

Title: End cap

Description

The present invention relates to an end cap for closing off the frontal side of a housing of a slide channel and/or of a door operator according to the generic part of claim 1.

End caps, having a filigree configuration, are disclosed in the state-of-the-art, thus requiring a strict observation of the relating dimension.

This embodiment is disadvantageous in that the end caps are susceptible to failure when improperly handled, and their production is expensive.

Another disadvantage is found in that, in case of coated end caps, dimensional stability may be influenced such that a reliable functioning can not be guaranteed.

The document DE 10 2004 008 117 A1 discloses an attachment device for a sliding channel or a guiding rail for door closers. The attachment device has a connecting plate, which is connected to the sliding channel and to the guiding rail in a clamping manner and subsequently the sliding channel and guiding rail are installed, for example at a wall. Moreover, the connecting plate has projections,

which cooperate with recesses in a cover cap in such a way that the cover cap can be snapped onto the connecting plate.

This embodiment is disadvantageous in that the cover cap, on account of the projections of the connecting plate, is bent open so far that dimensional stability of the cover cap can not be guaranteed resulting in the cover cap to be spaced apart from the sliding channel.

It is furthermore disadvantageous that, in case of dynamic stress of the sliding channel and guiding rail and of simultaneous unfavourable tolerance definition of the cover cap, the cover cap might disconnect from the sliding channel.

Therefore, it is the object of the present invention to provide an end cap for a sliding channel and a door operator, which overcomes the above disadvantages and has a simple design, and can be manufactured inexpensively.

This problem is solved according to the generic part of claim 1 in conjunction with the characterizing features. Advantageous further developments of the invention are indicated in the dependent claims.

The invention includes the technical teaching, that the end cap has guiding rails, which cooperate with grooves of the adapter member, wherein at least one guiding rail has an area with a portion, which is operatively connected to a portion located in an area of the grooves of the adapter member, wherein the end cap, once installed in installation direction, is positively and non-positively retained at the adapter member.

The inventive embodiment has the advantage that the end cap can be installed in a simple manner at a sliding channel and/or at a door operator, wherein the end cap is reliably retained at the sliding channel and/or at the door operator by latching even during dynamic movements of the sliding channel and/or of the door operator, and the positive and non-positive connection absorbs dimensional fluctuations.

It is likewise an advantage, if the portion disposed in the area of the guiding rail consists of at least one elevation. A first required area for arresting and/or latching the end cap with the adapter member is thus created.

It is likewise an advantage, if the portion disposed in the area of the groove consists of at least one depression. A second required area for arresting and/or latching the end cap with the adapter member is thereby created.

It is furthermore an advantage, if the elevation projects into the depression. It is thus ensured that an arresting and/or a latching connection between the end cap and the adapter member is possible.

It is likewise an advantage, if the elevation latches with the depression. The end cap is thus firmly retained at the adapter member by means of the latching connection even during dynamic movements of the housing of the sliding channel and/or of the door operator.

It is advantageous, if the depression is disposed in the area of the groove bottom. An appropriate geometry is thus created in an inexpensive and simple manner, which allows for latching the end cap to the adapter member.

It is likewise an advantage, if the end cap can be uninstalled from the adapter. Required maintenance work at the sliding channel and at the door operator can be performed without having to damage the end cap. If, after a certain period of time, it is desired to exchange the end cap, a simple option is provided to be able to remove the installed end cap.

It is likewise an advantage, if the end cap is made from plastic material. Thus an inexpensive manufacturing process for producing the end cap is chosen.

It is furthermore an advantage, if the end cap is coated. Different types of surface finishing can thus be provided whereby design wishes can be considered.

It is advantageous, if the end cap is painted. Thus colour surface finishings can be provided whereby further design wishes can be considered.

It is likewise an advantage, if the end cap is made from metal material. This circumstance allows for reacting to design wishes in a simple manner.

Another preferred embodiment consists of the adapter member being made from plastic material. Thus the connection between the housing and/or the door operator to the end cap can be realized with an inexpensive structural component, wherein the adapter member can be produced in an inexpensive production process.

Since the end cap is being used in different embodiments of sliding channels, adapter members are utilized, the reception areas thereof being adapted to the different sliding channels on the one hand, wherein the reception areas for the end cap of the respective adapter members have the same embodiment. It is thus ensured, that, when using different adapter members, just a single embodiment form of end caps needs to be kept in stock, in order to be

able to equip sliding channels with the same end caps. This modular construction system is advantageous in that the multitude of variants and thus the stock keeping of the end cap can be very low.

A preferred embodiment of the invention will be illustrated in more detail based on the following description and Figures, in which:

Figure 1: shows the end cap with the adapter member in the installed condition in a perspective view,

Figure 2: shows the end cap and the adapter member as an individual component in a perspective view,

Figure 3: shows the end cap and the adapter member of Figure 2 in a frontal view,

Figure 4: shows the end cap and the adapter member of Figure 2 in another perspective view,

Figure 5: shows a detailed view of Figure 4.

Figure 1 shows the end cap 10 with the adapter member 30 in the installed condition, wherein the end cap 10 is completely pushed onto the adapter member 30. The end cap 10 has webs 65, 70, which, at least partially, are

provided for enclosing an additional frontal side covering of the sliding channel and/or of the door operator. The adapter member 30 has a reception 60, which serves for coupling the adapter member 30 to the sliding channel 30 and/or to the door operator. The reception 60 may be configured to be different, because the corresponding geometries of the sliding channel and of the door operator may be different as well.

Figure 2 shows the end cap 10 and the adapter member 30 as an individual part in the non-installed condition. The end cap 10 has guiding rails 15, 20, which extend transversely to the longitudinal extension of the end cap 10 across the entire height of the end cap 10. However, in this case it is not required to extend the guiding rails 15, 20 across the entire height of the end cap 10. At least one guiding rail 15, 20, in this case the guiding rail 20, has an elevation 25, which extends in the direction of the guiding rail 15. The adapter member 30 has grooves 35, 40, which cooperate with the guiding rails 15, 20 of the end cap 10. At least one groove, in this case the groove 35 has a depression 50, which, in the installed condition, cooperates with the elevation 25 of the end cap 10 in such a way that the elevation 25 projects into the depression 50, wherein the end cap 10 latches with the adapter member 30.

Figure 3 shows the end cap 10 and the adapter member 30 of Figure 2 in a frontal view, in which the elevation 25 at the guiding rail 20 of the end cap 10 is disposed in the central area of the guiding rail 20. The installation direction 55 indicates that the end cap 10 is to be pushed onto the adapter member 30, on account of the guiding rails 15, 20 and the grooves 25, 40 of the adapter member 30.

Figure 4 shows the end cap 10 and the adapter member 30 of Figure 2 in another perspective view, wherein a detail X is indicated.

Figure 5 shows the detailed view X of Figure 4. It becomes obvious in this case, how the guiding rail 20 of the end cap 10 is to be introduced into the groove 35 of the adapter member 30 in installation direction 55, wherein, in the non-visible area, the groove 40 of the adapter member 30 accommodates the guiding rail 15. The depression 50, which accommodates the elevation 25, is disposed in one portion of the groove 45, whereby the end cap 10 latches with the adapter member 30.

A sliding channel as well as a door operator may be configured such that they have openings at the frontal sides, which are to be closed, wherein in the closed condition, it is aimed to achieve an appealing design both at the sliding channel and at the door operator.

In order to be able to close off the frontal side openings, an adapter member 30 is utilized, which has a reception 60 serving for coupling to both to the sliding channel 30 and to the door operator. The configuration of this reception 60 may be different, because the corresponding geometry of the sliding channel and of the door operator may be different as well. Furthermore, the adapter member 30 has areas which are utilized for fastening the sliding channel for example to a wall or to a door frame.

The adapter member 30 has grooves 35, 40 which are disposed on the opposite side of the reception 60 and extend across the entire height of the adapter member 30. The extension of the grooves 35, 40 across the entire height of the adapter member 30 is not required, meaning the grooves 35, 40 may be configured to be shorter.

At least one groove, in this case the groove 35 has a depression 50 in the area of the groove bottom 45, into which depression an elevation 25 of an end cap 10 projects. The end cap 10 has guiding rails 15, 20, which cooperate with the grooves 35, 40 of the adapter member 30. At least one guiding rail, in this case the guiding rail 20, has the elevation 25, which may project into the depression 50 of the groove 35.

If the end cap 10 is pushed onto the adapter member 30 in the installation direction 55, at first the elevation 25 is clamped to the groove bottom 45 until the elevation 25 has reached the depression 50 and projects into the depression 50, whereby the end cap 10 latches with the adapter member 30.

The elevation 25 may be likewise disposed in other areas of the guiding rail 20. It is likewise possible to dispose several elevations 25 at the guiding rail 20, wherein, in this case, the adapter member 30 needs to be provided with corresponding depressions 50.

In case the sliding channel and/or the door operator are provided with an additional covering at the frontal side, the end cap 10 is configured in such a way that it encloses, at least partially, this additional covering with its webs 65 and 70, in order to guarantee a homogenous design at the sliding channel as well as at the door operator.

The configuration of the end cap 10 and of the adapter member 30 is designed in that the end cap 10 can be uninstalled in order to perform required maintenance work at the sliding channel or at the door operator.

The end cap 10 may be made from plastic material, which allows for coloured configurations. It is likewise possible to

coat or to paint the end cap 10 in order to comply with other design requirements.

It is equally possible to produce the end cap 10 from metal, in order to comply with even more design requirements.

List of reference numerals

10	end cap
15	guiding rail
20	guiding rail
25	elevation
30	adapter member
35	groove
40	groove
45	groove bottom
50	depression
55	installation direction
60	reception
65	web
70	web

Patent claims

1. An end cap (10) for covering the frontal side of a housing of a sliding channel and/or of a door operator, including an adapter member (30), which, on the one hand, is operatively connected to the housing of the sliding channel and/or of the door operator and, on the other hand, is operatively connected to the end cap (10), **characterized in that** the end cap (10) has guiding rails (15, 20), which cooperate with grooves (35, 40) of the adapter member (30), wherein at least one guiding rail (15, 20) has an area with a portion, which is operatively connected to a portion disposed in an area of the grooves (35, 40) of the adapter member (30), wherein, after completing the installation in the installation direction (55), the end cap (10) is positively and non-positively retained at the adapter member (30).
2. The end cap (10) according to claim 1, **characterized in that** the portion disposed in the area of the guiding rail (15, 20) consists of at least one elevation (25).

3. The end cap (10) according to the claims 1 and 2, **characterized in that** the portion disposed in the area of the groove (35, 40) consists of at least one depression (50).
4. The end cap (10) according to the claims 2 and 3, **characterized in that** the elevation (25) projects into the depression (50).
5. The end cap (10) according to claim 4, **characterized in that** the elevation (25) latches with the depression (50).
6. The end cap (10) according to claim 3, **characterized in that** the depression (50) is disposed in the area of the groove bottom (45).
7. The end cap (10) according to claim 1, **characterized in that** the end cap (10) can be uninstalled from the adapter member (30).
8. The end cap (10) according to claim 1, **characterized in that** the end cap (10) is made from plastic material.
9. The end cap (10) according to claim 8, **characterized in that** the end cap (10) is coated.

10. The end cap (10) according to claim 8,
characterized in that the end cap (10) is painted.
11. The end cap (10) according to claim 1,
characterized in that the end cap (10) is made
from metallic material.
12. The end cap (10) according to claim 1,
characterized in that the adapter member (30) is
made from plastic material.