

Title: Door Closer

Description

The invention relates to a door closer or the like having a housing, whereby a cover can be mounted to the housing and whereby each front side of the housing is closed by an
5 end cap, which has an end surface oriented towards the outside.

Such door closers are very well known. The housings, which accommodate the actual door closer mechanism,
10 generally are visually not very appealing and they can only partially be adapted to individual customer needs. Very often, it is especially disturbing that the housing does not seem to be homogeneous.

Therefore, it is an object of the present invention to provide
15 a novel door closer, which leaves a pleasing impression also from the visual point of view.

This object is achieved with a door closer or the like having a housing, whereby a cover can be mounted to the housing and whereby each front side of the housing is closed by an
20 end cap, which has an end surface oriented towards the outside, characterized in that the cover extends as far as into the plane of the end surface.

As a result of this embodiment, a door closer is provided, which, through its overall homogeneous appearance, is
25 visually particularly appealing and very slim.

Advantageous further developments will result from the dependent claims.

According to an advantageous further embodiment, the housing has a mounting bracket, which is L-shaped in cross-section, the vertical leg thereof serving to attach the mounting bracket at a door, at a door frame, at a wall or the like, and the door closer mechanism being mountable to the horizontal leg thereof. As a result of the L-shape, such mounting bracket is not only easy to mount to the door, to the door frame, to the wall or the like, but it also offers excellent mounting and maintenance properties for the actual door closer mechanism, as the door closer mechanism is exposed on almost all sides and therefore is easily accessible.

Preferably, the cross-section of the cover is U-shaped with open front sides, such that mounting the door closer to the mounting bracket is simple and quick to realize.

For guaranteeing a reliable fixing of the cover at the mounting bracket, according to an advantageous further development, the cover is maintained at the mounting bracket via a positive snap connection.

This snap connection is preferably formed in that it consists of two extensions protruding inwards at the free ends of the U-shaped cover and two projections cooperating therewith, protruding outwards and being located in the area of the vertical leg of the mounting bracket.

Advantageously, the cover is formed as an extruded profile to achieve sufficient torsional strength.

A particular visual effect can be obtained if, according to a preferred embodiment, a shadow gap, which is visible from
5 the front side of the housing, is formed between the cover and the end cap.

The shadow gap is preferably realized by means of a notch (recess) provided on three sides of the end cap. No notch is provided on the fourth side, such that, once completely
10 mounted, the end cap covers the vertical leg of the mounting bracket without any gap.

For easy installation of the end cap at the mounting bracket, according to an advantageous further development, the end cap is slidable onto a fastening
15 component mounted to the mounting bracket.

Advantageously, the fastening component is formed as an angle section, the one leg thereof being connectable to the horizontal leg of the mounting bracket and the other leg thereof being located in front of the front side of the
20 housing. The connection to the horizontal leg of the mounting bracket is preferably realized via a screw connection, such as to allow for a fast and nevertheless releasable fastening.

Advantageously, the leg located in front of the front side of
25 the housing has a substantially circular attachment ring

with a peripheral groove. As a result of the circular shape, the end cap is easy to mount, because no particular aligning operations need to be carried out. The peripheral groove guarantees a reliable and accurate positioning of
5 the end cap.

In order to be able to easily and simply mount the end cap to the attachment ring, according to a preferred embodiment, the end cap is provided with an inside located wall, which has an oblong hole open to one side. Thus, it
10 is easy to slide the end cap onto the attachment ring.

In order to guarantee a reliable support of the end cap at the attachment ring, according to an advantageous further embodiment, in the installed state, the edges of the oblong hole, which is open to one side, engage in the groove of
15 the attachment ring. Therefore, the end cap is reliably and accurately positioned and held at the attachment ring.

The reliable support can be even improved in that, if, in an advantageous manner, the lateral edges of the oblong hole are provided with one projection each, which, in the
20 installed state, engages with the attachment ring by means of a snap connection.

For aesthetical reasons, the front side of the end cap can be provided with a hole pattern, preferably in the shape of blind holes.

25 According to a preferred embodiment, the housing is longer

than the actual door closer mechanism, such as to leave some free space available in the housing, e.g. to accommodate a drive. If, furthermore, the housing of the door closer has a height/depth ratio of about 5/4, the
5 overall door closer can be formed in a visually appealing way.

According to an advantageous further development, the housing is about 49 mm high and about 37 mm deep.

Furthermore, a particularly appealing visual impression can
10 be obtained, if the housing extends over the total width of the door and/or if a slide channel cooperating with the door closer presents the same length as the housing of the door closer.

With the inventive door closer, the housing can be attached
15 at the door or the like and the slide channel at an associated door frame or the like. According to an alternative embodiment, also the slide channel can be attached at the door or the like and the housing at an associated door frame or the like.

20 Further details, features and advantages of the invention will result from the following description of a preferred exemplary embodiment, based on the figures, in which:

Figure 1: shows a perspective illustration of an inventive door closer;

25 Figure 2: shows a frontal view of the inventive door closer

according to Figure 1;

Figure 3: shows an end view of the inventive door closer according to Figure 1;

5 Figure 4: shows a section through the housing of the door closer according to Figure 1;

Figure 5: shows a detailed view of the particular detail X of Figure 4;

Figure 6: shows a view of the mounting bracket from the rear side;

10 Figure 7: shows a view of the mounting bracket from above;

Figure 8: shows a perspective view of an end cap;

Figure 9: shows a view on the front side of the end cap according to Figure 8;

15 Figure 10: shows an inside view of the end cap according to Figure 8;

Figure 11: shows a plan view on a slide channel;

Figure 12: shows the frontal view of the slide channel according to Figure 11;

20 Figure 13: shows a perspective view of an attachment part;

Figure 14: shows a plane view of the attachment part

according to Figure 13;

Figure 15: shows a cross-section through the slide channel; and

5 Figure 16: shows a detailed view of the particular detail X of Figure 15.

In the illustration, only the relevant parts are depicted, all other structural components have been omitted for clarity's sake.

10 A door closer has a housing 1, wherein the actual door closer mechanism (not shown) is accommodated. In known manner, a drive shaft 2, to which an arm assembly 3 is fastened, protrudes from the housing 1, which assembly, at its other end, carries a slide member 4 (see Figure 11) guided in a slide channel 5.

15 The housing 1 has an L-shaped mounting bracket 6, the vertical leg 6a thereof being provided with bores 7 for attaching the mounting bracket 6 at a door, at a door frame, at a wall or the like. The horizontal leg 6b of the mounting bracket 6 is provided with attachment bores 8 for
20 the actual door closer mechanism, with through holes 9 for the drive shaft 2, with access holes 10 for valves provided in the door closer mechanism, and with holding bores 11 for fastening components 12 to be mounted to the front sides of the mounting bracket 6. The attachment bores 8,
25 the through holes 9 and the access holes 10 are provided

twofold at the mounting bracket 6, such as to allow for using the same mounting bracket 6 for right and left closing door closers.

Furthermore, the housing 1 of the door closer has a U-shaped cover 13 formed as an extruded profile, which is open at the front sides thereof. A section through the mounting bracket 6, with the cover 13 being installed, is shown in Figure 4. A positive snap connection, which is illustrated in detail in Figure 5, is provided for latching the cover 13 at the mounting bracket 6.

The snap connection consists of extensions 14 protruding inwards at the free ends of the U-shaped cover 13 and being able to engage rearwards with projections 15 protruding outwards and being located in the area of the vertical leg 6a of the mounting bracket 6, as can be seen in Figure 4 and Figure 5.

The front sides of the housing 1 are closed off by end caps 16, which can be slid onto the fastening components 12 mounted to the horizontal leg 6b of the mounting bracket 6. For this purpose, the fastening component 12 is formed as an angle section. If the one leg of the fastening component 12 is connected to the horizontal leg 6b of the mounting bracket 6, the other leg will be located in front of the front side of the housing 1. The leg located in front of the front side of the housing 1 has a substantially circular attachment ring 12a with a peripheral groove 12b.

Furthermore, each end cap 16 has an inside located wall 16a, which has an oblong hole 16b open to one side. It is via this oblong hole 16b that the end cap 16 can be slid onto the attachment ring 12a such that the edges of the oblong hole 16b engage in the groove 12b of the attachment ring 12a. In order to guarantee a reliably positioned snap connection between the end cap 16 and the fastening component 12, the lateral edges of the oblong hole 16b are provided with one extension 16c each, which, in the installed state, engages rearwards with the attachment ring 12a.

Furthermore, the side of the end cap 16 oriented outwards is decorated with a hole pattern 17, which, in the illustrated exemplary embodiment, consists of symmetrically arranged blind holes; however, it may have different forms or embodiments.

The end cap 16 has a notch (recess) on three sides of the circumference thereof, which forms a shadow gap 18 between the end cap 16 and the cover 13.

In the installed state, the cover 13 does not only cover the mounting bracket 6, but also the end caps 16, as can be seen particularly well in Figure 2, such that the end caps 16 are not visible in a frontal view as the open terminal surfaces of the cover 13 and the end surfaces of the end caps 16 are located in one plane. As already explained, the notch provided on three sides of the end caps 16 forms

a shadow gap 18 between the end caps 16 and the cover 13. As no notch is provided on the fourth side of the end cap 16, the end caps 16 cover the vertical leg 6a of the mounting bracket 6 on this side, such that the latter can not
5 be seen.

The entire housing 1 is relatively small and has a height/depth ratio of about 5/4. It is in particular about 49 mm high and about 37 mm deep.

The slide channel 5 has a similar embodiment as the
10 housing 1. It consists of a C-shaped guide rail 20 wherein the slide member 4 is guided and which rail is open at its front sides. Attachment parts 21, by means of which the guide rail 20 can be attached at the door, at the door frame, at the wall or the like, can be inserted into these
15 open front sides.

Each attachment part 21 consists of a shoulder 22, which is insertable into the guide rail 20, of a holding block 23, provided with an attachment bore for fastening the guide rail 20, and of an end wall 24. The end wall 24 - like the
20 end cap 16 - is provided with a notch on three sides of its circumference to form a shadow gap 24a.

The guide rail 20 - like the mounting bracket 6 - can be covered with a U-shaped cover element 25, which is open at the front sides thereof. For attaching the cover element
25 25 at the guide rail 20, snap cams 25a protruding inwards are provided in the area of the free ends of the U-shaped

cover element 25, which cooperate with snap openings 26 in the guide rail 20.

In the mounted state, the cover element 25 does not only cover the guide rail 20, but also covers the attachment parts 21 such that, as can be seen particularly in Figure 2, the attachment parts 21 can not be seen in a frontal view, as the open terminal surfaces of the cover element 25 and the end walls 24 of the attachment parts 21 are located in one plane. As already explained, the notch provided on three sides of the end walls 24 forms a shadow gap 24a between the attachment parts 21 and the cover element 25. As no notch is provided on the fourth side of the end wall 24, the end wall 24 covers the guide rail 20 on this side, such that the latter can not be seen.

The housing 1 may be longer than the actual door closer mechanism, such that there is space available in the housing 1, e.g. for a drive. The housing 1 may extend over the entire width of the door. For reasons of symmetry, the slide channel 5 is as long as the housing 1.

Depending on the application, the housing 1 can be attached at the door, and the slide channel 5 at the door frame or at a wall, or the slide channel 5 can be attached at the door and the housing 1 at the door frame or at a wall.

Employing the cover 13 for the door closer and the cover element 25 for the slide channel 5 allows for a particularly individual adaptation to fittings used for doors. The cover

13 and the cover element may consist of different materials, particularly of aluminium, stainless steel or plastic material, which, other than individual forms, may have different surface treatments.

List of reference numerals

	1	housing
	2	drive shaft
	3	arm assembly
5	4	slide member
	5	slide channel
	6	mounting bracket
	6a	vertical leg
	6b	horizontal leg
10	7	bore
	8	attachment bore
	9	through hole
	10	access hole
	11	holding bore
15	12	fastening component
	12a	attachment ring
	12b	groove
	13	cover
	14	extension
20	15	projections
	16	end cap
	16a	wall
	16b	oblong hole
	16c	extension
25	17	hole pattern
	18	shadow gap
	20	guide rail

- 21 attachment part
- 22 shoulder
- 23 holding block
- 24 end wall
- 5 24a shadow gap
- 25 cover element
- 25a snap cam
- 26 snap opening

Patent claims

1. A door closer or the like having a housing, whereby a cover can be mounted to the housing, and whereby each front side of the housing is closed by an end cap, which has an end surface oriented outwards, characterized in that the cover (13) extends as far as into the plane of the end surface.
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2. A door closer according to claim 1, characterized in that the housing (1) has a mounting bracket (6) L-shaped in cross-section, the vertical leg (6a) thereof serving to attach the mounting bracket (6) at a door, at a door frame, at a wall or the like, and a door closer mechanism being mountable to the horizontal leg (6b) thereof.
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3. A door closer according to one of the preceding claims, characterized in that the cover (13) is U-shaped in cross-section with open front sides.
4. A door closer according to one of the preceding claims, characterized in that the cover (13) is held at the mounting bracket (6) via a positive snap connection (14, 15).
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5. A door closer according to one of the preceding claims, characterized in that the snap connection is formed by two extensions (14) protruding
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inwards at the free ends of the U-shaped cover (13) and by two projections (15), which cooperate therewith, protruding outwards and being located in the area of the vertical leg (6a) of the mounting bracket (6).

6. A door closer according to one of the preceding claims, characterized in that the cover (13) is formed as an extruded profile.
7. A door closer according to one of the preceding claims, characterized in that a shadow gap (18), which is visible from the front side of the housing (1), is formed between the cover (13) and the end cap (16).
8. A door closer according to one of the preceding claims, characterized in that the shadow gap (18) is formed by a notch (recess) provided on three sides of the end cap (16).
9. A door closer according to one of the preceding claims, characterized in that the end cap (16) covers the vertical leg (6a) of the mounting bracket (6) without any gaps.
10. A door closer according to one of the preceding claims, characterized in that the end cap (16) can be slid onto an attachment part (12) mounted to the mounting bracket (6).

11. A door closer according to one of the preceding claims, characterized in that the attachment part (12) is formed as an angle section, the one leg thereof being connectable to the horizontal leg (6b) of the mounting bracket (6) and the other leg thereof being located in front of the front side of the housing (1).
12. A door closer according to one of the preceding claims, characterized in that the leg of the fastening component (12) located in front of the front side of the housing (1) has a substantially circular attachment ring (12a) with a peripheral groove (12b).
13. A door closer according to one of the preceding claims, characterized in that the end cap (16) is provided with an inside located wall (16a), which has an oblong hole (16b) open to one side.
14. A door closer according to one of the preceding claims, characterized in that the oblong hole (16b), open to one side, engages with its edges into the groove (12b) of the attachment ring (12a) in the mounted state of the end cap (16).
15. A door closer according to one of the preceding claims, characterized in that the lateral edges of the oblong hole (16b) are provided with one extension (16c) each, which, in the mounted

state, engages in a snap connection with the attachment ring (12a).

16. A door closer according to one of the preceding claims, characterized in that the front side of the end cap (16) is provided with a hole pattern (17), preferably in the shape of blind holes.
17. A door closer according to one of the preceding claims, characterized in that the housing (1) is longer than the actual door closer mechanism, such as to leave space available in the housing (1), e.g. to accommodate a drive.
18. A door closer according to one of the preceding claims, characterized in that the housing (1) has a height/depth ratio of about 5/4.
19. A door closer according to one of the preceding claims, characterized in that the housing (1) is about 49 mm high and about 37 mm deep.
20. A door closer according to one of the preceding claims, characterized in that the housing (1) extends over the entire width of a door connected to the door closer.
21. A door closer according to one of the preceding claims, characterized in that a slide channel (5) cooperating with the door closer has the same length as the housing (1).

22. A door closer according to one of the preceding claims, characterized in that the cover (13) consists of different materials, particularly aluminium, stainless steel or plastic material.
- 5 23. A door closer according to one of the preceding claims, characterized in that the cover (13) has a different design.
24. A door closer according to one of the preceding claims, characterized in that the surface of the
10 cover (13) can be configured differently.