



(11)

EP 3 508 663 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
10.07.2019 Bulletin 2019/28

(51) Int Cl.:
E04D 13/03^(2006.01) E06B 7/10^(2006.01)

(21) Application number: **19150613.8**

(22) Date of filing: **07.01.2019**

(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
Designated Validation States:
KH MA MD TN

(71) Applicant: **Keylite Roof Windows Limited**
Cookstown, Tyrone BT80 9LU (GB)

(72) Inventor: **WELLS, Colin**
Cookstown
County Tyrone BT80 9LU (GB)

(74) Representative: **Hanna, John Philip**
Hanna IP
4th Floor
58 Howard Street
Belfast BT1 6PJ (GB)

(30) Priority: **05.01.2018 GB 201800208**

(54) **WINDOW VENTILATION AND LOCKING MODULE AND WINDOW**

(57) A window ventilation and locking module adaptable to be attached to or abutting with an outer peripheral surface of a roof window sash. The window ventilation and locking module has a ventilation component, and a lock casing for a primary roof window lock. When fitted on a roof window, the ventilation component defines at

least one ventilation passage through the roof window and the lock casing encases at least part of the primary roof window lock. The ventilation component and lock casing can be formed and fitted as a unitary component thereby reducing the complexity of the manufacture of roof windows.

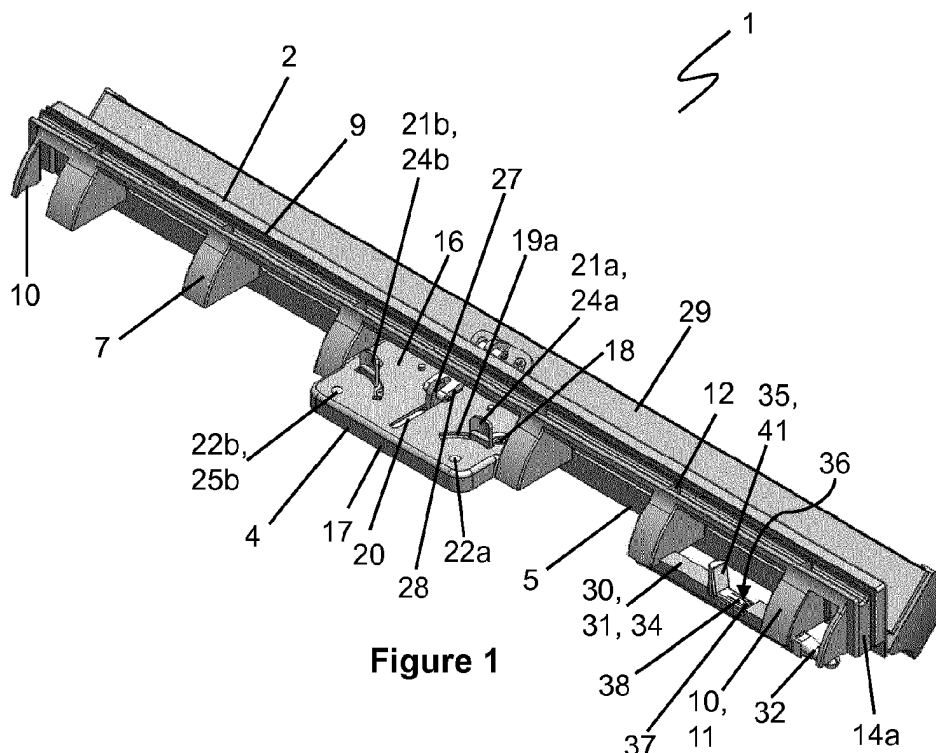


Figure 1

Description

[0001] The present invention is directed towards windows incorporating ventilation passages and a lock and in particular roof windows having a ventilation passage, at least one lock and a ventilation module.

[0002] Known windows and roof windows comprise a frame with a sash pivotally or fixedly mounted therein. The sash has a top member, bottom member, and two side members defining an opening for receiving a window pane. The sash is commonly provided with a ventilation passage extending between the exterior and interior to provide a route for ventilation even if the window is closed. For example, in the roof window disclosed in International Patent Publication WO 03/001017 A1 in the name of VKR Holding A/S, the ventilation passage is incorporated into the window sash and closable with a ventilation flap. In addition, many roof windows further comprise at least one lock positioned on the top member of the sash for locking the sash to the frame. A problem with this arrangement is that the location of the ventilation passage in the sash restricts the space available for the window pane. As a result, the total light admitting area for the window is reduced.

[0003] There have been attempts to overcome this problem by replacing the ventilation passage in the sash with a separate module that provides the ventilation passage. One such example is shown in International Patent Publication WO 2013/050039 A1 in the name of VKR Holding A/S. In this system, a top sash module with a generally rectangular construction connects or abuts with the outer surface of the sash. A ventilation flap for closing the ventilation passage in the top sash module is provided in pivot connection with the sash and a lock, which passes through the ventilation component and is connected to the ventilation flap. The top sash module increases the space available for the window pane over the space provided by conventional roof windows, and therefore increases the amount of light admitting area. However, the lock casing and the ventilation component are manufactured and installed as two separate parts of the roof window. This can lead to complications as some lock casings will not be compatible with the shape of some ventilation components. Further, the manufacturing process of fitting the lock casing and the ventilation component requires at least two steps; one for fitting the lock casing and another step for fitting the ventilation component. Finally, the small crevices between the lock casing and the ventilation component can accumulate water, dirt and dust and provide a suitable environment for growth of fungi, which can lead to rot of the window frame.

[0004] It is an object of the present invention to obviate or mitigate the problems associated with the installation and positioning of the lock casing and the ventilation component in roof windows.

[0005] Accordingly, the present invention provides a window ventilation and locking module adaptable to be attached to or abutting with an outer peripheral surface

of a roof window sash, the window ventilation and locking module comprising a ventilation component, and a lock casing for a primary roof window lock, such that, in use, the ventilation component defines at least one ventilation passage through the roof window and the lock casing encases at least part of the primary roof window lock.

[0006] Advantageously, fitting the window ventilation and locking module to a window provides at least one ventilation passage and a casing for the primary roof window lock.

[0007] Ideally, the window ventilation and locking module being a roof window ventilation and locking module.

[0008] Ideally, the lock casing being connected to the ventilation component.

[0009] Preferably, the lock casing being directly connected to the ventilation component.

[0010] Advantageously, as the ventilation component is connected to the lock casing they can be fitted to the window in a single step.

[0011] Ideally, the ventilation component and the lock casing being formed as a unitary component.

[0012] Advantageously, this is aesthetically pleasing and eliminates small crevices formed when the lock and ventilation component are fitted as single pieces and that can accumulate water, dirt and dust and provide a suitable environment for growth of fungi.

[0013] Alternatively, the ventilation component and the lock casing being formed as separate components that are connected via gluing, screws, adhesives, snap-fit connection and/or other suitable means of connection.

[0014] Preferably, the window ventilation and locking module being adaptable to be attached to or abutting with one or more of a top outer peripheral surface of a window sash, a bottom outer peripheral surface of a window sash, and/or a side outer peripheral surface of a window sash. By outer peripheral surface of the window sash we mean the surface of the sash which is opposed to an interior surface of the frame when the sash is closed.

[0015] Preferably, the ventilation component is an elongate component.

[0016] Preferably, the ventilation component being of a moulded construction.

[0017] Ideally, the lock casing being of a moulded construction.

[0018] Ideally, the ventilation component and/or the lock casing being injection moulded.

[0019] Preferably, the ventilation component and/or the lock casing being injection moulded from a plastic material.

[0020] Ideally, the lock casing being operable to house at least one lock or component parts of at least one lock.

[0021] In one embodiment, the window ventilation and locking module comprises a plurality of lock casings.

[0022] Ideally, the window ventilation and locking module comprises a downwardly depending skirt operable to extend below the outer peripheral surface of a window sash and rest against the room-facing surface of the sash. Advantageously, this securely locates the module

in position on the sash top member.

[0023] Ideally, the ventilation component comprises a hollow body.

[0024] Preferably, the ventilation component comprises a support frame.

[0025] Preferably, the ventilation component comprises a hollow body with a support frame for supporting a front panel and a canopy shaped skirt depending backwards and downwards from the front panel.

[0026] Ideally, the ventilation component comprises a substantially open bottom.

[0027] Preferably, the window ventilation and locking module comprises feet adaptable to be attached to or abutting with the outer peripheral surface of a window sash.

[0028] Ideally, the ventilation component comprises feet adaptable to be attached to or abutting with the outer peripheral surface of a window sash.

[0029] Preferably, the support frame comprises a plurality of feet spaced apart longitudinally along the length of the ventilation component for supporting the window ventilation and locking module on the outer peripheral surface of the window sash.

[0030] Ideally, the base of the feet define a virtual plane for mounting the window ventilation and locking module on the outer peripheral surface of the window sash.

[0031] Ideally, the feet extend rearwards from the front panel.

[0032] Preferably, the feet define a depth dimension for the ventilation component.

[0033] Ideally, the front panel extends beyond the base of the feet creating a downwardly depending skirt part of the front panel.

[0034] Preferably, the intersection between the base of the feet and the front panel define a locating corner which is locatable on the edge portion of the sash between the outer peripheral surface of the sash and room facing surface of the sash of the window.

[0035] Preferably, the support frame comprises a plurality of quadrant shaped feet.

[0036] Ideally, the quadrant shaped feet comprise a pair of spaced apart quadrant plates extending rearwards from the front panel and downwards from the canopy shaped skirt.

[0037] Preferably, the quadrant shaped feet define a depth dimension for the ventilation component.

[0038] Ideally, the ventilation component has means/through-bores for receiving fastening means for fastening the ventilation component to the sash.

[0039] Preferably, the means/through-bores extend through the feet, most preferably centrally.

[0040] Ideally, the front panel being generally planar.

[0041] Preferably, the front panel having at least one vent hole defining the at least one ventilation passage.

[0042] Preferably, the ventilation component having a plurality of vent holes.

[0043] Ideally, the front panel having a plurality of vent holes.

[0044] Preferably, the plurality of vent holes being differently sized.

[0045] Ideally, the feet having a base with a generally circular or U-shaped cross-section.

5 **[0046]** Preferably, the ventilation component comprising a pair of side panels.

[0047] Ideally, the pair of side panels being connected to the front panel and the canopy.

[0048] Preferably, one or both of the pair of side panels

10 having a generally planar or nonplanar

[0049] Ideally, one of both of the pair of side panels having an undulating profile.

[0050] Ideally, the lock casing is positioned substantially centrally along the ventilation component.

15 **[0051]** Preferably, the lock casing is positioned between the pair of side panels.

[0052] Ideally, the lock casing is positioned between two feet of the support frame of the ventilation component.

20 **[0053]** Ideally, the lock casing extends between two feet of the support frame of the ventilation component.

[0054] Preferably, the lock casing extends from the ventilation component.

[0055] Ideally, the lock casing extends rearwards from the front panel of the ventilation component.

25 **[0056]** Preferably, the lock casing comprises a top case member.

[0057] Ideally, the lock casing comprises at least one side case member.

30 **[0058]** Ideally, the top case member is substantially quadrangular.

[0059] Preferably, the top case member is substantially planar.

35 **[0060]** Preferably, the at least one side case member defines the height of the lock casing and, in use, extends substantially between the sash and the top case member.

[0061] Ideally, the lock casing comprises a plurality of side cases members, each joined so as to create a closed or substantially closed continuous side casing wall.

40 **[0062]** Preferably, the continuous side casing wall has smoothed and/or rounded corners.

[0063] Preferably, at least one side case member, the top case member and at least one foot of the support frame of the ventilation component are connected so as to form a unitary, continuous structure.

45 **[0064]** Advantageously, this eliminates any crevices that would form between joining separate, discontinuous lock casing and ventilation component structures.

[0065] Ideally, the lock casing has means/through-bores for receiving fastening means for fastening the lock to the sash.

[0066] Preferably, the means/through-bores extend through the top casing member.

55 **[0067]** Ideally, the lock casing comprises means for accommodating lock components.

[0068] Preferably, the means for accommodating lock components comprises one or more apertures for accommodating lock components.

[0069] Ideally, the one or more apertures for accommodating lock components comprises one or more arcuate apertures.

[0070] Preferably, the window ventilation and locking module comprises at least part of a locking means, the locking means operable to releasably lock the sash to the frame.

[0071] Ideally, at least part of the locking means being situated at or about the frame of the window when the ventilation and locking module is fitted to a window.

[0072] Ideally, the locking means comprises at least one latch, most preferably a pair of latches.

[0073] Ideally, the at least one latch extends through an aperture on the lock casing, most preferably an arcuate aperture.

[0074] Preferably, the at least one latch is pivotable about a point on the window ventilation and locking module, most preferably on the lock casing.

[0075] Ideally, the at least one latch comprises a substantially lateral portion being substantially parallel to the top casing member.

[0076] Ideally, the substantially lateral portion being pivotable about a point on the lock casing.

[0077] Preferably, the at least one latch comprises an upright portion.

[0078] Ideally, the upright portion being situated at or about one end of the lateral portion.

[0079] Ideally, the upright portion is substantially perpendicular to the plane of the top sash member when the ventilation and locking module is fitted to a window.

[0080] Preferably, the upright portion comprises an arcuate form wherein the curve of the arcuate form is equal or similar to the curve of the arcuate aperture.

[0081] Advantageously, the arcuate form enables free movement of the upright portion of the latch within the arcuate aperture of the top casing member.

[0082] Ideally, the at least one latch comprises a pivot on the lateral portion, at or about the end opposing the upright portion, the pivot being coupled to the lock casing, most preferably, being connected to the top casing member.

[0083] Preferably, when the at least one latch is pivoted the upright portion moves within the arcuate apertures of the lock casing.

[0084] Ideally, the at least one latch is configured to engage a corresponding structure situated on the frame.

[0085] Preferably, the corresponding structure on the frame is a latch keep.

[0086] Preferably, the at least one latch being operable to move between a locked configuration wherein, in use, the sash is locked to the frame and an unlocked configuration wherein, in use, the sash can move freely within the frame.

[0087] Ideally, the locking means comprises biasing means for biasing the at least one latch in the locked configuration or the unlocked configuration.

[0088] Preferably, the at least one latch being coupled to the biasing means.

[0089] Ideally, the biasing means being connected to the lock casing.

[0090] Most preferably, the biasing means being connected to the top casing member.

5 **[0091]** Ideally, the biasing means comprising at least one biasing member.

10 **[0092]** Preferably, the biasing means comprising at least two biasing members such that one resilient rod-like member urges the at least one latch to the locked configuration and another urges the at least one latch to the unlocked configuration.

[0093] Ideally, the biasing means comprising a torsion spring, flat spring and/or a resilient rod-like member.

15 **[0094]** Preferably, the biasing member being a torsion spring or a flat spring.

[0095] Preferably, the locking means comprises an activator for activating the locking means.

[0096] Ideally, the activator is moveable relative to the lock casing.

20 **[0097]** Preferably, the activator extends through an elongate aperture in the lock casing.

[0098] Ideally, the activator is operably connected to the biasing means.

25 **[0099]** Ideally, the activator is capable of movement in two directions relative to the lock casing.

[0100] Preferably, when the activator is moved the at least one latch is pivoted.

30 **[0101]** Ideally, when the activator is moved substantially in a first direction the at least one latch moves from the locked configuration to the unlocked configuration.

[0102] Preferably, when the activator is moved substantially in second direction the at least one latch moves from the unlocked configuration to the locked configuration.

35 **[0103]** Ideally, the activator comprises a connector operable to connect the activator to a handle.

[0104] Preferably, the connector extends through the ventilation component.

40 **[0105]** Ideally, the connector extends through one of the vent holes of the ventilation component.

[0106] Preferably, in use, when a handle connected to the activator via to the connector is moved, the activator correspondingly moves.

45 **[0107]** Ideally, the ventilation and locking module comprises at least part of a secondary lock for locking the sash to the frame.

[0108] Preferably, in use, the secondary lock being operable to lock the sash relative to the frame in at least one, most preferably at least two, positions.

50 **[0109]** Ideally, in use, the secondary lock being operable to lock the sash to the frame in a first open position or a second open position.

[0110] Preferably, in use, when the sash is locked in the first open position the window is ajar. Advantageously, this enables a user to lock the window when it is slightly open.

[0111] Ideally, in use, when the sash is locked in the second open position the sash is pivoted such that the

exterior surface of the sash is facing inwards. Advantageously, this locks the sash in place to enable easy cleaning of the exterior surface of the window.

[0112] Preferably, at least part of the secondary lock is accessible from the ventilation component.

[0113] Ideally, the window ventilation and locking module comprising a secondary locking means.

[0114] Preferably, the secondary locking means comprises an elongate locking component.

[0115] Ideally, the secondary locking means comprises a sheath for the elongate locking component.

[0116] Alternatively, the secondary locking means comprises a latch, hook or other locking arrangement.

[0117] Ideally, the elongate locking component being operable to be slidably moved relative to the ventilation component.

[0118] Preferably, the elongate locking component being slidably moveable within the sheath.

[0119] Preferably, the elongate locking component being operable to move between an unlocked and a locked position.

[0120] Ideally, in use, when the elongate locking component is moved to a locked position, it engages with the frame of a window to lock the sash relative to the frame.

[0121] Preferably, the elongate locking component extends through one or more of the feet of the ventilation component.

[0122] Ideally, the elongate locking component operable to extend beyond the ventilation component.

[0123] Preferably, the elongate locking component operable to extend beyond the plane of a side panel of the ventilation component.

[0124] Preferably, in use, the elongate locking component operable to extend beyond the plane of the top outer peripheral surface of the window sash, the bottom outer peripheral surface of the window sash, and/or a side outer peripheral surface of the window sash.

[0125] Ideally, the elongate locking component arranged so as to be substantially parallel to the front panel of the ventilation component.

[0126] Preferably, the secondary locking means comprises a stop means to stop movement of the elongate locking component such that it cannot easily move from the locked position to the unlocked position.

[0127] Ideally, the stop means comprises a male component and a female component.

[0128] Preferably, the male component being disposed on the elongate locking component and the female component being disposed on the sheath.

[0129] Alternatively, the male component being disposed on the sheath and the female component being disposed on the elongate locking component.

[0130] Ideally, the male component being a projection.

[0131] Preferably, the female component being a recess or aperture.

[0132] Ideally, the stop means comprising a stop biasing means to bias the male component in the female component and/or the female component in the male component.

ponent.

[0133] Preferably, the stop biasing means comprises a resilient member.

[0134] Ideally, the male component or the female component being disposed on the resilient member.

[0135] Ideally, the stop biasing means biases the male component against the sheath of the secondary lock.

[0136] Preferably, the male component and the female component are positioned such that when the elongate locking component is slid along the sheath the male component and the female component meet and the stop biasing means urges the components into an interlocking position. Advantageously, this stops the elongate locking component from easily moving further along the sheath in either direction.

[0137] Ideally, the male component comprising curved edges. Advantageously, this reduces the amount of force required to release the male component from the female component thereby freeing the elongate locking component.

[0138] Ideally, the secondary locking means, most preferably the elongate locking component, comprising a user-interaction portion. Advantageously, this enables a user to easily slide the elongate locking component to lock the sash to the frame.

[0139] Ideally, the sheath comprises a sheath aperture for accessing the elongate locking component, most preferably for accessing the user-interaction portion.

[0140] Preferably, the user-interaction portion comprising a projection. Advantageously, a user can push or pull the projection to move the elongate locking component.

[0141] Ideally, the projection being substantially perpendicular to the elongate locking component.

[0142] Preferably, the projection extending through the sheath aperture.

[0143] Alternatively, the user-interaction portion comprising a grip and/or an indent sized to receive a portion of a finger such that a user can move the elongate locking component with a finger.

[0144] In one embodiment, the window ventilation and locking module comprises a handle.

[0145] Ideally, the handle is operably engageable with a primary roof window lock such that moving the handle operates the lock and can thereby release the sash from the frame.

[0146] Preferably, the handle is operably engageable with the locking means such that moving the handle operates the lock and can thereby release the sash from the frame.

[0147] Ideally, the handle is movably connected, most preferably pivotally connected, to the ventilation component.

[0148] Preferably, the handle is movably connected, most preferably pivotally connected, to the front panel of the ventilation and locking module.

[0149] Accordingly, the present invention provides a roof window comprising a frame; a sash mounted in the

frame; a primary roof window lock; and a ventilation and locking module attached to or abutting with an outer peripheral surface of the sash.

[0150] Ideally, the ventilation and locking module defining at least one ventilation passage through the window.

[0151] Preferably, the ventilation and locking module comprising a ventilation component defining at least one ventilation passage through the window.

[0152] Ideally, the ventilation and locking module comprising a lock casing for the primary roof window lock.

[0153] Preferably, the lock casing being connected to the ventilation component.

[0154] Ideally, the sash is movable relative to the frame.

[0155] Preferably, the sash is pivotally connected to the frame.

[0156] Ideally, the sash is pivotally connected to the frame at one or more of the top of the frame, middle of the frame, or bottom of the frame.

[0157] Alternatively, the sash is fixed relative to the frame.

[0158] Ideally, the sash having a top sash member, bottom sash member, and a pair of side sash members, the top sash member, bottom sash member and side sash members defining an opening adaptable to receive a window pane.

[0159] Ideally, the ventilation component and/or the lock casing being attached to or abutting with the outer peripheral surface of at least one of the top sash member, bottom sash member, and side sash members.

[0160] Preferably, the sash being constructed from one of wood, plastic, or polyurethane, or a combination thereof.

[0161] Ideally, the frame being constructed from one of wood, plastic, or polyurethane, or a combination thereof.

[0162] Preferably, the roof window comprising a handle.

[0163] Ideally, the handle is operably engaged with the primary roof window lock such that moving the handle operates the lock and can thereby release the sash from the frame.

[0164] Preferably, the handle is movably connected, most preferably pivotally connected, the front panel of the ventilation and locking module.

[0165] Alternatively, the handle may be movably connected to the sash.

[0166] Accordingly, the present invention providing a method of manufacturing a roof window comprising a frame; a sash mounted in the frame; a primary roof window lock; and a ventilation and locking module attached to or abutting with an outer peripheral surface of the sash.

[0167] Ideally, the method comprising manufacturing the frame.

[0168] Preferably, the method comprising manufacturing the sash and mounting the sash in the frame.

[0169] Ideally, the method comprising manufacturing

the ventilation and locking module.

[0170] Preferably, the method comprising manufacturing a primary roof window lock.

[0171] Ideally, the method comprising manufacturing the ventilation and locking module with the primary roof window lock such that at least some components of the primary roof window lock are integrated with the ventilation and locking module.

[0172] Preferably, the method comprising attaching the ventilation and locking module to the sash frame.

[0173] Preferably, the method comprising attaching the ventilation and locking module to the outer peripheral surface of the sash frame.

[0174] Most preferably, the method comprising attaching the ventilation and locking module to the outer peripheral surface of the top member of the sash frame.

[0175] Ideally, forming the ventilation and locking module comprises forming the ventilation component and the lock casing as a unitary structure.

[0176] The skilled man will appreciate that all preferred or optional features of the invention described with reference to only some aspects or embodiments of the invention may be applied to all aspects of the invention.

[0177] It will be appreciated that preferable or ideal features applicable to one aspect of the invention can be used in any combination, and in any number. Moreover, they can also be used with any of the other aspects of the invention in any combination and in any number. This includes, but is not limited to, the dependent claims from any claim being used as dependent claims for any other claim in the claims of this application.

[0178] The invention will now be described with reference to the accompanying drawings which shows by way of example only two embodiments of apparatuses in accordance with the invention.

Figure 1 is a back perspective view of a window ventilation and locking module according to an embodiment of the present invention.

Figure 2 is an additional back perspective view of the window ventilation and locking module in Figure 1.

Figure 3 is a front perspective view of the window ventilation and locking module in Figure 1.

Figure 4 is a back view of the window ventilation and locking module in Figure 1.

Figure 5 is a top view the window ventilation and locking module in Figure 1.

Figure 6 is a partial back perspective view of the window ventilation and locking module in Figure 1.

Figure 7 is a side view of the window ventilation and locking module in Figure 1.

Figure 8 is a cross-sectional side view of the window ventilation and locking module in Figure 1, the cross-section passing through the lock casing.

Figure 9 is a front perspective view of a ventilation component and lock casing according to a second embodiment of the present invention.

Figure 10 is a side view of the ventilation component and lock casing in Figure 9.

Figure 11 is a top view of the ventilation component and lock casing in Figure 9.

Figure 12 is a bottom view of the ventilation component and lock casing in Figure 9.

Figure 13 is a back perspective view of the ventilation component and lock casing in Figure 9.

[0179] In the drawings there is shown a window ventilation and locking module indicated generally by reference numeral 1, 101, adaptable to be attached to or abutting with an outer peripheral surface of a window sash, the window ventilation and locking module 1, 101 having a ventilation component 2, 102 defining ventilation passages 3, 103 through the window when the ventilation and locking module is fitted in a window, and a lock casing 4, 104 connected to the ventilation component 2, 102. The ventilation component 2, 102 and the lock casing 4, 104 form a unitary component. Advantageously, as the ventilation component 2, 102 is connected to the lock casing 4, 104 they can be fitted to the window in a single step. In addition, the continuity of material between the lock casing 4, 104 and the ventilation component 2, 102 is aesthetically pleasing and eliminates small crevices formed when the lock casing 4, 104 and ventilation component 2, 102 are fitted as single pieces and that can accumulate water, dirt and dust and provide a suitable environment for growth of fungi. The window ventilation and locking module 1, 101 is adaptable to be attached to or abutting with one or more of a top outer peripheral surface of a window sash, a bottom outer peripheral surface of the window sash, and/or a side outer peripheral surface of the window sash.

[0180] The ventilation component 2, 102 is an elongate component, and the ventilation component 2, 102 and part of the lock casing 4, 104 are of a moulded construction. The ventilation component 2, 102 and part of the lock casing 4, 104 being injection moulded from a plastic material. The ventilation component 2, 102 has a downwardly depending skirt 5, 105 extending below the outer peripheral surface of the sash and resting against the room facing surface of the sash of the roof window. Advantageously, this securely locates the module 1, 101 in position on the sash top member. The ventilation component 2, 102 has a hollow body with a frame support 9, 109 for supporting a front panel 6, 106 and a canopy shaped skirt 7, 107 depending backwards and downwards from the front panel 6, 106. The ventilation component 2, 102 has a substantially open bottom 8, 108.

[0181] The support frame 9, 109 has a plurality of feet 10, 110 spaced apart longitudinally along the length of the ventilation component 2, 102 for supporting the ventilation component 2, 102 on the outer peripheral surface of the window sash. In the embodiment in Figures 1 to 8 the ventilation component 2 has eight feet 10; in the embodiment shown in Figures 9 to 13 the ventilation component 102 has six feet 110. The base of the feet 10, 110

define a virtual plane for mounting the ventilation component 2, 102 on the outer peripheral surface of the window sash. The feet 10, 110 extend rearwards from the front panel 6, 106 and downwards from the canopy shaped skirt 7, 107. The feet 10, 110 define a depth dimension for the ventilation component 2, 102. The front panel 6, 106 extends beyond the base of the feet 10, 110 creating a downwardly depending skirt part 5, 105 of the front panel 6, 106. The intersection between the base of the feet 10, 110 and the front panel 6 define a locating corner which is locatable on the edge portion of the sash between the outer peripheral surface of the sash and room facing surface of the sash of the roof window.

[0182] The support frame 9, 109 has a plurality of quadrant shaped feet 11, 111. The quadrant shaped feet comprise a pair of spaced apart quadrant plates extending rearwards from the front panel 9, 109 and downwards from the canopy shaped skirt 7, 107. The quadrant shaped feet 11, 111 define a depth dimension for the ventilation component 2, 102. In the embodiment in Figures 1 to 8 the ventilation component 2, 102 has six quadrant shaped feet 11, 111; in the embodiment shown in Figures 9 to 13 the ventilation component 2, 102 has four quadrant feet 11, 111.

[0183] The ventilation component 2, 102 has through bores 12, 112 for receiving fasteners, such as a screw or nail, for fastening the module 1, 101 to the sash. The through bores 12, 112 extend through the feet 11, 111, most preferably centrally. The front panel 6, 106 is generally planar and has a plurality of vent holes 13, 113 defining the ventilation passages 3, 103; for example, the front panel 106 of the embodiment shown in Figures 8 to 13 has seven vent holes 113. The plurality of vent holes 113 being differently sized. The feet 10, 110 of the ventilation component 2, 102 are adaptable to be attached to or abut with the outer peripheral surface of the window sash. The feet 10, 110 have a base with a generally circular or U-shaped cross-section. The ventilation component 2, 102 has a pair of side panels 14a, 14b which are connected to the front panel 9 and the canopy 7. The pair of side panels 14a, 14b have a generally planar profile.

[0184] The lock casing 4 is positioned between the pair of side panels 14a, 14b, 114a, 114b, more precisely, between two feet 10, 110 of the support frame 9, 109 of the ventilation component 2, 102. The lock casing 4, 104 covers some or all of the working components of the lock casing 4, 104. The lock casing 4, 104 extends between two feet 10, 110 of the support frame 9, 109 of the ventilation component 2, 102. The lock casing 4, 104 has a top case member 16, 116 and side case members 17, 117. The top case member 16, 116 is substantially quadrangular and planar. The side case member 17, 117 defines the height of the lock casing 4, 104 and, when the window ventilation and locking module 1, 101 is fitted, extends substantially between the sash and the top case member 16, 116. The lock casing 4, 104 has side case members 17, 117, each linked so as to create a closed

or substantially closed continuous side casing wall. The continuous side casing wall has smoothed and/or rounded corners. The side case members 17, 117 the top case member 16, 116 and two of the feet 11, 111 of the support frame 9, 109 of the ventilation component 2, 102 are connected so as to form a unitary, continuous structure. The lock casing 4, 104 has through bores 18, 118 for receiving fasteners, such as a nail or screw, for fastening the lock casing 4, 104 to the sash. The through bores 18, 118 extend through the top casing member 16, 116.

[0185] The lock casing 4, 104 has apertures 19a, 19b, 20, 119a, 119b, 120 for accommodating lock components. The lock casing 4 has a locking arrangement for releasably locking the sash to the frame. The locking arrangement has two latches 21a, 21b extending through arcuate apertures 19a, 19b. Each latch is pivotable about a point 22a, 22b on the lock casing 4. Each latch 21a, 21b comprise a lateral portion 23a being parallel to the top casing member 16 and an upright portion 24a, 24b at one end of the lateral portion 23a. The upright portion 24a, 24b is perpendicular to the plane of the top sash member when the ventilation and locking module 1 is fitted to a window. The upright portion 24a, 24b comprises an arcuate form wherein the curve of the arcuate form is equal to or similar to the curve of the arcuate aperture 19a, 19b. Advantageously, the arcuate form enables free movement of the upright portion 24a, 24b of the latch 21a, 21b within the arcuate aperture 19a, 19b of the top casing member 16. Each latch 21a, 21b comprises a pivot 25a, 25b on the lateral portion 23a, at the end opposing the upright portion 24a, 24b, wherein the pivot 25a, 25b is connected to the lock casing 4, more specifically being connected to the top casing member 16. When the latches 21a, 21b are pivoted the upright portion 24a, 24b moves within the arcuate apertures 19a, 19b of the lock casing 4. Each latch 21a, 21b is configured to engage a corresponding structure situated on the frame and are operable to move between a locked configuration, where the sash is locked to the frame, and an unlocked position where the sash can move freely within the frame. In another embodiment not shown, the lock has only a single latch as described above.

[0186] The lock casing 4 has a biasing arrangement 26 for releasably biasing the latches 21a, 21b in two configurations. The latches 21a, 21b are operably connected to the biasing arrangement 26. The biasing arrangement 26 is connected to the lock casing 4, more specifically to the top casing member 16. The biasing arrangement is a torsion spring.

[0187] The lock casing 4 has an activator 27 for activating the locking arrangement, the activator 27 being moveable relative to the lock casing 4. The activator 27 extends through an elongate aperture 20 in the lock casing 4. The activator 27 is connected to the biasing arrangement 26. The activator 27 is capable of movement in two directions relative to the lock casing 4. When the activator 27 is moved the latches 21a, 21b are pivoted. When the activator 27 is moved substantially in one di-

rection the latches 21a, 21b pivot from a locked configuration to an unlocked configuration. When the activator 27 is moved substantially in another direction the latches 21a, 21b pivot from an unlocked configuration to a locked configuration. The activator 27 has a connector 28 wherein the connector connects the activator to a handle 29. The connector 28 passes through one of the vent holes 13 of the ventilation component 2. When the handle 29 is moved by an operator the activator 27 correspondingly moves. The handle 29 is pivotally connected to the front panel 6 of the ventilation component 2.

[0188] The ventilation and locking module 1, 101 has a part 30, 130 of a secondary lock 31, 131 for locking the sash to the frame. The secondary lock 31, 131 is operable to lock the sash relative to the frame in two positions; a first open position or a second open position. When the sash is locked in the first open position the window is ajar. When the sash is locked in the second open position the sash is pivoted such that the exterior surface of the sash is facing inwards. This locks the sash in place to enable easy cleaning of the exterior surface of the window. Part 30, 130 of the secondary lock 31, 131 is accessible from the ventilation component 2, 102. The secondary lock 31 has comprises a secondary locking arrangement 32 that further has an elongate locking component 33 (see Figures 1 to 5) and a sheath 34, 134 for the elongate locking component 33. The elongate locking component 33 can be slidably moved relative to the ventilation component 2 and can move between an unlocked and a locked position. When the elongate locking component 33 is moved to a locked position, it engages with a frame component on the frame to lock the sash relative to the frame. The elongate locking component 33 extends through one or more of the feet 7 of the ventilation component 2. The elongate locking component 33 can extend beyond the ventilation component 2, beyond the plane of side panel 14a of the ventilation component 2 and beyond the plane of the top outer peripheral surface of the window sash. The elongate locking component 33 is arranged so as to be substantially parallel to the front panel 6 of the ventilation component 2.

[0189] The secondary locking arrangement 30 has a stop arrangement 36 to stop movement of the elongate locking component 33 such that it cannot easily move from the locked position to the unlocked position. The stop arrangement 36 has a male component 37 and a female component (not shown). The male component 37 is disposed on the elongate locking component 33 and the female component is disposed on the sheath 34. The male component 37 disposed on the sheath 34 and the female component being disposed on the elongate locking component 33. The male component 37 is a projection and the female component is a recess sized to accommodate the male component 37.

[0190] The stop arrangement 36 has a stop biasing arrangement 38 to bias the male component 37 in the female component (not shown). The stop biasing arrangement 38 has a resilient member 39. The male com-

ponent 37 is disposed on the resilient member 39. The stop biasing arrangement 38 biases the male component 37 against the sheath 34 of the secondary lock 31. The male component 37 and the female component (not shown) are positioned such that when the elongate locking component 33 is slid along the sheath 34 the male component 37 and the female component (not shown) meet and the stop biasing arrangement 38 urges the components into an interlocking position. This stops the elongate locking component 33 from easily moving further along the sheath 34 in either direction. The male component 37 has curved edges. This reduces the amount of force required to release the male component 37 from the female component (not shown) thereby freeing the elongate locking component 33.

[0191] The secondary locking arrangement 32 has a user-interaction portion 35, which is situated on the elongate locking component 33 (see Figures 1 to 6). This enables a user to easily slide the elongate locking component 33 to lock the sash to the frame. The sheath 34 has a sheath aperture 40 for accessing the elongate locking component 33 and, in particular, for accessing the user-interaction portion 35. The user-interaction portion 35 has a projection 41, enabling a user to push or pull the projection 41 to move the elongate locking component 33. The projection 41 is perpendicular to the elongate component. The projection 41 extends through the sheath aperture 40.

[0192] The ventilation component 2 of the embodiment shown in Figures 1 to 8 of the drawings is longer than that of the ventilation component 102 in the embodiment shown in Figures 9 to 13. The distance between the pair of side panels side panels 114a, 114b is less than that of the distance between side panels 14a, 14b. The front panel 106 in the embodiment of Figures 9 to 13 is accordingly smaller than the front panel 6 of the ventilation component 2 in Figures 1 to 8. The embodiment in Figures 9 to 13 has less vent holes 113 and feet 110 than the embodiment in Figures 1 to 8.

[0193] In one example, the ventilation and locking module 1, 101 is for use with a window (not shown). Specifically, a window with a frame (not shown); a sash mounted in the frame (not shown); a ventilation component 2, 102 attached to or abutting with an outer peripheral surface of the sash and defining at least one ventilation passage 3, 103 through the window; and a lock casing 4, 104 connected to the ventilation component 2, 102. The sash is movable relative to the frame and is pivotally connected to the frame. The sash is pivotally connected to the frame at one or more of the top of the frame, middle of the frame, or bottom of the frame. Alternatively, the sash is fixed relative to the frame (not shown). The sash having a top sash member, bottom sash member, and a pair of side sash members (not shown); the top sash member, bottom sash member and side sash members defining an opening adaptable to receive a window pane. In one embodiment the window is a roof window. The ventilation component 2, 102 and at

least part of the lock casing 4, 104 are attached to or abutting with the outer peripheral surface of at least one of the top sash member, bottom sash member, and side sash members (not shown). The sash is constructed from one of wood, plastic, or polyurethane, or a combination thereof. The frame is constructed from one of wood, plastic, or polyurethane, or a combination thereof. The lock casing 4, 104 is operable to lock the sash to the frame (not shown). The lock casing 4, 104 is adaptable to move between a locked and an unlocked position.

[0194] An exemplary method for constructing the window ventilation and locking module 1, 101 will now be described. The window ventilation and locking module 1, 101 is constructed by forming a ventilation component 2, 102 defining at least one ventilation passage 3, 103 connected to a lock casing 4, 104. Forming the ventilation and locking module 1, 101 involves forming the ventilation component 2, 102 with the lock casing 4, 104. The ventilation component 2, 102 and lock casing 4, 104 are manufactured as a unitary structure by injection moulding a plastic material to form the ventilation component 2, 102 and the lock casing 4, 104. The method further involves fitting primary and/or secondary lock components and attaching the window ventilation and locking module 1, 101 to the outer peripheral surface of the window sash (not shown).

[0195] In the preceding discussion of the invention, unless stated to the contrary, the disclosure of alternative values for the upper or lower limit of the permitted range of a parameter, coupled with an indication that one of the said values is more highly preferred than the other, is to be construed as an implied statement that each intermediate value of said parameter, lying between the more preferred and the less preferred of said alternatives, is itself preferred to said less preferred value and also to each value lying between said less preferred value and said intermediate value.

[0196] The features disclosed in the foregoing description or the following drawings, expressed in their specific forms or in terms of a means for performing a disclosed function, or a method or a process of 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 as defined in the appended claims.

Claims

1. A window ventilation and locking module adaptable to be attached to or abutting with an outer peripheral surface of a roof window sash, the window ventilation and locking module comprising a ventilation component, and a lock casing for a primary roof window lock, such that, in use, the ventilation component defines at least one ventilation passage through the roof window and the lock casing encases at least part of the primary roof window lock.

2. A window ventilation and locking module as claimed in claim 1 being adaptable to be attached to or abutting with one or more of a top outer peripheral surface of a window sash, a bottom outer peripheral surface of a window sash, and/or a side outer peripheral surface of a window sash. 5
3. A window ventilation and locking module as claimed in claims 1 or 2 comprising a downwardly depending skirt operable to extend below the outer peripheral surface of a window sash and rest against the room-facing surface of the sash. 10
4. A window ventilation and locking module as claimed in any preceding claim wherein the lock casing is positioned substantially centrally along the ventilation component. 15
5. A window ventilation and locking module as claimed in any preceding claim wherein the ventilation component and the lock casing are formed as a unitary component. 20
6. A window ventilation and locking module as claimed in any preceding claim comprising at least part of a locking means, the locking means operable to releasably lock the sash to the frame. 25
7. A window ventilation and locking module as claimed in claim 6 comprising a handle, the handle being operably engageable with the locking means such that moving the handle operates the lock and can thereby release the sash from the frame. 30
8. A window ventilation and locking module as claimed in claim 6 wherein the locking means comprises at least one latch, the at least one latch being configured to engage a corresponding structure situated on the frame. 35
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9. A window ventilation and locking module as claimed in claim 7 wherein the at least one latch is operable to move between a locked configuration wherein, in use, the sash is locked to the frame and an unlocked configuration wherein, in use, the sash can move freely within the frame. 45
10. A window ventilation and locking module as claimed in claim 8 wherein the locking means comprises biasing means for biasing the at least one latch in the locked configuration or the unlocked configuration. 50
11. A window ventilation and locking module as claimed in any one of claims 6 to 9 wherein the locking means comprises an activator for activating the locking means. 55
12. A window ventilation and locking module as claimed in claim 10 wherein the activator comprises a connector operable to connect the activator to a handle.
13. A window ventilation and locking module as claimed in any preceding claim comprising at least part of a secondary lock for locking the sash to the frame.
14. A window ventilation and locking module as claimed in claim 12 comprising a secondary locking means.
15. A roof window comprising a frame; a sash mounted in the frame; a primary roof window lock; and a ventilation and locking module attached to or abutting with an outer peripheral surface of the sash, the window ventilation and locking module comprising a ventilation component defining at least one ventilation passage through the roof window, and a lock casing for the primary roof window lock.

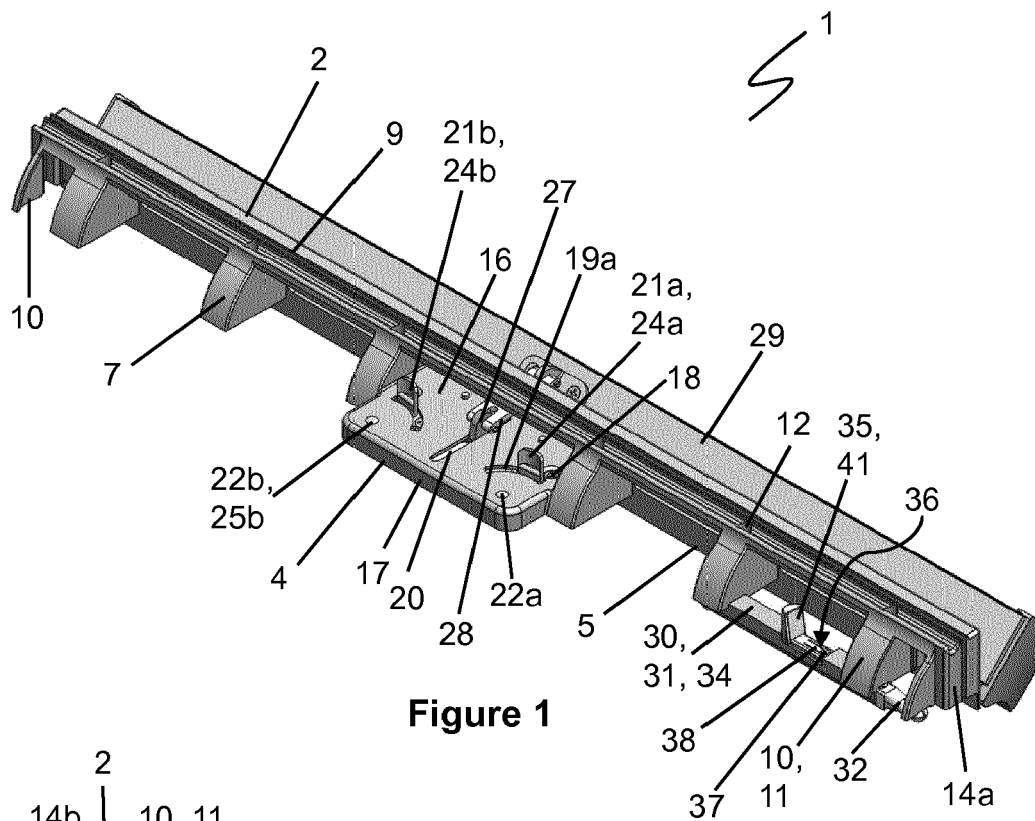


Figure 1

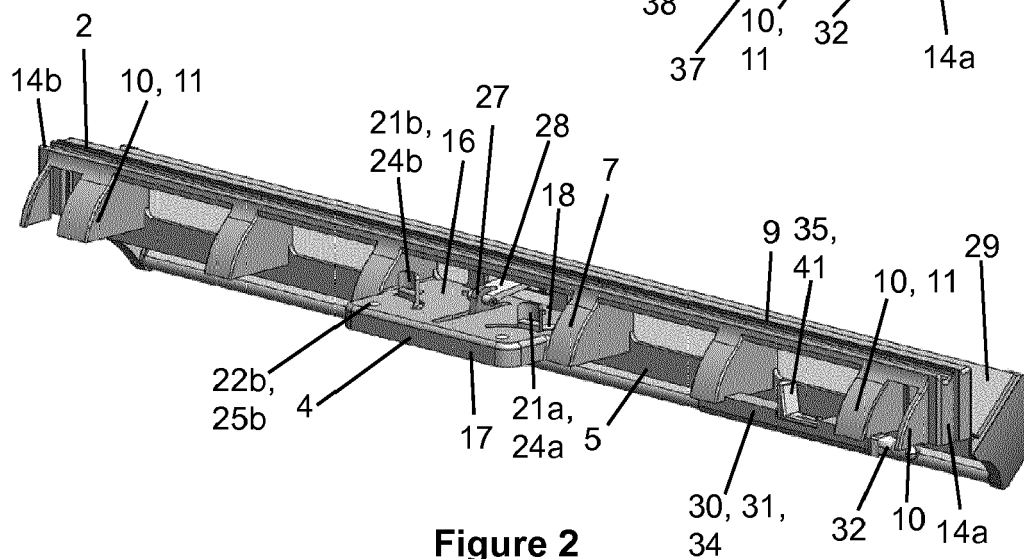
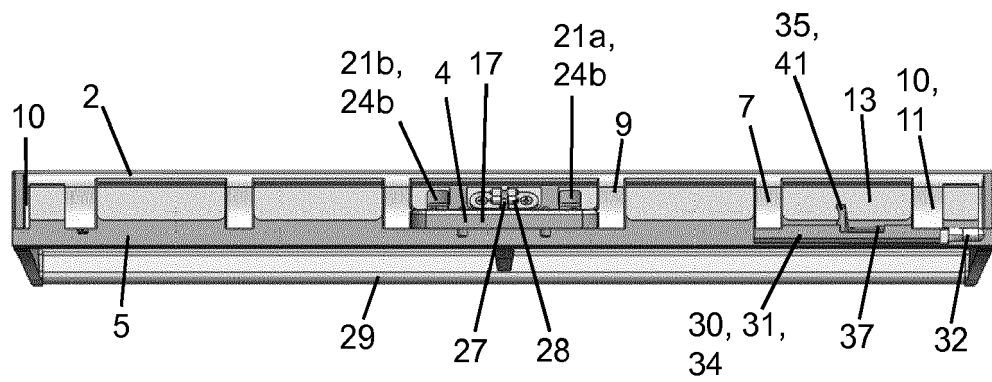
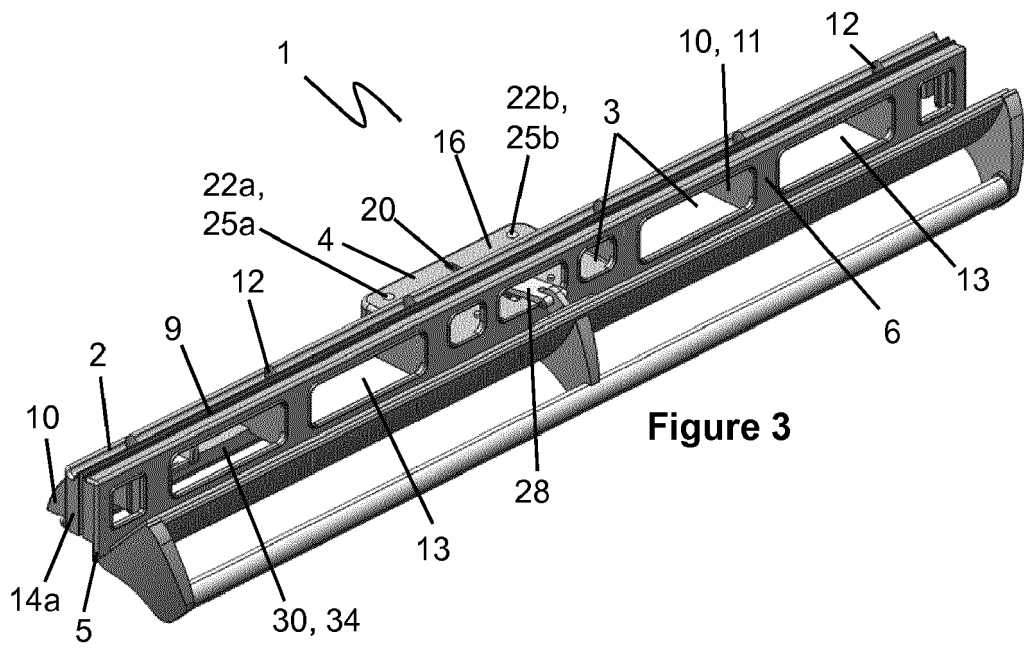


Figure 2



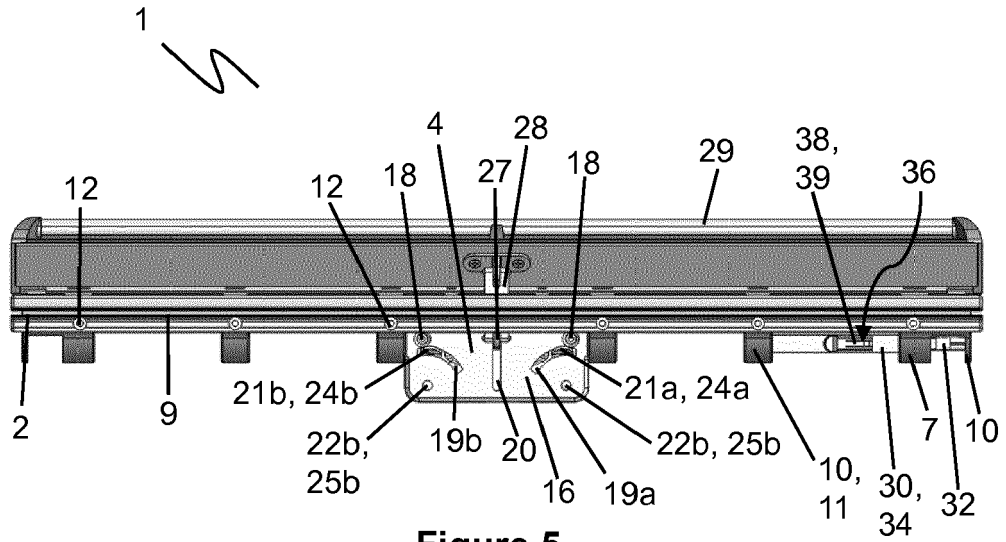


Figure 5

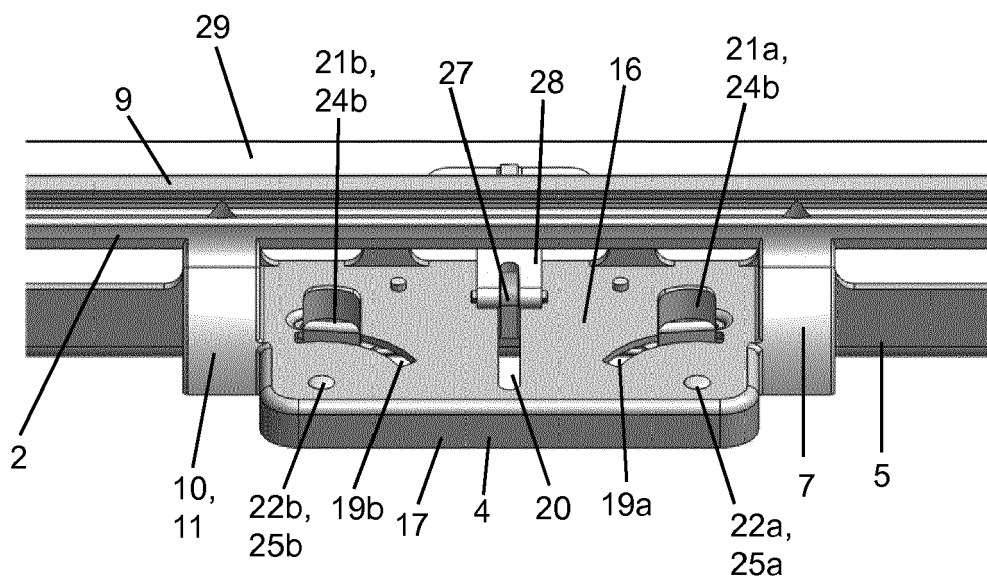


Figure 6

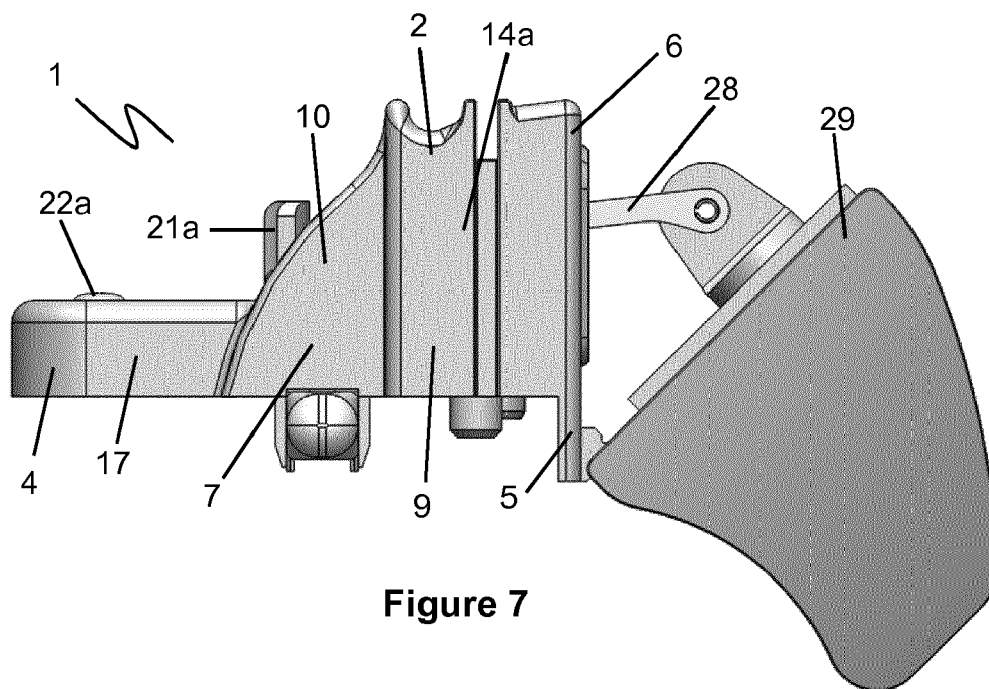


Figure 7

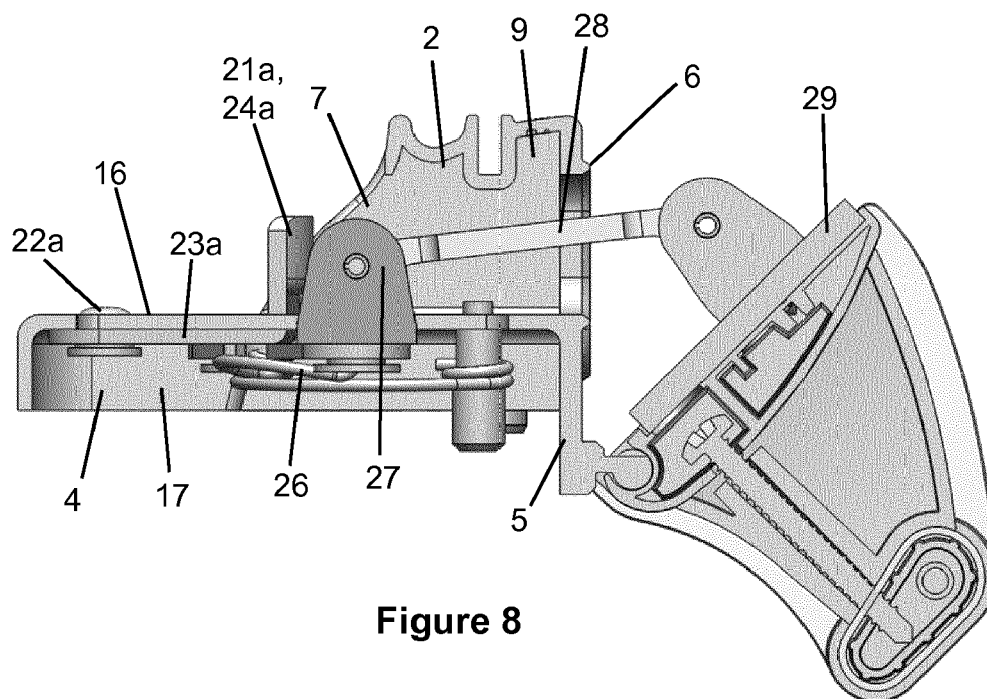


Figure 8

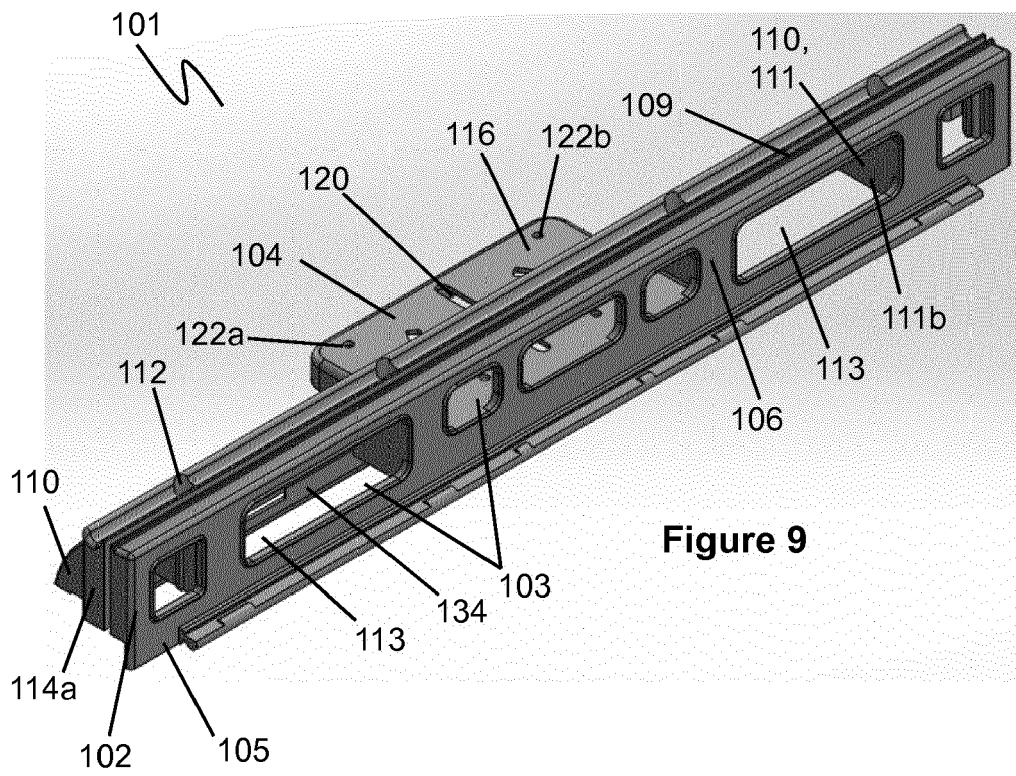


Figure 9

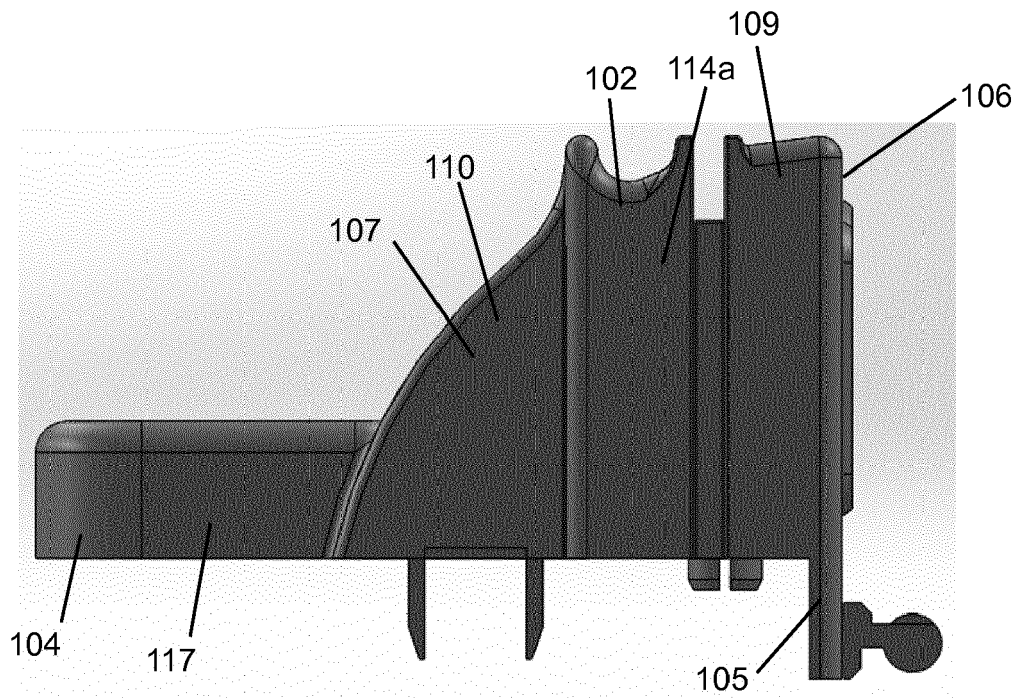
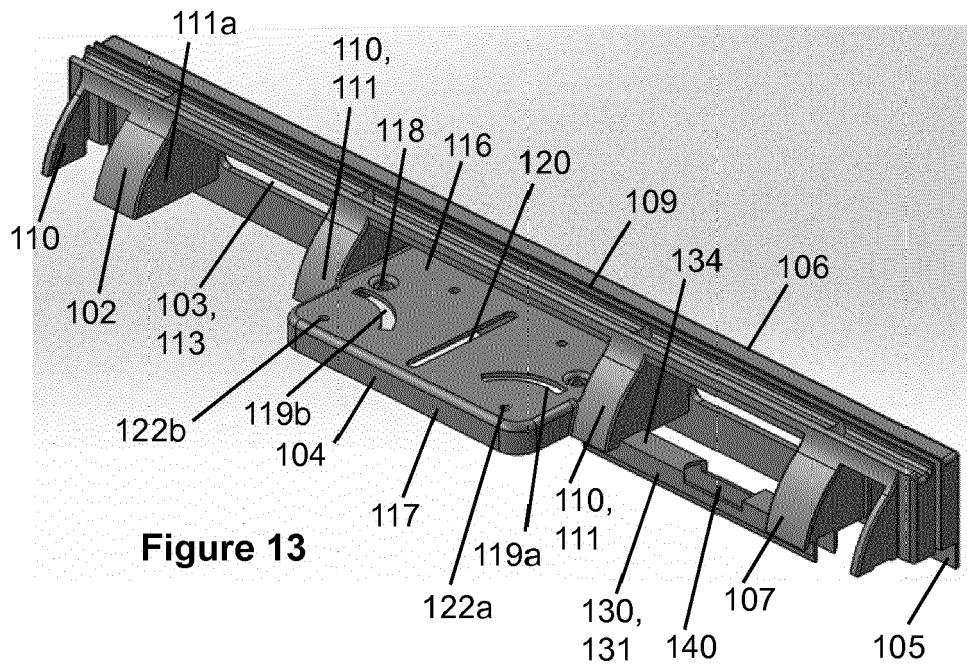
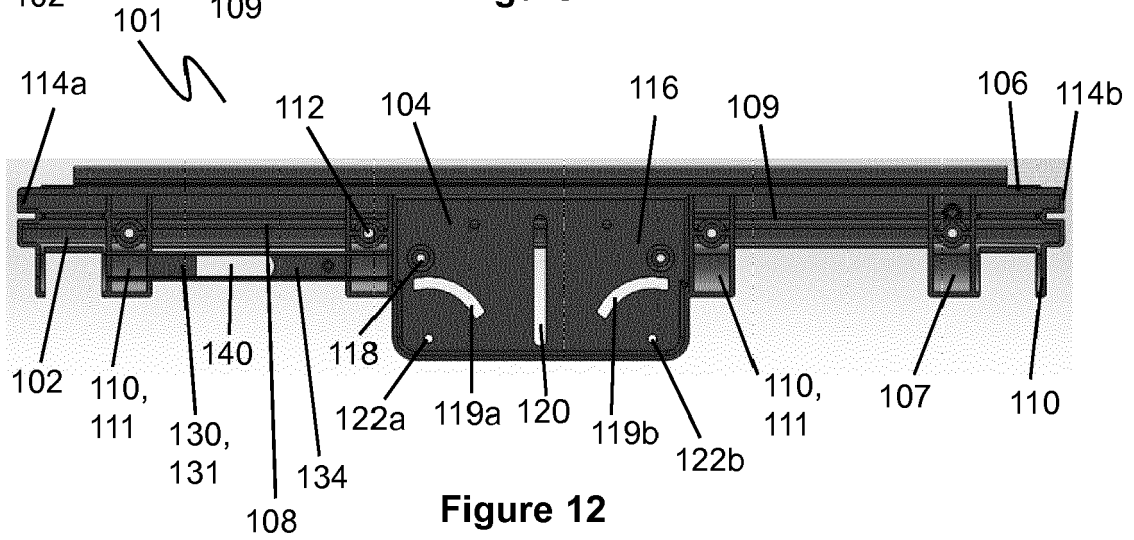
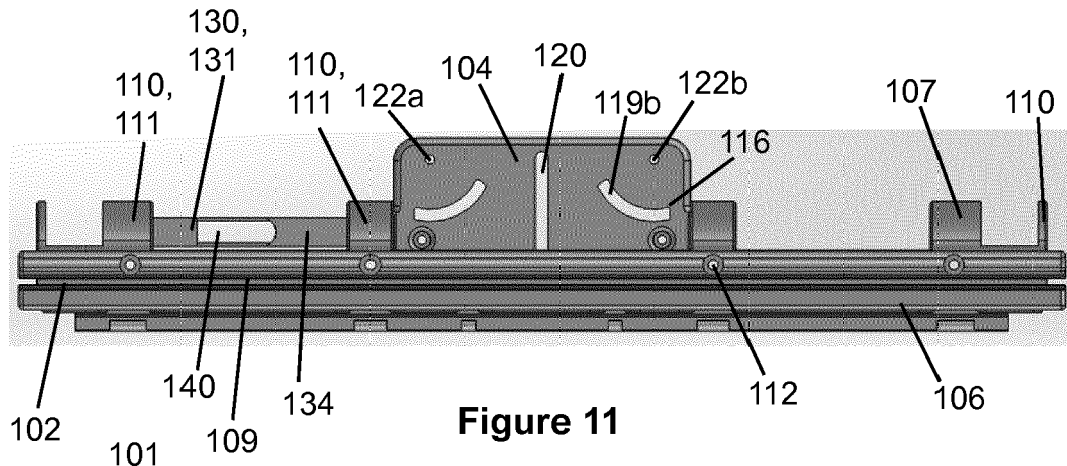


Figure 10





EUROPEAN SEARCH REPORT

Application Number
EP 19 15 0613

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2007/028590 A2 (VKR HOLDING AS [DK]; TORBEN ALLESEN PEDERSEN [DK]) 15 March 2007 (2007-03-15) * figures 14-16 *	1-15	INV. E04D13/03 E06B7/10
X	EP 2 565 355 A2 (VKR HOLDING AS [DK]) 6 March 2013 (2013-03-06) * figures 4-6 *	1-15	
			TECHNICAL FIELDS SEARCHED (IPC)
			E04D E06B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 17 April 2019	Examiner Demeester, Jan
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 19 15 0613

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2007028590 A2	15-03-2007	CN 101305148 A	12-11-2008
		EA 200800749 A1	30-12-2008
		EP 1922465 A2	21-05-2008
		JP 5114407 B2	09-01-2013
		JP 2009520134 A	21-05-2009
		US 2008309099 A1	18-12-2008
		WO 2007028590 A2	15-03-2007

EP 2565355 A2	06-03-2013	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 03001017 A1 [0002]
- WO 2013050039 A1 [0003]