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(54) **A method for the manufacture of a furniture panel and a panel obtained by such a method**

Verfahren zur Herstellung von Möbelpaneele und nach dem Verfahren hergestellte Paneele

Procédé de fabrication de panneaux pour meubles et panneaux ainsi fabriqués

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(73) Proprietor: **Hornslet Möbelfabrik A/S**
8543 Hornslet (DK)

(72) Inventor: **Thomsen, Jörgen**
8410 Rønde (DK)

(74) Representative: **Elmeros, Claus et al**
Hofman-Bang & Boutard,
Lehmann & Ree A/S
Ryesgade 3
P.O. Box 367
8100 Aarhus C (DK)

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Description

[0001] The present invention relates to a method of manufacturing of a furniture panel of a wooden fibre material for making a curved furniture panel, where the panel is coated with a veneer layer at a first side and a plurality of grooves on the second side for facilitating the bending of the veneered fibre board into the curved shape, said grooves of a uniform depth leaving a thin bending layer of fibre material behind the veneer coating. The invention further relates to a furniture panel in particular for a loudspeaker cabinet manufactured by such method.

[0002] From DE-A-28 15 714 it is known to manufacture convex bendings in coated panel consisting of a wooden fibre board by providing the front side with one or more layers of veneer and cutting specially shaped grooves in the rear side of the panel. The grooves are cut in parallel and with a depth leaving a thin unbroken fibre layer carrying the veneer coating. The panel is then bend to a convex shape whereafter the veneered convex top side is given a finishing smoothening and polish in order to smoothen the stepwise bending form of the veneer top layer.

[0003] Techniques of bending plate material by cutting grooves in the rear side of the panel are also known from EP-A-0 553 420 and DE-A-43 40 049. However, since the panels are uncoated, these pieces of patent literature do not deal with the specific problems of avoiding steps in the curved section of a veneer coated panel.

[0004] From the known methods of manufacture of curved panels the importance of the shaping the grooves is realised. The cost of manufacturing such a panel are somewhat high, due to the accuracy with which such grooves must be made. As in the case of the method according to DE-A-28 15 714 (see above) the manufacturer regards it as most beneficial to provide the panel with a final finish after the bending since it is realised that a smooth and continuous curvature of the bend otherwise is unlikely to obtain. Such a final finish has to be carried out manually, due to the curvature of the surface.

[0005] Recently, it was realised that by cutting the grooves with a rectangular shape and with an perfect precision a smooth and continuous curved veneer top layer can be obtained without having to do any expensive final finish to the curved surface. By this development it has been realised that a uniform thickness of the veneer carrying top fibre layer is of vital importance. Such a method, according to the preamble of independent claim 1, and a furniture panel, according to the preamble of independent claim 9, are known from DK 172 290 B1. Such grooves can be produced with the necessary precision on a computer controlled machine centre, whereby the costs of manufacture are somewhat reduced.

[0006] The object of the invention is to provide a method and a panel which is more cost effective in its man-

ufacturing and which ensures a satisfying accuracy of the grooves, so as to provide a curved panel in particular for loudspeaker cabinets in an inexpensive and reliable manner.

[0007] This object is achieved by a method according to claim 1. The invention also involves a furniture panel in particular for a loudspeaker cabinet manufactured by this method, whereby a panel according to the invention comprises the features of claim 9.

[0008] When manufacturing a furniture panel by a method according to the invention a similar depth of the grooves can be achieved in a very inexpensive manner. The first fibre board is a relatively thin fibre board which thereby is easily bendable to a convex or concave shape. In the front side of the second fibre board the grooves are cut. By gluing this grooved front side onto the second side of thin first fibre board it is assured that all the grooves end in the same distance from the veneered front side of the panel, so that a smooth curvature of the panel when it is bend. This manufacturing process can be carried out with a high degree of automation which results in a cost efficient manner of producing curved furniture panels for e.g. loudspeaker cabinets.

[0009] By applying the second side of the second fibre board with a sheet, such as a vapour impenetrable sheet, the moisture degree in the panel can be kept under control, in particular during transport or storage.

[0010] When the remaining layer on the second side of the second fibre board is at least partly removed, whereby the grooves are reopened, the panel is made ready for being bend in the sections where the groove covering layer is removed. The removal of this layer only just before the actual bending operation is due, is advantageous in so far the panel is better protected against moisture during storage due to the smaller outer surface, and in that the panel can just as well be used for a planar furniture panel if the remaining layer is preserved.

[0011] By bending the furniture panel to a curved shape and fixing it in this curved shape, curved sections of furniture panel can be produced in an inexpensive and reliable manner. In a particular embodiment of the method according to the invention, the panel is fixed in its curved shape by adhesively joining the groove carrying second side of the curved panel to a front side of a further fibre board also provided with grooves and shaped in a matching curvature. Hereby a light-weight furniture panel can be obtained, which also can be made self supporting.

[0012] In a preferred embodiment, the grooves are filled with a resilient material, preferably a sound absorbing foam material. Hereby the characteristics of the panel, in particular the damping characteristics can be controlled. This is especially advantageous when producing panels for loudspeaker cabinets.

[0013] In a second embodiment of the invention, the second fibre board is provided with one or more groups

of grooves, where said groups of grooves are separated by sections of regular fibre board. Hereby a furniture panel can be produced which is designed for sectional curvature bending as well as corner bending, since it is possible to cut an almost penetrating V-groove in the back side of the panel.

[0014] In the preferred embodiment of the invention, the veneered top layer is given a finishing treatment prior to any possible subsequent bending of the panel. This means that no additional labour intensive surface treatment is required after the bending process.

[0015] The invention is in the following explained in more detail with reference to the accompanying drawings, in which:

- fig. 1 is a cross-sectional view of the elements of a furniture panel according to the invention prior to their assembly,
- fig. 2 is a cross-sectional view of the assembled furniture panel,
- fig. 3 is a cross-sectional view of a furniture panel according to the invention prior to the bending thereof,
- fig. 4 is a cross-sectional view of a curved section of furniture panel according to the invention,
- fig. 5 shows a particular embodiment of the furniture panel according to the invention,
- fig. 6 shows the elements of another embodiment of a furniture panel according to the invention,
- fig. 7 shows the assembled panel, shown in fig. 6, and
- fig. 8 is a cross-sectional view of a furniture panel fixed in a curved shaped.

[0016] In figure 1, there is shown a first fibre board 3 having a first side 4 and a second side 5. The first side 4 is provided with a top layer of veneer 2. The second side 5 is jointed with a first side 7 of a second fibre board 6 which is provided with grooves 8 that are cut out in this second board 6. The grooves 8 are all cut in parallel and orientated perpendicular to the curvature. By the cutting of the grooves 8 a number of strips 10 are build in the second fibre board 6 just as a through-going remaining layer 9 of the fibre board 6 is preserved. On the rear side of the second fibre board 6 a thin sheet 13 is provided. This sheet is preferably of a vapour impenetrable material, so as to maintain a stabile moisture content in the fibre boards 3, 6 of the panel 1 during storage and transportation.

[0017] The veneer layer 2, the first fibre board 3, the grooved second fibre board 6 and the protecting sheet 13 are adhesively jointed together as shown in figure 2 in a single pressing operation.

[0018] The furniture panel 1 as shown in fig. 2 is well suited for storage under normal storage conditions, whilst awaiting the bending operation

[0019] In order to prepare the panel 1' for bending the remaining, preserved layer 9 is removed, as shown in

fig. 3, reopening the grooves 8 in the other end as they previously were. The remaining of the second fibre board 6 is hereby only the strips 10 - at least in the sections that are being prepared for curvature bending.

[0020] In fig. 4 the furniture panel 1'' is shown, where it is bent into a curved shape.

[0021] In fig. 5 a furniture panel 1' ready for curvature bending is shown, where the grooves 8 are filled with a resilient material 12, such a damping foam material. This material can either be applied after the rear layer 9 of the second fibre board 6 is removed or prior to the assembly of the panel 1, i.e. during the preparation of the second fibre board 6.

[0022] In fig. 6 and 7 another embodiment of the invention is shown. In this embodiment the second fibre board 6 is provided with groups 11 of grooves 8, and between the said groups 11 are built sections 14 of regular fibre board that are uncut. If necessary a V-groove 15 can be cut in such a section 14 as shown in fig. 7, so that a corner folding and also a panel curving can be carried out with a furniture panel according to the invention

[0023] In figure 8 a curved panel 1'' is shown where it is fixed in its curved shape by use of another grooved fibre board 12 that, similar to the second fibre board 6, is provided with grooves 8 and strips 10.

Claims

1. A method of manufacturing of a furniture panel (1, 1') of a wooden fibre material for making a curved furniture panel (1''), where the panel (1, 1') is coated with a veneer layer (2) at a first side and a plurality of grooves (8) on the second side for facilitating the bending of the veneered fibre board into the curved shape, said grooves (8) of a uniform depth leaving a thin bending layer of fibre material behind the veneer coating, **characterised in that** a layer of veneer (2) is adhesively jointed to a first side (4) of a first fibre board (3), and the second side (5) of the first fibre board (3) is adhesively jointed to the first side (7) of a second fibre board (6), which on this first side (7) is provided with grooves (8), wherein a remaining layer (9) on the second side of the second fibre board (6) is at least partly removed, whereby the grooves (8) are reopened.
2. A method according to claim 1, wherein the second side of the second fibre board (6) is applied with a sheet (13), such as a vapour impenetrable sheet, so as to maintain a stabile moisture content in the fibre boards (3, 6) of the panel 1 during storage and transportation.
3. A method according to claim 1 or 2, wherein the furniture panel (1'') is bent to a curved shape and is fixed in this curved shape.

4. A method according to claim 3, wherein the fixation in the curved shape involves fixing the second side (9) with the reopened grooves (8) to fixation means (12).
5. A method according to claim 4, wherein the panel (1'') is fixed in its curved shape by adhesively joining the groove carrying second side of the curved panel (1'') to a front side of a further fibre board (12) also provided with grooves (8).
6. A method according to any of the preceding claims, wherein the grooves (8) are filled with a resilient material (9), preferably a sound absorbing foam material.
7. A method according to any of the preceding claims, wherein the second fibre board (6) is provided with one or more groups (11) of grooves (8).
8. A method according to claims 1, 2 or 7, where the veneered top layer (2) is given a finishing treatment prior to any possible subsequent bending of the panel (1, 1').
9. A furniture panel (1, 1', 1''), in particular for a loudspeaker cabinet manufactured by a method according to any of the claims 1, 2 or 8, where the panel (1, 1', 1'') comprises a veneered top layer (2) that is adhesively bonded to a first fibre board (3) which on its second side is adhesively bonded to a first side of a second fibre board (6) which is provided with grooves (8), **characterised in that** the second fibre board (6) comprises a number of strips (10) on the second side of the first fibre board (3), where the grooves (8) are built between these strips (10).
10. A furniture panel according to claim 9, wherein the panel (1'') is bent into a convex and/or concave shape and fixed in this shape by fixation means (12).
11. A furniture panel according to claim 10, wherein the fixation means is a further fibre board (12) provided with grooves, which is equivalently shaped in convex and/or concave configuration and fixed to the rear side of the second fibre board (6), whereby the grooves of both fibre boards (6, 12) are closed.
12. A furniture panel according to any of claims 9-11, wherein the grooves (8) are at least partly filled with a resilient material (9), preferably a sound absorbing foam material.

Patentansprüche

1. Verfahren zur Herstellung von Möbelpaneele (1, 1')

aus einem Holzfaserwerkstoff zum Herstellen einer gebogenen Möbelpaneele (1''), wobei die Paneele (1, 1') mit einer Furnierschicht (2) auf einer ersten Seite und mehreren Rillen (8) auf der zweiten Seite bedeckt ist, um das Biegen der Furnierfaserplatte in die gebogene Form zu erleichtern, wobei die Rillen (8) mit einer gleichmäßigen Tiefe eine dünne Biegeschicht aus Fasermaterial hinter der Furnierschicht hinterlassen,

dadurch gekennzeichnet, dass

eine Furnierschicht (2) klebend mit einer ersten Seite (4) einer ersten Faserplatte (3) und die zweite Seite (5) der ersten Faserplatte (3) klebend mit der ersten Seite (7) einer zweiten Faserplatte (6) verbunden ist, die auf dieser ersten Seite (7) mit Rillen (8) bereitgestellt ist, wobei eine verbleibende Schicht (9) auf der zweiten Seite der zweiten Faserplatte (6) mindestens teilweise entfernt wird, wobei die Rillen (8) wieder geöffnet werden.

2. Verfahren nach Anspruch 1, wobei die zweite Seite der zweiten Faserplatte (6) mit einer Lage (13), etwa einer dampfundurchlässigen Lage, aufgebracht wird, um einen gleichbleibenden Feuchtigkeitsgehalt in den Faserplatten (3, 6) der Paneele 1 während der Lagerung und des Transportes zu halten.
3. Verfahren nach Anspruch 1 oder 2, wobei die Möbelpaneele (1'') in eine gebogene Form gebogen wird und in dieser gebogenen Form fixiert wird.
4. Verfahren nach Anspruch 3, wobei das Fixieren in der gebogenen Form mit dem Fixieren der zweiten Seite (9) mit den wieder geöffneten Rillen (8) an den Fixierungsmitteln (12) verbunden ist.
5. Verfahren nach Anspruch 4, wobei die Paneele (1'') in ihrer gebogenen Form durch klebendes Verbinden der Rille, die die zweite Seite der gebogenen Paneele (1'') trägt, an einer Vorderseite einer weiteren Faserplatte (12) fixiert wird, die ebenfalls mit Rillen (8) bereitgestellt ist.
6. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Rillen (8) mit einem elastischen Material (9), vorzugsweise mit einem schalldämmenden Schaummaterial, gefüllt werden.
7. Verfahren nach einem der vorhergehenden Ansprüche, wobei die zweite Faserplatte (6) mit einer oder mehreren Gruppen (11) von Rillen (8) bereitgestellt ist.
8. Verfahren nach Anspruch 1, 2 oder 7, wobei die Furnieroberschicht (2) eine Oberflächenbehandlung erhält, bevor irgendein nachfolgendes Biegen der Paneele (1, 1') erfolgt.

9. Möbelpaneele (1, 1', 1'') insbesondere für eine Lautsprecherbox, die gemäß einem Verfahren nach einem der Ansprüche 1, 2 oder 8 hergestellt wird, wobei die Paneele (1, 1', 1'') eine Furnieroberschicht (2) umfasst, die klebend mit einer ersten Seite einer zweiten Faserplatte (6) verbunden wird, die mit Rillen (8) bereitgestellt ist, **dadurch gekennzeichnet, dass** die zweite Faserplatte (6) eine Anzahl Streifen (10) auf der zweiten Seite der ersten Faserplatte (3) umfasst, wobei die Rillen (8) zwischen diesen Streifen (10) angeordnet sind.
10. Möbelpaneele nach Anspruch 9, wobei die Paneele (1'') in eine konvex und/oder konkav ausgebildete Form gebogen wird und in dieser Form durch Fixierungsmittel (12) fixiert wird.
11. Möbelpaneele nach Anspruch 10, wobei das Fixierungsmittel eine weitere mit Rillen bereitgestellte Faserplatte (12) ist, die in gleicher Weise in einer konvexen und/oder konkaven Anordnung geformt ist und an der rückwärtigen Seite der zweiten Faserplatte (6) befestigt ist, wobei die Rillen der beiden Faserplatten (6, 12) geschlossen werden.
12. Möbelpaneele nach einem der Ansprüche 9 bis 11, wobei die Rillen (8) mindestens teilweise mit einem elastischen Material (9), vorzugsweise einem schalldämmenden Schaummaterial, gefüllt sind.

Revendications

1. Procédé de fabrication d'un panneau pour meuble (1, 1') en une matière en fibres de bois pour réaliser un panneau pour meuble courbé (1''), dans lequel le panneau (1, 1') est revêtu d'une couche de placage (2) au niveau d'une première face et a une pluralité de rainures (8) sur la seconde face pour faciliter le cintrage de la plaque fibreuse plaquée dans la forme courbée, lesdites rainures (8) d'une profondeur uniforme laissant une couche mince de cintrage de matière fibreuse derrière le revêtement de placage, **caractérisé en ce qu'une** couche de placage (2) est assemblée de façon adhésive à une première face (4) d'une première plaque fibreuse (3), et la seconde face (5) de la première plaque fibreuse (3) est assemblée de façon adhésive à la première face (7) d'une seconde plaque fibreuse (6), qui sur cette première face (7) est munie de rainures (8), dans laquelle une couche restante (9) sur la seconde face de la seconde plaque fibreuse (6) est au moins partiellement retirée, grâce à quoi les rainures (8) sont réouvertes.
2. Procédé selon la revendication 1, dans lequel la se-

conde face de la seconde plaque fibreuse (6) est appliquée sur une feuille (13), telle qu'une feuille imperméable à la vapeur, de façon à maintenir une teneur en humidité stable dans les plaques fibreuses (3, 6) du panneau (1) pendant le stockage et le transport.

3. Procédé selon la revendication 1 ou 2, dans lequel le panneau pour meuble (1'') est cintré en une forme courbée et est fixé dans cette forme courbée.
4. Procédé selon la revendication 3, dans lequel la fixation dans la forme courbée implique de fixer la seconde face (9) avec les rainures réouvertes (8) à des moyens de fixation (12).
5. Procédé selon la revendication 4, dans lequel le panneau (1'') est fixé dans sa forme courbée en assemblant de façon adhésive la seconde face portant les rainures du panneau courbé (1'') à une face avant d'une autre plaque fibreuse (12) également munie de rainures (8).
6. Procédé selon une quelconque des revendications précédentes, dans lequel les rainures (8) sont remplies d'une matière élastique (9), de préférence une matière en mousse insonorisante.
7. Procédé selon une quelconque des revendications précédentes, dans lequel la seconde plaque fibreuse (6) est munie d'un ou de plusieurs groupes (11) de rainures (8).
8. Procédé selon la revendication 1, 2 ou 7, où on donne à la couche supérieure plaquée (2) un traitement de finition avant un quelconque cintrage suivant éventuel du panneau (1, 1').
9. Panneau pour meuble (1, 1', 1''), en particulier pour une ébénisterie de haut-parleur, fabriqué par un procédé selon une quelconque des revendications 1, 2 ou 8, où le panneau (1, 1', 1'') comprend une couche de dessus plaquée (2) qui est liée de façon adhésive à une première plaque fibreuse (3) sur laquelle sa seconde face est liée de façon adhésive à une première face d'une seconde plaque fibreuse (6) qui est munie de rainures (8), **caractérisé en ce que** la seconde plaque fibreuse (6) comprend une pluralité de lames (10) sur la seconde face de la première plaque fibreuse (3), où les rainures (8) sont construites entre ces lames (10).
10. Panneau pour meuble selon la revendication 9, dans lequel le panneau (1'') est cintré en une forme convexe et/ou concave et fixé dans cette forme par des moyens de fixation (12).

11. Panneau pour meuble selon la revendication 10, dans lequel les moyens de fixation sont une autre plaque fibreuse (12) munie de rainures, qui est conformée de façon équivalente en une configuration convexe et/ou concave et fixée à la face arrière de la seconde plaque fibreuse (6), grâce à quoi les rainures des deux plaques fibreuses (6, 12) sont obturées.

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12. Panneau pour meuble selon une quelconque des revendications 9-11, dans lequel les rainures (8) sont au moins partiellement remplies d'une matière élastique (9), de préférence une matière en mousse insonorisante.

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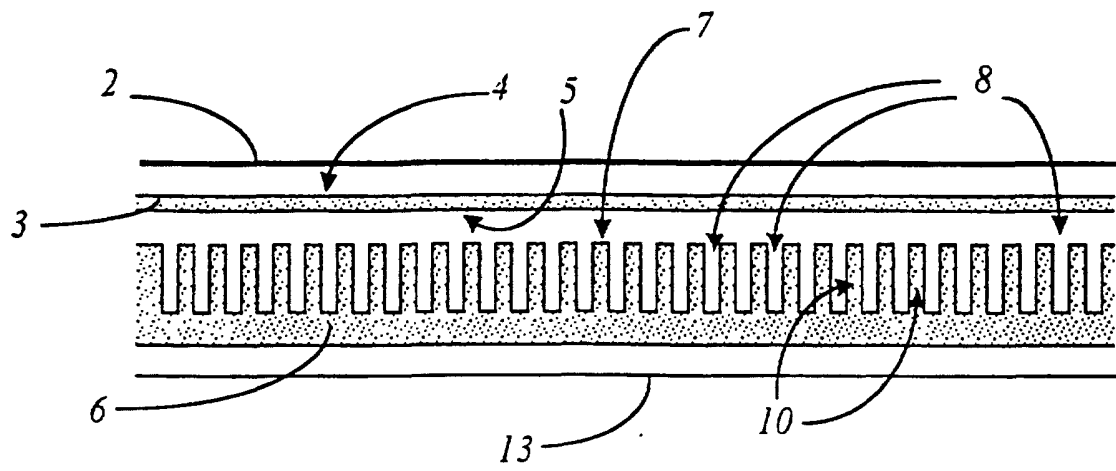


Fig. 1

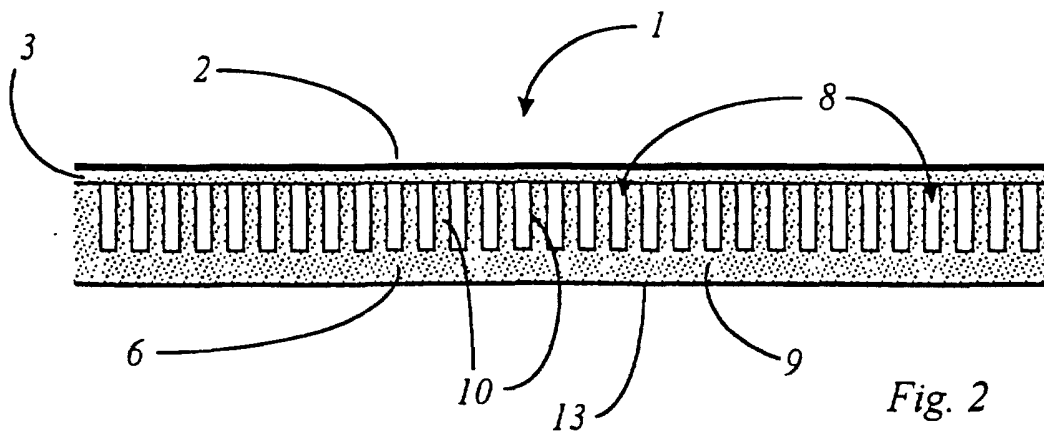


Fig. 2

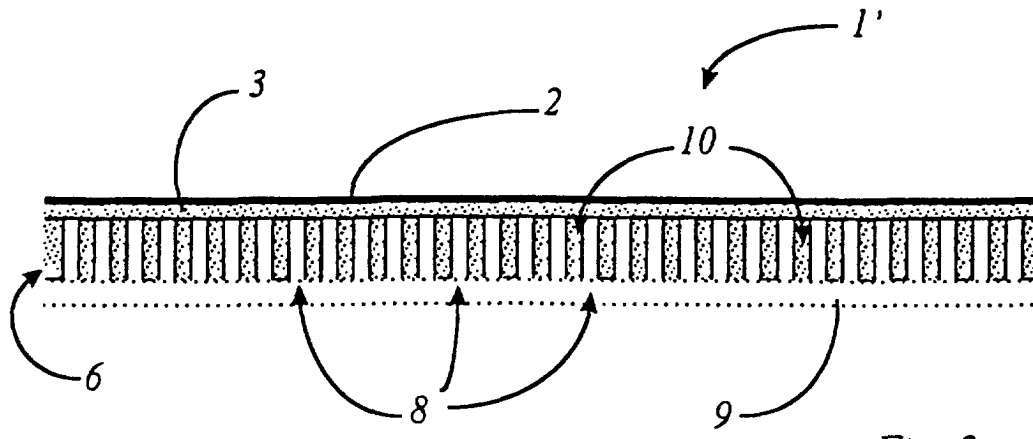


Fig. 3

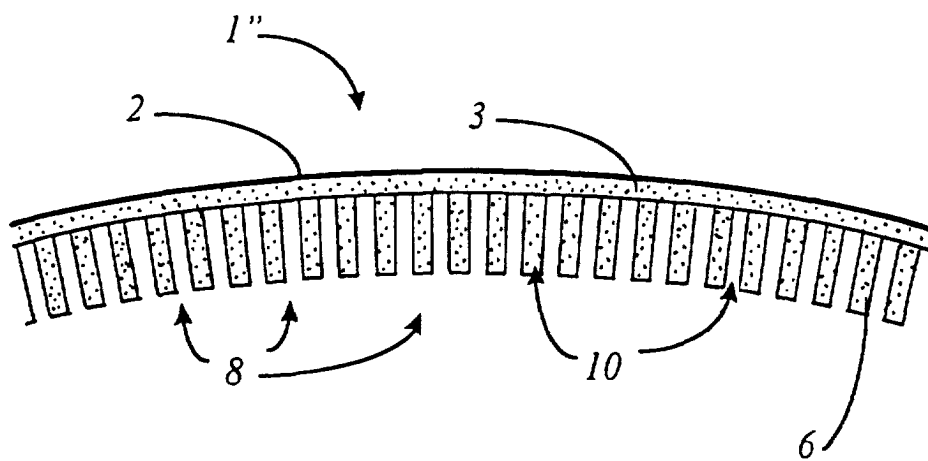


Fig. 4

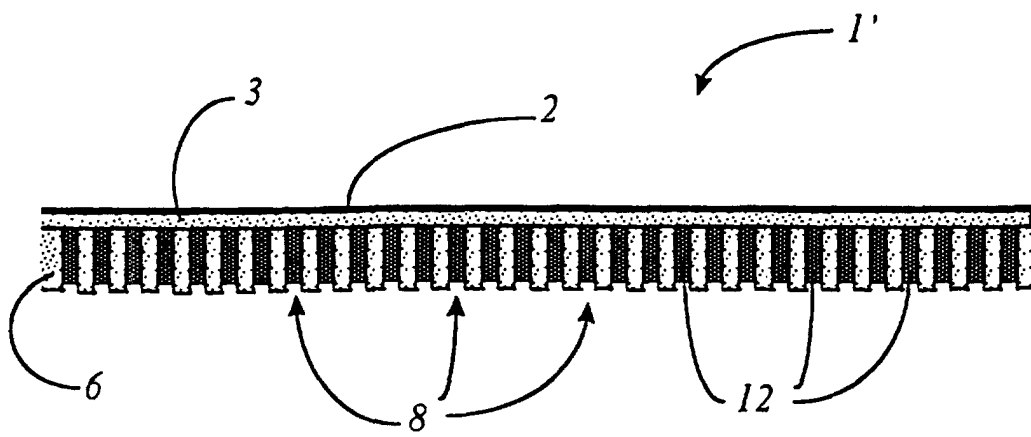


Fig. 5

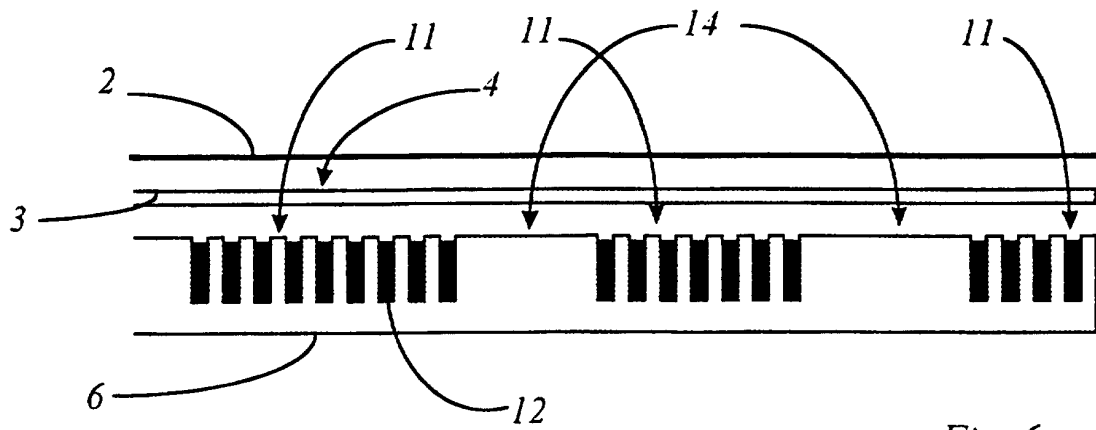


Fig. 6

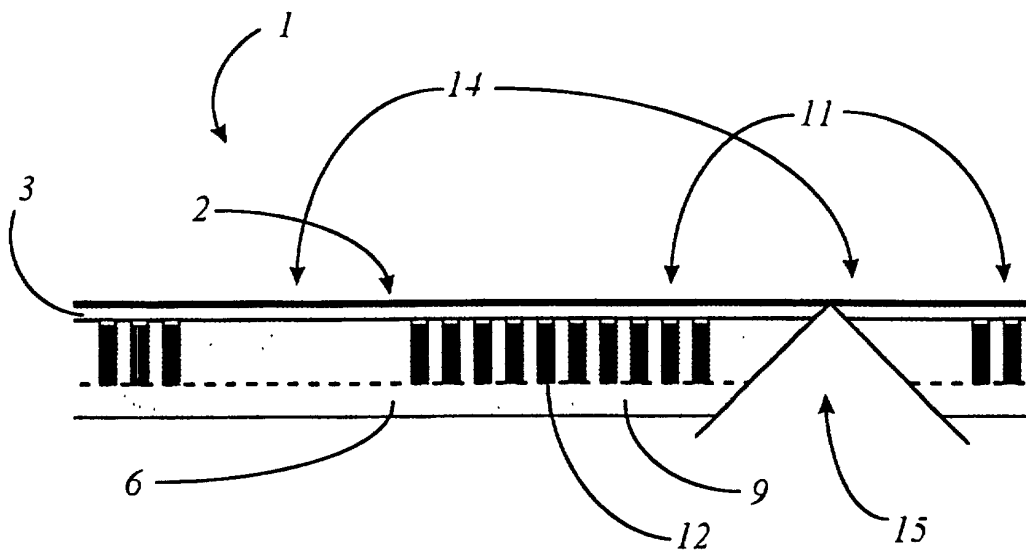


Fig. 7

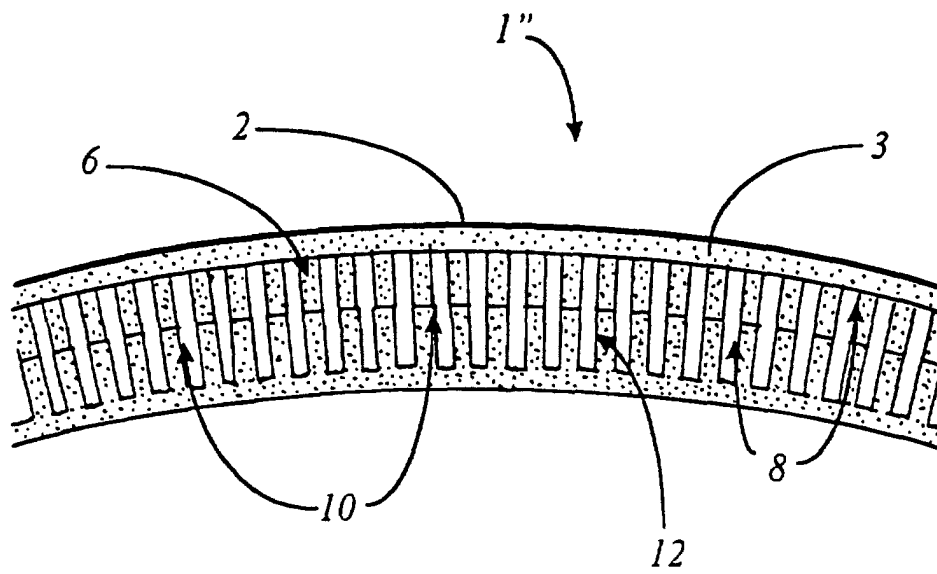


Fig. 8