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ELECTRIC CONNECTION SYSTEM, ESPECIALLY FOR DOMESTIC APPLIANCES

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FIG. 1

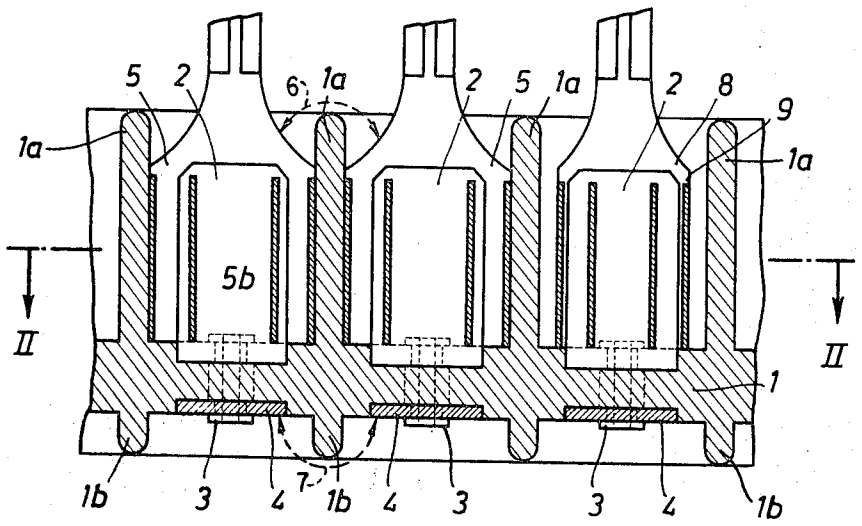
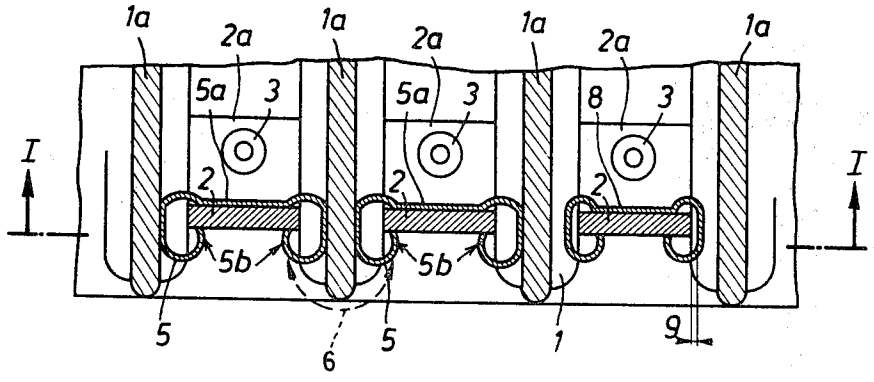


FIG. 2



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ELECTRIC CONNECTION SYSTEM, ESPECIALLY FOR DOMESTIC APPLIANCES

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4 Claims

ABSTRACT OF THE DISCLOSURE

Electric connection system for accessories of domestic appliances fitted with plug connectors which are fixed on an insulating support and intended to receive female flexible socket connectors which are of variable width comprised between a lower limit and an upper limit, each plug connector consisting of a male component having the width which is necessary to receive the socket connector having the smallest width, whereas the system further comprises insulating guiding abutment members disposed on each side of each male component considered in the direction of its width, the interval between two contiguous abutment members corresponding substantially to the width of the female flexible socket connector having the largest width utilizable with said male component.

Some devices which are mounted on electrical domestic appliances and especially washing machines and which include programmers, thermostats, pressostats and the like are provided for connecting purposes with flat plug connectors which are intended to accommodate flexible female socket connectors. This type of connector is in widespread use and accordingly exists in many differene sizes. For a given thickness of 0.8 mm., there thus exist three widths of plug connector, namely: 6.35 mm., 5 mm. and 4.75 mm.

Up to the present time, only connectors having a width of 6.35 mm. have been employed for ancillary devices in the countless numbers of washing machines which are in service. This arises from the fact that the first appliances were designed in this manner and that there has not been sufficient incentive to change the width of connectors because of either capital cost or overall size.

However, increasing competition in this field is imposing a need for reduction in costs with a resultant tendency towards miniaturization of equipment and the space available for accommodating accessories is therefore becoming progressively smaller.

It is acknowledged by the majority of manufacturers that the use of connectors of smaller size than those at present in use would make it possible to reduce both capital outlay and dimensional requirements. However, this logical solution has not been adopted owing to the disturbance in production which it would cause. In point of fact, new accessories which would be fitted with narrow connectors (5 or 4.75 mm. instead of 6.35 mm.) would not be interchangeable with connectors of previously existing types. For repair purposes, it would therefore be necessary either to stock a large number of appliances or to continue to manufacture them on a small scale, that is to say under uneconomical conditions.

The aim of the present invention is to permit the construction of an ancillary device such as, in particular, a washing machine programmer which is fitted with narrow connectors (for example 4.75 mm.) and which can be connected to the utilization machine in all cases, whether said machine is an old machine fitted with wide socket connectors (6.35 mm.) or a machine fitted with socket connectors of the narrow type (5 or 4.75 mm.).

The invention also makes it possible to reduce overall dimensions. In fact, the minimum spacing between the two plug connectors of 6.35 mm. width which are located in a same plane must be11 mm. in order to comply with regulations (distance between exposed conductors) when the movable plug components are in position. By virtue of the invention, this distance can be reduced to 9 mm.

It is known that, when a flexible female plug component having a width of 6.35 mm. is fitted in position over a male plug component, said female component is in electrical contact with said male component on one face solely by means of two rolled-back edges and along two parallel lines which are spaced at a distance of approximately 3 mm. and on the other face solely by means of a flat dorsal portion having a width of 4.75 mm. In consequence, any portion exceeding a width of 4.75 mm. in the male component has no useful function from an electrical standpoint and serves only to center the female component laterally.

In accordance with the invention, each fixed plug connector consists of a male component whose width is that which is necessary to receive the socket connector having the smallest width comprised between a predetermined lower limit and a predetermined upper limit, whilst the insulating support of the plug connector has, on each side of said connector, a lateral guiding wall or abutment member which limits the lateral play of the flexible or female component. Consequently, the portion which, on each side, exceeds the width of contact of 4.75 mm. can be dispensed with. The plug connector of 6.35 mm. width thus becomes a plug connector of 4.75 mm. width and is then capable of receiving either a female component of 6.35 mm. width which is maintained centered by the insulating walls or a female component of 5 mm. width (which will only have a slight lateral play) or even a female component having a width of only 4.75 mm.

When a plurality of connectors are mounted in a same plane, they are accordingly separated by an insulating wall which, with a thickness of the order of one millimeter, advantageously replaces the distance of 3 mm. which is imposed in free air, that is to say when there is no insulator. The invention therefore makes it possible to gain 2 mm. per connector and the fact that a connector of 6.35 mm. is replaced by a connector of 4.75 mm. represents an economy of copper alloy of 25%.

A better understanding of the invention will be gained by consideration of the accompanying drawings, in which:

FIG. 1 is a sectional view taken along line I—I of FIG. 2 and shows an insulating support fitted with connectors according to the invention;

FIG. 2 is a sectional view taken along line II—II of FIG. 1.

In FIGS. 1 and 2, the reference numeral **1** designates an insulating support which carries plug connectors **2** having a width of 4.75 mm., the bases **2***a* of said plug connectors being folded back at right angles and secured to said support by means of rivets **3** which provide an electrical connection with metallic strips **4**.

The insulating support **1** is provided with partition walls **1***a* which serve on the one hand to guide the flexible socket connectors **5** of large width (6.35 mm.) which are adapted to come into contact with the plug connector **2** over the entire width of the flat dorsal face **5***a* and by means of the lips **5***b* and, on the other hand, to ensure a sufficient insulation distance **6** between two flexible conductors **5** which are adjacent to each other.

Ribs **1***b* provide a sufficient insulation distance **7** between the conductors **4**.

On the right-hand side of the figures, there is shown a flexible connector **8** of medium width (5 mm.) which is mounted on the plug connector of 4.75 mm. width with a lateral clearance **9** which is sufficiently small and therefore does not constitute any disadvantage.

What is claimed is:

1. In an electric connection system for accessories of domestic appliances, fitted with plug connectors which are fixed on an insulating support for receiving female flexible socket connectors which may be of any width between a predetermined lower limit and a predetermined upper limit, each socket connector comprising a plate shaped body having two lateral flexible lips adapted to press against one side of said plug connector and force the plate shaped body against the opposite side of said plug connector, each plug connector consisting of a male component having a width substantially equal to the predetermined lower limit width of said socket connector, the system further comprising insulating guiding abutment members integral with said insulating support and disposed on each side of each male component considered in the direction of its width, the interval between two contiguous abutment members corresponding substantially to the predetermined upper limit width of female flexible socket connector whereby the socket connector of greatest width is held in position by the abutment members to assure that the plate shaped body portion of said socket connector is centered against the said opposite side of said plug connector.

2. An electric connection system as defined in claim **1**, wherein the insulating guiding abutment members for the female sockets terminate approximately at the height of the plug connectors.

3. An electric conenction system as defined in claim **2**, wherein the male components are aligned in a same plane and mounted on a common support, the insulating guiding abutment members for the female sockets also constituting partition walls of small thickness between said plug components.

4. An electric connection system as defined in claim **1**, wherein the insulating support is provided, on that face which is remote from the support face carrying the insulating partition-walls, with insulating partition ribs disposed in the same planes as said partition walls.

References Cited

UNITED STATES PATENTS

2,658,182	11/1953	Jackson et al.	339—45
2,985,861	5/1961	Rogoff et al.	339—198.4

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