(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 639 219 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
05.05.2010 Bulletin 2010/18

(21) Application number: **04735276.0**

(22) Date of filing: **28.05.2004**

(51) Int Cl.:
E05D 3/02 *(2006.01)* ***E05D 3/08*** *(2006.01)*

(86) International application number:
PCT/HU2004/000057

(87) International publication number:
WO 2004/106677 (09.12.2004 Gazette 2004/50)

(54) **HINGE FOR DOORS AND WINDOWS, ESPECIALLY FOOD INDUSTRY SWINGING DOORS**

SCHARNIER FÜR TÜREN UND FENSTER, INSBESONDERE FÜR PENDELTÜREN DER LEBENSMITTELINDUSTRIE

CHARNIERE POUR PORTES ET FENETRES, EN PARTICULIER POUR DES PORTES BATTANTES DANS LES INDUSTRIES ALIMENTAIRES

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PL PT RO SE SI SK TR

(30) Priority: **02.06.2003 HU 0301529**

(43) Date of publication of application:
29.03.2006 Bulletin 2006/13

(73) Proprietor: **Szörényi, Csaba**
2040 Budaors (HU)

(72) Inventor: **Szörényi, Csaba**
2040 Budaors (HU)

(74) Representative: **Kovari, György**
Advopatent,
Office of Patent and Trademark Attorneys,
Fö u. 19
1011 Budapest (HU)

(56) References cited:
GB-A- 804 584 **SE-C- 205 661**

EP 1 639 219 B1

Description

[0001] The invention relates to a hinge that can be used for doors and windows, especially food industry swinging doors, which is designed for connecting the door wing to the case. GB-A- 804 584 discloses a hinge for swinging doors and discloses the features of the preamble of claim 1.

[0002] It is known that numerous facilities with strict hygienic requirements, such as food industry plants, stores and similar facilities require doors and windows, first of all swinging doors, which are designed in a way that they do not need to be touched by hand in order to open or close them, but when trolleys are pushed against them they swing out of their still position and then close automatically. Also there is another requirement in connection with such swinging doors, namely that if people often go through the door opening during operating hours the door wing is expected to stay open temporarily- in a position open at 90 ° - because in this case it is easier to go through the door and less damage is done to the door structure.

[0003] Furthermore food industry doors and windows must also comply with the relating hygienic prescriptions, and the swinging door case and wing as well as the hinges connecting them must be made of a material complying with these requirements. This material must be suitable for letting the hinges fixed to the door panel slide and tilt on the case making it possible for the door wing to move easily and for enabling the hinges to support the weight of the heavy wings.

[0004] The presently known door hinges designed for this purpose only partly comply with these conditions. Generally they are made of graphite casting, and their more robust constructions are not suitable for complying with the hygienic requirements. The versions that comply with the hygienic requirements are made of stainless metal, their structural construction is complicated, their production is rather expensive, their bearing capacity is limited, their life is rather short first of all because of the jamming caused by the rotation of the hinges, and they cannot be fixed in a position open at 90°, resulting in the complete opening of the door wing. Although swinging door hinges made completely of plastic are hygienically suitable, but due to their small bearing capacity they are generally not used in practice.

[0005] European patent specification No. EP 1 148 195 for example describes a spring door-hinge, and USA patent specification No. 4 351 086 also relates to a similar structure, which consists of a spring surrounding a pin and a receiving house. The patent specification SE 205 661 relates to a door hing having an U-shaped casing by inserting a fixing plate, on the outside surface of which there is a friction-reducing plate. The curved head attached to the wing rotates on this plate-surface when the door is opened or closed. The three positions of the wing are: completely closed, completely opened, and an intermediate position, from which the door is returned by the springs into the closed position, while the completely opened position is fixed automatically. The springs surround the threaded shanks, which are connected to a vertical pin, and the wing rotates around this pin. The displacement of the wing in any direction results in the stretching of the springs, and after the decentering force terminates the springs pull back the wing into closed position. The stretch of the springs can be adjusted with the adjusting screws.

If the position of the wings parallel to the wall changes the appropriate position can be restored with the screws arranged in a V shape in top view.

[0006] However, the above-referenced solutions are not completely suitable for satisfying the requirements of food industry swinging doors described above.

[0007] The task to be solved with the invention is to provide a hinge ensuring connection between the case and stanchion of doors and windows, especially food industry swinging doors, which can completely satisfy the requirements of the known solutions for this purpose described above, complies with the hygienic prescriptions, its bearing capacity is suitable for heavy weight door wings, the surfaces of the structure parts easily sliding on each other do not get jammed as a result of these movements, and so the life of the hinge is long, the wing automatically stays open when it is turned round by 90°, and it can be used with different types of door panels.

[0008] The invention is based on the recognition that the disadvantageous characteristic feature of polished hinges made of cast stainless metal, satisfying hygienic requirements, namely that as a result of heavy loading they are liable to jamming, can be overcome, if the surfaces belonging to the case, getting in contact with the hinges in the course of their frequent sliding-tilting movements are made of bearing and enduring plastic, which is also suitable from a hygienic aspect. Our further recognition was that the wing, e.g. door panel, can also be easily moved, if the spring-force holding the wing to the case is rather great, and that in its open final position the wing automatically stays open, if in the case of opening the door at 90° the tilting point of the house supporting the wing goes through the centre-line of the bolted shaft connecting the case and the wing. Finally we recognised that the pull spring-force is also exerted, if in the case of opening the door the length of the shifting of the tilting point is greater - preferably by 4-5 mm in general - than the shifting of a bolted shaft connecting the house and the sleeved shaft to each other, perpendicular to the latter one.

[0009] On the basis of the above recognition the set task was solved with a hinge defined by the features of claim 1 according to the subject of the invention, especially a food industry swinging door hinge, which has a house receiving the wing of the door and a base attached to the surface of the case of the door facing the wing, which base contains an opening designed for guiding a pin connecting the wing and the case; in the area of the end of the pin guided in the house through the opening

there is a connecting element, and the house is connected to the pin by a bolt guided through the connecting element; on the side of the house facing the base there is a sliding-tilting head, which contains curved lateral surfaces fitting the base when turning the wing, and which can be turned against the force of the spring situated in the case, and which hinge is characterised by that

- sliding inserts made of a material resistant to wear and catches, preferably plastic, for example Teflon, are built in the base at places getting in contact with the sliding-tilting head when rotating the wing;

- the pin has a threaded part in the area of the end of the pin opposite the connecting element, and a preferably smooth part starting from the connecting element, surrounded at least partly by a cylindrical slide insert the position of which is fixed in relation to the base, allowing the longitudinal movement of the pin inside it, and by a sleeve fitting to it; and

- the spring is situated around the part of the pin inside the case, supported at its two ends.

[0010] According to a favourable construction example the spring is a spiral spring, the one end of which supports against the surface of the base facing the inside of the case and the other end supports against a favourably flat underplate situated between the end of the spring and a - practically self-locking - nut making it possible to control the spring force. Another construction example may also be favourable, according to which the slide insert is made of a material with a low coefficient of friction, favourable plastic, for example Teflon, and is provided with a flange supporting onto the base on its side facing the house.

[0011] According to a further preferred criterion of the invention the sleeve the length of which is suitable for taking in the spring and fits onto the slide insert is stiffly attached to the base or is made in one piece with it.

[0012] Another favourable construction of the hinge is characterised by that the sliding-tilting head of the house contains a lower head part and an upper head part at a certain distance from each other, and through openings of the same diameter are made in them in one line; the connecting element at the end of the pin is formed by a connecting sleeve the longitudinal geometrical central axis (y) of which is perpendicular to the pin's longitudinal geometrical central axis (x); in the operating position of the hinge the through opening of the connecting sleeve is in the same line with the openings in the head parts, its diameter is the same, and the house is connected to the pin with a bolt guided through these openings.

[0013] Furthermore it can be favourable, if the front sides of the lower and upper head parts of the sliding-tilting head facing the slide inserts of the base contain a flat, straight lateral surface in the middle, a curved lateral surface on both sides and tilting points in the area where the straight lateral side and the flat lateral sides meet. According to another construction example the distance of the tilting points of the sliding-tilting head measured from the vertical geometrical mid-plane of the wing is larger than the distance between the longitudinal geometrical central axis of the bolt connecting the wing to the pin and the outer plane of the base facing the wing. Finally it may be practical, if the house, the base, the pin with the connecting sleeve, the bolt and the spring-guiding sleeve are made of stainless metal.

[0014] Below the invention is described in detail on the basis of attached drawings, which show a favourable construction of the hinge. In the drawings

figure 1 shows the hinge in perspective;

figure 2 is a horizontal section taken along the longitudinal geometrical central axis of the hinge according to figure 1;

figure 3-5 show three basic positions of the house of the hinge connected to the door panel as compared to the breast plate belonging to the case, in diagrammatic top view.

[0015] The hinge shown in figures 1 and 2 made of a stainless material functions as a connecting member between the case 1 and wing 2 - door panel - of a swinging door, and its main parts are the house 3 holding and fixing the wing 2 and the base 4 attached to the case 1. The swinging wing 2 marked with dot-and-dash lines fits between the bearing plates 5a, 5b of the house 3 containing through openings 6 and holes parallel to each other, which wing is fixed to the house 3 with the help of milled oval-head nuts 8 driven through the pairs of holes formed by holes 6, 7 and with the help of milled oval-head screws 9. The base 4 is fixed to the case 1 in a similar way. The nut and screw heads are favourably countersunk.

[0016] The part of the house 3 from the bearing plates 5a, 5b towards the case 1 is formed by the sliding-tilting head 10, which has an upper head part 10a and a lower head part 10b at a certain distance from each other in a vertical sense, and between them there is an open gap 11 on all sides. In the head parts 10a, 10b there are through openings 12a, 12b with a circular cross-section, with the same diameter, falling in one line, with a common longitudinal geometrical central axis, so the cylindrical bolt 13 with a diameter suiting the cross-section size of the openings 12a, 12b can be driven through the openings 12a, 12b, and the length of the bolt 13 is chosen so that the circular grooves 13a, 13b in the area of its ends are situated slightly outside of the lower and upper surface of the house 3, and so the bolt 13 can be fixed in its position in the openings 12a, 12b with the rings 14 shown in figure 1. The openings 12a, 12b and the bolt 13 have a common y longitudinal geometrical central axis. The front side of the upper and lower head parts 10a, 10b of the sliding-tilting head 10 of the house 3 facing the case 1, in the middle, is constructed with a flat straight lateral

surface 27 ensuring the position of the wing 2 perpendicular to the base 4, and with curved lateral surfaces 26 on its two sides. Where the curved surfaces 26 end on the outer side, a tilting point 29 is shown at each place, the role of which will be explained later in the course of describing the operation of the hinge.

[0017] In the base 4 there is a central through opening 17 with a circular cross-section, and the pin 18 connecting the case 1 with the house 3 is driven through it, which pin 18 is formed by a cylindrical rod with a circular cross-section made of a corrosion-resistant material. Most of it goes inside the case 1, and its end going in the house 3 contains a connecting sleeve 21, which can be constructed in one piece with the rod. The through opening 22 of the connecting sleeve 21 with a circular cross-section also has the y longitudinal geometrical central axis mentioned above, so it is perpendicular to the x longitudinal geometrical central axis of the pin 18, and its diameter is the same as the diameter of the openings 12a, 12b. The connecting pint 18 has a smooth part 18a starting from the connecting sleeve 21 and a threaded part 18b extending from the end of the smooth part to the end of the pin 18 going into the case 1; in the case of the present example the smooth part 18a and the threaded part 18b are practically of the same or nearly same length. The connecting pin 18 goes into a nest 39 made for this purpose inside the case 1, so it is situated in an encircled space together with the spring surrounding it.

[0018] As it can be seen especially well in figure 2, the smooth part 18a of the pin 18 is surrounded by a cylindrical slide insert 19, which goes through the opening 17 and with its flange 19a running all round it supports onto the external surface of the base 4 facing the house 3, and with its internal cylindrical surface it fits onto the smooth part 18a of the pin 18 so that the smooth part 18a can move longitudinally, linearly, in the direction of double arrow back and forth inside the slide insert 19, onto which a spring-guide sleeve 20 made of stainless metal is fitted closely from the outside, and one end of the spring-guide sleeve 20 is welded to the surface of the base 4 facing the case 1, or it is made in one piece with it. In this way, in the course of the operation of the hinge - that is the movement of the pin 18 back and forth - the slide insert 19 and the spring-guide sleeve 20 always take the same fixed position in the structure.

[0019] Near the end of the threaded part 18b of the pin 18 there is a flat underplate 24 and a self-locking nut 25. One end of the spring 23 guided by the sleeve 20, constructed as a spiral spring, surrounding the part of the pin 18 going inside the case 1 supports against the underplate 24, while the other end supports against the internal side of the base 4. The force of the spring 23 can be adjusted as necessary by adjusting the nut 25.

[0020] At the places where in the course of the operation of the hinge the base 4 gets in contact with the sliding-tilting head 10 of the house 3, corrosion-resisting, wear resisting and catch resisting inserts 15, 16 made of a material with a low coefficient of friction, for example Teflon, are built in the base 4 in a way that their visible surface is in the same plane with the external surface of the base 4.

[0021] It can be seen from the above that the house 3 holding the wing 2 is both directly and indirectly connected to the supporting structure fixed onto the case.

[0022] Below the operation of the swinging door hinge shown in figures 1 and 2 is described on the basis of the diagrammatic figures 3-5, in which the same structural elements are marked with the reference numbers used earlier.

[0023] As it has been mentioned in the introductory part, food industry swinging doors, including the swinging door according to the invention, must basically fulfil three main functions: ensure the closed condition of the space delimited by it; if a vehicle, e.g.: a fork-lift truck, goes through the door opening, the wing must make it possible for the vehicle by swinging out of its closed position, and when the vehicle has gone through the opening, the wing must swing back into its closed position; finally, in the case of rotating the wing by 90 °C it must stay in the same position until it is pushed back into its closed position by an external force.

[0024] The closed position mentioned first is shown in figure 3, where the wing 2 is in one line with the case 1, and it completely closes the door opening. In this case the straight lateral surfaces 27 of the head parts 10a, 10b of the head 10 fit onto the base 4 and ensure the perpendicular position of the wing to the base 4.

[0025] If the wing 2 in closed position is opened by a vehicle (not shown) coming from the direction of arrow A shown in figure 4, the wing 2 rotates in the direction of arrow c, the curved lateral surfaces 26 of the head parts 10a, 10b slide on the insert plates 15, 16, and in the course of this the tilting point 29 also moves in accordance with the extent of rotation. In figures 3-5 the vertical geometrical centre-line of the base is marked with reference letter k. It can be seen well in figure 4 that the tilting point 29 does not go over the centre-line k, and from this position It is pushed back by the force of the spring 23 into its original closed position as shown in figure 3, after the vehicle has gone through the door opening and the force exerted onto the wing in the direction of arrow A has terminated.

[0026] If the wing 2 needs to be kept open for a longer period, it should be rotated in the direction of arrow c shown in figure 4 until the tilting point 29 gets over centreline k, as a result of which the wing 2 automatically remains fixed; this position is shown in figure 5, where the distance by which the tilting point 29 moved over centreline k is marked with reference letter e.

[0027] It is a pre-condition of the operation of the hinge described above that the geometrical relations of the structure should comply with the following conditions: the d_1 space between the tilting point 29 and the longitudinal geometrical mid-plane x_1 of the wing 2 (longitudinal geometrical central axis x falls in this longitudinal geometrical mid-plane x_1) must-be larger than the distance d_2

of the longitudinal geometrical central axis y of the bolt 13 connecting the wing 2 to the pin 18 measured from the external surface of the base 4 (figure 3). In this case the spring 23 exerts its stressing force onto the wing 2 as it has been described above in connection with figures 3-5 and as it is shown in the figures, where it can be seen well how the spring is pressed and how it is put under increasing stress while its length b_1 belonging to the closing position shown in figure 3 first decreases to a smaller length b_2 as shown in figure 4 and then it decreases to an even smaller length b_3 suiting the fixed open final position as shown in figure 5, while an increasingly bigger part of the pin 18 slides over into the space on the other side of the base 4 containing the wing 2.

[0028] If a vehicle goes through the door opening and the wing is open from the opposite direction as shown by arrow A, the second tilting point 29 situated at the bottom in figure 3 moves on a curved track in the opposite direction as shown by arrow c, and it must be situated on the other side of centre-line k for the wing 2 to remain fixed in its open final position on the other side.

The advantages of the invention are the following:

[0029] It is a basically important advantage that no wear or catches can take place while the base fixed onto the case and the house holding the door panel slide on each other in the course of the operation of the swinging door, as it can be experienced in the case of presently known structures of a similar purpose, because the insert plates built in on the contact surfaces overcome this danger due to the appropriately chosen material quality. Because of the inappropriate load bearing capacity of such materials the whole hinge cannot be made only of these materials, the rest of the hinge can be made of polishable stainless metal with suitable mechanical and endurance properties, which satisfy the strictest hygienic and aesthetic requirements.

[0030] Heavy-weight swinging door wings can also be suspended with the hinges according to the invention, which is also due to the adjustability of the spring force. The advantage of the hinge according to the invention is that when it rotates by 90 °C, it automatically stays in this position. The simple construction of th ehinge ensures a favourable price and quick assembly.

[0031] Obviously the invention is not restricted to the construction described in detail above on the basis of the drawings, it can be realised in several ways within the sphere of protection defined by the claims.

Claims

1. Hinge for doors and windows, especially food industry swinging doors, which has a house (3) receiving the wing (2) of the door or window and a base (4) attached preferably with screws to the surface of the case (1) of the door or window facing the wing (2), which base (4) contains an opening (17) designed for guiding a pin (18) connecting the house (3) and the base (4); in the area of the end of the pin (18) guided in the house (3) through the opening (17) there is a connecting element (21), and the house (3) is connected to the pin (18) by a bolt (13) guided through this connecting element (21), on the side of the house (3) facing the base (4) there is a sliding-tilting head (10), which contains straight lateral surfaces (27) contacting surfaces (15, 16) fitted onto the base (4) and ensuring the perpendicular position of the wing (2) to the base (4), as well as curved lateral surfaces (26) contacting said surfaces (15, 16) fitted onto the base (4) when turning the wing (2), and which can be turned against the force of a spring (23) situated around the part of the pin (18) inside the case (1) and supported at its two ends the pin (18) has a threaded part (18b) in the area of the end of the pin (18) opposite the connecting element, preferably connecting sleeve (21), and it has a smooth part (18a) starting from the connecting element **characterised in that**
said contacting surfaces (15, 16) fitted onto the base (4) are constituted of sliding inserts (15, 16) made of a material resistant to wear and catches, preferably plastic, for example Teflon, and are built in the base (4) at places getting in contact with the sliding-tilting head, (10) in the course of rotating the wing (2), whereby the visible surface of the sliding inserts (15, 16) is in the same plane as the external surface of the base (4); and the smooth part (18a) is surrounded at least partly by a cylindrical slide insert (19) made of a material with a low coefficient of friction, favourable plastic, for example Teflon, the position of which is fixed in relation to the base (4), allowing the longitudinal back and forth movement of the pin (18) inside the cylindrical slide insert (19), and by a spring-guide sleeve (20) fitted onto the cylindrical slide insert (19).

2. Hinge for doors and windows as in claim 1, **characterised by** that the spring (23) is a spiral spring, the one end of which supports against the surface of the base (4) facing the inside of the case (1) and the other end supports against a favourably flat underplate (24) situated between the end of the spring (23) and a - practically self-locking - nut (25) making it possible to control the spring force.

3. Hinge for doors and windows as in claim 1 or 2, **characterised by** that the slide insert (19) is provided with a flange (19a) supporting onto the base (4) on its side facing the house (3).

4. Hinge for doors and windows as in any of claims 1-3, **characterised by** that a spring-guide sleeve (20) the length of which is suitable for guiding the spring (23) and fits onto the slide insert (19) is stiffly at-

tached to the base (4) or is made in one piece with it.

5. Hinge for doors and windows as in any of claims 1-4, **characterised by** that the sliding-tilting head (10) of the house (3) contains a lower head part (10a) and an upper head part (10b) at a certain distance from each other, and through openings (12a, 12b) of the same diameter are made in them in one line; the connecting element at the end of the pin (18) is formed by a connecting sleeve (21) the longitudinal geometrical central axis y of which is perpendicular to the pin's (18) longitudinal geometrical central axis x; in the operating position of the hinge the through opening (22) of the connecting sleeve (21) is in the same line with the openings (12a, 12b) in the head parts (10a, 10b), its diameter is the same, and the house (3) is connected to the pin (18) with a bolt (13) guided through these openings (12a, 22, 12b).

6. Hinge for doors and windows as in any of claims 1-5, **characterised by** that the front sides of the lower and upper head parts (10a, 10b) of the sliding-tilting head (10) facing the slide inserts (15, 16) of the base (4) contain a flat, straight lateral surface (27) in the middle, a curved lateral surface (26) on both sides and tilting points (29) in the area where the straight lateral side (27) and the flat lateral sides (26) meet.

7. Hinge for doors and windows as in any of claims 1-6, **characterised by** that the distance d_1 of the tilting points (29) of the sliding-tilting head (10) measured from the vertical geometrical mid-plane of the wing (2) is larger than the distance d_2 between the longitudinal geometrical central axis y of the bolt (13) connecting the wing (2) to the pin (18) and the outer plane of the base (4) facing the wing (2).

Patentansprüche

1. Scharnier für Türen und Fenster, Insbesondere für Pendeltüren der Lebensmittelindustrie, welches ein Gehäuse (3) hat, welches den Flügel (2) von der Tür oder dem Fenster und eine Basis (4), welche vorzugsweise mit Schrauben an der Oberfläche des Gehäuses (1) von der Tür oder dem Fenster, welches dem Flügel (2) gegenüberliegt, befestigt ist, aufnimmt, wobei die Basis (4) eine Öffnung (17) enthält, welche dazu entworfen Ist, um einen Stift (18) zu führen, welcher das Gehäuse (3) mit der Basis (4) verbindet; wobei im Bereich des Endes von dem Stift (18), welcher über die Öffnung (17) In dem Gehäuse (3) geführt ist, ein Verbindungselement (21) vorliegt, und wobei das Gehäuse (3) über einen Bolzen (13) mit dem Stift (18) verbunden Ist, welcher durch dieses Verbindungselement (21) geführt ist; wobei auf der Seite des Gehäuses (3), welche der Basis (4) gegenüberliegt, ein gleitender Neigungskopf (10) vorliegt, welcher gerade seitliche Oberflächen (27) enthält, welche Oberflächen (15, 16) enthalten, welche der Basis (4) angepasst sind und die senkrechte Position des Flügels (2) zur Basis (4) sicherstellen, als auch gekrümmte seitliche Oberfläche (26) enthält, welche die Oberflächen (15, 16) enthalten, welche an der Basis (4) angebracht sind, wenn der Flügel (2) gedreht wird, und welche gegen die Kraft von einer Feder (23) gedreht werden können, welche um den Teil des Stiftes (18) innerhalb des Gehäuses (1) angeordnet sind und an ihren zwei Enden gelagert werden; wobei der Stift (18) einen Gewindeabschnitt (18b) Im Bereich des Endes des Stiftes (18), gegenüberliegend zu dem Kontaktelement hat, vorzugsweise eine Verbindungshülse (21), und einen glatten Teil (18a) hat, welcher vom Verbindungselement aus beginnt,
dadurch gekennzeichnet, dass die Kontaktflächen (15, 16), welche an der Basis (4) angebracht sind, aus Gleit-Einsätzen (15, 16) gebildet sind, welche aus einem widerstandsfähigen Material erstellt sind, vorzugsweise aus Kunststoff, beispielsweise Teflon, und in der Basis (4) an Stellen geblidet sind, welche mit dem gleitenden Neigungskopf (10) im Falle einer Umdrehung des Flügels (2) in Kontakt treten, wobei die sichtbare Oberfläche von den Gleit-Einsätzen (15, 16) in der gleichen Ebene wie die externe Oberfläche von der Basis (4) Ist, und der glatte Teil (18a) zumindest teilweise durch einen zylindrischen Gleit-Einsatz (18) umgeben ist, welcher aus einem Material mit einem geringen Reibungskoeffizienten, vorzugsweise Kunststoff, beispielsweise Teflon, erstellt ist, wobei jene Position, welche in Relation zur Basis (4) fixiert Ist, eine längs gerichtete Rückwärts- und Vorwärts-Bewegung des Stiftes (18) innerhalb des zylindrischen Gleit-Einsatzes (19) erlaubt, und durch eine Federführungs-Hülse (20), welche auf dem zylindrischen Gleit-Einsatz (19) angeordnet Ist.

2. Scharnier für Türen und Fenster nach Anspruch 1, **dadurch gekennzeichnet, dass** die Feder (23) eine Spiralfeder ist, wobei ein Ende davon gegen die Oberfläche von der Basis (4), welche der Innenseite von dem Gehäuse (1) gegenüberliegt, gelagert ist, und das weitere Ende gegen eine vorzugsweise flache Unterplatte (24) gelagert ist, welche zwischen dem Ende von der Feder (23) und einer praktisch selbst verriegelnden Gewindemutter (25) positioniert ist, wodurch es ermöglicht wird, die Federkraft zu steuern.

3. Scharnier für Türen und Fenster nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Gleit-Einsatz (19) mit einem Flansch (19a) bereitgestellt ist, welcher auf der Basis (4) auf ihrer Seite gelagert Ist, welche dem Gehäuse (3) gegenüberliegt.

4. Scharnier für Türen und Fenster nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** eine Federführungs-Hülse (20), deren Länge dazu geeignet ist, um die Feder (23) zu führen, und welche auf den Führungs-Einsatz (19) passt, steif an der Basis (4) befestigt Ist oder einstückig damit erstellt Ist.

5. Scharnier für Türen und Fenster nach einem der Ansprüche 1 bis 4, **dadurch gekennzeichnet, dass** der gleitende Neigungskopf (10) von dem Gehäuse (3) einen unteren Kopfteil (10a) und einen oberen Kopfteil (10b) bei einer bestimmten Distanz zueinander enthält, und wobei Durchgangsöffnungen (12a, 12b) des gleichen Durchmessers darin In einer Linie erstellt sind, wobei das Verbindungselement an dem Ende des Stiftes (18) durch eine Verbindungshülse (21) ausgebildet ist, wobei die längs gerichtete geometrische Mittenachse y davon senkrecht zur längs gerichteten geometrischen Mittenachse x des Stiftes (18) verläuft, wobei In der Betriebsposition des Scharniers die Durchgangsöffnung (22) von der Verbindungshülse (21) auf gleicher Linie zu den Öffnungen (12a, 12b) In den Kopfteilen (10a, 10b) liegt, wobei dessen Durchmesser der gleiche ist, und wobei das Gehäuse (3) durch einen Bolzen (13) mit dem Stift (18) verbunden ist, welcher durch diese Öffnungen (12a, 22, 12b) geführt ist.

6. Scharnier für Türen und Fenster nach einem der Ansprüche 1 bis 5, **dadurch gekennzeichnet, dass** die Vorderseiten von dem unteren und oberen Kopftell (10a, 10b) von dem gleitenden Neigungskopf (10), welcher dem Gleit-Einsätze (15, 16) von der Basis (4) gegenüberliegt, im Mittelbereich eine flache, gerade seitliche Oberfläche (27), an beiden Seiten eine gekrümmte seitliche Oberfläche (26) und in jenem Bereich, wo sich die gerade seitliche Seite (27) und die flachen seitlichen Seiten (26) treffen, Neigungspunkte (29) enthalten.

7. Scharnier für Türen und Fenster nach einem der Ansprüche 1 bis 6, **dadurch gekennzeichnet, dass** der Abstand d_1 von den Neigungspunkten (29) von dem gleitenden Neigungskopf (10), gemessen von der vertikalen geometrischen Mittenebene von dem Flügel (2), größer als der Abstand d_2 zwischen der längs gerichteten geometrischen Mittenachse y des Bolzens (13) ist, welcher den Flügel (2) mit dem Stift (18) und der Außenebene von der Basis (4), welche dem Flügel (2) gegenüberliegt, verbindet.

Revendications

1. Charnière pour portes et fenêtres, destinée spécialement à des portes battantes dans les industries alimentaire, laquelle comporte un logement (3) recevant le battant (2) de la porte ou de la fenêtre et une base (4) fixée, de préférence, avec des vis sur la surface du boîtier de la portion de la fenêtre faisant face au battant (2), laquelle base (4) contient une ouverture (17) conçue pour guider une broche (18) raccordant le logement (3) et la base (4) ; dans la zone de l'extrémité de la broche (18) guidée dans le logement (3) à travers l'ouverture (17) se trouve un élément de raccordement (21) et le logement (3) est raccordé à la broche (18) par un boulon (13) guidé à travers cet élément de raccordement (21), sur le côté du logement (3) faisant face à la base (4) il existe une tête coulissante-basculante (10), laquelle contient des surfaces rectilignes latérales (27), des surfaces de contact (15, 16) étant ajustées sur la base (4) et assurant la position perpendiculaire du battant (2) par rapport à la base (4), de même que des surfaces latérales courbes (26), lesdites surfaces de contact (15, 16) étant ajustées sur la base (4) lorsque tourne le battant (2), et qui peut tourner contre la force d'un ressort (23) situé autour de la partie de la broche (18) située à l'intérieur du boîtier (1) et supportée au niveau de ses deux extrémités , à broche (18) comporte une partie filetée (18b) dans la zone de l'extrémité de la broche (18) opposée à l'élément de raccordement, de préférence un manchon de raccordement (21), et elle présente une partie lisse (18a) commençant à partir de l'élément de raccordement,
caractérisée en ce que lesdites surfaces de contact (15, 16) ajustées sur la base (4) sont constituées de pièces d'insertion coulissantes (15, 16) réalisées en un matériau résistant à l'usure et aux accroches, de préférence en matière plastique, par exemple en Téflon et sont installées dans la base (4) au niveau d'emplacements permettant d'établir un contact avec la tête coulissante-basculante (10) au cours de la rotation du battant (2) de sorte que la surface visible des pièces d'insertion coulissantes (15, 16) se trouve dans le même plan que la surface externe de la base (4) ; et la partie lisse (18a) se trouve entourée au moins partiellement par une pièce d'insertion coulissante cylindrique (19) constituée d'un matériau présentant un faible coefficient de friction, une matière plastique favorable, par exemple du Téflon, dont la position est fixée en liaison avec la base (4), permettant un mouvement longitudinal vers l'avant et vers l'arrière de la broche (18) à l'intérieur de la pièce d'insertion coulissante cylindrique (19), et par un manchon de guidage de ressort (20) ajusté sur la pièce d'insertion coulissante cylindrique (19).

2. Charnière pour portes et fenêtres selon la revendication 1, **caractérisée par le fait que** le ressort (23) est un ressort hélicoïdal, dont la première extrémité s'appuie contre la surfaces de la base (4) faisant face à l'intérieur du boîtier (1) et l'autre extrémité

s'appuie contre une plaque inférieure avantageusement plane (24) située entre l'extrémité du ressort (23) et un écrou - pratiquement autobloquant - (25), ce qui rend possible le contrôle de la force du ressort.

3. Charnière pour portes et fenêtres selon la revendication 1 ou 2, **caractérisée par le fait que** la pièce d'insertion coulissante (19) est dotée d'un rebord (19a) s'appuyant sur la base (4) sur le côté de celle-ci tourné vers le logement(3).

4. Charnière pour portes et fenêtres selon l'une quelconque des revendications 1 à 3, **caractérisée par le fait qu'**un manchon de guidage de ressort (20) dont la longueur est appropriée pour guider le ressort (23) et s'ajuste sur la pièce d'insertion coulissante (19), est fixé de façon rigide sur la base (4) ou constitue une seule pièce avec elle.

5. Charnière pour portes et fenêtres selon l'une quelconque des revendications 1 à 4, **caractérisée par le fait que** la tête coulissante-basculante (10) du logement (3) contient une partie de tête inférieure (10a) et une partie de tête supérieure (10b) situées à une certaine distance l'une de l'autre, et des ouvertures de passage transversal (12a, 12b), du même diamètre, sont réalisées en alignement dans ces têtes ; l'élément de raccordement au niveau de l'extrémité de la broche (18) est formé par un manchon de raccordement (21) dont l'axe géométrique central longitudinal y est perpendiculaire à l'axe géométrique central longitudinal x de la broche (18) ; en position opérationnelle de la charnière l'ouverture de passage transversal (22) du manchon de raccordement (21) est dans le même alignement que les ouvertures (12a, 12b) dans les parties de tête (10a, 10b), son diamètre est le même, et le logement (3) est raccordé à la broche (18) au moyen d'un boulon (13) guidé à travers ces ouvertures (12a, 22, 12b).

6. Charnière pour portes et fenêtres selon l'une quelconque des revendications 1 à 5, **caractérisée par le fait que** les côtés avant des parties de tête inférieure et supérieure (10a, 10b) de la tête coulissante-basculante (10) faisant face aux pièces d'insertion coulissantes (15, 16) de la base (4) contiennent une surface latérale rectiligne plane (27) dans la partie centrale, une surface latérale courbe (26) sur les deux côtés et des points de basculement (29) dans la zone dans laquelle le côté latéral rectiligne (27) et les côtés latéraux plans (26) se rencontrent.

7. Charnière pour portes et fenêtres selon l'une quelconque des revendications 1 à 6, **caractérisée par le fait que** la distance d_1 des points de basculement (29) de la tête coulissante-basculante (10) mesurée à partir du plan médian géométrique vertical du battant (2) est plus grande que la distance d_2 comprise entre l'axe géométrique central longitudinal y du boulon (13) raccordant le battant (2) à la broche (18) et le plan extérieur de la base (4) faisant face au battant (2).

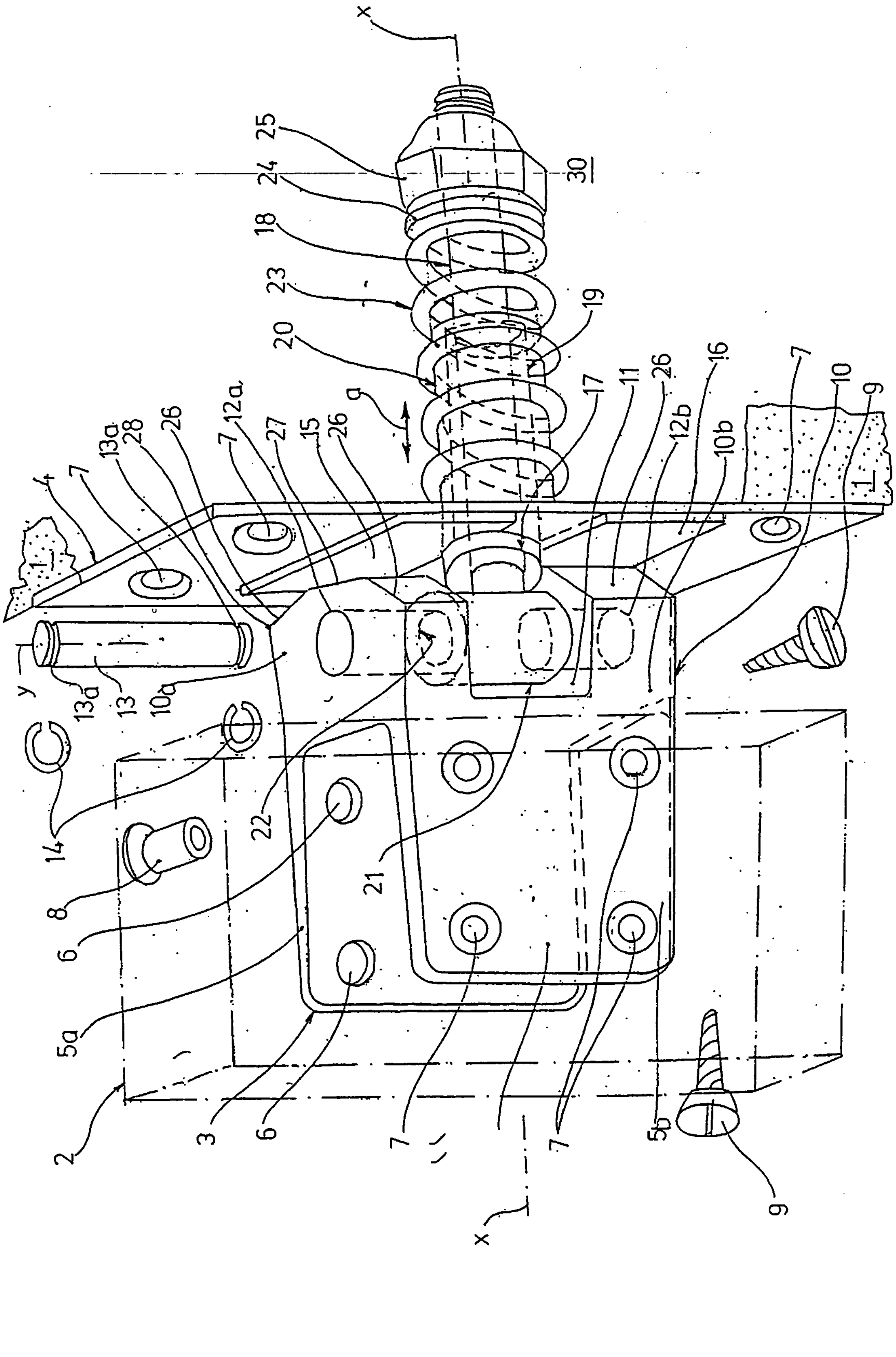

FIG. 1

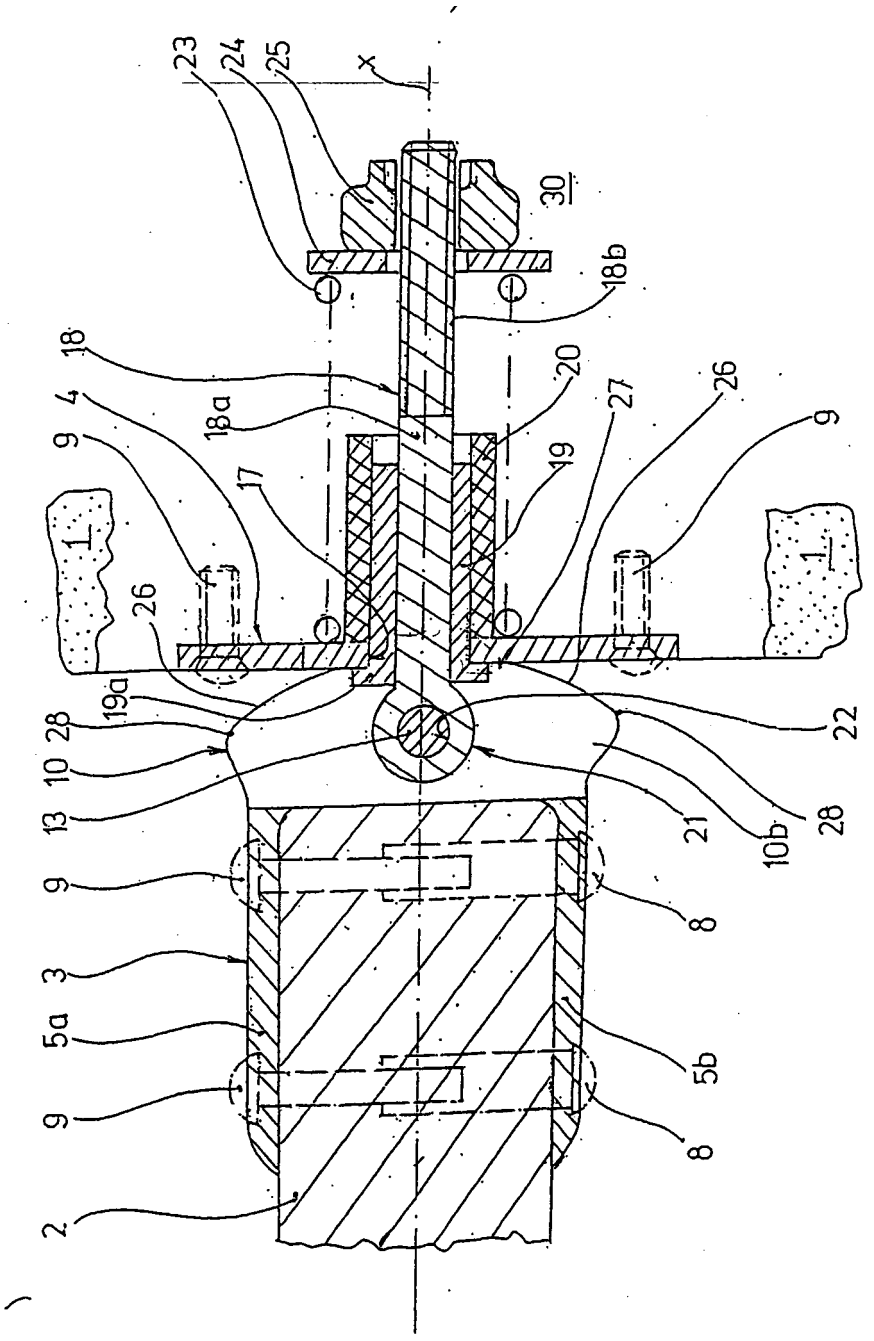
23
24
25
x
30
18b
18
18a
20
27
26
9
4
17
19
1
26
19a
28
10
13
22
21
10b
28
9
8
3
5a
5b
9
8
2

FIG. 2

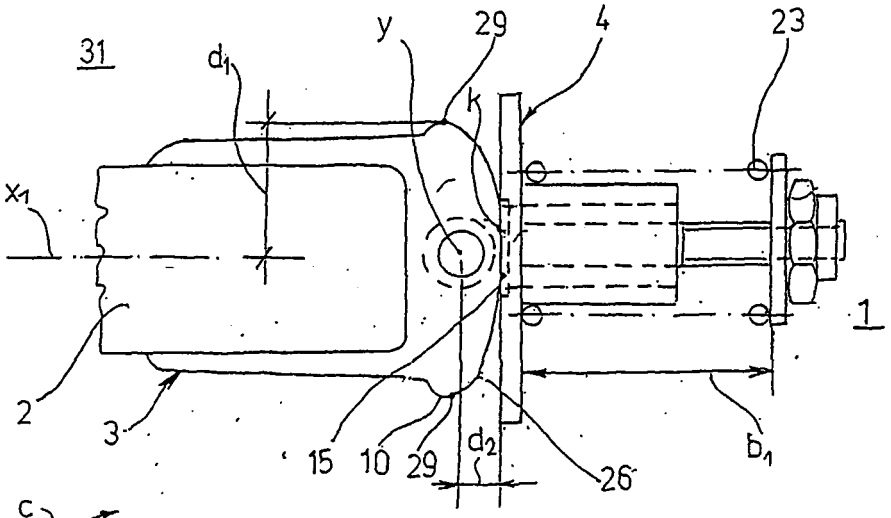

FIG. 3

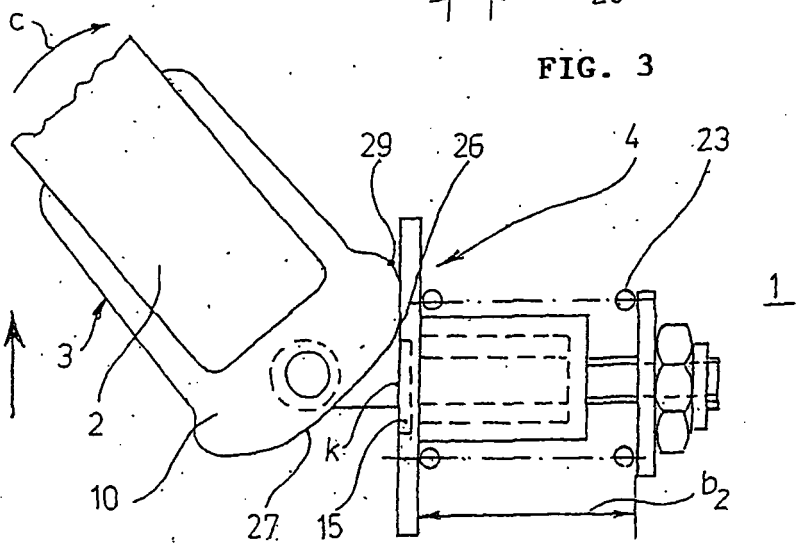

FIG. 4

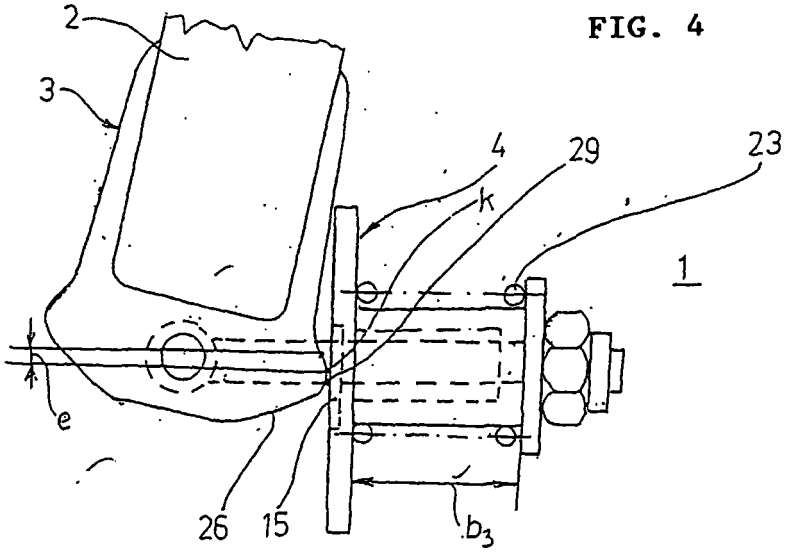

FIG. 5

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- GB 804584 A **[0001]**
- EP 1148195 A **[0005]**
- US 4351086 A **[0005]**
- SE 205661 **[0005]**