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(71) Applicant:
Winlock Security Limited
Telford, Shropshire TF7 4ES (GB)

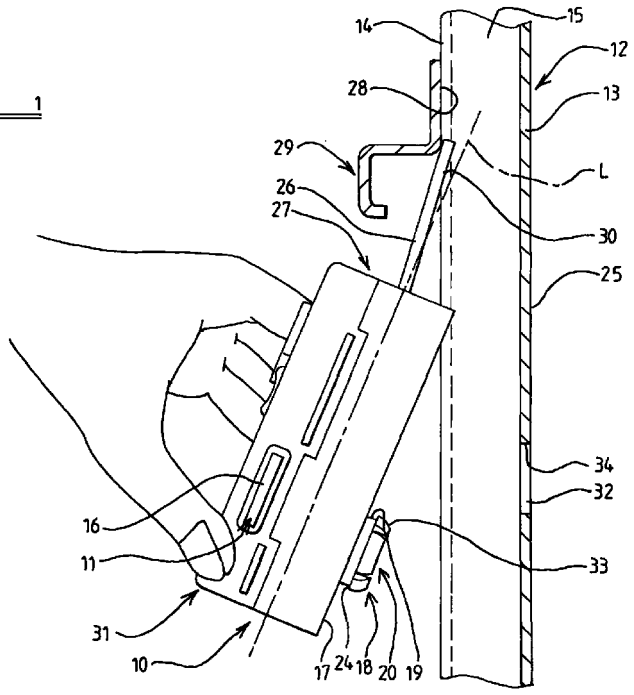
(72) Inventors:
- **Walsgrove, Michael, c/o Winlock Security Limited**
  Shropshire TF7 4ES (GB)
- **Edmonds, Tracy c/o Winlock Security Limited**
  Shropshire TF7 4ES (GB)

(74) Representative: **Lally, William**
FORRESTER & BOEHMERT
Franz-Joseph-Strasse 38
80801 München (DE)

(54) A housing for a closure member retaining assembly and a method of attachment thereof

(57) A housing (10) for a closure member retaining assembly (11) such as a garage door lock assembly having a resiliently deformable attachment part (18) by which the housing (10) may be attached to the closure member (12).

FIG 1



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Description

Description of the Invention

[0001] This invention relates to a housing for a closure member retaining assembly such as a door or window locking mechanism or latch assembly, and relates in particular, although not exclusively, to a housing for a garage door locking mechanism.

[0002] Housings of this type are usually positioned on a rear (i.e. inwardly facing) surface of a garage door, with a handle extending thereto from a front (i.e. forwardly facing) surface of the door. Typically, the handle is operatively associated with a slidable retaining member, which is movable from a first position in which an end of the retaining member abuts or lies closely adjacent a frame surrounding the door or a fixed structure adjacent the door, such that opening of the door is prevented, to a second position in which the end lies clear of the frame or fixed structure such that opening of the door is permitted.

[0003] In order to attach the locking mechanism housing to the rear surface of the door, it has hitherto been necessary for a person to hold the housing at a required position, and for a second person, located on the other side of the door, to secure the housing to the door by introduction of screws or other fastening means through the front surface of the door, into the housing.

[0004] Whilst this enables the housing to be attached securely to the door, the process is labour intensive, insofar as two people are required, and it is also sometimes difficult to position the housing on the door sufficiently accurately to enable the screws or other fastening means to be introduced properly.

[0005] It is therefore an object of the present invention to provide an improved housing of the kind generally described above which overcomes or at least mitigates these disadvantages.

[0006] According to a first aspect of the present invention, there is provided a housing for a closure member retaining assembly having a resiliently deformable attachment part by which the housing may be attached to the closure member.

[0007] The attachment part may comprise a spigot, conveniently extending from a front surface of the housing, the spigot having a shank portion and a resiliently deformable end portion which extends outwardly from the shank portion.

[0008] The spigot is preferably configured so as to be received in an aperture provided in the closure member.

[0009] Conveniently, the spigot is received in the aperture in a "snap-fitting" manner.

[0010] The spigot shank portion may conveniently be generally cylindrical, and the resiliently deformable end portion may extend radially outwardly therefrom.

[0011] Desirably, the spigot is generally tubular and is provided at its end with a split collet formation.

[0012] The split collet formation may be generally part frusto-conical, and may be provided with at least one, preferably at least two, and conveniently three or four, slots extending from a distal rim thereof towards the shank portion of the spigot.

[0013] Conveniently, the slots are distributed evenly about the circumference of the rim.

[0014] The housing may further comprise a biasing member, conveniently extending from a surface of the housing which is remote from the surface from which the spigot extends, which, in use, serves to bias the housing towards the closure member to which the housing is attached.

[0015] Conveniently, the biasing member extends from an upper surface of the housing.

[0016] The biasing member may comprise a plate or strip extending from an upper part of the housing, which in use bears upon a bearing surface of the closure member, which is spaced from the front surface thereof. The bearing surface may form part of an inner panel of the closure member, but conveniently is provided by a section of a reinforcing cross member.

[0017] The cross member may be provided by a metal bar or strip which, when the closure member adopts a generally vertical attitude, extends generally horizontally across a rear part of the closure member.

[0018] Preferably, the spigot is co-axial with a handle-receiving aperture passing through the retaining assembly.

[0019] In this way, a spindle of the handle may pass through the spigot.

[0020] According to a second aspect of the present invention, there is provided a method of attaching a housing for a closure member retaining assembly to a closure member, comprising positioning a resiliently deformable attachment part of the housing near or adjacent an aperture provided in a surface of the closure member, the aperture being smaller than the attachment part prior to resilient deformation thereof, and exerting pressure on the housing generally towards the aperture so as to cause resilient deformation of the attachment part, enabling it to pass through the aperture, and subsequently allowing the attachment part to expand.

[0021] Preferably, the attachment part is provided with a rearwardly facing shoulder formation which, subsequent to passage through the aperture, abuts a forwardly facing surface of the closure member, such that a "snap-fit" attachment may be effected.

[0022] The housing may be substantially in accordance with one or more of the preceding paragraphs.

[0023] In this way, the housing may be attached securely, precisely, and quickly to a closure member such as a garage door, by a single person, and without requiring the use of additional fastening means, as has hitherto been the case.

[0024] According to a third aspect of the present invention, there is provided a retaining assembly for a

closure member having a housing which is provided with a resiliently deformable attachment part by which the housing may be attached to the closure member.

[0025] The housing may be substantially in accordance with one or more of the preceding paragraphs.

[0026] The invention will now be described in greater detail, but by way of example only, by reference to the accompanying drawings wherein:

Figures 1 to 3 illustrate, sequentially, attachment of a housing for a locking mechanism to a garage door;

Figure 4 shows the housing in position, and a handle, prior to attachment thereof to the locking mechanism;

Figure 5 shows a completed locking mechanism and handle assembly, attached to the door;

Figure 6 shows a rear view of the housing, attached to the door; and

Figure 7 is a perspective view of the front of the arrangement shown in Figure 6.

[0027] Referring first to Figures 1 to 3, these show sequential steps in the attachment to a garage door of a housing 10 for a locking mechanism 11. The door 12 is of the type which comprises front and rear panels 13, 14 which are spaced by a cavity 15 therebetween. The locking mechanism 11 is generally conventional, and therefore requires no detailed elaboration, although for the sake of clarity, it should be noted that it comprises a slidable retaining member 16 which, in Figures 1 to 3, is moveable into and out of the paper upon movement of a handle (see Figures 4 and 5) which is operatively associated therewith.

[0028] The housing 10 is generally box-shaped, and serves to conceal the internal workings of the locking mechanism, and to protect them from ingress of dirt and the like.

[0029] Disposed on a front part 17 of the housing 10 is a resiliently deformable attachment part in the form of a spigot 18 having a shank 19 and a resiliently deformable end 20.

[0030] As shown in particular in Figure 7, the end portion 20 comprises a split collet 21 which is provided with four slots 22, disposed evenly about the circumference of the distal rim 23 of the collet 21.

[0031] As shown especially in Figures 1 to 3, the resiliently deformable end portion 20 is somewhat frusto-conical in configuration, and is provided with a rearwardly facing shoulder 24, the purpose of which is explained in more detail in relation to Figures 3 and 4.

[0032] To attach the housing 10 to the door 12, the housing is brought to the position shown in Figure 1, at which a biasing member 26, provided in this example by a strip of steel, attached to an upper part 27 of the housing by any convenient means, is brought into engagement with a rear surface 28 of a generally horizontally extending cross member 29, which serves to increase the strength, and hence improve the security of the garage door 12.

[0033] As shown in Figure 1, the biasing member is tilted slightly rearwardly in relation to the housing, so that it lies some 2 to 3 degrees offset from the line L which extends generally parallel to a nominal longitudinal axis of the housing 10.

[0034] As the housing 10 is introduced further into the cavity 15, it will be appreciated that the rear surface 28 of the cross member 29 exerts a generally forwardly extending force against the end 30 of the biasing member 26, causing the biasing member 26 to be pushed away from its rest position (shown in Figure 1), towards the front panel 13 of the garage door 12.

[0035] In this way, when a user holds the housing 10 by a lower part 31 thereof, the resilience of the biasing strip 26 is effective to bias the upper part of the housing 27 towards the panel 13, thus reducing any "play" which might otherwise exist between the housing and the panel 13.

[0036] At the same time, as shown especially in Figure 2, the end portion 20 of the spigot 18 is brought into engagement with an aperture 32 provided in the front panel 13. In particular, it will be seen from Figure 2 that the inclined sides 33 of the split collet 21 are caused to bear upon the inner surface 34 of the aperture 32, thus guiding the spigot into engagement with the aperture.

[0037] Continued movement of the housing towards the aperture 32 increases the pressure exerted on the inclined sides 33 by the inner surface 34 of the aperture 32, and as the aperture 32 is smaller than the split collet 21, continued movement causes the end portion 20 to compress generally radially inwardly, which in turn allows passage of the end portion 20 through the aperture 32.

[0038] As shown in Figure 3, still further movement of the housing 10 towards the aperture 32 enables the end portion 20 to complete its passage through the aperture, and, by virtue of the resilient nature of the split collet 21, the end portion is able to expand subsequent to passing through the aperture.

[0039] As a result of this expansion, the rearwardly facing shoulder 24 of the split collet 21 abuts that part of the front face 25 which surrounds the aperture, thus preventing rearward movement of the spigot 18, and hence preventing removal of the housing 10 from the garage door 12.

[0040] As can also be seen from Figure 3, the biasing member 26 is effective to bias the upper part of the housing 27 towards the panel 13 by virtue of it being displaced from its "rest" position (shown in Figure 1) to a somewhat bent position, as shown in Figure 3.

[0041] Referring next to Figure 4, this shows introduction of a handle 40 having a grip part 41, a cylindrical boss 41a and a square spindle 42, which, as shown in Figures 6 and 7, engages with a correspondingly dimensioned square passage 43 through the spigot 18

and the body of the housing 10, in generally conventional manner.

[0042] It will be appreciated from Figure 5 in particular that the cylindrical boss 41a is dimensioned so as to be received in a close fitting manner in the generally circular aperture defined by the rim 23 of the collet 21. Thus, once inserted, the boss 41a serves to prevent inward radial deformation of the collet, and thus prevents removal of the housing from the door.

[0043] Additionally, as the end part 44 of the grip 41 is larger than the end portion 20 of the spigot 18, once the spindle 42 is inserted fully into the passage 43, the handle 40 covers, and hence also protects, the resiliently deformable part 20 of the spindle.

[0044] As shown in Figure 5, once the spindle 42 has passed completely through the passage 43, a further handle 45 is attached to the remote end of the spindle, and secured thereto by the use of a threaded fastener 46, subsequent to which the housing 10 becomes "sandwiched" to the garage door between the two handles 40 and 45.

[0045] As indicated previously, the locking mechanism 11 concealed within the housing 10 is generally conventional and therefore forms no part of the present invention. However, for ease of reference, Figure 6 shows a rear, perspective view, of the housing and locking mechanism, and in particular illustrates a retaining member 16 which is slidably movable in the direction shown by the arrows A, upon rotational movement of either of the handles 44 or 45. The retaining member 16 is in the form of a steel strip, which, when the housing 10 is positioned at an edge of the door 12 may engage with a keep 47 mounted on a door frame, for example, (see Figure 7), which in the position shown prevents outward movement of the door to which the housing 10 is attached. Alternatively, in situations where the housing 10 is positioned more centrally of the door 12, extension rods or bars 49, again of conventional type, may be attached to the ends of the retaining member 16 using the apertures 48 provided therein so that distal ends of the extension bars 49 may engage with keeps such as those shown at 47. As shown in Figure 6, the extension bars 49 may be attached to the retaining member 16 by a nut and bolt arrangement generally indicated at 50.

[0046] It will be appreciated from the foregoing that the provision of a resiliently deformable attachment part on the housing enables the housing to be positioned securely, quickly, and accurately on a garage door and that only one person is required to effect the attachment operation.

[0047] In view of this, assembly costs may be reduced considerably, and the simplification of the procedure means that lock assembly housings of this general type may be installed by less skilled persons, on a so-called "DIY" basis.

[0048] Insofar as the materials from which the various components are made are concerned, it will be appreciated that the housing is by its nature likely to require a considerable degree of strength, and that as a result a metallic material such as a steel is likely to be particularly suitable. Similar considerations apply to the retaining member/extension bars, as appropriate, although the spigot shank and resiliently deformable end part are likely to be produced from a plastics material, to provide the required degree of strength and resilience, and to facilitate moulding of the component parts.

[0049] The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

Claims

1. A housing (10) for a closure member retaining assembly (11) having a resiliently deformable attachment part (18) by which the housing (10) may be attached to the closure member (12).

2. A housing (10) according to claim 1 wherein the attachment part (18) comprises a spigot.

3. A housing (10) according to claim 2 wherein the spigot (18) comprises a shank portion (19) and a resiliently deformable end portion (20) which extends outwardly from the shank portion (19).

4. A housing (10) according to claim 2 or claim 3 wherein the spigot (18) is configured so as to be received in an aperture (32) provided in the closure member (12) in a snap-fitting manner.

5. A housing (10) according to claim 3 or claim 4 wherein the shank portion (19) of the spigot (18) is generally cylindrical, and wherein the resiliently deformable end portion (20) extends radially outwardly therefrom.

6. A housing (10) according to any one of claims 2 to 5 wherein the spigot (18) is generally tubular and is provided at its end with a split collet formation (21).

7. A housing (10) according to claim 6 wherein the split collet formation (21) is generally part frusto-conical.

8. A housing (10) according to claim 6 or claim 7 wherein the split collet formation (21) is provided with at least one slot (22) extending from a distal rim (23) thereof towards the shank portion (19) of the spigot (18).

9. A housing (10) according to any one of the preced-

ing claims further comprising a biasing member (26) which, in use, serves to bias the housing (10) towards the closure member (12) to which the housing (10) is attached.

10. A housing (10) according to claim 9 wherein the biasing member (26) comprises a plate or strip extending from an upper part (27) of the housing (10), which, in use, bears upon a bearing surface (28) of the closure member (12), the bearing surface (28) being spaced from a front surface (25) of the closure member (12).

11. A housing (10) according to any one of claims 2 to 10 wherein the spigot (18) is coaxial with a handle-receiving aperture (43) passing through the retaining assembly (11).

12. A method of attaching a housing (10) for a closure member retaining assembly (11) to a closure member (12), the method comprising positioning a resiliently deformable attachment part (18) of the housing (10) near or adjacent an aperture (32) provided in a surface (25) of the closure member, the aperture (32) being smaller than the attachment part (18) prior to resilient deformation thereof, and exerting pressure on the housing (10) generally towards the aperture (32) so as to cause resilient deformation of the attachment part (18), enabling it to pass through the aperture (32), and subsequently allowing the attachment part (18) to expand.

13. A method according to claim 12 wherein the attachment part (18) is provided with a rearwardly facing shoulder formation (24) which, subsequent to passage through the aperture (32), abuts a forwardly facing surface (25) of the closure member (12), such that a snap-fit attachment may be effected.

14. A method according to claim 12 or claim 13 wherein the housing (10) is in accordance with any one of claims 1 to 11.

15. A retaining assembly (11) for a closure member (12) having a housing (10) which is provided with a resiliently deformable attachment part (18) by which the housing (10) may be attached to the closure member (12).

16. A retaining assembly (11) according to claim 15 wherein the housing (10) is in accordance with any one of claims 1 to 11.

17. A closure member retaining assembly (11) comprising a housing (10) having a resiliently deformable attachment part (18) by which the housing (10) may be attached to the closure member (12), securing means (41a) being provided to prevent or restrict further resilient deformation of the attachment part (18) to prevent or restrict removal of the housing (10) from the closure member (12).

18. An assembly according to claim 17 wherein the securing means (41a) is attached to or integral with a handle (40) which is provided to operate the retaining assembly (11).

19. An assembly according to claim 18 wherein the securing means (41a) comprises a generally cylindrical boss which in use is located within an aperture defined by a distal portion (23) of the attachment part (18).

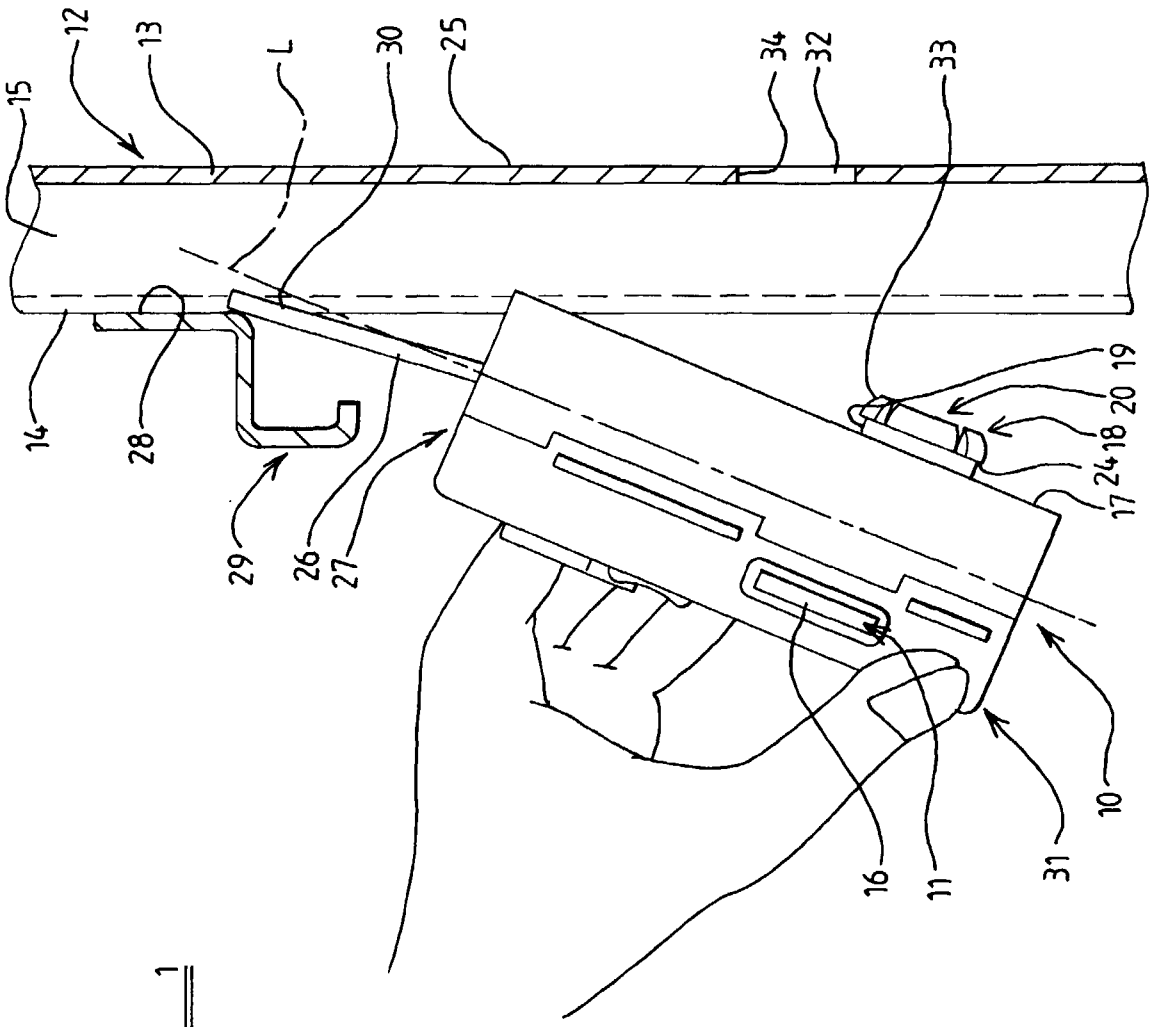

FIG 1

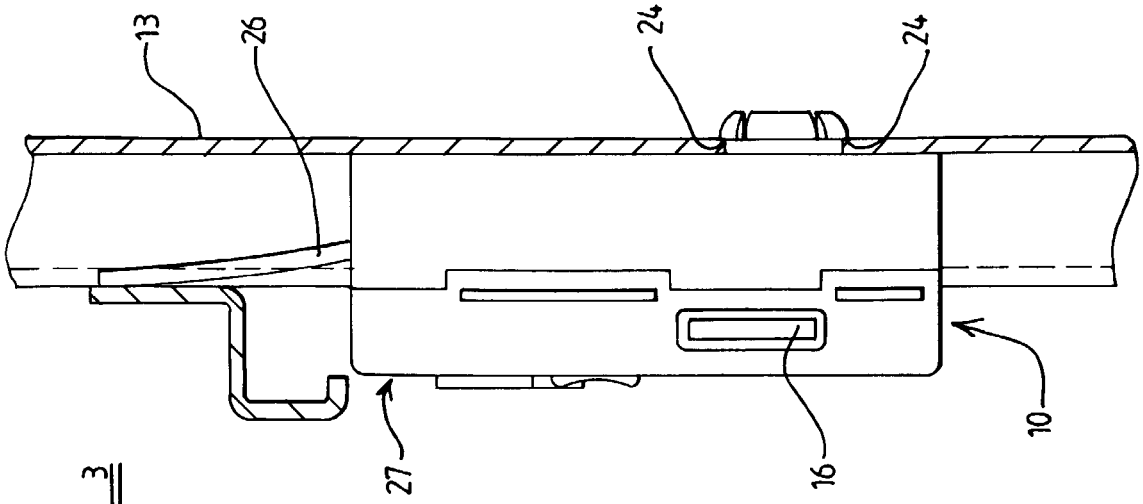

FIG 3

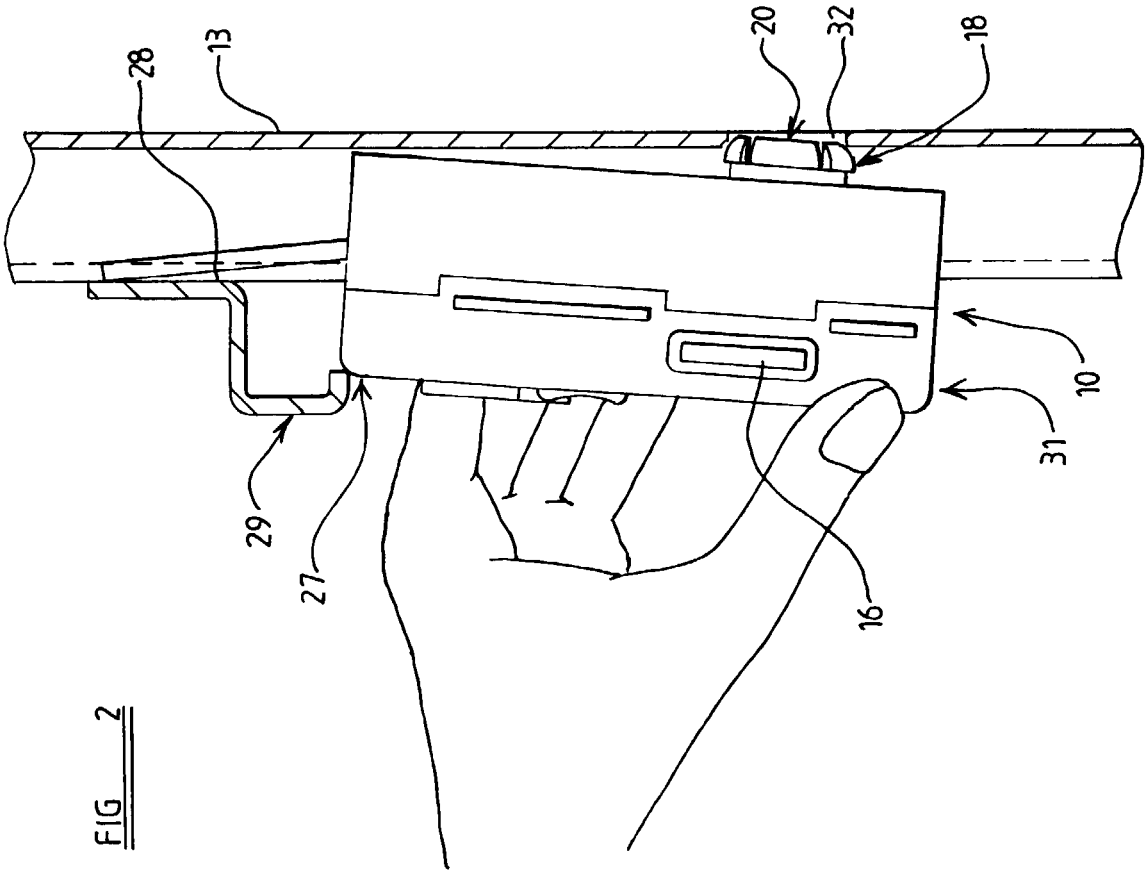

FIG 2

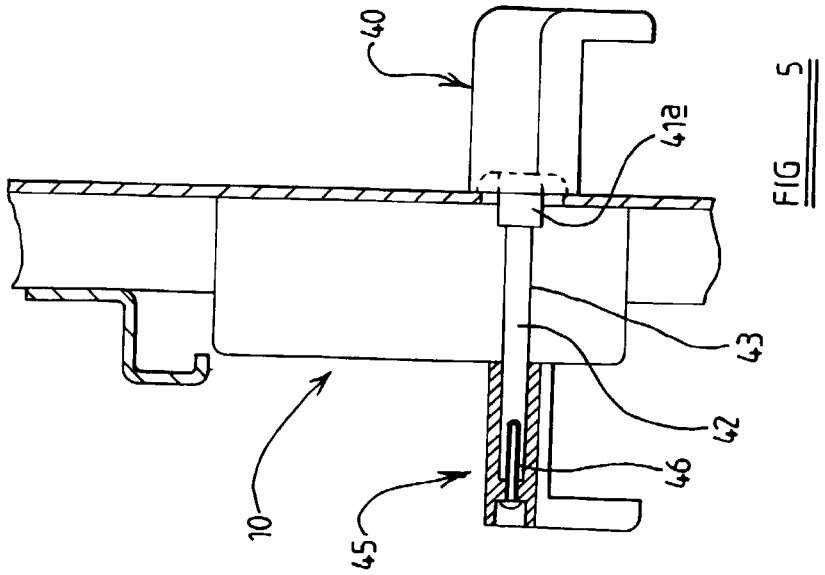

FIG 5

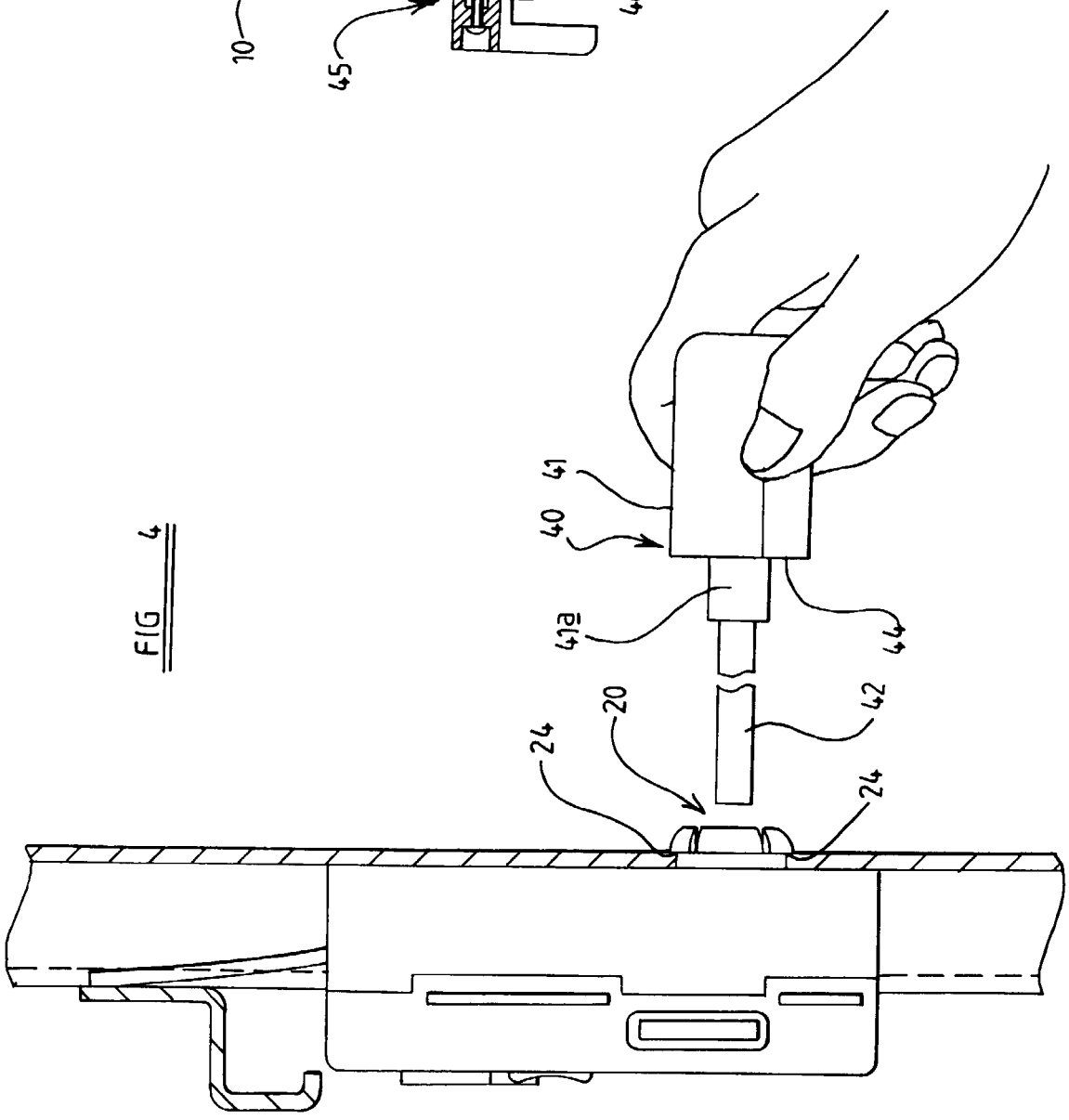

FIG 4

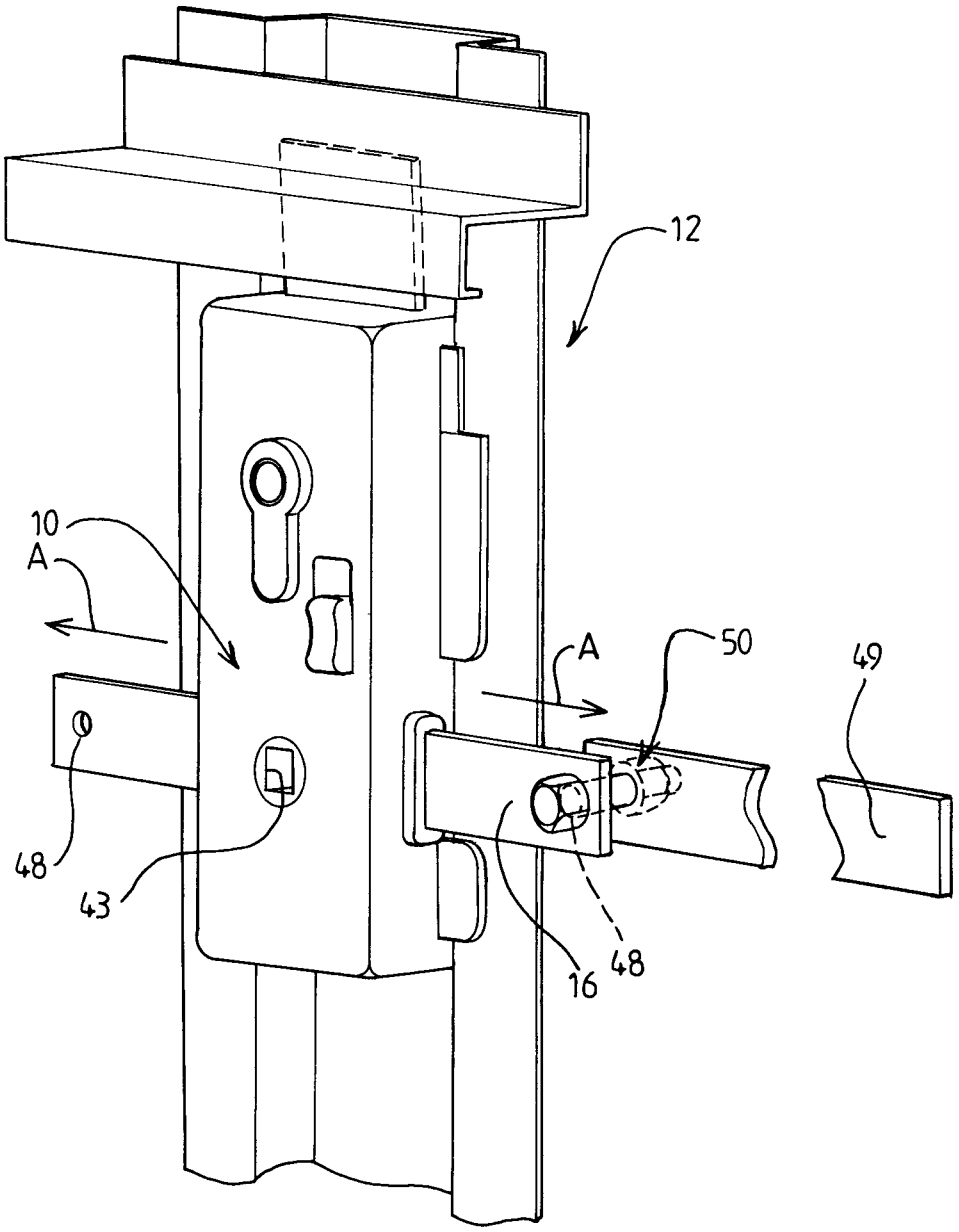

FIG 6

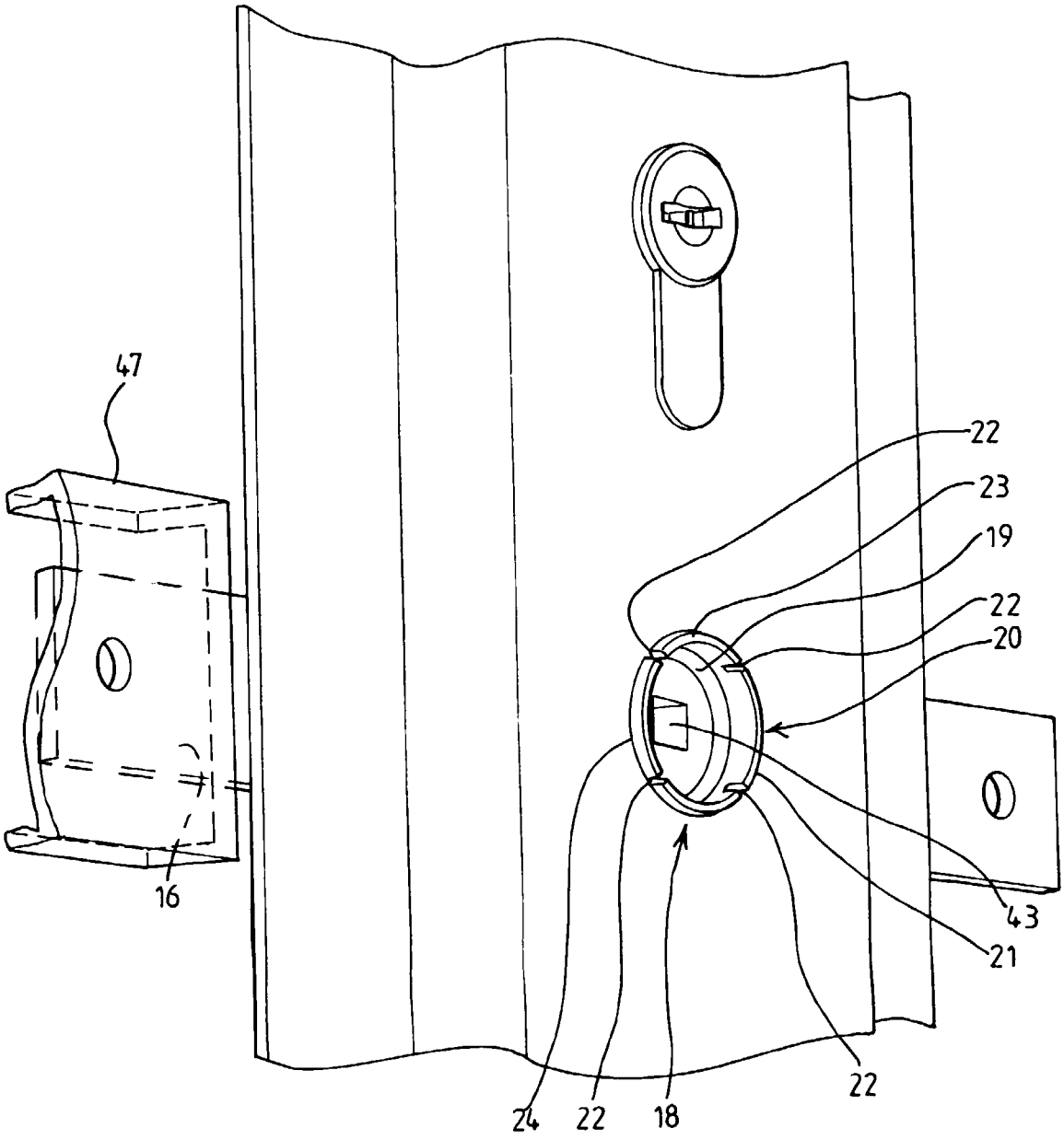

FIG 7

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 11 5794

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

E05B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	24 November 2000	Vacca, R

CATEGORY OF CITED DOCUMENTS

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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