

(19)



(11)

EP 2 520 744 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:

07.11.2012 Bulletin 2012/45

(51) Int Cl.:

E05B 3/04 (2006.01)

E05B 13/10 (2006.01)

E05B 15/16 (2006.01)

(21) Application number: **12166733.1**

(22) Date of filing: **04.05.2012**

(84) Designated Contracting States:

AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated Extension States:

BA ME

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(30) Priority: **04.05.2011 GB 201107423**

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(54) **Handles for windows and doors**

(57) A handle mechanism 8 for a window or door, comprises a lever 10 and a rose 12. The lever 10 is journaled in the rose 12, typically by spin-riveting techniques, to allow for relative rotation between the two to operate a lock mechanism located in a window opening sash 50 to which the handle is in use attached. The handle 8 also incorporates a lock mechanism 14 that allows the lever

10 to be locked to the rose 12. A spindle 16 is located in a tapered spindle receiving cavity 18, also known as a core, of the handle 8. The spindle 16 is secured in the spindle receiving cavity 18 by means of a friction fit and also by means of a steel retaining pin 26 which is received in a semi circle clip section 28 located on an end of the spindle 16.

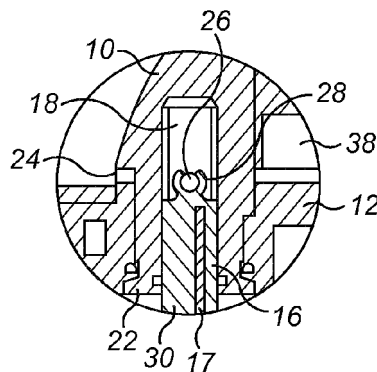


FIG. 3b

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Description

[0001] This invention relates to handles for windows or doors and also to a spindle for use with such handles.

[0002] Figures 1 and 2 show a conventional window handle for a window or door, which is conventionally manufactured from zinc or aluminium die cast. The handle has two main components in the form of a lever 2 to operate a spindle 7 and a rose 6, which is a fixed based that is fastened to the window opening sash that is to be operated. The lever 2 and the rose 6 are typically joined by a riveting operation. Within the lever 2 positioned coaxially with a point of rotation of the lever 2 is a cavity with tapered walls. The cavity is arranged to receive the spindle 7 in a friction fit. The spindle 7 is conventionally produced from an industry standard square section mild steel bar that is sized to pass through a spindle hub of a window lock operated by the lever 2.

[0003] The end of the spindle 7 that fits into the lever cavity mentioned above is typically reduced to a cylindrical profile which allows the spindle 7 to be mechanically press fitted into the lever cavity to form a tight interference fit, from which the spindle cannot generally be removed.

[0004] The fenestration industry naturally produces many different thicknesses of window frame and window opening sash. Although there are industry standard details that are applicable to all of the various profiles that are manufactured, such as the Eurogroove that specifies the relation between a surface of the window opening sash and a groove carrying a window lock, positions of these details differ between manufacturers. These differences lead to disadvantages, because different lengths of spindle are required for different windows. Consequently, the number of variants for each handle is large.

[0005] Typically each window manufacturer will offer one or two profile (thickness) choices to their customers and provide correspondingly sized spindles that the customer will need with their chosen profile.

[0006] A disadvantage arises when casement window handles are sold into the replacement market, typically through DIY stores. Most stores will only stock a small range of handles and will not provide a choice of spindle length for the customer. Consequently, a handle that has been purchased may not be suitable for the window system of the purchaser, because of an incorrect spindle length in relation to the window that it should fit, which leads to the customer returning the handle to the store.

[0007] It is an object of the present invention to address the above mentioned disadvantages.

[0008] According to the present invention there is provided an apparatus and method as set forth in the appended claims. Other features of the invention will be apparent from the dependent claims, and the description which follows.

[0009] According to a first aspect of the present invention there is provided a spindle for use with handles for windows and doors, the spindle comprising a head section having first abutment means adapted to abut corre-

sponding second abutment means of the handle with which the spindle is to be used, wherein the first abutment means are adapted for axial abutment with the second abutment means.

[0010] The first abutment means are preferably located at an end of the spindle, preferably on an end face of the spindle. The first abutment means are preferably include locking means, which may be clip means. The first abutment means may be retaining means, adapted to retain the spindle at the corresponding second abutment means.

[0011] The second abutment means may be a locking member, which may be a locking pin. The first and second abutment means may be adapted for inter-engagement with each other.

[0012] The spindle is preferably adapted to be received in a cavity of the handle, preferably in a tapered cavity.

[0013] The spindle may comprise a tapered neck section, which may be adapted to be received in a cavity of the handle.

[0014] The spindle may comprise a body section adjacent to the neck section, the body section being adapted in use to extend away from the handle.

[0015] The spindle may comprise a shoulder section between the neck section and the body section, wherein the shoulder section is preferably adapted to abut an exterior of the handle.

[0016] The spindle may be made of a plastics material, preferably a reinforced plastics material, reinforced with one or more fibre, wherein the fibre may be glass. The plastics material may comprise a polymeric material. The plastics material may be selected from one of the following: polyester, polyamide, polyurethane, polyacrylate, polystyrene, polycarbonate, polyalkene, preferably polyamide, which is preferably nylon, or may be glass-reinforced nylon. The elastic properties of plastics material are advantageously used to allow the first abutment means to removably attach to the second abutment means.

[0017] The spindle may include a reinforcing insert that may be internal to a body of the spindle. The reinforcing insert may be metal and may have an angled cross-section, which may be an obtuse angled cross-section.

[0018] According to a second aspect of the present invention there is provided a handle for windows and doors, the handle comprising a handle section for operating a lock and a cavity for receiving a spindle adapted to extend into the lock, the cavity being adapted to receive the spindle and comprising second abutment means, wherein the second abutment means are adapted for axial abutment with first abutment means of the handle.

[0019] The first abutment means are preferably located at an end of the spindle, preferably on an end face of the spindle. The first abutment means are preferably include locking means, which may be clip means. The first abutment means may be retaining means, adapted to retain the spindle at the corresponding second abutment means.

[0020] The second abutment means may be a locking member, which may be a locking pin. The second abutment means may extend across the cavity, preferably from sidewalls thereof. The first and second abutment means may be adapted for inter-engagement with each other.

[0021] According to a third aspect of the present invention there is provided an assembly comprising a handle for windows and doors and a spindle, the handle comprising a handle section for operating a lock and a cavity for receiving the spindle, which is adapted to extend into the lock, the spindle comprising a head section having first abutment means adapted to abut corresponding second abutment means of the handle, wherein the first abutment means are adapted for axial abutment with the second abutment means.

[0022] According to a fourth aspect of the invention, there is provided a kit of parts comprising at least one spindle as described in the first aspect of the invention and at least one handle as described in the second aspect of the invention.

[0023] For a better understanding of the invention, and to show how embodiments of the same may be carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings in which:

Figure 1 is a schematic side view of a prior art window handle incorporating a spindle to be received in a window opening sash;

Figure 2 is a schematic end view of the prior art window as shown in figure 1;

Figures 3a and 3b are schematic cross-sectional full and detailed views respectively of a window handle with a clip in spindle;

Figure 4 is a partially exploded side view of the handle shown in figures 3a and 3b;

Figure 5 is an exploded view of the handle and clip in spindle shown in figures 3a and 3b;

Figures 6a to 6d are schematic side, front, perspective and end views respectively of the clip in spindle; and

Figures 7 is a schematic side view of the handle with clip in spindle showing its location relative to a window opening sash and window frame.

[0024] Figure 3a shows a handle mechanism 8 for a window or door, which comprises a lever 10 and a rose 12. The lever 10 is journaled in the rose 12, typically by spin-rieving techniques, to allow for relative rotation between the two to operate a lock mechanism (see 54 in Figure 7) located in a window opening sash 50 to which

the handle is in use attached. The handle 8 also incorporates a lock mechanism 14 that allows the lever 10 to be locked to the rose 12.

[0025] A spindle 16 is located in a tapered spindle receiving cavity 18, also known as a core, of the handle 8.

[0026] Openings 20 are provided in the rose 12 to receive fixings (not shown) to allow the rose 12 to be fixed to a window opening sash 50.

[0027] As shown in figure 3b the lever 10 is assembled with the rose 12 by means of a rivet form 22 at a base part of the lever 10 as it emerges from the rose 12. Similarly, an enlarged section 24 of the lever above the rose 12 ensures that the lever is retained on the rose 12.

[0028] The spindle 16 is secured in the spindle receiving cavity 18 by means of a friction fit and also by means of a steel retaining pin 26 which is received in a semi circle clip section 28 located on an end of the spindle 16.

[0029] As shown in figures 6a to 6c the spindle 16 comprises the semi circular clip section 28 and also a neck section 30, together with a body section 32. The neck section 30 is tapered towards the clip section 28 at a draft angle corresponding to a draft angle of the spindle receiving cavity 18 to allow for a good friction fit. In cross-section the neck section 30 has a generally square shape with chamfered corners. This cross-section allows for good transfer of torsional forces between the lever 10 and a lock mechanism 54 that is operated by the lever 10.

[0030] The length of the body section 32 is chosen to ensure proper engagement thereof with the lock section 54 of the window opening sash 50 to above.

[0031] In addition to the friction fit mentioned above, the semi circular clip 28 is secured to the retaining pin 26 by a push fit action. As shown in figure 5 the steel retaining pin 26 is received in openings 34 on either side of a spigot 36 of the lever 10 that projects into the rose 12. The steel retaining pin 26 is received in the openings 34 in the spigot 36 by means of an interference fit.

[0032] The spindle 16 may be made of glass-reinforced nylon and may have a strengthening metal insert 17 (see Figure 6d) running inside the spindle 16 along the length thereof. The insert provides additional torsional stability.

[0033] Also shown in figure 5 is an intermediate plate 38 which incorporates an opening 40 through which the spigot 36 of the lever 10 projects into a corresponding opening 42 of the rose 12. The intermediate plate 38 also incorporates a catch element 44 for engagement with the lock mechanism 14 in the lever 10. In addition, openings 46 for receipt of the steel retaining pins 26 are present in side elevations 48 of the intermediate plate 38.

[0034] With the steel retaining end 26 in position in the lever 10 the spindle 16 can be pushed into engagement with the lever 10 until there is an interference fit between the neck section 30 and the spindle receiving cavity 18 and the semi circular clip 28 is secured to the steel retaining pin 26.

[0035] This arrangement of the spindle 16, which has a well defined neck section 30 with the semi circular clip

28, allows for precise location of the spindle in relation to the lever 10 and rose 12. This compares to the prior art method of a circular cross-section of spindle being pushed into circular opening in which an amount of engagement between the two is difficult to define because of the nature of the interference fit.

[0036] The benefit of the precise location of the spindle 16 with relation to the lever 10 and rose 12 is that the body section 32 of the spindle 16 extends away from the handle 8 to a well defined point defined by the length of the body section 32. It is the length of the body section 32 that extends into a window opening sash 50 to a point required by the Eurogroove position for the lock mechanism 54. Different thicknesses of window opening sash 50 require different lengths of spindle 16. Given that the relative positions of the spindle 16 and handle 8 are well defined in the example described above it means that the relative location of the spindle 16 with respect to the window opening sash 50 is also well defined.

[0037] By using the spindle 16 described above the handle 8 has wide application in many types of windows and doors. This is because the same handle 8 can be used with a spindle 16 that has been specifically chosen for a given window or door. Thus, compared to the prior art, which required a specific handle and spindle pair, there is much wider application for the handle and spindle arrangement described herein. Thus, a supplier can supply a handle 8 with a variety of lengths of spindle 16 to allow for the handle 8 to be fitted to numerous different sizes of window opening sash or door. In this way there are considerable reductions in redundancy of handle and spindle pairs, which could otherwise only be used in one thickness of window opening/or door. In addition, for unusual thicknesses of window openings sash 50 or door a bespoke length of spindle 16 can be manufactured to the correct length.

[0038] It will be seen from the above that the disadvantages of the prior art handles have been addressed by the provision of a precise locate relationship between the handle 8 and spindle 16 to allow for a precise relationship between the spindle 16 and the casement lock mechanism 54.

[0039] In addition, the system described herein has the advantage that the spindle 16 is removable to allow the handle 8 to be used on a different thickness of window openings sash 50 or door.

[0040] Furthermore, the use of plastics material for the spindle 16 allows the clip 28 to be formed on the spindle and allows the clip 28 to function well and function in a repeatable way that is harder to achieve with metal spindles.

[0041] The invention takes into account current mass production techniques which takes into account the draft angle of the handle core detail. In fact the draft angle of the core detail provides the parallel walls that are matched on the tapered end of the spindle to provide a Morse taper type fit which is necessary to transfer the torsion loads from the spindle drive into the handle body.

[0042] Current standard practice in the industry is to spin rivet (orbital rivet) the lever to the base providing a secure fixing but allowing the lever to rotate freely in respect to the rose. The invention takes this fundamental principle into account and relies on this standard practice as the method of assembly. The invention only relies on the insertion of a 2mm diameter steel pin across the lever cavity as additional to current manufacturing techniques, but can still form part of any mass production.

[0043] Therefore it is the ability to mass produce that drives the new invention. The new invention is concerned with providing a handle which has interchangeable spindles that can be mass produced, economically. The novelty comes from manufacturing a spindle from plastics material thereby utilising the principle of a mechanical clip property of the plastics material to engage the steel pin and thus hold it securely and positively in position within the lever cavity. The spindle is proposed to be manufactured using over moulded steel reinforcement techniques to provide adequate mechanical strength to the spindle. The additional novelty comes from utilising the draft taper of the lever core to produce a Morse taper type fit between the spindle and lever to provide a sound mechanical method of transferring the mechanical torsion loads.

[0044] Attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0045] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0046] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings) may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0047] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A spindle for use with handles for windows and doors, the spindle comprising a head section having first abutment means adapted to abut corresponding

- second abutment means of the handle with which the spindle is to be used, wherein the first abutment means are adapted for axial abutment with the second abutment means.
2. The spindle as claimed in claim 1, wherein the first abutment means are located at an end of the spindle. 5
3. The spindle as claimed in claim 1 or claim 2, wherein the first abutment means include locking means. 10
4. The spindle as claimed in any preceding claim, wherein the first abutment means are retaining means adapted to retain the spindle at the corresponding second abutment means. 15
5. The spindle as claimed in claim 4, wherein the second abutment means is a locking member.
6. The spindle as claimed in any preceding claim, wherein the spindle is adapted to be received in a cavity of the handle. 20
7. The spindle as claimed in any preceding claim, wherein the spindle comprises a tapered neck section, adapted to be received in a cavity of the handle. 25
8. The spindle as claimed in any preceding claim, wherein the spindle is made of a reinforced plastics material. 30
9. The spindle as claimed in any preceding claim, wherein the spindle includes a reinforcing insert that may be internal to a body of the spindle. 35
10. A handle for windows and doors, the handle comprising a handle section for operating a lock and a cavity for receiving a spindle adapted to extend into the lock, the cavity being adapted to receive the spindle and comprising second abutment means, wherein the second abutment means are adapted for axial abutment with first abutment means of the handle. 40
11. The handle as claimed in claim 10, in which the first abutment means are preferably located at an end of the spindle. 45
12. The handle as claimed in claim 10 or claim 11, in which the first and second abutment means are adapted for inter-engagement with each other. 50
13. An assembly comprises a handle for windows and doors and a spindle, the handle comprising a handle section for operating a lock and a cavity for receiving the spindle, which is adapted to extend into the lock, the spindle comprising a head section having first abutment means adapted to abut corresponding second abutment means of the handle, wherein the 55
- first abutment means are adapted for axial abutment with the second abutment means.
14. A kit of parts comprises at least one spindle as claimed in any one of claims 1 to 9 and at least one handle as described in any one of claims 10 to 12.

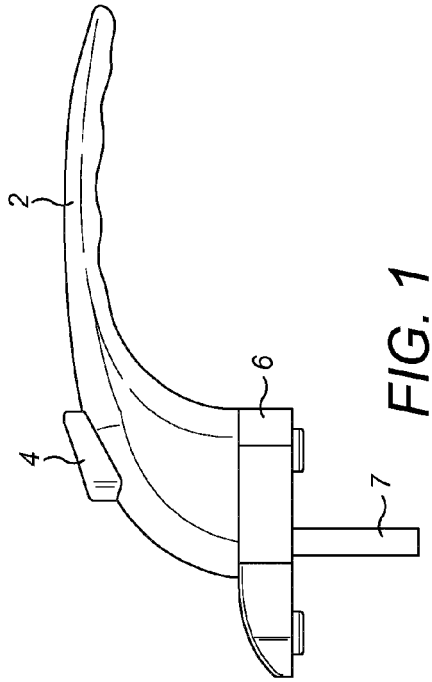


FIG. 1

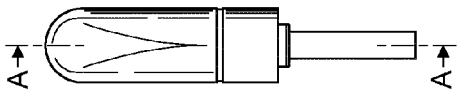


FIG. 2

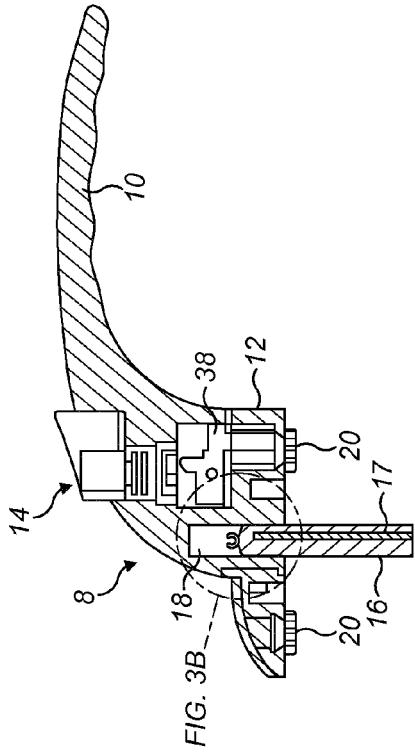


FIG. 3a

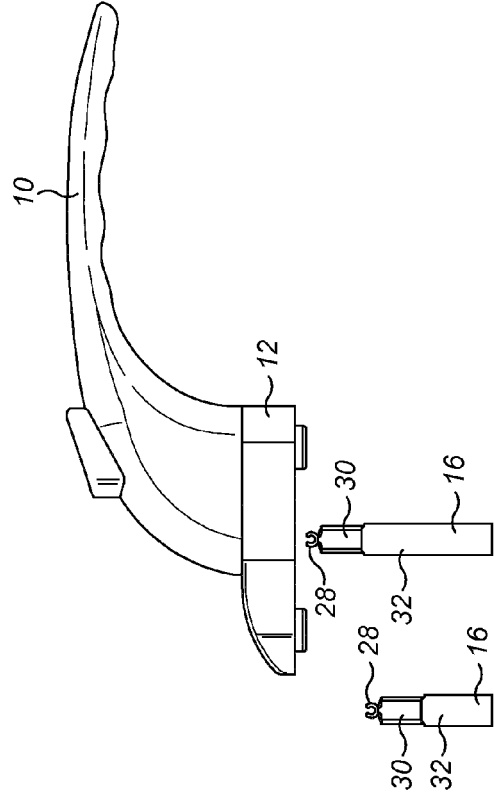


FIG. 4

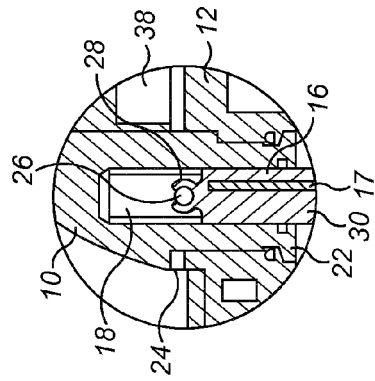


FIG. 3b

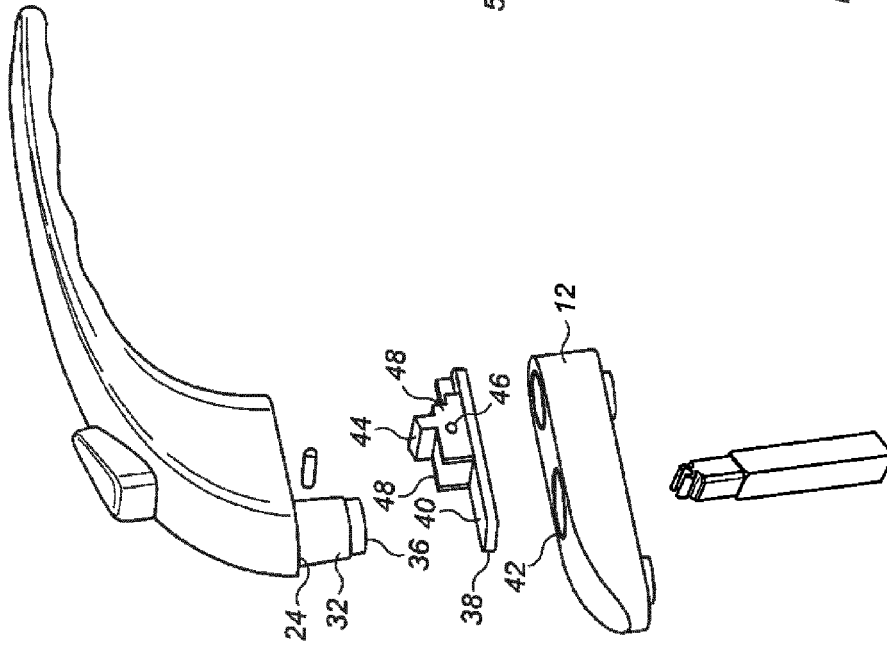


FIG. 5

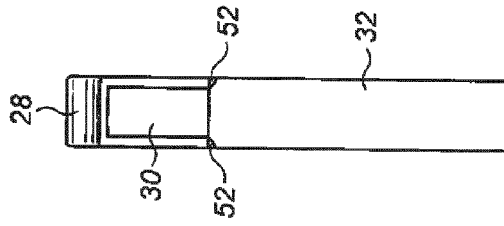


FIG. 6a

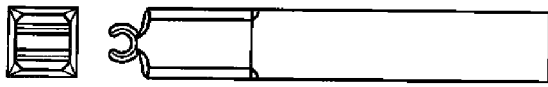


FIG. 6b



FIG. 6d

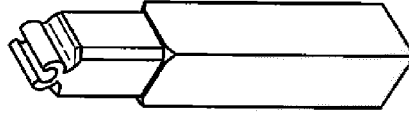


FIG. 6c

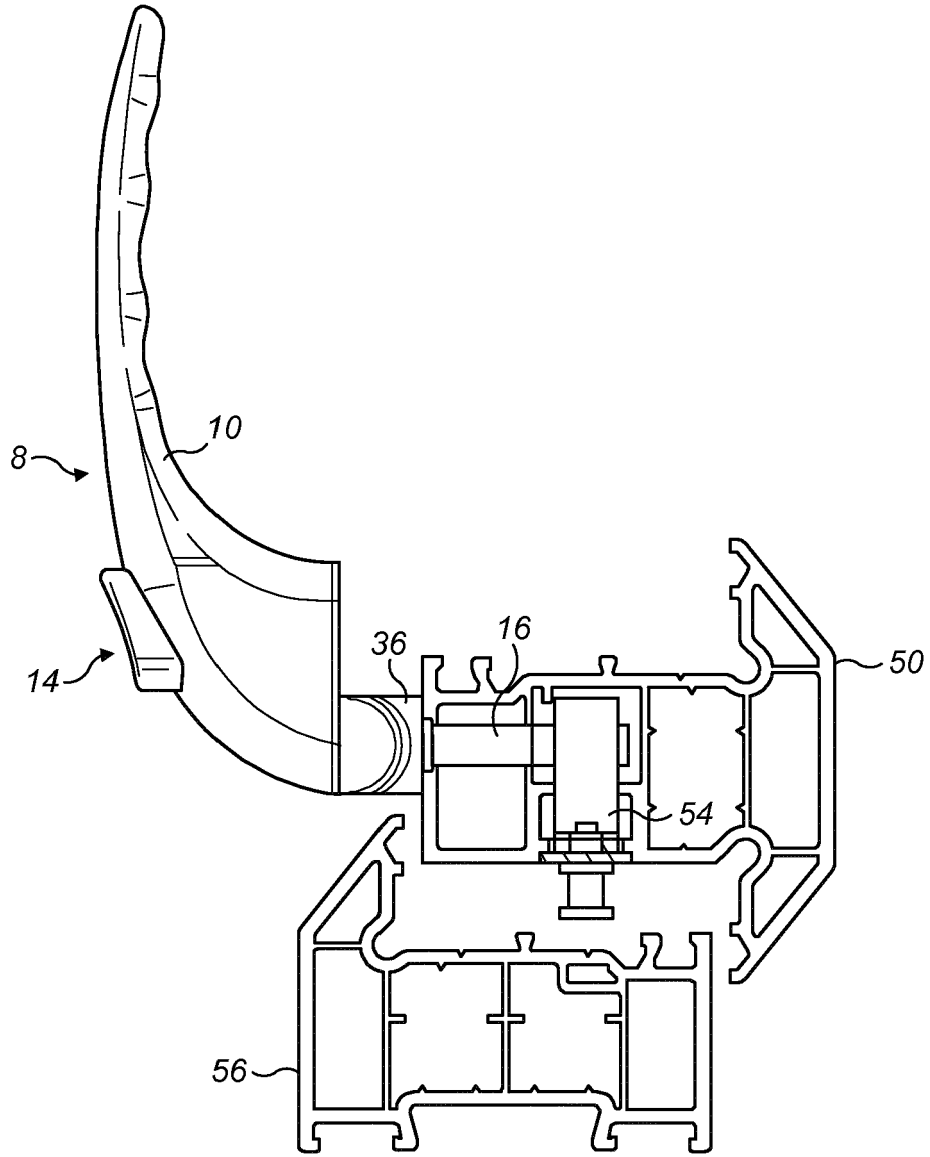


FIG. 7