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(54) **Automatically-orientating actuation pushbutton for automatic draft stopper and draft stopper provided with the pushbutton**

Selbsttätig sich einstellender Betätigungsdruckknopf für einen automatischen Zugluftstopper und mit dem Druckknopf ausgestatteter Zugluftstopper

Bouton-poussoir d'actionnement orientable automatiquement pour l'arrêt d'un courant d'air automatique et dispositif d'arrêt d'un courant d'air équipé d'un tel bouton

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- **PATENT ABSTRACTS OF JAPAN** vol. 1997, no. 05, 30 May 1997 (1997-05-30) -& JP 09 006455 A (HITACHI CONSTR MACH CO LTD), 10 January 1997 (1997-01-10)

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Description

[0001] The present invention relates to an automatically-orientating actuation pushbutton for automatic draft stoppers. The invention further relates to a draft stopper which includes the pushbutton.

[0002] Draft stoppers can be applied to the leaves of door frames. These draft stoppers are fitted to the lower edge of the door so as to automatically close the gap with respect to the floor when the door is closed, in order to limit air passage and heat loss.

[0003] Conventional draft stoppers (cf. for example US 4 089 136 A) are essentially constituted by a fixed profiled member, which can be anchored to the lower edge of the door that faces the floor. A profiled member is inserted in the fixed profiled member, is parallel thereto, is provided with a sealing member and can slide transversely with respect to the fixed profiled member.

[0004] A means is also provided for rigidly coupling the movable profiled member to the fixed one, and there is also a means for promoting the mutual translatable motion of the two profiled members, allowing the sealing member to produce a seal against the floor.

[0005] The translatable motion means is generally constituted by a pusher which is arranged inside the fixed profiled member, lies substantially parallel thereto, and is connected to the movable profiled member so as to convert its longitudinal motion into a transverse motion of the movable profiled member when closing or opening the door.

[0006] Conveniently, the pusher includes a rod with an actuation tip or pushbutton which protrudes from the lateral edge of the door and cooperates with the doorjamb during closure in order to actuate the pusher.

[0007] In order to avoid early wear of the doorjamb or jamming of the pusher, a plate is generally nailed or screwed to the doorjamb and acts as an abutment which co-operates with the actuation pushbutton when the door is closed.

[0008] One drawback of the above described conventional devices is that the actuation pushbutton, despite having a generally rounded or chamfered shape, is monolithic with the rod of the pusher and therefore rigidly follows it as it moves. Accordingly, the pushbutton has no possibility of orientation upon interaction with the abutment plate fixed to the doorjamb, and this causes a certain resistance to the movement of the pusher as well as rough, noisy and ineffective operation of the translatable motion means.

[0009] Another drawback is constituted by the fact that the abutment plate and the corresponding nails or screws for fixing are rather small components and therefore must be supplied separately to the installer, packaging them in a specifically provided package whose contents must be specifically checked.

[0010] For the manufacturer, this entails a greater burden because of the costs related to the materials and most of all for their packaging and checking.

[0011] Furthermore, these loose parts can be lost during transport or installation, entailing problems for the installer.

[0012] The aim of the present invention is to overcome the drawbacks of the prior art by providing an actuation pushbutton for a draft stopper which orientates itself automatically with respect to the doorjamb.

[0013] An object of the invention is to eliminate the need for any plate or contrast member for the actuation pushbutton to be fixed to the doorjamb.

[0014] A further object of the invention is to reduce production and installation costs of draft stoppers and of the corresponding members for fixing the accessories to be installed on the doorjamb.

[0015] A further object of the invention is to be able to retrofit an actuation pushbutton according to the invention to any existing draft stopper installed on a door.

[0016] This aim, these objects and other objects which will become apparent hereinafter are achieved by a universal actuation pushbutton for automatic draft stoppers comprising a fixed profiled member, which can be anchored to the lower edge of a door, and a movable profiled member, which is slidably connected to the fixed profiled member and is provided with a sealing means adapted to interact with the floor and a means for promoting the translatable motion of the movable profiled member with respect to the fixed profiled member caused by the closing action wherein the translatable motion means includes a pusher which is arranged inside the fixed profiled member in order to convert the longitudinal motion of the pusher into a transverse motion of the movable profiled member, wherein the actuation pushbutton is arranged at the end of the pusher that protrudes from the lateral edge of the door in order to cooperate with the doorjamb, characterized in that the actuation pushbutton includes a sleeve for connection to the pusher and a pusher stud which is coupled to the sleeve by means of a homokinetic universal joint.

[0017] Preferably, the universal joint includes a convex head which is rigidly coupled to the connecting sleeve and a concave seat which is rigidly coupled to the pusher stud or vice-versa.

[0018] The convex head and the concave seat have a preferably spherical complementary shape in order to allow full automatic orientation of the joint.

[0019] Further characteristics and advantages of the invention will become apparent from the detailed description of a preferred but not exclusive embodiment of a draft stopper, described by way of nonlimitative example with the aid of the accompanying drawings, wherein:

Fig. 1 is a partially sectional view of a draft stopper with an actuation pushbutton according to the invention, taken along an axial longitudinal plane;

Fig. 2 is an axonometric view of the actuation pushbutton of Fig. 1 in a first position;

Fig. 3 is an axonometric view of the pushbutton of Fig. 2 in a different position;

Fig. 4 is an enlarged-scale sectional side view of a detail of Figure 1, taken along an axial longitudinal plane;

Fig. 5 is an exploded longitudinal sectional view of the actuation pushbutton according to the invention;

Fig. 6 is a partial side view of the actuation pushbutton applied to a draft stopper.

[0020] A draft stopper according to the invention, generally designated by the reference numeral 1, is described with reference to the above figures; by way of nonlimitative example, the draft stopper corresponds to the one described and claimed in the Italian patent application No. VIA000000185, the contents of which are considered an integral part of the present application.

[0021] Briefly, the draft stopper 1 includes a fixed profiled member 2, which has a substantially U-shaped transverse cross-section, and a movable profiled member 4, which also has a substantially U-shaped transverse cross-section and is slidably inserted in the fixed profiled member 2 so that it can translate with respect to the fixed profiled member in a substantially transverse direction.

[0022] The fixed profiled member 2 can be connected to the door 3 by virtue of self-tapping preinstalled screws 5 which are inserted in a corresponding number of holes 6 formed in the upper horizontal band 2a of the profiled member 2, passing through holes 7 of the horizontal lower band of the fixed profiled member.

[0023] A rigid coupling means is provided which is constituted for example by a rigid linkage 8 whose ends are hinged to the respective profiled members 2 and 4 and by a traction spring 9 which is coupled to the points 10 and 11.

[0024] A sealing means, for example a sealing member G acting against the floor P, is applied to the lower part of the movable profiled member 4.

[0025] An automatic translatory motion means, adapted to act on the movable profiled member 4, is constituted by a pusher 12 which is adapted to convert its longitudinal motion into a transverse translatory motion of the profiled member 4 and of the sealing member G.

[0026] The pusher 12 can be formed by a substantially tubular body 13, an end of which is pivoted at 14 to the movable profiled member 4. The tubular body 13 can have an axial hole 15 with a central cylindrical portion 16 having a reduced diameter, at the ends of which the respective abutment steps 17 and 18 are formed.

[0027] A smooth rod 19 can be arranged in the axial hole 15 and is obtained for example from a screw whose diameter is slightly smaller than the diameter of the cylindrical portion 16 of the hole 15 so that it can slide free-

ly therein.

[0028] An actuation pushbutton is provided at the free end of the rod 19 and is generally designated by the reference numeral 20.

[0029] According to the invention, the pushbutton 20 comprises a sleeve 21, which is closed at one end and is internally threaded for connection to the rod 19 of the pusher 12, and a pusher stud 22 which is coupled to the sleeve 21 by means of an orientatable universal joint.

[0030] The universal joint is formed by a convex head 24 which is formed on the closed end of the sleeve 21 and by a concave seat 25 which is shaped complementarily and is formed in the body 26 of the pusher stud 22.

[0031] Preferably, the shape of the convex head 24 and of the concave seat 25 is spherical in order to allow complete freedom of orientation of the joint. The dimensions of the head 24 and of the seat 25 are chosen so as to allow mutual orientation of the two parts of the joint with minimal friction.

[0032] Preferably but not necessarily, the seat 25 of the pusher stud 22 has a degree of elasticity which is sufficient to allow it to deform in order to receive the convex head 24 with a snap-action coupling.

[0033] The body 26 of the pusher stud 22 is provided with an end portion or face 27 which is substantially flat and is large enough to interact directly with the doorjamb without the aid of any plate or abutment member to be fixed by virtue of screws or nails.

[0034] Conveniently, the sleeve 21 has an internal thread 28 which can engage an external thread 29 which is formed on the end of the rod 19 which is part of the pusher 12.

[0035] The convex head 24 has, at its top, a slit or a hexagonal socket 30 to allow the access of a screwdriver or of an Allen wrench so as to adjust the axial position of the sleeve 21 on the rod 19 of the pusher.

[0036] The body 26 of the pusher stud 22 is provided with an axial through hole 31 which can be aligned by rotation with respect to the slit or hexagonal socket 30 for the passage of the screwdriver or screwing tool. In this way it is possible to adjust the axial position of the pushbutton 20 with respect to the pusher 12 without having to disassemble the draft stopper.

[0037] During operation, when the door is closed the flat face 27 of the pusher stud 22 forces against the door frame, automatically orientating itself since it can assume any position in space by virtue of its characterizing ability to be orientated.

[0038] This allows particularly effective and silent operation for the pusher 12, to which a force F is applied which is directed along the longitudinal axis of the rod 19 with which it is provided, against the contrast force of a compression spring 32.

[0039] When the door is reopened, the elastic return of the spring 32 causes the actuation pushbutton 20 to protrude and return to its initial position.

[0040] Simultaneously, the spring 9 moves the movable profiled member 4 upward inside the fixed profiled

member 2 until the end 30 of the rigid linkage 8 abuts against the fixed profiled member 2.

[0041] The pushbutton 20, and in particular the pusher stud 22, can also be provided with shapes other than the one shown. In particular, it can be shaped so that it is coupled to the end of the pushbutton of a pusher 12 which belongs to any conventional type of draft stopper.

[0042] In this manner, conventional draft stopper, which are commercially available, can be modified by applying an orientatable pushbutton according to the invention to the end of the pusher.

[0043] In view of the above, it is therefore evident that the draft stopper according to the invention has achieved its aim and all the intended objects.

[0044] In particular, the draft stopper according to the invention has an orientatable actuation pushbutton which allows more reliable, effective and silent operation with respect to known types of draft stopper.

[0045] Furthermore, the pusher stud with which the draft stopper according to the invention is provided can be retrofitted to known types of draft stopper in order to convert them into draft stoppers according to the invention.

[0046] The actuation pushbutton and the draft stopper according to the invention are susceptible of numerous modifications and variations, within the scope of the inventive concept expressed in the accompanying claims.

[0047] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. An automatically-orientating actuation pushbutton for automatic draft stoppers (1) comprising a fixed profiled member (2), which can be anchored to the lower edge of a door (3), and a movable profiled member (4), which is slidingly connected to the fixed profiled member (2) and is provided with a sealing means (G) adapted to interact with the floor (P) and a means for promoting the translatable motion of the movable profiled member (4) with respect to the fixed profiled member (2) caused by the closing action, wherein said translatable motion means comprises a pusher (12) which is arranged inside said fixed profiled member (2) in order to convert the longitudinal motion of the pusher (12) into a transverse motion of the movable profiled member (4), wherein the actuation pushbutton (20) is arranged at the end of said pusher (12) that protrudes from the lateral edge of the door in order to co-operate with the doorjamb, **characterized in that** said actuation pushbutton (20) comprises a sleeve (21)

connected to said pusher (12) and a pusher stud (22) which is coupled to said sleeve (21) by means of a homokinetic universal joint (24,25).

2. A pushbutton according to claim 1, **characterized in that** said universal joint comprises a convex head (24) which is rigidly coupled to said connecting sleeve (21) and a concave seat (25) which is rigidly coupled to said pusher stud (22) or vice-versa.
3. A pushbutton according to claim 1, **characterized in that** said convex head (24) and said concave seat (25) are complementarily shaped.
4. A pushbutton according to claim 3, **characterized in that** said complementary shape is substantially spherical, with dimensions which allow free orientation with minimal friction.
5. A pushbutton according to claim 3, **characterized in that** said concave seat (25) has a degree of elasticity which is sufficient to allow it to deform so as to couple with a snap action to said convex head (24).
6. A pushbutton according to claim 1, **characterized in that** said pusher stud (22) has an end portion (27) which is substantially flat and is adapted to interact directly with the doorjamb.
7. A pushbutton according to claim 2, **characterized in that** said sleeve (21) has an internal thread (28) which can engage an external thread (29) formed on a rod (19) which belongs to said pusher (12).
8. A pushbutton according to claim 7, **characterized in that** said convex head (24) has, at its top, a slit or a hexagonal socket (30) for a screwdriver or for an Allen wrench, so as to allow screwing and adjustment of the sleeve (21) on the rod of the pusher.
9. A pushbutton according to claim 8, **characterized in that** said pusher stud (22) is provided with an axial through hole (31) which can be aligned by rotation with said slit or hexagonal socket for the passage of said screwdriver or screwing tool.
10. A draft stopper with universal actuation pushbutton, comprising a fixed profiled member (2), a movable profiled member (4) which is slidingly connected to the fixed one (2) and is provided with a sealing means (G) which is meant to interact with the floor (P), a means (12) for the translatable motion of the movable profiled member (4) with respect to the fixed one (2) which comprises a pusher (12), an actuation pushbutton (20) arranged at the end of said pusher (12) that protrudes from the lateral edge of the door in order to co-operate with the doorjamb, **characterized in that** said actuation pushbutton

(20) comprises a sleeve (21) for connection to said pusher (12) and a pusher stud (22) which is coupled to said sleeve (21) by means of a homokinetic universal joint (24,25).

Patentansprüche

1. Selbsttätig sich einstellender Betätigungsknopf für automatischen Zugluftstopper (1) mit einem festen profilierten Element (2), das an dem unteren Rand einer Tür (3) verankert werden kann und einem beweglichen profilierten Element (4), das gleitfähig verbunden ist mit dem festen profilierten Element (2) und mit einer Dichtungseinrichtung (G) versehen ist, das ausgebildet ist, um mit dem Boden (P) und einer Einrichtung zum Fördern der translatorischen Bewegung des beweglichen profilierten Elementes (4) relativ zum festen profilierten Element (2) zusammen zu wirken, die von der Schließbetätigung verursacht ist, wobei die translatorische Bewegungseinrichtung einen Drücker (12) umfasst, der innerhalb von dem festen profilierten Element (2) angeordnet ist, um die longitudinale Bewegung des Drückers (12) in eine transversale Bewegung des beweglichen profilierten Elementes (4) umzuwandeln, wobei der Bestätigungsknopf (20) an dem Ende von diesem Drücker (12) angeordnet ist, das von dem seitlichen Rand der Tür hervorragt, um mit der Tür zusammen zu wirken, **dadurch gekennzeichnet, dass** der Bestätigungsknopf (20) eine Hülle (21), die mit dem Drücker (12) verbunden ist, und einen Druckzapfen (22) umfasst, der mit der Hülle (21) verbunden ist mittels eines homokinetischen Gelenks (24, 25).
2. Druckknopf gemäß Anspruch 1, **dadurch gekennzeichnet, dass** dieses Universalgelenk einen konvexen Kopf (24) umfasst, der steif verbunden ist mit dieser verbindenden Hülle (21) und einem konkaven Sitz (25), der steif verbunden ist mit diesem Druckzapfen (22) oder umgekehrt.
3. Druckknopf gemäß Anspruch 1, **dadurch gekennzeichnet, dass** dieser konvexe Kopf (24) und dieser konvexe Sitz (25) komplementär geformt sind.
4. Druckknopf gemäß Anspruch 3, **dadurch gekennzeichnet, dass** diese komplementäre Form im wesentlichen räumlich ist mit Abmessungen, die freie Ausrichtung mit minimaler Reibung ermöglichen.
5. Druckknopf gemäß Anspruch 3, **dadurch gekennzeichnet, dass** dieser konkave Sitz (25) einen Grad an Elastizität aufweist, der ausreicht es zu verformen, um es mit einer Schnappbetätigung mit diesem konvexen Kopf (24) zu verbinden.

6. Druckknopf gemäß Anspruch 1, **dadurch gekennzeichnet, dass** dieser Druckzapfen (22) einen Endabschnitt (27) aufweist, der im wesentlichen flach ist und ausgebildet ist um direkt mit der Tür zusammen zu wirken.

7. Druckknopf gemäß Anspruch 2, **dadurch gekennzeichnet, dass** diese Hülle (21) ein inneres Gewinde (28) aufweist, das in ein äußeres Gewinde (29) eingreifen kann, dass auf einem Zapfen (19) ausgebildet ist, der zu dem Drücker (12) gehört.

8. Druckknopf gemäß Anspruch 7, **dadurch gekennzeichnet, dass** dieser konvexe Kopf (24) an seiner Spitze einen Schlitz oder einen hexagonalen Sockel (30) für einen Schraubenzieher oder für einen Allen Schraubenschlüssel aufweist, um so Schrauben und Einstellen der Hülle (21) am Zapfen des Druckers zu ermöglichen.

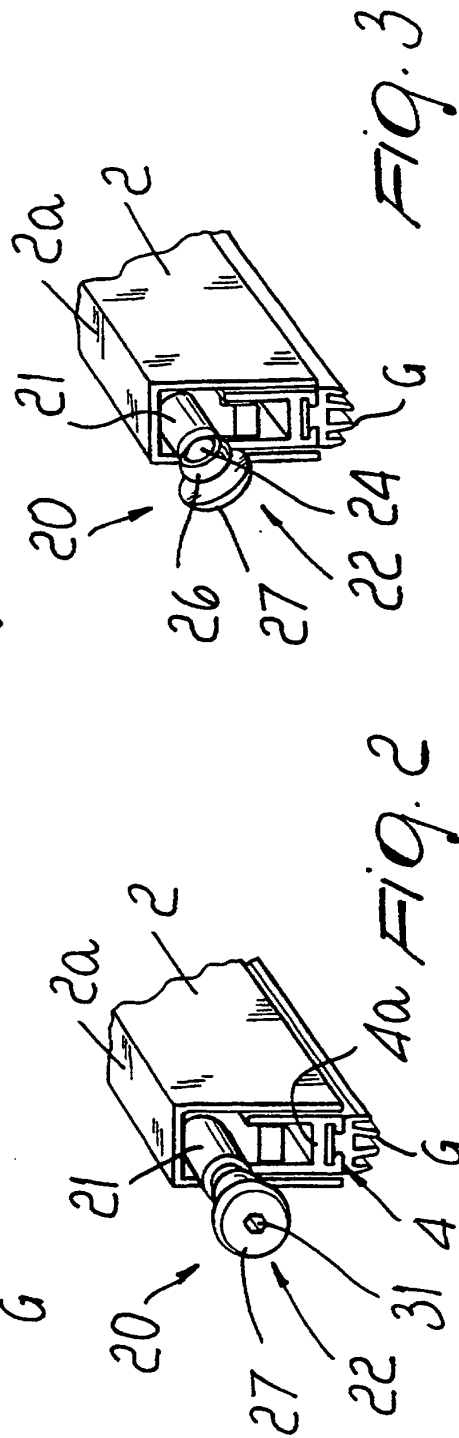
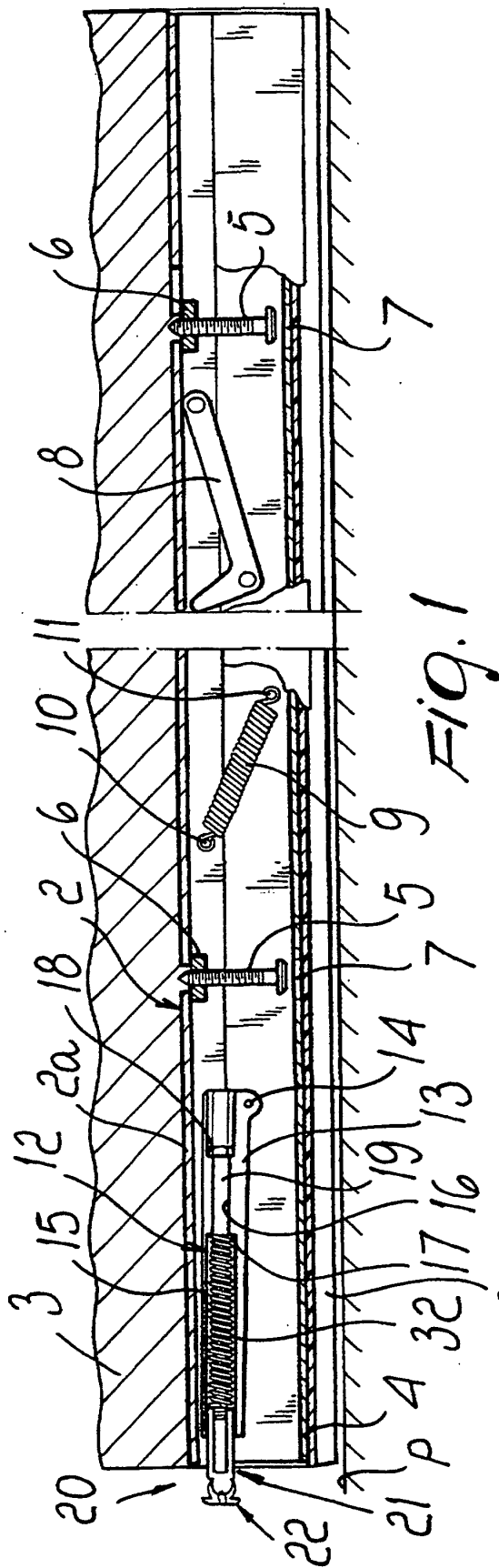
9. Druckknopf gemäß Anspruch 8, **dadurch gekennzeichnet, dass** dieser Druckzapfen (22) versehen ist mit einem axialen Durchlass (31), der mittels Drehung ausgerichtet werden kann mit dem Schlitz oder hexagonalen Sockel für den Durchlass des Schraubenziehers oder des Schraubenwerkzeugs.

10. Zugluftstopper mit universellem Betätigungsknopf mit einem festen profilierten Element (2), einem beweglichen profilierten Element (4), das gleitfähig verbunden ist mit dem festen Element (2) und mit einer Dichtungseinrichtung (G) versehen ist, das ausgebildet ist, um mit dem Boden (P) zusammen zu wirken, einer Einrichtung für die translatorische Bewegung des beweglichen profilierten Elementes (4) relativ zum festen Element (2), die einen Drücker (12) umfasst, einem Bestätigungsknopf (20), der an dem Ende von diesem Drücker (12) angeordnet ist, das von dem seitlichen Rand der Tür hervorragt, um mit der Tür zusammen zu wirken, **dadurch gekennzeichnet, dass** der Bestätigungsknopf (20) eine Hülle (21), die mit dem Drücker (12) verbunden ist, und einen Druckzapfen (22) umfasst, der mit der Hülle (21) verbunden ist mittels eines homokinetischen Gelenks (24, 25).

Revendications

1. Bouton-poussoir d'actionnement à orientation automatique pour obturateurs de courants d'air automatiques (1) comprenant un élément profilé fixe (2) qui peut être ancré au bord inférieur d'une porte (3), un élément profilé mobile (4) qui est assemblé de façon coulissante à l'élément profilé fixe (2) et est muni d'un moyen de fermeture étanche (G) adapté pour coopérer avec le sol (P) et un moyen pour favoriser le mouvement de translation de l'élément

- profilé mobile (4) par rapport à l'élément profilé fixe (2) provoqué par l'action de fermeture, dans lequel ledit moyen de mouvement de translation comprend un poussoir (12) qui est arrangé à l'intérieur dudit élément profilé fixe (2) pour convertir le mouvement longitudinal du poussoir (12) en un mouvement transversal de l'élément profilé mobile (4), dans lequel le bouton-poussoir d'actionnement (1) est arrangé à l'extrémité dudit poussoir (12) qui fait saillie en dehors du bord latéral de la porte afin de coopérer avec l'hubriserie, **caractérisé en ce que** ledit bouton-poussoir d'actionnement (20) comprend un manchon (21) relié audit poussoir (12) et une tige de poussoir (22) qui est accouplée audit manchon (21) au moyen d'un joint universel homocinétique (24, 25).
2. Bouton-poussoir selon la revendication 1, **caractérisé en ce que** ledit joint universel comprend une tête convexe (24) qui est accouplée rigidement audit manchon de liaison (21) et un appui concave (25) qui est accouplé rigidement à ladite tige de poussoir (22) ou inversement.
3. Bouton-poussoir selon la revendication 1, **caractérisé en ce que** ladite tête convexe (24) et ledit appui concave (25) sont de forme complémentaire.
4. Bouton-poussoir selon la revendication 3, **caractérisé en ce que** ladite forme complémentaire est sensiblement sphérique, avec des dimensions qui permettent une libre orientation avec un frottement minime.
5. Bouton-poussoir selon la revendication 3, **caractérisé en ce que** ledit appui sphérique (25) a un degré d'élasticité qui est suffisant pour lui permettre de se déformer de manière à s'accoupler à ladite tête sphérique (24) par action brusque.
6. Bouton-poussoir selon la revendication 1, **caractérisé en ce que** ladite tige de poussoir (22) possède une partie d'extrémité (27) qui est sensiblement plate et est adaptée pour coopérer directement avec l'hubriserie de la porte.
7. Bouton-poussoir selon la revendication 2, **caractérisé en ce que** ledit manchon (21) possède un filetage intérieur (28) qui peut attaquer un filetage extérieur (29) formé sur une tige (19) qui appartient audit poussoir (12).
8. Bouton-poussoir selon la revendication 7, **caractérisé en ce que** ladite tête convexe (24) possède, à son sommet, une fente ou une empreinte hexagonale (30) pour un tournevis ou pour une clé Allen, de manière à permettre de visser et de régler le manchon (21) sur la tige du poussoir.
9. Bouton-poussoir selon la revendication 8, **caractérisé en ce que** la tige de poussoir (22) est munie d'un trou axial traversant (31) qui peut être aligné par rotation avec ladite fente ou ladite empreinte hexagonale pour le passage dudit tournevis ou dudit outil de vissage.
10. Obturateur de courant d'air muni d'un bouton-poussoir d'actionnement universel, qui comprend un élément profilé fixe (2), un élément profilé mobile (4) qui est assemblé de façon coulissante à l'élément fixe (2) et est muni d'un moyen de fermeture étanche (G) qui est conçu pour coopérer avec le sol (P), un moyen (12) prévu pour le mouvement de translation de l'élément profilé mobile (4) par rapport à l'élément fixe (2), qui comprend un poussoir (12), un bouton-poussoir d'actionnement (20) arrangé à l'extrémité dudit poussoir (12) qui fait saillie en dehors du bord latéral de la porte afin de coopérer avec l'hubriserie, **caractérisé en ce que** ledit bouton-poussoir d'actionnement (20) comprend un manchon (21) destiné au raccordement audit poussoir (12) et une tige de poussoir (22) qui est accouplée audit manchon (21) au moyen d'un joint universel homocinétique (24, 25).



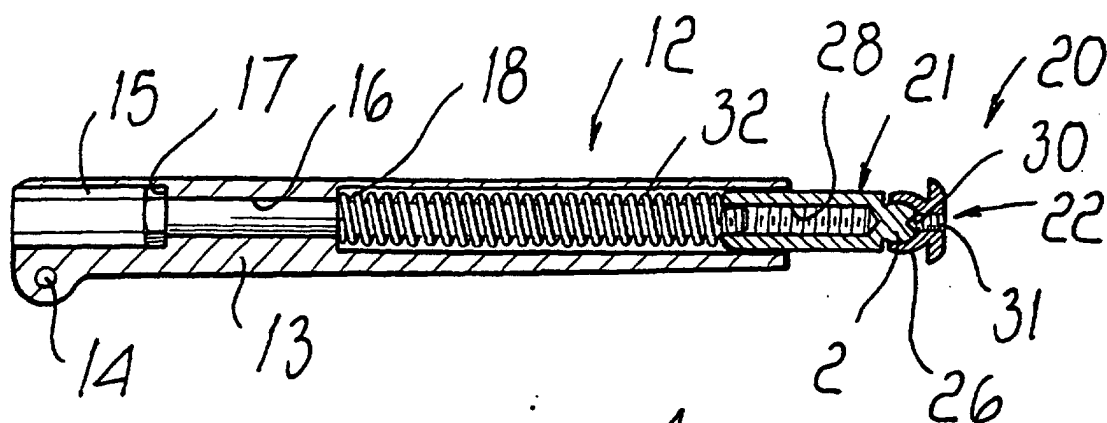


Fig. 4

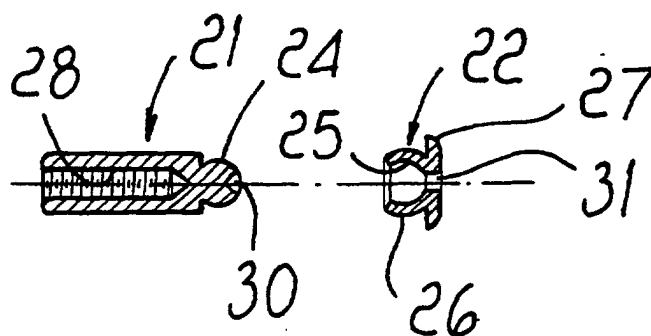


Fig. 5

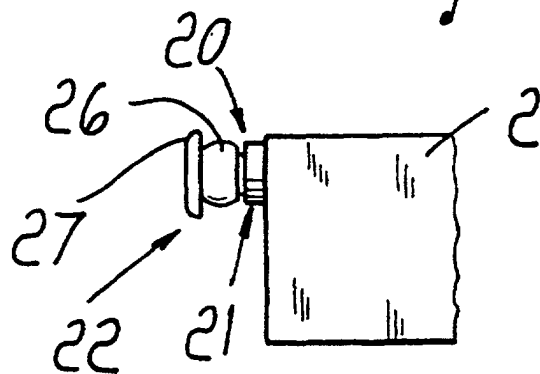


Fig. 6