

PATENT SPECIFICATION

(11) 1 484 133

- (21) Application No. 53240/73 (22) Filed 16 Nov. 1973
(23) Complete Specification filed 11 Nov. 1974
(44) Complete Specification published 24 Aug. 1977
(51) INT CL² H01R 13/46
(52) Index at acceptance
H2E 3A12 3A13 3A2 3B6 3C2C 3C2D 3D10 3E8B2
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(54) ELECTRIC CONNECTOR BLOCKS

(71) We, PRESSAC LIMITED, a British Company of Leopold Street, Long Eaton, Nottingham, NG10 4QL, do hereby declare the invention, for which we pray that a Patent may be granted to us and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to a connector block, especially a connector block adapted to be engaged with a timing device associated with apparatus, for example, a washing machine, for effecting and electrically controlling a plurality of required operations in a predetermined sequence, the operations being included in a cycle of operations which may be of different durations.

At present it is customary to connect circuit wires to a timer manually at the place of installation of the apparatus controlled by the timer and this is a time-consuming task as the individual circuit wires have to be separately connected, usually by soldering or crimping the wires to female contact members intended to be engaged with appropriate ones of a multiplicity of male contacts provided on the timer, these latter contacts being selectively engaged to suit the sequence and duration of the operations of a cycle of operations to be performed by the apparatus in question.

The primary object of the invention is the provision of a connecting block fitted with contacts for engagement by contacts of blade-like form of a separate member (e.g. a timing device associated with apparatus performing a plurality of required operations in a pre-determined sequence and which may be of different durations) wherein undesirable movement of the contacts in said block is eliminated or limited to a negligible amount to ensure that good electrical connections are obtained and maintained.

According to the present invention there is provided an electric connector block of insulating material fitted with a plurality of contacts for engagement by contacts of blade-like form of a separate member

(e.g. a timing device associated with apparatus performing a plurality of required operations in a pre-determined sequence and which may be of different durations) characterised in that said block comprises a plurality of parallel openings in each of which is a rib that is straddled by a pair of spaced-apart limbs of a first contact, each of said limbs having a bowed springy portion extending therefrom between which and an adjacent wall of the opening accommodating the first contact a contact of blade-like form of a separate member can be engaged to provide an electrical connection, the said limbs of the first contact abutting opposite faces of said rib respectively, said rib being formed at opposite ends thereof with abutment ledges against which about side edges of said limbs of the first contact, each said rib also being formed with a cut-out in which a spring latch provided on each of said limbs of a first contact is snapped and engaged, said latches co-acting with and preventing unintentional withdrawal of a first contact from the block, the latter being formed with slots of different lengths for engagement over complementary ribs on said separate member and between which complementary ribs the blade-like contacts of the member are positioned thereby ensuring that the connector block and said separate member can only be interengaged and the respective contacts correctly engaged when the block and said member are properly orientated.

To enable the invention to be clearly understood and readily carried into effect reference will now be made to the drawings accompanying the Provisional Specification which illustrate a preferred embodiment of the invention. In said drawings:—

Figure 1 is a plan view of the block with the contacts omitted:

Figure 2 is a section taken on the line II—II of Figure 1:

Figure 3 is a section taken on the line III—III of Figure 1:

Figure 3A is a detail view of the upper end of a rib engaged by a contact:—

Figure 4 is a fragmentary perspective view, drawn to a greatly enlarged scale illustrating how the contacts in the block are positioned and also illustrating the provision of a further contact for use as an earthing contact or to receive a link contact between different timer blocks:

Figures 5, 6, 7 and 8 are side, plan and two end views of a contact, and

Figure 9 is a plan view of a blank from which said contact is fashioned.

Referring firstly to Figures 1, 2 and 3 of said drawings, the connector block is indicated generally at 1 and consists of a moulding of a suitable electrically insulating synthetic plastics material. The bottom of this block, as viewed in Figures 2 and 3, is formed with openings 2 through which contacts fitted to the ends of conductor wires can be passed and the upper ends of these openings are each bridged by a contact-positioning rib 3 that is straddled by a pair of spaced apart limbs 4a each having a bowed portion 4 of a first contact as illustrated in Figures 5 to 9 and referred to hereinafter. Thus, each first contact is located with one limb 4a and a bowed portion 4 thereof located at each side of a rib 3 so that the contact straddles the rib from below. Each rib 3 is formed (see Figure 3A) with end portions 5 which are shaped to form abutment ledges 6 at each side and end of the rib 3 against which engage the side edges 4b of the limbs 4a having the bowed portions 4 of the contact thereby reducing sideways rocking of the contact in the plane of the rib 3 to a negligible amount.

Each rib 3 is also formed with a cut-out 7 in which can snap springy latches 8 formed on the limbs 4a as the limbs yield and then spring together as the limbs and the bowed portions of each contact pass respectively one to each side of the rib 3 during insertion of the contact into the block 1. These latches co-act with the upper edge of the cut-out 7 and prevent unintentional withdrawal of the contact in a direction opposite to that in which it is introduced into the block through an opening 2. These latches 8 additionally serve to reduce sideways rocking of the contact.

Movement of a first contact in the direction in which it is inserted into the block is limited by a back stop 8a on the contact (Figure 6) engaging against the edge 7b of the rib 3 (Figure 3A).

Movement of a first contact in a direction at right-angles to the plane of the rib 3 is prevented due to the engagement of the faces of the limbs 4a of the contact (Figure 6) with opposite faces 3a (Figure 1) of the rib 3.

As previously explained the block 1 is adapted to slide bodily over a set of ribs on the timing device (not illustrated) between

which ribs the contacts of the latter are located and to permit this the block 1 is formed with a set of complementary slots which can engage the ribs on the timing device. Each of these slots at one end thereof comprises (see Figure 1) a portion 9 in one side wall 10 of the block, and a portion 9a in the opposite side wall 10a of the block and the portions 9 of the slots are made longer (as shown in Figure 1) than the portions 9a so that if the block is not oriented correctly the slots will not be correctly aligned with the ribs of the timer and will not slide thereover, thus preventing engagement of the contacts fitted to the block with those fitted to the timer.

It will be seen that two parallel lines of first contacts are provided in the block 1 and that the block is formed with spaced apart inner walls 11 and that these walls 11 are formed with slots 12 which align with the slot portions 9 and 9a thus permitting sliding of the block over the ribs on the timing device. These walls 11 serve to support the blades of the male contacts and restrict lateral movement thereof by the springy portions 4 of the contacts.

Each wall 10 and 10a of the block is formed with grooves 13 on its inner face (Figure 2) for receiving a further contact indicated generally at 14 in figure 4 and which comprises a single bowed portion 15. This single-bowed contact 14 may be a further contact for use, for example, as an earthing contact or to receive a link contact between different timer blocks.

This single bowed portion of the further contact 14 may be formed with a pressed out dimple 16 which co-acts with a complementary hole (not illustrated) formed on a blade 18 of a timing device.

Referring lastly to Figures 5 to 9, each contact having two bowed portions in the block may be made from a one-piece blank as shown in Figure 9 which is folded longitudinally into a trough-like shape and parts thereof then curved back upon themselves to form the bowed springy portions 4, the outer faces of the bowed portions 4 being formed with said dimples 16 and the limbs 4a being formed with said pressed out latches 8. These contacts may be connected with conductor wires in any suitable manner, e.g. by forming them with parts 17 than can be crimped onto bared ends of the conductors.

Figure 4 already referred to illustrates two contact blades 18 of a timer mechanism which can be slidably engaged with the bowed contact portions 4 of the contacts in the block 1 to complete the circuit, each blade contact engaging between a bowed springy portion 4 and an adjacent wall of an opening 2.

The block may obviously be constructed

to contain any required number of contacts, e.g. double the required number for a single timer when it is intended to be used in conjunction with two timers.

5 The block may if desired be formed with a wall having exposable identification numbers moulded therein, the numbers representing different arrangements of contacts in the blocks so that by exposing an appropriate identification number a sub-
10 sequent indication is given to a user that the block has a particular "set-up" of contacts to satisfy particular requirements. This avoids the need for making blocks of different
15 colours to indicate those appropriate to different requirements.

WHAT WE CLAIM IS:—

1. An electric connector block of
20 insulating material fitted with a plurality of contacts for engagement by contacts of blade-like form of a separate member (e.g. a timing device associated with apparatus performing a plurality of required operations in a predetermined sequence and which
25 may be of different durations) characterised in that said block comprises a plurality of parallel openings in each of which is a rib that is straddled by a pair of spaced-apart limbs of a first contact, each of said limbs having a bowed springy portion extending
30 therefrom between which and an adjacent wall of the opening accommodating the first contact a contact of blade-like form of a separate member can be engaged to provide
35 an electrical connection, the said limbs of the first contact abutting opposite faces of said rib respectively, said rib being formed at opposite ends thereof with abutment ledges against which abut side edges of said
40 limbs of the first contact, each said rib also being formed with a cut-out in which a springy latch provided on each of said limbs of a first contact is snapped and engaged, said latches co-acting with and preventing

unintentional withdrawal of a first contact 45 from the block, the latter being formed with slots of different lengths for engagement over complementary ribs on said separate member and between which complementary ribs the blade-like contacts of the member 50 are positioned thereby ensuring that the connector block and said separate member can only be interengaged and the respective contacts correctly engaged when the block and said member are properly orientated. 55

2. An electric connector block as claimed in Claim 1, provided with an opening housing an earthing contact or to receive a link contact.

3. An electric connector block as claimed 60 in Claim 1 or 2, wherein movement of a first contact in the direction in which it is inserted into the block is limited by a back stop on the contact engaging an edge of said rib. 65

4. A electric connector block as claimed in any of the preceding Claims, wherein walls of the openings in said block serve to restrict lateral movement of the contact blades of the separate member by the bowed portions of the first contacts. 70

5. An electric connector block for engagement with a timing device associated with apparatus performing a plurality of required operations in a predetermined sequence and which may be of different durations, constructed substantially as hereinbefore described with reference to and as illustrated by the drawings accompanying the Provisional Specification. 75 80

6. An apparatus controlled by a timing device fitted with an electric connector block as claimed in any of the preceding Claims.

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to contain any required number of contacts, e.g. double the required number for a single timer when it is intended to be used in conjunction with two timers.

5 The block may if desired be formed with a wall having exposable identification numbers moulded therein, the numbers representing different arrangements of contacts in the blocks so that by exposing an appropriate identification number a subsequent indication is given to a user that the block has a particular "set-up" of contacts to satisfy particular requirements. This avoids the need for making blocks of different colours to indicate those appropriate to different requirements.

WHAT WE CLAIM IS:—

1. An electric connector block of insulating material fitted with a plurality of contacts for engagement by contacts of blade-like form of a separate member (e.g. a timing device associated with apparatus performing a plurality of required operations in a predetermined sequence and which may be of different durations) characterised in that said block comprises a plurality of parallel openings in each of which is a rib that is straddled by a pair of spaced-apart limbs of a first contact, each of said limbs having a bowed springy portion extending therefrom between which and an adjacent wall of the opening accommodating the first contact a contact of blade-like form of a separate member can be engaged to provide an electrical connection, the said limbs of the first contact abutting opposite faces of said rib respectively, said rib being formed at opposite ends thereof with abutment ledges against which abut side edges of said limbs of the first contact, each said rib also being formed with a cut-out in which a springy latch provided on each of said limbs of a first contact is snapped and engaged, said latches co-acting with and preventing

unintentional withdrawal of a first contact from the block, the latter being formed with slots of different lengths for engagement over complementary ribs on said separate member and between which complementary ribs the blade-like contacts of the member are positioned thereby ensuring that the connector block and said separate member can only be interengaged and the respective contacts correctly engaged when the block and said member are properly orientated.

2. An electric connector block as claimed in Claim 1, provided with an opening housing an earthing contact or to receive a link contact.

3. An electric connector block as claimed in Claim 1 or 2, wherein movement of a first contact in the direction in which it is inserted into the block is limited by a back stop on the contact engaging an edge of said rib.

4. A electric connector block as claimed in any of the preceding Claims, wherein walls of the openings in said block serve to restrict lateral movement of the contact blades of the separate member by the bowed portions of the first contacts.

5. An electric connector block for engagement with a timing device associated with apparatus performing a plurality of required operations in a predetermined sequence and which may be of different durations, constructed substantially as hereinbefore described with reference to and as illustrated by the drawings accompanying the Provisional Specification.

6. An apparatus controlled by a timing device fitted with an electric connector block as claimed in any of the preceding Claims.

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