

Abstract

Accordingly, the present invention provides an interlocking mechanism for a withdrawable module of a switchboard. The interlocking mechanism includes a mechanism handle and a short circuit protection device (SCPD). The mechanism handle of the present invention prevents an engagement of power contacts when the SCPD is ON and also, prevents an operation of the SCPD when the mechanism handle is inserted in the withdrawable module.

Figure 1

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We Claim:

1. An interlocking mechanism for a withdrawable module of a switchboard, the interlocking mechanism comprising:

a short circuit protection device (SCPD) configured within the withdrawable module;

a mechanism handle capable of being inserted in the withdrawable module for operating the withdrawable module to Service, Test and Isolation positions;

a first lever attached to a SCPD handle;

a third lever being capable of communicating with the mechanism handle, the third lever being capable of blocking the mechanism handle insertion in the withdrawable module when the short circuit protection device ON;

a rod assembly connecting a second lever and the third lever;

a side plate attached to a side of the withdrawable module, the sideplate having a slot, wherein the first lever enters into the slot when the mechanism handle is out of the module, and

wherein upon inserting the mechanism handle in the withdrawable module, the third lever gets activated thereby pulling the rod assembly attached to the third lever that in turn pulls the second lever causing blocking the slot of the sideplate thereby blocking an operation of the short circuit protection device.

2. The interlocking mechanism as claimed in claim 1 characterized in that the rod assembly is made of nylon.

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Interlocking Mechanism for Withdrawable Module of Switchboard

Field of the invention

The present invention relates generally to switchboards and more particularly, to an interlocking mechanism for a withdrawable module of the switchboard.

Background of the invention

There are two types of switchboards used to distribute the generated power namely a power control centre (PCC) and a motor control centre (MCC). PCC distributes the power to different MCC and MCC distributes that power intelligently to different motor loads and lamp loads using feeders/modules. Modules are semi enclosed housings consisting of various electrical and mechanical equipments. Modules are of a withdrawable type and a fixed type.

The withdrawable module of the switchboard has three distinct positions i.e. service, test and isolation. When power contacts and auxiliary contacts are engaged it is called as a service position. When power contacts are engaged and auxiliary contacts are disengaged it is called as a test condition and when both the contacts are disengaged it is called as an isolation condition.

These three positions like service, test and isolation in the withdrawable module are achieved by operating and inserting a mechanism handle in the withdrawable module. In a conventional interlock, when a short circuit protection device (SCPD) is ON, the mechanism handle cannot be inserted thus blocking the operation of the SCPD. Only when the SCPD is OFF, the mechanism handle can be inserted. But after inserting the mechanism handle, the SCPD can be made ON and after this the operation of the SCPD is possible. In absence of this interlock, power contacts can be engaged or

disengaged by operating the mechanism handle when the SCPD is in ON position leading to arcing.

Accordingly, there is a need of an interlocking mechanism for a withdrawable module of a switchboard that prevents an operation of a short circuit protection device when a mechanism handle is inserted in the withdrawable module and overcomes the drawbacks of the prior art.

Object of the invention

An object of the present invention is to prevent an operation of a short circuit protection device (SCPD) when a mechanism handle is inserted in a withdrawable module of a switchboard.

Summary of the invention

Accordingly, the present invention provides an interlocking mechanism for a withdrawable module of a switchboard. The interlocking mechanism comprises a short circuit protection device (SCPD), a SCPD handle, a mechanism handle, a cam, a first lever, a second lever, a third lever, a rod assembly, and a side plate. The short circuit protection device is configured within the withdrawable module. The mechanism handle is capable of being inserted in the withdrawable module for operating the module to Service, Test and Isolation positions. The first lever is attached to the SCPD handle. The third lever is capable of communicating with the mechanism handle and also, capable of blocking the mechanism handle insertion in the withdrawable module when the short circuit protection device is ON. The rod assembly connects the second lever and the third lever. The rod assembly is made of a nylon. The side plate is attached to a side of the withdrawable module and includes a slot. The first lever enters into the slot when the mechanism handle is out of the

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module and upon inserting the mechanism handle in the withdrawable module, the third lever gets activated thereby pulling the rod assembly attached to the third lever which in turn pulls the second lever causing blocking the slot of the side plate thereby blocking an operation of the short circuit protection device.

Brief description of the drawings

Figure 1 is a sectional view of an interlocking mechanism for a withdrawable module, in accordance with the present invention;

Figure 2 is another sectional view of the interlocking mechanism of figure 1 showing a rod assembly and a shaft;

Figure 3 is a perspective view of a side plate of the interlocking mechanism of figure 1; and

Figures 4-5 show a perspective view of a third lever of the interlocking mechanism of figure 1.

Detail description of the invention

The foregoing objects of the present invention are accomplished and the problems and shortcomings associated with the prior art, techniques and approaches are overcome by the present invention as described below in the preferred embodiment.

The present invention provides an interlocking mechanism for a withdrawable module of a switchboard. The interlocking mechanism includes a mechanism handle and a short circuit protection device (SCPD). The mechanism handle of the present invention prevents an engagement of power contacts when the SCPD is ON and also,

prevents an operation of the SCPD when the mechanism handle is inserted in the withdrawable module.

The present invention is illustrated with reference to the accompanying drawings, throughout which reference numbers in bracket indicate corresponding parts in the various figures.

Referring now to figures 1-4, an interlocking mechanism (200) for a withdrawable module (150) of a switchboard (not numbered) in accordance with the present invention is shown. The interlocking mechanism comprises a short circuit protection device (hereinafter "the SCPD (10)"), a SCPD handle (20), a mechanism handle (not numbered), a cam (30), a rod (40), a first lever (50), a side plate (60), a second lever (70), a third lever (80), a rod assembly (90) and a shaft (100).

The SCPD (10) is configured within the withdrawable module (150). The SCPD handle (20) is mounted on the SCPD (10) and attached to the cam (30). The SCPD handle (20) is used for operating the SCPD (10) in any one of ON and OFF position. The first lever (50) is attached to the SCPD handle (20) through the cam (30) and the rod (40). The rod assembly (90) connects the second lever (70) and the third lever (80). In an embodiment, the rod assembly (90) is made of nylon.

The side plate (60) is attached to the withdrawable module (150) at a side (not numbered) thereof. The side plate (60) includes a slot (55). The slot (55) is kept open for operating the SCPD (10) by placing the mechanism handle out of the withdrawable module (150). The first lever (50) enters into the slot (55) of the sideplate (60) when the mechanism handle is out of the withdrawable module (150). The third lever (80) is designed to work as a shutter for blocking the mechanism handle insertion when the SCPD (10) is ON. The third lever (80) allows the mechanism handle insertion only when the SCPD (10) is OFF. The third lever (80)

opens automatically when the mechanism handle is inserted and blocks the operation of the SCPD (10) when the mechanism handle is inside the withdrawable module (150). The mechanism handle is inserted in the withdrawable module (150) for operating the withdrawable module (150) to Service, Test and Isolation positions.

Again referring to figures 1-4, in operation, the SCPD (10) is made ON by rotating the SCPD handle (20) clockwise by 90 degrees. The cam (30) attached to the SCPD handle (20) also gets rotated by 90 degrees causing pulling of the first lever (50) attached to the rod (40). When the mechanism handle is inserted in the withdrawable module (150), the third lever (80) gets activated. When the third lever (80) is activated, the rod assembly (90) attached to the third lever (80) gets pulled that in turn pulls the second lever (70) thereby blocking the slot (55) of the sideplate (60). So, whenever the mechanism handle is inserted in the withdrawable module (150), the slot (55) gets blocked by the second lever (70) thereby blocking an operation of the SCPD (10).

Advantages of the invention:

1. The interlocking mechanism (200) blocks the SCPD (10) operation when the mechanism handle is inserted in the withdrawable module (150).
2. The third lever (80) blocks the insertion of the mechanism handle when the SCPD (10) is ON and opens automatically when the mechanism handle is inserted in the withdrawable module (150).

The foregoing objects of the invention are accomplished and the problems and shortcomings associated with prior art techniques and approaches are overcome by the present invention described in the present embodiment. Detailed descriptions of the preferred embodiment are provided herein; however, it is to be understood that the present invention may be embodied in various forms. Therefore, specific details

disclosed herein are not to be interpreted as limiting, but rather as a basis for the claims and as a representative basis for teaching one skilled in the art to employ the present invention in virtually any appropriately detailed system, structure, or matter. The embodiments of the invention as described above and the methods disclosed herein will suggest further modification and alterations to those skilled in the art. Such further modifications and alterations may be made without departing from the spirit and scope of the invention.

We Claim:

1. An interlocking mechanism for a withdrawable module of a switchboard, the interlocking mechanism comprising:

a short circuit protection device (SCPD) configured within the withdrawable module;

a mechanism handle capable of being inserted in the withdrawable module for operating the withdrawable module to Service, Test and Isolation positions;

a first lever attached to a SCPD handle;

a third lever being capable of communicating with the mechanism handle, the third lever being capable of blocking the mechanism handle insertion in the withdrawable module when the short circuit protection device ON;

a rod assembly connecting a second lever and the third lever;

a side plate attached to a side of the withdrawable module, the sideplate having a slot, wherein the first lever enters into the slot when the mechanism handle is out of the module, and

wherein upon inserting the mechanism handle in the withdrawable module, the third lever gets activated thereby pulling the rod assembly attached to the third lever that in turn pulls the second lever causing blocking the slot of the sideplate thereby blocking an operation of the short circuit protection device.

2. The interlocking mechanism as claimed in claim 1 characterized in that the rod assembly is made of nylon.

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