

Description

Closing apparatus for a switchgear cabinet

The present invention describes a closing apparatus for a cabinet, specifically for a switchgear cabinet, comprising a door with a first and a second receiving device, a closing device and a hinge device.

In order to permit a user to gain access to the interior of a switchgear cabinet or a switchgear assembly, doors are fitted to switchgear cabinets or to switchgear assemblies. One of these doors is usually connected to the switchgear cabinet or to the switchgear assembly by means of a hinge device. The switchgear cabinet or the switchgear assembly can be closed by means of a closing device which is likewise fitted to the door.

When a switchgear cabinet or a switchgear assembly is being erected, it is necessary to take note of the stop side of the door in areas where space is limited. This refers to the right-hand-side and/or left-hand-side stop of a door. It is necessary to take note of the stop side in order to be able to open the door easily in spite of the limited amount of space. Care should also be taken that the open door does not present an obstruction in emergency exit situations. It is therefore advantageous if the door is designed such that it can be fitted to the switchgear cabinet or to the switchgear assembly both for a right-hand-side stop and also for a left-hand-side stop.

CH 487 575 describes a switchgear cabinet with an associated door. In this case, the switchgear cabinet has at least one fastening lug on the left-hand side and on the right-hand side. Corresponding cutouts are therefore made in the door such that the fastening lugs protrude into the cutouts when the door is in the closed state. The cutouts

are symmetrical to one another with respect to an axis which runs perpendicularly through the middle of the door. The installation of a plurality of hinge parts on a fastening lug and within the associated cutout means the door can be connected to the switchgear cabinet on one side such that the door can rotate in relation to the switchgear cabinet and therefore fulfill its function as a door. In a similar way, the door can be provided with a lock by installing a plurality of lock parts on a fastening lug and within the associated cutouts on the other side. In this case, the user is free to decide on which side of the door a hinge is installed and on which side a lock is installed. This permits both a left-hand-side and also a right-hand-side stop using the same door.

GM 80 15 411 describes a switchgear cabinet door which has a lock/hinge device both on the left-hand side and on the right-hand side. The insertion of a hinge pin means a lock/hinge device can be formed such that it fulfills the function of a hinge. Replacement of the hinge pin with a locking pin likewise enables a lock/hinge device to be converted into a lock. Therefore, a left-hand-side or a right-hand-side stop is permitted for the same door even in the case of a switchgear cabinet door according to utility model GM 80 15 411.

However, in the case of doors for switchgear cabinets which are described in CH 487 575 and GM 80 15 411, conversion from a door which stops on the left-hand side into a door which stops on the right-hand side involves changes to the hinge and to the lock of the door. This in turn requires precise knowledge about the construction and operation of the lock and the hinge and additionally is comparatively time-consuming.

The object of the present invention is therefore to find a closing apparatus in which it is easier to change the stop side.

According to the invention, the object is achieved by a closing apparatus for a cabinet, specifically for a switchgear cabinet, comprising a door with a first and a second receiving device, a closing device and a hinge device, wherein the closing device is designed as a closing module and the hinge device is designed as a hinge module, and the first and the second receiving devices are suitable for receiving both the hinge module and the closing module.

In this case, the hinge device in the form of a hinge module has the full functionality of a hinge. In addition, the closing device is designed such that it has all the moving parts of a lock. The door itself does not comprise any moving parts and is not directly connected to moving parts either. In one particular embodiment of the hinge device and of the closing device, fastening lugs are not fitted either to the door or to the frame of the cabinet.

The modular construction ensures that the hinge device and closing device can be easily interchanged. Since this is done without intervention in the hinge device or closing device, the user does not require precise knowledge about the hinge device or the closing device for this.

According to the invention, the first receiving device can be arranged symmetrically in relation to the second receiving device with respect to an axis which runs vertically through the door. As a result, it is possible to convert a closing apparatus according to the invention from a

closing apparatus which closes on the right-hand side into a closing apparatus which closes on the left-hand side in a few operating steps which are easy to execute.

By way of example, the first receiving device and/or the second receiving device are/is designed as at least one cutout in the door. By virtue of this at least one cutout, a closing device or hinge device can be easily fastened to the door.

The closing device may preferably have a first fastening insert and a closing element. The hinge device can likewise have a second fastening insert and a hinge element. This ensures rapid mounting and demounting of the closing element and of the hinge element.

The closing device may, for example, have an individual closure, a multiple closure or a rod-type closure. However, these are only a few examples of possible closing means; other closing means which are not listed here can also be used for the closing apparatus according to the invention. A wide selection of possible closing devices are therefore available to the manufacturer of a closing apparatus according to the invention. The manufacturer can also choose from a large selection of usable fastening inserts and usable hinge elements.

The present invention will now be explained in greater detail with reference to the attached drawings, in which:

fig. 1 shows a closing apparatus according to the invention;

fig. 2 shows a door with a plurality of cutouts which are positioned symmetrically in relation to one another;
and

fig. 3 shows a door with a plurality of insert hooks which are situated symmetrically in relation to one another.

The exemplary embodiments explained in greater detail below represent preferred embodiments of the present invention.

The closing apparatus according to the invention from fig. 1 comprises a door 1, a closing module 3 and a hinge module 6. The switchgear cabinet or the switchgear assembly to which the door can be fastened is not shown in fig. 1.

The door 1 has two cutouts 2a and 2b. In this case, the cutout 2a has the same shape as the cutout 2b. In addition, the cutouts 2a and 2b are symmetrical to one another with respect to an axis which runs vertically through the middle of the door 1.

The closing module 3 comprises a fastening insert 4 and a closing element 5. The fastening insert 4 is formed such that it can be inserted into either of the two cutouts 2a and 2b. The closing element 5 is then fastened to the door 1 by means of the fastening insert 4 and the cutout 2a or 2b.

The closing element 5 comprises all movable parts of a lock. No movable parts of a lock are provided on the door 1 itself or on the cabinet frame, which is not shown in fig. 1.

The hinge module 6 likewise has a fastening insert 7. This fastening insert 7 is also designed such that it can be inserted both into the cutout 2a and also into the cutout 2b. A hinge element 8 is likewise fastened to the fastening insert 7. The hinge element 8 can be fastened to the door by means of the fastening insert 7. Furthermore, the hinge element 8 can be fastened to the switchgear cabinet by means of a fastening point which is not shown in fig. 1. It is therefore possible to rotate the

door 1 with respect to the switchgear cabinet by means of the hinge element 8.

The hinge element 8 has the full functionality of a hinge. It has all components of a hinge which can move relative to one another. As can be seen when looking at fig. 1, the door 1 itself does not comprise any moving parts of a hinge and is therefore not directly connected to a moving part of a hinge either.

The two cutouts 2a and 2b and the two fastening inserts 4 and 7 are, for example, designed in relation to one another such that each of the two fastening inserts 4 and 7 can be inserted into one of the two cutouts 2a or 2b by a slight pressure being exerted. The cutouts 2a and 2b are designed such that an inserted fastening insert 4 or 7 is held within the cutout 2a or 2b. The fastening insert can be released from the respective cutout 2a or 2b again only when a user exerts a predefined pressure on the fastening insert 4 or 7.

However, the manner of fastening presented here is only one example of a manner of fastening which can be used. It would also be possible to screw the fastening insert to the door by means of a cutout which is designed for this purpose or to firmly bond the fastening insert to the door by means of a bonding apparatus which is fitted to the door. A fastening insert which is designed for this purpose can also be fastened to a door using one or more magnets.

In order to move the closing element 5 or the hinge element 8 from one side of the door 1 to the other side, it suffices in the example from fig. 1 to push the fastening insert 4 or 7 together with the closing or hinge element 5 or 8 which is fastened to it out of a cutout 2a or 2b and then insert the respective fastening insert 4 or 7 into the other cutout 2a or 2b. It is therefore not necessary to use

tools or to have precise knowledge about the construction and operation of the closing element 5 or the hinge element 8 for this purpose.

Fig. 2 shows a further example of a door 9 of a closing apparatus according to the invention. In this case, the door 9 has a total of eight cutouts 10a and 10b. The four cutouts 10a are provided on the left-hand side of the door 9 and the four cutouts 10b are provided on the right-hand side. Each of these cutouts 10a and 10b has an identical shape. In this case, the cutouts 10a are symmetrical to the cutouts 10b with respect to an axis of symmetry 11 which runs vertically through the middle of the door.

The closing apparatus, which is not shown in fig. 2, can be fitted to the respective side of the door 9 either by means of the cutouts 10a or by means of the cutouts 10b. In this case, the closing device can, for example, have individual closures, multiple closures or a rod-type closure. The hinge device, which is likewise not shown in fig. 2, can also be fastened to the door 9 either by means of the cutouts 10a or by means of the cutouts 10b.

Fig. 3 shows a further example of a door 12 of a closing apparatus according to the invention. In this case, the door 12 has, as an alternative to the cutouts 10a and 10b shown in fig. 2, eight fastening openings 13a and 13b. The four fastening openings 13a are provided on the outside of the left-hand side of the door 12, and the four fastening openings 13b are fastened to the right-hand side. All the fastening openings 13a and 13b are identical to one another. In addition, the fastening openings 13a are symmetrical to the fastening openings 13b with respect to a vertical axis of symmetry 14 through the middle of the door 12.

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A hinge device, which is not shown in fig. 3, can be fastened

to the door 12 by means of the four fastening openings 13a or by means of the four fastening openings 13b. Equally, a closing device, which is likewise not shown in fig. 3, can be fastened to the door 12 either by means of the fastening openings 13a or by means of the fastening openings 13b. The closing elements provided for this closing device can also be individual closures, multiple closures or rod-type closures.

List of reference symbols

1, 9, 12	Door
2a, 2b, 10a, 10b	Cutouts
3	Closing device
4, 7	Fastening inserts
5	Closing element
6	Hinge device
8	Hinge element
11, 14	Axis of symmetry
13a, 13b	Fastening openings

Patent claims

1. A closing apparatus for a cabinet, in particular for a switchgear cabinet, comprising

- a door (1, 9, 12) with a first and a second receiving device (2a, 2b, 10a, 10b, 13a, 13b),
- a closing device (3) and
- a hinge device (6),

characterized in that

- the closing device (3) is designed as a closing module (3) and the hinge device (6) is designed as a hinge module (6), and
- the first and the second receiving devices (2a, 2b, 10a, 10b, 13a, 13b) are suitable for receiving both the closing module (3) and the hinge module (6).

2. The closing apparatus as claimed in claim 1, wherein the first receiving device (2a, 10a, 13a) is arranged symmetrically in relation to the second receiving device (2b, 10b, 13b) with respect to an axis (11, 14) which runs vertically through the door.

3. The closing apparatus as claimed in claim 1 or 2, wherein the first receiving device and/or the second receiving device (2a, 2b, 10a, 10b, 13a, 13b) are/is designed as at least one cutout (2a, 2b, 10a, 10b, 13a, 13b) in the door (1, 9, 12).

4. The closing apparatus as claimed in one of claims 1 to 3, wherein the closing device (3) has a first fastening insert (4) and a closing element (5).

5. The closing apparatus as claimed in one of the preceding claims, wherein the hinge device (6) has a second fastening insert (7) and a hinge element (8).

6. The closing apparatus as claimed in one of the preceding claims, wherein the closing device (3) has an individual closure,

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a multiple closure or a rod-type closure.