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(54) **TWO-PIECE CONTROL PANEL USED FOR ELECTRICAL HOUSEHOLD APPLIANCES**

ZWEITEILIGE SCHALTAFEL FÜR ELEKTRISCHE HAUSHALTSGERÄTE

TABEAU DE COMMANDE EN DEUX PARTIES UTILISABLE SUR DES APPAREILS
ELECTROMENAGERS

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Description

[0001] The present invention is related to the two-piece control panel particularly used in such electrical household appliances as washing machines, dish washers and refrigerators.

[0002] The control panels of the electrical household appliances such as washing machines and dish washers are commonly produced mainly in two types. In the first type, the control panel consists of one piece. The detail structures that hold the components and provide the connection with the components are prepared by plastic piece injection at the back side of the control panel and taken out of the one-piece plastic panel structure. This application leads to unwanted traces and recesses appearing on the front side of the panel and therefore damages the aesthetic appearance of the front face as a smooth surface sheen cannot be obtained. In order to avoid this, the wall thickness of the plastic material used in the construction of the panel is increased which in turn causes a substantial increase in the production cost.

[0003] The second type of control panels consists of two pieces. The front surface of the plastic part forming the panel is made in the shape of a concave basin, and the details holding the components, buttons etc. are placed on this surface. For aesthetic purposes this part of the panel is generally covered by another piece made of a higher-quality surface material which is provided with openings for the buttons and other functional regions that have to be exposed.

[0004] A control panel formed by this method is first of all relatively expensive because of the front piece which is made of high-quality material and since it does not have the desired strength to withstand the torsion and tensile forces created at the doors of the dishwashers wherein the control panel is mounted on the mobile loading port, generally a metal support piece is used in the assembly in order to increase the endurance strength of the plastic parts assembled at the control panel. Furthermore, in case the flat plate used for the front surface is made of a painted or printed transparent material, the lights on the panel may create unwanted shades from aesthetic point of view. Cleaning the dirt and dust accumulated in the gaps around the edges of the front plate and around the openings on its surface creates problems for the users.

[0005] As a change in the model of the above mentioned two types of control panels requires substantial modifications to be made in the moulds or new moulds to be used, this change increases the cost. Besides, additional mechanical systems are used in order to keep the tolerance deviations that may arise between the component holding structures and electrical components during the assembly process, at the desired level.

[0006] In systems with fixed panels, such as in the case of washing machines, the control panel may be made of two pieces, however in practice these pieces engage to each other by means of lugs.

[0007] Although the use of lugs as joining elements provide the panel to stand the vertical forces on its front and back faces, it is not applied for dish washers with mobile ports as it does not give sufficient endurance strength against torsional and tensile forces created on the mobile ports during usage. As a structural unity has not been provided, this type of control panel makes noise as the result of the friction between the two parts during torsion. Another drawback is the wearing and breaking of the lugs in the course of time. A change in the model of this control panel is made possible by the holes opened on the outer part.

[0008] The object of the present invention is to realize a two piece control panel that minimises the tolerance deviations that may arise between the component holding structures and electrical components during assembly process and provides facility in assembly; and that shows the desired strength (resistance) against the torsional and tensile forces created particularly at the mobile ports of the dish washers during usage.

[0009] Another object of the invention is to realize in an economic and cost saving manner, a control panel consisting of two separate plastic parts, that increases the aesthetic appearance quality of the front face and that can be formed in such a manner that it allows model changes eliminating the obligation to modify the moulds.

[0010] The two-piece control panel realized to achieve the objects of the invention is shown in the attached drawing wherein external view of the shell part (1) forming the visible surface of the panel according to the present invention and the back (rear) part (2) providing the connection with the components are shown.

[0011] The two piece control panel of the invention consists of two separate plastic parts formed so that they can be joined by vibro-welding in order to provide the structural strength of the panel as a whole. The shell (1) is the visible part providing the aesthetic appearance of the control panel. During plastic part injection, no detail structure that may cause unwanted traces or recesses on the front surface are formed on the rear unseen surface of this part. Thus, the front surface of the control panel is provided with the desired quality of smoothness and brightness. Whereas the back part (2) of the panel comprises component holders and functional structures (2b) placed in separate partitions in order to provide the connection with all components. The shell (1) and the back (rear) piece (2) are welded together by using vibro-welding method all along their peripheral edges and at welding details (1a and 2a) formed at various partitions where the components are to be connected and thus it becomes a unitary part. Welding details (1a and 2a) are the structural projections that provide the joining of two parts by melting during vibro-welding. These projections are formed particularly at such areas that are frequently exposed to tension and stress, for instance at the handles of the dish washer loading ports; and their number, shapes and lengths may be variable.

[0012] The vibro-welding method that provides a ho-

mogeneous joining of a plastic structure also provides a control panel body which is resistant against torsions and tensions as a monobloc body after the assembly process is completed. The parts can be assembled within accurate limits and thus tolerance deviations can be minimized.

[0013] The back part (2) can be prepared so as to comprise the structural details required for its conformity to the future model modifications. When a model modification is considered, it can be realized only by changing the locations and numbers of the openings on the shell (1) without any need to use a new mould.

[0014] In this way the cost of changing the model may be kept at lower levels.

Claims

1. A two-piece control panel used for electrical household appliances **characterized in that** it consists of two separate plastic parts connected to each other by welding, one part being the shell (1) that is the visible part providing the aesthetic appearance of the panel, and the second being a rear (back) part (2) providing connection with all components.
2. A control panel according to claim 1 **characterized in that** the welding method used to join the above mentioned two separate plastic parts is vibro-welding.
3. A control panel according to claims 1 and 2, **characterized** with welding details (1a and 2a) described as structural projections the numbers, shapes, lengths of which may be different, that are formed all along the joined edges of the shell and back part as well as at the areas where the components are to be connected and that provide the joining of the said two parts by melting during vibro-welding, being particularly placed at the regions that are frequently subject to tensions.

Patentansprüche

1. Zweiteilige Steuerkonsole, die für elektrische Haushaltsgeräte verwendet wird, **dadurch gekennzeichnet, dass** sie aus zwei getrennten Kunststoffteilen besteht, die durch Schweißen miteinander verbunden sind, wobei ein Teil die Abdeckung (1) ist, die den sichtbaren Teil bildet und das ästhetische Erscheinungsbild der Konsole schafft, und der zweite Teil ein hinterer (rückseitiger) Teil (2) ist, der die Verbindung mit sämtlichen Komponenten schafft.
2. Steuerkonsole nach Anspruch 1, **dadurch gekennzeichnet, dass** das Schweißverfahren, das ver-

wendet wird, um die beiden oben genannten getrennten Kunststoffteile miteinander zu verbinden, das Vibrationsschweißen ist.

3. Steuerkonsole nach den Ansprüchen 1 und 2, **gekennzeichnet durch** Schweißelemente (1a und 2a), die als strukturelle Vorsprünge gegeben sind, deren Anzahl, Formen und Längen verschieden sein können, die alle längs der miteinander verbundenen Kanten der Abdeckung und des rückseitigen Teils sowie in den Bereichen, in denen die Komponenten verbunden werden sollen, ausgebildet sind und die die Verbindung der beiden Teile **durch** Schmelzen während des Vibrationsschweißens schaffen, wobei sie insbesondere in jenen Bereichen angeordnet sind, die häufig Spannungen unterliegen.

Revendications

1. Un panneau de contrôle en deux morceaux destiné à être utilisé dans des appareils domestiques électriques, **caractérisé en ce qu'il** consiste en deux éléments séparés en matière plastique réunis l'un à l'autre par soudure, une partie constituant l'enveloppe (1) qui est la partie visible assurant l'aspect esthétique du panneau et la seconde étant un élément arrière (postérieur) (2) assurant la connexion avec tous les composants.
2. Un panneau de contrôle selon la revendication 1, **caractérisé en ce que** la méthode de soudage utilisée pour réunir les deux éléments séparés en matière plastique précités est le vibrosoudage.
3. Un panneau de contrôle selon les revendications 1 et 2, **caractérisé par** des détails de soudure (1a et 2a) décrits en tant que reliefs structuraux, dont le nombre, la forme et les longueurs peuvent être différents et qui sont créés le long des bords jointifs de l'enveloppe et du fond ainsi que dans les zones où les composants doivent être connectés et qui assurent la réunion des deux éléments précités par fusion au cours du vibrosoudage, étant placés particulièrement dans les régions qui sont soumises fréquemment à des tensions.

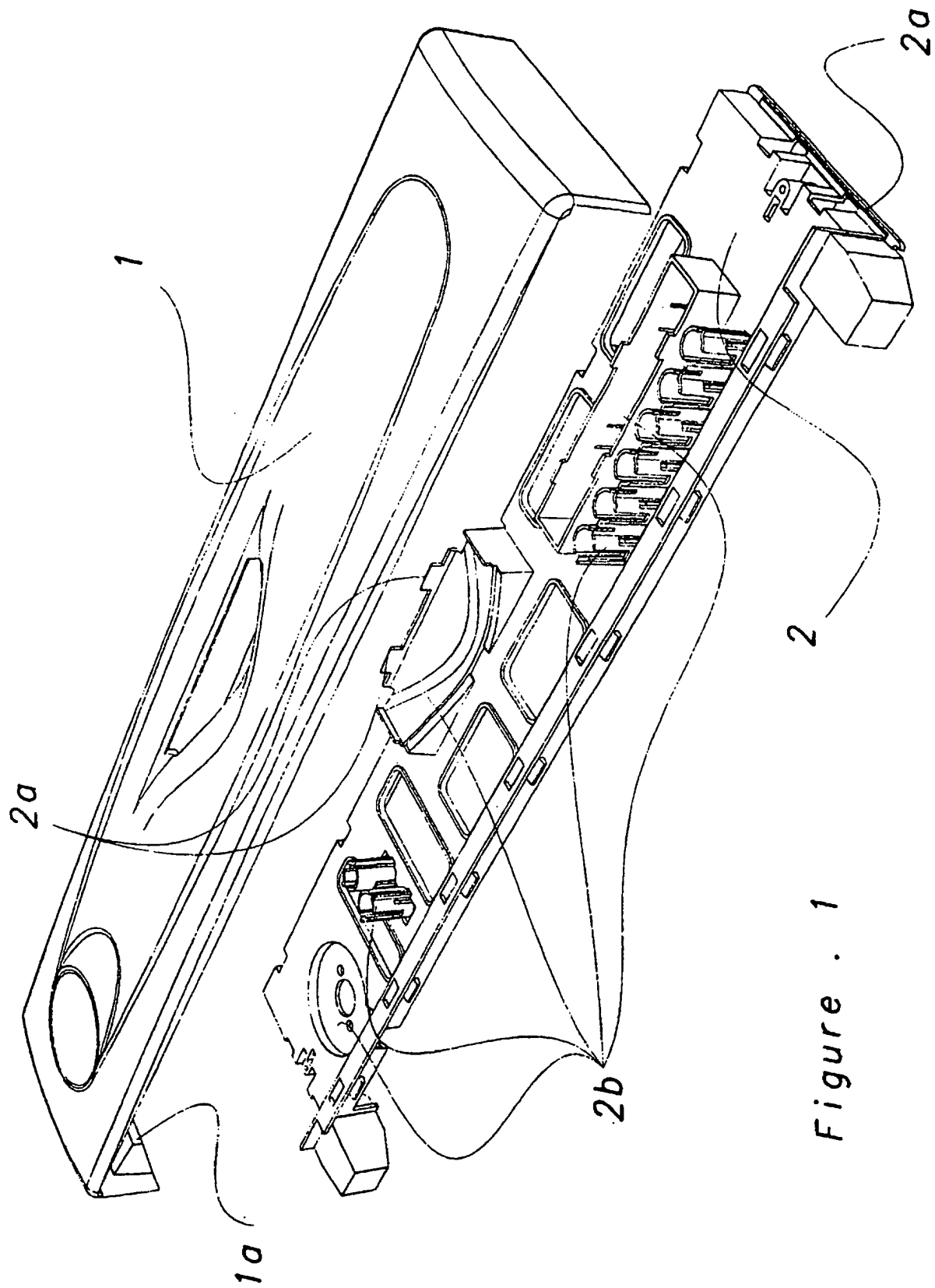


Figure . 1