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(71) Applicant: **Kazimierz, Stec**
31-990 Krakow (PL)

(72) Inventor: **Kazimierz, Stec**
31-990 Krakow (PL)

(74) Representative: **Godlewski, Piotr**
JWP
Rzecznicy Patentowi Dorota Rzazewska sp.k.
Sienna Center
ul. Zelazna 28/30
00-833 Warszawa (PL)

(54) **ROLLER SHUTTER BOX**

(57) The subject matter of the invention is a window roller shade box, used for interior and exterior fabric roller shades, fixed at the ends to side elements and consisting of at least two elements, characterised in that the box has a three-part structure in the form of detachably connected top strip (3) and/or back strip (10) and/or front strip (16, 20) or an adapting element (24), with the back strip, top strip and adapting element provided with curvatures (13, 19, 22, 26), wherein the profile of the top strip (3) is a long arm (4), said arm terminated at its each end with a bend (5), each bend having the same bend radius, and said arm provided with an irregularly shaped supporting wall (6) and catch elements (8, 9) positioned opposite and symmetrically, wherein the arm (4) is provided with a projection (7) positioned centrally between catch elements (8, 9); the profile of the back strip (10) is a long arm (11), said arm inclined at angle α by the first groove (12) and provided with a second groove (14) having the same diameter d, with the second groove (14) having an edge shared with a T-shaped groove (15), the latter being the tip of the arm (11) at one of the ends of the arm, with the other end of the arm (11) having a curvature (13); the profile of the front strip (16, 20) is a long arm, whose bottom end is provided with a groove (17) with an edge shared with a T-shaped groove (18), the latter being the tip of the arm of the front strip (17, 20), with the top end having a curvature (19, 22); the adapting element (24) in the form of an irregularly shaped groove (25) terminated with a curvature (26).

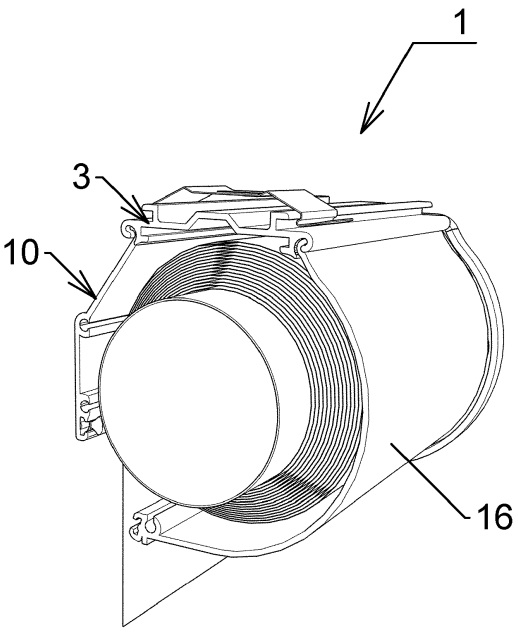

Fig. 1

EP 3 971 384 A1

Description

[0001] The subject matter of the invention is a window roller shade box used for interior and exterior fabric roller shades.

[0002] Two-part boxes for window roller shades used for interior or exterior fabric roller shades and made of aluminium are known. Most common solutions are two-part, where one part of the roller shade box makes both the back and upper wall or the back and lower wall.

[0003] European patent EP 2374982 B1 describes a two-part box of a roller shutter with a seat for the catch of the bottom part of the box, the seat constructed of two half-round components of different curve radii, making together with the half-round component tipped with the inserting stop the slot of a width slightly greater than the catch thickness.

[0004] Polish patent PL 181164 B1 describes a window blind case, whose back and lower wall are formed by a flap tiltably fixed to a ceiling plate.

[0005] European patent EP 2828461 B1 describes a roller shutter box comprising an upper longitudinal profile A destined to be attached to the wall, and a lower longitudinal profile B, detachably connected to the upper profile to permit opening of the shutter box. The lower profile B is connected to the upper profile by means of an extremal coupling portion D which is inserted in a catching relation in a housing seat C made at an extremal portion A1 of the upper profile A.

European patent EP 0841460 B1 describes a two-part roller shutter box with a circular top part and part-circular bottom part, the box provided at the end of the top half with an S-shaped recess, in which a Z-shaped portion of the bottom half engages.

[0006] The objective of the invention is to develop a three-part structure of a roller shade box, with each part of the box being an autonomous product. The box can be used for every type of fabric window roller shades, both interior and exterior, and is provided with catches making it possible to stick in/out any chosen elements of the roller shade box with its functionality as well as stable and stiff structure being at the same time maintained regardless of overall dimensions of the box. Additionally, the structure of the box provides easy access to its interior as the front strip can be opened. Versatility of the box makes it also possible to use roller winding tubes with a large span (Ø 24 - Ø 50 mm) and, with dedicated sides of the cassette being used, to install most commercially available elements cooperating with the box: drivers and side channels. The box of the invention can be used with most commercially available side channels. Additionally, the structure of the top strip makes it possible to use most commercially available mounting clips, bead chain mechanisms of the drivers and crank mechanisms.

[0007] The essence of the window roller shade box, said box fixed at its ends to side elements and consisting of at least two elements, is that the box has a three-part structure in the form of detachably connected top strip and/or back strip and/or front strip or an adapting element, with the back strip, top strip and adapting element provided with curvatures, wherein the profile of the top strip is a long arm, said arm terminated at its each end with a bend, each bend having the same bend radius, and said arm provided with an irregularly shaped supporting wall and catch elements positioned opposite and symmetrically, wherein the arm is provided with a projection positioned centrally between catch elements;

the profile of the back strip is a long arm, said arm inclined at the angle of 45° by the first groove and provided with a second groove, wherein the second groove has an edge shared with a T-shaped groove, the latter being the tip of the arm at one of the ends of the arm, with the other end of the arm having a curvature;

the profile of the front strip is a long arm, whose bottom end is provided with a groove with an edge shared with a T-shaped groove, the latter being the tip of the arm, with the top end having a curvature;

the adapting element in the form of an irregularly shaped groove is terminated with a curvature.

[0008] Preferably, the curvature of the back strip is directed towards the outside and the curvatures of the front strips and of the adapting element are directed towards the inside.

[0009] Preferably, the arm of the bend is directed towards the inside.

[0010] Preferably, the catch elements are L-shaped.

[0011] Preferably, the projection is in the shape of a trapezoid.

[0012] Preferably, the groove is in the shape of a circle.

[0013] Preferably, the profile of the arm of the front strip is arch-shaped.

[0014] Preferably, the profile of the arm of the front strip is L-shaped.

[0015] Preferably, the top part of the arm is formed by a ledge set back in relation to the arm and having a curvature towards the outside.

[0016] Preferably, the arm of the back strip is inclined at angle α = 45°.

[0017] Preferably, the groove of the adapting element has an approximately U-shaped cross-section and its curvature is directed towards the inside.

[0018] The window roller shade box of the invention is presented in the embodiments and in the drawing, where:

Fig. 1 shows the first embodiment of the window roller shade box in a front perspective view;

Fig. 2 shows the second embodiment of the window roller shade box in a front perspective view;

Fig. 3 shows the third embodiment of the day-night window roller shade box in a side perspective view;

Fig. 4 shows another embodiment of the window roller shade box without the back strip in a side perspective view, with the arch-shaped front strip;

Fig. 5 shows another embodiment of the window roller shade box without the back strip in a front perspective view, with the L-shaped front strip;
Fig. 6 shows another embodiment of the window roller shade box provided only with the mounting top strip, in a front perspective view;
Fig. 7 shows the profile of the top strip;
Fig. 7a shows detail A of the profile of the top strip;
Fig. 7b shows detail A' of the profile of the top strip;
Fig. 8 shows the profile of the back strip;
Fig. 8a shows detail A of the profile of the back strip;
Fig. 9 shows the profile of the arch-shaped front strip;
Fig. 9a shows detail A of the profile of the arch-shaped front strip;
Fig. 10 shows the profile of the L-shaped front strip;
Fig. 10a shows detail A of the profile of the L-shaped front strip;
Fig. 11 shows the profile of the adapting element for the day/night fabric;
Fig. 11a shows detail A of the profile of the adapting element.

[0019] The subject matter of the invention is a three-part window roller shade box 1, consisting in its full version of three strips, these being a top strip 3, back strip 10 and front strip 16, with a cylinder seated between the strips and having a window roller shade wound on it, the strips combined into a structure of the box by means of deflections 13, 19 or 22 and side elements not shown in the drawing.

[0020] In the first embodiment (Fig. 1), the complete window roller shade box 1 is shown, the box having a base strip in the form of a mounting top strip 3, detachably connected with the back strip 10 and the front strip 16 in the form of a long arm. The profile of the top strip 3 (Fig. 7, 7a, 7b) is a long arm 4 provided at its each end with a bend 5 directed towards the inside and together with an irregularly shaped supporting wall 6 forming an irregularly edged seat for receiving curvatures 13, 19 of the strips 10, 16. The arm 4 of the profile of the top strip 3 in its central part has a projection 7, said projection stiffening the structure and being in the shape of a trapezoid, and two L-shaped catch elements 8, 9, said elements positioned opposite to each other and symmetrically and directed towards the outside, to mount mounting clips to the top strip 3. The profile of the back strip 10 (Fig. 8, 8a) is a long arm 11 inclined at angle α=45 º by a first groove 12, said groove designed for fitting a mounting screw into it, and provided with a second groove 14 of the same diameter. The second groove 14 has an edge shared with a T-shaped groove 15 being the tip of the arm 11 at the bottom end of the arm, with the other end of the arm 11 having a curvature 13 directed towards the outside and being a catch for the back strip 10 within the bend 5. The profile of the front strip 16 (Fig. 9, 9a) has the form of a long arm, the bottom end of said arm having a groove 17, where a pin is placed into to counterbalance the strip, said groove having an edge shared with a T-shaped groove 18, said groove designed for the cord of the day-night fabric or a brush seal protecting against rubbing against the front strip 16 and said groove being the tip of the arm of the front strip 16, with the top end having a curvature 19 directed towards the outside and being a catch of the arm 16 within the bend 5. The T-shaped grooves 15, 18 have the same technical features. The profile of the front strip 16 is bent in the shape of an arch. In order to assemble the window roller shade box 1, the top strip 3 is connected to the back strip 10 such that the curvature 13, being the catch of the arm 11, is placed into the bend 5 by gently tilting the arm 11 upwards and then lowering the arm 11. The curvature 19 being the catch for the arm 16 is analogously placed into the second bend 5. The stabilisation of curvatures 13 or 19 within the bend 5 is provided by a supporting wall 6, against which the curvature 13 or 19 leans. Sticking the arm 11 and/or 16 out of the bend 5 is by titling the arm 11 and/or 16 upwards and pulling it out to the front/back.

[0021] In the second embodiment (Fig. 2), the window roller shade box 2 has the profile of the front strip 20 (Fig. 10, 10a) in the form of an L-shaped long arm, whose top part forms a ledge 21, said ledge set back in relation to the arm 20 and having a curvature 22 towards the outside, the curvature being the catch of the arm 20 in the seat formed between the bend 5 and the supporting wall 6. The process of sticking in and sticking out the arm of the front strip 20 of the box 2, by placing the curvature 22 into the seat formed between the bend 5 and the supporting wall 6, is analogous to the first embodiment. Once the window roller shade box 2 is assembled, the bottom edge of the front strip 20 and the bottom edge of the back strip 10 remain detached. Thus, a working chamber is formed between the bottom edges of the strips 20 and 10 for the fabric of the window roller shade.

[0022] In the third embodiment (Fig. 3), in the window roller shade box 23 with the day/night-type fabric, an irregularly-shaped adapting element 24 (Fig. 11, 11a) is used, said element having a groove 25 with an approximately U-shaped cross-section, with the top end of said groove being a small curvature 26 directed towards the inside. The curvature 26 is a catch to seat the adapting element 24 in the seat formed between the bend 5 and the supporting wall 6. The adapting element 24 is connected to the top strip 3 such that the curvature 26 of the adapting element 24 is placed into the bend 5 by gently tilting the adapting element 24 upwards and then lowering it. Sticking the adapting element 24 out of the bend 5 is by tilting it upwards and pulling it out to the side. The roller shade fabric terminated with a stiff cord, said cord connected to the fabric with an adhesive layer, is inserted into the groove 25 from the top. As a result, there is no need to dismount the winding cylinder and the adapting element 24 when placing the roller shade fabric into the groove 25, which ensures quick replacement and quick regulation of the fabric.

[0023] In further embodiments, the box 1' for the arch-shaped front strip 16 (Fig. 4) and the box 2' for the L-

shaped front strip 16 (Fig. 5) is shown, without the back strip 10 mounted.

[0024] In yet another embodiment, the window roller shade box 27 (Fig. 6) in a minimalistic version is shown, with only the top mounting strip 3 being used integrated with the strip closing the cassette and connected to the winding roll.

[0025] The elements of the roller shade box in the form of the top strip 3, back strip 10, front strip 16, 20 and adapting element 24 are extruded from aluminium.

Claims

1. A window roller shade box, fixed at the ends to side elements and consisting of at least two elements, **characterised in that** the box has a three-part structure in the form of detachably connected top strip (3) and/or back strip (10) and/or front strip (16, 20) or an adapting element (24), with the back strip, top strip and adapting element provided with curvatures (13, 19, 22, 26), wherein

   the profile of the top strip (3) is a long arm (4), said arm terminated at its each end with a bend (5), each bend having the same bend radius, and said arm provided with an irregularly shaped supporting wall (6) and catch elements (8, 9) positioned opposite and symmetrically, wherein the arm (4) is provided with a projection (7) positioned centrally between catch elements (8, 9);
   the profile of the back strip (10) is a long arm (11), said arm inclined at angle α by the first groove (12) and provided with a second groove (14) having the same diameter d, with the second groove (14) having an edge shared with a T-shaped groove (15), the latter being the tip of the arm (11) at one of the ends of the arm, with the other end of the arm (11) having a curvature (13);
   the profile of the front strip (16, 20) is a long arm, whose bottom end is provided with a groove (17) with an edge shared with a T-shaped groove (18), the latter being the tip of the arm of the front strip (16, 20), with the top end having a curvature (19, 22);
   the adapting element (24) in the form of an irregularly shaped groove (25) terminated with a curvature (26).

2. Window roller shade box of claim 1, **characterised in that** the curvature (13) is directed towards the outside, whereas the curvatures (19, 22, 26) of the front strips (16, 20) and of the adapting element (24) are directed towards the inside.

3. Window roller shade box of claim 1, **characterised in that** the arm of the bend (5) is directed towards the inside.

4. Window roller shade box of claim 1, **characterised in that** the catch elements (8, 9) are L-shaped.

5. Window roller shade box of claim 1, **characterised in that** the projection (7) is in the shape of a trapezoid.

6. Window roller shade box of claim 1, **characterised in that** the groove (17) is in the shape of a circle.

7. Window roller shade box of claim 1, **characterised in that** the profile of the arm of the front strip (16) is arch-shaped.

8. Window roller shade box of claim 1, **characterised in that** the profile of the arm of the front strip (20) is L-shaped.

9. Window roller shade box of claim 1 or 3, **characterised in that** the top part of the arm of the front strip (20) is formed by a ledge (21) set back in relation to the arm (20) and having a curvature (22) towards the outside.

10. Window roller shade box of claim 1, **characterised in that** the arm (11) of the back strip (10) is inclined at angle α = 45º.

11. Window roller shade box of claim 1, **characterised in that** the groove (25) of the adapting element (24) has an approximately U-shaped cross-section and its curvature (26) is directed towards the inside.

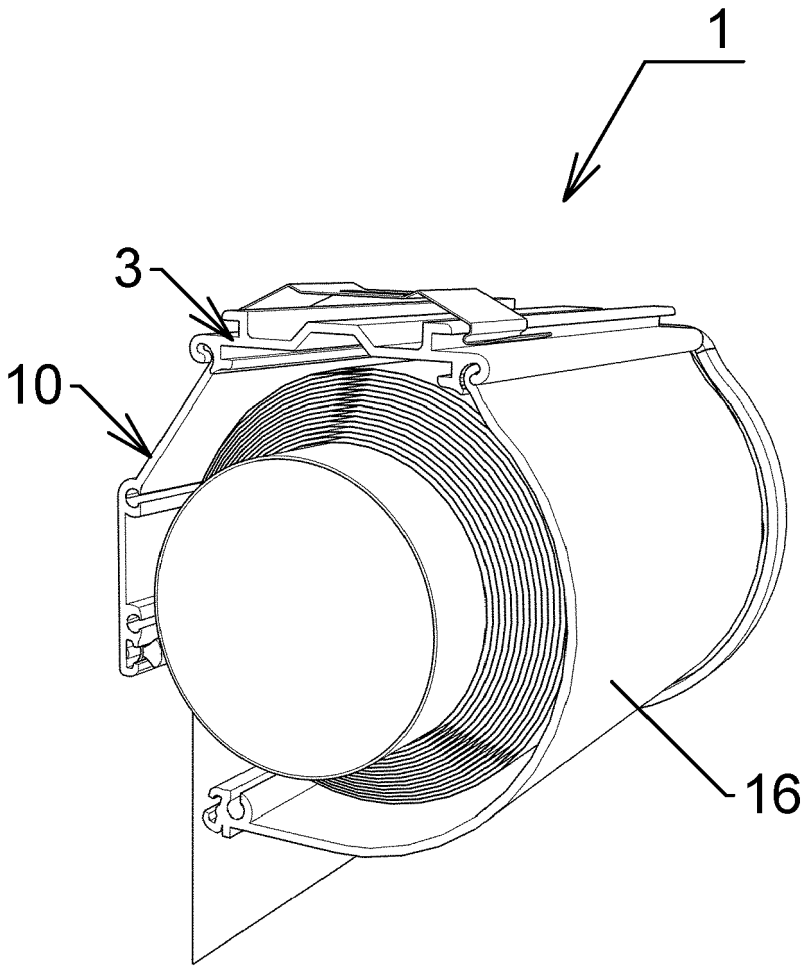

Fig. 1

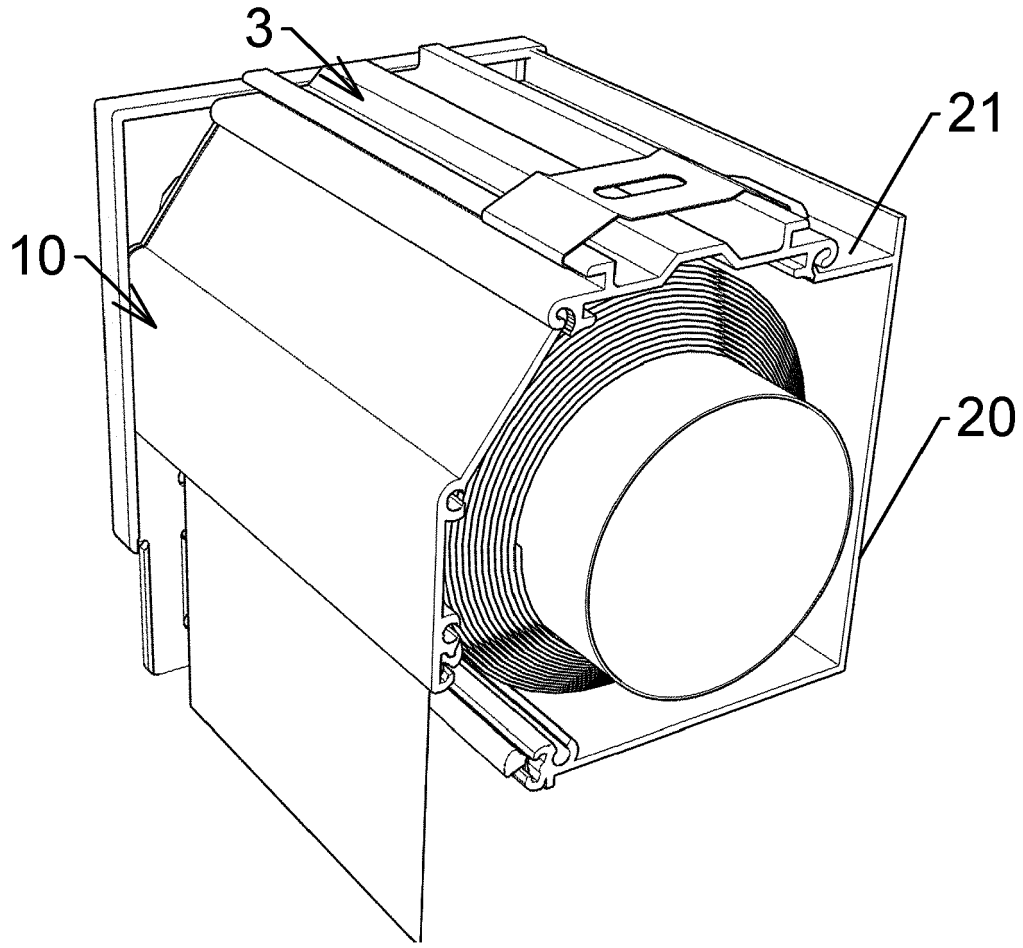

Fig. 2

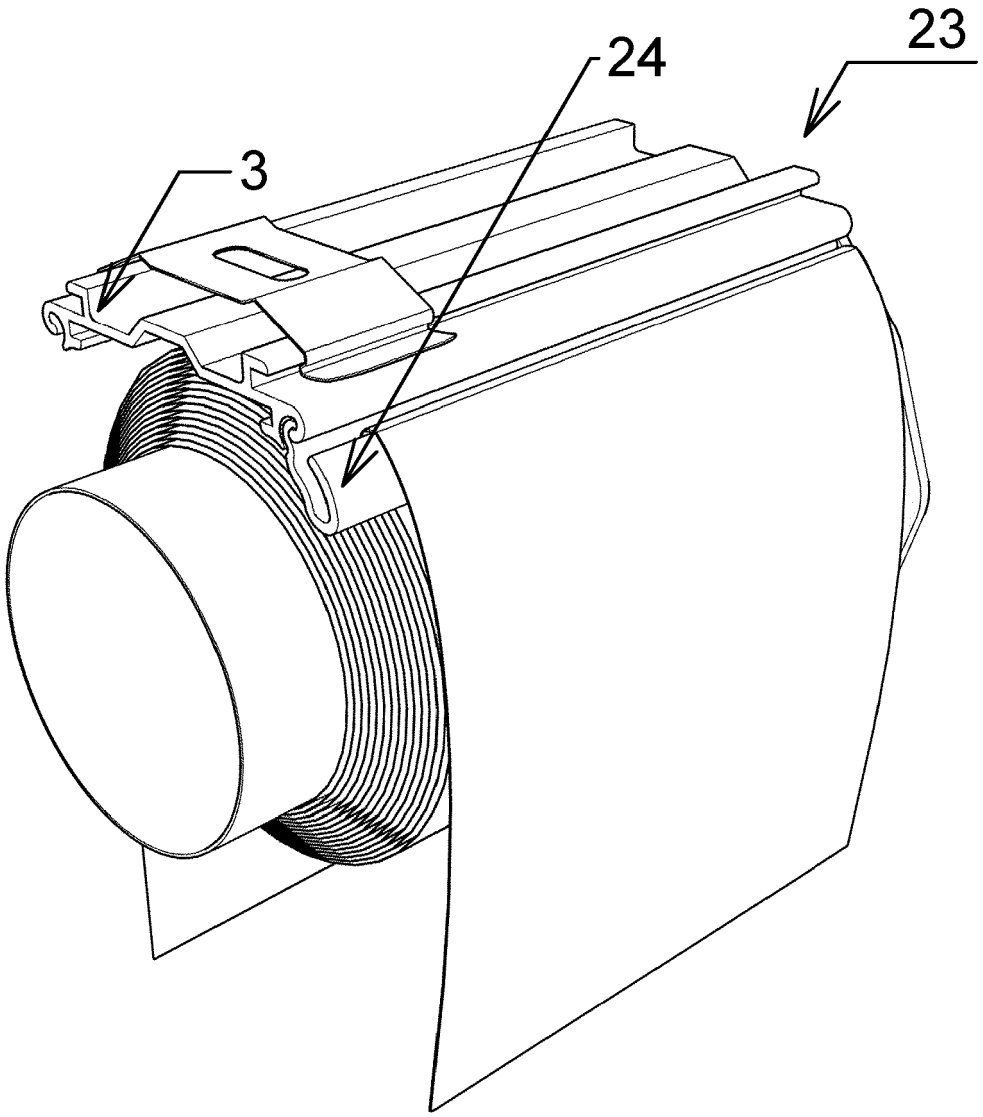

Fig. 3

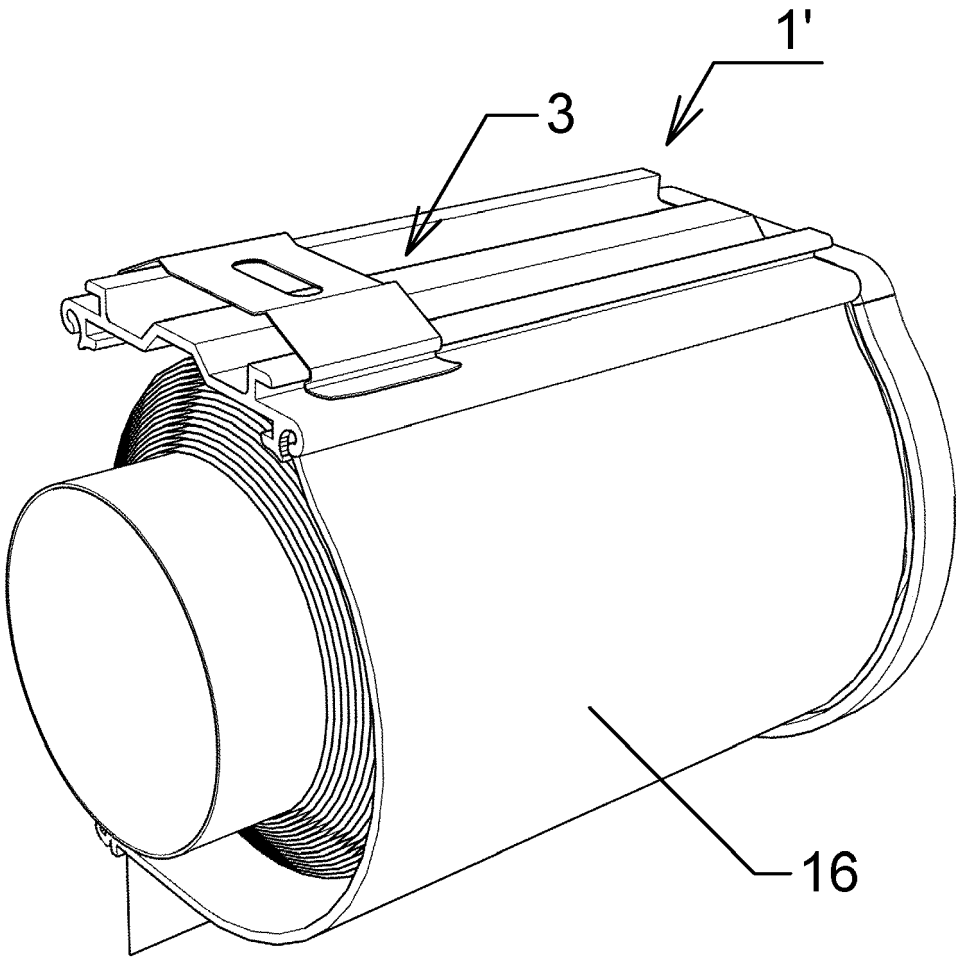

Fig. 4

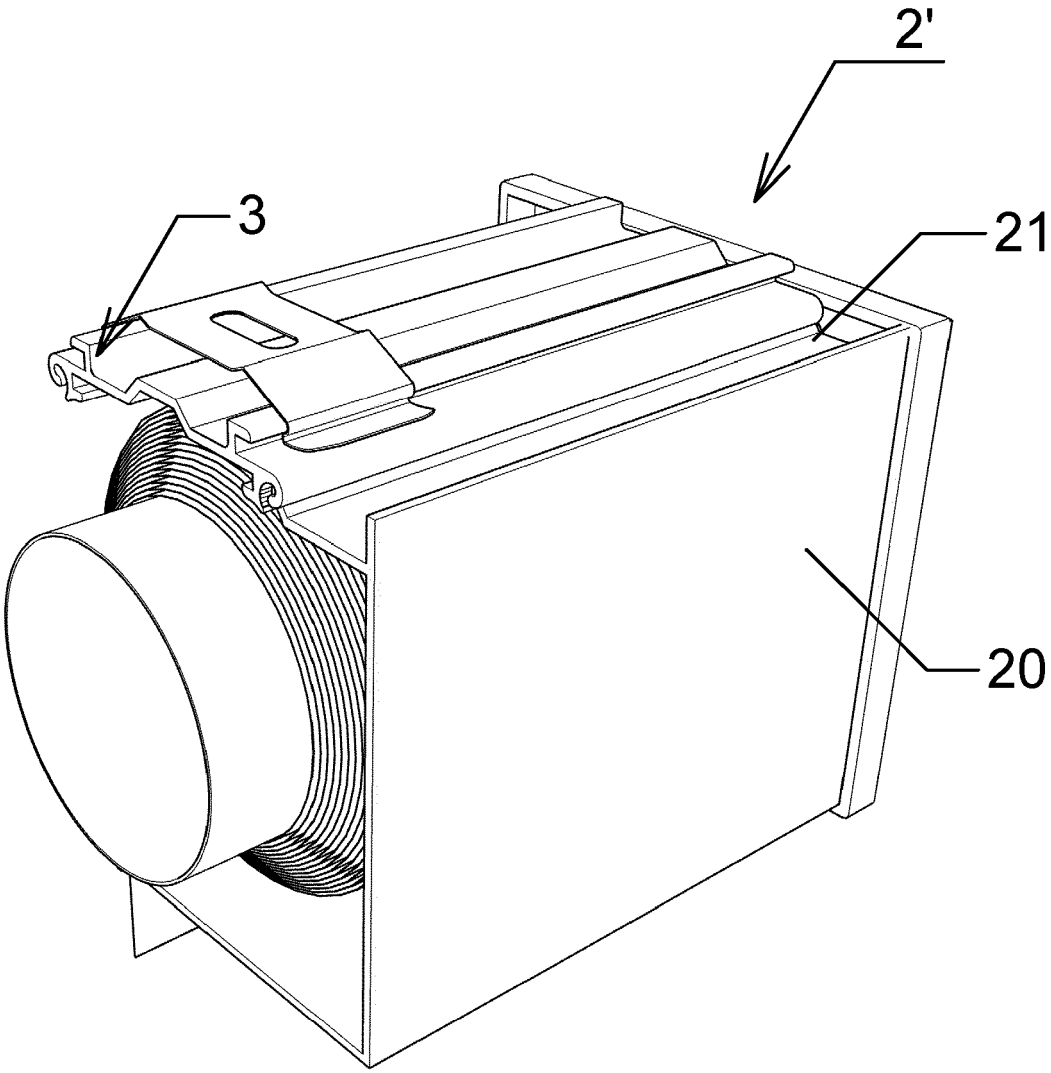

Fig. 5

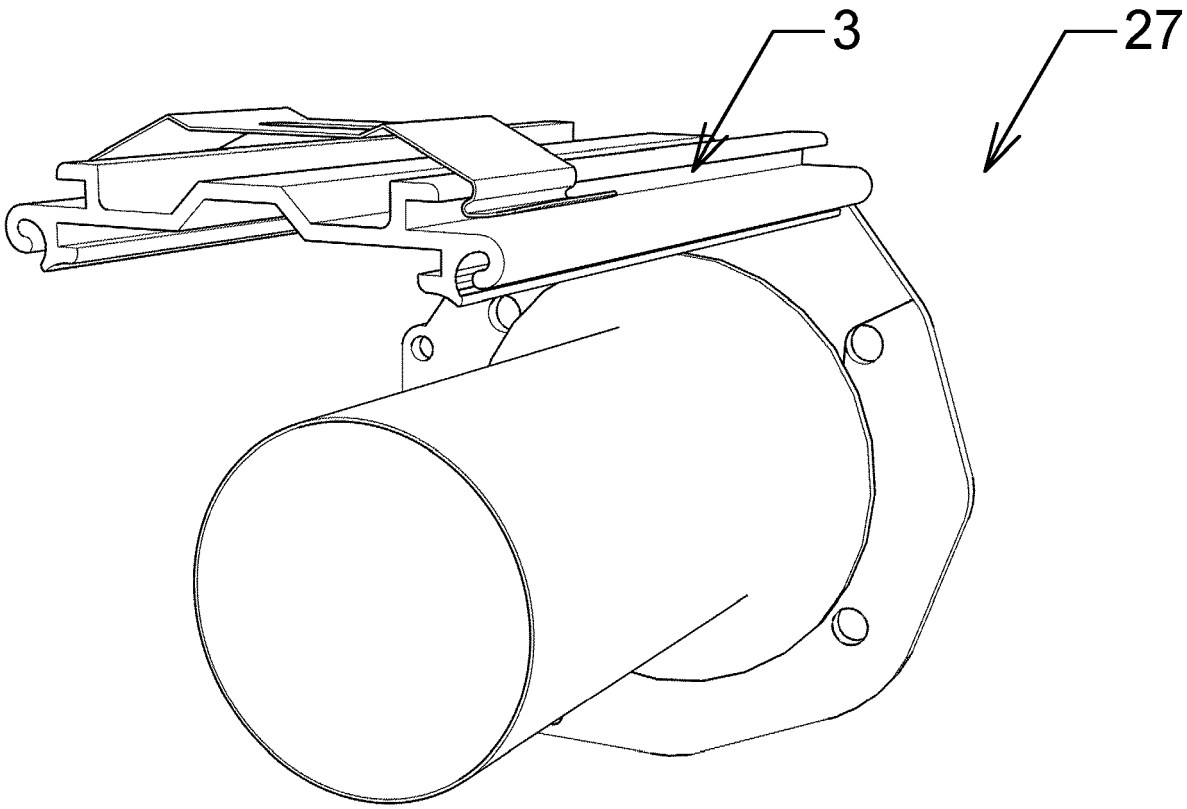

Fig. 6

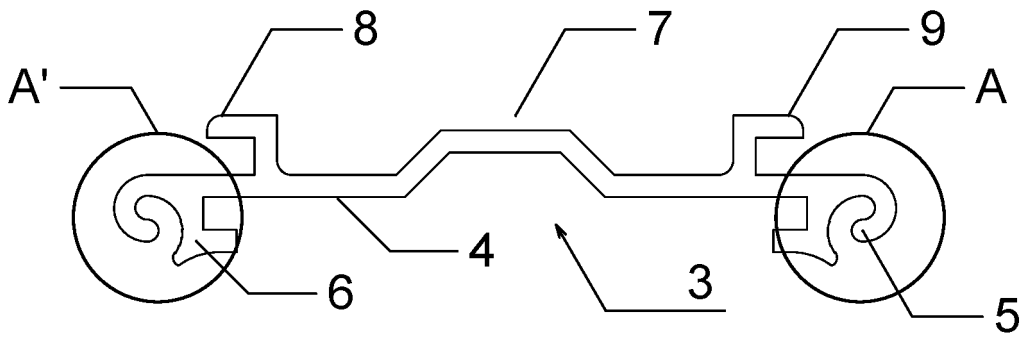

Fig. 7

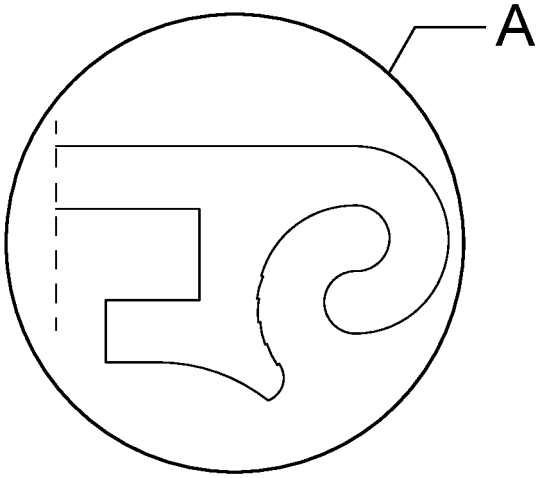

Fig. 7a

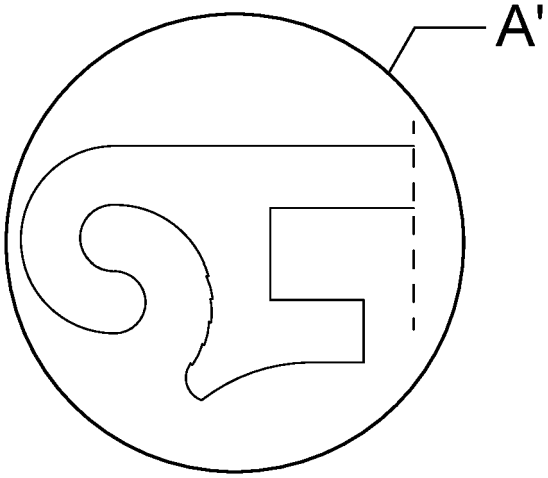

Fig. 7b

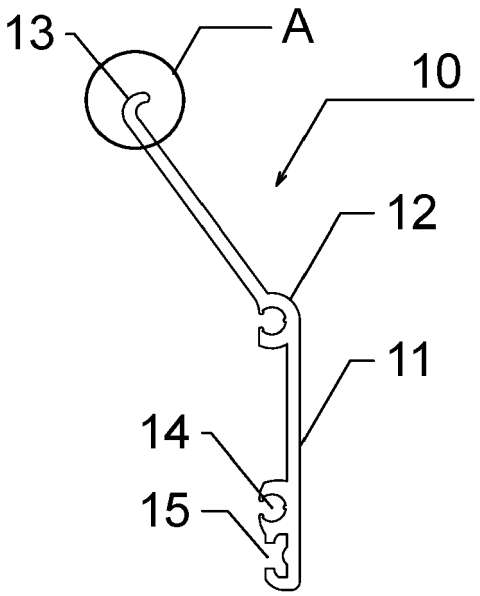

Fig. 8

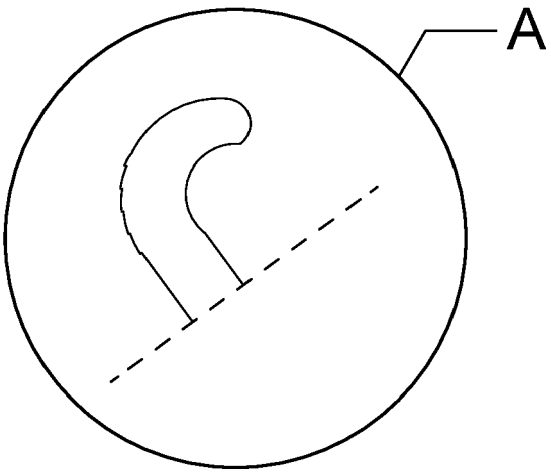

Fig. 8a

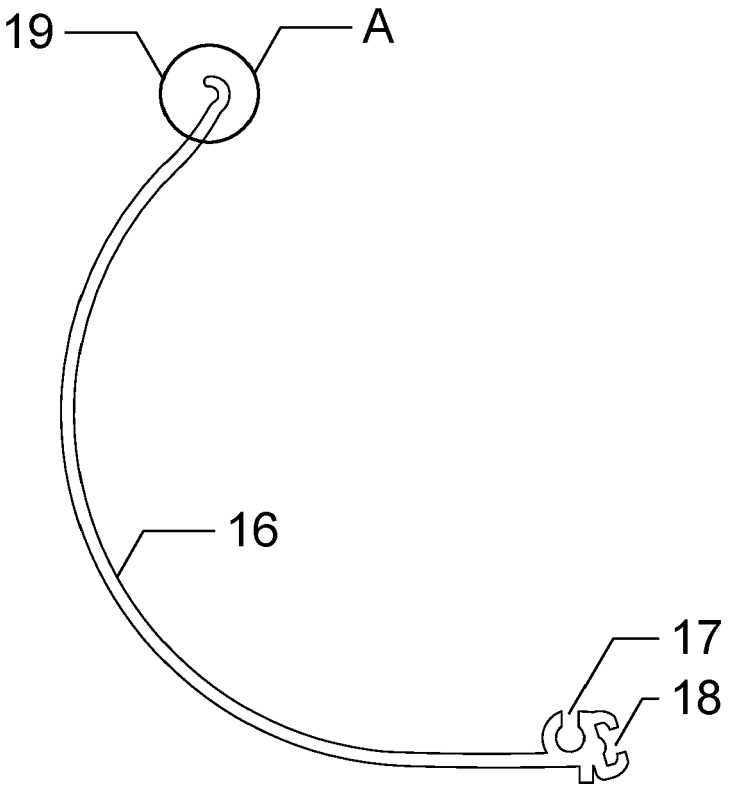

Fig. 9

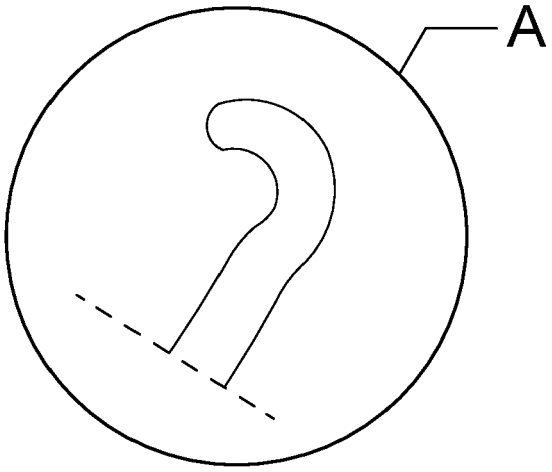

Fig. 9a

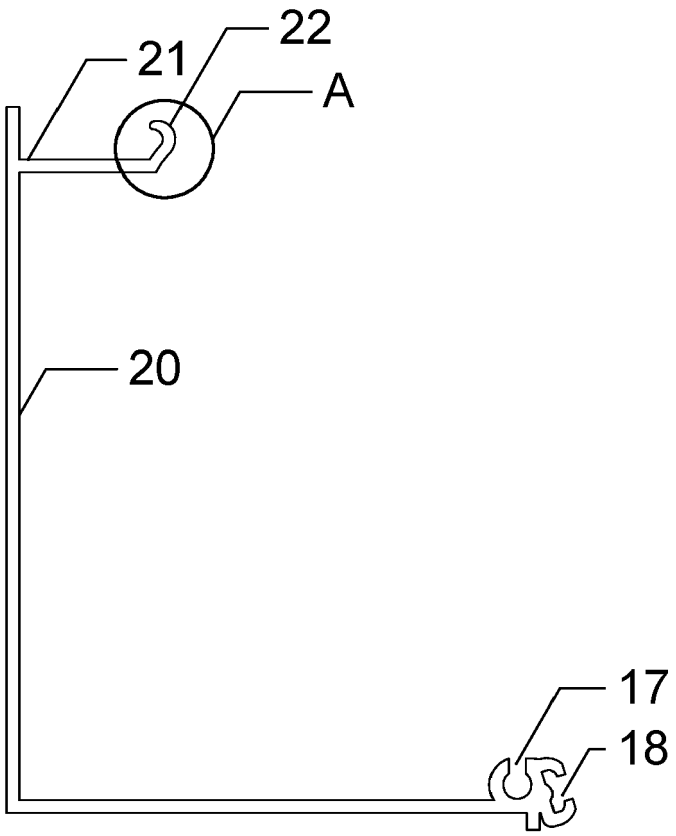

Fig. 10

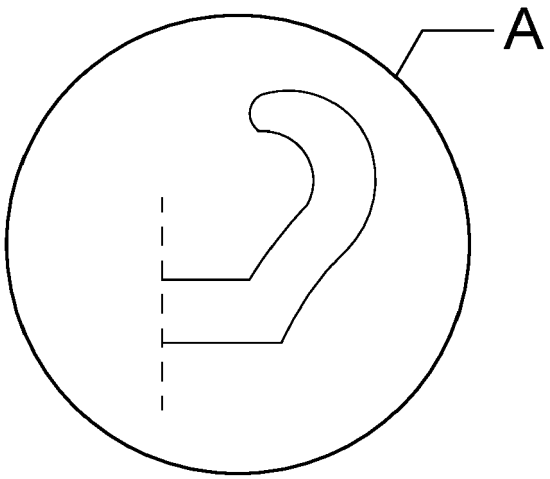

Fig. 10a

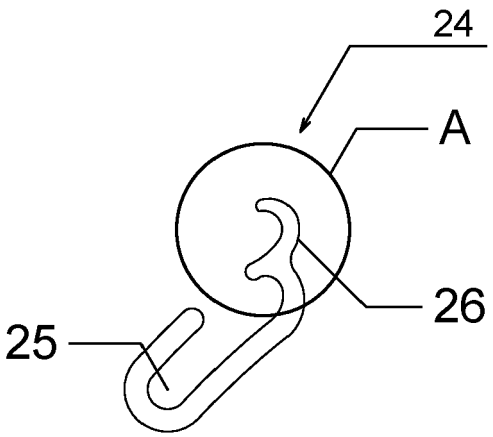

Fig. 11

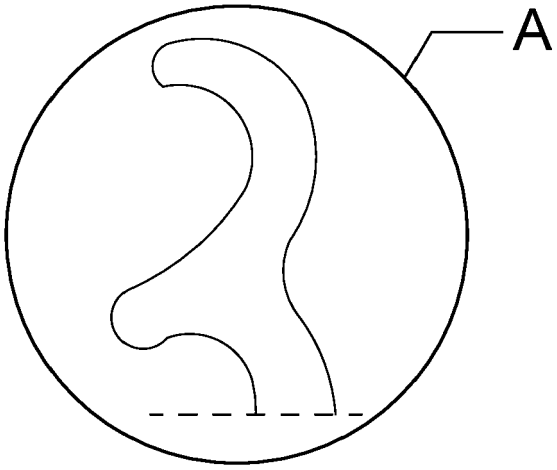

Fig. 11a

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EUROPEAN SEARCH REPORT

Application Number
EP 21 19 6480

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1 The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 February 2022	Pieper, Fabian

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 21 19 6480

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

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