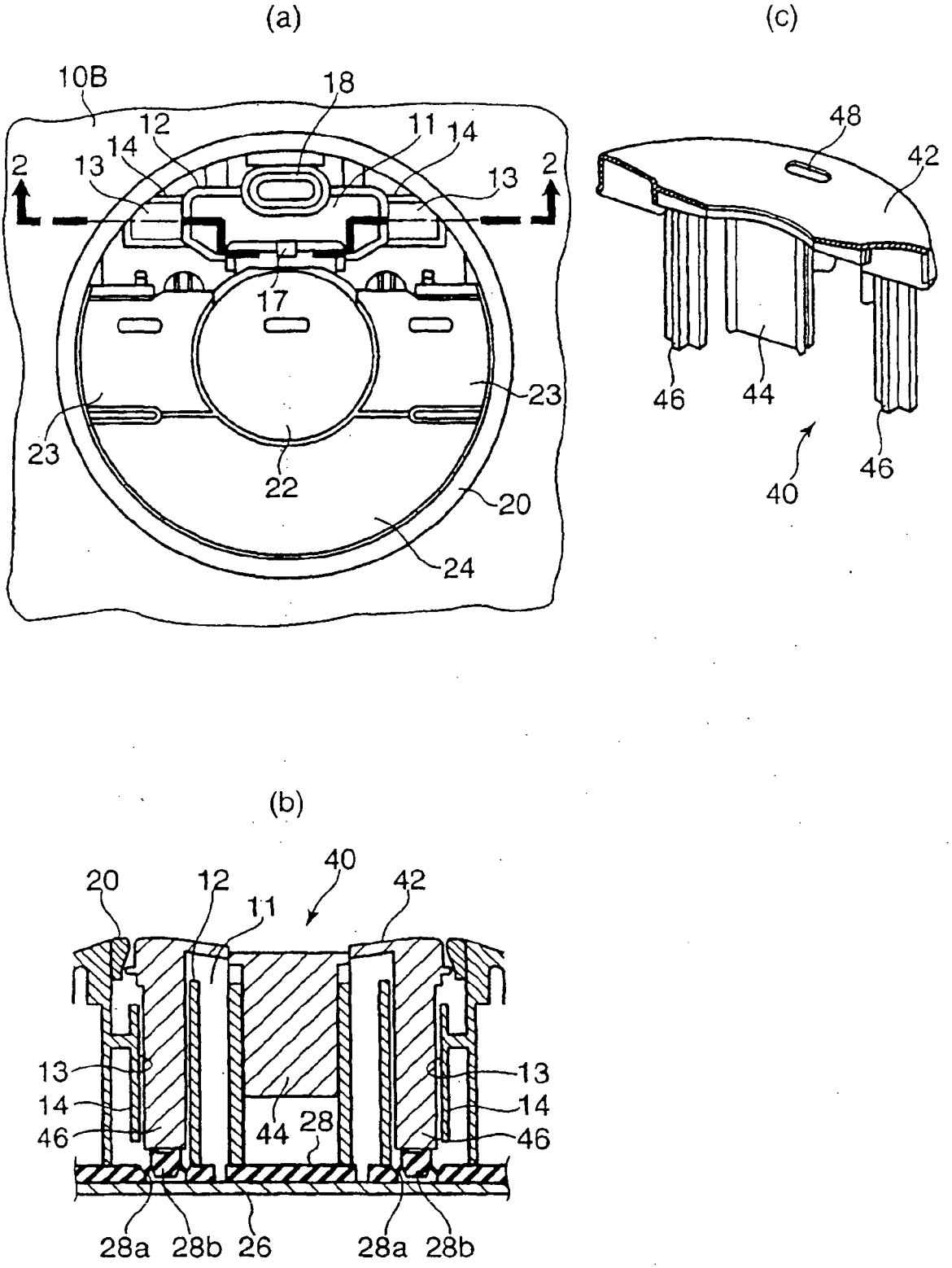


FIG.2



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EUROPEAN SEARCH REPORT

Application Number
EP 06 29 0151

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 May 2006	Simonini, S

CATEGORY OF CITED DOCUMENTS

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