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(54) Title: TRIM PANEL

(54) Bezeichnung: VERKLEIDUNGSPANEEL

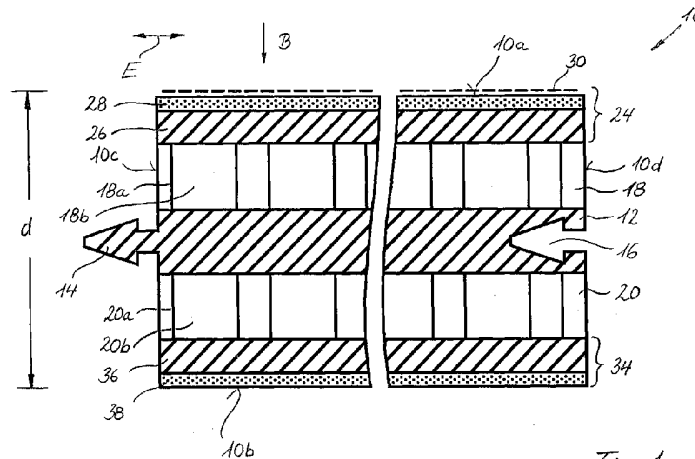


Fig. 1

WO 2008/098783 A1

(57) Abstract: The invention relates to a trim panel (10), comprising a decoration side (10a) which is provided with a decoration, a contact side (10b) intended for contact with a substrate, and a connecting layer (12) which is manufactured from a wood material and with which at least one connecting element (14, 16) of a connecting arrangement which is configured in the manner of a tongue and groove connection is configured in one piece. According to the invention, at least one intermediate layer (18) which has a cell structure and is connected indirectly or directly to a decoration layer (24) which has the decoration side (10a) is arranged on that side of the connecting layer (12) which faces the decoration side (10a), and/or at least one intermediate layer (20) which has a cell structure and is connected indirectly or directly to a contact layer (34) which has the contact side (10b) is arranged on that side of the connecting layer (12) which faces the contact side (10b).

(57) Zusammenfassung: Die Erfindung betrifft ein Verkleidungspaneel (10), umfassend eine mit einem Dekor versehene Dekorseite (10a), eine zur Anlage an einem Untergrund bestimmte Anlageseite (10b), und eine aus einem Holzwerkstoff gefertigte Verbindungsschicht (12), mit welcher wenigstens ein Verbindungselement (14, 16) einer nach Art einer Nut-Feder-Verbindung ausgebildeten Verbindungsanordnung

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ZM, ZW), eurasisches (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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einstückig ausgebildet ist. Erfindungsgemäß ist auf der der Dekorseite (10a) zugewandten Seite der Verbindungsschicht (12) wenigstens eine eine Zellenstruktur aufweisende Zwischenschicht (18) angeordnet, welche mittelbar oder unmittelbar mit einer die Dekorseite (10a) aufweisenden Dekorschicht (24) verbunden ist, oder/und ist auf der der Anlageseite (10b) zugewandten Seite der Verbindungsschicht (12) wenigstens eine eine Zellenstruktur aufweisende Zwischenschicht (20) angeordnet, welche mittelbar oder unmittelbar mit einer die Anlageseite (10b) aufweisenden Anlagenschicht (34) verbunden ist.

Trim Panel

Specification

- 5 The invention relates to a trim panel, comprising a decoration side provided with a decoration, a contact side intended for contact with a substrate and a connecting layer produced from a wood material, with which at least one connecting element of a connecting arrangement embodied in the manner of a tongue and groove connection is embodied in one piece.
- 10 Trim panels of this type are known for example from EP 1 319 773 A2. Essentially the entire volume of the known trim panels is composed of the wood material, for example, MDF (medium density fiberboard) or HDF boards (high density fiberboard). A laminate is provided only on a visible or decoration side, which laminate is formed, for example, from a plurality of paper plies impregnated with synthetic resin, wherein the uppermost
- 15 of these paper plies, i.e., that facing the eye of the observer, is printed with a decoration. Furthermore, a counteracting paper can be provided on the contact side.

With rising environmental awareness, the demand for renewable energy sources has also increased in the recent past. This has led among other things to an increase in the number of pellet-burning systems even in private homes. Since these pellets are likewise

20 produced from wood, a decrease in the availability of wood on the market was the result. Not least the price increase associated therewith led to the desire to reduce the wood consumption per unit area of the trim panel with the given thickness of the generic trim panel.

- According to the invention, a trim panel of the generic type meets this requirement in
- 25 which at least one intermediate layer having a cell structure is arranged on the side of the connecting layer facing towards the decoration side, which intermediate layer is connected indirectly or directly to a decoration layer having the decoration side, and/or at least one intermediate layer having a cell structure is arranged on the side of the connecting layer facing towards the contact side, which intermediate layer is connected
- 30 indirectly or directly to a contact layer having the contact side.

As can be easily realized the wood consumption according to the invention is reduced in that a part of the volume of the trim panel is accounted for by the at least one intermediate layer having a cell structure. The walls of the cell structure of the at least one intermediate layer thereby surround volumes filled with gas, preferably air. If it should be necessary with respect to the stability of the at least one intermediate layer, however, the volumes of the at least one intermediate layer can also be filled at least in part with a stabilizing medium, for example, a foamed medium.

In a further development of the invention it is proposed that the walls of the cell structure are formed at least in part of a non-metallic, lightweight structural material. The structural material can thereby be paper and/or cardboard and/or paperboard, for example, wherein these materials differ mainly through their weights per unit area and one also encounters conceptual overlapping of these designations among experts.

Furthermore, it is possible that the structural material is impregnated and/or reinforced with at least one thermoplastic material and/or at least one thermosetting plastic, for example, with polyolefin plastic.

With respect to the highest possible stability of the at least one intermediate layer it is furthermore advantageous if the walls of the cell structure run essentially orthogonally to the panel plane.

In a further development of the invention, it is furthermore proposed that at least a part of the cells of the cell structure in a section taken essentially parallel to the panel plane has a hexagonal cross section or a rectangular, for example, square, cross section or a triangular cross section.

At this point it should be noted that the use of cell structures of this type is known *per se* from door leaves, for example. However, with these applications the cell structure layer is surrounded on its edges running orthogonally to the door leaf plane or panel plane by a solid frame, which guarantees the stability of the panel with respect to shearing forces running parallel to the panel plane and thus prevents a lateral buckling of the walls of the cell structure. In contrast thereto, however, the at least one intermediate layer is exposed on the edges of the trim panel according to the invention running orthogonally to the panel plane. However, surprisingly this does not have any negative impact on the stability

of the trim panel according to the invention. This exposure does not represent a disadvantage from an esthetic viewpoint, either, since the trim panels are laid with decoration sides adjoining one another.

5 The connecting layer of the trim panel according to the invention can be formed by, for example, an MDF board, an HDF board, a particle board, a chipboard, a plywood board or a combination board, which contains at least one of the materials of chips, MDF and HDF. A combination board of chips with plywood or a chemically and thermally posthardened HDF board can be cited as an example.

10 Depending on the intended field of application, the decoration layer can also be formed of different materials or assembled from different materials.

For example, the decoration layer can comprise a carrier layer and a decorative ply connected to the carrier layer. The decorative ply is thereby usually arranged on the surface of the carrier layer facing towards the decoration layer.

15 The carrier layer can be formed of an HDF board, for example. However, in principle the use of other materials to form the carrier layer is also conceivable. Furthermore, the decorative ply can comprise a laminate, which is formed, for example of a plurality of paper plies impregnated with synthetic resin.

20 In a further development of the invention it is proposed that the decoration side of the decoration layer is formed by a paper ply printed with a decoration. This decoration paper ply can thereby be a paper ply of the above-mentioned laminate. Furthermore, it is possible to arrange a so-called overlay paper on the printed side of this decoration paper ply, in order to increase the wear resistance of the decoration. Overlay papers of this type are usually likewise impregnated with synthetic resin and transparent in this state so that they do not impede the view of the decoration.

25 In a further development of the invention it can furthermore be provided that the decoration layer comprises a veneer at least on its decoration side. This veneer can thereby form only the decoration ply of the decoration layer, which is arranged on a carrier layer of the decoration layer. However, it is also possible that the veneer forms the

entire decoration layer. Furthermore, the veneer can also be covered with an overlay paper to increase the wear resistance.

5 Different embodiment variants can also be considered with respect to the contact layer depending on the field of use. For example, the contact layer can comprise an HDF board or a thin laminate. In the case of the use of the trim panel according to the invention as a floor panel, the contact layer can furthermore comprise an impact-sound sheet. Furthermore, with respect to the dimensional stability of the trim panel, in particular to avoid a bulging or dishing of the panel it can be advantageous if the contact side of the contact layer is formed by a counteracting paper ply.

10 It should be noted at this point that the connection arrangement embodied in the manner of a tongue and groove connection can produce a connection of adjacent trim panels through an essentially planar relative displacement of the two adjacent panels essentially in the panel plane and/or by pivoting into one another the connecting elements of the two adjacent panels about a plane running essentially parallel to the panel plane, as is known  
15 *per se* from EP 1 024 234 A1. Furthermore, it is possible that the trim panels are embodied exclusively with connecting grooves and that double-tongue elements have to be provided in addition for connecting adjacent panels, as is known, for example, from EP 1 319 773 A2.

20 The trim panels can be used for wall, ceiling or floor trim, wherein their layer thickness measured orthogonally to the panel plane can be between approximately 3 mm and approximately 40 mm.

The invention is explained in more detail below with exemplary embodiments based on the attached drawings. They show:

25 Fig. 1 A cross-sectional view of a concrete exemplary embodiment of a trim panel according to the invention; and

Figs. 2 – 4 Cross-sectional representations analogous to Fig. 1 to explain the basic structure of different variants of the trim panels according to the invention.

In Fig. 1 a trim panel according to the invention is generally labeled by 10. It comprises a decoration side 10a and a contact side 10b intended for contact on a substrate (not

shown). The decoration side 10a and the contact side 10b run essentially parallel to the panel plane E. Furthermore, the panel 10 is limited by side edges running essentially orthogonally to the panel plane E, of which side edges only the edges 10c and 10d are shown in Fig. 1.

- 5 Panel 10 comprises a connecting layer 12, with which a connecting tongue 14 is embodied in one piece on the side surface 10c of the panel 10 and with which a connecting groove 16 is embodied in one piece on the side surface 10d. It should be noted that corresponding connecting elements can also be provided on the side edges of the panel 10 not shown in Fig. 1.
- 10 In the exemplary embodiment according to Fig. 1 an intermediate layer 18 or 20, which has a cell structure, is arranged respectively on the side of the connecting layer 12 facing towards the decoration side 10a as well as on the side of the connecting layer 12 facing towards the contact side 10b. The walls 18a or 20a of this cell structure preferably run essentially orthogonally to the panel plane E and have a honeycomb-shaped arrangement,
- 15 for example, in the viewing direction B. Furthermore, the walls 18a and 20a can be formed of cardboard, for example, which is impregnated with a thermoplastic or thermosetting plastic in order to ensure the necessary stability of the intermediate layer 18 or 20. The gaps 18b or 20b are preferably filled with air.

On the side of the intermediate layer 18 facing towards the decoration side 10a, a

20 decoration layer 24 adjoins thereto, which in the exemplary embodiment shown comprises a carrier layer 26 and a decoration ply 28. The carrier layer 26 can be an HDF board, for example, whereas the decoration ply 28 can be of a laminate of paper plies impregnated with synthetic resin, the uppermost of which, i.e., that closest to the decoration side 10a, is printed with a desired decoration. As is known *per se*, the

25 decoration ply 28 moreover can be covered with an overlay paper ply 30. However, alternatively it is also possible that the decoration ply 28 or even the entire decoration layer 24 is formed by a veneer, which can optionally likewise be covered by an overlay paper ply 30.

A contact layer 34 is also provided in a corresponding manner on the side of the

30 intermediate layer 20 facing towards the contact side 10b, which contact layer comprises



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a carrier layer 36 and a counteracting paper 38 in the depicted exemplary embodiment. However, it is also possible to embody the contact layer 34 as a thin laminate or to provide an impact-sound sheet additionally or alternatively to the carrier layer and/or the counteracting paper layer 38.

5

The connecting layer 12 and the two intermediate layers 18 and 20 can respectively have a thickness of approximately 2 mm, for example, while the decoration layer 24 and the contact layer 34 have a thickness of approximately 1 mm, so that in all a panel thickness d of approximately 8 mm measured orthogonally to the panel plane E results.

10

The fundamental structure of the exemplary embodiment according to Fig. 1 is shown once again in Fig. 2.

15

Figs. 3 and 4 are used merely to clarify that is also possible in principle to provide only a single intermediate layer.

20

Based on this embodiment, in the panel 10' according to Fig. 3 the connecting layer 12' extends up to the decoration side 10a', while the panel 10' with respect to the intermediate layer 20' and the contact layer 34' corresponds to the panel 10 according to Fig. 2. In a corresponding manner in the panel 10" according to Fig. 4 the connecting layer 12" extends up to the contact side 10b" of the panel 10", whereas the panel 10" with respect to the intermediate layer 18" and the decoration layer 24" corresponds to the panel 10 according to Fig. 2. The connecting layer 12' of the embodiment according to Fig. 3 thus also forms in one piece the carrier layer 26 of the decoration layer 24, and the connecting layer 12" of the embodiment according to Fig. 4 also forms in one piece the carrier layer 36 of the contact layer 34. With respect to the further embodiment in the area of the decoration side 10a' or the contact side 10b", reference can be made to the statements on the embodiment according to Fig. 1.

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Throughout this specification and the claims which follow, unless the context requires otherwise, the word "comprise", and variations such as "comprises" and "comprising".

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will be understood to imply the inclusion of a stated integer or step or group of integers or steps but not the exclusion of any other integer or step or group of integers or steps.

The reference in this specification to any prior publication (or information derived from it),  
5 or to any matter which is known, is not, and should not be taken as an acknowledgment or admission or any form of suggestion that that prior publication (or information derived from it) or known matter forms part of the common general knowledge in the field of endeavour to which this specification relates.

## THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Trim panel, comprising a decoration side provided with a decoration, a contact side intended for contact with a substrate and a connecting layer produced from a wood material, with which at least one connecting element of a connecting arrangement embodied in the manner of a tongue and groove connection is embodied in one piece, wherein at least one intermediate layer having a cell structure is arranged on the side of the connecting layer facing towards the decoration side, which intermediate layer is connected indirectly or directly to a decoration layer having the decoration side, and/or at least one intermediate layer having a cell structure is arranged on the side of the connecting layer facing towards the contact side, which intermediate layer is connected indirectly or directly to a contact layer having the contact side.
2. Trim panel according to claim 1, wherein the walls of the cell structure of the at least one intermediate layer surround volumes filled with gas, preferably air.
3. Trim panel according to claim 1 or 2, wherein the walls of the cell structure are formed at least in part of a non-metallic, lightweight structural material.
4. Trim panel according to claim 3, wherein the structural material is paper and/or cardboard and/or paperboard.
5. Trim panel according to claim 3 or 4, wherein the structural material is impregnated and/or reinforced with at least one thermoplastic material and/or at least one thermosetting plastic, for example, with polyolefin plastic.
6. Trim panel according to one of claims 1 through 5, wherein the walls of the cell structure run essentially orthogonally to the panel plane.

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7. Trim panel according to one of claims 1 through 6, wherein at least a part of the cells of the cell structure has a hexagonal cross section or a rectangular, for example, square, cross section or a triangular cross section.
- 5 8. Trim panel according to one of claims 1 through 7, wherein the connecting layer is formed by an MDF board, an HDF board, a particle board, a chipboard, a plywood board or a combination board, which contains at least one of the materials of chips, MDF and HDF.
- 10 9. Trim panel according to one of claims 1 through 8, wherein the decoration layer comprises a carrier layer and a decorative ply connected to the carrier layer.
10. Trim panel according to claim 9, wherein the carrier layer comprises an HDF board.
- 15 11. Trim panel according to claim 9 or 10, wherein the decorative ply comprises a laminate.
12. Trim panel according to one of claims 1 through 11, wherein the decoration side of the decoration layer is formed by a paper ply printed with a decoration.
- 20 13. Trim panel according to one of claims 1 through 10, wherein the decoration layer comprises a veneer at least on its decoration side.
- 25 14. Trim panel according to one of claims 1 through 13, wherein the contact layer comprises an HDF board.
15. Trim panel according to one of claims 1 through 14, wherein the contact layer comprises a thin laminate.
- 30 16. Trim panel according to one of claims 1 through 15, wherein the contact layer

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comprises an impact-sound sheet.

17. Trim panel according to one of claims 1 through 16, wherein the contact side of the contact layer is formed by counteracting paper ply.

5

18. Trim panel according to one of claims 1 through 17, wherein it has a thickness of between approximately 3 mm and approximately 40 mm.

19. A trim panel substantially as hereinbefore described with reference to the  
10 accompanying drawings.

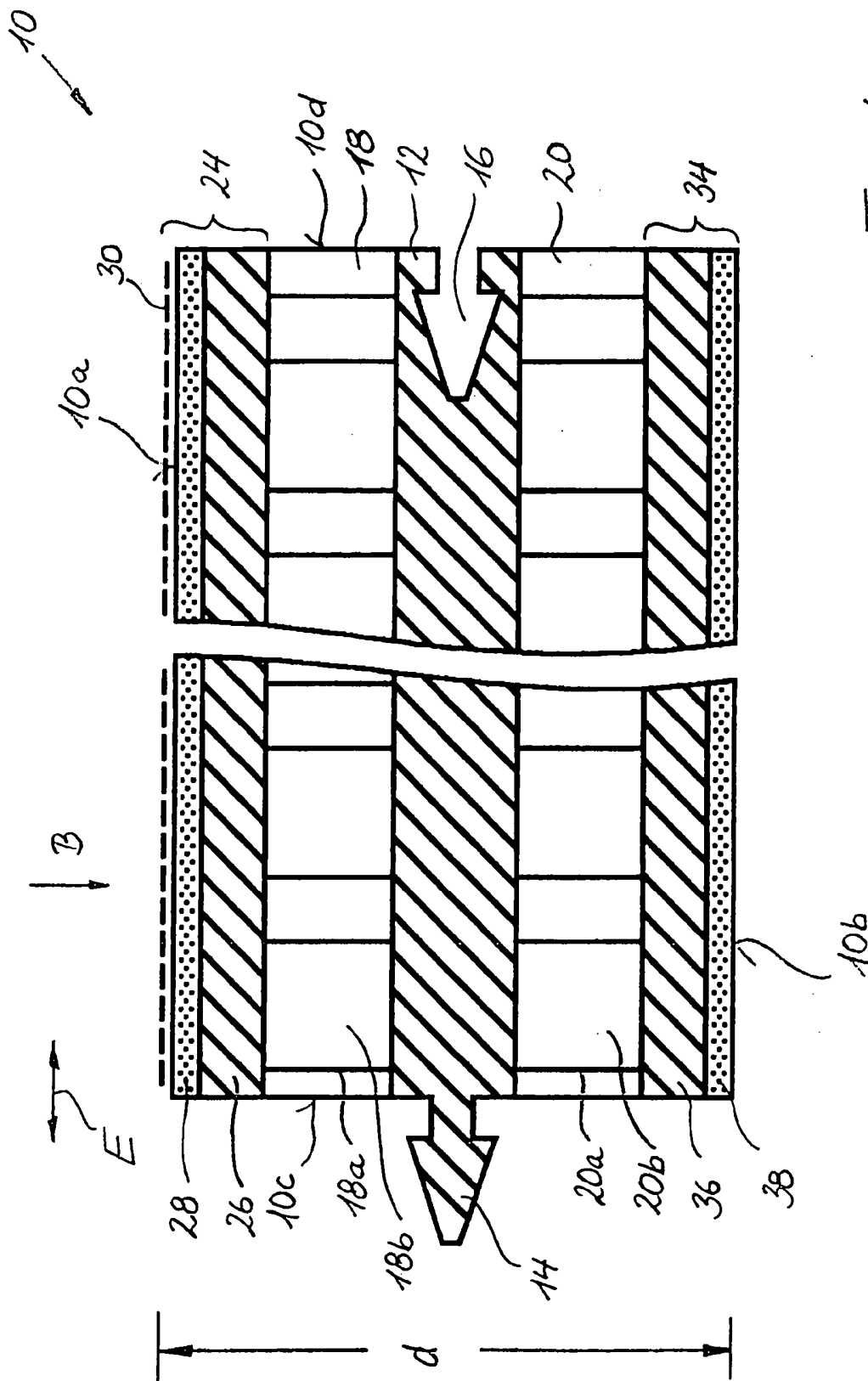


Fig. 1

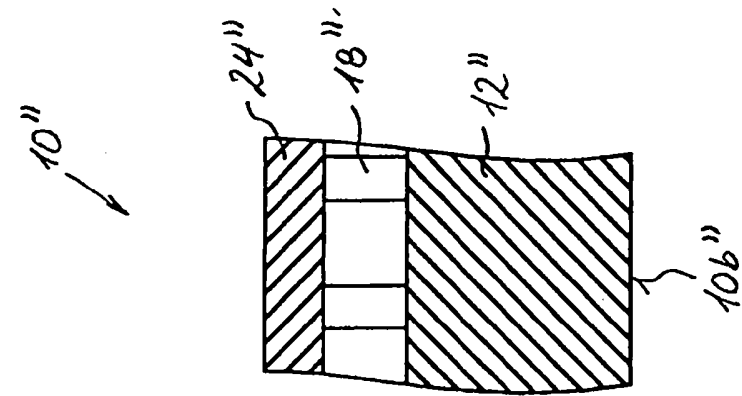


Fig. 4

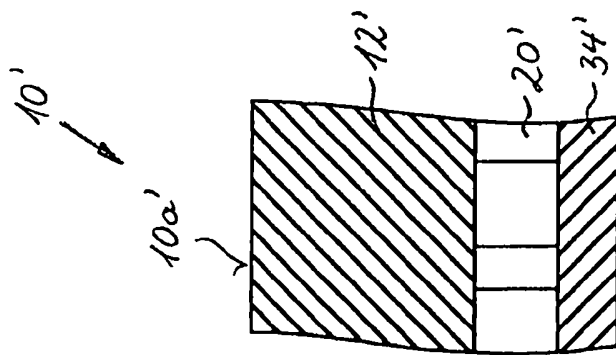


Fig. 3

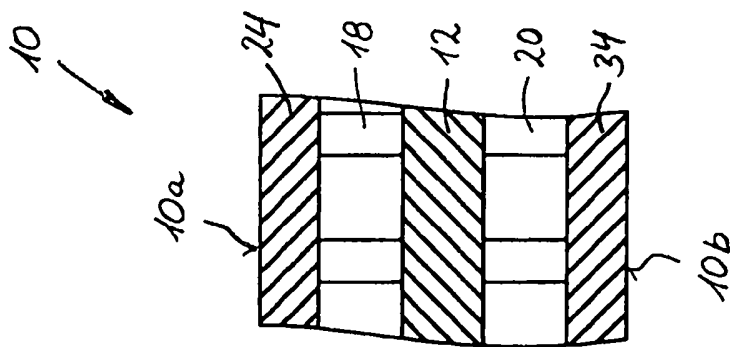


Fig. 2