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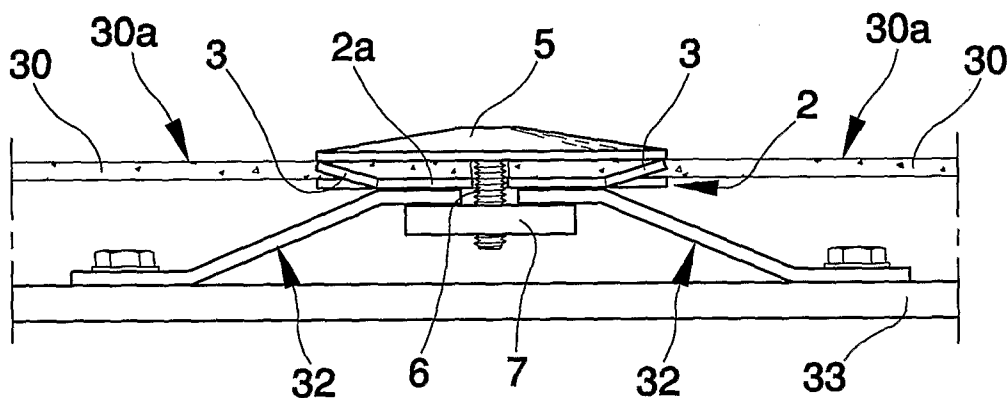
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(54) Title: A SPACER ELEMENT FOR FLAT ELEMENTS, SUCH AS SLABS, TILES AND THE LIKE.



(57) Abstract: A spacer element for fixing flat elements such as slabs, tiles and the like comprising: a plate (2) exhibiting a rest surface (2a) predisposed for partial resting of one or more slabs (30); to make the spacer element suitable for laying slabs not having regular shapes, in particular for slabs of different shapes, laid in irregular patterns, there are shaped appendages (3), each of which is mobile with respect to the plate (2) between at least a first position, in which it does not project with respect to the rest surface (2a), and at least a second position, in which it projects from the rest surface (2a) in such a way as to be positioned between two slabs (30) positioned resting on the rest surface (2a).

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Description

A Spacer Element for Flat Elements, such as Slabs, Tiles and the like.

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Technical Field

The invention relates to a spacer element for fixing slabs and the like. In particular, the invention relates to spacers normally used in laying slab coverings, such as for example ceramic tiles, glass panes and the like.

Background Art

10 In the laying of ceramic tiles spacers are mainly used which have the function of creating separation lines between the tiles. The market offers cross-shaped elements having a determined number of arms. A spacer is positioned at the corners of each tile so that the arms of the spacer are interpositioned between
15 two tiles located side-by-side. The interpositioning of the spacer arms enables space-lines to be made which are at least as wide as the arms. The spacers can be sunk into the grout filling the lines or can be removed after the grout has hardened to a sufficient extent.

20 Known-type spacers have some drawbacks. Firstly, they have a stable shape and are therefore suited to a determined type of laying of the tiles (or slabs in general). These known-type spacers, once more because of their stable shape, are not suitable for laying slabs not having regular shapes, in particular slabs of different shapes, laid in irregular patterns.

25 The main aim of the present invention is to provide a spacer which overcomes the drawbacks in the known-type spacers. This aim is attained by the spacer element of the first claim. The spacer enables slabs of various forms to be

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laid, in patterns which are also various, while maintaining constant-width lines between the slab elements.

In an especially advantageous preferred embodiment, the spacer of the present invention can be usefully employed for fixing the slabs to a support

5 structure.

Various devices for fixing slabs to support structures are known in the prior art. All the known device exhibit characteristics which are susceptible to improvement.

A first type of fixture device is constituted by usually C-shaped hook
10 elements, predisposed to hook to edges of the slabs in order in turn to be fixed to a support structure. The devices of this type exhibit the advantage of not requiring any working of the slabs, but are exclusively suitable for fixing square slabs. In order to fix a slab, at least eight fixing elements (two for each side) are needed, leading to rather long and laborious mounting operations.

15 A second type of fixing device comprises shaped elements which are anchored to the slabs before being fixed to a support structure. Although this type of device exhibits the advantage of being usable with slabs of any shape, it is also true that the anchoring of the shaped elements to the slabs required working on the slabs, including possibly having to bore holes therein, and/or
20 sinking channels therein. These operations lead to a certain increase in slab production costs.

The main aim of the present invention is to provide a spacer element which enables fixture of slabs to support structures in a way which obviates the drawbacks of known-type fixing devices. This aim is attained by the spacer
25 element for fixing slabs according to the included claims.

Disclosure of Invention

Further characteristics and advantages of the present invention will better emerge from the detailed description made herein below with reference to the accompanying figures of the drawings, which are non-limiting and offered by way of example, and in which:

Figure 1 is a plan view of a first embodiment of the spacer element according to the present invention;

Figure 2 is a section view of the element of figure 1, during use;

Figure 3 is a simplified plan view of the element of figure 2;

Figure 4 is a plan view of a second embodiment of the spacer element of the present invention;

Figure 5 is a section view of the element of figure 4 in a use condition;

Figure 6 is a simplified plan view of the element of figure 5;

Figure 7 is a plan view of a third embodiment of the spacer element of the present invention;

Figure 8 is a section view of the element of figure 7 in a use condition;

Figure 9 is a simplified plan view of the element of figure 8.

With reference to the figures of the drawings, the spacer for fastening flat elements such as slabs, tiles and the like according to the present invention comprises a plate 2 having a rest surface 2a predisposed for partially contacting one or more slabs 30. The spacer further comprises shaped appendages 3 associated to the plate 2. Each of the shaped appendages 3 is mobile with respect to the plate 2 between at least a first position, in which it does not project with respect to the rest surface 2a and at least a second position in which it projects from the rest surface 2a in such a way as to be interplaceable between two slabs 30 positioned resting on the rest surface 2a.

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The shaped appendages 3 are preferably arranged on a peripheral portion of the plate 2.

As can be seen in particular in figures 1 and 4, the plate 2 preferably exhibits a circular shape. The shaped appendages 3 are constituted by peripheral
5 sectors of the plate 2, which appendages 3 are separated from one another by radially-developing cuts. The shaped appendages 3 are mobile with respect to the plate 2, preferably by plastic deformation in the joint areas between the shaped appendages 3 and the plate 2. In the first position the appendages 3 are co-planar to the rest surface 2a, so that the plate 2 is flat. In the second
10 position the appendages 3 are bent in order to project with respect to the rest surface 2a at least by a portion thereof. In the second position of the shaped appendages 3, the edges of two slabs 30 can be positioned in contact with two opposite sides of the projecting portion, with respect to the rest surface 2a, of a shaped appendage 3, so that the two slabs 30 are spaced one from another
15 by the projecting portion of the shaped appendage 3.

As can be seen in figures 2 and 5, some of the shaped appendages 3 are in the first position, while others are in the second position. The different positioning of the appendages 3 can be organised on the basis of the conformation and type of positioning of the slabs 30. In the case illustrated in
20 figure 3, the slabs exhibit various and different shapes. This means that the separation lines 31 between the slabs 30 do not meet up at equal angles. Consequently the shaped appendages 3 indicated by 3a are brought into the second position in order each to be interlaced between two slabs 30 in order to account for the arrangement of the lines 31. At the opposite end of each
25 line 31 a plate 2 as in figure 3 can be positioned, but with shaped appendages 3a in the second position which are different from those illustrated in figure 3,

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in order to take into account the various arrangements the lines 31 can exhibit at this position.

In the example illustrated in figure 6, the slabs 30 exhibit a quadrangular shape, and the lines 31 are arranged in right-angles. Therefore, for all the plates 2 arranged at the ends of the lines 31, the shaped appendages 3a in the second position are separated by right angles. In figure 7 a plate 2 is illustrated having a shape that is suitable for quadrangular slabs 30. In this example only four shaped appendages 3 are present, separated by right-angles and delimited by shaped cuts developing not necessarily radially.

The spacer can be usefully applied for laying ceramic tiles. In a first embodiment the spacer is arranged on the tile laying plane, where the tiles are laid in positions which overlie at least partially the spacer element itself. Thereafter the grout is spread to fill the lines between the tiles. The spacer is consequently sunk into the grout. In a second embodiment the tiles are laid in succession on the laying plane. The progressive laying of the tiles is added to by the use of one or more spacer elements which are laid above the tiles already laid in order that the shaped appendages 3 arranged in the second position are applied at the edges of the already-laid tiles. The tiles to be laid are then brought up to the shaped appendages 3 arranged in the second position so that the predetermined lines are formed.

In the illustrated embodiments in figures 4 and 7, at least some of the shaped appendages 3 are advantageously provided with a hooking portion 4. The hooking portion 4 is predisposed to be positioned in contact with a front surface 30a of at least a slab 30 positioned in contact with the shaped appendage 3 to which the hooking portion 4 is associated. Each of the hooking portions 4 extends preferably in a transversal direction with respect to the shaped appendage 3 to which it is associated.

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The function of the hooking portion 4, illustrated schematically in figures 5 and 8, is to enable the slabs 30 to be constrained to the plate 2 to prevent direct movements perpendicularly to the rest surface 2a. Each of the hooking portions 4 defines two undercuts 4a. Each undercut 4a faces towards the rest surface 2a in order to define a space in which a slab 30 can be inserted at a portion of edge.

The hooking portions 4 are preferably arranged and conformed in such a way that the slabs 30 insert by friction in the space defined between the undercuts 4a and the rest surface 2a, so that displacements of the slabs 30 in a plane parallel to the rest surface 2a are limited or prevented. In this case the function of the hooking portions is particularly advantageous as it enables blocking of the slabs 30 while enabling the lines 31 between the slabs 30 to remain empty. A further important advantage is that the blocking of the slabs does not require the performing of any working operations on the tiles themselves.

In both examples of figures 5 and 8, the hooking portions 4 can be positioned in an application configuration, in which the undercuts 4a face the rest surface 2a, by a plastic deformation of the zone in which the hooking portions 4 are connected with the shaped appendages 3. In the embodiment of figure 5 a single bend is sufficient, bringing the undercuts 4a into a parallel position to the rest surfaces 2a, while in the example of figure 8 two bends are needed to deform the shaped appendages 3 into an S shape so that the undercuts 4a are arranged in a parallel position to the rest surface 2a.

In an especially advantageous embodiment, the spacer of the present invention comprises means for blocking predisposed to fix the slabs 30 to the rest surface 2a of the plate 2.

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A first example of the means for blocking is illustrated in figure 2. In this example the means for blocking comprise a small plate 5 predisposed to be placed in contact with the front surface 30a of the slabs resting on the rest surface 2a of the plate 2. Means for fastening are predisposed to draw the
5 small plate 5 towards the plate 2, and thus into contact with the front surface 30a of the slabs 30. The small plate 5 enables blocking the slabs 30 without any special work operations being necessary.

The means for blocking preferably comprise a threaded element, for example a screw 6 arranged through the small plate 5 and predisposed for screwing
10 into an anchoring element 7 associable to a support structure 32, 33.

The support structure 32, 33 can be of any type, for example a scaffold of elements, a frame for ventilated walls or a brick wall. Figure 2 illustrates a support structure in which elements 32 are connected to a wall 33. The means for blocking and the means for fastening connect the slabs 30 to the elements
15 32 in such a way that the slabs 30 are not in contact with the wall 33. Alternatively the screw 6 might engage directly to the wall 33 in a case in which no spacing is envisaged between the slabs 30 and the wall 33.

The slabs can be mounted in the following stages. The plates 2 required for the fixing of a slab are each engaged to the support structure by means of the
20 anchor element 7 and the screw 6. The slabs 30 are then positioned with respect to the plates 2 and the small plates 5 are positioned with respect to the screws 6 and the slabs 30. At this point by tightening the screws 6 the slabs 30 are blocked to the support surface.

Concerning the support structure 32, 33 in general, apart from being of any
25 type, it can present any inclination between a vertical position and a horizontal position. In particular the support structure might be arranged horizontally above a space and the slabs 30 might be fixed, by means of the

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spacer element of the invention, below the support structure, facing onto the underlying space.

A second embodiment of the means for blocking is illustrated in figure 5. In this embodiment the means for blocking comprise the hooking portions 4,
5 elastic means, predisposed to be interposed between the slabs 30 and the rest surface 2a, and means for fastening predisposed to fix the plate 2 to a support structure 32.

The elastic means are preferably constituted by elastic shaped appendages 3e located by the side of the hooking portions 4. This shaped appendages 3e are
10 slightly inclined in order to project from the rest surface 2a. The slabs rest on the shaped appendages 3e located by the side of the hooking portions 4 and are slightly distanced from the rest surface 2a. The slabs 30 are thus elastically supported as the elastic shaped appendages 3e are elastically flexible.

15 Alternatively, as illustrated in figure 8, the elastic rest for the slabs 30 can be obtained by using an elastic ring 8 positioned between the rest surface 2a and the slabs 30. The presence of the elastic means guarantees an efficient absorbent effect against the impacts or vibrations that the slabs may be subject to.

20 In this second embodiment the means for fastening also comprise threaded element or a screw 6 arranged through a small plate 5 and predisposed to tighten in an anchoring element 7 associable to a support structure 32. The small plate 5, in this case, is placed in contact not with the front surface 30a of the slabs 30, but instead with the plate 2, as the fastening of the slabs 30 to
25 the plate 2 is realised by means of the hooking portions 4. The support structure 32 is, schematically described, a shaped element, though as

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previously mentioned the support structure could be of any type and might be arranged in any way.

In this case assembly of the slabs can be performed in the following stages.

The plates 2 needed for fastening a slab are each engaged to the support structure by means of the hooking element 7 and the screw 6 and the small
5 plate 5. The slabs 30 are positioned with respect to the plates 2. At this point, by tightening the screw 6 the slabs are blocked to the support surface.

The spacer for fastening flat elements such as slabs, tiles and the like of the present invention offers important advantages.

10 Firstly, as already described, it requires no particular working of the slabs to enable fastening. The element also enables fixing slabs of any shape with the interpositioning of lines between the slabs, which can be kept free.

Realising an elastic rest surface for the slabs means providing absorbency for impacts and vibrations, to which the slabs can be subject during normal use.

15 Interpositioning the shaped appendages between the slabs means allowing the slabs to dilate, preventing the development of deformation and tensions following variations in temperature.

The spacer of the present invention also enables fixing slabs to support structures of any type and in any position, in particular to the floor, the ceiling
20 and the walls. All mounting and dismounting operations are extremely simple and rapid.

Claims.

- 1). A spacer element for fixing flat elements such as slabs, tiles and the like wherein it comprises: a plate (2) exhibiting a rest surface (2a) predisposed for partial resting of one or more slabs (30); shaped appendages (3), each of which is mobile with respect to the plate (2) between at least a first position, in which it does not project with respect to the rest surface (2a), and at least a second position, in which it projects from the rest surface (2a) in such a way as to be positioned between two slabs (30) positioned resting on the rest surface (2a).
- 2). The element of claim 1 wherein the shaped appendages (3) are arranged on a peripheral portion of the plate (2).
- 3). The element of claim 2, wherein at least some of the shaped appendages (3) are provided with a hooking portion (4) predisposed to be positioned in contact with a front surface (30a) of at least a slab (30) positioned in contact with the shaped appendage (3) to which the hooking portion (4) is associated.
- 4). The element of claim 3, wherein the hooking portions (4) extend transversally with respect to the shaped appendage (3) to which the hooking portions (4) are associated.
- 5). The element of at least one of the preceding claims, wherein the plate (2) exhibits a circular shape and the shaped appendages (3) are arranged on a peripheral portion of the plate (2) and are constituted by peripheral sectors of the plate (2).
- 6). The element of at least one of the preceding claims, comprising means for blocking predisposed to fix the slabs (30) to the rest surface (2a) of the plate (2).

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- 7). The element of claim 6, wherein the means for blocking comprise a small plate (5) predisposed to be placed in contact with the front surface (30a) of the slabs (30), resting on the rest surface (2a) of the plate (2), means for fastening being predisposed for pressing the small plate (5) against the plate (2).
- 8). The element of claim 7, wherein the means for fastening comprise a threaded element arranged through the small plate (5) and being predisposed to screw into an anchoring element (7) which is associable with a support structure (32, 33).
- 9). The element of claim 6, wherein the means for blocking comprise the hooking portions (4), means for fastening being predisposed for fastening and fixing the plate (2) to a support structure (32).
- 10). The elements of claim 9, wherein elastic means (3e, 8) are predisposed to be positioned between the rest surface (2a) of the plate (2) and one or more slabs (30) positioned resting on the rest surface (2a).

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Fig. 1

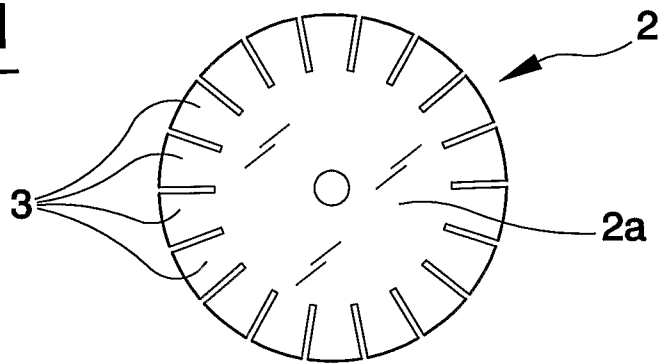


Fig. 2

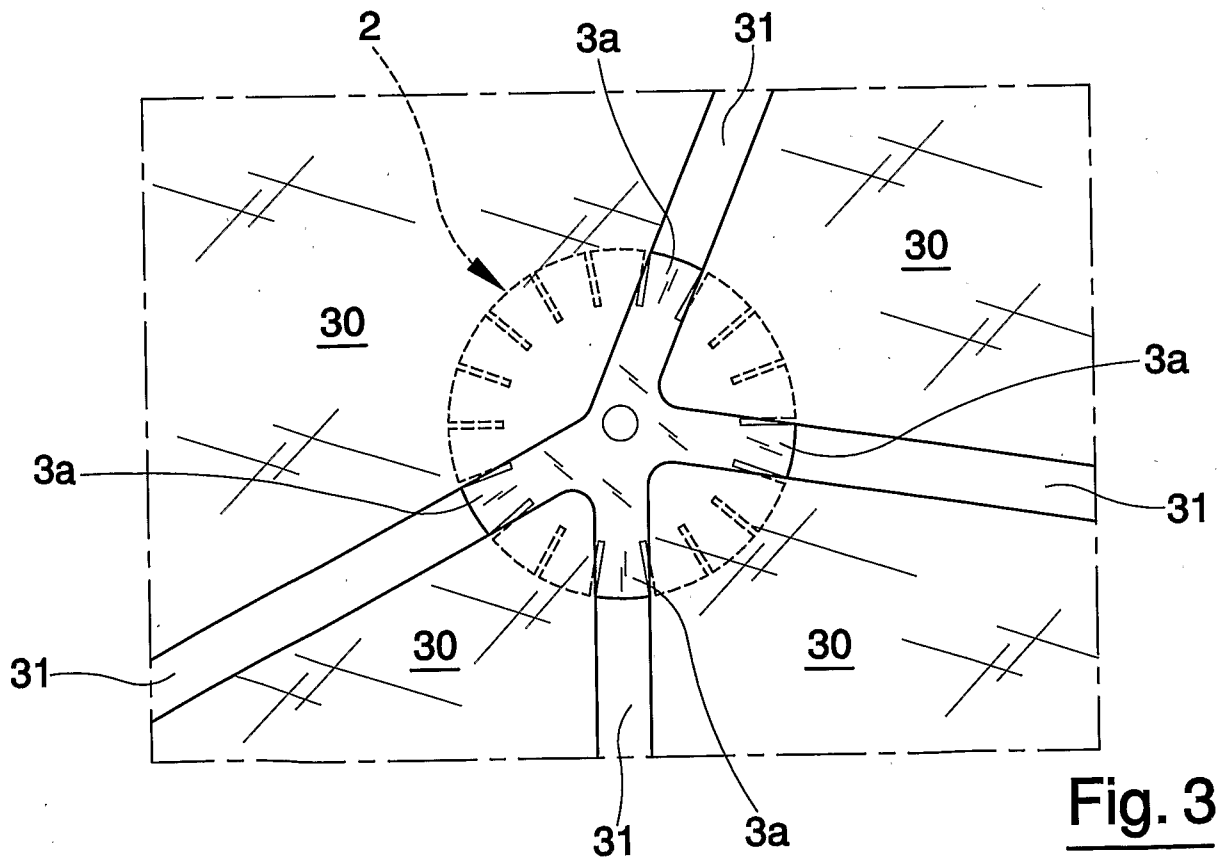
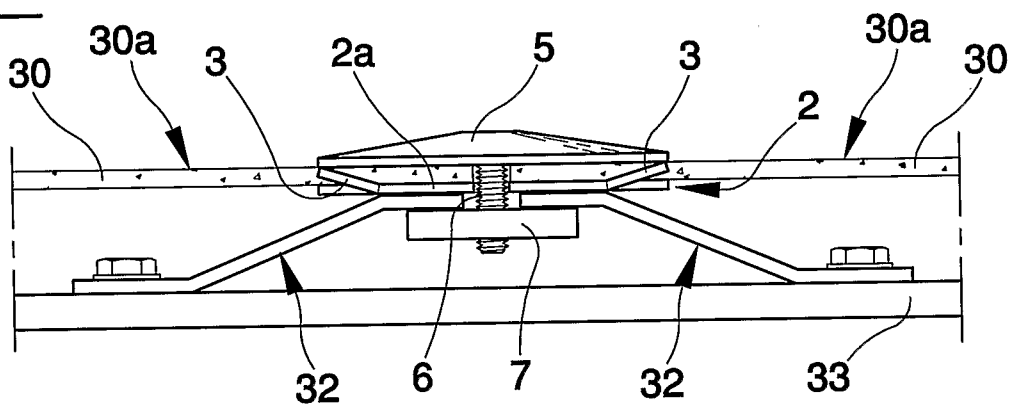


Fig. 4

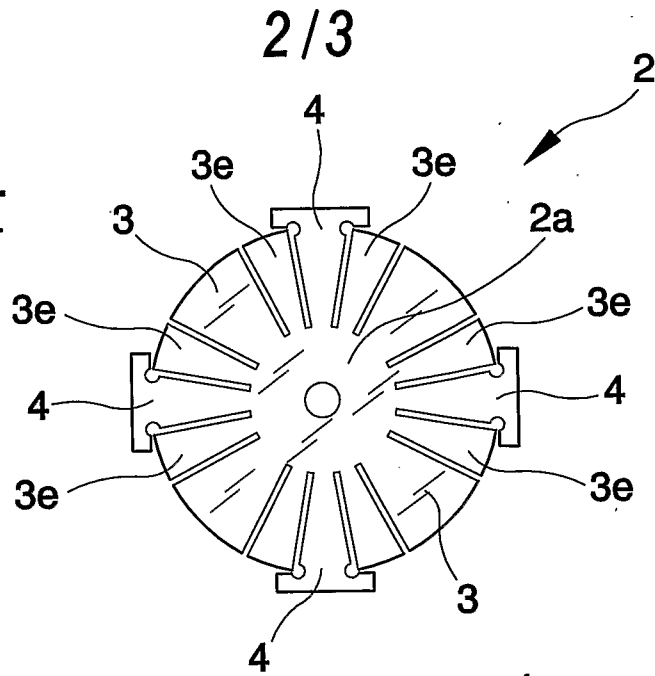


Fig. 5

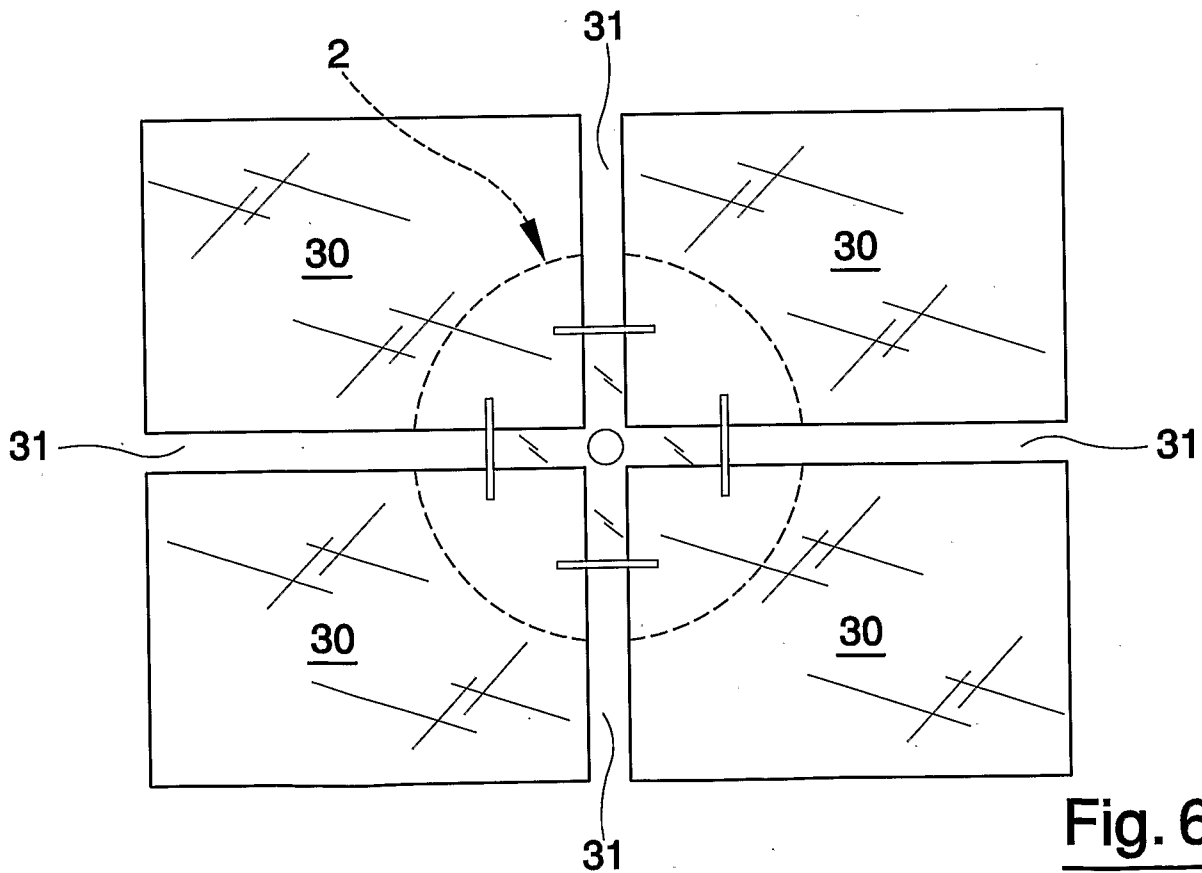
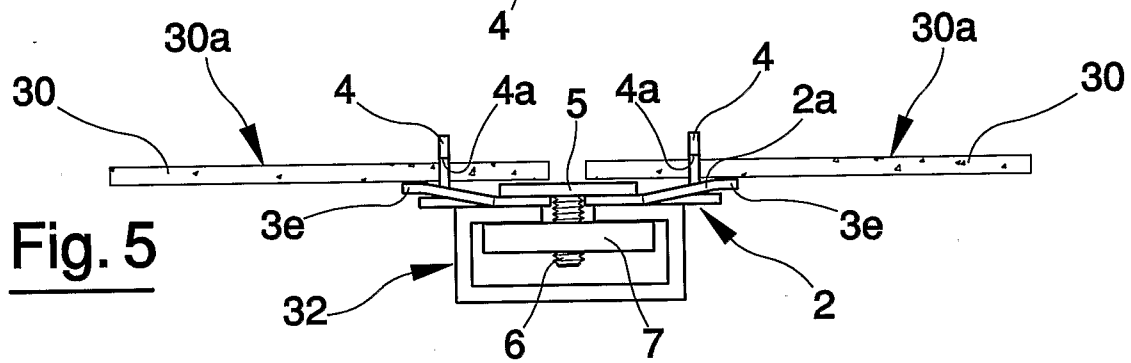


Fig. 6

Fig. 7

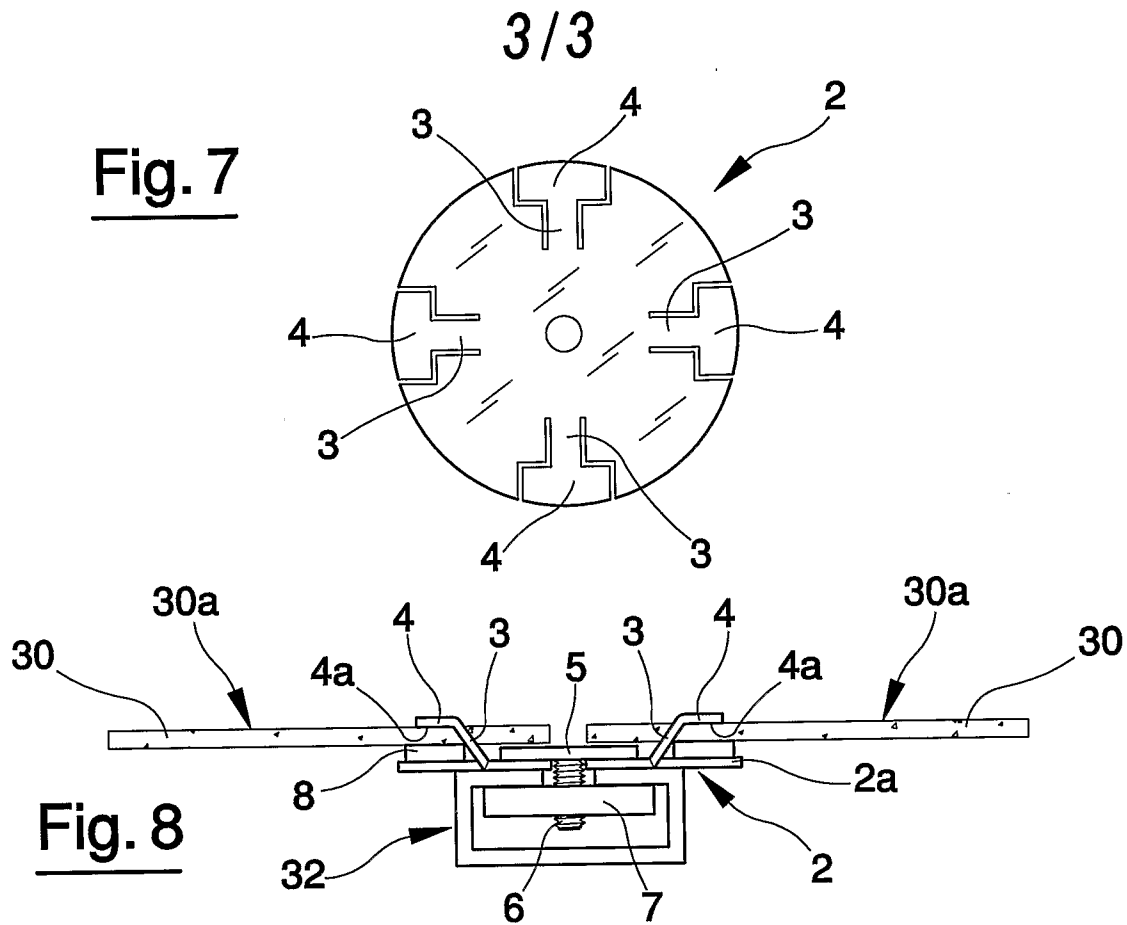


Fig. 8

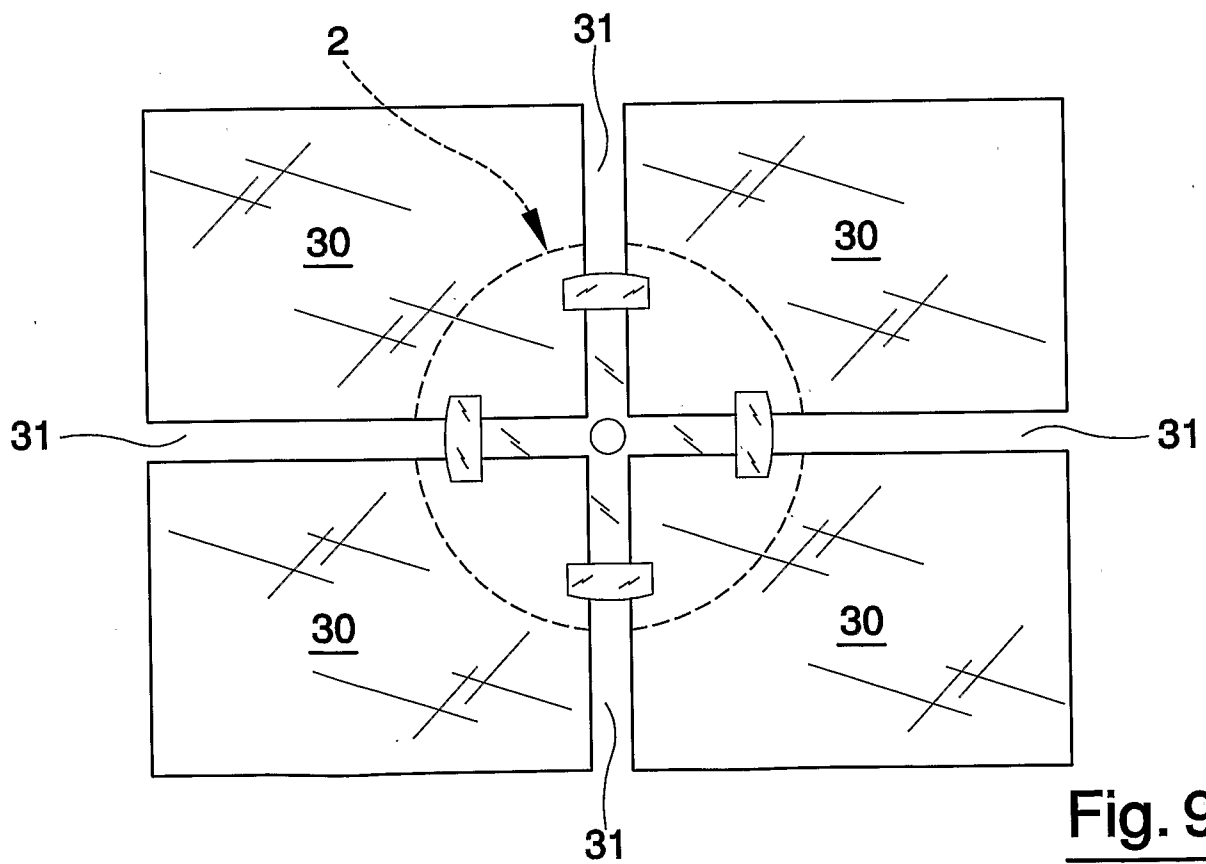
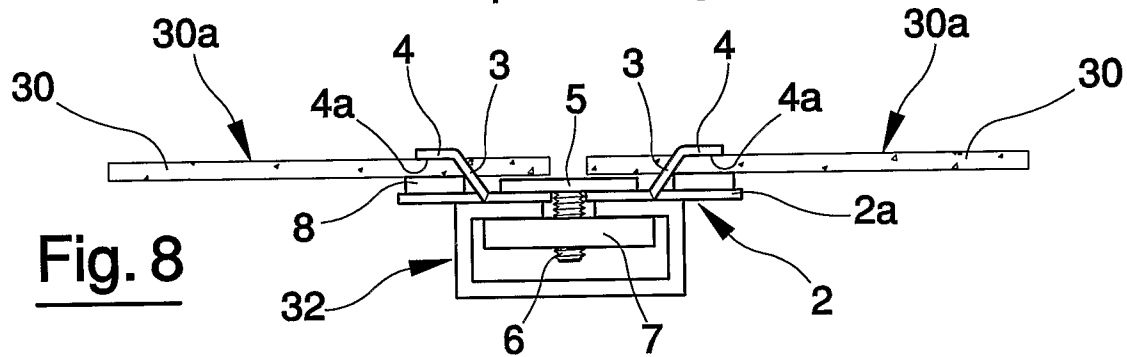


Fig. 9

INTERNATIONAL SEARCH REPORT

International application No

PCT/IT2006/000346

A. CLASSIFICATION OF SUBJECT MATTER
INV. E04F13/08 E04F13/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
E04F E06B F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	DE 32 25 651 A1 (HESS HEINRICH BETONWERKE [DE]) 12 January 1984 (1984-01-12) page 3, paragraph 2 page 4, paragraph 1 page 6, paragraph 1 page 9, paragraph 3 figures 1-3	1,2,6,7, 9 8
X A	EP 1 431 477 A (LUMMEL GMBH & CO KG [DE]) 23 June 2004 (2004-06-23) column 1, line 3 - line 6 column 3, line 17 - line 22 column 4, line 9 - line 14 column 10, line 11 - line 12 column 10, line 30 - line 32; figure 2 ----- -/--	1,6,9,10 3,5

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	paragraphs [0001], [0008] - [0012]; figures 1,3 -----	6,7

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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