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(71) Applicant: **Garner Aluminium Extrusions Limited**
Ormonde Drive, Denby Hall Business Park
Derby
Derbyshire DE5 8LE (GB)

(72) Inventor: **PARRY, Philip Dayton**
Derby, Derbyshire DE5 8LE (GB)

(74) Representative: **Foot, Paul Matthew James**
Withers & Rogers LLP
4 More London Riverside
London
Greater London SE1 2AU (GB)

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(54) A HINGE LOCATOR

(57) A hinge locator for installing a hinge mechanism of a sash window within an outer frame of a fenestration unit, illustrated in Figure 2, the hinge locator comprising; a body defining a ramp portion configured to be mounted within an outer frame of the fenestration unit so as to

guide the window sash into a desired position during the closure thereof, and a retaining formation for receiving a first end of the hinge mechanism formed from the body.

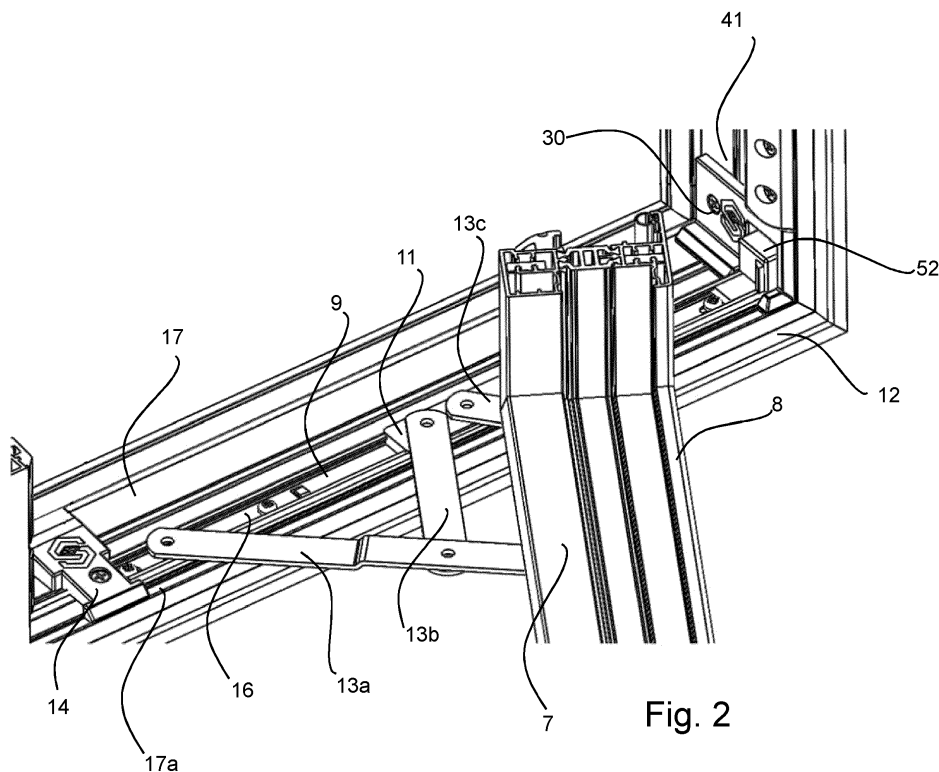


Fig. 2

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Description

FIELD

[0001] The present teachings relate to a hinge locator for installing a hinge mechanism of a sash window within an outer frame of a fenestration unit, and a method of installing a sash within an outer frame.

BACKGROUND

[0002] Modern fenestration units typically comprise a frame assembly, into which a panel, such as a glass pane, or a sealed double glazing unit, is inserted in a direction generally normal to the plane of the panel. Typically, such frame assemblies are pre-assembled prior to the panel being inserted. A glazing bead is then secured to the frame assembly after the panel has been inserted into the frame assembly, along with a gasket, for securing and sealing said panel within the frame assembly.

[0003] The frame assembly is commonly a moveable sash, which can rotate and translate within an outer frame of the fenestration unit. The sash can be fitted into the outer frame via a hinge mechanism. Correct positioning and alignment of the hinge mechanism within the outer frame is essential to the functionality of the fenestration unit. Misalignment of the hinge mechanism may result in gaps between the sash and the outer frame when the outer frame is in a closed position, and allow airflow and moisture through the fenestration unit.

[0004] In order to fasten the hinge mechanism to the outer frame, the sash must be in an open position to prevent obstruction of the fastening process. This means the installer, or installers, must support some of the weight of the sash, whilst holding the hinge mechanism in the correct positioning and fastening the hinge mechanism within the outer frame. For large fenestration units, the sash may be too heavy to be supported by one installer, meaning additional labour is required. Even in the case of small fenestration units, additional installers may be required if one installer cannot support the sash and hold the hinge mechanism in position, whilst fastening the hinge mechanism into place. This is a cumbersome and labour inefficient process.

[0005] Beadless window frames require the glazing unit to be installed within the sash prior to installation within the outer frame. The additional weight of the glazing unit will makes the sash heavy, and additional labour may again be required to support the extra weight of the glazing unit whilst installing the sash in the correct position.

[0006] The present teachings seek to overcome or at least mitigate the problems of the prior art.

SUMMARY

[0007] A first aspect of the present invention is provides

a hinge locator for installing a hinge mechanism of a sash window within an outer frame of a fenestration unit, the hinge locator comprising;

a body defining a ramp portion configured to be mounted within an outer frame of the fenestration unit so as to guide the window sash into a desired position during the closure thereof, and
a retaining formation for receiving a first end of the hinge mechanism formed from the body.

[0008] Advantageously, this retains the base of the hinge mechanism within the retaining formation in the correct alignment within the outer frame. In order to fasten the hinge mechanism, it must be in its open position, meaning the weight of the sash window cannot be fully supported by the outer frame and the fitter must support some of the weight. The hinge locator assists in locating the fixed part of the hinge mechanism within the outer frame for fastening into place, therefore minimising user intervention. The configuration minimises the number of extra parts needed to be manufactured, as the ramp member and the first guiding formation are integral, and minimises the labour required to install the fenestration unit.

[0009] The retaining formation may be located on a side surface of the ramp portion and extend from a top surface of the ramp portion to a base surface of the ramp portion.

[0010] The hinge locator may be configured to be fitted within the outer frame of the fenestration unit prior to the fixing of the hinge mechanism within the retaining formation.

[0011] The ramp portion and the retaining formation may be integral.

[0012] The retaining formation may be located on a side surface of the hinge locator that is adjacent to an inclined edge of the ramp portion.

[0013] Advantageously, this configuration enables the ramp member to serve the function of guiding the glazing unit into the correct alignment, whilst the retaining formation is in the correct configuration to receive the hinge mechanism.

[0014] The retaining formation may be a recess.

[0015] Advantageously, this is a simple way of configuring the retaining formation to receive the hinge mechanism, whilst using a part that is required for to aid closing of the sash regardless. The shape of the recess can be altered based on the shape of the end of the part it receives.

[0016] The retaining formation may be a recess comprising two parallel sides and one perpendicular side.

[0017] Advantageously, this shape of recess complements the common shape of the end of the fixed part of the hinge mechanism. This has functional advantages because the end of the fixed part is more likely to be correctly aligned, and additionally makes the hinge locator applicable to a wide range of hinge mechanisms cur-

rently on the market.

[0018] The hinge locator may comprise a bore configured to receive a fastener.

[0019] Advantageously, this is a simple way of securing the hinge locator within the outer frame.

[0020] The bore may be located on a top surface of the hinge locator extending from a top edge of the ramp portion.

[0021] Advantageously, having the hole in the top surface makes it easily accessible to the fitter installing the fastening mechanism, for example a screw.

[0022] The hinge locator may comprise an at least partially planar bottom surface configured to sit within the outer frame, and a mutually parallel top surface extending from the ramp portion.

[0023] Advantageously, the bottom surface of the hinge locator being planar allows it to sit flush to the outer surface upon installation. The planar top surface is advantageous because it provides a region for the sash to sit upon when it is in the closed position.

[0024] A second aspect of the present invention provides a hinge locator system for installing a hinge mechanism within a fenestration unit comprising;

- a hinge locator of the first aspect, and
- a second locator comprising;
- a body configured to be mounted to an outer frame, and
- a second retaining formation configured to receive a second end of a hinge mechanism.

[0025] Advantageously, having a second locator retains the hinge mechanism at a second location, and therefore restricts its movement in an axis that is running between the hinge locator and the second locator, and decreases the likelihood of misalignment.

[0026] The second locator may be configured to be located at a corner of the outer frame remote from the hinge locator.

[0027] Advantageously, this may be a space efficient configuration, and inhibits the second locator being an obstacle to the movable parts of the hinge mechanism upon assembly, and to the installation process. Additionally, the corner is a suitable datum to retain the hinge mechanism in the correct position in two directions.

[0028] The body of the second hinge locator may be configured to engage a first surface of the outer frame and an adjacent second surface of the outer frame.

[0029] Advantageously, this configuration is a compact way of seating the second locator within the corner.

[0030] The second locator may comprise a ramped surface.

[0031] Advantageously, this aids the glazing unit being in the correct position when it is in its closed position.

[0032] The second locator may comprise a hole configured to receive a fastener.

[0033] Advantageously, this is a simple way of securing the hinge locator within the outer frame.

[0034] A third aspect of the present invention provides a fenestration unit assembly for installation within an opening comprising;

- an outer frame,
- a sash moveable relative to the outer frame member comprising;
- an inner frame, and
- a glazing unit,
- a hinge mechanism comprising;
- a fixed component, and
- an arm pivotable relative to the fixed component, and
- a hinge locator system of the second aspect.

[0035] Advantageously, this assembly requires a lower level of user intervention than traditional methods. Additionally, if the sash is beadless the glazing unit must be installed prior to fitting within the outer frame, which makes the sash heavier. The hinge locator system is particularly advantageous in this case because the fitter does not have to hold the entire weight of the frame in position.

[0036] The hinge mechanism may be further configured to move the sash to translate relative to the outer frame.

[0037] A second hinge locator system may be mounted within the outer frame on an opposing side to the first hinge locator system.

[0038] Advantageously, this further simplifies the fitting of the sash by enabling hinges on both sides of the sash to be more easily secured.

[0039] A forth aspect of the present invention provides a method of installing a glazing unit within an outer frame of a fenestration unit comprising the steps of;

- a. fitting the hinge locator of a first aspect within the outer frame,
- b. offering up a hinge mechanism mounted to a sash to the outer frame such that an end of a fixed part of the hinge mechanism is located in the retaining formation, and
- c. fastening the fixed part of the hinge mechanism to the outer frame

[0040] Advantageously, this method reduces the level of user intervention because the fitter does not have to hold the base of the hinge mechanism in place. This may reduce the cost of labour for installing the fenestration unit.

[0041] The method may comprise a further step d) after step a) of fitting the second locator within the outer frame.

[0042] The method may comprise a further step e) after step b) of retaining a second end of the fixed part of the

hinge mechanism in the retaining formation of the second locator.

BRIEF DESCRIPTION OF THE DRAWINGS

[0043]

Figure 1 is a front view of a fenestration unit having a hinge locator system according to an embodiment of the present teachings;

Figure 2 shows an isometric view of a section of the fenestration unit of Figure 1, showing the window sash in its open position and the hinge locator system;

Figure 3 is an isometric view of the hinge locator of Figure 2; and

Figure 4 is an isometric view of the second locator of Figure 2.

DETAILED DESCRIPTION OF EMBODIMENTS

[0044] Figure 1 shows a fenestration unit of an embodiment of the present teachings generally indicated at 10, comprising an outer frame 12 with a hinge locator 14, illustrated in Figure 2, mounted thereto. The fenestration unit 10 of this embodiment is suitable for a window, door or other type of fenestration, such as a vent or cladding panel. A sash 8 is moveably mounted within the outer frame 12.

[0045] The term "closed position" refers to the position of the sash 8 when it is substantially coplanar with the outer frame 12. The open position refers to the position of the sash 8 when it is in any other position within the outer frame 12.

[0046] The term "vertical" in this context refers to the direction perpendicular to the side of the outer frame 12 in contact with the hinge locator 14. The term "horizontal" refers to the direction parallel to the side of the outer frame 12 in contact with the hinge locator 14.

[0047] The sash 8 comprises an inner frame 7 and a glazing unit 18. In this embodiment the sash 8 is beadless. That is, the glazing unit 18 is received within a fixed channel of the inner frame 7, and is fitted into the channel when three sides of the inner frame 7 are assembled. A fourth side of the inner frame 7 is then secured across the opening so the glazing unit 18 is held in place on all sides and cannot readily be removed from the inner frame 7. In other embodiments the inner frame may be beaded, and the glazing unit 18 may be fitted transverse to the plane of the inner frame, before a bead is fitted to hold it in place.

[0048] The sash 8 is connected to the outer frame 12 via a hinge mechanism 16, so that the sash is retained within the outer frame 12 whilst being moveable relative to the outer frame 12. It shall be appreciated that although

the glazing unit 18 in this embodiment is a double glazing unit, alternative glazing units, for example triple glazing or opaque panels, for example for doors, may be used.

[0049] Fenestration units 10 of this type are typically used in external walls of domestic and commercial buildings. It is therefore necessary that the fenestration unit meets requirements for thermal insulation, sealing against water ingress, draughts etc.

[0050] Typically, the sash 8 and the outer frame 12 are metallic frames constructed from four members connected by mitre joints. A metallic sash as described here may include features or components of some non-metallic or composite material, such as plastics material or wood. In particular, the sash 8 may comprise external and internal aluminium profiles, which provide structural strength to the inner frame, with a thermal break of plastics or foam material sandwiched therebetween.

[0051] Typically, the sash 8 and the outer frame 12 are aluminium. The sash 8 and the outer frame 12 of this embodiment comprise a 6063T6 aluminium alloy. However, it shall be appreciated that any other suitable material may be used. In one alternative, the sash and the outer frame are of some other suitable material, such as some other 6063 series aluminium alloy, or a 6060 series aluminium alloy.

[0052] Figure 2 is an isometric view of the fenestration unit 10 having a hinge locator system configured to position the hinge mechanism 16. In this embodiment, the outer frame 12 comprises a first surface 17, configured to receive the hinge locator 14. The first surface 17 and a second surface 41 normal to the first are configured to receive a second locator 30 of the hinge locator system. The first surface 17 of the outer frame 12 is substantially horizontal in this embodiment. In this embodiment a relatively narrow groove or channel 17a is provided on the surface 17, and an aligned groove or channel (not visible) is provided on the second surface 41.

[0053] The first groove 17a complements a corresponding mounting formation 44 on the hinge locator 14, and a corresponding mounting formation 46 on the second locator 30.

[0054] Figure 3 is an enlarged view of the hinge locator 14 illustrated in Figure 2. The hinge locator 14 comprises a body 19, a ramp portion 20 formed from the body and a first retaining formation 22, to receive the hinge mechanism 16. In this embodiment, the body 19, the ramp portion 20 and the first retaining formation 22 are integral and the retaining formation is a recess. This reduces the number of parts necessary for manufacture and installation, and is also space efficient.

[0055] The hinge locator 14 is manufactured from a plastics material, but in other embodiments may be metallic or another suitable material. The hinge locator 14 is manufactured using injection moulding, however any suitable manufacturing technique may be used.

[0056] The ramp portion 20 of the hinge locator 14 comprises a first ramp section 24 and a second ramp section 26. The ramped surface of the first ramp section 24 is

configured to be steeper in gradient than the ramped surface of the second ramp section 26, to aid the run-up process of the sash 8 into the closed position. The base surface of the first ramp section 24 is mounted within the first groove 17a upon assembly. This assists with its correct alignment and retention.

[0057] The second ramp section 26 comprises a planar bottom surface configured to sit within the outer frame 12 on the surface 17. The first retaining formation 22 and a hole 28 extend from the top surface of the ramp section 26 to the base surface of the ramp section 26. The hole 28 is configured to receive a fastener. In this embodiment, the hole 28 is countersunk to receive the head of a screw in a flush manner, as illustrated in Figure 2.

[0058] The first retaining formation 22 is located on a side surface of the hinge locator 14 that is adjacent to an inclined edge of the ramp portion 20. A second retaining formation 23 is located on the opposing side of the ramp portion 20 in the same equivalent position. The second retaining formation 23 makes the hinge locator 14 suitable for use on either side of the hinge mechanism 16, and therefore increases its versatility for both right hand and left hand opening sashes.

[0059] In this embodiment, the retaining formations 22, 23 are both recesses, each comprising two parallel sides, and a side perpendicular to the parallel sides that extend the full depth of the hinge locator. This arrangement is suitable for receiving the hinge mechanism 16 of Figure 2, because the two ends of the hinge mechanism 16 are rectangular. The width of the retaining formation 22 is configured to be slightly wider than the width of the end of the hinge mechanism 16, to ensure the hinge mechanism 16 fits within the retaining formation 22, but that the movement of the hinge mechanism 16 within the retaining formation 22 is restricted. The two parallel sides restrict the movement of the hinge mechanism in a first axis extending between the parallel sides, the perpendicular side restricts the movement in an axis running perpendicular to the first axis, and the outer frame restricts the movement downwardly. Thus, the hinge mechanism 16 is correctly aligned in three directions when fitted therein.

[0060] The body 19 of the hinge locator 14 comprises a planar top surface 50 that extends from a top edge of the ramp portion 20, parallel to the base surface that is mounted to the surface 17 of the outer frame 12. This configuration enables the sash 8 to sit upon the planar top surface 50 of the hinge locator 14 when the window is in its closed position, in the correct alignment.

[0061] Figure 4 shows a perspective view of the second locator 30. The hinge locator 14 and the second locator 30 together make up the hinge locator system.

[0062] The second locator 30 comprises a body 34 configured to be mounted to the outer frame 12, a third retaining formation 32 and a second ramp portion 36. Upon assembly, the second locator 30 engages with the end of the hinge mechanism 16 remote from the hinge locator 14. The second locator 30 is configured to be

mounted to the outer frame 12 at a corner. The corner acts as a datum point and positions the second locator 30 correctly in two directions, which consequently aids the correct positioning of the hinge mechanism 16.

[0063] The second locator 30 is manufactured from a plastics material, however it shall be appreciated that the second locator 30 may be manufactured using any suitable material, for example a metallic material. The second locator 14 is manufactured using injection moulding, however any suitable manufacturing technique may be used.

[0064] In this embodiment, the second locator 30 extends in two perpendicular directions to form a substantially L-shaped cross-section. A vertically extending section of the L-shape is longer than a horizontally extending section of the L-shape. This arrangement enables the second locator 30 to receive the end of the hinge mechanism 16 that has a vertical protrusion 52.

[0065] The third retaining formation 32 extends in two perpendicular directions to form an L-shaped recess in the body 34 of the second locator 30. The third retaining formation 32 comprises two sets of parallel sides that are perpendicular to one another, and a side that is perpendicular to both sets of parallel lines to form an L-shape. This configuration restricts the movement and aids the correct positioning of the hinge mechanism 16 in three directions. Having the hinge locator 14 and the second locator 30 fixes the position of the hinge mechanism 16 and prevents it from sliding out of the retaining formation 22.

[0066] The second locator 30 comprises a second mounting formation 48 to mount into the non-visible groove of the second surface 41 to aid retention and alignment of the second locator.

[0067] The second ramp portion 36 extends from the horizontally extending section of the second locator 30. In this embodiment, the horizontally extending section and the second ramp portion 36 are shorter than the total length of the first ramp portion 20 and the body 19. This is because there is more space available both at the location of the hinge locator 14 and in the orientation of the hinge locator 14. The second ramp portion 36 aids the correct positioning of the sash 8 by providing a run up.

[0068] The second locator 30 comprises a countersunk bore 38 extending through the vertical section of the second locator 30 to receive a screw.

[0069] The hinge mechanism 16 comprises a fixed component and at least one moveable arm. The fixed component of the hinge mechanism 16 of this embodiment is a track 9. A slidable member 11 allows the sash 8 to translate through the linear movement of the slidable member 11 within the track 9. The hinge mechanism 16 of this embodiment comprises a first, second and third arm 13a, 13b, and 13c. The arms 13a-c are configured in such a way as to allow a simultaneous pivoting and translational movement of the sash 8 as is known per se.

[0070] To fit the sash 8 within the outer frame 12, firstly the hinge locator 14 of the above embodiment is fitted

within the outer frame 12 by mounting the mounting formation 44 within the first groove 17a of the outer frame 12 and securing it with the screw. This ensures the hinge locator 14 is correctly aligned within the outer frame 12. The hinge mechanism 16, which is mounted to the sash 8, is subsequently offered up to the outer frame 12 such that an end of the track 9 of the hinge mechanism 16 is located in the retaining formation 23. In this embodiment, the second locator 30 is fitted to the corner of the sash 8 prior to the installation of the sash 8, so that the base surface of the second locator 30 and the base surface of the hinge locator 14 are positioned on the first surface 17 of the outer frame 12. The second end of the hinge mechanism 16 is retained in the third retaining formation 32. This provides positive location and support for the track 9 and for the sash 8.

[0071] The hinge mechanism 16 is then fastened to the outer frame 12; in this embodiment using a screwdriver and screw. This permanent mounting is facilitated by the hinge locator system already aligning the track 9 in the correct location.

[0072] In preferred embodiments, a corresponding locating formation is provided on the opposing outer frame member so that a second hinge on a second side of the sash 8 may be located within that corresponding formation.

[0073] In alternative embodiments, the retaining formation may be a separate part that clips onto the body of the hinge locator. The retaining formation may be any suitable shape, for example triangular or rounded. The retaining formation may be any suitable means of retaining the hinge mechanism, for example a clamp.

[0074] In alternative embodiments, the hole in the ramp section of the hinge locator may be located in any position, for example extending from the top surface to the bottom surface of the body 19. The hole may be configured to receive any suitable form of fastener, for example a rivet. Alternatively, the hinge locator 14 may be mechanically fastened to the other frame 12 via a clip fit mechanism between the base surface of the hinge locator 14 and the outer frame 12. Any suitable non-mechanical fastening means may also be used, for example an adhesive.

[0075] In alternative embodiments, the second locator may comprise any suitable cross-section configured to position the second locator in a corner of the outer frame 12. Alternatively, the second locator 30 may be configured to sit at any suitable location within the outer frame, for example displaced from the corner. The second locator may be identical to the hinge locator and positioned at a remote end of the hinge mechanism.

[0076] Although described in relation to a side hung sash that pivots about a vertical axis, the hinge locator may also be used for mounting hinges of top hung windows that pivot about a horizontal axis.

[0077] In alternative embodiments, the hinge mechanism may comprise any number of arms configured in any suitable arrangement. For example, a simple hinge

mechanism may comprise a fixed component and a single pivotable arm.

5 Claims

1. A hinge locator for installing a hinge mechanism of a sash window within an outer frame of a fenestration unit, the hinge locator comprising;

a body defining a ramp portion configured to be mounted within an outer frame of the fenestration unit so as to guide the window sash into a desired position during the closure thereof, and a retaining formation for receiving a first end of the hinge mechanism formed from the body.

2. The hinge locator of claim 1 wherein the retaining formation is located on a side surface of the ramp portion and extends from a top surface of the ramp portion to a base surface of the ramp portion.

3. The hinge locator of claim 1 or claim 2 wherein the ramp portion and the retaining formation are integral.

4. The hinge locator of any preceding claim wherein the retaining formation is located on a side surface of the hinge locator that is adjacent to an inclined edge of the ramp portion.

5. The hinge locator of any preceding claim wherein the retaining formation is a recess, optionally wherein the recess comprises two parallel sides and one perpendicular side.

The hinge locator of any preceding claim wherein the hinge locator comprises a bore configured to receive a fastener, optionally wherein the bore is located on a top surface of the hinge locator extending from a top edge of the ramp portion.

6. The hinge locator of any preceding claim comprising an at least partially planar bottom surface configured to sit within the outer frame, and a mutually parallel top surface extending from the ramp portion.

7. A hinge locator system for installing a hinge mechanism within a fenestration unit comprising;

a hinge locator of any preceding claim, and a second locator comprising;

a body configured to be mounted to an outer frame, and a second retaining formation configured to receive a second end of a hinge mechanism.

8. The hinge locator system of claim 7 wherein the sec-

ond locator is configured to be located at a corner of the outer frame remote from the hinge locator, optionally wherein the second locator comprises a hole configured to receive a fastener.

part of the hinge mechanism in the retaining formation of the second locator.

- 5
9. The hinge locator system of any one of claim 7 or claim 8 wherein the body of the second locator is configured to engage a first surface of the outer frame and an adjacent second surface of the frame, optionally wherein the second locator comprises a ramped surface. 10
10. A fenestration unit assembly for installation within an opening comprising; 15
- an outer frame,
- a sash moveable relative to the outer frame member comprising;
- an inner frame, and 20
- a glazing unit,
- a hinge mechanism comprising;
- a fixed component, and 25
- an arm pivotable relative to the fixed component, and
- a hinge locator system of any one of claims 9 to 13. 30
11. The fenestration unit assembly of claim 10 wherein the hinge mechanism is further configured to move the sash to translate relative to the outer frame. 35
12. The fenestration unit assembly of any one of claim 10 or 11 wherein a second hinge locator system is mounted within the outer frame on an opposing side to the first hinge locator system. 40
13. A method of installing a glazing unit within an outer frame of a fenestration unit comprising the steps of;
- a) fitting the hinge locator of any one of claims 1 to 6 within the outer frame, 45
- b) offering up a hinge mechanism mounted to a sash to the outer frame such that an end of a fixed part of the hinge mechanism is located in the retaining formation, and
- c) fastening the fixed part of the hinge mechanism to the outer frame 50
14. The method of claim 13 comprising a further step d) after step a) of fitting the second locator of within the outer frame. 55
15. The method of claim 14 comprising a further step e) after step b) of retaining a second end of the fixed

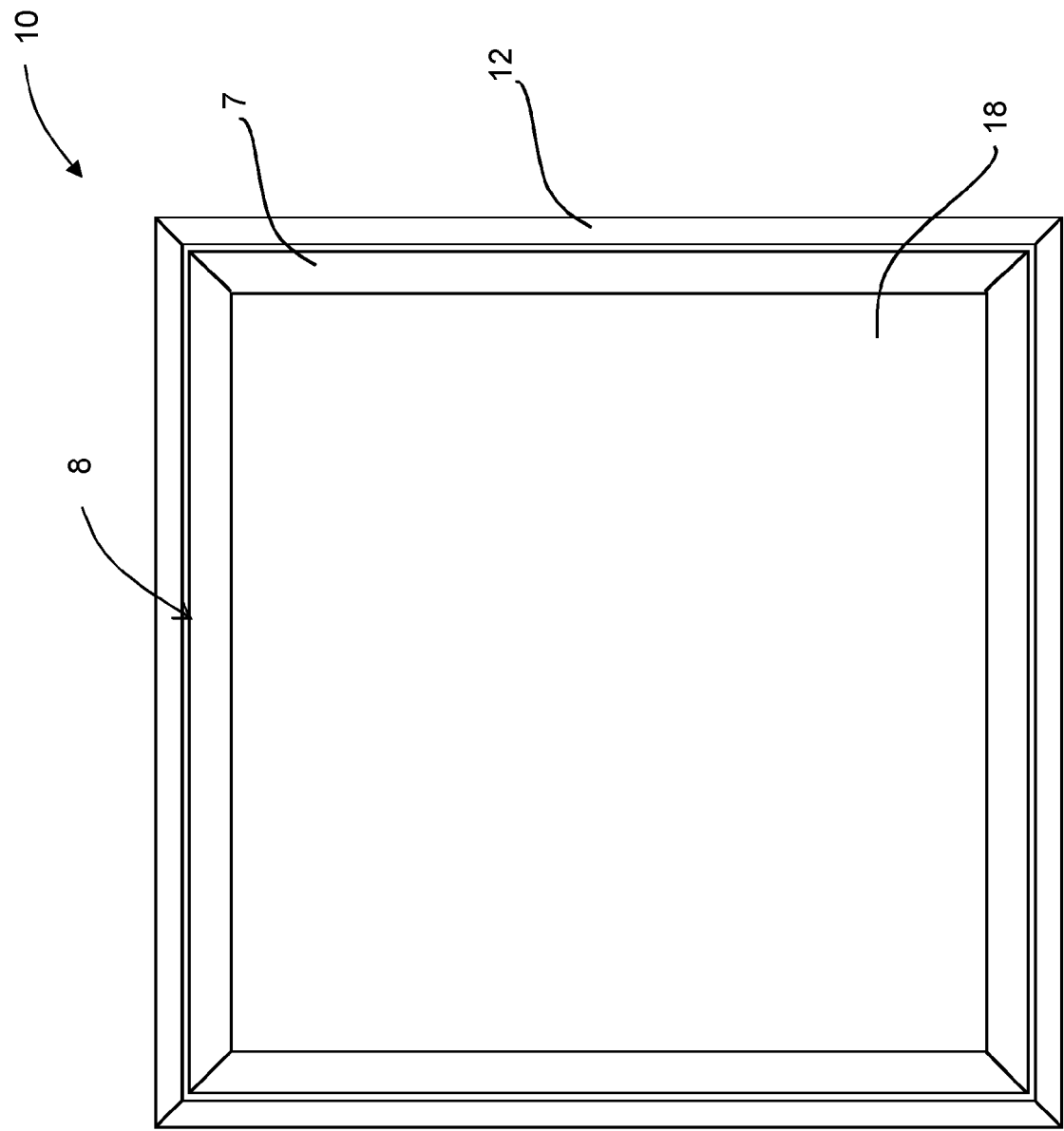


Fig. 1

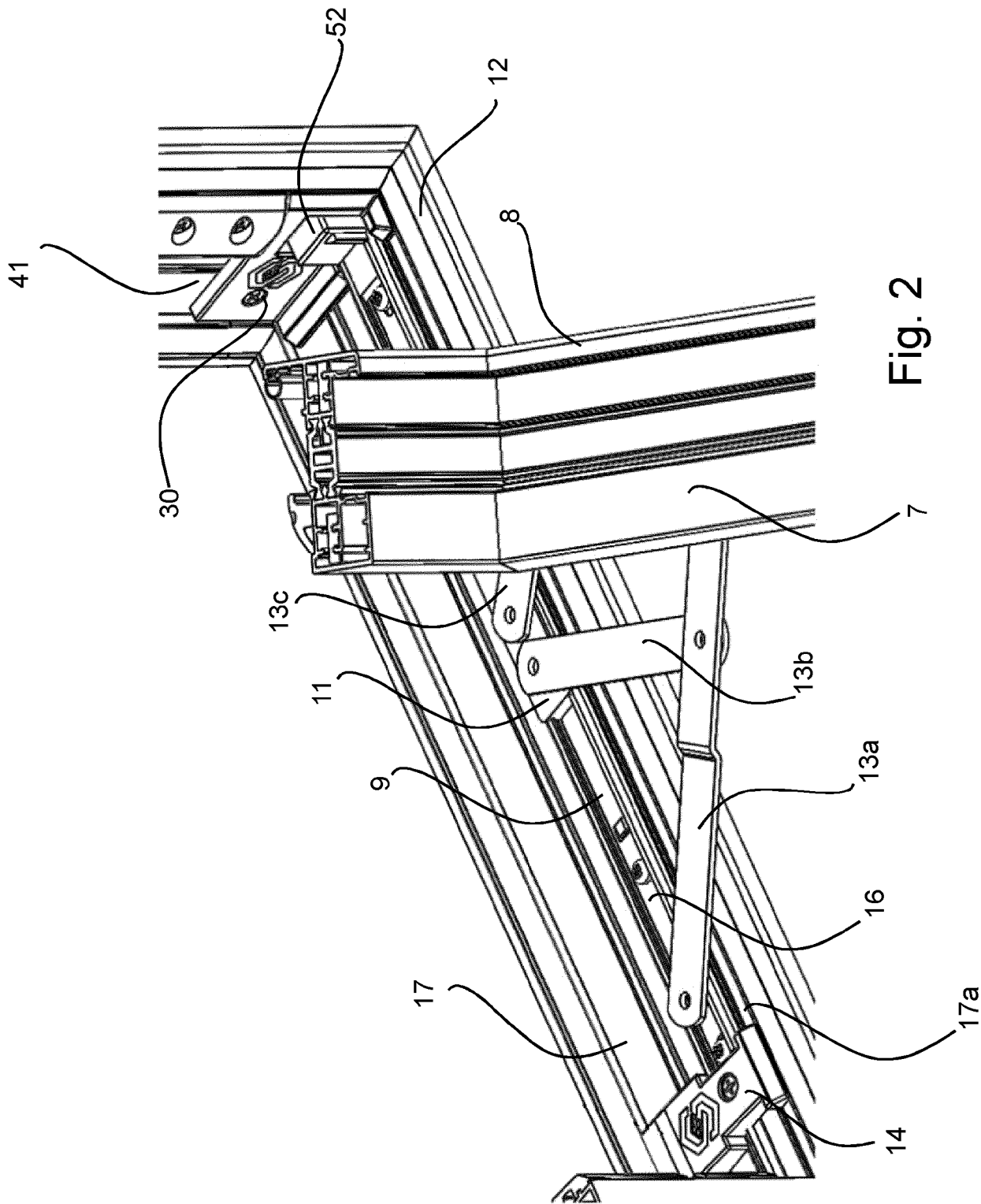
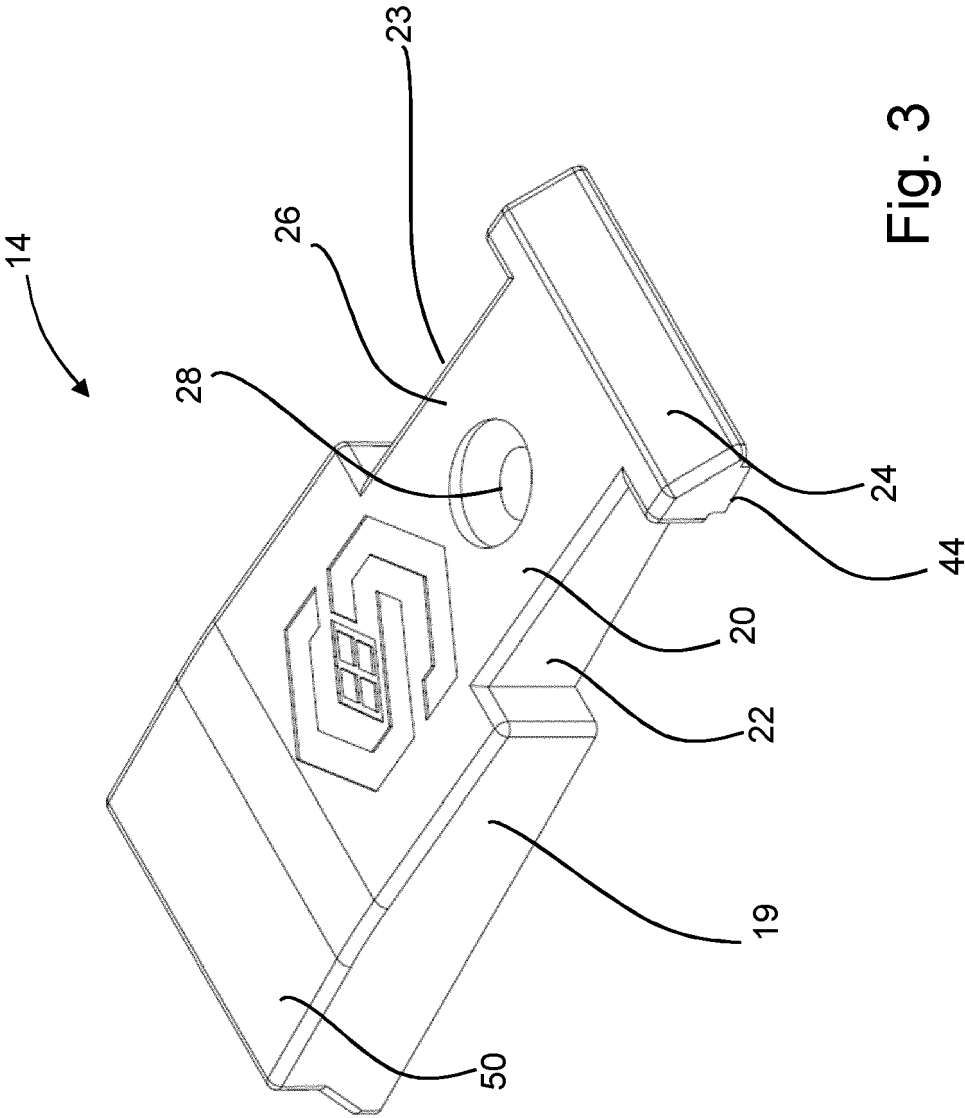


Fig. 2



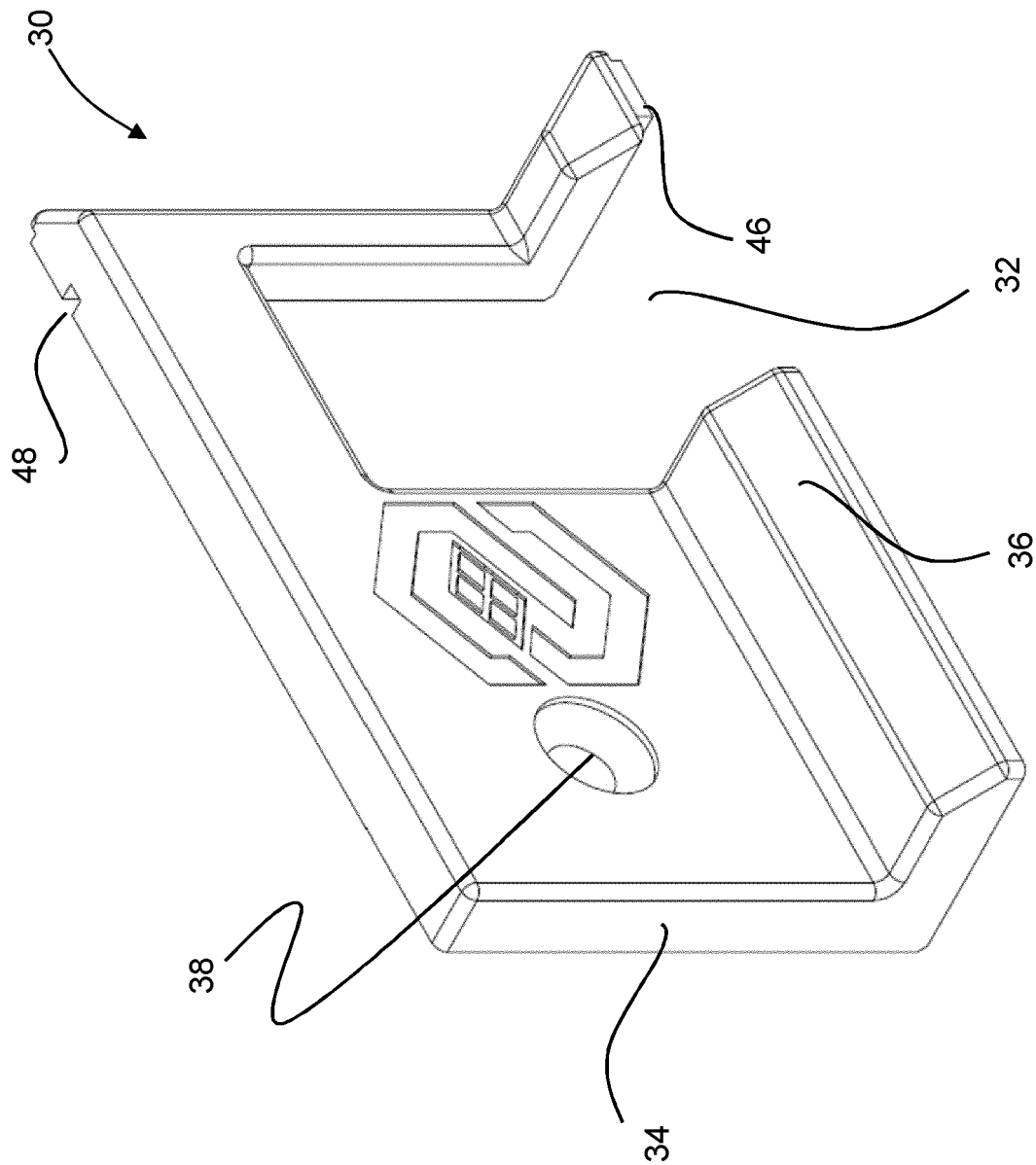


Fig. 4



EUROPEAN SEARCH REPORT

Application Number
EP 21 15 3855

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	GB 2 374 899 A (COTSWOLD ARCHITECT PROD [GB]) 30 October 2002 (2002-10-30) * page 3, line 17 - page 5, line 9; figures 1-3 *	1-15	INV. E05D15/28 E05D15/30 E05D15/52 E05F7/00 E05F7/06
X	WO 02/12667 A1 (JURRAS LTD [IE]; BAILEY RICHARD ALAN [GB]; RING DONAL [IE]) 14 February 2002 (2002-02-14) * page 4, paragraph 4 - page 9, paragraph 5; figures 1-8 *	1-15	
X	DE 10 2006 005953 B3 (ROTO FRANK AG [DE]) 14 June 2007 (2007-06-14) * paragraphs [0019], [0020]; figures 1,2 *	1-6	
			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 19 May 2021	Examiner Rémondot, Xavier
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 21 15 3855

5 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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