



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**13.07.2016 Bulletin 2016/28**

(51) Int Cl.:  
**E06B 1/36 (2006.01)** **E06B 1/60 (2006.01)**  
**E06B 1/68 (2006.01)**

(21) Application number: **16020002.8**

(22) Date of filing: **05.01.2016**

(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:  
**MA MD**

(71) Applicant: **VKR Holding A/S**  
**2970 Hørsholm (DK)**

(72) Inventors:  
• **Bjørn, Eirik**  
**DK-6950 Ringkøbing (DK)**  
• **Hessel, Søren Fabricius**  
**DK7550 Sørvad (DK)**  
• **Rowley, James Richard**  
**Broughton Astley, Leicestershire LE9 6WZ (GB)**

(30) Priority: **08.01.2015 DK 201500016**

(54) **MULLION RAIL AND FRAME INSTALL**

(57) A mullion rail (5) for installing frames, windows or doors. The mullion rail may be used between the frame and wall construction and between the frame and frame construction. The mullion rail (5) has slots (1,2) and matching clips (11,12). The clips (11,12) are separate

and insertable into the slots (1,2). The mullion rail (5) provides better levelling and alignment of frames in building apertures and also provides enhanced install. A method is also disclosed.

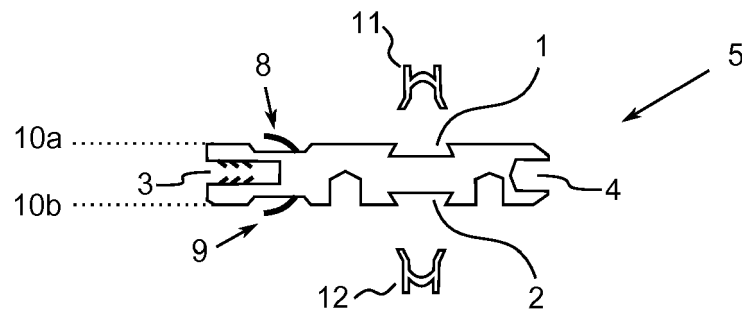


Fig. 1

**Description**Mullion rail

**[0001]** This invention relates to a rail for holding frames to installation of windows or doors.

BACKGROUND ART

**[0002]** Window and door frames may be held and adjusted when installed in a building aperture. When multiple windows are installed the frames have to be spaced and aligned. For this it is known to employ a mullion rail. US2008016800 discloses a two part rail for joining two adjacent frames. One disadvantage of such solution is that it can not be used on plural frame sides simultaneously.

DISCLOSURE OF THE INVENTION

**[0003]** In the following the term frame will be used, while it is understood that this disclosure is applicable to window and door frames.

**[0004]** Mullion rails may be installed between two frames to keep them aligned. The present mullion rail may also be fixed to the wall and provide enhanced single frame install or multiple frame install.

**[0005]** It is an objective to provide mullion rail which has multiple advantages:

The mullion rail may be used between adjacent frames.

The mullion rail may be pre-installed on a wall and be levelled before lifting and placing the frame units. The mullion rail may extend across multiple frames and keep them in line and aligned.

The mullion rail may temporary hold the frame until the frame is permanently secured with fasteners.

**[0006]** It is an object to provide a mullion rail which may be used in different frame configurations.

**[0007]** This is achieved according to the independent claims. Favorable embodiments are defined in the dependent claims.

**[0008]** Other objectives, features and advantages of the present invention will appear from the following detailed disclosure, from the attached dependent claims as well as from the drawings.

**[0009]** Generally, all references to "a/an/the [element, slot, clip]" are to be interpreted openly as referring to at least one instance of the element, slot, clip. Steps in the method are not limited by the listed order.

BRIEF DESCRIPTION OF THE DRAWINGS**[0010]**

Fig. 1 shows a cross section of the mullion rail.

Fig. 2 shows four frames configuration.

Fig. 3 shows a window frames installed to a wall.

Fig. 4 shows two windows frames adjacent each other.

Fig. 5 shows detailed mullion rail cross section.

Fig. 6 shows a mullion rail clip.

DETAILED DESCRIPTION

**[0011]** The exterior periphery of frames usually has at least one longitudinal groove 22. By frame periphery is understood the face lying towards the wall or neighbor frame.

**[0012]** The frame groove 22 is used to connect a mullion rail 5. Hereby the frames may be aligned or the frame may temporary be held until the frame is permanently secured with fasteners.

**[0013]** Figure 1 shows a mullion rail 5 body cross section. The features shown are elongated and extend along the length of the mullion rail. The mullion rail 5 has two opposite faces 10a, 10b preferably each comprising a slot 1,2 facing the frames. The slots 1,2 are configured to hold clips 11,12 and the clips 11,12 are adapted to fit in the frame grooves 22. The mullion rail 5 has a first exterior connector 3 and an opposite second interior connector 4. The connectors 3,4 are for optional mounting of covers, cill, flashing, seals etc. The connectors 3,4 are for example U shaped recesses with barbs adapted to receive and hold tabs inserted into them. The interior connector 4 is at the interior portion facing inside the building aperture. The exterior connector 3 is at the exterior portion facing outside the building aperture. The mullion rail 5 has seals 8,9 which seal against the frame. The seals 8,9 are near the exterior portion.

**[0014]** Figure 2 shows a frame configuration with frames 20. The mullion rail 5 is used in a wall-to-frame configuration such as 5a,5b,5c,5d illustrated in figure 3. The mullion rail 5 is used in a frame-to-frame configuration 5e,5f illustrated in figure 4.

**[0015]** Figure 3 shows a wall 30 to frame 21 configuration. The frame 21 has a groove 22. The clip 11 aligns the frame 21 with the mullion rail 5 by positioning the frame groove 22 next to the slot 1,2. The mullion rail 5 is installed first for example by means of a bracket 24 and shims 23. The mullion rail 5 can also be directly fastened to the wall if it is levelled. The bracket 24 may also extend beyond the wall so the window frame is offset from the wall.

**[0016]** If space allows the clip 11 may be pressed into the mullion rail 5 and afterwards the frame 21 is positioned by placing the groove 22 above the clip 11. However when space is limited the clip 11 is inserted into the frame groove 22 and the frame 21 is moved transversely towards the slot 1 whereby the clip 11 snaps into the slot 1 and positions the frame 21. In one example the mullion rail 5 has at least one substantially smooth face 10a, 10b suitable for moving the clips across. The frames are permanently secured by screws once aligned and levelled.

elled. A cill extension 25 is inserted into the exterior connector 3 and the frame-to-wall gap may be sealed by silicone or a foam strip etc.

**[0017]** Figure 4 shows a frame 21 to frame 21 configuration. Both opposite slots 1,2 employ a clip 11,12. And the clips 11,12 are mounted into the frame groove 22. Both seals 8,9 seal against the frame 21. The exterior connector 3 holds an extension 25 and the interior connector 4 is sealed or it could hold a cover etc. The extension 25 is generally provided, because in some frame configurations the extension 25 space may be needed to be sealed instead. The extension 25 extends the mullion rail 5 at the exterior connector 3 and registers with the first face 10a and second face 10b. The releasable extension 25 of the mullion rail 5 generally enhances the use of various seals, gaskets and covers in different frame configurations. The mullion rail 5 width from the interior 4 to the exterior 3 is adjustable by at least one extension 25 preferably being releasable.

**[0018]** The mounting of adjacent frames 21 may be done with the clip 11,12 inserted in the frame groove 22 or in a slot 1,2 as explained in relation to fig 3. However in a frame-to-frame configuration the clip 11 may on one side be inserted into one slot 1 while the opposite clip 12 is inserted into the frame groove 22 and later connected to slot 2. Alternatively the clips 12 on both sides of the mullion rail 5 are inserted into the two frame grooves 22.

**[0019]** Generally the method of the installing a frame 21 with an exterior periphery groove 22 comprises:

- a. arranging one mullion rail 5 face 10a, 10b towards a frame or wall,
- b. engage a clip 11,12 to the frame groove 22,
- c. moving the frame transverse across the mullion rail 5 to connect the clip 11,12 to the slot 1,2.

Further the method may include any of d-i not limited to any order:

- d. permanently secure the frame 21 with fasteners.
- e. arranging one mullion rail 5 face 10a, 10b towards a wall and securing the mullion rail 5 to the wall prior to moving the frame.
- f. arranging multiple mullion rails 5 by multiple sides of the frame 21.
- g. arranging three or four mullion rails 5 by three or four sides of the frame 21.
- h. cutting the mullion rail 5 substantially to a length of multiple frames 21.
- i. positioning the frame 21.

**[0020]** When the mullion rail is employed in a frame-to-wall configuration, the mullion rail 5 is secured to the wall prior to moving or positioning the frame. Multiple mullion rails 5 may be used to position multiple frame 21 sides simultaneously.

**[0021]** Figure 5 shows the detailed mullion rail 5. The mullion rail 5 cross section is elongated with a height to

width ratio of less than 1:4. The mullion rail 5 body has two opposite faces (i.e. first face 10a and second face 10b) each comprising a slot 1,2 facing the frames or wall. The majority of the clip 11,12 extends beyond the mullion rail 5 face. The clips 11,12 are separate and connectable to the slots 1,2. The interior connector 4 and the exterior connector 3 and the recess 4a and 4b located at a face 10b are all suitable for accessory attachment such as a membrane 26. The face 10b comprises at least one recess 4a,4b for connecting an accessory such as a membrane.

**[0022]** The slots 1,2 provide a snap effect for the clips. The slots 1,2 have a clip engaging portion 1a for example barb shaped or inwardly projecting lips. The slot 1,2 engaging portion 1a is 2-5mm deep in relation to the face, preferably about 3mm. This means the clip 11,12 protrudes slightly from the frame groove only and hereby enables the use of the mullion rail 5 on multiple sides of a frame. The slots 1,2 as such may be deeper, as seen with slot 2 in fig. 5 which has a larger opening adapted for inserting a mounting bracket tab.

**[0023]** The seals 8,9 provide a secondary seal (extra seal) against the frame 21. The seals 8,9 are on each of the first 10a and second face 10b of the mullion rail 5. The seals 8,9 may be near the exterior portion 3. The seals 8,9 are in a countersunk channel 14. This provides enhanced water drain and also enables the seal to compress below the face of the mullion rail so the seal is not in the way. The seals are adapted to seal against the frame 21 when in use. The seals 8,9 shown are tongue shaped. Each seal may be provided as plural tongues. The seals may be tubular. The seals may be integral with the mullion rail 5. So the seals for example are co-extruded with the mullion rail 5.

**[0024]** The exterior connector 3 and the interior connector 4 are perpendicular in relation to the slots 1,2 and the first 10a and second face 10b. The connectors are configured to connect and retain accessories such as an extension 25, a membrane 26, flashing, cill, cover etc. The connectors 3,4 may be provided by a recess. The recess may have engagement fingers or teeth or corrugations on the sides. The connectors 3,4 and accessory may be of the male or female type or vice versa.

**[0025]** Figure 6 shows an example of the clips 11,12. The clips 11,12 are resilient to enable snap into the slots 1,2. The clips 11,12 have two legs 16. The clips 11,12 may have an interconnecting portion 15. The interconnecting portion 15 may be located substantially halfway between the legs 16 whereby the legs project substantially transversely from the interconnecting portion 15. The legs 16 may have a protruding and/or slanted catch portion 18 at the bottom towards the mullion rail 5. This may enhance the engaging of the slot 1,2 by the engaging portion 1a. Generally a slanted portion 18 may be provided at one extremity of the legs 16, each leg being opposite and the slanted portion facing outwards. Hereby the clip is not easily damaged and provides a good slot engagement. Generally the clips 11,12 may have a sub-

stantially H-shaped body. Or the clips 11,12 may have a substantially X-shaped body. Or the clips 11,12 may have a substantially C-shaped body. All such shapes enable the resilient legs 16 to provide the snap effect. Generally the clips 11,12 do not need to extend along the whole mullion rail 5. The frame groove 22 may be part damaged or filled with dirt. So the clips 11,12 may be short and it suffices to use a few clips for each frame side. This avoids long clips which may be difficult to handle and connect. The clips 11,12 may have a substantially square height-width ratio. The clips 11,12 may be from a structural polymer such as PVC or POM.

**[0026]** The present mullion rail 5 has the advantage, that is can be used between frame-frame and between frame-wall configurations. The mullion rail 5 may be pre-mounted and used on one or two or three or four sides of a frame. The present mullion rail 5 enhances the installation of windows in various walls and various installations because it is modular and works and with different brackets, cills, flashings, covers, membranes, seals, etc. The present mullion rail 5 may be provided in standard lengths and easily cut on the building site. When in use the mullion rail 5 may be longer than the frame, preferably lengths of integer frame side multiplications. The mullion rail may for example be made from a structural polymer, polyvinyl chloride (PVC), or a fiberglass or carbon fiber reinforced composite material.

**[0027]** The disclosed mullion rail 5 and associated clips 11,12 may be considered a system or a kit. The disclosure may apply to a window with a groove 22 and a mullion rail 5 and clips 11,12.

**[0028]** Although the present invention has been described in detail for purpose of illustration, it is understood that such detail is solely for that purpose, and variations and combinations can be made therein by those skilled in the art without departing from the scope of the appended claims.

## Claims

1. Mullion rail 5 with connectable clip 11,12 for installing window or door frames 21, the rail 5 comprises a body with a first face 10a and a second opposite face 10b, the face 10a is adapted to face a frame and face 10b adapted to face a frame or wall, **characterised in that** at least one face 10a comprises a slot 1,2, and a corresponding connectable clip 11,12 adapted to engage a frame periphery groove 22, and when in use the clip 11,12 engages the mullion rail 5 slot 1,2 and projects beyond the face of the mullion rail 5 into a frame periphery groove 22
2. Mullion rail 5 according to previous claim, wherein the cross-section of the connectable clip 11,12 is configured to slide transversely across the cross-

section of the mullion rail 5 face 10a, 10b and snap into the slot 1,2.

3. Mullion rail 5 according to any previous claims, wherein both faces 10a, 10b comprise a slot 1,2 and a corresponding connectable clip 11,12.
4. Mullion rail 5 according to any previous claims, wherein the slots 1,2 have inwardly projecting lips 1a and wherein the clips 11,12 have legs 16 with a protruding and/or slanted catch portion 18, and wherein the clips 11,12 have resilient legs 16 and are from structural polymer.
5. Mullion rail 5 according to any previous claims, wherein perpendicular to the first face 10a the two body extremities provide an exterior connector 3 and an interior connector 4.
6. Mullion rail 5 according to any previous claims, wherein both faces 10a, 10b comprise at least one seal 8,9 preferably nearby the exterior portion 3 and preferably in a channel 14 configured to house the flattened seal 8,9.
7. Mullion rail 5 according to claim 3, wherein the mullion rail 5 is adapted to be mounted between a frame and wall 5a-5d and also adapted to be mounted between a frame and frame 5e,5f.
8. Mullion rail 5 according to any previous claims, wherein the clip 11,12 cross section is substantially H-shaped or X-shaped.
9. Mullion rail 5 according to any previous claims, further comprising a window frame with a periphery groove 22.
10. Method of installing a window or door frame 21 with a periphery groove 22 comprising:
 

providing a mullion rail 5 comprising a body with a first face 10a and a second opposite face 10b, at least one face 10a comprises a slot 1,2, and a corresponding connectable clip 11,12 arranging the face 10a to face a frame and face 10b to face a frame or wall, **characterised in that** engaging the clip 11,12 to the frame periphery groove 22, moving the frame 21 transverse across the mullion rail 5 cross-section to connect the clip 11,12 to the slot 1,2 and position the frame 21.
11. Method of installing a window or door frame 21 according to previous claim, wherein both faces 10a, 10b comprise a slot 1,2 and both slots 1,2 connect to a clip 11,12.

12. Method of installing a window or door frame 21 according to any previous claim, wherein the mullion rail 5 is provided on multiple sides of a frame.
13. Method of installing a window or door frame 21 according to any previous claims, wherein the mullion rail 5 extends substantially along the periphery of multiple frames in order to align the frames. 5
14. Method of installing a window or door frame 21 according to any previous claim, wherein the mullion rail is fixed to a building aperture prior to positioning the window frame 21. 10
15. Method of installing a window or door frame 21 according to any previous claims, wherein the mullion rail 5 is provided on multiple sides of a frame prior to positioning the frame. 15

20

25

30

35

40

45

50

55

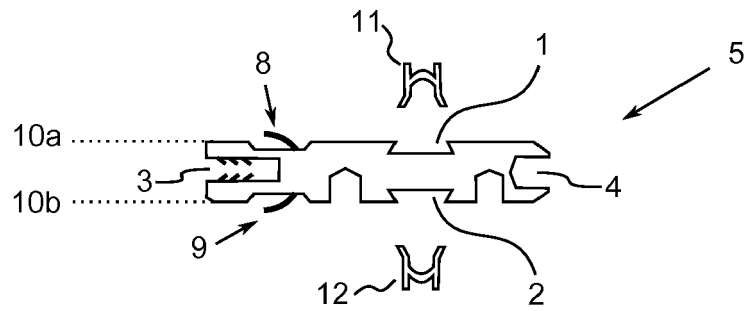


Fig. 1

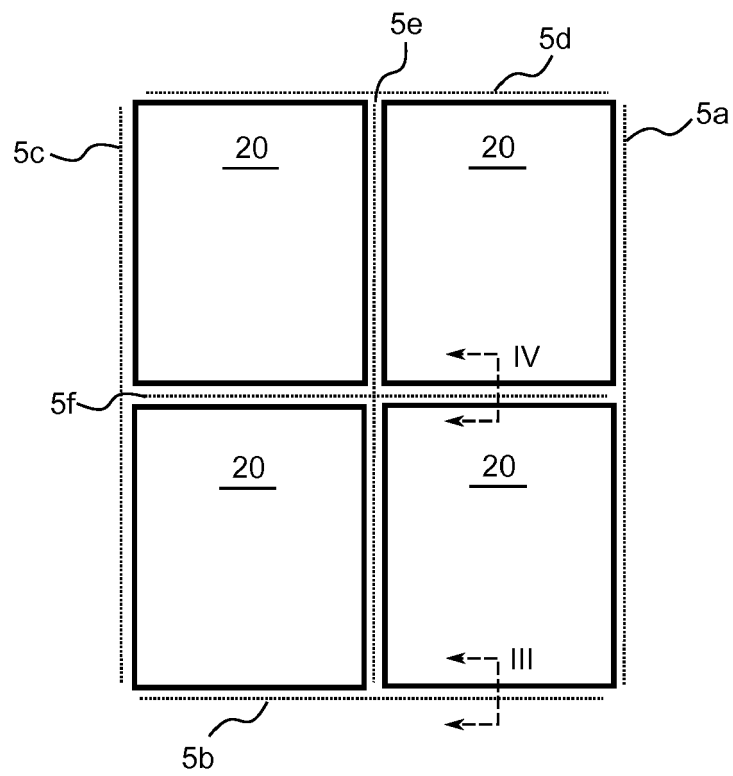


Fig. 2

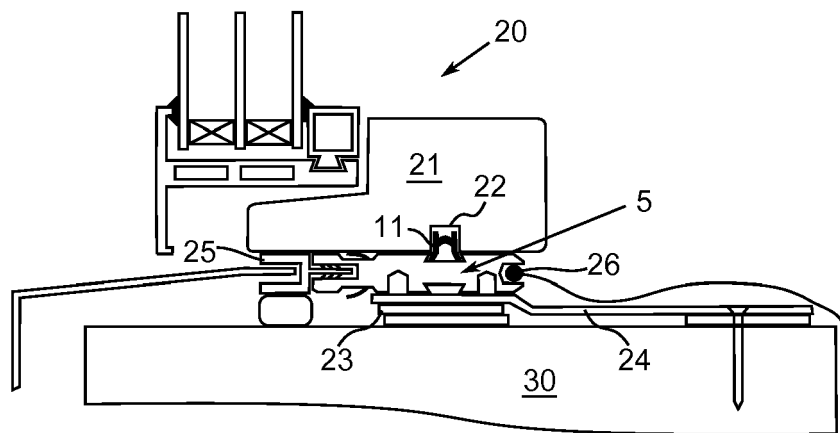


Fig. 3

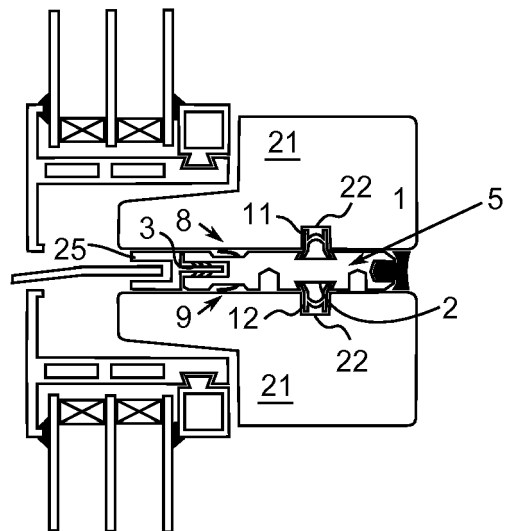


Fig. 4

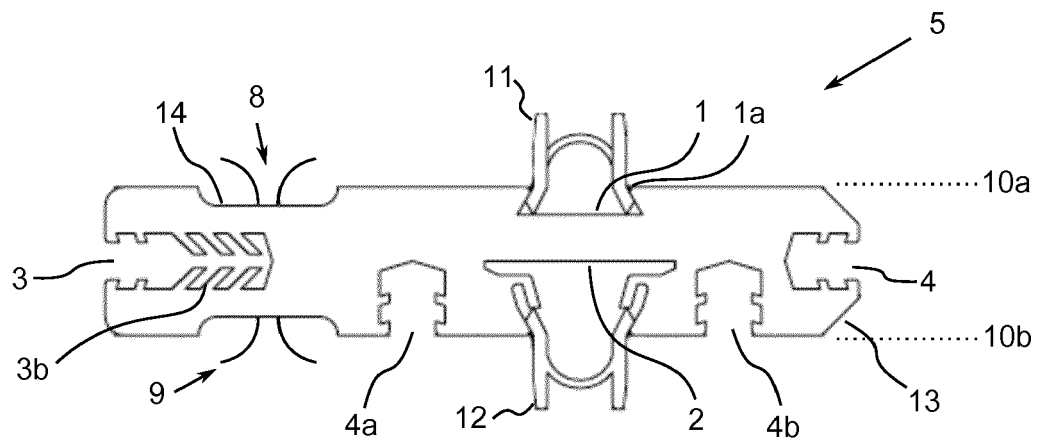


Fig. 5

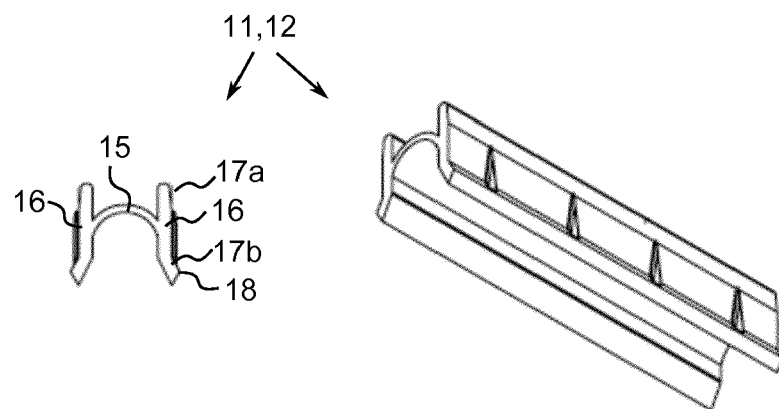


Fig. 6





## EUROPEAN SEARCH REPORT

 Application Number  
 EP 16 02 0002

5

10

15

20

25

30

35

40

45

50

55

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 2006/095201 A1 (ULTRAFRAME UK LTD [GB]; THOMPSON ANDREW [GB]; WOOFF PAUL JAMES [GB]) 14 September 2006 (2006-09-14) * page 12, line 16 - page 13, line 12; figures 18, 19 *	1-15	INV. E06B1/36 E06B1/60 E06B1/68
A	US 6 360 498 B1 (WESTPHAL DENNIS C [US]) 26 March 2002 (2002-03-26) * abstract; figures 1-6 *	1,10	
			TECHNICAL FIELDS SEARCHED (IPC)
			E06B
The present search report has been drawn up for all claims			
Place of search <b>The Hague</b>		Date of completion of the search <b>19 May 2016</b>	Examiner <b>Couprie, Brice</b>
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			

 1  
 EPO FORM 1503 03/02 (P04C01)

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

EP 16 02 0002

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  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

19-05-2016

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006095201 A1	14-09-2006	GB 2425143 A	18-10-2006
		WO 2006095201 A1	14-09-2006
-----			
US 6360498 B1	26-03-2002	NONE	
-----			

15

20

25

30

35

40

45

50

55

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**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- US 2008016800 A [0002]