



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication: **28.08.2013 Bulletin 2013/35** (51) Int Cl.: **E06B 9/52 (2006.01)**

(21) Application number: **12192442.7**

(22) Date of filing: **13.11.2012**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME

(30) Priority: **16.11.2011 NL 2007796**

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(54) **Screen device having a pleated corner**

(57) An improved screen device (21) is adapted for use in a window assembly (1). A pane-carrying sash (5) is hinged, at least selectively, along one of its sides (9) to a casement frame (3) to define in its open position a wedge-shaped three-sided ventilation opening. The improved screen device (21) is adapted to cover the wedge-shaped three-sided ventilation opening (23, 25, 27) and

to prevent ingress of foreign matter while allowing ventilation. The screen device (21) includes an extendible and collapsible pleated screening member formed substantially of pre-pleated sheet material (51) that is brought into a three-dimensional configuration separately and after pre-pleating. Also included is a method of making a three sided pleated screening member (29, 31, 33) for use in the screen device (21).

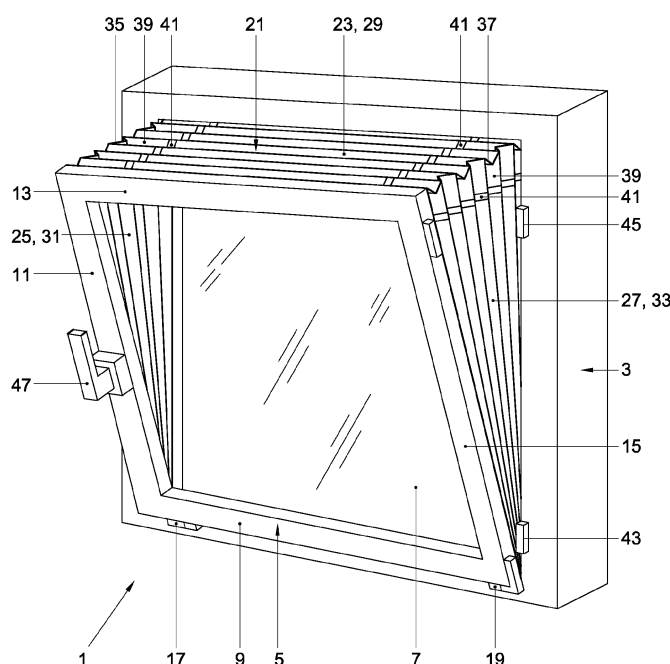


Fig. 1

Description

[0001] The invention relates to a screen device for a window having a fixedly installed, substantially rectangular casement frame and a pane-carrying sash with co-extensive sides and hinged along at least one of its sides to the casement frame. The screen device is adapted for mounting between the casement frame and the pane-carrying sash to cover a wedge-shaped three-sided ventilation opening between the casement frame and the pane-carrying sash to prevent ingress of insects while allowing ventilation.

[0002] Such screen devices are known in general and are described amongst others in the following patent publications: US 2,311,413; US 2,261,941; US 5,694,996; and DE 44 33 841. The known devices have been reasonably successful when used in so-called tilt-and-turn windows, which can selectively pivot about a vertical axis for general opening and about a horizontal axis for ventilation purposes. One of the attractions of such screening devices is that these leave the sight through the window pane unobstructed, while still effectively keeping out insects and to some extent airborne particles, such as dust. Nonetheless a difficulty in providing this kind of screening is that the wedge-shaped three-sided ventilation opening, which exists between the casement frame and the pane-carrying sash when the window is open, has two opposite triangular sides and one rectangular side. It has been attempted to cover this three-sided opening in various ways, but advantageously with pleated insect screen material that fans out over the triangular sides and is extended with the pleats parallel over the rectangular side. To provide a reliable barrier against insects it is important that interruptions in the continuity of the pleated screening member are avoided. This continuity has been achieved by pleating the pleated screening member around the corners between the fanning sides and the rectangular side. As a consequence the pleated screening members have to be custom made for each and every available window dimension, which is costly and time consuming. Another drawback is that standard pre-pleated insect screen material cannot be used, because around the corners the crests of the pleats that are formed by the outer fold lines, change to a valley that is defined by an inwardly extending fold line. It would not be a practical proposition to reverse the pleats in pre-pleated material and hence the pleated screening members to which the invention relates are conventionally made by pleating yet unpleated material to exactly the size in which these are required.

[0003] Accordingly it is an object of the present invention to propose an improved screen device for windows of the type referred to herein above that notably will allow use of pre-pleated sheet material. In a more general sense it is an object of the invention to overcome or ameliorate at least one of the disadvantages of the prior art. It is also an object of the present invention to provide alternative structures which are less cumbersome in as-

sembly and operation and which moreover can be made relatively inexpensively. Alternatively it is an object of the invention to at least provide the public with a useful choice that was not before available.

[0004] To this end the invention provides for a screen device for a window having a fixedly installed, substantially rectangular casement frame and a pane-carrying sash with sides coextensive with the casement frame with the pane-carrying sash being hinged, at least selectively, along one of its sides to the casement frame to define in an open position a wedge-shaped three-sided ventilation opening between the casement frame and the pane-carrying sash composed of a rectangular opening portion extending between opposite triangular opening portions, the screen device being adapted for mounting between the casement frame and the pane-carrying sash to cover the wedge-shaped three-sided ventilation opening to prevent ingress of foreign matter while allowing ventilation, wherein the screen device includes a pleated screening member having at least three sides of extendible and collapsible pleated sheet material and a corner fold between adjacent ones of its three sides, and wherein the at least three sides of pleated sheet material are formed using pre-pleated sheet material that is brought into a three-dimensional configuration. In one preferred embodiment the corner fold can be formed as an integral part of a separate corner element that is separately attached to interconnect sheets of pre-pleated sheet material. In another preferred embodiment the corner fold can be formed as an integral part of a sheet of pre-pleated material by doubling over flanks defining an inwardly extending fold, while forming triangular gussets of folded over flanks.

[0005] Such a screen device can be readily made from existing and commonly available pre-pleated sheet material. When a separate corner element is provided that is separately attached to interconnect sheets of pre-pleated sheet material, then it is easy to construct screen devices for a variety ventilation opening sizes associated with various window sizes. Also when a sheet of pre-pleated material has its flanks defining an inwardly extending fold, doubled over by forming triangular gussets of folded over flanks, pre-cut widths of pre-pleated sheet material may be used to integrally form screen devices for the variety of window sizes.

[0006] A screen device according to the invention in which the corner fold is formed as an integral part of a sheet of pre-pleated material, the corner fold may preferably be formed by doubling over the flanks that define the inwardly extending fold, with the triangular gussets of folded over flanks alternating every other pleat. This arrangement with the triangular gussets of folded over flanks alternating every other pleat, substantially reduces the folding thickness at the corners, when the screening member is collapsed.

[0007] It is also advantageous for the screen device according to the invention, in which a separate corner element is separately attached, for the separate corner

element to interconnect the sheets of pre-pleated sheet material by one of stitching, gluing and welding. While normally such connecting methods are avoided in insect screen mesh material, so as not to clutter the viewing there through, the present invention in use has little or no impact on the view through the opened window. Hence the convenience of connecting mesh material by stitching, gluing, or welding, can be used without its inherent drawbacks.

[0008] In combination with the embodiments of the invention it may further be advantageous, when the pleated screening member includes a first perimeter reinforcement attached to a flank of an end pleat for facing the casement frame and a second perimeter reinforcement attached to a flank of an end pleat for facing the pane-carrying sash. In regard it may be further preferred, when the first perimeter reinforcement can be removably attached to the casement frame. More in particular it may then also be preferred when the first perimeter reinforcement has an S-shaped cross section with a first flange coextensive with the flank of the end pleat confronting it and an outwardly directed second flange for attachment to the casement frame that is offset in a direction toward the second perimeter reinforcement to an extent allowing to accommodate the folding thickness of the screening member alongside a depth of a web portion interconnecting the first and second flanges. Thereby preferably the pleated screening member upon folding can be received in a cavity formed by the web portion and the first flange of the S-shaped first perimeter reinforcement.

[0009] The embodiments that use perimeter reinforcements can advantageously be arranged such that the second perimeter reinforcement can be removably attached to the pane-carrying sash. Using such an arrangement a preferred combination can be obtained when optionally the first perimeter reinforcement and the second perimeter reinforcement are adapted for mounting between the casement frame and the pane-carrying sash, using one of adhesive, magnetic strips and hook and loop fasteners.

[0010] The pre-pleated sheet material that is brought into the three-dimensional configuration for use in the present invention may advantageously be insect screen material.

[0011] The present invention also includes a method of making a pleated screening member having a three-dimensional configuration defined by at least three sides of extendible and collapsible pleated sheet material and a corner fold connecting adjacent ones of its three sides to extend perpendicular to one another for use in a screen device for a window having a fixedly installed, substantially rectangular casement frame and a pane-carrying sash with sides coextensive with the casement frame with the pane-carrying sash being hinged, at least selectively, along one of its sides to the casement frame to define in its open position a wedge-shaped three-sided ventilation opening between the casement frame and the pane-carrying sash composed of a rectangular opening

portion extending between opposite triangular opening portions, the screen device being adapted for mounting between the casement frame and the pane-carrying sash to cover the wedge-shaped three-sided ventilation opening to prevent ingress of foreign matter while allowing ventilation, wherein the at least three sides of pleated sheet material of the screening member are formed using pre-pleated sheet material that is brought into the three-dimensional configuration separately and after initially pleating to bring it into pleated form. In such a method it may be advantageous when the pre-pleated sheet material is brought into the three-dimensional configuration by separately attaching a separate corner element for interconnecting sheets of pre-pleated sheet material. In combination with such a method it may be preferred when the corner fold is formed as an integral part of the separate corner element interconnecting sheets of pre-pleated sheet material by one of stitching, gluing and welding. Alternatively in such a method it may also be advantageous when the pre-pleated sheet material is brought into the three-dimensional configuration by doubling over flanks defining an inwardly extending fold of a sheet of pre-pleated material, while forming triangular gussets of folded over flanks. In combination with such an alternative method it may be preferred when the doubling over of the flanks defining the inwardly extending fold in forming the corner fold, is accomplished by alternating the triangular gussets of the folded over flanks every other pleat. The advantages of a screening member obtained by such methods have already been mentioned herein above.

[0012] Further advantageous aspects of the invention will become clear from the appended description and in reference to the accompanying drawings, in which:

Figure 1 shows a window assembly and an improved screen device according to the invention;

Figure 2 illustrates one form of pleated screening member for use as a screen device according to the invention;

Figure 3 is a plan view of an area of flattened out pre-pleated sheet material, showing the particular arrangement of fold lines;

Figure 4 is an exploded view of a first alternative embodiment of forming a corner in a screening member in accordance with the invention; and

Figure 5 is a perspective view of a portion of a separate corner element according to a second alternative embodiment in accordance with the invention.

[0013] In Figure 1 a window assembly 1 is shown that includes a substantially rectangular casement frame 3. The casement frame 3 in use will be fixedly installed in a wall of a building as is conventional. For clarity the building wall is omitted in Figure 1. A sash 5 carrying a pane of glass 7 has perimeter sides 9, 11, 13, 15 that are coextensive with confronting sides of the rectangular casement frame 3. The pane-carrying sash 5 is hinged

at its bottom perimeter side 9 to the confronting side of the casement frame 3 by hinges 17, 19. As shown in Figure 1 the pane-carrying sash 5 is in an open position and forms a wedge-shaped three sided ventilation opening between the casement frame 3 and the pane-carrying sash 5, in which a screen device 21 is received. The three-sided ventilation opening is composed of a rectangular portion 23 and opposite first and second triangular portions 25, 27. The screen device 21 prevents the ingress of foreign matter through the three-sided ventilation opening by having three sides of collapsible pleated sheet material sides corresponding to the rectangular and triangular portions 23, 25, 27. As such the screen device 21 includes a pleated screening member that has three sides 29, 31, 33 of extendible and collapsible pleated sheet material corresponding to the respective portions of the ventilation opening. Adjacent ones of the triangular portions 31, 33 are each connected to the central rectangular portion 29 by a first and second corner fold 35, 37 respectively. A substantial portion of each of the three sides 29, 31, 33 of the screening members consists of pre-pleated sheet material, such as in the present example, insect screen mesh material. A three-dimensional configuration of the pre-pleated sheet material can be obtained by providing the first and second corner folds 35, 37 as an integral part in a sheet of pre-pleated sheet material, or as shown in Figure 1 by providing the first and second corner folds 35, 37 each as a part of a prefabricated corner element 39 of which appropriate lengths are attached to the individual sheets of pleated sheet material used for the triangular sides and the rectangular portion. The portions of pre-pleated sheet material used for the opposite first and second triangular portions 31, 33 of a screening member fan out, while the pre-pleated sheet material in the rectangular area 29 extends with its pleats generally parallel. The separate corner elements 39 are joined or bonded to interconnect both lateral sides of the central rectangular sheet of pre-pleated material 29 to a respective one of the first and second triangular portions 31, 33. The joints, in as far as visible in Figure 1, are indicated by reference numeral 41. Not shown in detail, but within the purview of the skilled person, is the option of having opposite perimeter reinforcements attached to opposite end pleats along the three sides 29, 31, 33 of the pleated screen member for use in the mounting of the screen device 21 between the casement frame 3 and the pane-carrying sash 5. Mounting can be by means of adhesive, magnetic strips, or hook and loop fasteners as is conventional. Apart from not using any reinforcements at all, it is also possible to use other means for retaining the screen device 21 in position between the casement frame 3 and the pivotable sash.

[0014] As further indicated in Figure 1, the window assembly 1 may be of a so-called tilt-and-turn version, which can selectively also pivot about vertical hinges 43, 45 on confronting vertical sides of the casement frame 3 and sash 5, for other purposes than ventilation. Such

alternative pivoting can conventionally be selected by operation of an operating handle.

[0015] Referring now to Figure 2, there is shown screen device 21 having an integral corner, such as the first and second corner folds 35, 37, formed in a sheet of pre-pleated sheet material 51. The pre-pleated sheet material 51 has convex outwardly extending folds 53 and concave inwardly extending folds 55 forming crests and valleys respectively between opposite flanks 57, 59. At the corner fold 35, 37 each of the flanks 57, 59 defining an inwardly extending or concave fold 55 are doubled over and thereby have formed triangular gussets 61 of folded over flank material. The folder over gussets 61 are formed by a zig-zag concave fold line 63, which in the drawing Figures is shown as a dotted line.

[0016] In Figure 3 a flattened portion of pre-pleated sheet material 51 is shown in the area of a corner fold 35, 37. Because the zig-zag fold line 63 alternates about the actual corner fold line 65 of the corner folds 35, 37, which is convex, the doubled over gussets 61 are alternately positioned on opposite sides. This has the advantage that the stacking height of the doubled over gussets 61 is distributed evenly at each side of the corner fold 35, 37.

[0017] Figure 4 shows a first alternative embodiment, in which the second corner fold 37 is shown as an integral part of a prefabricated separate corner element 39 that is separately attached to a sheet 51 of pre-pleated sheet material. The bonding joint (41 in Figure 1) is formed by confronting bonding areas 41A and 41B shown in Figure 4. In this first alternative embodiment the corner element 39 can also be formed from pre-pleated sheet material in the manner explained in reference to Figures 2 and 3.

[0018] The screen devices obtained as explained in reference to Figures 2 to 4, as explained above can be completed by attaching first and second perimeter reinforcements to flanks 57 or 59 of an end pleat 53 or 55 that are each adapted to face or connect to respectively the window casement frame 3 or the pane-carrying sash 5. Preferably a connection is selected that can be disconnected to allow the screen device 21 to be removed for cleaning or other purposes. In a conventional manner the perimeter reinforcement that is connectable to the casement frame 3 can be given an S-shaped cross section, with spaced flanges connected by a web portion. One of the spaced flanges of the S-shaped reinforcement extends outwardly from the web portion to connect to the casement frame 3 and the other flange extends inwardly to form a cavity with the web portion for receiving the pleated screening member when it is folded and the window is closed. Such configurations are conventional and do not form an independent part of the invention and are optional.

[0019] A second alternative embodiment of a prefabricated separate corner element 139 is shown in Figure 5. In this embodiment the corner element 139 is formed of previously unpleated sheet material. At the corner fold 165, the convex folds 153 on one side of the corner fold,

change to concave folds 255 on the other side of the corner fold. Conversely the convex fold 253 at the opposite side of the corner fold 165 changes to concave folds 155 at the one side of the corner fold 165. As in the embodiment of Figures 1 and 4, the corner element 139 can be used to interconnect pre-pleated sheet of pleated material by means of bonding or like connecting means.

[0020] Accordingly an improved screen device 21 has been described that is adapted for use in a window assembly 1 that has a fixedly installed, substantially rectangular casement frame 3 and a pane-carrying sash 5 with perimeter sides 9, 11, 13, 15 coextensive with the casement frame 3. The pane-carrying sash 5 of the window assembly 1 is hinged, at least selectively, along one of its sides 9 to the casement frame 3 to define in its open position a wedge-shaped three-sided ventilation opening between the casement frame 3 and the pane-carrying sash 5. The ventilation opening thereby is composed of a rectangular opening portion 23 extending between opposite first and second triangular opening portions 25, 27. The improved screen device 21 is adapted for mounting between the casement frame 3 and the pane-carrying sash 5 to cover the wedge-shaped three-sided ventilation opening 23, 25, 27 and to prevent ingress of foreign matter while allowing ventilation. The screen device 21 includes a pleated screening member that has at least three sides 29, 31, 33 of extendible and collapsible pleated sheet material and a corner fold 35, 37, 65, 165 connecting adjacent ones of its three sides to extend perpendicular to each other. The at least three sides of pleated sheet material are formed substantially of pre-pleated sheet material 51 that is brought into a three-dimensional configuration separately and after initially pleating that has brought it into pre-pleated form. Also included the above description is a method of making the three sided pleated screening member 29, 31, 33 for use in the screen device 21.

[0021] It is thus believed that the operation and construction of the present invention will be apparent from the foregoing description and drawings appended thereto. It will be clear to the skilled person that the invention is not limited to any embodiment herein described and that modifications are possible which should be considered within the scope of the appended claims. Also kinematic inversions are considered inherently disclosed and to be within the scope of the invention. In the claims, any reference signs shall not be construed as limiting the claim. The term 'comprising' and 'including' when used in this description or the appended claims should not be construed in an exclusive or exhaustive sense but rather in an inclusive sense. Thus the expression 'comprising' as used herein does not exclude the presence of other elements or steps in addition to those listed in any claim. Furthermore, the words 'a' and 'an' shall not be construed as limited to 'only one', but instead are used to mean 'at least one', and do not exclude a plurality. Features that are not specifically or explicitly described or claimed may be additionally included in the structure of the invention

within its scope. Expressions such as: "means for ..." should be read as: "component configured for ..." or "member constructed to ..." and should be construed to include equivalents for the structures disclosed. The use of expressions like: "critical", "preferred", "especially preferred" etc. is not intended to limit the invention. Additions, deletions, and modifications within the purview of the skilled person may generally be made without necessarily departing from the scope of the invention, as is determined by the claims.

Claims

1. Screen device for a window having a fixedly installed, substantially rectangular casement frame and a pane-carrying sash with sides coextensive with the casement frame with the pane-carrying sash being hinged, at least selectively, along one of its sides to the casement frame to define in an open position a wedge-shaped three-sided ventilation opening between the casement frame and the pane-carrying sash composed of a rectangular opening portion extending between opposite triangular opening portions, the screen device being adapted for mounting between the casement frame and the pane-carrying sash to cover the wedge-shaped three-sided ventilation opening to prevent ingress of foreign matter while allowing ventilation, wherein the screen device includes a pleated screening member having at least three sides of extendible and collapsible pleated sheet material and a corner fold between adjacent ones of its three sides, and wherein the at least three sides of pleated sheet material are formed using pre-pleated sheet material that is brought into a three-dimensional configuration.
2. Screen device according to claim 1, wherein the corner fold is formed as an integral part of a separate corner element that is separately attached to interconnect sheets of pre-pleated sheet material.
3. Screen device according to claim 1, wherein the corner fold is formed as an integral part of a sheet of pre-pleated material by doubling over flanks defining an inwardly extending fold, while forming triangular gussets of folded over flanks.
4. Screen device according to claim 3, wherein the corner fold is formed by doubling over flanks defining the inwardly extending fold, with the triangular gussets of folded over flanks alternating every other pleat.
5. Screen device according to claim 2, wherein the corner fold is formed as an integral part of the separate corner element interconnecting sheets of pre-pleated sheet material by one of stitching, gluing and

welding.

6. Screen device according to any one of claims 2 to 5, wherein the pleated screening member includes a first perimeter reinforcement attached to a flank of an end pleat for facing the casement frame and a second perimeter reinforcement attached to a flank of an end pleat for facing the pane-carrying sash. 5
7. Screen device according to claim 6, wherein the first perimeter reinforcement can be removably attached to the casement frame. 10
8. Screen device according to claim 7, wherein the first perimeter reinforcement has an S-shaped cross section with a first flange coextensive with the flank of the end pleat confronting it and an outwardly directed second flange for attachment to the casement frame that is offset in a direction toward the second perimeter reinforcement to an extent allowing to accommodate the folding thickness of the screening member alongside a depth of a web portion interconnecting the first and second flanges. 15 20
9. Screen device according to claim 8, wherein the pleated screening member upon folding is receivable in a cavity formed by the web portion and the first flange. 25
10. Screen device according to any one of claims 6 to 9, wherein the second perimeter reinforcement can be removably attached to the pane-carrying sash. 30
11. Screen device according to claim 10, wherein the first perimeter reinforcement and the second perimeter reinforcement are adapted for mounting between the casement frame and the pane-carrying sash, using one of adhesive, magnetic strips and hook and loop fasteners. 35 40
12. Screen device according to any one of claims 1 to 11, wherein the pre-pleated sheet material that is brought into the three-dimensional configuration is insect screen material. 45
13. Method of making a pleated screening member having a three-dimensional configuration defined by at least three sides of extendible and collapsible pleated sheet material and a corner fold connecting adjacent ones of its three sides to extend perpendicular to one another for use in a screen device for a window having a fixedly installed, substantially rectangular casement frame and a pane-carrying sash with sides coextensive with the casement frame with the pane-carrying sash being hinged, at least selectively, along one of its sides to the casement frame to define in its open position a wedge-shaped three-sided ventilation opening between the casement frame and 50 55

the pane-carrying sash composed of a rectangular opening portion extending between opposite triangular opening portions, the screen device being adapted for mounting between the casement frame and the pane-carrying sash to cover the wedge-shaped three-sided ventilation opening to prevent ingress of foreign matter while allowing ventilation, wherein the at least three sides of pleated sheet material of the screening member are formed using pre-pleated sheet material that is brought into the three-dimensional configuration separately and after initially pleating to bring it into pleated form.

14. Method according to claim 13, wherein the pre-pleated sheet material is brought into the three-dimensional configuration by separately attaching a separate corner element for interconnecting sheets of pre-pleated sheet material.
15. Method according to claim 14, wherein the corner fold is formed as an integral part of the separate corner element interconnecting sheets of pre-pleated sheet material by one of stitching, gluing and welding.
16. Method according to claim 13, wherein the pre-pleated sheet material is brought into the three-dimensional configuration by doubling over flanks defining an inwardly extending fold of a sheet of pre-pleated material, while forming triangular gussets of folded over flanks.
17. Method according to claim 16, wherein the doubling over of the flanks defining the inwardly extending fold in forming the corner fold, is accomplished by alternating the triangular gussets of the folded over flanks every other pleat.

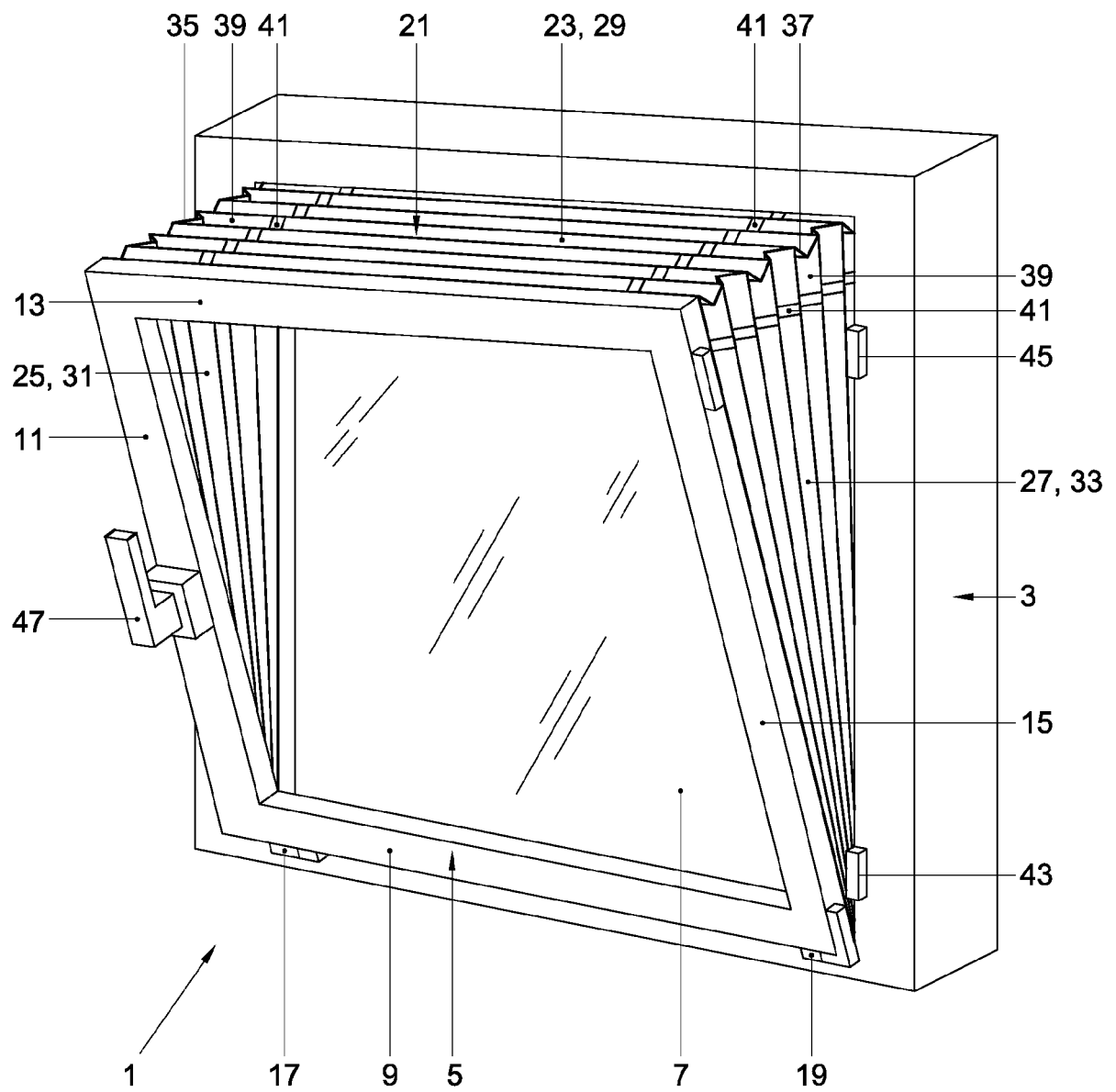


Fig. 1

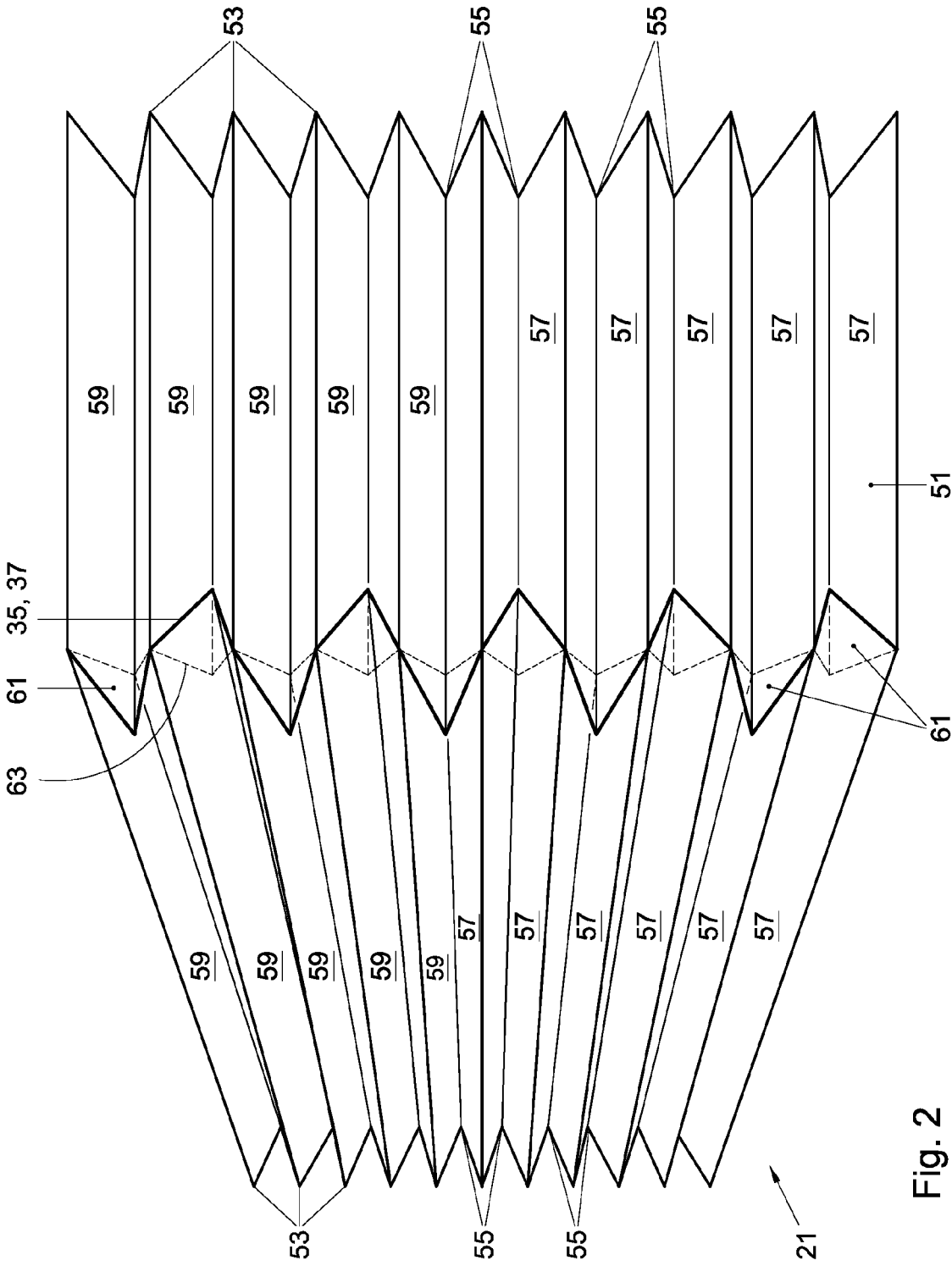


Fig. 2

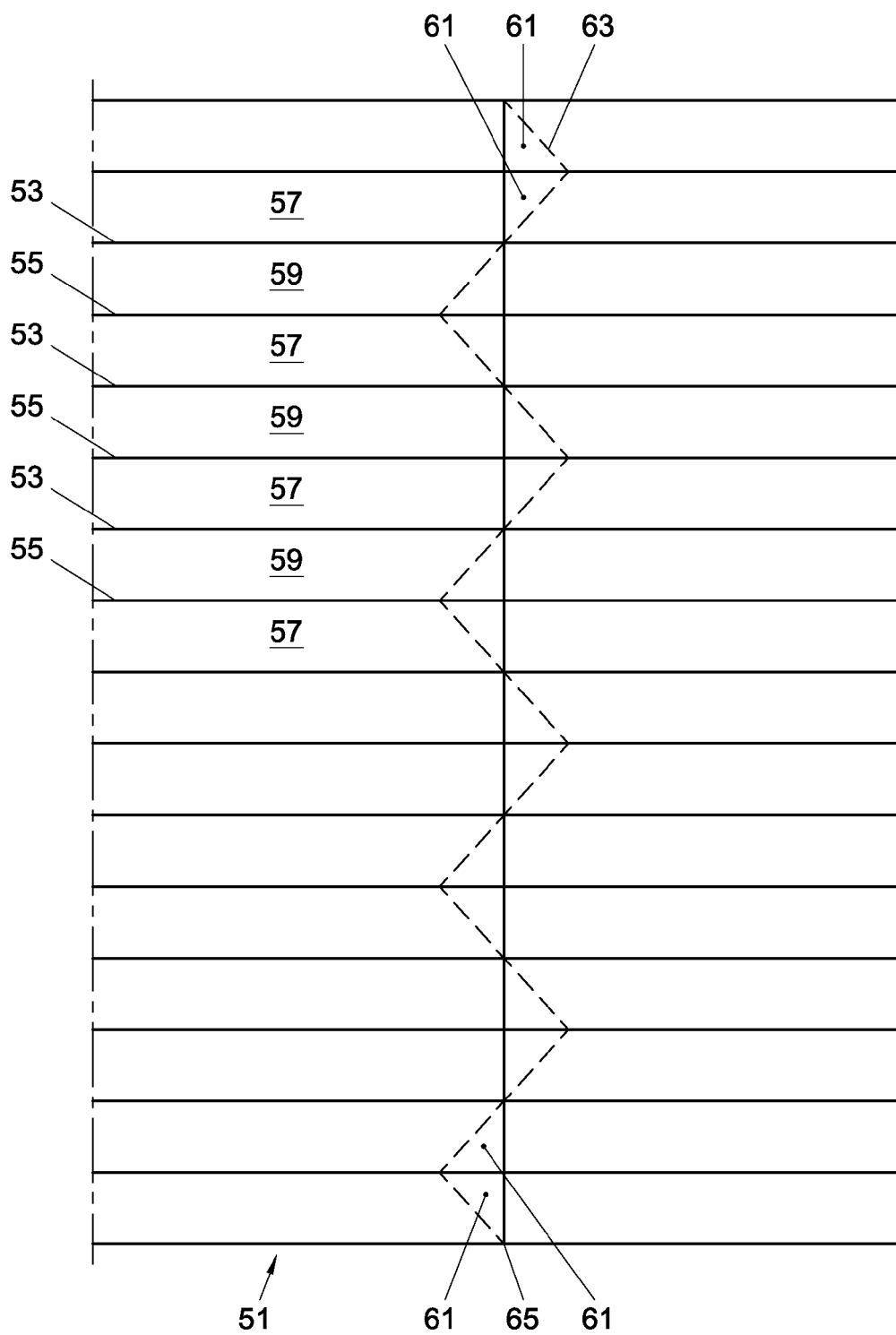
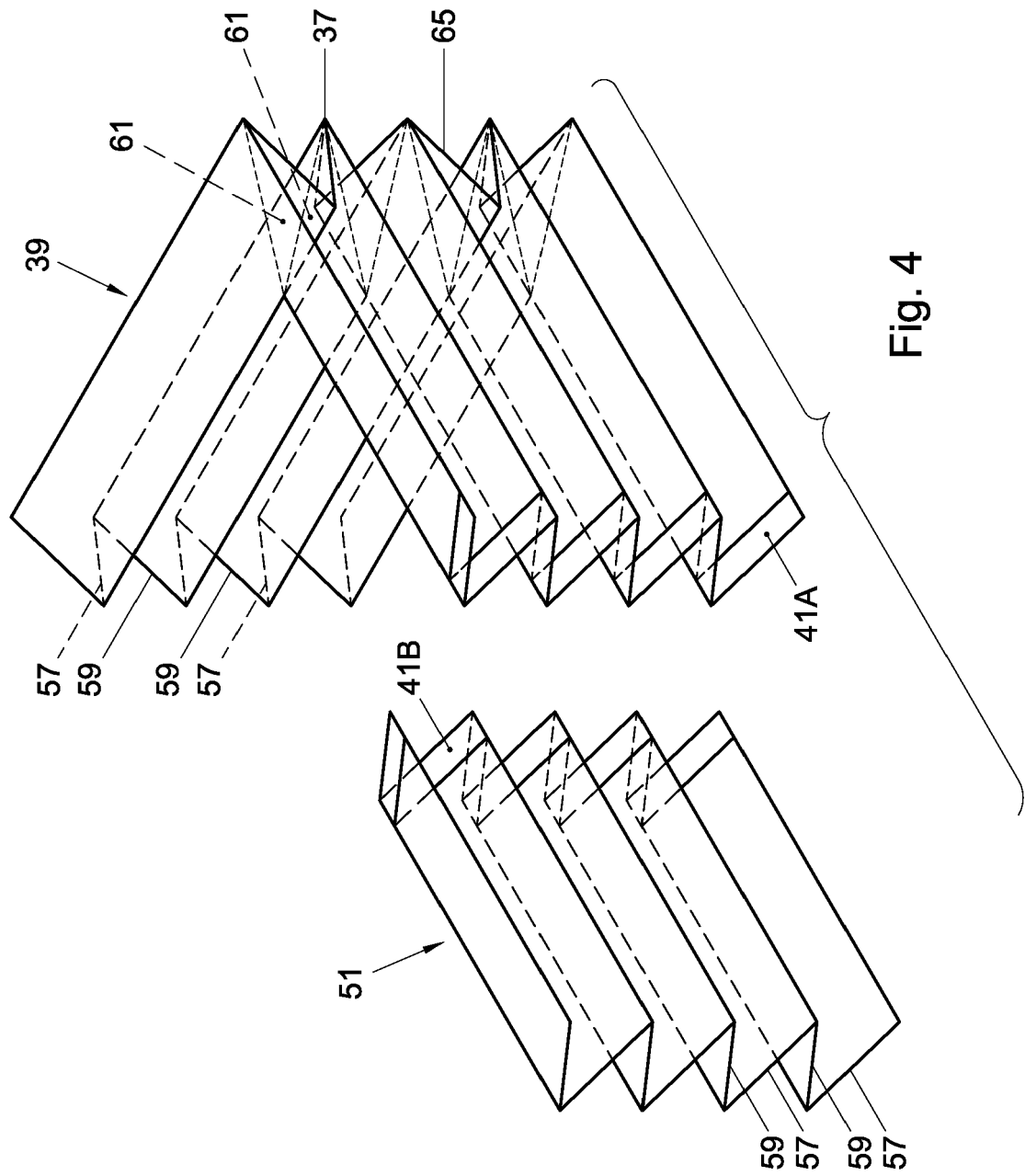


Fig. 3



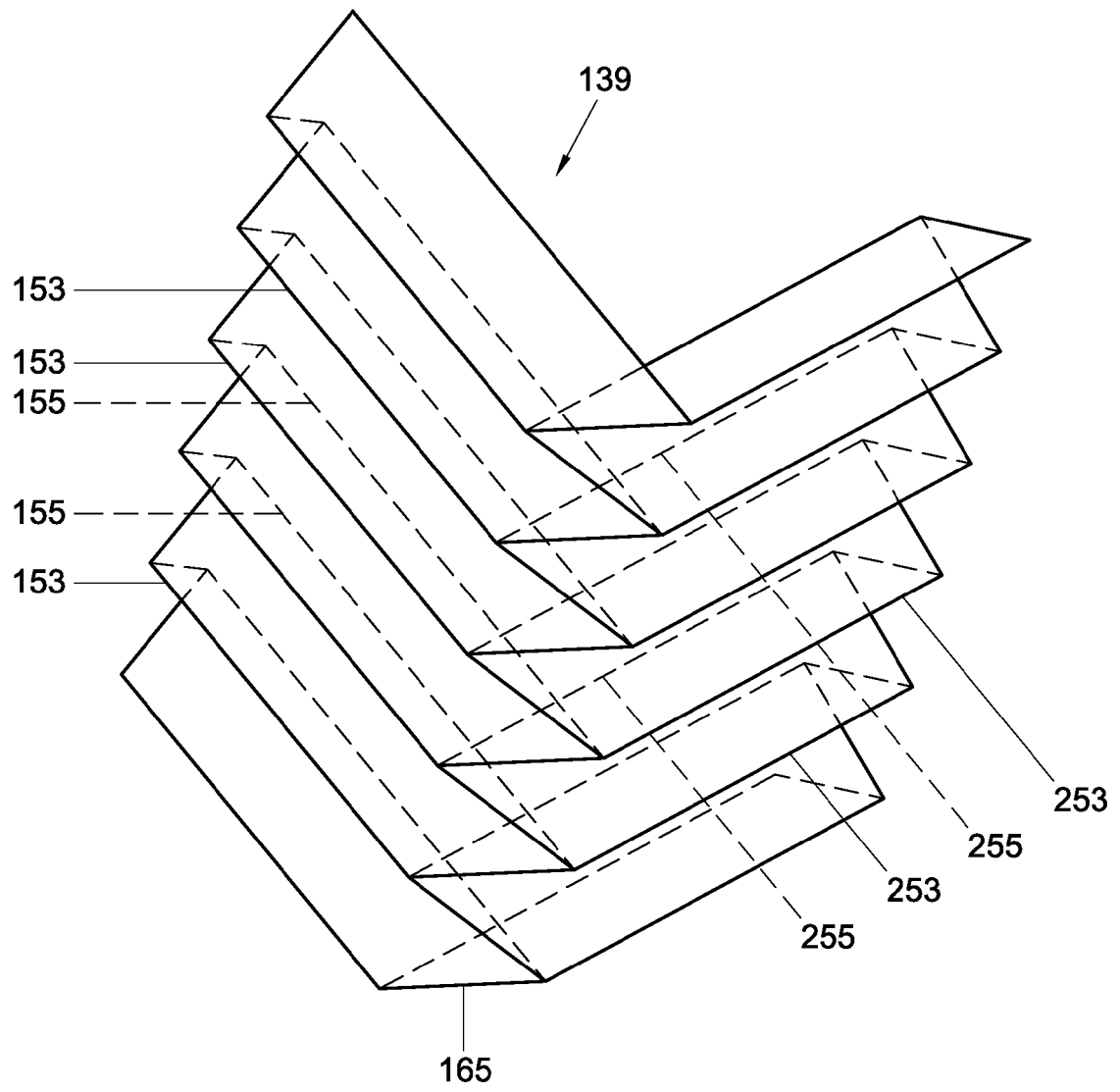


Fig. 5



EUROPEAN SEARCH REPORT

 Application Number
EP 12 19 2442

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	BE 1 013 135 A6 (DEN BUYS JOZEF VAN [BE]) 2 October 2001 (2001-10-02) * page 6, paragraph 2; figures 4,5,6,9,10 *	1,2, 5-10, 12-15	INV. E06B9/52
X	DE 20 2008 016773 U1 (KEYACE LTD [HK]) 19 March 2009 (2009-03-19) * Bezugszeichenliste; paragraphs [0029] - [0030], [0034] - [0038]; figures 2,5-8 *	1,3,4,6, 7,10-13, 16,17	
X	GB 1 251 493 A (BERRY FRANK) 27 October 1971 (1971-10-27) * the whole document *	1,3,4, 13,16,17	
X	NL 1 005 291 C2 (LEEN HUISMAN B V [NL]) 18 August 1998 (1998-08-18) * page 8, line 33 - page 9, line 9; figures 5,6 *	1,3,6-8, 10,13,16	
X	DE 42 18 088 C1 (NIEBER MATHIAS [DE]) 28 October 1993 (1993-10-28) * column 2, lines 4-17; figure 5 *	1	TECHNICAL FIELDS SEARCHED (IPC) E06B
X	DE 296 04 407 U1 (SCHNEIDER ADAM [DE]) 15 May 1996 (1996-05-15) * Zusammenstellung der Bezugszeichen; page 8; figures 2,3 *	1,3,4	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 18 July 2013	Examiner Kofoed, Peter
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 03.02 (P04C01)

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

EP 12 19 2442

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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18-07-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
BE 1013135 A6	02-10-2001	NONE	
DE 202008016773 U1	19-03-2009	DE 202008016773 U1 EP 2199525 A2	19-03-2009 23-06-2010
GB 1251493 A	27-10-1971	NONE	
NL 1005291 C2	18-08-1998	NONE	
DE 4218088 C1	28-10-1993	NONE	
DE 29604407 U1	15-05-1996	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 2311413 A [0002]
- US 2261941 A [0002]
- US 5694996 A [0002]
- DE 4433841 [0002]