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(54) **WALL OR CEILING COVERING SYSTEM**

(57) A wall or ceiling covering or cladding system comprising: a plate element (1), said plate element having a front surface (10), a rear surface (11), and a material thickness (33) between said front and rear surfaces, and where the plate perimeter is delimited by edges (12, 13); one or more attachment strips (30); and a plurality of profiles (20-23), where:
- each attachment strip (30) has fastening means (34) suitable to attach the attachment strip to an edge (12, 13) of the plate element, and further has an attachment fork (31), which fork when arranged on the plate element (1) extends from the front surface (10) of the plate element;
- each profile (20-23) has an attachment surface (25) where a groove (35) is provided in said attachment surface, such that the groove can accommodate and hold the attachment fork (31) of the attachment strip (30).

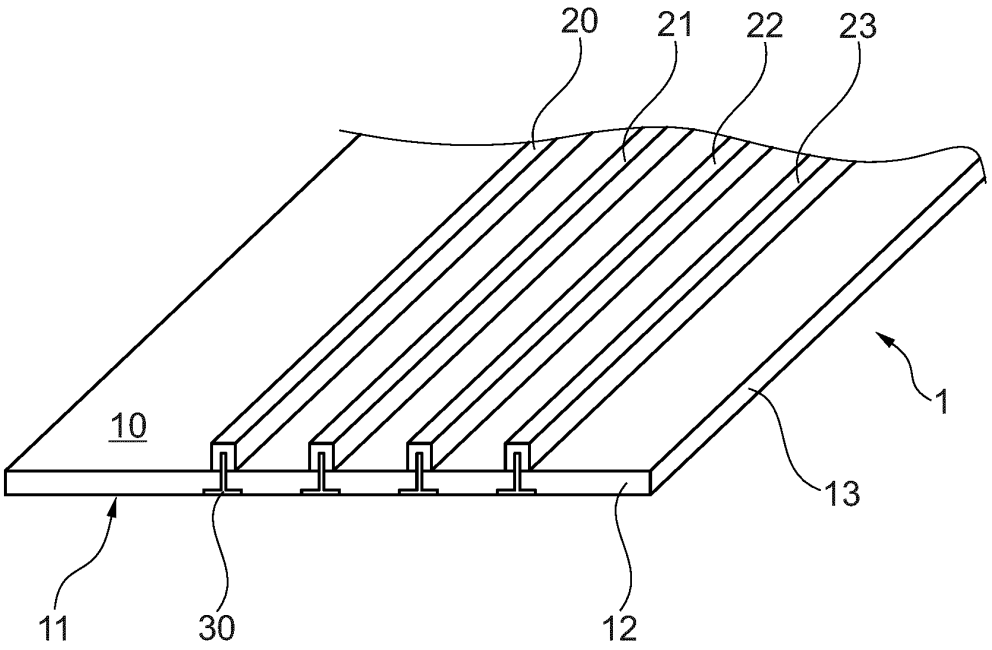

Fig. 1

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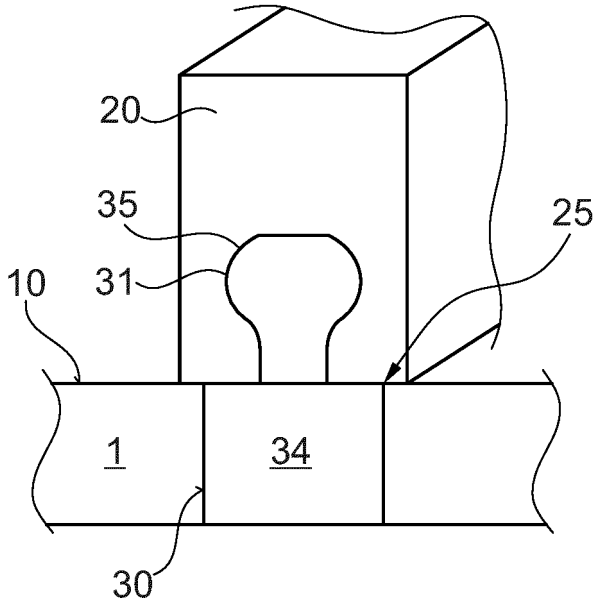

Fig. 4

Description

Field of the Invention

[0001] The present invention relates to a wall or ceiling covering system as well as a method for installing such a wall or ceiling covering system.

Background of the Invention

[0002] It is well-known in the art to use pre-manufactured plate elements in order to create wall or ceiling surfaces. Such plate elements may for example be made from gypsum where the gypsum material is sandwiched between two layers of paper. Afterwards the gypsum plates are screwed onto a timber or thin metal skeleton in order to create a wall or ceiling. Likewise, plate elements made from compressed wood, typically with veneer on the visible surface are also often used as particularly panelling and cladding for ceilings etc.

[0003] Further wall or ceiling plate elements may be manufactured from a cement-bonded wood wool material. Common for all these types of wall or ceiling plate materials is that they are usually presented with a substantially even surface. For the cement-bonded wood wool materials the surface is typically provided with a number of apertures/spaces which have some acoustic advantages which the normal plaster boards and compressed wood plates do not exhibit.

[0004] In some instances it is desirable to provide a surface with a pattern profiling or relief. In these instances, typically the surface of the plate element is worked for example by a CNC machine in order to provide the desired texture or surface pattern.

[0005] In other instances it is desirable to provide strips or profiles on the surface of the cladding panel element. One such example is disclosed in EP 3138976.

[0006] In this system a number of parallel grooves are provided in the surface of the ceiling plate element. A number of profiles having a tongue provided with a cross-section corresponding to the cross-section of the groove are then afterwards fitted into the groove such that the plate-like element in this manner is provided with a number of profiles.

[0007] This system, however, has a number of drawbacks such as for example that the plate elements must be pre-manufactured to have the grooves suitable to receive the profiles and furthermore the distance between the profiles is pre-determined during the manufacturing process of the plate-like element. Furthermore, the profiles must be provided with a tongue corresponding to the groove and particularly when the plate element is made from for example plasterboard or cement bonded wood wool material the groove may be damaged during installation of the tongue of the profile as it is necessary to "wriggle" the tongue into the groove in order to ensure that the profile is firmly attached to the plate element via the groove and tongue connection.

[0008] At the same time the groove and tongue shall be dimensioned such that a very tight and narrow fit is provided in order for the profile to come into very close contact with the surface of the plate element in order not to create undesirable crevices and openings.

Object of the Invention

[0009] Consequently, there is a need to provide a system of this type which does not require the ceiling or wall panel elements to be pre-manufactured specifically for this purpose and where the installation of profiles on the ceiling or wall elements does not provide the risk of damaging the wall or ceiling element as such.

Description of the Invention

[0010] The present invention addresses this by providing a wall or ceiling covering system comprising a plate element, said plate element having a front surface, a rear surface, and a material thickness between said front and rear surfaces where the plate perimeter is delimited by edges, one or more attachment strips and a plurality of profiles, where:

- each attachment strip has fastening means suitable to attach the attachment strip to an edge of the plate element, and further has an attachment fork, which fork when arranged on the plate element extends from the front surface of the plate element;
- each profile has an attachment surface where a groove is provided in said attachment surface, such that the groove can accommodate and hold the attachment fork of the attachment strip.

[0011] As the attachment strip is attached to an edge of the plate element no working on the plate element itself needs to be carried out beforehand and as such standard plate elements which in other situations may be installed either as ceiling or wall panels may be used. This, of course, provides the advantage that it is not necessary to carry a special stock of plate elements suitable for the present system, but any plate element suitable for wall or ceiling cladding may be used with the present invention.

[0012] Naturally the attachment strip must be dimensioned to the selected plate element, but typically in the building industry there is widespread use of standard thickness plate elements and as such the attachment strips shall only be carried in a very limited number of different dimensions in order to be able to be applied to a substantial part of the plate elements used for these purposes.

[0013] As the profiles are provided with a groove (versus the prior art where the groove is provided in a plate element) these grooves may very simply be made during the manufacturing of the profiles. Particularly where the profiles are made from wood the profiles will need to be

machined anyway in order to provide the desired surface structures and during this machining cutting of a suitable groove may be carried out in an industrial manner without large extra effort.

[0014] Consequently, the present invention provides a very advantageous system which is easy to install, easy to adapt to various wall or ceiling covering systems and at the same time may provide the desired aesthetic effects with standard components and without a risk of damaging the standard components during installation of the system.

[0015] In a further advantageous embodiment of the invention the attachment strip is made from spring steel where the attachment strip in a cross-section has a U- or C-shape comprising two substantially parallel legs connected in one end by a connection piece, such that the plate thickness may be accommodated between the parallel legs where the attachment fork is part of one of the legs and extends away from said legs.

[0016] Particularly the provision of the attachment strip in spring steel provides the possibility of designing the attachment fork congruently to the groove such that as the groove in the profile is passed over the attachment fork the attachment fork due to the fact that it is made from spring steel will slightly deform when being introduced into the groove, but afterwards it will expand and thereby secure the profile in a firm fit against the attachment fork and against the surface of the plate element. In this manner an easy-to-install system is provided where it is ensured that the profiles are retained in a firm relationship to the attachment strip and thereby to the plate element, and by dimensioning the attachment fork correctly with respect to the groove it is also ensured that the attachment surface of the profile is flush with the surface of the plate element.

[0017] By forming the attachment strips such that it has a C- or U-shaped cross-section it is possible to slide the attachment strip over an edge of the plate element such that the attachment strip will clip onto the edge of the plate element and thereby be securely retained on the plate element.

[0018] In a further advantageous embodiment of the invention the attachment strips have two orthogonal flanges, where on a first flange the attachment fork extends from said flange, and on the second flange one or more spikes are arranged perpendicular to said second flange, either only on one side or on both sides of said second flange.

[0019] With the embodiment of the attachment strip having one or more studs or spikes extending from one flange it is foreseen that when the attachment strip is mounted on the plate element the spike will be embedded in the plate material and if a second spike is provided in the opposite direction this spike will be embedded in an adjacent plate element thereby retaining the attachment strip in firm engagement with the plate elements making out the wall or ceiling system.

[0020] In a still further advantageous embodiment the groove in the attachment surface of the profile has a mushroom cross section, wherein the smaller opening is connected to the attachment surface, and where the attachment fork in a cross-section has two arms extending from a connection bridge, which bridge in use is in contact with the plate element, and where the arms from the bridge section has first straight parallel sections arranged at a mutual distance corresponding to the smaller opening, and where between the straight sections and the distal ends of the arms are provided bulging sections, where the bulging sections bulge away from each other, and where the bulging sections together have a larger dimension parallel to the surface of the plate than the largest dimension of the mushroom cross section in the profile parallel to the plate, when said profile is arranged on the plate.

[0021] The mushroom cross section of the groove, particularly in combination with attachment strips made from spring steel, ensures that as the attachment fork is passed through the narrow section of the mushroom the attachment fork is somewhat compressed whereas as the profile is positioned in its correct position in contact with the plate element the wider section of the mushroom cross section allows the attachment fork to expand thereby retaining the profile in contact with the surface of the plate element.

[0022] In a further advantageous embodiment a connection member is provided, which connection member has a cross-sectional shape corresponding to the cross-sectional shape of the groove, such that when inserting the connection member in two facing ends of two profiles, the connection member will align said two profiles.

[0023] This connection member ensures that when assembling the profiles in a longitudinal direction the continuity and linearity of the profiles are ensured such that the assembly of profiles end to end is less visible and does not provide an aesthetically unpleasing offset between adjacent profiles.

[0024] In a further advantageous embodiment of the invention the attachment fork in use extends on both sides of the edge of the plate onto which it is mounted.

[0025] With this embodiment of the attachment fork a guidance of the profile when installed on the attachment fork is secured across the end-to-end fitting of two adjacent plate elements and as such a relatively rigid connection and guidance of the profiles is ensured.

[0026] In a still further advantageous embodiment the profiles are made from any or a combination of the following materials: wood, plastics, glass-fibre reinforced composite, metal, in particular aluminum, stainless steel, copper, or zinc. Naturally, the profiles may be made from any suitable material, but as the profiles mainly serve as decoration decorative materials are especially preferred.

[0027] In cases where the profiles are made from wood the wood is selected from oak, teak, mahogany, beech, birch, ash and optionally provided with a surface finish selected amongst varnish, impregnation, whitewash, paint or lacquer.

[0028] As already discussed above the present system is suitable to use with substantially any type of plate element which is suitable to be used as a wall or ceiling cladding element, but particularly plate elements made from any of the following materials or a combination of these materials:

- a cellulose based material;
- a cement-bonded wood wool material;
- wood;
- gypsum or plaster;
- concrete or other cement-based hardenable material;
- fiber reinforced composites

are preferred.

[0029] In a further advantageous embodiment of the invention the attachment strip has a plurality of attachment forks arranged with a predetermined mutual distance, such that in use it is possible to arrange a plurality of profiles in parallel on the surface of the plate member where each profile is attached to a separate fork on the same attachment strip.

[0030] By arranging a plurality of attachment forks on the same attachment strip it is ensured that the mutual distance between adjacent attachment forks and thereby adjacent profiles when installed may be kept with a precise mutual distance in that the attachment fork decides the mutual distance between adjacent profiles when mounted on the plates.

[0031] In a still further advantageous embodiment at least the front surface is provided with a cover material different front the material from which the plate element is manufactured, where said cover material may be a cloth, textile, membrane, foil, plate, glass plate, surface coating, netting or the like. In this manner it is possible to provide the surface with a completely different impression from the material from which the plate elements are manufactured. The technical characteristics may therefore be altered to the desired use, without having to alter the plate material. For example when the plate material is cement-bonded wood wool material, a cloth or textile covering may provide additional noise dampening properties or aesthetically change the impression of the plate element.

[0032] The invention is also directed to a method for installing a wall or ceiling system using the wall or ceiling covering system as described above. Naturally, the same advantages will be achieved with the method, but additionally the method illustrates how versatile and easy it is to install the wall or ceiling system according to the present invention.

Description of the Drawing

[0033] The invention will now be described in more detail with reference to the accompanying drawing wherein

Figure 1 illustrates an assembled wall or ceiling covering system
Figure 2 illustrates an end section of a profile
Figure 3A illustrates a symmetric view of one embodiment of the attachment strip comprising a plurality of attachment forks
Figure 3B illustrates a side view of an attachment strip according to the present invention
Figure 4 illustrates a profile mounted on a front surface of a plate element
Figure 5 illustrates an alternative embodiment of the attachment strip
Figure 6 illustrates an embodiment where two lengths of profile are assembled end to end on the front surface of a plate element

Detailed Description of the Invention

[0034] In figure 1 is illustrated an assembled wall or ceiling covering system according to the present invention where the system comprises a plate element 1 where the plate element has a front surface 10, a rear surface 11 and a material thickness between said front and rear surfaces 10, 11.

[0035] The perimeter of the plate element 1 is delimited by edges 12, 13. A plurality of profiles 20, 21, 22, 23 are arranged substantially parallel on the front surface 10 of the plate element 1. The profiles 20, 21, 22, 23 will be substantially identical with respect to dimensions, i.e. have the same cross section. The profiles 20, 21, 22, 23 are attached to the front surface 10 of the plate element 1 by means of an attachment strip 30.

[0036] Turning to figure 2 an end section of a profile 20 is illustrated where it is evident that the profile has an attachment surface 25 in which attachment surface a groove 35 is provided. In this embodiment the groove 35 has a mushroom shape such that the opening 36 towards the attachment surface 25 has a smaller cross sectional dimension than the wider section of the mushroom shaped groove 35.

[0037] The attachment strip 30 is illustrated in more detail with reference to figure 3A and 3B where figure 3A illustrates a symmetric view of one embodiment of the attachment strip comprising a plurality of attachment forks whereas figure 3B illustrates a side view of an attachment strip according to the present invention.

[0038] Turning to figure 3A the attachment strip 30 has fastening means suitable to attach the attachment strips to a plate element 1. In this embodiment the attachment means are provided by bending the attachment strip such that attachment fork 31 and a flange 32 provide a space 33 corresponding to the plate thickness. Consequently, by inserting a plate such that the edge 12 of the plate comes against a connection piece 34 the bottom of an attachment fork 31 and the flange 32 will be positioned on either side of a plate element 1 thereby firmly holding the attachment strip relative to the plate element 1.

[0039] In figure 3B a side-view of an attachment strip

as discussed in figure 3A is illustrated. As is clear from this illustration the distance 33 is provided between the attachment fork 31 and the flange 32. Consequently, by sliding the attachment strip onto the end of the plate 1 the attachment fork 31 will be projecting from the front surface of the plate whereas the flange 32 will be positioned on the rear side of the plate element 1.

[0040] Turning to figure 4 a profile 20 is mounted on a front surface 10 of a plate element 1 by means of an attachment strip 30. The attachment fork 31 is as illustrated with reference to figure 3A shaped such it has a shape congruent to the mushroom cross section 35 of the groove provided in the profile 20. Consequently, by forcing the profile 20 down over the attachment fork 31 the attachment fork will slightly deform during passage of the entrance 36 of the groove 35 and the profile 20, but will expand into the larger cavity 35 of the mushroom shaped cross section thereby firmly attaching the profile 20 to the surface 10 of the plate element 1. By shaping the attachment fork 31 and the groove 35 in the profile 20 correctly the attachment surface 25 of the profile 20 will be in close contact with the surface 10 of the plate element 1. In this manner an invisible attachment is provided between the profile 20 and the blade element 1.

[0041] In figure 5 is illustrated an alternative embodiment of the attachment strip 30' according to the present invention. In this embodiment the attachment fork 31 still projects from a flange 38 suitable to be arranged flush with the front surface 10 of a plate element 1. In this embodiment a second flange 39 substantially orthogonal to the first flange 38 is provided and intended to be inserted between edges 12, 12' between adjacent plate elements 1, 1'. The flange 39 is provided with spikes 40, 41 which spikes when the plates 1, 1' are forced together edge against edge 12, 12' whereby the spikes 41, 41 will be embedded in the material of the plates 1, 1' thereby effectively fixating the attachment strip 30' to the front surface 10 of the plate elements.

[0042] I figure 6 is illustrated an embodiment where two lengths of profile 20, 20' are assembled end to end on the front surface 10 of a plate element. In order to ensure proper alignment of the two lengths of profile 20, 20' a connection member 44 is provided. The connection member 44 has a cross section corresponding to the cross section of the groove 35 such that by inserting the connection member 44 in the groove 35 of the two lengths of profile 20, 20' will be fully aligned thereby avoiding any aesthetically unpleasing offset of the profiles.

Claims

1. A wall or ceiling covering (cladding) system comprising a plate element, said plate element having a front surface, a rear surface, and a material thickness between said front and rear surfaces, and where the plate perimeter is delimited by edges, one or more attachment strips and a plurality of profiles, where:
   - each attachment strip has fastening means suitable to attach the attachment strip to an edge of the plate element, and further has an attachment fork, which fork when arranged on the plate element extends from the front surface of the plate element;
   - each profile has an attachment surface where a groove is provided in said attachment surface, such that the groove can accommodate and hold the attachment fork of the attachment strip.

2. A wall or ceiling covering (cladding) system according to claim 1 wherein the attachment strip is made from spring steel, and where the attachment strip in a cross-section has a U- or C-shape comprising two substantially parallel legs connected in one end by a connection piece, such that the plate thickness may be accommodated between the parallel legs, and where the attachment fork is part of one of the legs and extends away from said legs.

3. A wall or ceiling covering (cladding) system according to claim 1 wherein the attachment strip has two orthogonal flanges, where on a first flange the attachment fork extends from said flange, and on the second flange one or more spikes are arranged perpendicular to said second flange, either only on one side or on both sides of said second flange.

4. A wall or ceiling covering (cladding) system according to any preceding claim wherein the groove in the attachment surface of the profile has a mushroom cross section, wherein the smaller opening is connected to the attachment surface, and where the attachment fork in a cross-section has two arms extending from a connection bridge, which bridge in use is in contact with the plate element, and where the arms from the bridge section has first straight parallel sections arranged at a mutual distance corresponding to the smaller opening, and where between the straight sections and the distal ends of the arms are provided bulging sections, where the bulging sections bulge away from each other, and where the bulging sections together have a larger dimension parallel to the surface of the plate than the largest dimension of the mushroom cross section in the profile parallel to the plate, when said profile is arranged on the plate.

5. A wall or ceiling covering (cladding) system according to claim 1, wherein a connection member is provided, which connection member has a cross-sectional shape corresponding to the cross-sectional shape of the groove, such that when inserting the connection member in two facing ends of two profiles, the connection member will align said two profiles.

6. A wall or ceiling covering (cladding) system according to claim 1 wherein the attachment fork in use extends on both sides of the edge of the plate onto which it is mounted.

7. A wall or ceiling covering (cladding) system according to claim 1 wherein the profiles are made from any or a combination of the following materials: wood, plastics, glass-fibre reinforced composite, metal in particular aluminum, stainless steel, copper, or zinc.

8. A wall or ceiling covering (cladding) system according to claim 7 wherein when the profiles are made from wood the wood is selected from oak, teak, mahogany, beech, birch, ash, walnut, pine, poplar and optionally provided with a surface finish selected amongst varnish, impregnation, whitewash, paint or lacquer.

9. A wall or ceiling covering (cladding) system according to claim 1 wherein the plate element is made from any of the following materials or a combination of these materials:

- a cellulose based material;
- a cement-bonded wood wool material;
- wood;
- gypsum or plaster;
- concrete or other cement-based hardenable material;
- fiber reinforced composites;
- magnasit bonded wood wool;
- fiber plaster;
- mineral wool.

10. A wall or ceiling covering (cladding) system according to claim 1 wherein the attachment strip has a plurality of attachment forks arranged at a predetermined mutual distance, such that in use it is possible to arrange a plurality of profiles in parallel on the surface of the plate member where each profile is attached to a separate fork on the same attachment strip.

11. A wall or ceiling covering (cladding) system according to any preceding claim wherein at least the front surface is provided with a cover material different from the material from which the plate element is manufactured, where said cover material may be a cloth, textile, membrane, foil, surface coating, netting or the like.

12. Method for installing a wall or ceiling system according to any of claims 1 to 11, to a structure, comprising:

- selecting one or more suitable plate elements, where each plate element has a material thickness, and edges along the perimeter of the plate element, where said edges are substantially at right angles to a front surface of the plate element;
- along two opposing and parallel edges arranging attachment strips, where each attachment strip has fastening means suitable to attach the attachment strip to an edge of the plate element, and further has one or more attachment fork(s) which fork(s) when arranged on the plate element extend(s) from the front surface of the plate element;
- installing or fastening the plate element to the structure by suitable means, such that the front surface with the forks extending from the surface is visible;
- placing one or more profiles on the front surface of the plate elements, where each profile has an attachment surface and where a groove is provided in said attachment surface, and where the groove is shaped such that the groove can accommodate and hold the attachment fork of the attachment strip, whereby the profile is held in contact with the surface of the plate element.

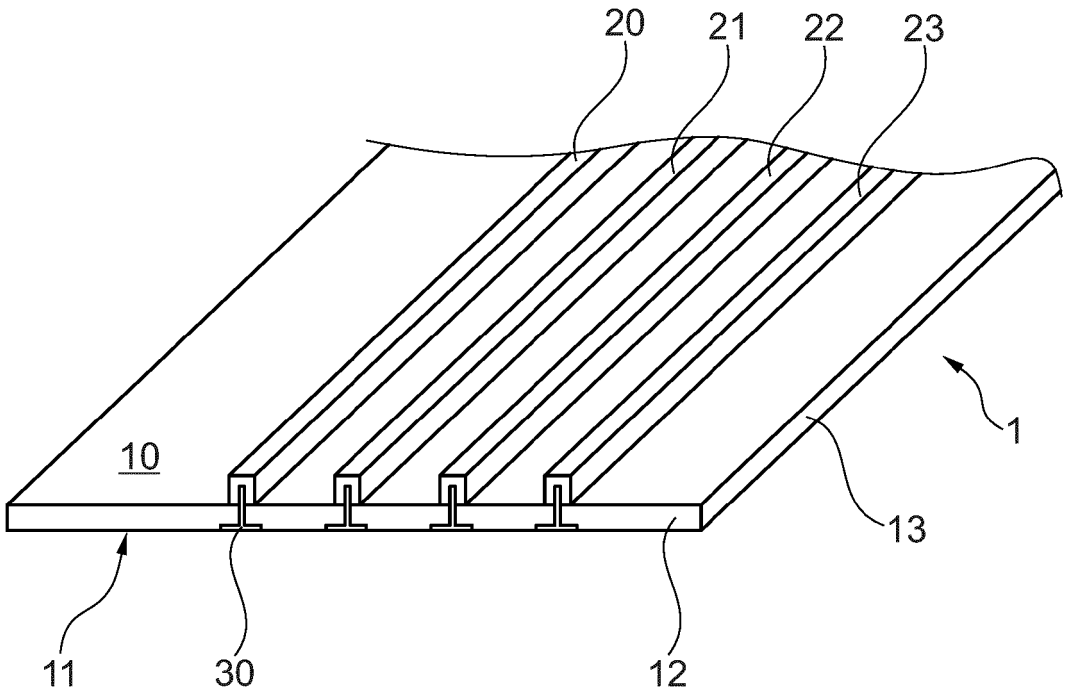

Fig. 1

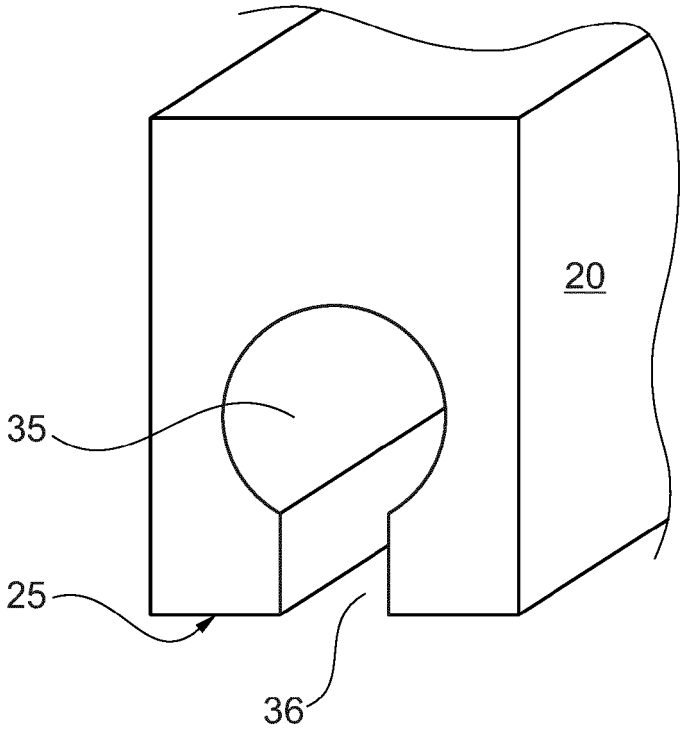

Fig. 2

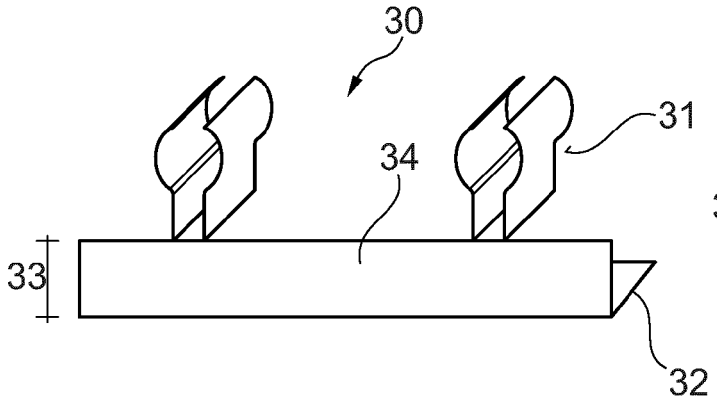

Fig. 3a

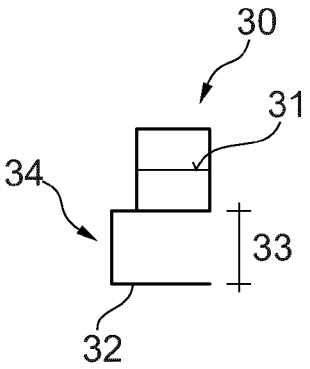

Fig. 3b

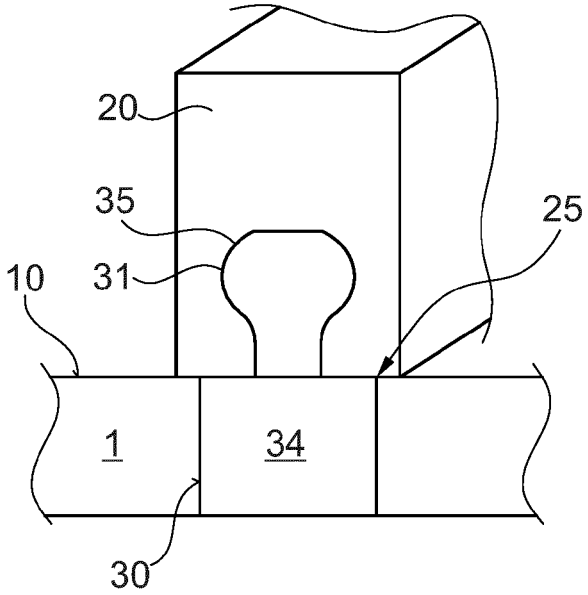

Fig. 4

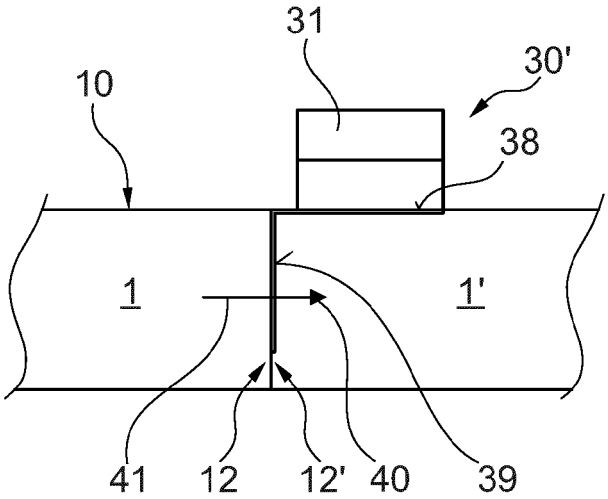

Fig. 5

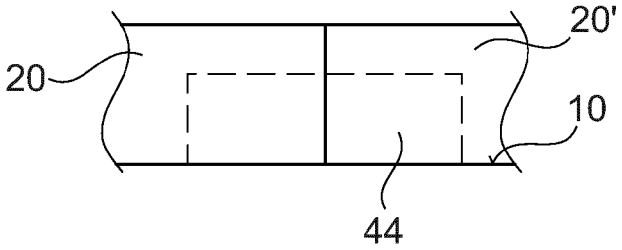

Fig. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 21 15 2703

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	26 May 2021	Khera, Daljit

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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