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(54) **ACTUATOR FOR ELECTRIC DOOR OPENERS**

(57) An actuator for electric door openers comprising: - a bobbin (1) formed by a spool (11) that has a cylindrical body with end flanges (12, 13) and a conducting filament winding (14) wound around the spool (11); - a casing or shield (2) having a cavity (21) for tightly housing the bobbin; and - a core (3) mounted such that it can move axially inside the spool (11) of the bobbin (1). The

cavity of the casing or shield and the bobbin comprise retention means of the bobbin (1) in the mounting position, made up of complementary configurations (15, 22) that can be coupled under pressure during the axial insertion of the bobbin in the cavity of the casing or shield and defined in the facing surfaces of the cavity and of at least one of the flanges of the bobbin.

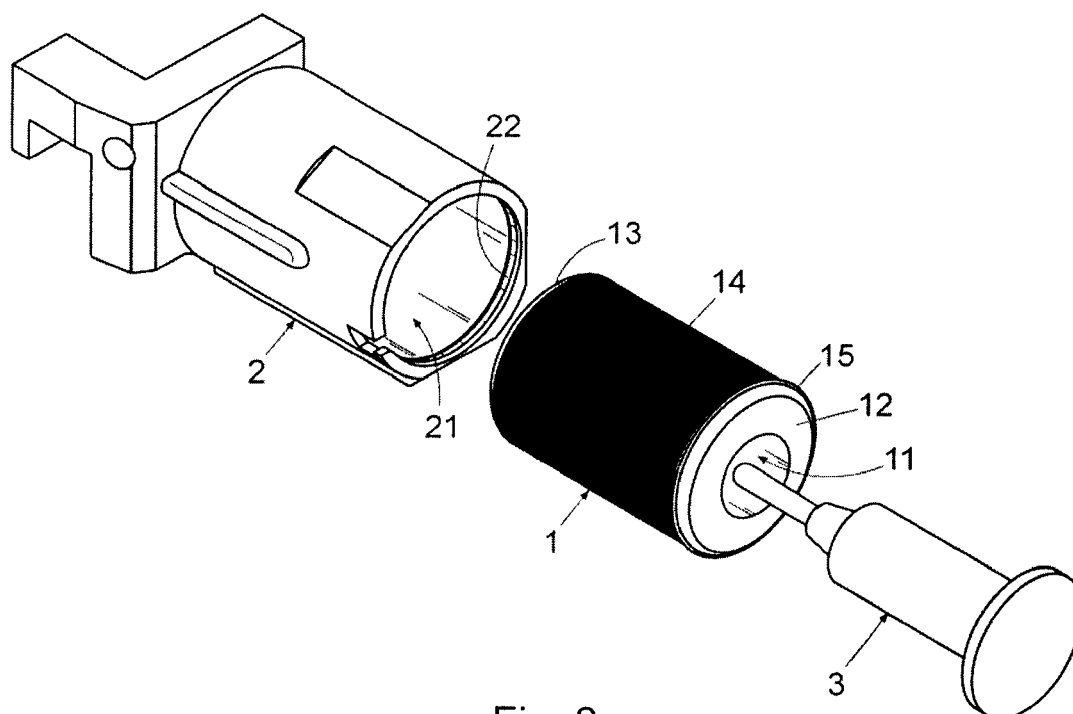


Fig. 2

Description

Object of the invention

[0001] The object of the present invention is an actuator for electric door openers of the type comprising: - a bobbin made up of a spool and a winding mounted thereon, - a shield or casing in which the bobbin is housed, and - a core that axially moves inside the spool of the bobbin to actuate the door opener, when the bobbin is electrically powered.

[0002] This actuator has constructive features aimed at mounting and fastening the bobbin inside the shield or casing simply by applying pressure and without the intervention of any additional fastening element.

Field of application of the invention

[0003] This invention is applicable to electrically operated actuators intended for electric door openers.

State of the art

[0004] Currently, actuators used in electric door openers are widely known, and they have the characteristics described in the preamble of claim 1 which basically comprise a bobbin having a spool and a winding, mounted in a shield or casing and a core that can axially move inside the spool of the bobbin by the action of the magnetic field created by the bobbin when said bobbin is electrically powered.

[0005] These actuators basically comprise a core mounted such that it can move axially with respect to a bobbin assembly, said core moving in a particular direction when a bobbin is electrically powered.

[0006] In the market, the fastening of the actuator to the door opener by means of the riveting of one of the ends to the box of the door opener is known; however, this operation is relatively complex and prevents the actuator from being replaced, at least quickly and simply, in the case of failure.

[0007] In another option described in the utility model ES 1 175 683 U of the same owner of the present invention, the assembly of the bobbin has a guide for the movement of the core, said guide having a threaded yarn for the fastening thereof to the door opener, the assembly of the bobbin operating the aforementioned guide as a support element.

[0008] In these door openers, the fastening of the bobbin inside the shield or casing requires the intervention of additional fastening elements such as adhesives, screws, rivets or the like, which increase the manufacturing cost of the actuator and the assembly time thereof, either because of the placement and tightening time of the fastening screw and the rivets or because of the application and drying time of the adhesive.

[0009] Therefore, the technical problem set forth is the development of an actuator for electric door openers that

enables quick and reliable mounting of the bobbin inside the casing or shield without using additional fastening elements and with the resulting reduction of costs and manufacture time.

Description of the invention

[0010] The actuator for electric door openers object of this invention is of the type described in the preamble of claim 1 and has constructive features aimed at achieving the objectives proposed with regards to the speed and reliability of mounting the bobbin in the casing or shield, and with regards to the reduction of the costs and manufacture time of the actuator.

[0011] As described in the preamble of claim 1, this actuator is of the type comprising: - a bobbin formed by a spool having a cylindrical body with flanges on the opposite ends and a conducting filament winding wound around the spool; - an exterior casing or shield of the bobbin defined or fastened in the casing of an electrical door opener and having a cavity for tightly housing the bobbin; and - a core mounted such that it can move axially inside the spool of the bobbin.

[0012] To achieve the objectives proposed, the cavity of the casing or shield and the bobbin comprise retention means of the bobbin in the mounting position, said means being made up of complementary configurations that can be coupled under pressure during the axial insertion of the bobbin in the cavity of the casing or shield; said complementary configurations being defined on facing surfaces of the cavity and of at least one of the flanges of the spool of the bobbin.

[0013] Said complementary retention means comprise a perimetral channel and a perimetral appendage, which are continuous or discontinuous, such that in the mounting position of the bobbin, the perimetral appendage is housed inside the perimetral channel preventing the movement of the bobbin with respect to the casing or shield.

[0014] With these characteristics, it is only necessary to axially insert the bobbin in the casing or shield until the perimetral appendage of the bobbin is inserted under pressure inside the perimetral channel of the casing or shield, establishing the relative fastening thereof without the intervention of any additional fastening element.

Description of the figures

[0015] As a complement to the description provided herein, and for the purpose of helping to make the characteristics of the invention more readily understandable, the present specification is accompanied by a set of drawings, by way of illustration and not limitation, represent the following:

- Figure 1 shows a perspective view of an exemplary embodiment of the actuator for electric door openers according to the invention.

- Figure 2 shows an exploded perspective view of the actuator of the previous figure.
- Figure 3 shows an elevation view of a vertical cross section of the actuator for electric door openers of the invention and a detailed enlargement of the fastening means of the bobbin with respect to the casing or shield.

Preferred embodiment of the invention

[0016] As can be observed in the exemplary embodiment of the attached figures, this actuator for electric door openers comprises a bobbin (1), an external casing or shield (2) and a core (3) that axially moves inside the bobbin when said bobbin is electrically powered.

[0017] Figure 3 shows how the bobbin (1) is formed by a spool (11) that has a cylindrical body with flanges (12, 13) on the opposite ends and a conducting filament winding (14) wound around the spool.

[0018] The casing or shield (2) intended to be fastened in the casing of an electric door opener (not shown) has a cavity for tightly coupling the bobbin (1), the core (3) being such that it can move axially inside the spool (11) of the bobbin (1).

[0019] The cavity of the casing or shield (2) and the bobbin (1) comprise retention means in the mounting position, made up of complementary configurations (15, 22) that can be coupled under pressure during the axial insertion of the bobbin in the cavity (21) of the casing (2).

[0020] In this specific example, said complementary configurations are made up of a perimetral channel (22) defined in the inner surface of the cavity (21), said cavity for the insertion of the bobbin (1) next to the mouth defined, and a perimetral appendage (15) defined in one of the flanges (12) of the spool of the bobbin; such that upon axially inserting the bobbin (1) in the casing (2), the perimetral appendage (15) is housed in the channel (22), the bobbin (1) being immobilized with respect to the casing or shield (2) without the intervention of any screw, adhesive or additional fastening element.

[0021] Having sufficiently described the nature of the invention, in addition to an example of a preferred embodiment, it is hereby stated for the relevant purposes that the materials, shape, size and layout of the described elements may be modified, provided that it does not imply altering the essential characteristics of the invention claimed below.

Claims

1. An actuator for electric door openers comprising:

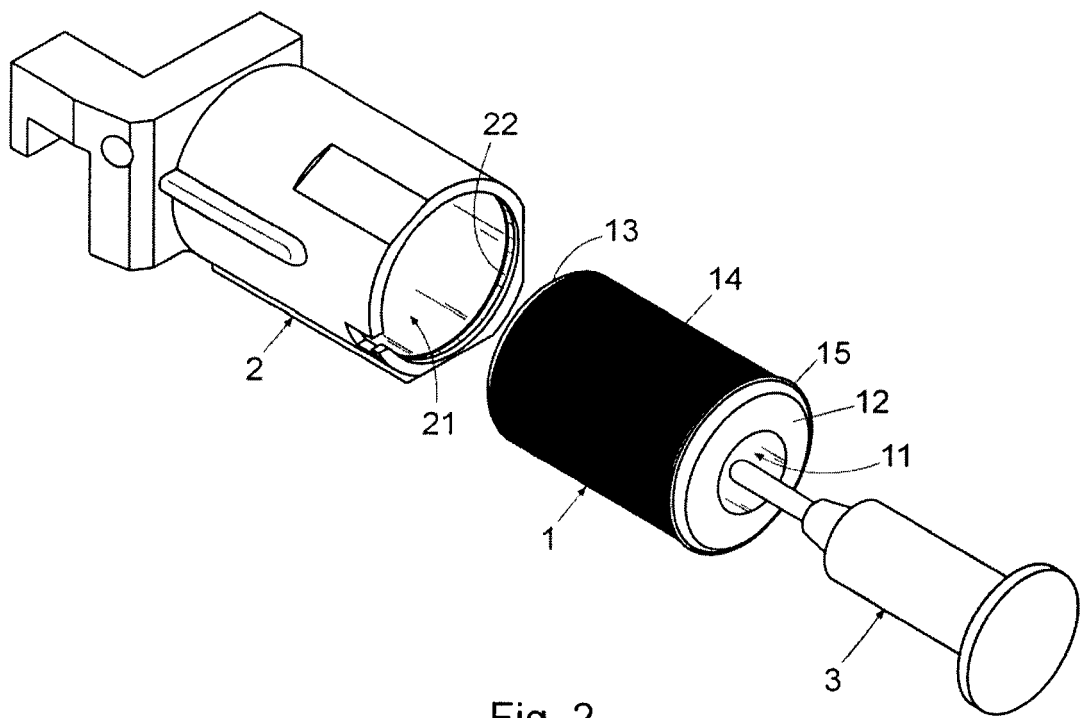
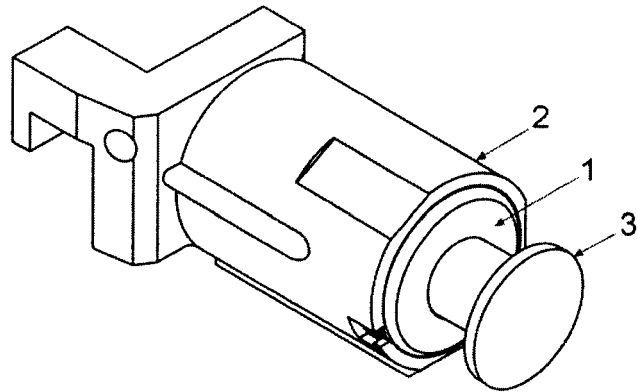
- a bobbin (1) is formed by a spool (11) that has a cylindrical body with flanges (12, 13) on the opposite ends and a conducting filament winding (14) wound around the spool (11);
- a casing or shield (2) of the bobbin (1) defined

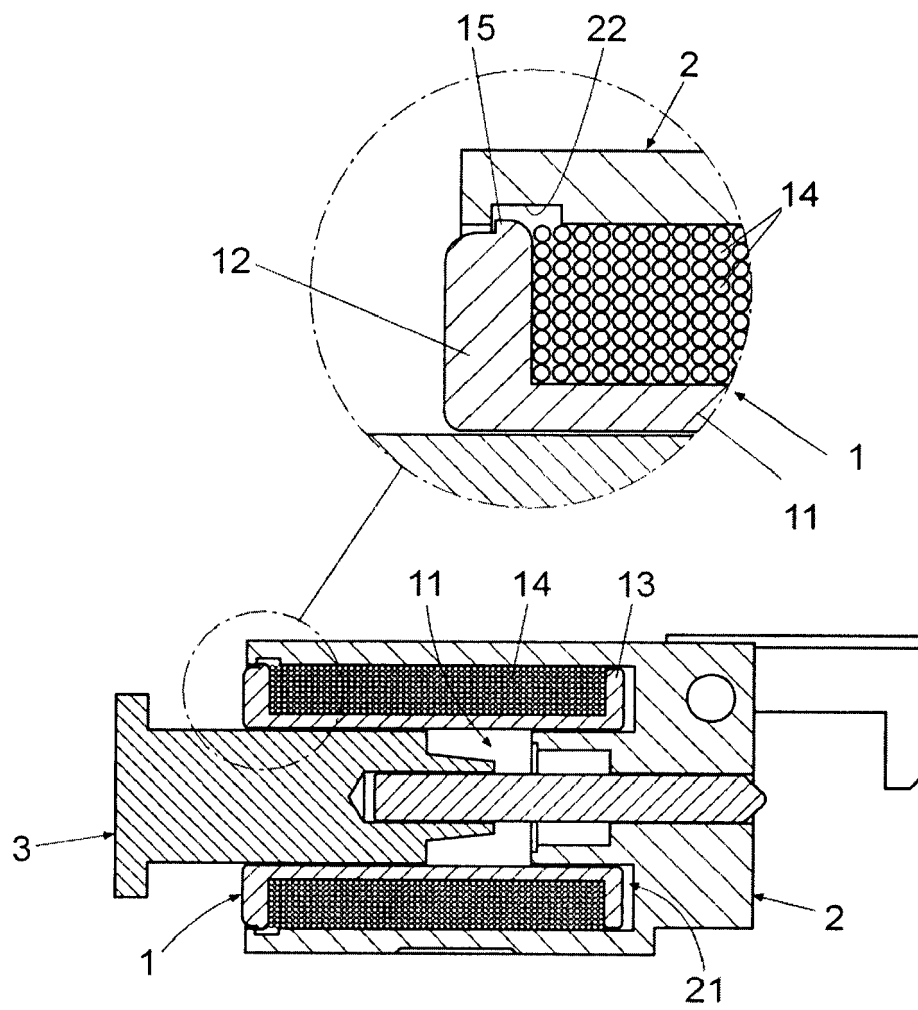
or fastened in the casing of an electric door opener and having a cavity (21) for tightly housing the bobbin and,
- a core (3) mounted such that it can move axially inside the spool (11) of the bobbin (1);

characterized in that the cavity of the casing or shield and the bobbin comprise retention means of the bobbin in the mounting position, made up of complementary configurations (15, 22) that can be coupled under pressure during the axial insertion of the bobbin in the cavity of the casing or shield and defined in facing surfaces of the cavity and of at least one of the flanges of the bobbin.

2. The actuator according to claim 1, **characterized in that** the complementary retention means comprise a perimetral channel and a perimetral appendage, which are continuous or discontinuous.

3. The actuator according to claim 2, **characterized in that** the perimetral channel is defined in the inner surface of the cavity (21).







EUROPEAN SEARCH REPORT

Application Number
EP 18 00 0190

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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 15 August 2018	Examiner Koster, Michael
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 18 00 0190

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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