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(54) Device and method for panelling a framework

(57) The present invention relates to a device and method for panelling a structure (20) in connection with construction, comprising a gypsum plaster-board (10) having two opposite and substantially plane surfaces (11, 12) and at least a first edge side (13) and a second edge side (14), wherein the first edge side (13) comprises a projecting portion (17) and the second side edge (14) comprises a recess (18) corresponding to the projecting portion (17) so that the recess (18) and the projecting portion (17) form means for interconnecting adjacent gypsum plasterboards. The invention also relates to a building element comprising such a device.

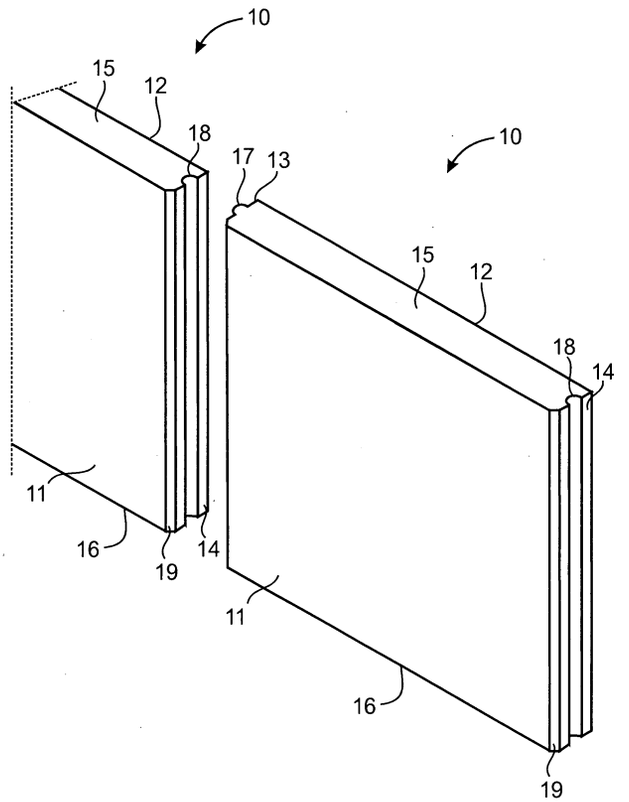

Fig. 1

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present invention relates to a device and method for panelling a structure in connection with construction. The device according to the invention particularly relates to a gypsum plasterboard for panelling a structure in connection with construction. Gypsum plasterboards of this type are commonly used for panelling interior walls and ceilings in buildings, such as houses and industrial buildings.

STATE OF THE ART

[0002] Prior art devices of this type comprise gypsum plasterboards having two opposite and substantially plane surfaces. Such prior art devices for panelling, for example, interior walls and ceilings are rectangular and comprise a circumference of four plane edge sides. Further, such devices are arranged to be brought onto and attached to a structure, such as an underlying surface or a framework, by means of conventional fastening means. Such fastening means can, for example, comprise screws, nails or similar. Generally, the gypsum plasterboards are attached to a framework of wood or steel, wherein the gypsum plasterboards are fastened to the framework by screws so that one plane surface of the gypsum plasterboards engages the framework and the opposite plane surface forms the interior wall or ceiling, Generally, a plurality of adjacent gypsum plasterboards are used, which are arranged so that the edge sides are in contact with each other to obtain an interior wall or a ceiling. For example, the gypsum plasterboards can also be arranged so that two layers of gypsum plasterboard are obtained. Then, the plane surface of the gypsum plasterboard forming the interior wall or ceiling can be painted, provided with wall paper or be subject to any other finishing treatment.

[0003] One problem with such prior art devices is that the mounted gypsum plasterboards can have a deficient capacity to resist forces in a direction perpendicular to the plane of the gypsum plasterboards.

[0004] One drawback with such prior art devices is that they can require an extensive work effort in connection with mounting.

SUMMARY OF THE INVENTION

[0005] One object of the present invention is to eliminate the above mentioned drawbacks and problems with this type of prior art devices.

[0006] Further one object of the invention is to provide a device that results in a more rigid construction in connection with panelling a structure with gypsum plasterboards and which more efficiently can resist forces perpendicular to the plane of the gypsum plasterboards. The device according to the invention further results in an easily mounted gypsum plasterboard, which results in a more cost efficient mounting. Yet another object of the present invention is to provide a device which results in that gypsum plasterboards can be mounted on a structure or a load carrying structure in a lying position while maintaining a rigid construction. These objects are achieved by the invention obtaining the features of claim 1.

[0007] The present invention comprises a device for panelling a structure in connection with construction, comprising a gypsum plasterboard having two opposite and substantially plane surfaces and at least a first edge side and a second side edge, wherein the first edge side comprises a projecting portion and the second side edge comprises a recess corresponding to the projecting portion so that the recess and the projecting portion form means for interconnecting adjacent gypsum plasterboards. The gypsum plasterboard can be formed with conventional dimensions, such as thickness, width and length, and is arranged for mounting on a structure or framework of wood, metal, gypsum or similar. The gypsum plasterboard further comprises a third and fourth edge side, which can be formed in a conventional manner or can comprise a projecting portion and a recess, respectively, in similarity with the first and second edge sides.

[0008] The projecting portion can be arranged in a plurality of different shapes, such as a semi-circle, triangle or rectangle. The projecting portion is arranged to project into the recess and consequently engage an adjacent gypsum plasterboard for interconnection thereof. The recess is arranged correspondingly to receive and partially enclose the projecting portion. The projecting portion and the recess can be arranged along the length of the edge sides, respectively, i.e. from a first end of the edge side to a second end of the edge side or along the entire length of the edge sides, respectively. Alternatively, the projecting portion and the recess are arranged intermittently along the length of the edge sides, respectively, so that the edge sides alternately are arranged with conventional portions and projecting portions and/or corresponding recesses.

[0009] The projecting portion and the recess can be arranged centrally along the edge sides. In addition to the projecting portion or the recess the edge sides can comprise plane portions adjacent the projecting portion and the recess so that a first plane portion is arranged on one side of the projecting portion and the recess and a second plane portion is arranged on the opposite side thereof.

[0010] The edge sides of the gypsum plasterboard can also comprise a chamfered edge. The chamfered edge can be arranged towards the first plane surface of the gypsum plasterboard. For example the chamfered edge can be arranged between the first plane surface of the gypsum plasterboard and the first plane portion of the edge side. Then, the projecting portion and the recess can be somewhat displaced towards the second

plane surface of the gypsum plasterboard to provide space for the chamfered edge.

[0011] The invention also relates to a method for panelling a structure in connection with construction by means of a device according to the invention, comprising the steps of

connecting a first gypsum plasterboard with the structure,

bringing the projecting portion or the recess of a second gypsum plasterboard to engage the recess or the projecting portion of the first gypsum plasterboard to prevent displacement pf the gypsum plasterboards in a direction perpendicular to the plane of the gypsum plasterboards and obtain a connection between them, and

further connecting the second gypsum plasterboard with the structure.

[0012] In consequence of the projecting portion and the recess of the edge sides a large surface of the edge sides is provided, which can be coated with glue for further interconnection of adjacent gypsum plasterboards. In addition, glue can be applied to a plane surface of the gypsum plasterboard for connection with the structure. Hence, a rigid construction when panelling walls, interior walls, roofs, ceilings and floors is provided, which facilitates mounting and enable rigid constructions having standing as well as lying gypsum plasterboards. Since a rigid construction and favourable connection between gypsum plasterboards is obtained the material in, for example, the structure can be reduced. For example, the number of latches in a framework can be reduced while maintaining a rigid construction.

[0013] For example, a glue, which forms a wet suction effect between the gypsum plasterboards and the structure in a first wet condition, is applied to a first plane surface of a gypsum plasterboard. Then, the first plane surface of the gypsum plasterboard is brought into contact with the structure and is detained by means of the wet suction effect of the glue, wherein the gypsum plasterboard is displaceable in a direction along the plane of the gypsum plasterboard to enable correction of its position in the same direction. If required, the position of the gypsum plasterboard can be adjusted in a direction along the plane of the gypsum plasterboard, whereupon the gypsum plasterboard is stationary fixed to the structure by means of the glue, which in a second dry condition forms a fixed connection through increased adhesive and cohesive forces due to solidification.

[0014] The gypsum plasterboards can be interconnected by means of the glue, by applying the glue on the projecting portion and/or the recess. Alternatively, the glue can be applied on suitable edge sides. Further, gypsum plasterboards can be connected to a conventional structure, such as a framework of wood or metal or an underlayer of gypsum, by means of the glue. The term structure also includes wall frameworks, base structures and similar. The gypsum plasterboards can also be connected with frameworks of expanded metal latches.

[0015] By connecting gypsum plasterboards with a structure by means of glue the required number of screws or similar conventional fastening means to obtain a rigid construction is reduced. This results in that required work effort for mounting is reduced and that the risk of different types of injuries in connection with mounting is reduced.

[0016] Hence, the glue forms a wet suction effect between the gypsum plasterboard and the structure in a first wet condition and a fixed connection between the gypsum plasterboard and the structure in a second dry condition. In the wet condition the glue shows a relatively high wet suction effect so that a gypsum plasterboard is detained on the structure by suction. Hence, the glue is arranged to fasten to the structure and the gypsum plasterboard, wherein a movable connection between the gypsum plasterboard and the structure is provided, which resists forces in a direction perpendicular to the plane of the gypsum plasterboard but enables displacement of the gypsum plasterboard laterally, vertically or in the plane of the gypsum plasterboard. Consequently, the glue connects the gypsum plasterboard with the structure in a wet or non-solid condition and shows low resistance against shearing strain in this condition. This results in that a gypsum plasterboard can be fastened to the structure and then be adjusted for position in a simple manner. When the glue solidifies the gypsum plasterboard is connected with the structure due to the increasing adhesive and, particularly, cohesive properties of the glue.

[0017] The glue can be water-based and may comprise a polymer in the form of an acrylate copolymer, such as styrene-acrylate copolymer or similar. The glue can further comprise filler, thickening agent, film former, wetting agent and tack agent. For example, the filler comprises dolomite or filler with similar properties. The glue can further comprise a dry content between 70 and 100 percentage by weight, suitably between 80 and 90 percentage by weight and preferably about 86 percentage by weight. The glue can have a relatively thick consistence, which in combination with the dry content, provide a wet suction effect suitable for the application. For example, the glue has a consistence corresponding to 5mm with a needle weight of 20g during 5s with the penetration method.

[0018] The present invention further comprises a building element comprising at least one construction plate connected to a structure, wherein the construction plate comprises a gypsum plasterboard having two opposite and substantially plane surfaces and at least a first edge side and a second edge side, characterised in that the first edge side comprises a projecting portion for engaging a recess of a gypsum plasterboard adjacent the first edge side, which recess corresponds to the projecting portion, and the second edge side comprises a recess for receiving a projecting portion of a gypsum plasterboard adjacent the second edge side, wherein

the recess and the projecting portion form means for interconnecting adjacent gypsum plasterboards. In addition a plane surface of the gypsum plasterboard can be provided with glue to obtain a building element in which gypsum plasterboards are connected with the structure by means of the glue.

[0019] According to one embodiment of the invention the glue is applied on the edge sides of the gypsum plasterboards to provide interconnection thereof. The first and/or second edge side can be provided with the glue for further connection between gypsum plasterboards. For example, the recess and/or the projecting portion of the gypsum plasterboards are provided with glue. Also the third and fourth edge side, which may be arranged conventionally or may comprise a projecting portion and a recess, respectively, in similarity with the first and second edge sides, can be provided with glue.

[0020] Additional objects and advantages of the present invention is evident from the description, enclosed drawings and independent claims.

[0021] Gypsum plasterboards having a recess and projecting portion can be manufactured with or without a carton coating. When a gypsum plasterboard without carton coating or without carton coating on the edge sides is to be manufactured the recess and the projecting portion can be milled off by means of a suitable milling machine. For example, notches through the carton are cut by means of two saw blades to prevent the material to fluff, wherein a saw notch is formed. Then the recess and the projecting portion are formed by milling by means of wheels provided with milling blades, which mill along the saw notch. To provide gypsum plasterboards having a carton coated recess and a carton coated projecting portion notches can be scribed in suitable positions in the carton, i.e. the positions where the carton is to be folded. When the carton runs on a conveyor, portions thereof comprising the scribed notches are folded forming sides, wherein a mould for gypsum paste is provided. Hence, portions of the carton form the long sides. The mould formed by the folded carton is provided with gypsum paste, wherein a relatively small portion of carton is folded over the gypsum paste to the side which subsequently is to be provided with back carton. The carton coated projecting portion is for example formed by folding the carton at the notches and the carton coated recess is for example formed by means of a moulding tool forming the recess and, simultaneously, push carton therein. The back carton is applied and is glued conventionally. Also cutting to suitable length is performed conventionally. For example, a rough cutting is performed on carton coated gypsum paste to obtain pieces with suitable length. Then, these are brought into a furnace, whereupon the length is tuned to provide gypsum plasterboards having suitable length.

BRIEF DESCRIPTION OF THE DRAWINGS

[0022] The invention will now be described in more detail with reference to the accompanying drawings, in which

Fig. 1 is a schematic perspective view inclined from above, illustrating the principle of the device according to the invention,

Fig. 2 is a schematic front view showing gypsum plasterboards arranged on a structure according to one embodiment of the invention,

Fig. 3 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a first edge side of the gypsum plasterboard according to a first embodiment of the present invention,

Fig. 4 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a second edge side of the gypsum plasterboard according to the first embodiment of the present invention,

Fig. 5 is a schematic view of two connected gypsum plasterboards according to Fig. 3 and Fig. 4,

Fig. 6 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a first edge side of the gypsum plasterboard according to a second embodiment of the present invention,

Fig. 7 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a second edge side of the gypsum plasterboard according to the second embodiment of the present invention,

Fig. 8 is a schematic view of two connected gypsum plasterboards according to Fig. 6 and Fig. 7,

Fig. 9 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a first edge side of the gypsum plasterboard according to a third embodiment of the present invention,

Fig. 10 is a schematic view of one portion of a gypsum plasterboard seen from above, illustrating a second edge side of the gypsum plasterboard according to the third embodiment of the present invention, and

Fig. 11 is a schematic view of two connected gypsum plasterboards according to Fig. 9 and Fig. 10.

DESCRIPTION

[0023] Fig. 1 is a schematic perspective view inclined from above, illustrating the principle of the invention.

The device comprises a gypsum plasterboard 10 having two opposite and substantially plane surfaces 11,12 and a first edge side 13 and a second edge side 14. The device, or gypsum plasterboard 10, further comprises a third edge side 15 and, in the embodiment shown, a fourth edge side 16. The gypsum plasterboard 10 is, for example, rectangular but may be formed in any other suitable shape, dependent on the current application. Preferably, the gypsum plasterboard 10 is rectangular, wherein the first edge side 13 is arranged on a side of the gypsum plasterboard opposite the second edge side 14. The gypsum plasterboard 10 is arranged for panelling a structure in connection with construction, such as panelling a framework in connection with construction of walls, interior walls, roofs, ceilings, floors or similar, which is described in more detail with reference to Fig. 2. For example, the gypsum plasterboard 10 is of common dimensions, such as 2400 mm x 900 mm, 2400 mm x 600 mm or 2400 mm x 1200 mm. Of course, the gypsum plasterboard 10 can be formed with other dimensions, depending on the application and requirements. According to one embodiment of the present invention the gypsum plasterboard 10 is provided with carton or paper coating on at least one plane surface. Alternatively, both plane surfaces of the gypsum plasterboard are provided with paper coating. According to yet another embodiment one or more of the edge sides 13-16 of the gypsum plasterboard 10 are provided with paper coating. For example, the gypsum plasterboard 10 is a normal quality plate or normal plate, in which the plane surfaces and long sides of the gypsum plasterboard are coated with carton.

[0024] The gypsum plasterboard 10 comprises means for locking adjacent gypsum plasterboards, which adjacent gypsum plasterboards are formed in similarity with the gypsum plasterboard 10. The gypsum plasterboard 10 comprises a projecting portion 17 and a recess 18, wherein the recess 18 and the projecting portion 17 form means for interconnection of adjacent gypsum plasterboards. The projecting portion 17 projects from and in a direction along the plane of the gypsum plasterboard 10 and the recess 18 extends in a corresponding direction. The projecting portion 17 is arranged to project into a recess 18 of an adjacent gypsum plasterboard arranged in the same plane as the gypsum plasterboard 10 and the recess 18 is arranged for receiving the projecting portion 17 of yet another adjacent gypsum plasterboard. The gypsum plasterboard 10 is formed to be arranged with its first edge side 13 towards the second edge side 14 of an adjacent gypsum plasterboard. Hence, the first edge side 13 comprises a projecting portion 17 and the second edge side 14 comprises a recess 18 corresponding to the projecting portion 17. The projecting portion 17 projects substantially perpendicular from the edge side 13 and the recess 18 projects into the gypsum plasterboard 10 correspondingly. Hence, the first edge side 13 comprises a projecting portion 17 for engaging a recess 18 of a gypsum plasterboard adjacent the first edge side 13 and the second edge side 14 comprises a recess 18 for receiving a projecting portion 17 of a gypsum plasterboard adjacent the second edge side 14.

[0025] In the embodiment of Fig. 1 the projecting portion 17 extends along the entire length of the first edge side 13, i.e. from a first end of the first edge side 13 to a second end of the first edge side 13. Suitably, the recess 18 is extending in a manner corresponding to the projecting portion 17. According to an alternative embodiment, which is not illustrated in the drawings, the projecting portion 17 and the recess 18 extend a suitable distance or in intervals along the edge sides 13, 14.

[0026] A plurality of gypsum plasterboards can be connected as described above, since the first edge side 13 of each gypsum plasterboard is provided with a projecting portion 17 and the second edge side is provided with a recess 18 corresponding to the projecting portion 17. By means of the invention a first gypsum plasterboard 10 is connectable with an adjacent second gypsum plasterboard in a manner to provide a rigid construction when panelling a structure with gypsum plasterboards, and which is more resistant to forces perpendicular to the plane of the gypsum plasterboards. Additionally, the projecting portion 17 and the recess 18 results in a larger contact surface between the first and second edge sides 13, 14, which is advantageous when interconnecting adjacent gypsum plasterboards 10 by means of glue or similar. Due to that adjacent gypsum plasterboards 10 are connected by means of the projecting portion 17 and the recess 18, mounting is facilitated. This results in a reduced working effort for holding the gypsum plasterboards in position for further fastening by means of screws, nails, glue or any other suitable fastening means, which results in a more cost efficient mounting. Due to that the gypsum plasterboards are interconnected by means of the projecting portion 17 and the recess 18 less screws, for example, are required to obtain a sufficient connection with the structure.

[0027] In the embodiment of Fig.-1 the third edge side 15 and the fourth edge side 16 are arranged with a substantially plane surface. Thus, the third and fourth edge sides 15, 16 can be arranged in contact with adjacent gypsum plasterboards conventionally. Alternatively, also the third and fourth edge sides 15, 16 comprise a projecting portion 17 and a recess 18, respectively, in similarity with the first edge side 13 and the fourth edge side 14, which is not illustrated in the drawings. Hence, the third edge side 15, for example, comprises a projecting portion 17 for engaging a recess 18 of a gypsum plasterboard adjacent the third edge side 13, and the fourth edge side 16 comprises a recess 18 for receiving a projecting portion 17 of a gypsum plasterboard adjacent the fourth edge side 16. For example, the gypsum plasterboard 10 also comprises a chamfered edge 19.

[0028] Fig. 2 is a schematic front view of gypsum plasterboards 10 arranged on a structure 20 according to one embodiment of the present invention. The structure

20 is, for example, arranged conventionally, such as by means of latches or similar, and is not limited to the example of Fig. 2.

[0029] When mounting gypsum plasterboards 10 in accordance with the invention initially a first gypsum plasterboard 10' is connected to a structure conventionally, such as by means of screws, nails or similar. Alternatively, the first gypsum plasterboard 10' is connected with the structure by means of glue. Then, a second gypsum plasterboard 10" is brought into contact with the first gypsum plasterboard 10', wherein the means for locking adjacent gypsum plasterboards of the gypsum plasterboard 10' is brought into engagement with each other. The gypsum plasterboards 10', 10" are mounted in the same direction so that the first edge side 13 of each gypsum plasterboard 10', 10" is arranged in one direction and the second edge side 14 is arranged in the opposite direction. Hence, the projecting portion 17 of the first gypsum plasterboard 10' is brought into contact with the recess 18 of the second gypsum plasterboard 10", wherein the gypsum plasterboards 10', 10" are connected through the engagement of the projecting portion 17 with the recess 18. Then, the second gypsum plasterboard 10" is further connected with the structure 20 by means of screws, nails, glue or similar.

[0030] In the embodiment of Fig. 2 gypsum plasterboards having a length of 2400 mm and a width of 600 mm are mounted on a vertical structure 20 for construction of a wall, wherein a long side of the gypsum plasterboards is arranged horizontally. Hence, the gypsum plasterboards are arranged in a lying position on the structure 20. Due to the relative connection between the gypsum plasterboards through the projecting portion 17 and the recess 18 a rigid construction is obtained also with lying gypsum plasterboards, wherein the required number of latches is reduced. Alternatively, the gypsum plasterboards can be mounted conventionally, i.e. so that the long sides are arranged vertically. By means of the teachings of the invention, it is, however, obvious for a person skilled in the art that the shape, dimensions and orientation of the gypsum plasterboards can be adapted to the current application.

[0031] In reference to Fig. 3, 4 and 5 the means for interconnection of adjacent gypsum plasterboards of the device is illustrated according to a first embodiment of the present invention. In the embodiment of Fig. 3-5 a gypsum plasterboard 10a comprises a first edge side 13a and a second edge side 14a, wherein the first edge side 13a, for example, is arranged on one side of the gypsum plasterboard 10a and the second edge side 14a is arranged on the opposite side thereof. The first edge side 13a is arranged for abutment against and connection with a second edge side 14a of an adjacent gypsum plasterboard. The second edge side 14a is arranged for abutment against and connection with a first edge side 13a of an adjacent gypsum plasterboard.

[0032] In reference to Fig. 3 the first edge side 13a comprises a projecting portion 17a in the form of a rounded profile or a semicircle, wherein the arc of the semicircle projects in the plane of the gypsum plasterboard 10a. For example, the projecting portion 17a extends along the first edge side 13a forming a half cylinder. Additionally, the first edge side 13a comprises a first plane portion 21 on one side of the projecting portion 17a and a second plane portion 22 on the other side. For example, the first plane portion 21 is arranged with a length corresponding to the second plane portion 22, wherein the projecting portion 17a is arranged substantially in the centre of the first edge side 13a. For example, the projecting portion 17a is arranged somewhat displaced towards the second plane surface 12 of the gypsum plasterboard 10a to provide space for the chamfered edge 19 in a direction towards the first plane surface 11 of the gypsum plasterboard 10a.

[0033] In reference to Fig. 4 the second edge side 14a of the gypsum plasterboard 10a comprises a recess 18a having a shape corresponding to the projecting portion 17a. In the embodiment of Fig. 4 the recess 18a is formed as a rounded profile or a semicircle and extends along the second edge side 14a forming a semi-cylindrical recess. The second edge side 14a also comprises the first plane portion 21, the second plane portion 22 and the chamfered edge 19 in similarity with the first edge side 13a. As described above the gypsum plasterboard can be provided with carton or paper coating on one or both of the plane surfaces 11,12 and one or more of the edge sides 13-16, which is not illustrated in the drawings. For example, a paper coating is arranged around the projecting portion 17a and/or into the recess 18a so that one or each edge side is coated with paper.

[0034] In reference to Fig. 5 a first gypsum plasterboard 10a' is connected to a second gypsum plasterboard 10a" by means of the projecting portion 17a and the recess 18a. The first gypsum plasterboard 10a' is suitably connected with a structure 20 conventionally, as described above in reference to Fig. 2. Then the second gypsum plasterboard 10a" is brought into contact with the first gypsum plasterboard 10a' so that the first edge side 13a of the first gypsum plasterboard 10a' engages the second edge side 14a of the second gypsum plasterboard 10a". The projecting portion 17a of the first gypsum plasterboard 10a' is brought to project into the recess 18a of the second gypsum plasterboard 10a" for relative connection of the gypsum plasterboards 10a' and 10a", wherein the first plane portion 21 of the first gypsum plasterboard 10a' is in contact with the first plane portion 21 of the second gypsum plasterboard 10a", the second plane portion 22 of the first gypsum plasterboard 10a' is in contact with the second plane portion 22 of the second gypsum plasterboard 10a" and the chamfered edge 19 of the gypsum plasterboards 10a' and 10a" is arranged in the same direction. Then, also the second gypsum plasterboard 10a" can be further connected with the structure 20 conventionally, as described above.

[0035] In reference to Fig. 6, 7 and 8 the means for

interconnection of adjacent gypsum plasterboards of the device is illustrated according to a second embodiment of the present invention. In the embodiment of Fig. 6-8 a gypsum plasterboard 10b comprises a first edge side 13b and a second edge side 14b, wherein the first edge side 13b, for example, is arranged on one side of the gypsum plasterboard 10b and the second edge side 14b is arranged on the opposite side thereof. The first edge side 13b is arranged for abutment against and connection with a second edge side 14b of an adjacent gypsum plasterboard. The second edge side 14b is arranged for abutment against and connection with a first edge side 13b of an adjacent gypsum plasterboard.

[0036] In reference to Fig. 6 the first edge side 13b comprises a projecting portion 17b in the form of a pointed, triangular or v-shaped profile, wherein the apex projects in the plane of the gypsum plasterboard 10b. For example, the projecting portion 17b extends along the first edge side 13b. Suitably, the projecting portion 17b is arranged substantially in the centre of the first edge side 13b so that the apex of the projecting portion 17b is arranged in the centre thereof.

[0037] In reference to Fig. 7 the second edge side 14b of the gypsum plasterboard 10b comprises a recess 18b having a shape corresponding to the projecting portion 17b. In the embodiment of Fig. 7 the recess 18b is formed as a v-shaped profile, wherein the apex projects into the gypsum plate 10b. As described above the gypsum plasterboard 10b can be provided with carton or paper coating on one or both of the plane surfaces 11,12 and one or more of the edge sides 13-16, which is not illustrated in the drawings. For example, a paper coating is arranged around the projecting portion 17b and/or into the recess 18b so that one or each edge side is coated with paper.

[0038] In reference to Fig. 8 a first gypsum plasterboard 10b' is connected to a second gypsum plasterboard 10b" by means of the projecting portion 17b and the recess 18b. The first gypsum plasterboard 10b' is suitably connected with a structure 20 conventionally, as described above in reference to Fig. 2. Then the second gypsum plasterboard 10b" is brought into contact with the first gypsum plasterboard 10b' so that the first edge side 13b of the first gypsum plasterboard 10b' engages the second edge side 14b of the second gypsum plasterboard 10b". The projecting portion 17b of the first gypsum plasterboard 10b' is brought to project into the recess 18b of the second gypsum plasterboard 10b" for relative connection of the gypsum plasterboards 10b' and 10b". Then, also the second gypsum plasterboard 10b" can be further connected with the structure 20 conventionally, as described above.

[0039] In reference to Fig. 9, 10 and 11 the means for interconnection of adjacent gypsum plasterboards of the device is illustrated according to a third embodiment of the present invention. In the embodiment of Fig. 9-11 a gypsum plasterboard 10c comprises a first edge side 13c and a second edge side 14c, wherein the first edge side 13c, for example, is arranged on one side of the gypsum plasterboard 10c and the second edge side 14c is arranged on the opposite side thereof. The first edge side 13c is arranged for abutment against and connection with a second edge side 14c of an adjacent gypsum plasterboard. The second edge side 14c is arranged for abutment against and connection with a first edge side 13c of an adjacent gypsum plasterboard.

[0040] In reference to Fig. 9 the first edge side 13c comprises a projecting portion 17c in the form of an angular, quadratic or rectangular profile projecting in the plane of the gypsum plasterboard 10c. For example, the projecting portion 17c extends along the first edge side 13c. Additionally, the first edge side 13c comprises a first plane portion 21 on one side of the projecting portion 17c and a second plane portion 22 on the other side. For example, the first plane portion 21 is arranged with a length corresponding to the second plane portion 22, wherein the projecting portion 17c is arranged substantially in the centre of the first edge side 13c. For example, the projecting portion 17c is arranged somewhat displaced towards the second plane surface 12 of the gypsum plasterboard 10c to provide space for the chamfered edge 19 in a direction towards the first plane surface 11 of the gypsum plasterboard 10c.

[0041] In reference to Fig. 10 the second edge side 14c of the gypsum plasterboard 10c comprises a recess 18c having a shape corresponding to the projecting portion 17c. In the embodiment of Fig. 10 the recess 18c is formed as an angular, quadratic or rectangular profile projecting into the gypsum plasterboard 10c in the plane of the gypsum plasterboard 10c and extends along the second edge side 14c. The second edge side 14c also comprises the first plane portion 21, the second plane portion 22 and the chamfered edge 19 in similarity with the first edge side 13c. As described above the gypsum plasterboard can be provided with carton or paper coating on one or both of the plane surfaces 11,12 and one or more of the edge sides 13-16, which is not illustrated in the drawings. For example, a paper coating is arranged around the projecting portion 17c and/or into the recess 18c so that one or each edge side is coated with paper.

[0042] In reference to Fig. 11 a first gypsum plasterboard 10c' is connected to a second gypsum plasterboard 10c" by means of the projecting portion 17c and the recess 18c. The first gypsum plasterboard 10c' is suitably connected with a structure 20 conventionally, as described above in reference to Fig. 2. Then the second gypsum plasterboard 10c" is brought into contact with the first gypsum plasterboard 10c' so that the first edge side 13c of the first gypsum plasterboard 10c' engages the second edge side 14c of the second gypsum plasterboard 10c". The projecting portion 17c of the first gypsum plasterboard 10c' is brought to project into the recess 18c of the second gypsum plasterboard 10c" for relative connection of the gypsum plasterboards 10c' and 10c", wherein the first plane portion 21 of the first

gypsum plasterboard 10c' is in contact with the first plane portion 21 of the second gypsum plasterboard 10c", the second plane portion 22 of the first gypsum plasterboard 10c' is in contact with the second plane portion 22 of the second gypsum plasterboard 10c" and the chamfered edge 19 of the gypsum plasterboards 10c' and 10c" is arranged in the same direction. Hence, the recess 18c is brought to enclose three sides of the projecting portion 17c to prevent displacement of the gypsum plasterboards in a direction perpendicular to the plane of the gypsum plasterboards and to provide a locking of the gypsum plasterboards. Then, also the second gypsum plasterboard 10c" can be further connected with the structure 20 conventionally, as described above.

[0043] The first edge side and/or the second edge side of each gypsum plasterboard can be provided with glue for further connecting a first gypsum plasterboard with a second gypsum plasterboard. Hence, the projecting portion and the recess can be glued together, which results in a rigid construction when mounting gypsum plasterboards in a standing as well as lying position. In the case in which the edge sides comprise the first plane portion and the second plane portion, these can also be provided with glue. The gypsum plasterboards can also be fastened to the structure or the latches by means of the glue to connect the gypsum plasterboards with the structure. Then, the structure is suitably provided with glue, wherein the gypsum plasterboards are brought into contact therewith.

[0044] For example, initially a first gypsum plasterboard according to the invention is connected with a structure by means of glue. Hence, the glue is applied to at least one portion of the structure and/or at least one portion of the first plane surface of the gypsum plasterboard. Suitably, the glue is applied to the structure, wherein the gypsum plasterboard or the first plane surface of the gypsum plasterboard is brought into contact with the glue on the structure. The glue is arranged to form a wet suction effect between the gypsum plasterboard and the structure in a first wet condition, wherein a gypsum plasterboard is detained by suction and resists forces in a direction perpendicular to the plane of the gypsum plasterboard while allowing displacement of the gypsum plasterboard in the plane of the gypsum plasterboard. Consequently, when required the position of the gypsum plasterboard can be adjusted laterally and vertically due to that the glue shows a low resistance to shearing strain in the wet condition. The properties of the glue can in the wet condition be similar to high adhesion and low cohesion, wherein the cohesion is low in a direction along the plane of the gypsum plasterboard. For example, the cohesion is high in a direction perpendicular to the plane of the gypsum plasterboard. Then, the gypsum plasterboard 10 is fastened to the structure by means of increasing cohesive and adhesive forces of the glue during solidification so that the gypsum plasterboard is fixed to the structure. Hence, the gypsum plasterboard is stationary fastened to the structure by means of the glue, which forms a fixed connection through increasing cohesive and adhesive forces due to solidification. A second gypsum plasterboard and additional gypsum plasterboards can then be connected with the structure in a corresponding manner. Edge side of the gypsum plasterboards are then, for example, provided with the glue for interconnection thereof.

[0045] When the gypsum plasterboard is arranged in a suitable position it is further fastened by means of conventional fastening means, such as screws. Screws are, for example, arranged in the corners of the gypsum plasterboard to fasten the gypsum plasterboard while the glue solidifies. A second gypsum plasterboard and additional gypsum plasterboards can then be connected with the structure in a corresponding manner. Then, the second plane surface of the gypsum plasterboards can be provided with paint, tapestry, wallpaper or similar.

[0046] A suitable number of gypsum plasterboards can be arranged on a structure forming a building element. The building element comprises at least one gypsum plasterboard connected with the structure by means of the glue. For example, the building element also comprises the screws. For example, such a building element also comprises paint, tapestry, wallpaper or similar arranged on the second plane surface of the gypsum plasterboards forming prefabricated building elements for walls, interior walls, roof, ceilings or floors, which demands a low supplementary work effort.

[0047] In a first wet condition the glue shows a relatively high wet suction effect so that a gypsum plasterboard is detained on the structure by suction. Hence, the glue is arranged to fasten to the structure and the gypsum plasterboard, wherein a connection between the gypsum plasterboard and the structure is provided, which resists forces in a direction perpendicular to the plane of the gypsum plasterboard but enables displacement of the gypsum plasterboard laterally, vertically or in the plane of the gypsum plasterboard. Consequently, the glue detains the gypsum plasterboard on the structure in a wet or non-solid condition and shows low resistance against shearing strain in this condition. This results in a movable connection between the gypsum plasterboard and the structure so that a gypsum plasterboard can be fastened to the structure and then be adjusted for position in a simple manner. When the glue solidifies the gypsum plasterboard is connected with the structure due to the increasing adhesive and, particularly, cohesive properties of the glue. Then, the glue, which forms a fixed connection in a second dry condition due to increasing adhesive and cohesive forces upon solidification, fasten the gypsum plasterboard on the structure or forms a stationary connection between them.

[0048] For example, the glue is water-based and comprises a polymer in the form of an acrylate copolymer, such as styrene-acrylate copolymer or similar. For example, the glue further comprises filler, thickening agent, film former, wetting agent and tack agent. For ex-

ample, the filler comprises dolomite or filler with similar properties. For example, the glue further comprises a dry content between 70 and 100 percent by weight, suitably between 80 and 90 percent by weight and preferably about 86 percent by weight. The glue can have a relatively thick consistence, which in combination with the dry content, provides a wet suction effect suitable for the application. For example, the glue has a consistence corresponding to 5mm with a needle weight of 20g during 5s with the penetration method.

[0049] The projecting portion and the recess results in a larger contact surface between the first and second edge sides, which is advantageous when interconnecting adjacent gypsum plasterboards by means of the glue. Due to that adjacent gypsum plasterboards are connected in this way, mounting is facilitated. This results in a reduced working effort for holding the gypsum plasterboards in position for further fastening by means of screws, nails, glue or any other suitable fastening means, which results in a more cost efficient mounting. Due to that the gypsum plasterboards are interconnected by means of the projecting portion and the recess less screws, for example, are required to obtain a sufficient connection with the structure.

[0050] When mounting gypsum plasterboards according to the invention initially a first gypsum plasterboard is connected to a structure by means of the glue. For example, the gypsum plasterboard is further connected with the structure by means of screws, as described above. Then, a second gypsum plasterboard is brought into contact with the first gypsum plasterboard, wherein the means for locking adjacent gypsum plasterboards of the gypsum plasterboards are brought into contact with each other. The gypsum plasterboards are mounted in the same direction so that the first edge side of each gypsum plasterboard is arranged in one direction and the second edge side is arranged in the opposite direction. Hence, the projecting portion of the first gypsum plasterboard is brought into contact with the recess of the second gypsum plasterboard, wherein the gypsum plasterboards are connected by the projecting portion engaging the recess and the glue. Then the second gypsum plasterboard is further connected with the structure by means of screws, as described above.

Claims

1. A device for panelling a structure (20) in connection with construction, comprising a gypsum plasterboard (10) having two opposite and substantially plane surfaces (11, 12) and at least a first edge side (13) and a second edge side (14), ***characterised*** **in that** the first edge side (13) comprises a projecting portion (17) for engaging a recess (18) of a gypsum plasterboard adjacent the first edge side (13), which recess (18) corresponds to the projecting portion (17), and the second edge side (14) comprises a recess (18) for receiving a projecting portion (17) of a gypsum plasterboard adjacent the second edge side (14), wherein the recess (18) and the projecting portion (17) form means for interconnecting adjacent gypsum plasterboards.

2. A device according to claim 1, wherein the projecting portion (17) projects in the plane of the gypsum plasterboard (10) and the recess (18) stretch into the plane of the gypsum plasterboard (10).

3. A device according to claim 1, wherein the recess (18) is arranged for partially enclosing the projecting portion (17) to prevent displacement of the gypsum plasterboards in a direction perpendicular to the plane of the gypsum plasterboards and to obtain a locking of the gypsum plasterboards.

4. A device according to claim 1, wherein the projecting portion (17) and the recess (18) are arranged along the side edges (13, 14).

5. A device according to claim 1, wherein the projecting portion (17) and the recess (18) are arranged on opposite side edges (13, 14).

6. A device according to claim 5, wherein the gypsum plasterboard (10) comprises a third edge side (15) provided with a projecting portion (17) and a fourth edge side (16) provided with a recess (18).

7. A device according to claim 1, wherein the projecting portion (17) and the recess (18) are formed in a v-shape.

8. A device according to claim 1, wherein the projecting portion (17) and the recess (18) are formed in a semi-circular shape.

9. A device according to claim 1, wherein the projecting portion (17) and the recess (18) are formed in a rectangular shape.

10. A device according to claim 1, wherein the edge sides (13-16) of the gypsum plasterboard (10) are provided with a cardboard or paper coating.

11. A device according to claim 1, wherein the gypsum plasterboard (10) is provided with a cardboard or paper coating

12. A device according to claim 1, wherein the first edge side (13) and the second edge side (14) are provided with a first plane portion (21) and a second plane portion (22) on each side of the projecting portion (17) and the recess (18).

13. A device according to claim 1, wherein the gypsum

plasterboard (10) is provided with a chamfered edge (19) in a direction towards the first plane surface (11).

14. A method for panelling a structure (20) in connection with construction by means of a device according to claim 1, comprising the steps of

connecting a first gypsum plasterboard (10') with the structure (20),

bringing the projecting portion (17) or the recess (18) of a second gypsum plasterboard (10") to engage the recess (18) or the projecting portion (17) of the first gypsum plasterboard (10') to prevent displacement pf the gypsum plasterboards (10', 10") in a direction perpendicular to the plane of the gypsum plasterboards and obtain a connection between them, and

further connecting the second gypsum plasterboard (10") with the structure (20).

15. A method according to claim 14, wherein at least one edge side of the first gypsum plasterboard (10') or the second gypsum plasterboard (10") is provided with glue so that the first gypsum plasterboard (10') is further connected with the second gypsum plasterboard (10").

16. A method according to claim 14, wherein a glue, which forms a wet suction effect between the gypsum plasterboards and the structure in a first wet condition, is applied on at least one portion of the structure and/or at least one portion of a first plane surface of a gypsum plasterboard.

17. A method according to claim 14, wherein the first plane surface of a gypsum plasterboard is brought into contact with the structure and is detained at the structure by means of the wet suction effect of the glue, wherein the gypsum plasterboard is displaceable in a direction along the plane of the gypsum plasterboard to enable correction of the position of the gypsum plasterboard in the same direction and wherein the gypsum plasterboard is stationary fixed to the structure by means of the glue, which in a second dry condition forms a fixed connection through increased cohesive and adhesive forces due to solidification.

18. Building element comprising at least one construction plate connected to a structure (20), wherein the construction plate comprises a gypsum plasterboard (10) having two opposite and substantially plane surfaces (11, 12) and at least a first edge side (13) and a second edge side (14), ***characterised in that*** the first edge side (13) comprises a projecting portion (17) for engaging a recess (18) of a gypsum plasterboard adjacent the first edge side (13), which recess (18) corresponds to the projecting portion (17), and the second edge side (14) comprises a recess (18) for receiving a projecting portion (17) of a gypsum plasterboard adjacent the second edge side (14), wherein the recess (18) and the projecting portion (17) form means for interconnecting adjacent gypsum plasterboards.

19. Building element according to claim 18, wherein the gypsum plasterboard (10) is connected to the structure (20) by means of glue, which forms a wet suction effect between the gypsum plasterboard (10) and the structure (20) in a first wet condition and forms a fixed connection between the gypsum plasterboard (10) and the structure (20) in a second dry condition.

20. Building element according to claim 18, wherein the building element comprises a plurality of gypsum plasterboard connected to each other by means of glue.

21. Building element according to claim 20, wherein the glue is arranged on the projecting portion (17) and/or the recess (18) of each gypsum plasterboard.

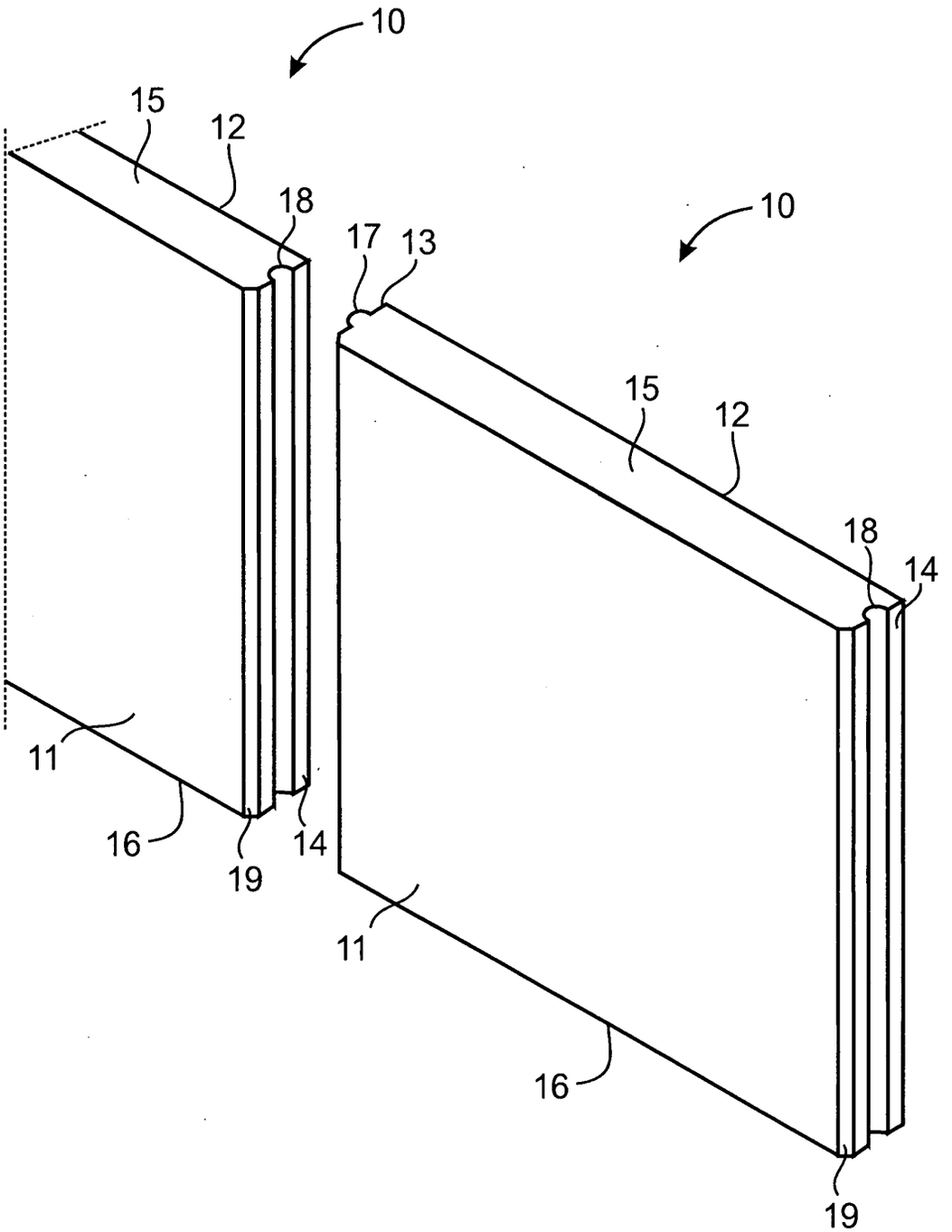

Fig. 1

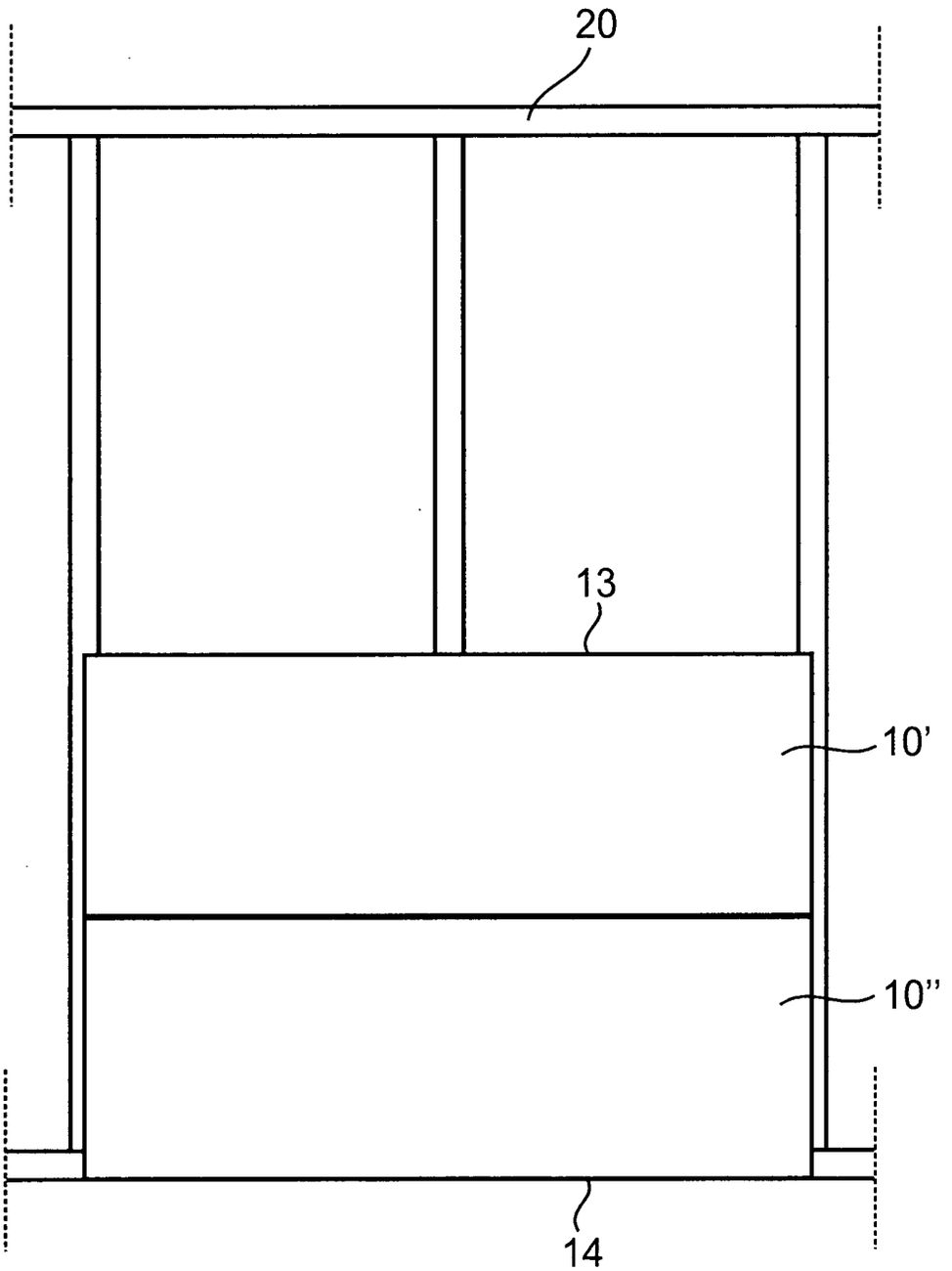

Fig. 2

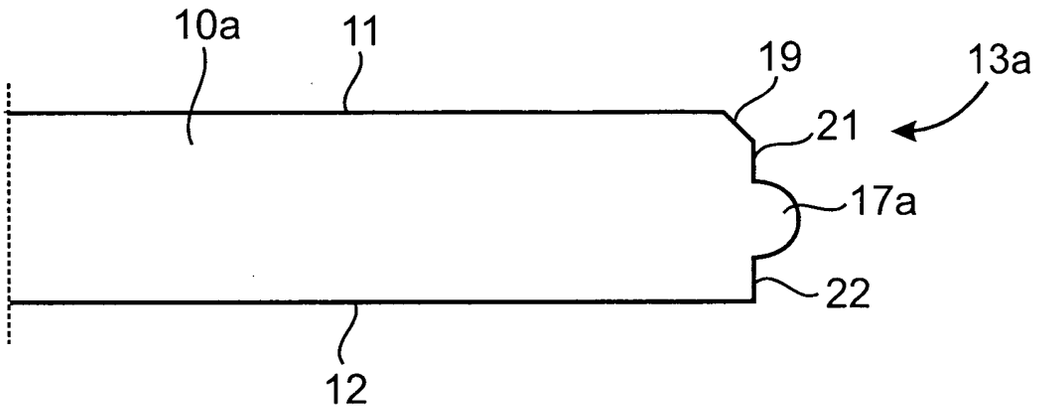

Fig. 3

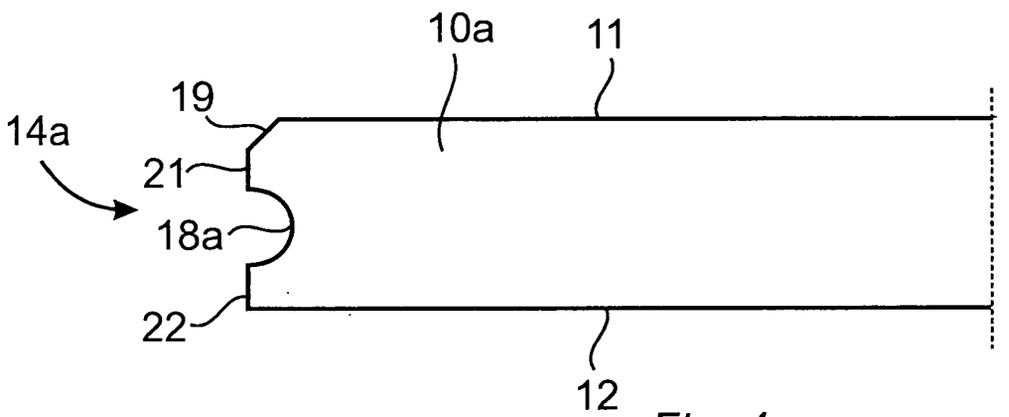

Fig. 4

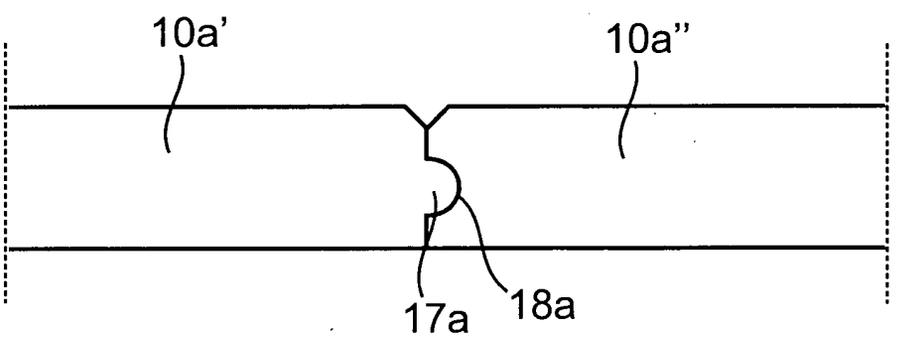

Fig. 5

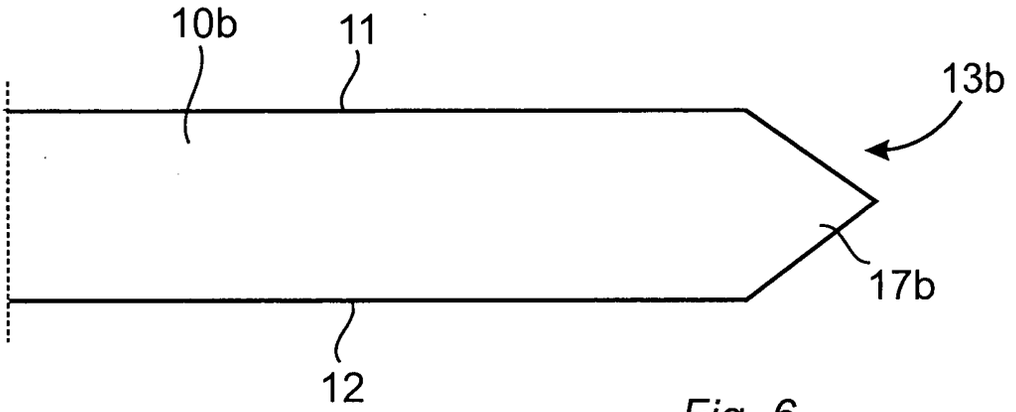

Fig. 6

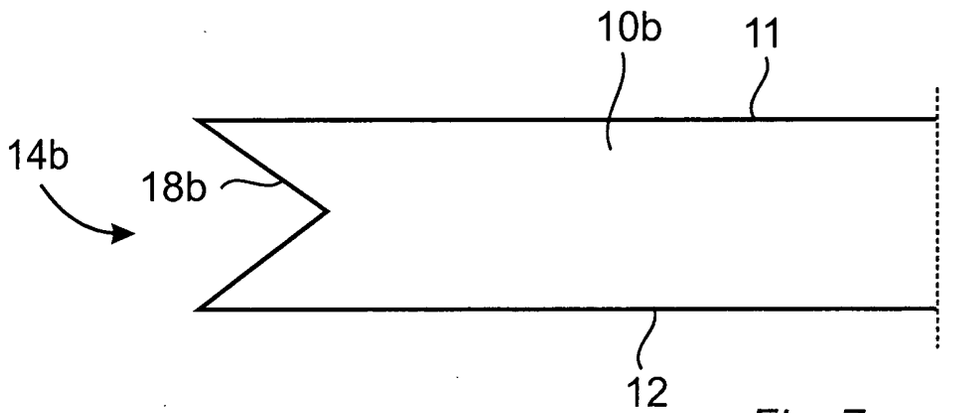

Fig. 7

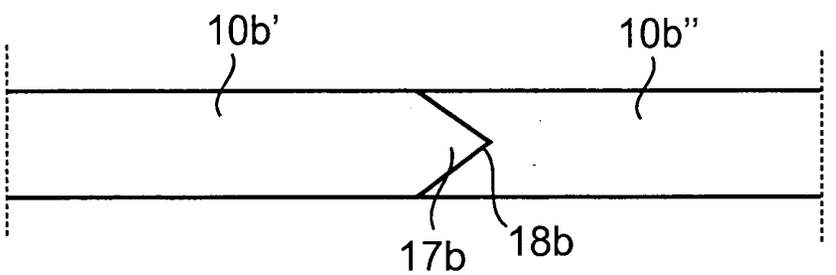

Fig. 8

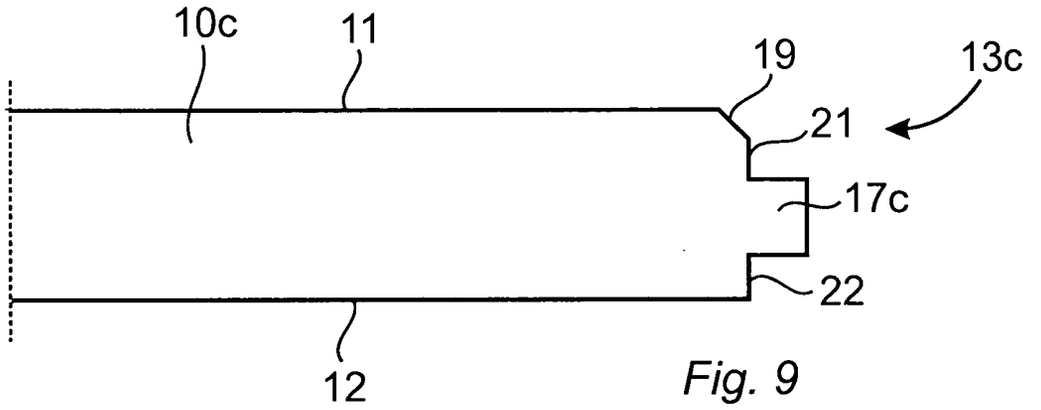

Fig. 9

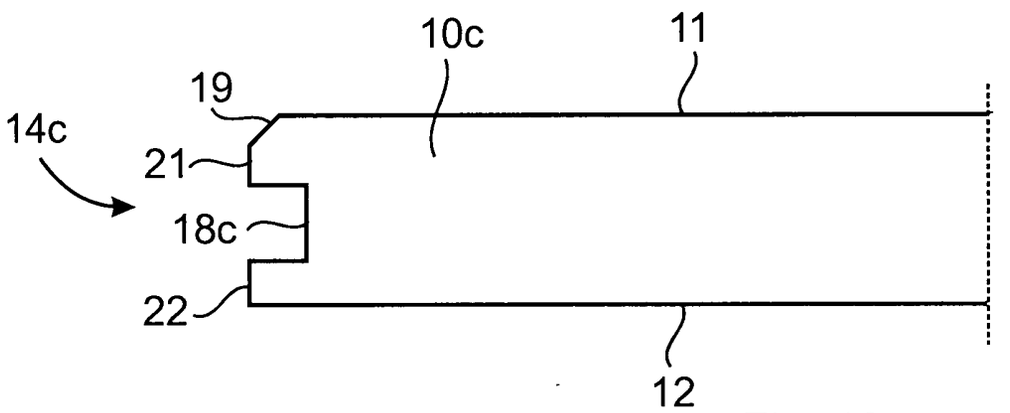

Fig. 10

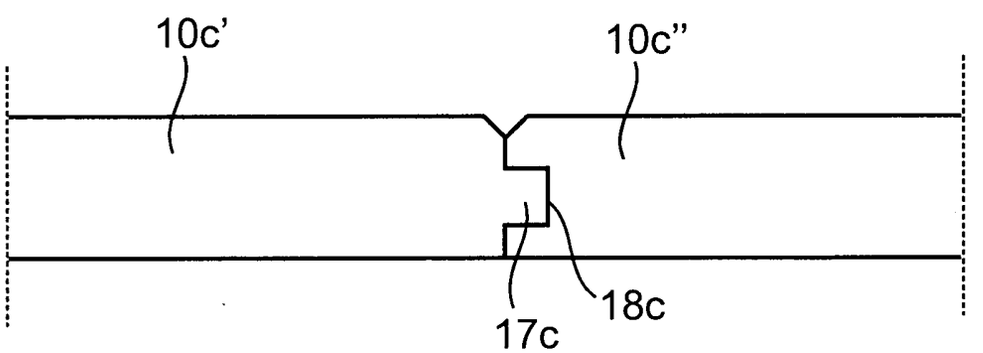

Fig. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 00 3707

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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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	11 June 2004	Vratsanou, V

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Application Number
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