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(54) **Flanged shim**

(57) This invention relates to a shim (23) used in construction work particular building work such as roof construction. The shim is supplied with one or more flanges (7, 8) by side of one of its two surfaces (5, 6). The flange or flanges are placed on and along the sides (3, 4) of the shim. They are lowered or raised from the shim body. When applied in construction work, the flanged shim (23)

and the construction part (11) to be supported, adjusted or levelled by the shim form a ridge-and-groove arrangement, where the construction part (11) is a ridge and the flanged shim (23) is a groove. The arrangement prevents the shim from rotating or sliding laterally and thus keeps the shim accurately at the required position in the construction.

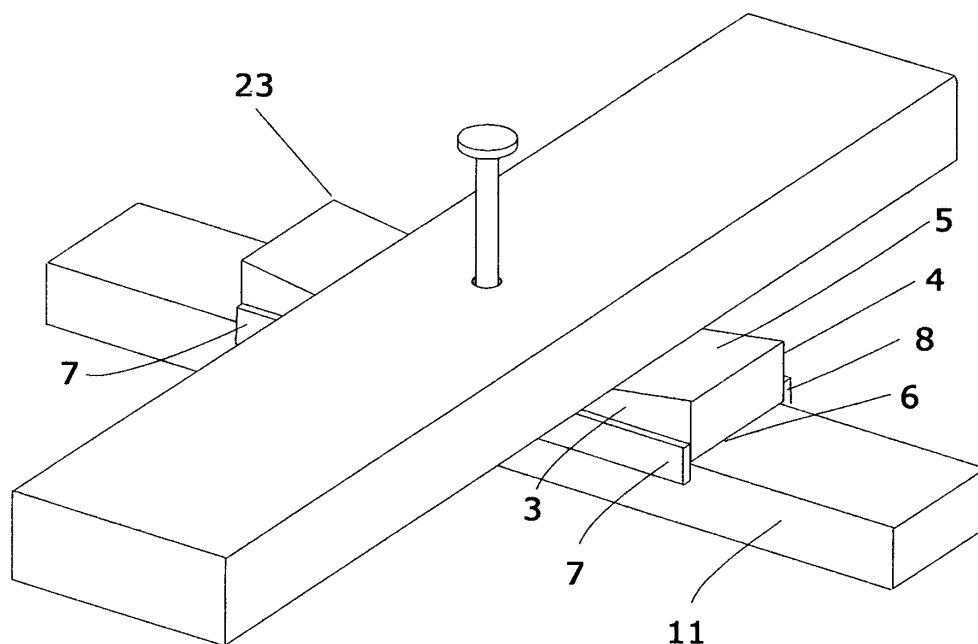


Fig 5

Description

[0001] This invention relates to a shim supplied with flanges for construction work particular building work such as roof construction. The flanges serve to hold and keep the shim accurately at the required position in the construction.

Background:

[0002] Shim or wedge to fill small gaps or spaces between objects has been used in construction work for a long time. Shims are typically used in order to support and adjust for better fit, or to provide a level surface. A shim has two surfaces (upper and lower surface), two sides (right and left side) and two ends (front and rear end). When one end is thinner than the other end, the shim is a wedge that has a tapered body with two triangle-shaped sides. Shim or wedge can be used singly, in pair or in pairs.

[0003] In DK141414 and EP0891495 the wedge is provided with profiles on its upper or/and lower surfaces to prevent it from sliding from each other when it is used in pair or in pairs.

[0004] In EP0127021, EP0171545, DE9112961U, DE8322420U and DE8808202U the shim or wedge is supplied with an inserting slot opening to one end. It is thus possible to fasten the shim or wedge at the required point on the construction with a nail, a screw or the like.

[0005] In W02005069722 and EP0719953 the shim or wedge is further provided with teeth or barb along both of the slot's sides. It is thus possible, with the help of a nail or a screw, to position and retain the shim or wedge at a required point in the gap between two loosely connected construction parts. After correction of the orientation or level of the construction parts, the nail or screw and the shim or wedge are tightened.

[0006] The problem is, while being positioned and retained by a nail or a screw at a required point in the gap between two loosely nailed or screwed construction parts, the shim or wedge tends to rotate between the construction parts with the nail or screw as axle during driving-in and setting. In situation where a nail or screw is not applied to keep the shim or wedge at a required point, the shim or wedge can easily slide from its original position in the construction during driving-in and setting.

The invention:

[0007] In recognition of the disadvantages of the state of the art, it is an object of the invention to provide a shim that prevents itself from rotating or sliding in the construction and keeps itself accurately at the required position in the construction.

[0008] The object is achieved in the invention by providing the shim with one or more flanges by side of one of its two surfaces. Flanges are placed on and along one or both sides of the shim. The flange can, but not neces-

sary, run from one end to the other end of the shim. It can be in any size and in any shape such as rectangle, circle and triangle. Further more, the flange can extend outward from the shim body to achieve required distance between two flanges.

[0009] When applied in construction work, a shim with said flanges and the construction part to be supported or adjusted by the shim can be regarded as a ridge-and-groove arrangement, where the construction part is ridge and the shim with flanges is groove.

[0010] The present invention will be explained in detail in the following with reference to embodiments and drawings which are:

Fig. 1: It is a perspective view of an embodiment of said shim that is a wedge (23) with two profiled surfaces (upper surface 5 and lower surface 6), two sides (right side 3 and left side 4), two ends (front end 2 and rear end 1) where front end (2) is thinner than the rear end (1), an inserting slot (19) opening towards front end (2) and teeth along both sides of the slot (14a, 14b). The two flanges (right flange 7 and left flange 8) are located by side of shim's lower surfaces (6) and are placed on and along both sides (3, 4) of the shim. The length of flange is about 2/3 of the length of the shim body measured between the two ends of the shim. The flange is lowered from the shim body so that around half of the flange is attached to the shim body. This embodiment is made of hard plastic, and it is well known in plastic industry to have recess (20) of different sizes and shapes in a product like this to save raw materials.

Fig. 2: It is a perspective view of an embodiment of said shim that is a rectangular shim stock (24) with two surfaces (5, 6), two sides (3, 4) and two ends (1, 2). The two flanges (7, 8) are located by side of one of the shim's two surfaces (6) and are placed on and along both sides (3, 4) of the shim. They are lowered or raised from the shim body.

Fig. 3: It is a perspective view of an embodiment of said shim that is a rectangular shim stock (25) with two surfaces (5, 6), two sides (3, 4), two ends (1, 2) and an inserting slot (19). The two flanges (7, 8) are located by side of one of the shim's two surfaces (6) and are placed on and along both sides (3, 4) of the shim. They are lowered or raised from the shim body.

Fig. 4a-b-c-d: Figures show how the embodiment in Fig. 1 is applied in roof construction work. In traditional constructions and particularly in Scandinavian, roof rafters (22) are first covered by an underlay (21) nailed to rafters. On top of each rafter, a lath (11) is nailed to provide sufficient ventilation for the roof construction. Over the underlay and transversely across the laths, parallel spaced battens (12) are then nailed (13) for supporting roof tiles or other roof

finishing materials. The battens are only loosely nailed (13) to the laths and rafters, so that it is possible to level each batten before the finishing materials such as tiles are put onto the roof.

[0011] Gaps of different sizes between battens and laths after levelling are usually filled with shims or/and wedges made of plastic, metal, stone, wood or even paper/cardboard. Shims/wedges can be used singly, in pair or in pairs. Some methods are invented to retain the shims and wedges in-between the laths and battens during levelling (for example W02005069722 and EP0719953), and other methods are invented to prevent shims and wedges from sliding from each other when they are used in pair or pairs (for example DK141414 and EP0891495).

[0012] It happens oftenly that shims or wedges tend to rotate between laths and battens with the nail (13) as axle during driving-in and setting as illustrated in Fig. 4d. This problem is solved by the embodiment as shown in Fig. 1 and as illustrated in Fig. 4a-b-c.

[0013] The wedge (23) in Fig. 1 and Fig. 4a-b-c has two side flanges (7, 8) that are lowered or raised from the shim body (Fig. 4b). The distance between the flanges is at least equal to the width of the lath (11 in Fig. 4c). After being put onto the lath, the flanges keep the lath in-between themselves (Fig. 4c) and thus prevent the wedge (23) from rotating or sliding between laths and batens (11 and 12).

Fig. 5: This figure is an enlarged drawing of Fig. 4a.

Fig. 6: An embodiment of said shim that is a wedge with two profiled surfaces (5, 6), two sides (3, 4), two ends (1, 2) where one end (2) is thinner than the other (1), an inserting slot (19) and teeth on and along both sides of the slot (14a, 14b). The two flanges (7, 8) are located by side of one of the shim's two surfaces (6) and are placed on and along both sides (3, 4) of the shim. Flanges are lowered or raised from the shim body. The figure shows a plan view (middle), a side view (down), an end view (right) and an end-sectional view (left) taken on line A-B of the wedge.

Fig. 7: An embodiment of said shim that is similar to the embodiment in Fig. 6 with the difference that there is no inserting slot in it. The figure shows a plan view (middle), a side view (down), an end view (right) and an end-sectional view (left) taken on line C-D of the wedge.

Fig. 8: The figure shows a pair of wedges in use. It is the side view of the wedge-pair illustrated in Fig. 4.

Fig. 9: The figure shows two pairs of wedges in use. The wedges are parallelly stacked and set atop one another. Here the flanges have a further function

where they act as side-lock to each other. It means that each wedge in the stack is laterally locked by its flanges atop one another and is thus prevented from lateral sliding from each other.

Fig.10: It is a perspective view of an embodiment of said shim where the flanges are extended outward from the shim body to achieve required distance between flanges.

Flanges are lowered or raised from the shim body and can have any size and be in any shape. They can be used singly, in pair or in plural. They can be located anywhere on the sides of the shim body. Below are some examples of variations of the flange and its position on shim:

Fig. 11: It is a perspective view of an embodiment of said shim where the flanges are placed in the middle of the sides of the shim.

Fig.12: It is a perspective view of an embodiment of said shim where the flanges have the same length as the shim body and run from one end to the other end.

Fig. 13: It is a perspective view of an embodiment of said shim where the flanges have the shape of a circle or wheel.

Fig.14: It is a perspective view of an embodiment of said shim where the flanges have the shape of a semi-circle or more or less of a semi-circle.

Fig. 15: It is a perspective view of an embodiment of said shim where the flanges have the shape of a table-leg.

Fig.16: It is a perspective view of an embodiment of said shim that has a plurality of semi-circled flanges on both of its two sides.

Fig.17: It is a perspective view of an embodiment of said shim that has a plurality of triangled flanges on both of its two sides.

Fig. 18: It is a perspective view of an embodiment of said shim that has a plurality of dotted flanges on both of its two sides.

Fig.19: It is an end view of the shim (23) shown in Fig. 1 and Fig. 4, and is copied from Fig. 4b and Fig. 4c. Where the width of lath (11) in Fig. 4c is equal to the distance between the flanges (7, 8), the width of lath in Fig. 19 is much smaller than the distance between the flanges. The shim (23) can become laterally unstable, and the undesired situation as illustrated in Fig. 4d can occur. In a situation like this, a method is needed to stabilize the shim.

Fig. 20-24: The figures show the principle of the desired stabilizing method when the distance between the flanges is much bigger than the width of the construction part that the flanges hold onto. Fig. 20 shows horizontal projected teeth (15). Fig. 21 shows tilted barbs (16). They are placed on and along each of the inner sides (26) of the flanges and can be a single piece or consist of multiple pieces. They can be in row or rows, in layer or layers (17 in Fig. 22) or in other form such as semi-circle (18 in Fig. 23). Fig. 24 shows how the construction part (lath 11) is squeezed into the space between the flanges (7, 8) that is equipped with barbs (16) as shown in Fig. 21.

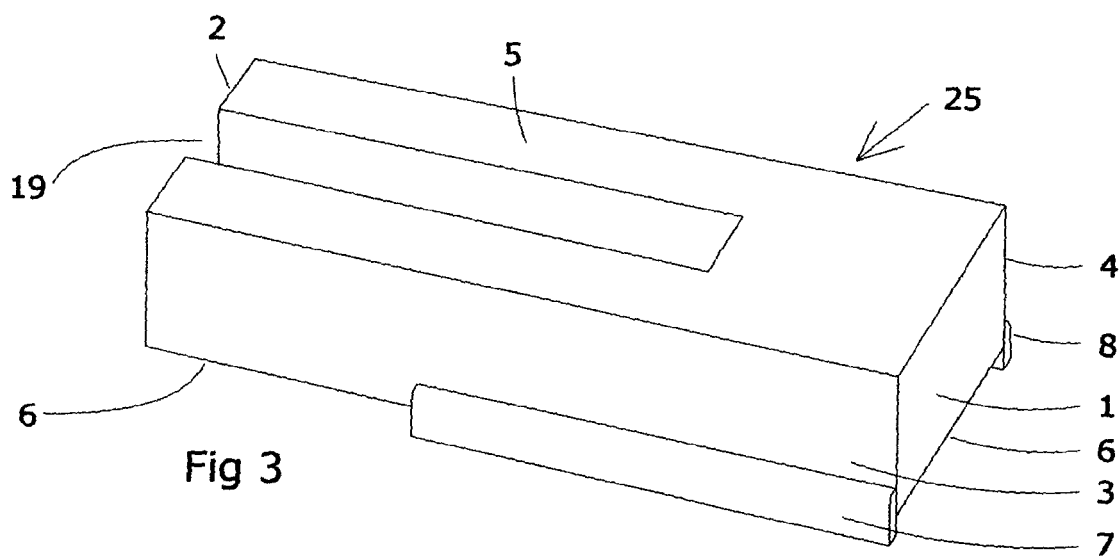
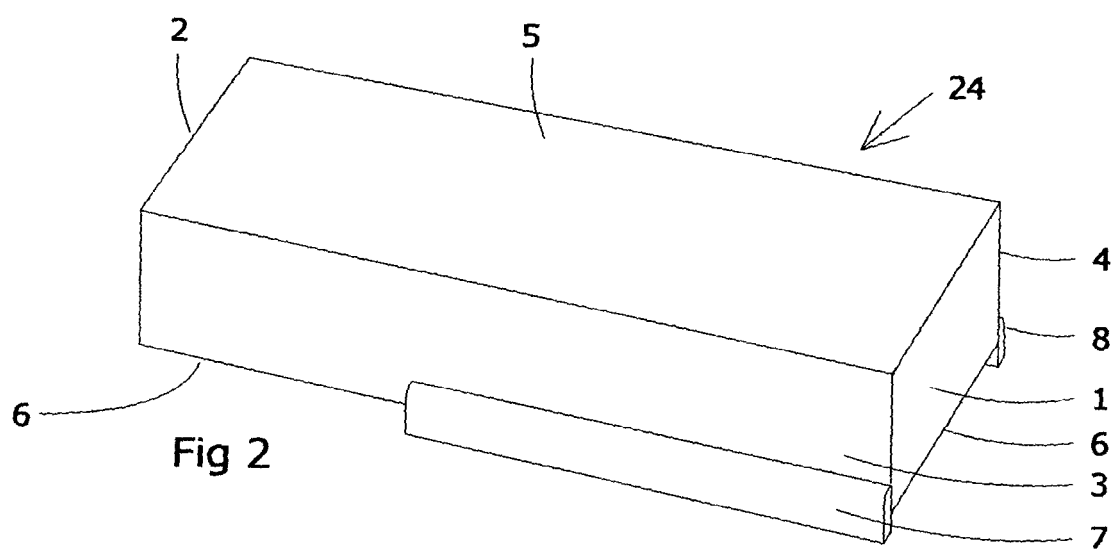
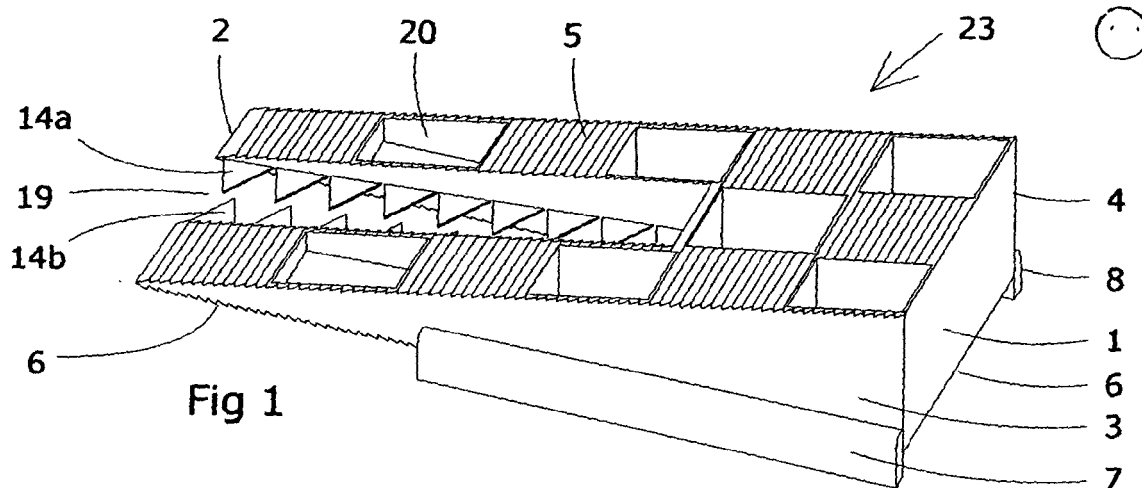
Claims

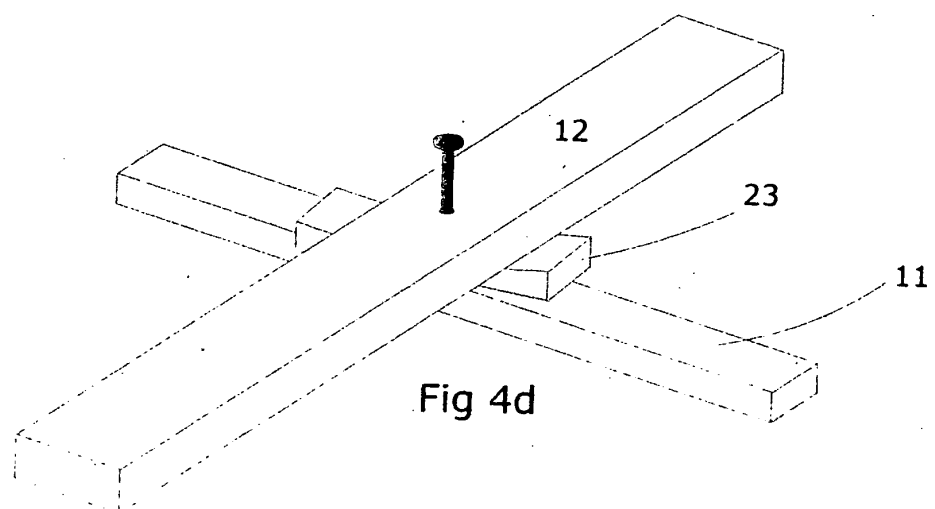
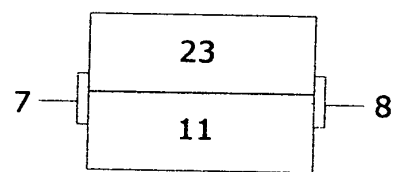
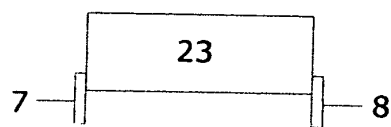
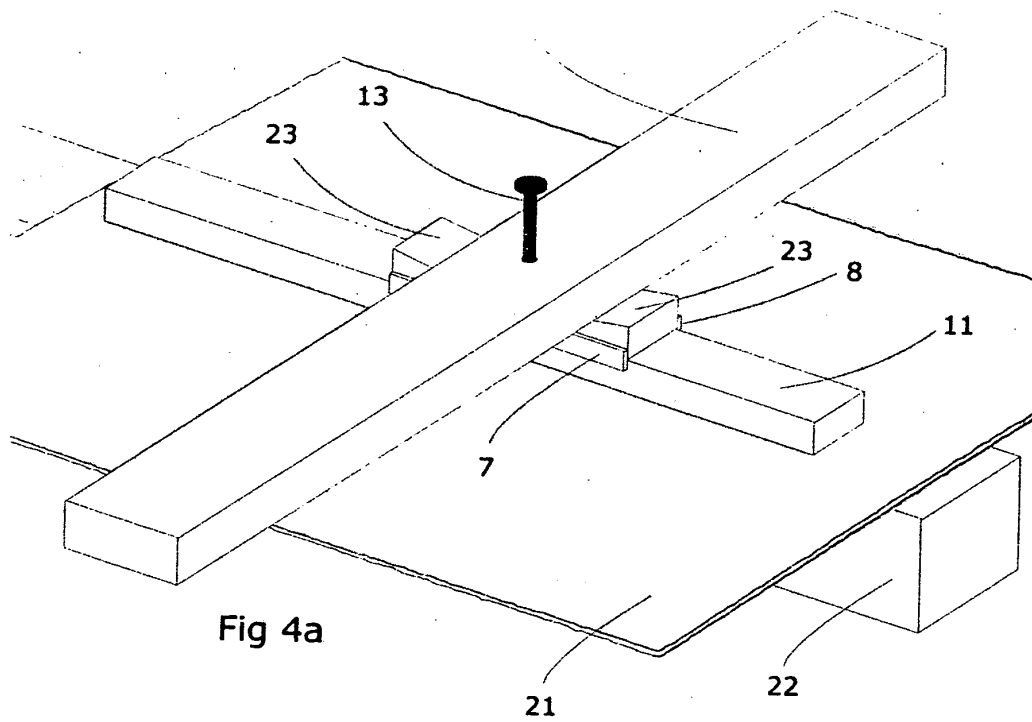
1. A shim for filling gaps or spaces between two construction parts that has two surfaces, two sides and two ends provided with one or more flanges by side of one of its two surfaces, where the flange or flanges are placed on and along the sides of the shim and where the flange or flanges are lowered or raised totally or partly from the shim body.
2. A shim according to claim 1, wherein the flange has the shape of a rectangle, a circle, a triangle, or of other possible regular or irregular shapes.
3. A shim according to claim 1, wherein the flange extends outward from the shim body.
4. A shim according to claim 1, wherein the flange is as long as the shim body and run from one end to the other end of the shim.
5. A shim according to claim 1, wherein the flange is longer or shorter than the length of shim body measured between its two ends.
6. A shim according to claim 1, wherein the flange is located anywhere on the sides of the shim body.
7. A shim according to claim 1, wherein the flange consists of one or more flanges.
8. A shim according to claim 1, wherein the shim is equipped with a single, a pair or pairs of flanges.
9. A shim according to claim 1, wherein the shim is prevented from rotating or sliding laterally when it is attached to the construction parts with flanges holding onto the construction part.
10. A shim according to claim 1, wherein each shim in a stack of parallel shims is laterally locked by its flanges atop one another and is prevented from lateral sliding from each other.

11. A shim according to claim 1, wherein the flanged shim and the construction part to be supported, adjusted or levelled by the shim form a ridge-and-groove arrangement, where the construction part is a ridge and the shim is a groove.
12. A shim according to claim 1, wherein the flange has a retaining element or retaining elements placed on and along the inner side of it and projected towards the middle or centre of the shim
13. A shim according to claim 12, wherein the retaining element has the shape of a tooth, a barb, a circle, a semi-circle or of other possible regular and irregular shapes.
14. A shim according to claim 12, wherein the retaining elements are in row or rows, or in layer or layers.
15. A shim according to claim 1, wherein the shim is made of plastic, metal, stone, wood, cardboard or paper.
16. A shim according to claim 1, wherein the shim and flanges are made of the same or different materials.
17. A shim according to claim 1, wherein the flange is a dependent and fixed part or independent and separated part of the shim body.

Amended claims in accordance with Rule 137(2) EPC.

1. A shim or wedge for filling gaps between two construction parts with opposed flanges placed on and along its sides or surfaces **characterized in that** the flanges are equipped with one or more retaining elements that are placed on and along the inner side of the flanges and projected towards the middle or centre of the shim or wedge with the aim to keep the shim or wedge accurately at the required position on the construction parts.
2. A shim or wedge according to claim 1, **characterized in that** the retaining element can have the shape of a tooth (11 and 12), a barb (13 and 14), a semicircle (17 and 18), a triangle (19 and 20) or of other possible regular and irregular shapes, and they can be in row or rows or in layer or layers (15 and 16).





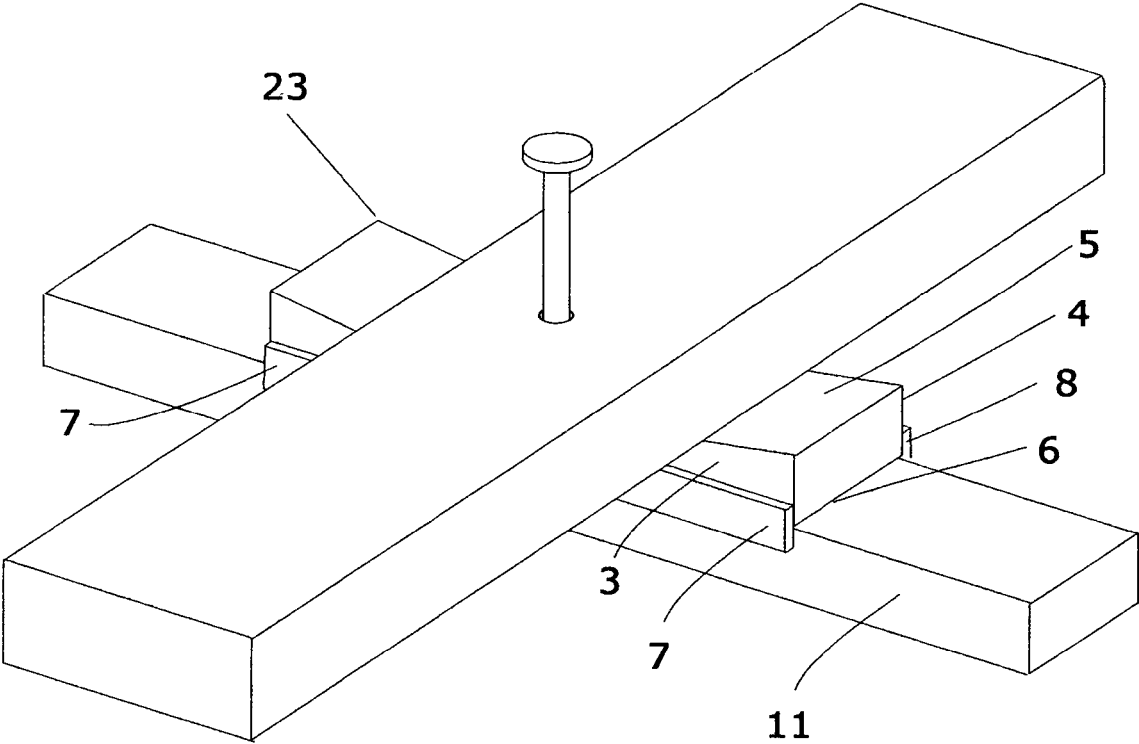


Fig 5

Fig 6

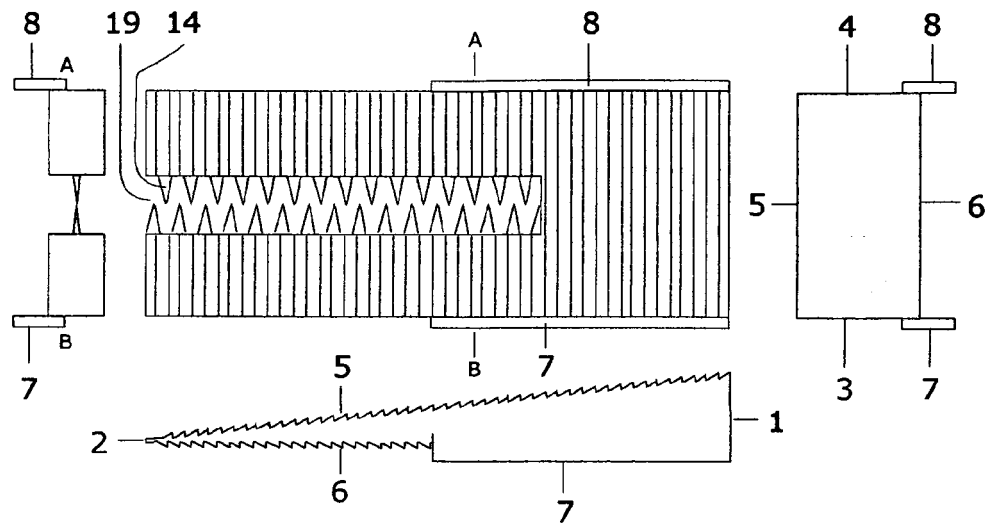


Fig 7

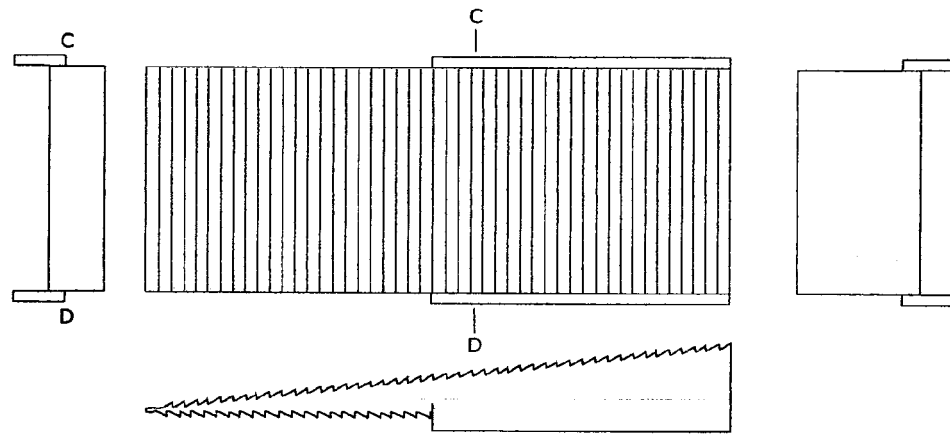


Fig 8

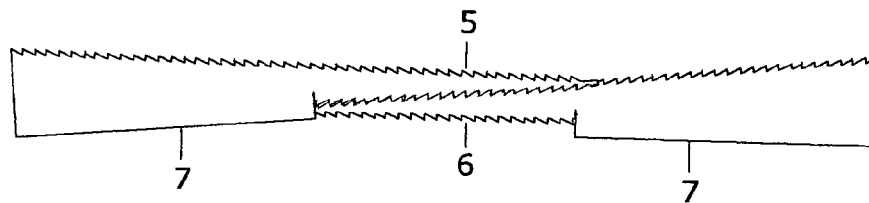
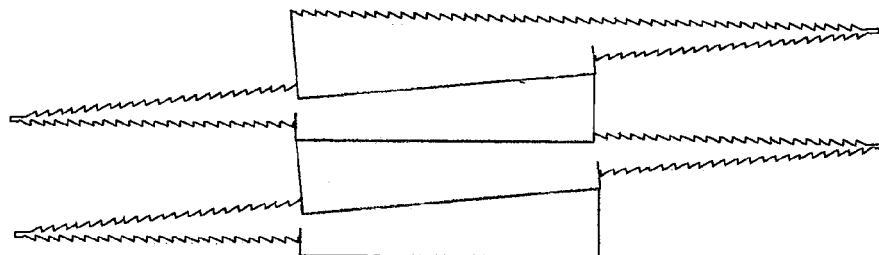
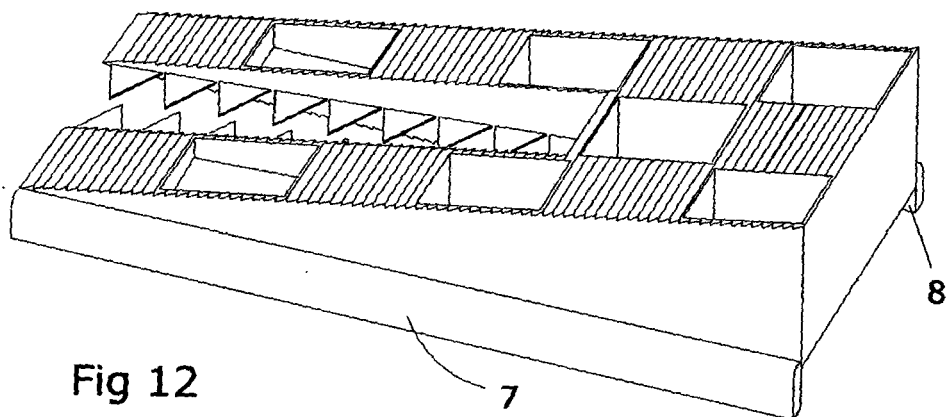
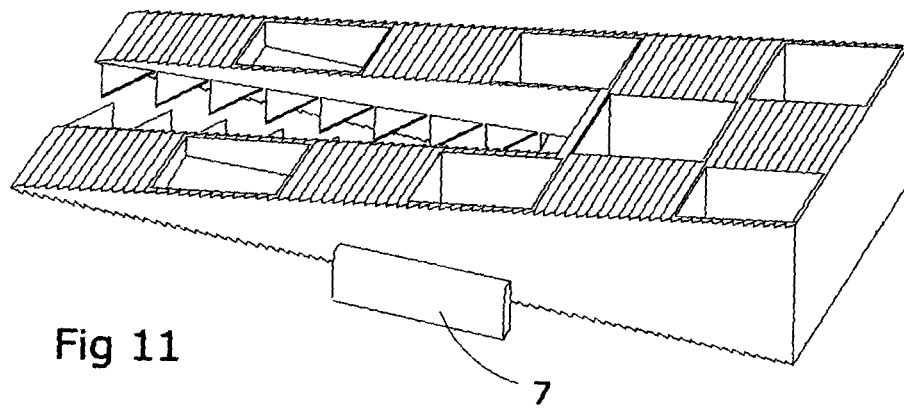
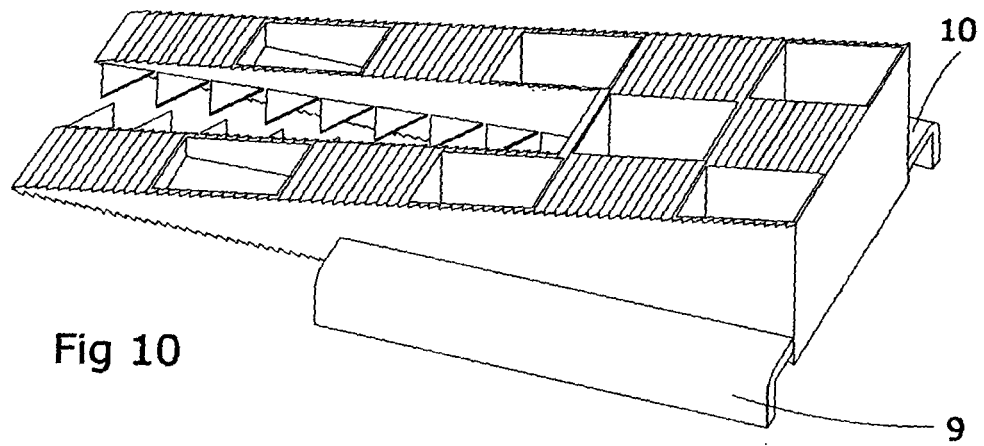
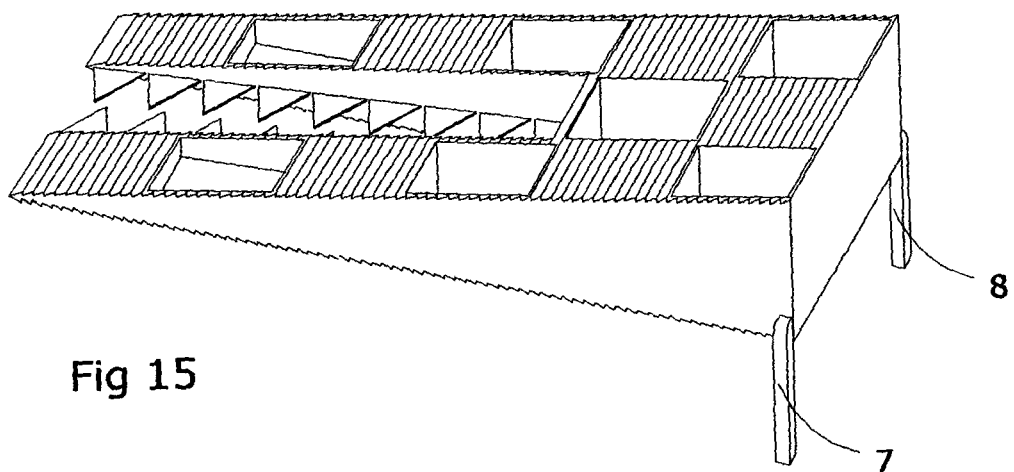
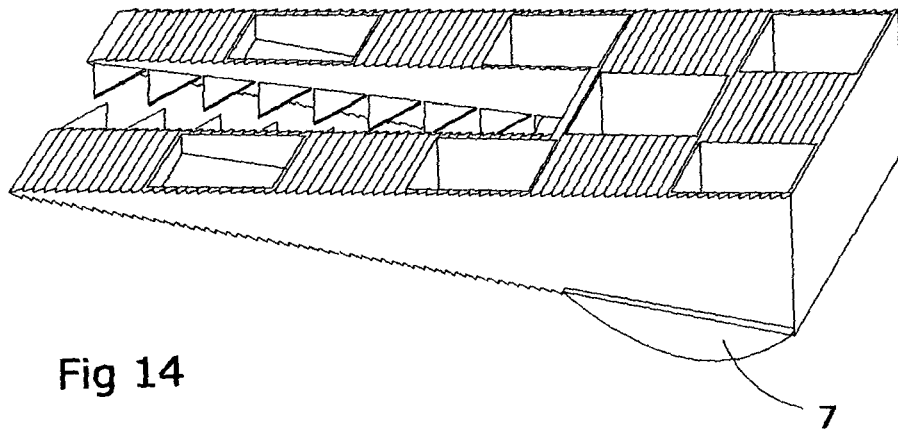
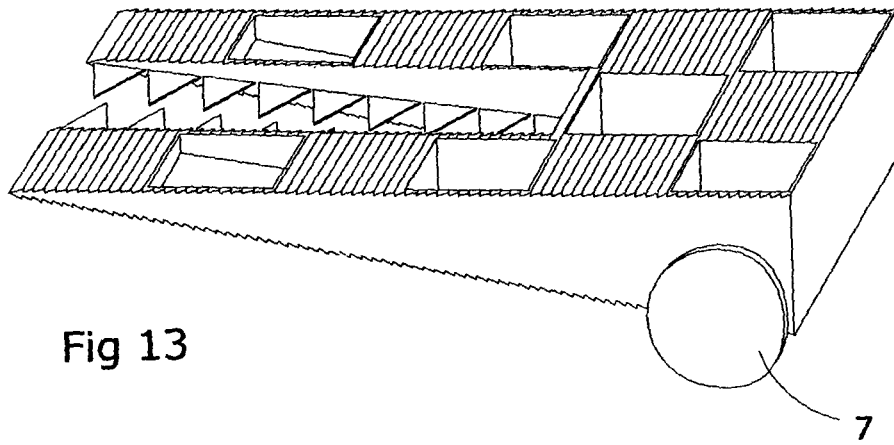


Fig 9







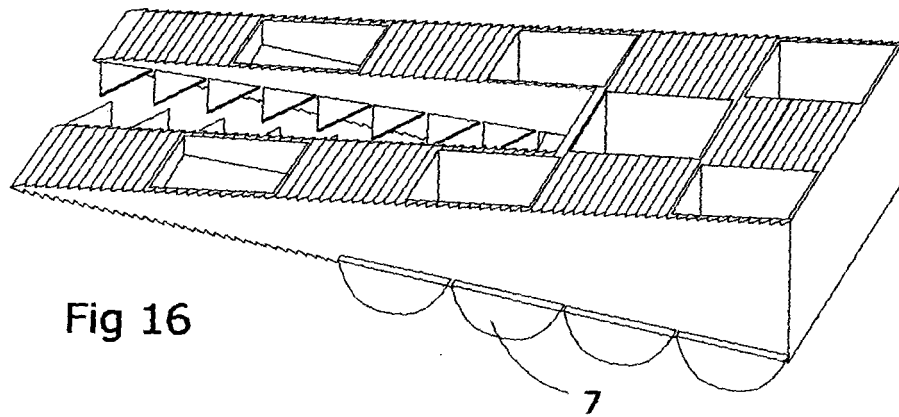


Fig 16

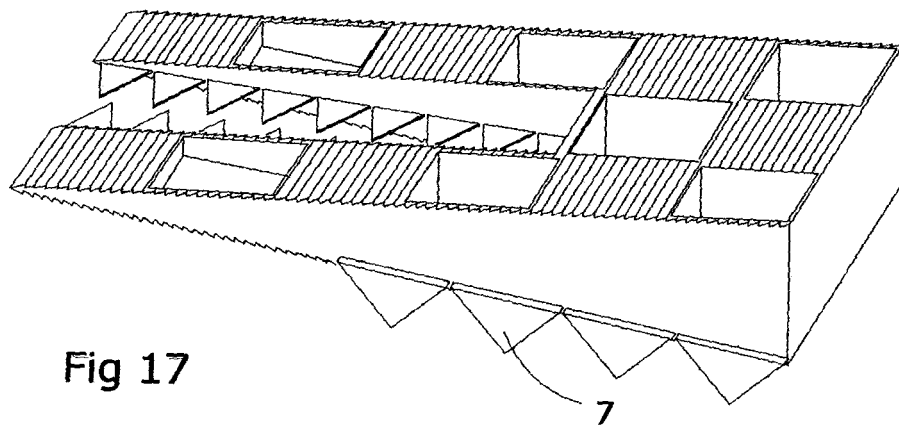


Fig 17

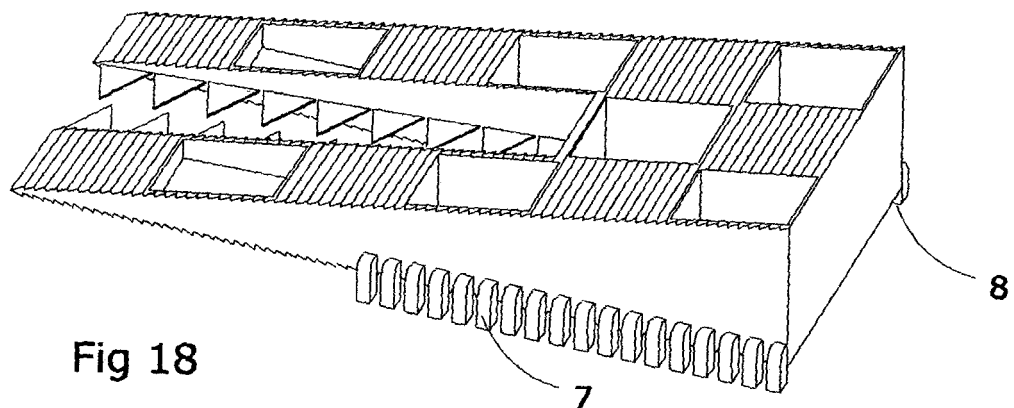


Fig 18

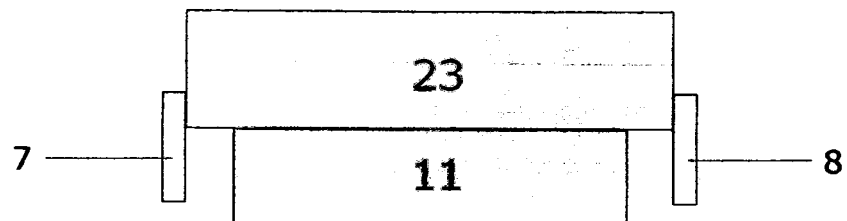


Fig 19

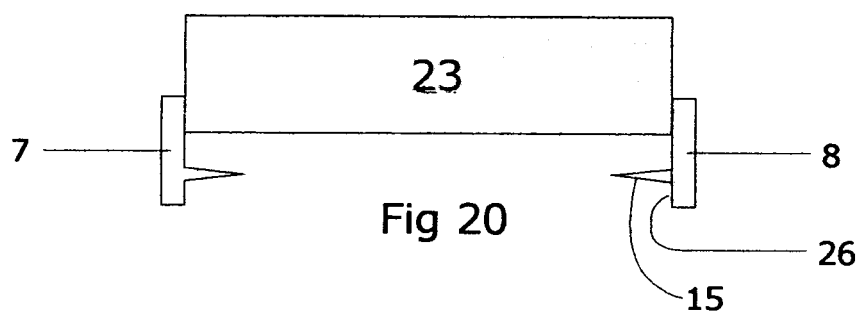


Fig 20

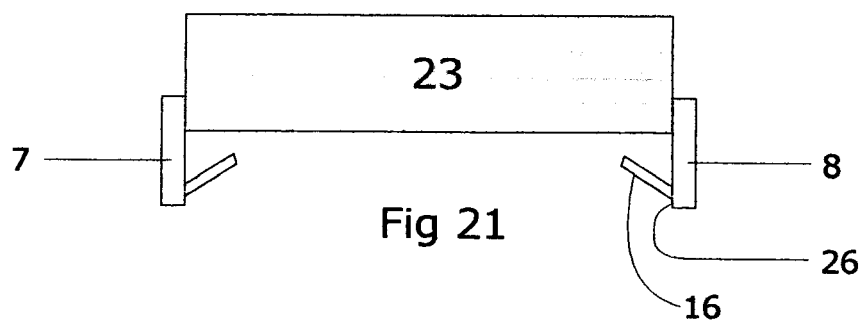
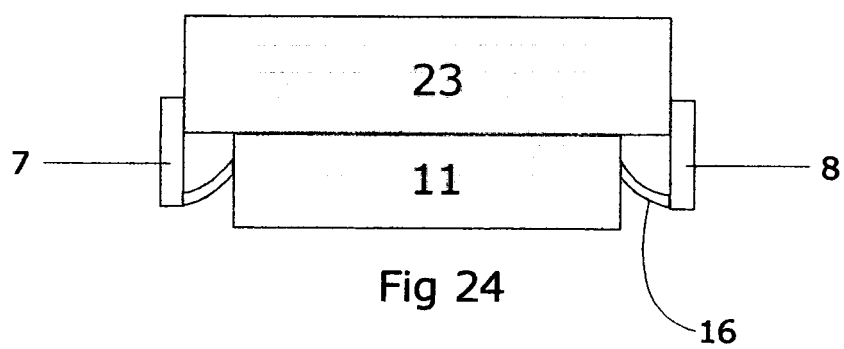
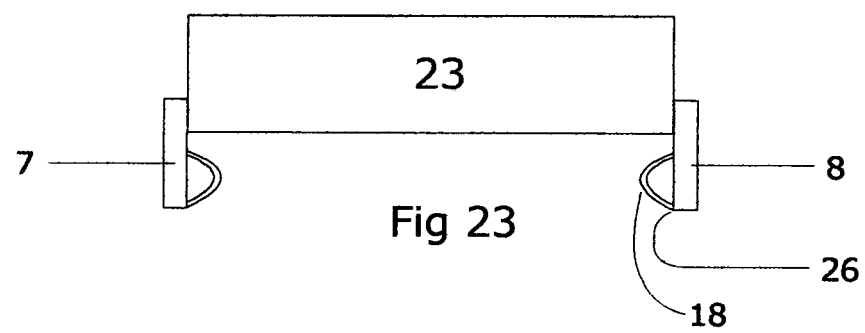
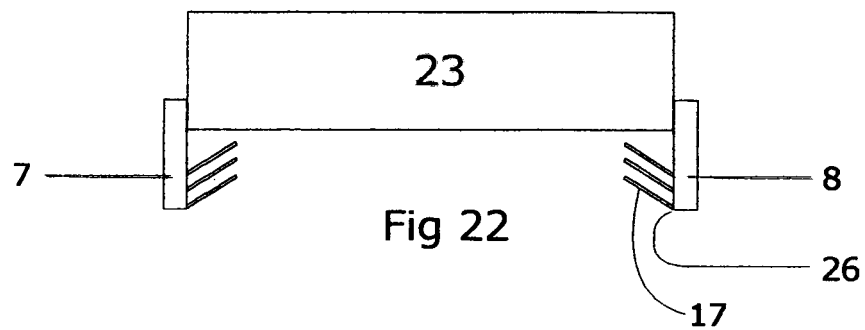


Fig 21





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 08 07 5020

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 17 June 2008	Examiner Tänzler, Ansgar
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EPO FORM 1503 03.82 (P04C01)

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

EP 08 07 5020

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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17-06-2008

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