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(54) DOOR CLOSURE APPARATUS

TÜRSCHLIESSVORRICHTUNG

APPAREIL DE FERMETURE DE PORTE

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Description

[0001] This invention relates to door closure apparatus.

[0002] Conventional devices for controlling the movement of a door from its open to closed positions tend to comprise some form of pivotable bracket which extends between an attachment to an upper door face and an attachment to the headrail of the frame in which the door is mounted. Movement of the bracket arms is then controlled through a hydraulic, pneumatic or spring operated cylinder mounted on the door itself or on the headrail of the frame. Such closure devices are unsightly, cumbersome and difficult to instal and adjust. An example of a device for supporting a door on a frame to swing between the opened and closed position about a fixed axis and for latching the door in the closed position is shown in document US-A-3 016 563.

[0003] One object of this invention is to provide an improved door closure apparatus which overcomes, or at least alleviates, many of the disadvantages of conventional door closure devices.

[0004] According to the present invention, there is provided door closure apparatus comprising a hinge having a first hinge plate for attachment to one upstanding side edge of a door, a second hinge plate for attachment to an upstanding side edge of a doorpost and means for enabling relative rotation between the two hinge plate; and magnetic means comprising a first element which includes a magnet and a second element which includes a keeper plate; the magnetic means includes an electromagnet to which the keeper plate is attracted when the electromagnet is connected to mains electricity; one of the elements of the magnetic means being supported from the second hinge plate and the other of the elements being supported by the first hinge plate or the door, the arrangement being such that the elements of the magnetic means co-operate to control movement of the door between its open and closed position.

[0005] A housing may form part of, be secured to or be supported by the second hinge plate, the housing being dimensioned to receive and retain the electromagnet. The side of the housing closest to the door may be formed with an opening through which one end of the electromagnet is exposed.

[0006] The keeper plate may be secured to a door face surface which, when the door is in its open position, lies directly opposite and possibly in contact with the electromagnet.

[0007] A switching mechanism may be provided which enables power to be maintained to the electric magnet to retain the door in its open position for a set period of time or until re-operation of the switching mechanism. In a preferred arrangement, the switching mechanism is positioned within the housing.

[0008] A smoke and/or fire detector may be provided to automatically deactivate power to the magnet in response to an electrical or electronic signal generated by the detector upon smoke or fire being detected.

[0009] Additionally or alternatively, an electric motor may be provided which operates to effect movement of the first hinge plate relative to the second hinge plate about the pin on which the two hinge plates are supported. The electric motor may be operated remotely in response to an electrical signal, for example an RF signal received from a hand-held signal initiating device.

[0010] The invention will now be described by way of example only with reference to the accompanying diagrammatic drawing in which the sole Figure is an exploded view of door closure apparatus in accordance with the invention.

[0011] The illustrated apparatus comprises a hinge 1 including a spindle about which can rotate a first hinge plate 2 formed with screw receiving holes to enable it to be secured to a side edge of a door (not shown) and a second hinge plate 3 formed with screw receiving holes to enable it to be secured to a doorpost (not shown).

[0012] The first hinge plate 2 carries a metallic keeper plate 4 having a screw receiving hole 5 to enable it to be attached to one face of the door. The keeper plate may be formed integrally with the first hinge plate 2. Generally, the keeper plate 4 will subtend a right angle to the first hinge plate. In an alternative arrangement, the keeper plate 4 is separate from the hinge plate 2.

[0013] The screws of the second hinge plate 3 pass through suitably aligned holes 6 formed in a flange 7 of a housing 8. Thus, on assembly the opposing faces of the second hinge plate 3 and the housing flange 7 are in contact one with the other and are secured to the doorpost by the same screw set.

[0014] The housing 8 comprises a backing plate 9 from which protrudes an electromagnet 10 connected through switches or electrical connections 11 to a mains source of electricity. The housing includes a removable cover 12 connectable to the backing plate 9 by screws which pass through holes 14 formed in one side wall 15 of the housing and holes 16 formed in angled projections 17 attached to the backing plate 9. The cover includes a front opening 18 by which the face end of the electromagnet 10 is exposed.

[0015] In use, the keeper plate 4 is sited opposite the exposed end of the electromagnet 10 when the door is in its open position, these two elements co-operating to hold the door in its open position by the force of attraction between the electromagnet 10 and the keeper plate 4. The switches 11 may operate to switch off power to the electromagnet after a set period of time thereby imposing a delay on closure of the door. Alternatively or additionally, the force of attraction can readily be selected to control the speed of movement of the door between its open and closed positions.

[0016] The switches 11 may operate in response to an electrical or electronic signal received from a smoke and/or fire detecting device. Thus, upon smoke or fire being detected, power to the electromagnet is switched

off to cause the door immediately to move to its closed position.

[0017] An electric motor may be provided selectively to impart movement of the hinge plate 2 and therefore the door. The motor may be operated remotely via a hand-held RF signal generator.

[0018] It will be appreciated that the foregoing is merely exemplary of door closure apparatus in accordance with the invention and that changes can readily be made thereto without departing from the invention described above, which is defined in the appended claims.

Claims

1. Door closure apparatus comprising a hinge having a first hinge plate (2) for attachment to one upstanding side edge of a door, a second hinge plate (3) for attachment to an upstanding side edge of a doorpost, means for enabling relative rotation between the two hinge plates, and magnetic means comprising a first element which includes a magnet and a second element which comprises a keeper plate (4); the apparatus being **characterised in that** the magnetic means includes an electromagnet (10) to which the keeper plate (4) is attracted when the electromagnet is connected to mains electricity, and **in that** one of the elements (4, 10) of the magnetic means is supported from the second hinge plate (3) and the other of the elements is supported by the first hinge plate (2) or the door, the arrangement being such that the electromagnet (10) and the keeper plate (4) co-operate to control movement of the door between its open and closed positions.

2. Apparatus as claimed in claim 1 wherein a housing (8) forms part of, or is secured to or is supported by the second hinge plate (3), the housing (8) being dimensioned to receive and retain the electromagnet (10).

3. Apparatus as claimed in claim 2 wherein the side of the housing (8) closest to the door is formed with an opening through which one end of the electromagnet (10) is exposed.

4. Apparatus as claimed in any one of the preceding claims wherein the keeper plate (4) is securable to a door face surface which, when the door is in its open position, lies directly opposite the electromagnet (10).

5. Apparatus as claimed in any one of the preceding claims wherein a switching mechanism (11) is provided which enables power to be maintained to the electromagnet to retain the door in its open position for a set period of time or until re-operation of the switching mechanism.

6. Apparatus as claimed in claim 5 wherein the switching mechanism (11) is positioned within the housing (8).

7. Apparatus as claimed in any one of the preceding claims wherein an electric motor is provided which operates to effect movement of the first hinge plate (2) relative to the second hinge plate (3) about a pin on which the two hinge plates are supported.

8. Apparatus as claimed in claim 7 wherein the electric motor is operated remotely in response to an electrical signal.

9. Apparatus as claimed in claim 8 wherein the signal is an RF signal received from a hand-held signal initiating device.

Patentansprüche

1. Türschließvorrichtung mit einem Gelenk, das eine erste Gelenkplatte (2) zur Befestigung an einem aufrecht stehenden Seitenrand einer Tür, eine zweite Gelenkplatte (3) zur Befestigung an einem aufrecht stehenden Seitenrand eines Türpfostens, Mittel zur Relativdrehung zwischen den beiden Gelenkplatten und Magnetmittel aufweist, die ein erstes Element mit einem Magneten und ein zweites Element umfassen, das aus einer Halteplatte (4) besteht;
dadurch gekennzeichnet, dass die Magnetmittel einen Elektromagneten (10) aufweisen, von dem die Halteplatte (4) angezogen wird, wenn der Elektromagnet mit dem Stromnetz verbunden ist und dass eines der Elemente (4, 10) der Magnetmittel von der zweiten Gelenkplatte (3) getragen wird und das andere der Elemente von der ersten Gelenkplatte (2) oder der Tür getragen wird, wobei die Anordnung derart ist, dass der Elektromagnet (10) und die Halteplatte (4) zusammenwirken, um die Bewegung der Tür zwischen ihrer Öffnungsstellung und ihrer Schließstellung zu steuern.

2. Vorrichtung nach Anspruch 1, bei welcher ein Gehäuse (8) einen Teil der zweiten Gelenkplatte (3) bildet oder von dieser getragen wird und das Gehäuse (8) so dimensioniert ist, dass es den Elektromagneten (10) aufnimmt und haltert.

3. Vorrichtung nach Anspruch 2, bei welcher die Seite des Gehäuses (8), die der Tür am Nächsten liegt, mit einer Öffnung versehen ist, über der ein Ende des Elektromagneten (10) freiliegt.

4. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher die Halteplatte (4) an einer Türseitenfläche befestigbar ist, die beim Öffnungs-

zustand der Tür direkt dem Elektromagneten (10) gegenüberliegt.

5. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher ein Schaltmechanismus (11) vorgesehen ist, der den Elektromagneten unter Spannung hält, um die Tür während einer vorbestimmten Zeitdauer oder so lange in ihrer Öffnungsstellung zu halten, bis der Schaltmechanismus wieder betätigt wird.

6. Vorrichtung nach Anspruch 5, bei welcher der Schaltmechanismus (11) innerhalb des Gehäuses (8) angeordnet ist.

7. Vorrichtung nach einem der vorhergehenden Ansprüche, bei welcher ein Elektromotor vorgesehen ist, der die Bewegung der ersten Gelenkplatte (2) relativ zu der zweiten Gelenkplatte (3) um einen Gelenkzapfen bewirkt, von dem die beiden Gelenkplatten getragen werden.

8. Vorrichtung nach Anspruch 7, bei welcher der Elektromotor gemäß einem elektrischen Signal femgesteuert wird.

9. Vorrichtung nach Anspruch 8, bei welcher das Signal ein Hochfrequenzsignal ist, das von einem Handsender empfangen wird.

Revendications

1. Appareil de fermeture de porte comprenant une charnière possédant une première plaque de charnière (2) à des fins de fixation à un bord latéral dressé d'une porte, une deuxième plaque de charnière (3) à des fins de fixation à un bord latéral dressé d'un chambranle de porte, un moyen pour permettre une rotation relative entre les deux plaques de charnière, et un moyen magnétique comprenant un premier élément qui englobe un aimant et un deuxième élément qui comprend une plaque de gâche (4) ; l'appareil étant **caractérisé en ce que** le moyen magnétique englobe un électro-aimant (10) en direction duquel est attiré la plaque de gâche (4) lorsque l'électro-aimant est raccordé au réseau électrique, et **en ce qu'**un des éléments (4, 10) du moyen magnétique est supporté par la deuxième plaque de charnière (3), l'autre élément étant supporté par la première plaque de charnière (2) ou par la porte, l'arrangement étant tel que l'électro-aimant (10) et la plaque de gâche (4) coopèrent pour commander le mouvement de la porte entre ses positions ouverte et fermée.

2. Appareil selon la revendication 1, dans lequel un boîtier (8) fait partie de la deuxième plaque de charnière (3) ou bien est fixé ou encore est supporté par cette dernière, le boîtier (8) étant dimensionné pour recevoir et retenir l'électro-aimant (10).

3. Appareil selon la revendication 2, dans lequel le côté du boîtier (8) situé le plus près de la porte comprend une ouverture à travers laquelle est exposée une extrémité de l'électro-aimant (10).

4. Appareil selon l'une quelconque des revendications précédentes, dans lequel la plaque de gâche (4) peut être fixée à une surface frontale de porte qui, lorsque la porte se trouve dans sa position ouverte, est disposée directement face à l'électro-aimant (10).

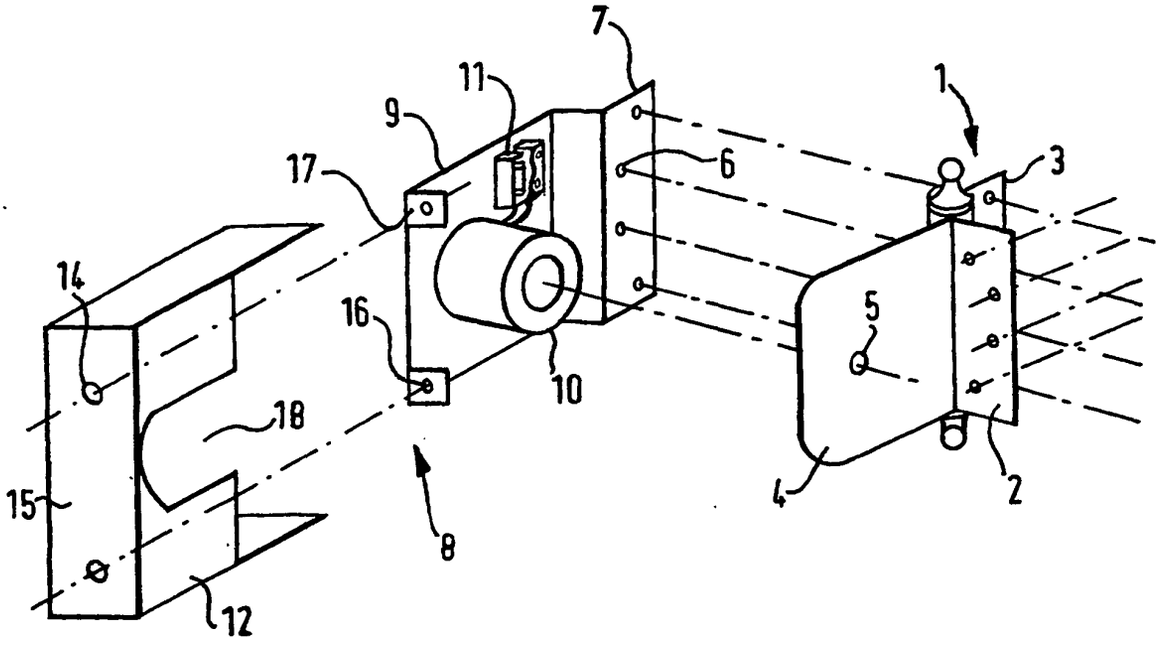
5. Appareil selon l'une quelconque des revendications précédentes, dans lequel on prévoit un mécanisme de commutation (11) qui permet de maintenir l'alimentation de l'électro-aimant afin de retenir la porte dans sa position ouverte pendant un laps de temps prédéterminé ou jusqu'à la réactivation du mécanisme de commutation.

6. Appareil selon la revendication 5, dans lequel le mécanisme de commutation (11) est disposé dans le boîtier (8).

7. Appareil selon l'une quelconque des revendications précédentes, dans lequel on prévoit un moteur électrique qui est actionné pour mettre en oeuvre le mouvement de la première plaque de charnière (2) par rapport à la deuxième plaque de charnière (3) autour d'une broche sur laquelle sont supportées les deux plaques de charnière.

8. Appareil selon la revendication 7, dans lequel le moteur électrique est actionné à distance en réponse à un signal électrique.

9. Appareil selon la revendication 8, dans lequel le signal est un signal radioélectrique émis par un dispositif d'émission de signaux tenu en main.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