

**Title: Attachment of end caps to housings, which
are composed of profiles**

Description

This invention relates to an attachment of end caps
5 to housings according to the generic part of patent
claim 1, housings which are composed of profiles and
utilised for door specific equipment for automatic
operated doors. These are especially swing doors,
sensor strips, sensor strips with integrated slide
10 channel, sliding door operators, etc.

EP 0 544 134 A1 discloses a cover hood invisibly
mounted at the fronts of a housing. This mounting
is realised by catchings, which have been
manufactured as tabs, whereby the end caps
15 simultaneously present opposite notched catchings
and thus can be fastened to the housing without
tools. In this case, the end caps slide on from
above and snap-in with the housing.

Especially with housings, which are made of extruded
20 material and if possible realised in one single
piece and are considered having an aesthetic
exterior aspect, there is not enough room provided
inside the profile for a traditional attachment,
namely with screws. Furthermore, it is often
25 difficult to always properly and satisfyingly fasten
such profiles, as they are utilised in most
differing lengths. Simultaneously, mounting of such
difficult accessible attachment type is very time
consuming, thus provoking high mounting costs, as
30 for example it is not possible to drill through the
profile.

The object of the invention is to improve the imperfections of the state of the art and to conceive an attachment type suitable to be employed independently from the lengths of the profile and
5 offering simultaneously an invisible attachment of end caps and of the housing.

The problem of the invention is solved according to patent claim 1, whereby the sub-claims represent a further embodiment of the invention. In this case,
10 the end caps are invisibly attached by means of intermediate mounting elements snapping-in within the profile (housing) and simultaneously fastening the profile at the place of installation. Hereby, the mounting elements are designed in a way to clamp
15 in chambers respectively between webs, which are provided at/in the profile. This clamping for example is realised by the fact that parts of the mounting element's cross section are made resilient to guarantee the snapping-in within the profile end
20 portion. Furthermore, at least one mounting element is equipped with an attachment leg, permitting a mounting and thus simultaneously a fastening of the entire profile at the place of installation. This is done through a bore hole inside the attachment
25 leg.

Another mounting element may for example connect in a differing way with the profile at its fronts, whereby for this purpose screw channels are used that are provided inside the profile. Simultaneously
30 the mounting element may be formed in way to perform cable strain relief. This is for example possible due to the fact that the mounting element presents a slot extending in a bore hole. In this case, the slot has to be arranged in the area of the

installation bore hole for the attachment in the screw channel. Simultaneously, catchings are conformed to this mounting element interacting with catchings respectively projections inside the end caps in a way that the end cap just needs to be slipped on. With the intention to assure an even more secure fitting, the end cap too may be provided with projections, which form is designed such to match with the profile's inner wall contour; and thus a displacing is impossible once the end caps snapped-in. Should the end caps be removed, this is possible without tools, likewise putting them in place, as the end caps just have to be pulled away.

The invention is represented on the basis of one possible embodiment example by figure 1.

The embodiment example of figure 1, shows for example a housing 5, which is conceived as profile of a sensor strip with integrated slide channel in form of a chamber 6. In this case, the housing 5 presents inside possibilities to receive electronic boards 8 so that the radiation, e.g. infrared of such sensor may be emitted through a window 7 adapted to the inside contour. Moreover screw channels 9, 10 extending in longitudinal direction are provided inside the housing 5.

In this execution example are illustrated two different mounting elements 3, 4 with the purpose to picture the universal attachment possibility of the end caps 2.

The mounting element 3 hereby basically comprises an attachment leg 17, penetrated by an attachment bore hole 18. The mounting element 3 with connected sensor strip, namely the housing 5, is fastened

through the attachment bore hole 18 on each end side for example to a door or above the door. A support 21 is arranged at an angle of approximately 90° with regard to the attachment leg 17. Resilient legs 19
5 are accurately to size conformed to the support 21 so that they can be introduced into the chamber 6 of housing 5. At the same time and also in the same direction as the resilient legs 19, is provided a web 12, separated by an indent 29 from the resilient
10 legs 19. The indent 29 has almost got the same width as the web 26 arranged inside the housing 5. Thus it is possible to introduce the web 12 into the inside of another chamber 30 of the housing 5. In order both tabs, that means the resilient legs 19
15 and the web 12, can be properly placed into the housing 5, close to the end portion for example, that is to say close to the support 21 is arranged a tapered cross section 20 by which means the resilient leg 19 can be supplied with a certain
20 pretension. The mounting element 3 has got a recess 28 which allows to pass a leg 27 of profile 30 located on the installation side, such that the rear side of attachment leg 17 also sits flush at the place of installation.

25 The second mounting element 4 is differently conceived and provides moreover another function besides the interlocking with end cap 2. This mounting element 4 is screwed through an attachment bore hole 23 within the screw channel 9 by means of
30 a screw element to the housing 5. However the mounting element 4 is simultaneously shaped such that it presents a slot 25 almost in the center, ending within a cable duct 24 in form of a bore hole. Due to the fact that on tightening the screw
35 in the screw channel 9, both legs, which are built

by the slot 25 at the mounting element 4, are contracted, a cable strain relief for the cable passing through the cable duct 24 is guaranteed at the same time. There are protruding catchings 22
5 laterally at the mounting element 4, which again interact with corresponding matching webs respectively catchings that are not represented in this embodiment example, provided inside the end cap 2.

10 In case the end cap 2, once the sensor strip is mounted, is to snap-in over the mounting element 3 and the attachment of mounting element 4, this is possible without needing any tools. The end cap 2 will snap-in on the one side within the tapered
15 cross section 20 and on the other side at the catchings 22. In order to guarantee a more proper holding secured against displacing, there are moreover projections 13, 14 provided at the end cap 2, which are interrupted by a recess 15. These
20 projections 13, 14 are shaped in a way permitting an exact adaptation to the contour of housing 5. In order the end cap 2 complies with the aesthetic shaped exterior aspect, as illustrated in the embodiment example, a lateral wall 11 is slightly
25 rounded executed and interrupted by design gaps 16. The lateral walls 1 moreover describe the same contour as profile 5.

The object according to the invention provides a simple, inexpensive and secure attachment for
30 example of profiles and moreover a mounting of end caps without requiring any tools.

References

- 1) Curved lateral wall
- 2) End cap
- 3) Mounting element
- 5 4) Mounting element
- 5) Housing (profile)
- 6) Chamber
- 7) Window
- 8) Board
- 10 9) Screw channel
- 10) Screw channel
- 11) Lateral wall
- 12) Web
- 13) Projection
- 15 14) Projection
- 15) Recess
- 16) Design gap
- 17) Attachment leg
- 18) Attachment bore hole
- 20 19) Resilient leg
- 20) Tapered cross section
- 21) Support
- 22) Catching
- 23) Attachment bore hole
- 25 24) Cable duct
- 25) Slot
- 26) Web
- 27) Leg
- 28) Recess
- 30 29) Indent
- 30) Chamber

**Claims**

- 1) Attachment of end caps to housings, which are composed of profiles and employed for door specific equipment at automatic operated doors, whereby the end caps are invisibly united with the housing via snap-in fastenings, characterised in that the end caps (2) are snapped-in over mounting elements (3, 4) connected to the housing (5), whereby at least one of the mounting elements (3, 4) is simultaneously utilised as fastening for the housing (5).
- 2) Attachment according to claim 1, characterised in that the mounting element (3) is conceived such that it is introduced into chambers respectively between webs of the housing (5) and that simultaneously an attachment leg (17) is provided presenting at least one bore hole (18) through which the installation of housing (5) with the mounting element (3) may be realised.
- 3) Attachment according to claim 1, characterised in that the mounting element (4) is linked to the housing (5) through an attachment bore hole (23) via a screw channel (9).
- 4) Attachment according to claim 1, characterised in that projections and/or recesses are provided at the mounting elements (3, 4), which projections/recesses produce, together with likewise provided projections and/or recesses inside the end



caps (2), an interengagement of the end caps with the housing (5).

- 5) Attachment according to claim 1, characterised in that the end caps (2) present projections (13, 14) engaging into webs etc., which are arranged inside the housing (5).
- 6) Attachment according to one or several of the previous claims, characterised in that the mounting element (4) presents a cable strain relief.
- 7) Attachment according to claim 1, characterised in that the end caps' (2) exterior contour is adapted to the form of the housing (5) and that they are made of plastic.
- 8) Attachment according to claim 1, characterised in that the mounting elements (3, 4) are made of plastic or light metal.
- 9) Attachment according to claim 1, characterised in that the housing (5) is made of plastic respectively of aluminium or of a combination of both materials.
- 10) Attachment according to claim 1, characterised in that the housing (5) is the housing for a swing door operator.
- 11) Attachment according to claim 1, characterised in that the housing (5) is the housing for a sensor strip.