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(54) **ANTIPANIC DEVICE**

ANTIPANIKVORRICHTUNG

DISPOSITIF ANTI-PANIQUE

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Description

[0001] The present invention relates to an antipanic device.

[0002] Antipanic push bars, handles and touch bars are safety devices designed to ensure quick evacuation even in danger conditions (for example in case of fire), which must be fitted to doors arranged along the evacuation paths in environments that are open to the public and frequented by a certain number of people.

[0003] These devices must comply with specific national or international standards (for example, in the European Union they must comply with the UNI EN 1125 standard). The standards are aimed at defining a classification which, by coding each element, assigns particular functional characteristics and precise dimensional indications to it.

[0004] This type of device is unidirectional, i.e., allows facilitated evacuation along a predefined direction (generally the direction for exit from the installation environment).

[0005] However, in some specific applications, the use of safety exits must be disciplined, since a free use of the exit openings might cause problems of various kinds.

[0006] In commercial establishments, schools, hospitals, and other places frequented by a large number of people, the use of antipanic devices installed on safety doors is potentially harmful, since it can facilitate illicit or irregular or otherwise unwanted behaviors.

[0007] For example, it is easier for a thief to escape with the stolen goods, since the antipanic device allows immediate exit from one of the safety openings of a commercial establishment; likewise, students of a school (or patients of a hospital) might exit very easily and in an uncontrollable manner from one of the safety exits of the building.

[0008] In order to avoid these situations (and others which are not described) while maintaining safety of the evacuation paths, it is known to use assemblies designed to delay the opening of a door on which an antipanic device is installed.

[0009] Generally, an electromagnet is installed which is designed to keep the door in the closed configuration and is controlled by the antipanic device. The electromagnet is installed on the jamb and, in the door closure configuration, faces a portion of the leaf that comprises a block made of ferromagnetic material or a bracket that is integral with the leaf and is made of ferromagnetic material.

[0010] In normal operation, the door is closed by simultaneous effect of the bolt of the antipanic device and of the electromagnet (which is normally active and therefore powered in order to apply an attraction force to the respective ferromagnetic abutment that is integral with the leaf).

[0011] In case of actuation of the antipanic device, interruption of the power supply of the electromagnet, with consequent possible opening of the door, occurs only if the pressure applied by the user is continuous and prolonged for a predefined time (in some cases governed by specific standards and/or laws).

[0012] This solution entails the persistence of the pressure on the touch bar or push bar (or other actuation element) of the antipanic device, and this can be associated with alarm messages or signals, so that it is possible to be aware that that door will open shortly thereafter. In other words, the possibility is offered to predict in advance the imminent opening of a door, by virtue of the delay between the application of the pressure on the element of the antipanic device and the actual opening of the door.

[0013] Furthermore, in compliance with the provisions of the currently applicable European standard EN 13637 (and any equivalents thereof at the international level), upon the application of a pressure to the touch bar (possible applied with great force), opening must necessarily occur no later than one second after the application of said force.

[0014] In order to maintain high safety standards, in case of blackout the lack of power supply of the electromagnet in any case ensures that the door is controlled exclusively by the antipanic device, which will allow it to open if needed.

[0015] The adoption of the electromagnet increases considerably the complexity of the installation activities and requires the execution of masonry work and/or the mounting of additional components on the leaf; furthermore, it is necessary to provide the electric power supply of the antipanic device (in order to allow it to communicate with the electromagnet so as to ensure the interruption of the corresponding power supply after the provided delay time) and of the electromagnet, with functionally associated circuits.

[0016] Furthermore, the electromagnet causes continuous electric power consumption (of non-negligible value, since the force applied by the magnet must be such as to hold the door closed even in case of pressure by a user), which makes it uneconomical and scarcely sustainable from an environmental standpoint.

[0017] US5011199, FR2622240 and WO9708668 each disclose an antipanic device of the known types. EP2319886 discloses an antipanic device using an electromagnet.

[0018] The aim of the present invention is to solve the problems described above, devising an antipanic device that ensures complete control of an evacuation opening and is easy to install.

[0019] Within the scope of this aim, an object of the invention is to devise an antipanic device that does not require interventions for modification of the leaf and/or of the installation opening.

[0020] Another object of the invention is to devise an antipanic device that entails very low energy consumption.

[0021] Another object of the invention is to devise an antipanic device that does not compromise the appearance and design of the installation leaf and of the corresponding evacuation opening.

[0022] A further object of the present invention is to provide an antipanic device that has low costs, is relatively simple to provide in practice and is safe in application.

[0023] This aim, as well as these and other objects which will become better apparent hereinafter, are achieved by an antipanic device as defined in claim 1.

[0024] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the antipanic device according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a schematic sectional side view, taken along a longitudinal central plane, of an antipanic device according to the invention;

Figure 2 is a schematic sectional perspective view, taken along a transverse plane, of an antipanic device according to the invention in the closed configuration;

Figure 3 is a schematic sectional perspective view, taken along a transverse plane, of an antipanic device according to the invention in the open configuration.

[0025] With reference to the figures, an antipanic device is generally designated by the reference numeral 1.

[0026] The antipanic device 1 according to the invention comprises a boxlike body 2 on which a movable component 2a is articulated which is of a type chosen from a handle, a touch bar, a push bar and the like and accommodates at least one sliding rod 3 for the actuation of the at least one closure element, of a type chosen from a bolt, a spring latch, a latch and the like.

[0027] The device 1 furthermore comprises at least one kinematic assembly 4, which is associated with the body 2, which is functionally associated with the rod 3. The kinematic assembly 4 is pivoted to the boxlike body.

[0028] The presence of temporary retention means of the type of an electromagnet 5 which is normally electrically powered ensures magnetic attraction, in the locking configuration, of a tab 6 of the at least one kinematic assembly 4: the tab 6 is made of ferromagnetic material.

[0029] At least one control and management unit 7 is controlled by at least one sensor 8 for detecting the position of the rod 3 and for controlling the power supply of the electromagnet 5.

[0030] Following a partial translation of the rod 3, which corresponds to the actuation of the movable component 2a by a user to open the device 1, the at least one sensor 8 signals the detected translation to the unit 7, and the unit 7 interrupts the power supply of the electromagnet 5 in order to release, within a predefined and settable time, the tab 6 of the kinematic assembly 4, freeing (i.e., allowing) further translations of the rod 3 for the retraction of the at least one said closure element.

[0031] It is pointed out that the release of the tab 6 of the kinematic assembly 4 also occurs while loaded (i.e., while pressure is applied to the movable antipanic element arranged on the leaf and also to the leaf itself), thus ensuring considerable safety of the evacuation path at which the antipanic device 1 according to the invention is installed.

[0032] According to the invention, the at least one kinematic assembly 4 comprises a first carousel 9, which is pivoted on the pin 10 of the boxlike body 2 proximate to the rod 3, and a second carousel 11, which is pivoted on the pin 12 of the boxlike body 2 proximate to the electromagnet 5.

[0033] The first carousel 9 comprises a first arm 13 which interferes with the rod 3 at a predefined portion of its stroke and a second arm 14 which abuts against the front of a first protrusion 15 of the second carousel 11 which comprises a second protrusion 16 provided with the terminal tab 16 that abuts against the electromagnet 5.

[0034] When the device 1 is in the inactive configuration (therefore the respective movable component 2a is not actuated by any user and the installation leaf is in the closed configuration), the first protrusion 15 is not perpendicular to the surface of the second arm 14 against which it abuts.

[0035] The torque applied by the second arm 14 of the first carousel 9 to the second carousel 11 is equal to the ratio between the torque applied to the first carousel 9 by the rod 3 (by means of the first arm 10) and the corresponding second arm 14 (its length), in turn multiplied by the product between the length of the first protrusion 15 the cosine of an angle α.

[0036] The angle α is the offset angle of the first protrusion 15 with respect to the surface of the second arm 14 against which it abuts.

[0037] The torque applied to the second carousel 11 can therefore be calculated by applying the formula:

$$C_{(2nd\ carousel)} = [C_{(1st\ carousel)}/L_{(2nd\ arm)}]x[L_{(1st\ protrusion)} \cos \alpha]$$

[0038] With particular reference to this embodiment, it is specified that the attraction force applied by the electromagnet 5 to the tab 6 (integral with the second protrusion 16 of the second carousel 11) is greater than the force, applied by said tab 6 in the direction away from the electromagnet 5, that is applied to the tab 6 by virtue of the torque of said

second carousel 11 following a translation of the rod 3 caused by the actuation of the movable antipanic component 2a by a user.

[0039] In this manner, even upon the application of a pressure to the movable component 2a of the device 1 (with consequent movement of the component in the respective configuration designed for opening), the rod 3 can only perform a short portion of translational stroke, until the second arm of the first carousel 9 jams against the first protrusion 15 of the second carousel 11 without being able to move it, since the applied force is not capable of overcoming the magnetic attraction force applied by the electromagnet 5 to the tab 6.

[0040] One can conclude that the magnet must have an attraction force on the tab 6 that is greater than the spacing force caused by the torque applied to the second carousel 11 when the movable component 2a of the device 1 is actuated, thus complying with the following formula:

$$F_{(\text{electromagnet})} > C_{(\text{2nd carousel})} x\ L_{(\text{2nd protrusion})}$$

[0041] Therefore (with appropriate further revisions which take into account the specific shape of each element and of the arrangement thereof with respect to the other parts involved):

$$F_{(\text{electromagnet})} > [C_{(\text{1st carousel})}/L_{(\text{2nd arm})}]x[L_{(\text{1st protrusion})} \cos \alpha]x\ L_{(\text{2nd protrusion})}$$

[0042] By means of the formula given above (or by means of a corresponding more precise and specific version) it is possible to calculate the breadth of the angle α that can ensure compliance with said formula at a magnetic force of low extent, which can be generated with a small electromagnet 5 (or other temporary retention means).

[0043] The dimensions of the electromagnet 5 are in fact fundamental in the device 1 according to the invention, since said electromagnet 5 must be installable within the boxlike body 2 which must have dimensions that are similar to those of a boxlike body of a traditional antipanic device.

[0044] It is specified furthermore that at least one kinematic assembly 4 comprises respective elastic means 17 for automatically restoring the inactive configuration (in which the tab 6 abuts against the end face of the electromagnet 5), at which no pressure is applied to the movable antipanic component 2a and the rod 3 is in a retracted limit configuration.

[0045] In particular, at least one part of the kinematic assembly 4, chosen between the first carousel 9 and the second carousel 11, advantageously comprises a torsion spring 17 for the automatic restoring of the respective inactive configuration.

[0046] With particular reference to a constructive solution of unquestionable interest in practice and in application, the tab 6 can advantageously have shape and dimensions which are complementary to those of the surface of the electromagnet 5 on which it abuts: this dimensional match allows to utilize in an optimum manner the attraction force of the entire surface of the electromagnet 5.

[0047] Furthermore, it is deemed appropriate to point out that the sensors 8 for detecting the position of the rod 3 are at least two.

[0048] Said sensors 8 are designed to detect an inactive configuration with retracted rod 3, a configuration of maximum translation, which determines the retraction of the closure element by the rod 3, and an intermediate configuration of partial advancement of the rod 3 and abutment of the rod 3 against the first arm 13 of the first carousel 9, with consequent forcing of the second arm 14 on the front of the first protrusion 15 of the second carousel 11.

[0049] During the second configuration (which lasts for an adjustable time determined by the control and management unit 7), the electromagnet 5 retains the tab 6 and prevents the rotation of the carousels 9 and 11, also preventing the translation of the rod 3 toward the first configuration of maximum translation which would cause the retraction of the closure element.

[0050] Conveniently, the control and management unit 7 comprises appropriate calibration means, for adjusting the duration of the time interval (delay time) that elapses between the actuation of the movable component 2a by the user, with consequent translation of the rod 3 from the inactive configuration to the intermediate configuration, and interruption of the electric power supply of the electromagnet 5.

[0051] In order to ensure optimum orientation of each operating part, the boxlike body 2 can advantageously comprise, proximate to the pivoting point (pin 12) of the second carousel 11, at least one shoulder 18 for the abutment thereon of the first protrusion 17, at the inactive configuration in which the tab 6 is juxtaposed against the respective surface of the electromagnet 5.

[0052] Furthermore, the shoulder 18 can be used also to anchor part of the torsion spring 17 which ensures the return of the second carousel 11 to the inactive position.

[0053] Advantageously, the present invention solves the problems described above, devising an antipanic device 1 that ensures complete control of an evacuation opening and is simple to install.

[0054] The device 1 according to the invention in fact prevents accidental openings of the leaf installed in the opening, since opening is allowed only following the persistence of the pressure on the movable component 2a, so as to ensure that opening is dependent on an actual need of who is applying pressure to the movable component 2a.

[0055] Conveniently, the antipanic device 1 does not require interventions for modification of the leaf and/or of the installation opening.

[0056] In fact, all the apparatuses required to ensure the opening of the leaf (which is dependent upon the retraction of the at least one closure element) after a programmable delay time, starting from the instant of first application of the pressure to the movable component 2a, are accommodated within the boxlike body 2, without requiring any specific work on the leaf and/or on the opening.

[0057] By providing the device 1 also with a power supply unit (of the type of a battery pack), it is not even necessary to provide the connection of the device 1 to an electric power supply grid, minimizing the interventions required for its installation.

[0058] Efficiently, the antipanic device produces a very low energy consumption: the sizing is in fact such as to allow the use of a low-power electromagnet 5 (and therefore low energy consumptions).

[0059] Positively, the antipanic device 1 does not compromise the appearance and the design of the installation leaf and of the corresponding exit opening, by virtue of the fact that it does not provide for any external apparatus and by virtue of the fact that it has a shape and dimensions that are fully similar to those of an antipanic device of the traditional type.

[0060] Validly, the antipanic device 1 according to the invention is relatively simple to provide and is of low cost: for these reasons, the device 1 according to the invention is to be considered an innovation of assured application.

[0061] The device thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the accompanying claims; all the details may furthermore be replaced with other technically equivalent elements.

Claims

1. An antipanic device of the type comprising a boxlike body (2) on which a movable component (2a) is articulated which is of the type chosen from a handle, a touch bar, a push bar and the like, and which accommodates at least one sliding rod (3) for the actuation of the at least one closure element, of a type chosen from a bolt, a spring latch, a latch and the like, wherein the antipanic device comprises:

   - at least one kinematic assembly (4) associated with said boxlike body (2) functionally associated with said rod (3),
   - temporary retention means of the type of an electromagnet (5), normally supplied with electric power for magnetic attraction in the configuration for locking a tab (6) of said at least one kinematic assembly (4) made of ferromagnetic material,
   - at least one control and management unit (7), controlled by at least one sensor (8) for detecting the position of said rod (3) and for controlling the power supply of said electromagnet (5),

   following a partial translation of said rod (3), which corresponds to the actuation of said movable component (2a) by a user to open said device (1), said at least one sensor (8) signaling the translation to said unit (7) and said unit (7) interrupting the power supply of said electromagnet (5) for the release, within a predefined and settable time, of said tab (6) of said kinematic assembly (4), freeing further translations of said rod (3) for the retraction of the at least one said closure element,

   characterized in that said at least one kinematic assembly (4) comprises a first carousel (9) which is pivoted on said boxlike body (2) proximate to said rod (3) and a second carousel (11) which is pivoted on said boxlike body (2) proximate to said electromagnet (5), said first carousel (9) comprising a first arm (13) which interferes with said rod (3) at a predefined portion of its stroke and a second arm (14) which abuts against the front of a first protrusion (15) of said second carousel (11) which comprises a second protrusion (16) provided with said end tab (6) which abuts against said electromagnet (5), in the inactive configuration said first protrusion (15) being non-perpendicular to the surface of said second arm (14) against which it abuts.

2. The antipanic device according to claim 1, **characterized in that** the torque applied by said second arm (14) of said first carousel (9) to said second carousel (11) is equal to the ratio between the torque applied to the first carousel (9) by said rod (3) and the corresponding second arm (14), in turn multiplied by the product between the length of said first protrusion (15) and the cosine of an angle α, i.e., the offset angle of said first protrusion (15) with respect to the direction of the surface of said second arm (14) against which it abuts, according to the formula:

$$C_{(2nd\ carousel)} = [C_{(1st\ carousel)}/L_{(2nd\ arm)}]x[L_{(1st\ protrusion)} \cos \alpha]$$

3. The antipanic device according to claim 2, **characterized in that** the attraction force applied by said electromagnet (5) to said tab (6) that is integral with said second protrusion (16) of said second carousel (11) is greater than the force, applied in the direction for the movement of said tab (6) away from said electromagnet (5), applied to said tab (6) by virtue of said torque applied to said second carousel (11) following a translation of said rod (3) caused by the actuation of said movable antipanic component (2a) by a user.

4. The antipanic device according to claim 1, **characterized in that** said at least one kinematic assembly (4) comprises respective elastic means (17) for automatically restoring the inactive configuration, at which no pressure is applied to said movable antipanic component (2a) and said rod (3) is in a retracted limit configuration.

5. The antipanic device according to one or more of the preceding claims, **characterized in that** at least one part of said kinematic assembly (4) chosen from said first carousel (9) and said second carousel (11) comprises a torsion spring (17) for the automatic restoring of the respective inactive configuration.

6. The antipanic device according to one or more of the preceding claims, **characterized in that** said tab (6) has a shape and dimensions which are complementary to those of the surface of said electromagnet (5) against which it abuts.

7. The antipanic device according to one or more of the preceding claims, **characterized in that** said sensors (8) for detecting the position of said rod (3) are at least two, for detecting an inactive configuration with retracted rod (3), a configuration of maximum translation for the retraction of said closure element by said rod (3), and an intermediate configuration of partial advancement of said rod (3) and of abutment of said rod (3) against said first arm (13) of said first carousel (9), with consequent forcing of said second arm (14) on the front of said first protrusion (15) of said second carousel (11).

8. The antipanic device according to one or more of the preceding claims, **characterized in that** said control and management unit (7) comprises appropriate calibration means for adjusting the duration of the time interval that elapses between the actuation of the movable component (2a) by the user, with consequent translation of said rod (3) from said inactive configuration to said intermediate configuration, and the interruption of the electric power supply of said electromagnet (5).

9. The antipanic device according to one or more of the preceding claims, **characterized in that** said boxlike body (2) comprises, proximate to the pivoting point of said second carousel (11), at least one shoulder (18) for the abutment thereon of said first protrusion (15) at said inactive configuration in which said tab (6) is juxtaposed with respect to the respective surface of said electromagnet (5).

Patentansprüche

1. Eine Antipanikvorrichtung von der Art, die einen kastenähnlichen Körper (2) umfasst, an den eine bewegliche Komponente (2a) gelenkig angeschlossen ist, die von der Art gewählt aus einem Griff, einer Betätigungsstange, einer Druckstange und dergleichen ist, und die mindestens einen Gleitstange (3) zur Betätigung des mindestens einen Verschlusselements, von einer Art gewählt aus einem Bolzen, einer Federklinke, einer Klinke und dergleichen, enthält; wobei die Antipanikvorrichtung Folgendes umfasst:

    - mindestens einen kinematischen Aufbau (4), verbunden mit dem kastenähnlichen Körper (2), funktionell mit der Stange (3) verknüpft,
    - temporäre Haltemittel von der Art eines Elektromagneten (5), normalerweise mit elektrischem Strom versorgt zur magnetischen Anziehung in der Konfiguration zum Blockieren einer Nase (6) des mindestens einen kinematischen Aufbaus (4), hergestellt aus ferromagnetischem Material,
    - mindestens eine Steuerungs- und Verwaltungseinheit (7), gesteuert von mindestens einem Sensor (8) zur Erkennung der Position der Stange (3) und zur Steuerung der Stromversorgung des Elektromagneten (5);

        wobei nach einer partiellen Translationsbewegung der Stange (3), die der Betätigung der beweglichen Komponente (2a) durch einen Benutzer, um die Vorrichtung (1) zu öffnen, entspricht, der mindestens eine Sensor (8) der Einheit (7) die Translationsbewegung mitteilt und die Einheit (7) die Stromversorgung des Elektromagneten (5) unterbricht zur Freisetzung der Nase (6) des kinematischen Aufbaus (4) innerhalb einer vordefinierten und einstellbaren Zeit, was weitere Translationsbewegungen der Stange (3) zum Zwe-

cke des Einzugs des mindestens einen Verschlusselements freisetzt;
dadurch gekennzeichnet, dass der mindestens eine kinematische Aufbau (4) ein erstes Karussell (9) umfasst, welches drehgelenkig in der Nähe der Stange (3) an dem kastenähnlichen Körper (2) befestigt ist, und ein zweites Karussell (11), das in der Nähe des Elektromagneten (5) drehgelenkig an dem kastenähnlichen Körper (2) befestigt ist; wobei das erste Karussell (9) einen ersten Arm (13) umfasst, der mit der Stange (3) an einem vordefinierten Abschnitt ihres Hubs in Eingriff steht, und einen zweiten Arm (14), der am vorderen Ende eines ersten Vorsprungs (15) des zweiten Karussells (11) anliegt, das einen zweiten Vorsprung (16) umfasst, ausgestattet mit der Endnase (6), die an dem Elektromagneten (5) anliegt, wobei in der inaktiven Konfiguration des erste Vorsprung (15) nicht senkrecht zur Oberfläche des zweiten Arms (14) ist, an dem er anliegt.

2. Die Antipanikvorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** das Drehmoment, das von dem zweiten Arm (14) des ersten Karussells (9) auf das zweite Karussell (11) ausgeübt wird, gleich dem Verhältnis zwischen dem Drehmoment, das von der Stange (3) auf das erste Karussell (9) ausgeübt wird, und dem entsprechenden zweiten Arm (14) ist, wiederum multipliziert mit dem Produkt aus der Länge des ersten Vorsprungs (15) und dem Kosinus eines Winkels α, d. h. dem Winkelversatz des ersten Vorsprungs (15) mit Bezug auf die Richtung der Oberfläche des zweiten Arms (14), an welchem er anliegt, nach der Formel:

$$C_{(2.\ Karussell)} = [C_{(1.\ Karussell)} / L_{(2.\ Arm)}] \times [L_{(1.\ Vorsprung)} \cos\ \alpha]$$

3. Die Antipanikvorrichtung gemäß Anspruch 2, **dadurch gekennzeichnet, dass** die Anziehungskraft, die von dem Elektromagneten (5) auf die Nase (6) ausgeübt wird, welche integral mit dem zweiten Vorsprung (16) des zweiten Karussells (11) ist, größer ist als die Kraft, ausgeübt in die Richtung zur Bewegung der Nase (6) fort von dem Elektromagneten (5), die auf die Nase (6) durch das Drehmoment ausgeübt wird, das auf das zweite Karussell (11) infolge einer Translationsbewegung der Stange (3) ausgeübt wird, die durch die Betätigung der beweglichen Antipanikkomponente (2a) durch einen Benutzer ausgelöst wird.

4. Die Antipanikvorrichtung gemäß Anspruch 1, **dadurch gekennzeichnet, dass** der mindestens eine kinematische Aufbau (4) dazugehörige elastische Mittel (17) zur automatischen Wiederherstellung der inaktiven Konfiguration umfasst, in welcher kein Druck auf die bewegliche Antipanikkomponente (2a) ausgeübt wird und die Stange (3) sich in einer eingezogenen Endkonfiguration befindet.

5. Die Antipanikvorrichtung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** mindestens ein Teil des kinematischen Aufbaus (4), gewählt aus dem ersten Karussell (9) und dem zweiten Karussell (11), eine Torsionsfeder (17) zur automatischen Wiederherstellung der entsprechenden inaktiven Konfiguration umfasst.

6. Die Antipanikvorrichtung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Nase (6) eine Form und Abmessungen hat, die komplementär zu denjenigen der Oberfläche des Elektromagneten (5) sind, an welcher sie anliegt.

7. Die Antipanikvorrichtung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Sensoren (8) zur Erfassung der Position der Stange (3) mindestens zwei an der Zahl sind, zur Erfassung einer inaktiven Konfiguration mit eingezogener Stange (3), einer Konfiguration maximaler Translation zum Einziehen des Verschlusselements durch die Stange (3) und einer intermediären Konfiguration partiellen Vorschubs der Stange (3) und Anliegens der Stange (3) an dem ersten Arm (13) des ersten Karussells (9), mit daraus folgendem Pressen des zweiten Arms (14) an das vordere Ende des ersten Vorsprungs (15) des zweiten Karussells (11).

8. Die Antipanikvorrichtung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** die Steuerungs- und Verwaltungseinheit (7) geeignete Kalibrationsmittel umfasst, um die Dauer des Zeitintervalls anzupassen, das zwischen Betätigung der beweglichen Komponente (2a) durch den Benutzer, mit daraus folgender Translationsbewegung der Stange (3) aus der inaktiven Konfiguration in die intermediäre Konfiguration, und der Unterbrechung der Stromversorgung des Elektromagneten (5) verstreicht.

9. Die Antipanikvorrichtung gemäß einem oder mehreren der obigen Ansprüche, **dadurch gekennzeichnet, dass** der kastenähnliche Körper (2) in der Nähe des Drehpunkts des zweiten Karussells (11) mindestens eine Schulter (18) zum Anliegen des ersten Vorsprungs (15) daran in der inaktiven Konfiguration umfasst, in welcher die Nase (6)

neben der entsprechenden Oberfläche des Elektromagneten (5) liegt.

Revendications

1. Dispositif antipanique comprenant un corps en forme d'enceinte (2) sur lequel un composant mobile (2a) est articulé et est l'un d'une poignée, d'une barre tactile, d'une barre de poussée et similaires, et qui contient au moins une tige coulissante (3) destinée à l'actionnement du au moins un élément de fermeture, d'un type choisi parmi un boulon, un linguet à ressort, un verrou et similaires, dans lequel le dispositif antipanique comprend :

   - au moins un ensemble cinématique (4) associé audit corps en forme d'enceinte (2) associé à ladite tige (3),
   - un moyen de retenue provisoire de type électroaimant (5), normalement alimenté en électricité en vue d'une attraction magnétique dans la configuration destinée à bloquer une languette (6) dudit au moins un ensemble cinématique (4) composé d'un matériau ferromagnétique,
   - au moins une unité de commande et de gestion (7), pilotée par au moins un capteur (8) destiné à détecter la position de ladite tige (3) et à contrôler l'alimentation électrique dudit électroaimant (5),

   après une translation partielle de ladite tige (3), qui correspond à l'actionnement dudit composant mobile (2a) par un utilisateur afin d'ouvrir ledit dispositif (1), ledit au moins un capteur (8) signalant la translation à ladite unité (7) et ladite unité (7) coupant l'alimentation électrique dudit électroaimant (5) afin de libérer, dans un délai prédéfini et réglable, ladite languette (6) dudit ensemble cinématique (4), et de permettre d'autres translations de ladite tige (3) en vue de la rétraction dudit au moins un élément de fermeture, **caractérisé en ce que** ledit au moins un ensemble cinématique (4) comprend un premier carrousel (9) qui pivote sur ledit corps en forme d'enceinte (2) près de ladite tige (3) et un deuxième carrousel (11) qui pivote sur ledit corps en forme d'enceinte (2) près dudit électroaimant (5), ledit premier carrousel (9) comprenant un premier bras (13) qui interfère avec ladite tige (3) au niveau d'une partie prédéfinie de sa course et un deuxième bras (14) qui bute contre la partie avant d'une première saillie (15) dudit deuxième carrousel (11) qui comprend une deuxième saillie (16) prévue avec ladite languette d'extrémité (6) qui bute contre ledit électroaimant (5), dans la configuration inactive, ladite première saillie (15) étant non-perpendiculaire à la surface dudit deuxième bras (14) contre laquelle elle bute.

2. Dispositif antipanique selon la revendication 1, **caractérisé en ce que** le couple appliqué par ledit deuxième bras (14) dudit premier carrousel (9) audit deuxième carrousel (11) est égal au rapport entre le couple appliqué au premier carrousel (9) par ladite tige (3) et le deuxième bras correspondant (14), à son tour multiplié par le produit entre la longueur de ladite première saillie (15) et le cosinus d'un angle α, c'est-à-dire l'angle de décalage de ladite première saillie (15) par rapport à la direction de la surface dudit deuxième bras (14) contre laquelle elle bute, selon la formule :

$$C_{(2nd\ carousel)} = [C_{(1st\ carousel)}/L_{(2nd\ arm)}]x[L_{(1st\ protrusion)} \cos \alpha]$$

3. Dispositif antipanique selon la revendication 2, **caractérisé en ce que** la force d'attraction appliquée par ledit électroaimant (5) à ladite languette (6) qui fait partie intégrante de ladite deuxième saillie (16) dudit deuxième carrousel (11) est supérieure à la force, appliquée dans la direction d'éloignement de ladite languette (6) par rapport audit électroaimant (5), appliquée à ladite languette (6) en raison du couple appliqué audit deuxième carrousel (11) après une translation de ladite tige (3) provoquée par l'actionnement dudit composant antipanique mobile (2a) par un utilisateur.

4. Dispositif antipanique selon la revendication 1, **caractérisé en ce que** ledit au moins un ensemble cinématique (4) comprend des moyens élastiques respectifs (17) destinés à rétablir automatiquement la configuration inactive, dans laquelle aucune pression n'est appliquée audit composant antipanique mobile (2a) et ladite tige (3) se trouve dans une configuration limite rétractée.

5. Dispositif antipanique selon une ou plusieurs des revendications précédentes, **caractérisé en ce qu'**au moins une partie dudit ensemble cinématique (4) choisie parmi ledit premier carrousel (9) et ledit deuxième carrousel (11) comprend un ressort de torsion (17) destiné au rétablissement automatique de la configuration inactive respective.

6. Dispositif antipanique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite languette (6) possède une forme et des dimensions qui sont complémentaires à celles de la surface dudit électroaimant (5)

contre laquelle elle bute.

7. Dispositif antipanique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** lesdits capteurs (8) destinés à détecter la position de ladite tige (3) sont au moins deux, afin de détecter une configuration inactive avec la tige rétractée (3), une configuration de translation maximale pour la rétraction dudit élément de fermeture par ladite tige (3), et une configuration intermédiaire d'avancée partielle de ladite tige (3) et de butée de ladite tige (3) contre ledit premier bras (13) dudit premier carrousel (9), avec le forçage consécutif dudit deuxième bras (14) sur la partie avant de ladite première saillie (15) dudit deuxième carrousel (11).

8. Dispositif antipanique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ladite unité de commande et de gestion (7) comprend un moyen de calibrage adéquat destiné à ajuster la durée de l'intervalle de temps qui s'écoule entre l'actionnement du composant mobile (2a) par l'utilisateur, avec la translation consécutive de ladite tige (3) de ladite configuration inactive vers ladite configuration intermédiaire, et la coupure de l'alimentation électrique dudit électroaimant (5).

9. Dispositif antipanique selon une ou plusieurs des revendications précédentes, **caractérisé en ce que** ledit corps en forme d'enceinte (2) comprend, près du point de pivotement dudit deuxième carrousel (11), au moins un épaulement (18) destiné à la butée, sur celui-ci, de ladite première saillie (15) dans ladite configuration inactive dans laquelle ladite languette (6) est juxtaposée par rapport à la surface respective dudit électroaimant (5).

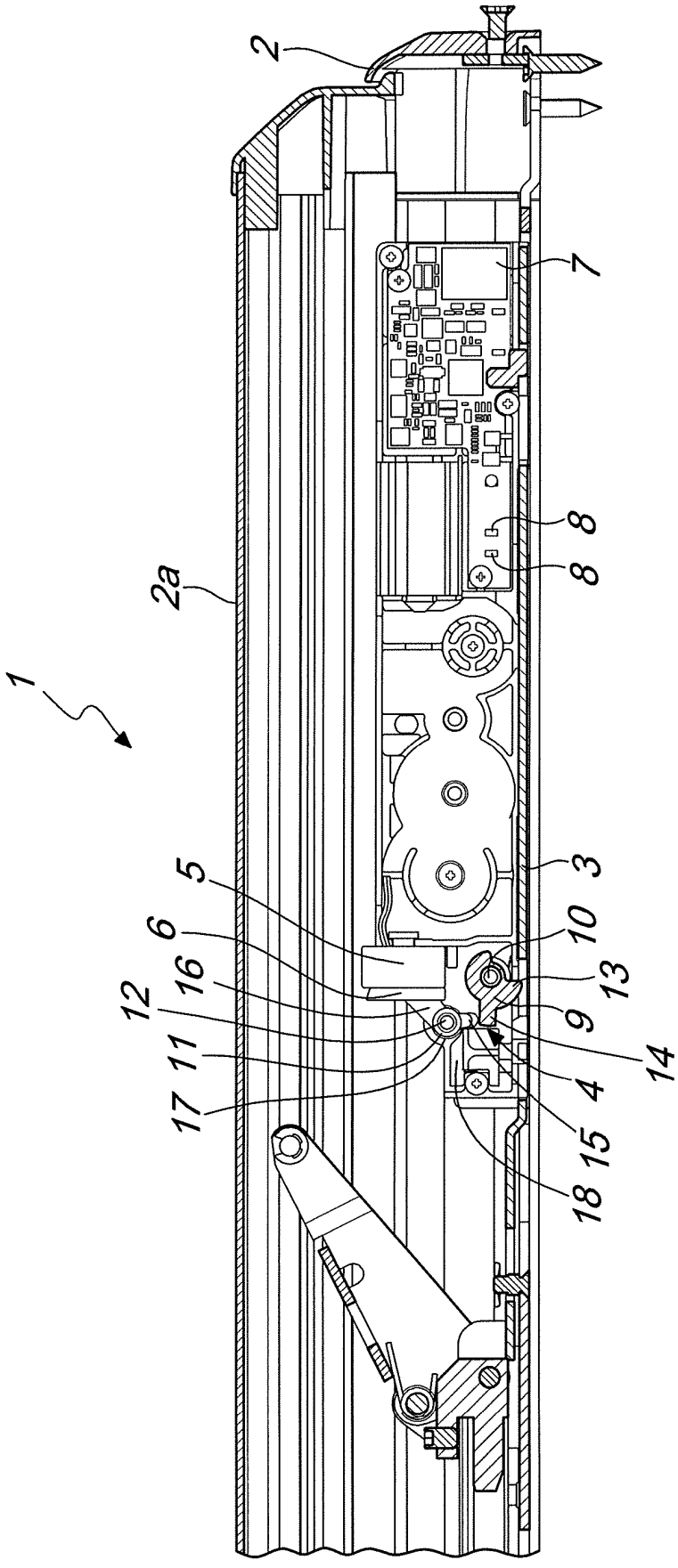

Fig. 1

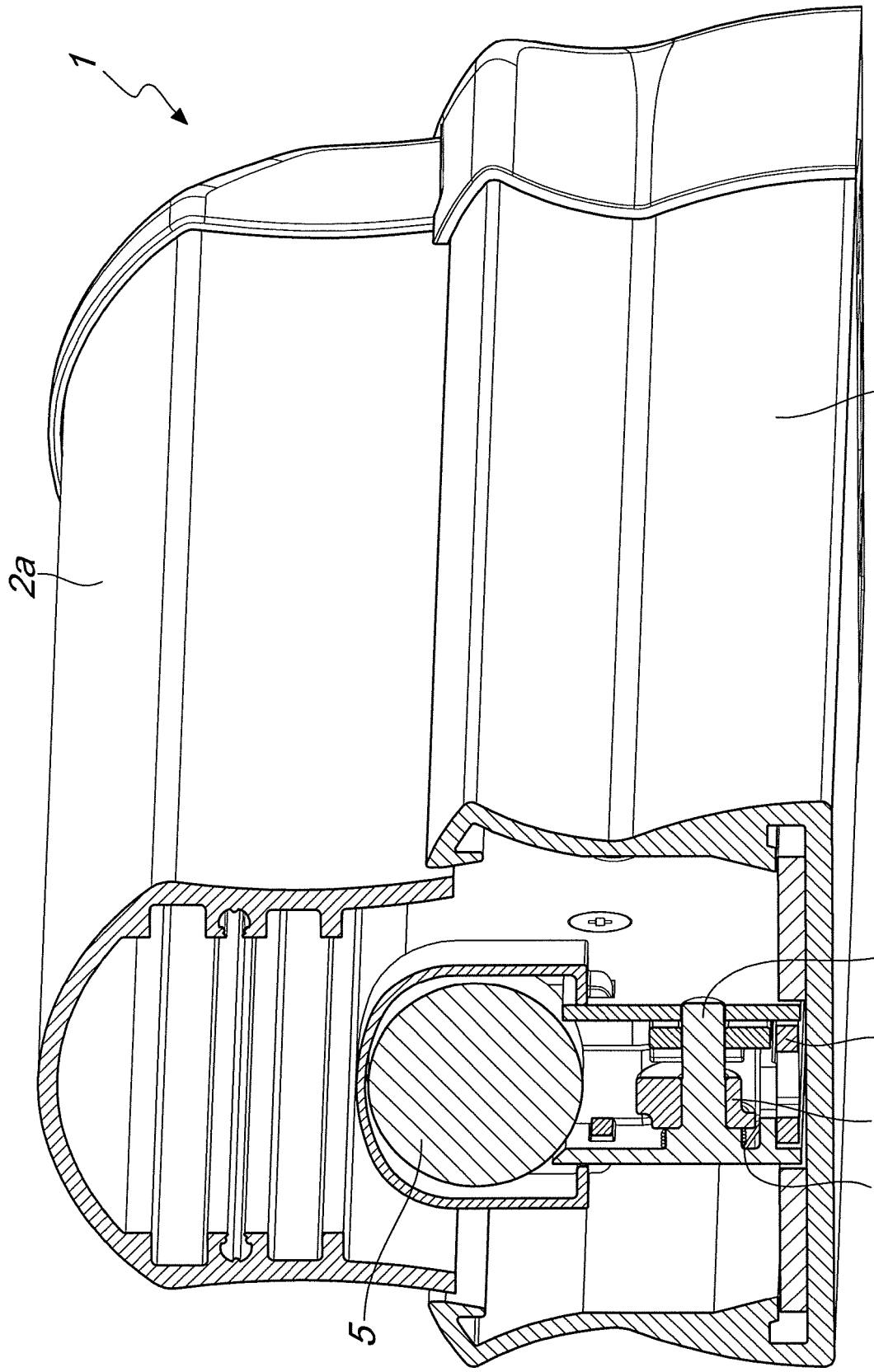

Fig. 2

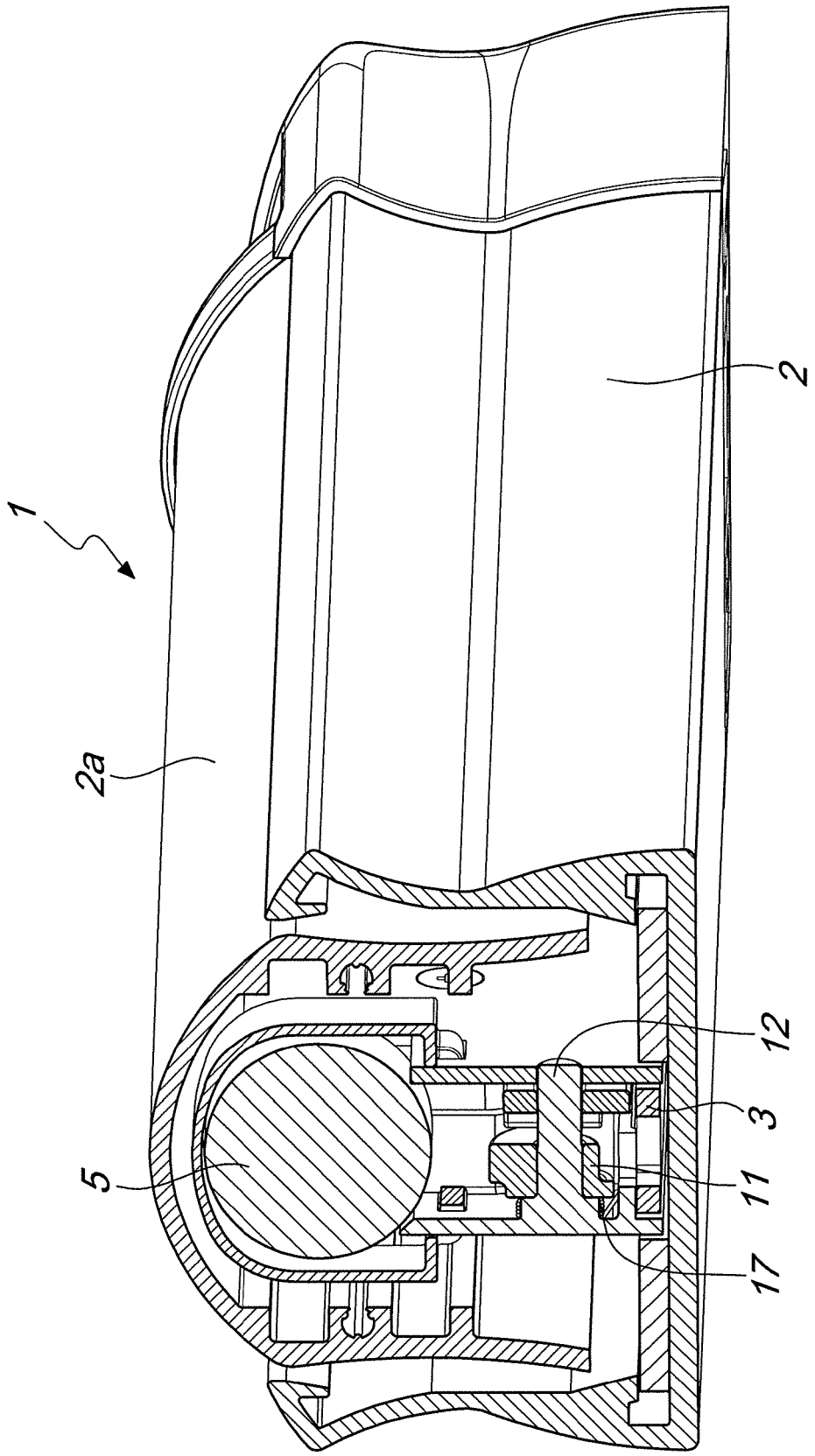

Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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