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(54) **Hinge**

Scharnier

Charnière

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Description

[0001] The present invention relates to a hinge. More particularly it relates to a hinge for door leaves, doors or windows, in particular formed from a panel of glass, wood or the like (see e.g. document US-A-3657766).

[0002] Such hinges currently present a connection element positioned on a pin inserted into a support structure or directly into the floor, and connected to the panel to be supported.

[0003] The panel to be supported is usually a glass element, hence very heavy, with which a generally pneumatic external device is usually associated to return the panel or door leaf to its closed position.

[0004] An object of the present invention is to provide a hinge presenting an integrated system able to return the door leaf or door to its closed position after being moved from said position, for opening.

[0005] This and other objects are attained by a hinge formed in accordance with the technical teachings of the accompanying claims.

[0006] Further characteristics and advantages of the invention will be more apparent with reference to the accompanying description of one embodiment of the hinge of the present invention provided by way of non-limiting example, in which:

Figure 1 is a view taken on the section line 1-1 of Figure 4,

Figure 2 is a partial front view of a detail of a pin of the hinge shown in Figure 1,

Figure 3 is a section through the pin of Figure 2, taken on the line 3-3, and

Figure 4 is a plan view of the hinge of the present invention.

[0007] With reference to said figures, these show a hinge for door leaves, doors or the like, which is indicated overall by the reference numeral 1.

[0008] The hinge 1 comprises a support element 2 which can have any shape. In particular, this element is of circular shape and is arranged to be partially embedded in the floor and fixed to it. The support 2 presents an axial hole 3 with axis A, housing a pin 5 mounted in bearings 4A, 4B. In particular, the upper bearing 4a is a thrust ball bearing, while the lower bearing is a conventional ball bearing.

[0009] Integral with the pin 5 there is a cylindrical portion having a circular cross-section of radius greater than that of the pin 5 and projecting from the top of the support element 2. The portion 6 presents an upperly open diametrical cavity 7 intended to house a portion of a glass door leaf. In one of the shoulders 8 defined by said cavity 7, two holes are provided housing two setscrews which, when tightened against the panel, maintain it in position within the cavity 7.

[0010] The pin 5 presents a portion the form of which defines a cam 11. This cam presents a first surface of

radius coinciding with that of the pin 5, and a second curved surface 13 of radius of curvature greater than that of the first surface. The two surfaces are connected together at two cusp points 15 and 16. At the centre of the second surface a recess 14 is provided, the use of which is clarified hereinafter.

[0011] The support element comprises a guide hole 20, which faces the cam 11 when the pin is inserted into the hole 3; this guide hole 20 acts as a housing for a sphere 21. The sphere 21 presents a diameter slightly less than that of the guide hole 20, being hence slidable within it.

[0012] The sphere 21 is loaded by a presser 22, on which there rests the end of a spring 30 housed in a second hole 23 substantially coaxial with the guide hole 20. The other end of the spring is connected to an end element 24 presenting an inclined plane 25 on that surface thereof opposite that on which the spring rests.

[0013] The support element 2 also presents a further threaded axial hole 26 in which a threaded stop element 27 engages. The stop element presents two cylindrical portions 27A, 27B of different radius, connected by an inclined surface 27C. The surface 27A is threaded and engages in the hole 26, while the surface 27B is freely inserted and is slidable within a further hole 28, coaxial to the hole 26.

[0014] When the stop 27 is in position, the profile or inclined plane 27 of the stop element and the inclined plane 25 of the end element 24 are in contact, a greater or lesser extent of screwing of the stop 24 into the hole 26 causing greater or lesser compression of the spring 30, to load the sphere 21 resting on the cam 11 with different force. This adjustment facility is very useful in adapting the hinge to the different weight of the glass or other material panels which it has to support.

[0015] The operation of the invention is apparent to the expert of the art from the foregoing description and is as follows.

[0016] When in its rest position the sphere 21 is housed within the recess 14 of the cam 11. In this position, the door leaf inserted into the recess 7 is closed. An opening movement of the door leaf causes the pin to rotate about the axis A. Consequently the sphere leaves the recess 14 and enables the door to be opened. However the profile of the cam 11, and in particular the sliding of the sphere 21 along the second surface 13 of the cam 11, causes compression of the spring 30. The compression of the spring is minimal when the sphere rests on a region of the second surface close to the recess 14 and increase as the sphere approaches the points 13 or 15; it is a maximum at these points and along the entire first surface 12.

[0017] Consequently, when the pressure on the door leaf ceases, if the sphere lies on the second surface 13 the pressure of the spring 30 returns the pin 5 to its rest position (i.e. housed in the recess 14), so causing the pin 5 to rotate and close the door or leaf. If instead the sphere rests on the first surface 12, the spring 30 does not op-

erate, hence leaving the door in the position in which it lies.

[0018] The extent of the first surface can be varied to set the angle of intervention for automatic closure, and the curvature of the second surface can be varied to obtain a different closure response. In the same manner the spring can be of different length and cross-section, and can also be replaced by another elastic element, such as a pneumatic cylinder.

[0019] In an alternative embodiment, the ball bearings 4A and 4B can be eliminated and the pin be inserted directly into the support 2, or the ball bearings can be replaced by plain bearings.

Claims

1. A hinge (1) presenting a support element (2) and a pin (5) connectable to a door leaf, said pin (5) and said support element (2) being connected together by connection means enabling said pin (5) to rotate about an axis, said pin being associated with a cam (11) loaded by an elastic element in such a manner as to maintain said pin (5) in at least one rest position corresponding to a door leaf closure position, said cam (11) presenting a profile such as to return said pin (5) into its rest position when the latter is withdrawn from the former, said elastic element presenting adjustment means to regulate the force with which it loads said cam, **characterized in that** said elastic element is a spring (30) housed in a seat (23) of said support element (2), at least one sphere (21) being interposed between said cam (11) and said spring (30), said sphere (21) being loaded by a pusher (22) directly associated with said spring (30), said pusher (22) presenting a surface on which said sphere (21) can slide, said adjustment means comprising an inclined plane (25) associated with an end of said spring (30), said inclined plane (25) cooperating with a corresponding inclined plane provided on a stop (27) screwable into the support element (2) in a direction transverse to the axis of said spring (30).
2. A hinge as claimed in claim 1, **characterised in that** said connection means comprise at least one ball bearing.
3. A hinge as claimed in the preceding claim, **characterised in that** said ball bearing is a thrust bearing.
4. A hinge as claimed in one or more of the preceding claims, **characterised in that** said cam (11) is integral with said pin (5).
5. A hinge as claimed in claim 1, **characterised in that** said cam (11) has a first circular surface connected

to a second surface with a radius of circumference greater than that of the first.

6. A hinge as claimed in the preceding claim, **characterised in that** said second surface presents, at its centre, a seat in which said sphere (21) engages to determine said second at least one rest position.
7. A hinge as claimed in one or more of the preceding claims, **characterised in that** said pin (5) is formed integral with a connection element between said hinge and a panel.
8. A hinge as claimed in the preceding claim, **characterised in that** said connection element presents a housing for a portion of said panel and at least one screw element arranged to laterally load said panel to maintain it within said housing.

Patentansprüche

1. Scharnier (1) mit einem Stützelement (2) und einem Stift (5), der mit einem Türblatt verbunden werden kann, wobei der Stift (5) und das Abstützelement (2) durch Verbindungseinrichtungen miteinander verbunden sind, wodurch ermöglicht wird, dass der Stift (5) um eine Achse rotiert, wobei der Stift mit einem Nocken (11) in Beziehung steht, der durch ein elastisches Element in einer solchen Weise vorgespannt ist, um den Stift (5) in mindestens einer Ruhestellung zu halten, die einer geschlossenen Position des Türblatts entspricht, wobei der Nocken (11) ein Profil hat, um den Stift (5) in seine Ruhestellung zurückzubewegen, wenn der Letztere aus der Erstgenannten herausbewegt ist, wobei das elastische Element Einstelleinrichtungen aufweist, um die Kraft zu steuern, mit der der Nocken vorgespannt wird, **dadurch gekennzeichnet, dass** das elastische Element eine Feder (30) ist, die in einem Sitz (23) des Abstützelements (2) untergebracht ist, mindestens eine Kugel (21) zwischen dem Nocken (11) und der Feder (30) angeordnet ist, die Kugel (21) durch einen Drücker (22) vorgespannt ist, der direkt mit der Feder (30) in Beziehung steht, wobei der Drücker (22) eine Fläche hat, an der die Kugel (21) gleiten kann, die Einstelleinrichtungen eine schräge Ebene (25) haben, die mit einem Ende der Feder (30) in Beziehung steht, wobei die schräge Ebene (25) mit einer entsprechenden schrägen Ebene zusammenwirkt, die an einem Anschluss (27) vorgesehen ist, der in einer Richtung quer zur Achse der Feder (30) in das Abstützelement (2) geschraubt werden kann.
2. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** die Verbindungseinrichtungen min-

destens ein Kugellager aufweisen.

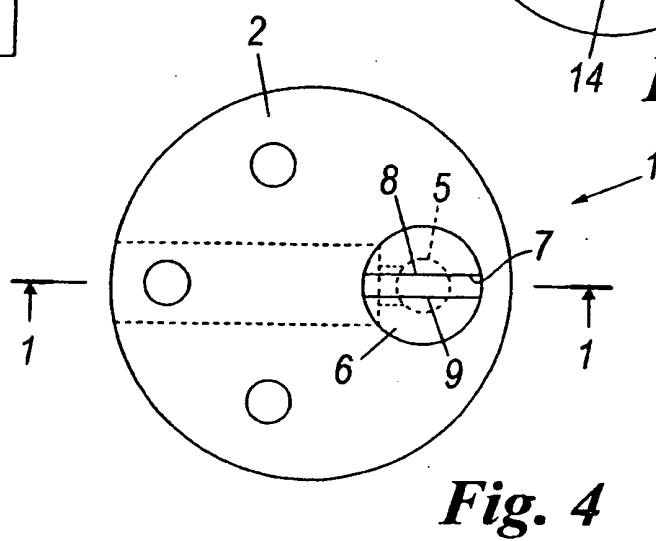
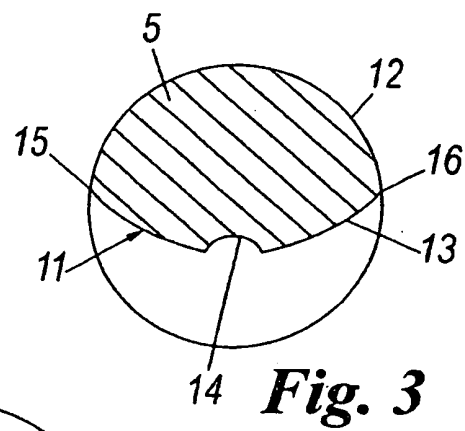
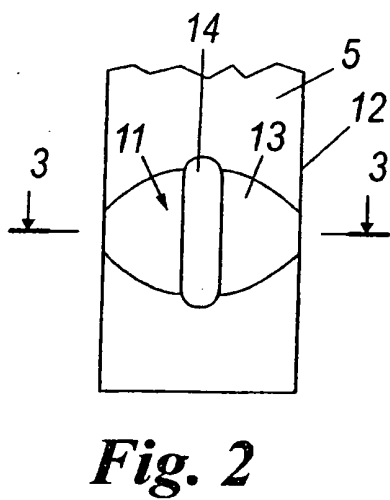
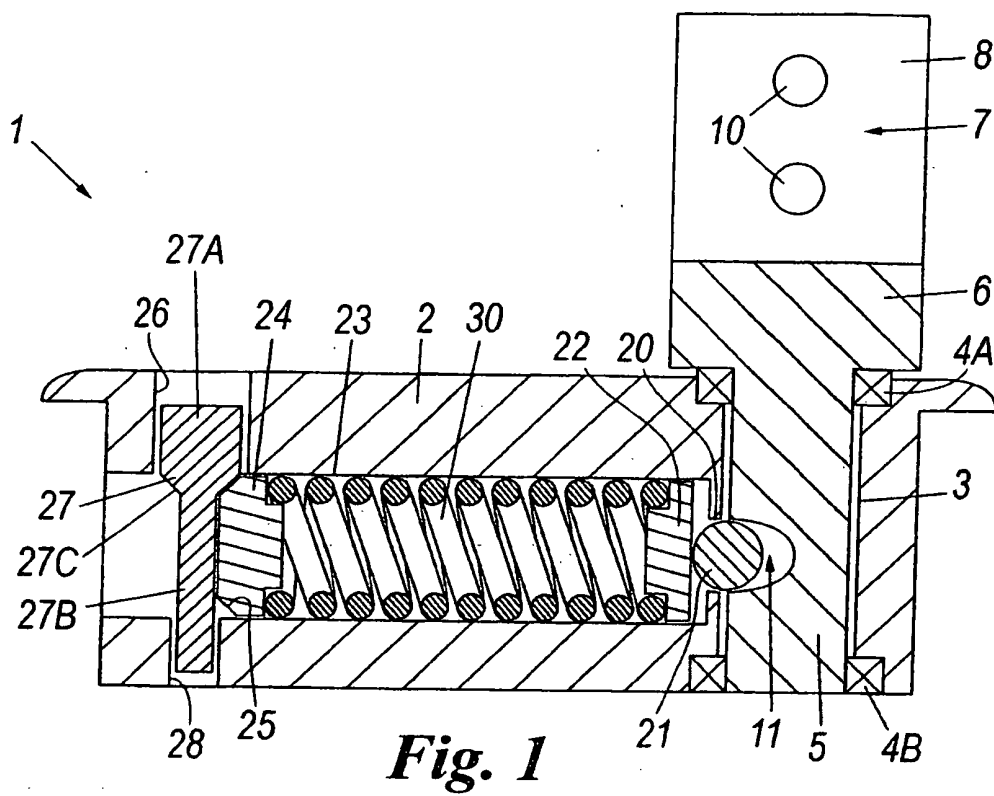
3. Scharnier nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Kugellager ein Drucklager ist. 5
4. Scharnier nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Nocken (11) mit dem Stift (5) integriert ist. 10
5. Scharnier nach Anspruch 1, **dadurch gekennzeichnet, dass** der Nocken (11) eine erste runde Fläche hat, die mit einer zweiten Fläche verbunden ist, die einen Umfangs radius hat, der größer ist als der der ersten Fläche. 15
6. Scharnier nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die zweite Fläche in ihrer Mitte einen Sitz hat, in den die Kugel (21) eingreift, um die zweite mindestens eine Ruhestellung zu bestimmen. 20
7. Scharnier nach einem oder mehreren der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Stift (5) integriert mit einem Verbindungselement zwischen dem Scharnier und einem Türblatt gebildet ist. 25
8. Scharnier nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das Verbindungselement ein Gehäuse für einen Bereich des Türblatts und mindestens ein Schraubelement aufweist, das ausgestaltet ist, um das Türblatt lateral mit einer Kraft zu beaufschlagen, damit es in dem Gehäuse verbleibt. 30

Revendications

1. Charnière (1) présentant un élément de support (2) et un gond (5) qui peut être relié à un battant de porte, ledit gond (5) et ledit élément de support (2) étant reliés l'un à l'autre par des moyens de raccordement qui permettent audit gond (5) de tourner autour d'un axe, ledit gond (5) étant associé à une came (11) chargée par un élément élastique de façon à maintenir ledit gond (5) dans au moins une position de repos correspondant à une position fermée du battant de porte, ladite came (11) présentant un profil tel que ledit gond (5) est ramené dans sa position de repos lorsque ce dernier est retiré de la première, ledit élément élastique présentant des moyens d'ajustement pour régler la force à laquelle il charge ladite came, **caractérisée en ce que** ledit élément élastique est un ressort (30) disposé dans un logement (23) dudit élément de support (2), au moins une sphère (21) étant intercalée entre ladite came (11) et ledit ressort (30), ladite sphère (21) 40

étant chargée par un poussoir (22) directement associé audit ressort (30), ledit poussoir (22) présentant une surface sur laquelle ladite sphère (21) peut glisser, lesdits moyens d'ajustement comprenant un plan incliné (25) associé à une extrémité dudit ressort (30), ledit plan incliné (25) coopérant avec un plan incliné correspondant prévu sur une butée (27) qui se visse dans l'élément de support (2) dans une direction perpendiculaire à l'axe dudit ressort (30).

2. Charnière selon la revendication 1, **caractérisée en ce que** lesdits moyens de raccordement comprennent au moins un roulement à billes. 10
3. Charnière selon la revendication précédente, **caractérisée en ce que** ledit roulement à billes est un palier de butée. 15
4. Charnière selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ladite came (11) est formée d'un seul tenant avec ledit gond (5). 20
5. Charnière selon la revendication 1, **caractérisée en ce que** ladite came (11) possède une première surface circulaire raccordée à une deuxième surface ayant un rayon de circonférence plus grand que celui de la première. 25
6. Charnière selon la revendication précédente, **caractérisée en ce que** ladite deuxième surface présente en son centre un logement dans lequel ladite sphère (21) s'engage afin de déterminer ladite deuxième au moins une position de repos. 30
7. Charnière selon l'une ou plusieurs des revendications précédentes, **caractérisée en ce que** ledit gond (5) est formé d'un seul tenant avec un élément de raccordement entre ladite charnière et un panneau. 35
8. Charnière selon la revendication précédente, **caractérisée en ce que** ledit élément de raccordement présente un logement pour une partie dudit panneau et au moins un élément à vis disposé de façon à charger latéralement ledit panneau afin de le maintenir à l'intérieur dudit logement. 40



REFERENCES CITED IN THE DESCRIPTION

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