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

(57) The present invention has the object of providing a method of manufacturing a curved panel in particular for loudspeaker cabinets in an inexpensive and reliable manner. This object is achieved by a method of manufacturing of a furniture panel (1, 1', 1'') of a wooden fibre material for making a curved furniture panel (1''), where the panel (1) is coated with a veneer layer (2) at the 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 uni-

form depth leaving a thin bending layer of fibre material behind the veneer coating, wherein a layer of veneer (2) is adhesively joined to a first side (4) of a first fibre board (3), and the second side (5) of the first fibre board (3) is adhesively joined to the first side (7) of a second fibre board (6), which on this first side (7) is provided with grooves (8). The invention also relates to a furniture panel (1, 1', 1'') in particular for a loudspeaker cabinet manufactured by such method.

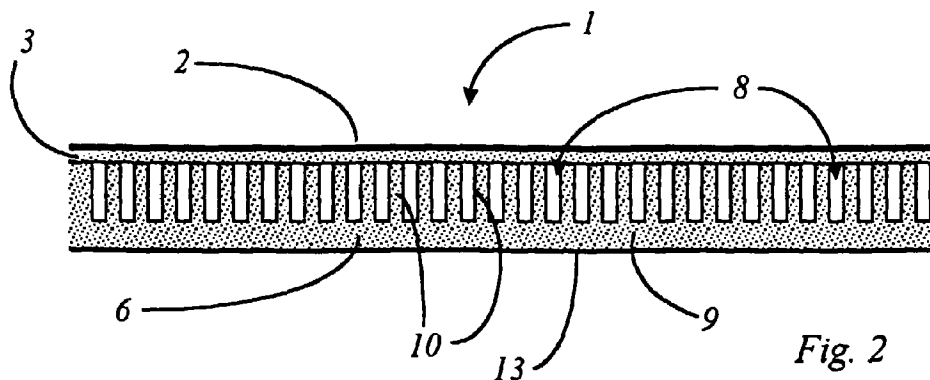


Fig. 2

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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 is 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 manufacturing and which ensures a satisfying accuracy of the grooves, so as to provide a curved panel in partic-

ular for loudspeaker cabinets in an inexpensive and reliable manner.

[0007] This object is achieved by a method of the introductory mentioned kind, where a layer of veneer is adhesively joined to a first side of a first fibre board, and the second side of the first fibre board is adhesively joined to the first side of a second fibre board, which on this first side is provided with grooves. 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 a veneered top layer that is adhesively bond to a first fibre board which on its second side is adhesively bond to a first side a second fibre board which is provided with grooves.

[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 bend 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 joined to a first side (4) of a first fibre board (3), and the second side (5) of the first fibre board (3) is adhesively joined to the first side (7) of a second fibre board (6), which on this first side (7) is provided with grooves (8).
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.
3. A method according to claim 1 or 2, wherein the remaining layer (9) on the second side of the second fibre board (6) is at least partly removed,

whereby the grooves (8) are reopened.

4. A method according to claim 3, wherein the furniture panel (1'') is bend to a curved shape and is fixed in this curved shape. 5
5. A method according to claim 4, wherein the fixation in the curved shape involves fixing the second side (9) with the reopened grooves (8) to fixation means (12). 10
6. A method according to claim 5, 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). 15
7. 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. 20
8. 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). 25
9. A method according to claims 1-3 or 8, where the veneered top layer (2) is given a finishing treatment prior to any possible subsequent bending of the panel (1, 1'). 30
10. A furniture panel (1, 1', 1'') in particular for a loud-speaker cabinet manufactured by a method according to any of the claims 1-3 or 9, **characterised** in that the panel (1, 1', 1'') comprises a veneered top layer (2) that is adhesively bond to a first fibre board (3) which on its second side is adhesively bond to a first side a second fibre board (6) which is provided with grooves (8). 35
11. A furniture panel according to claim 10, wherein the second fibre board (6) displays a preserved fibre layer (9) on the second side of the fibre board (6) below the grooves (8). 40
12. A furniture panel according to claim 10, wherein the second fibre board (6) consists of a number of strips (10) on the second side on the first fibre board (3), where the grooves (8) are build between these strips (10). 45
13. A furniture panel according to claim 12, wherein the panel (1'') is bend into a convex and/or concave shape and fixed in this shape by fixation means (12). 50
14. A furniture panel according to claim 13, wherein the fixation means is a further fibre board (12) provided

with grooves, which is equivalently shaped in the 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.

15. A furniture panel according to any of the preceding claims, wherein the grooves (8) are at least partly filled with a resilient material (9), preferably a sound absorbing foam material.

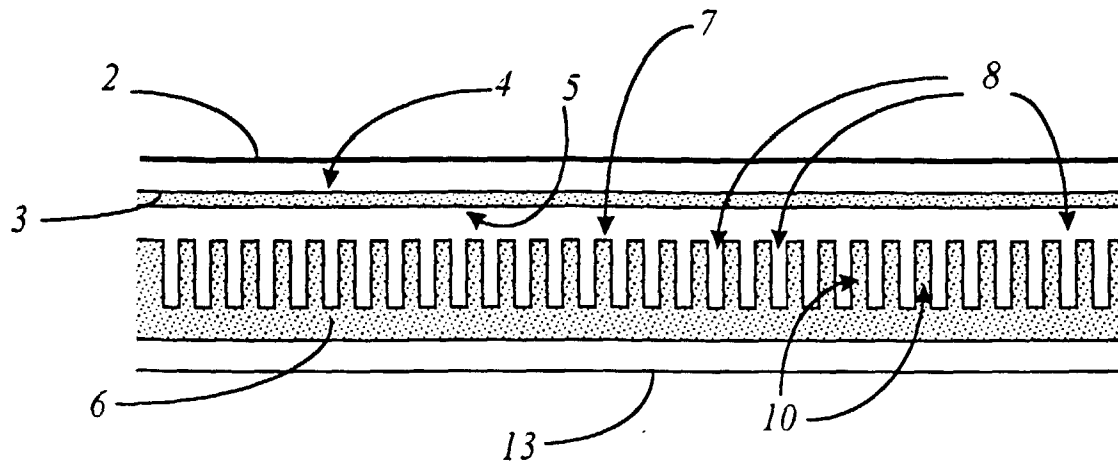


Fig. 1

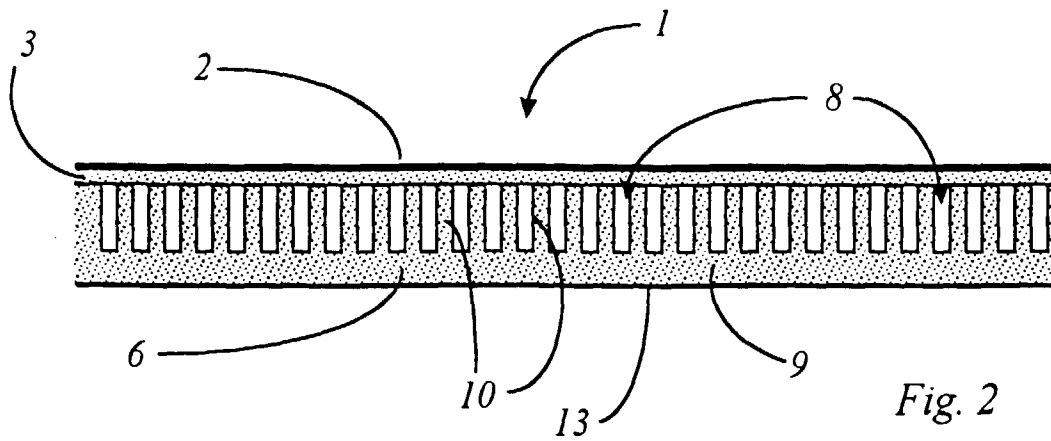


Fig. 2

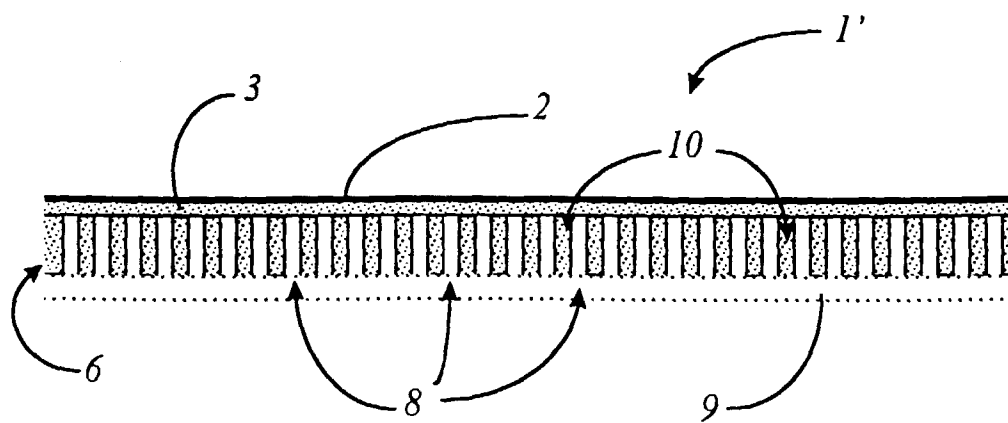


Fig. 3

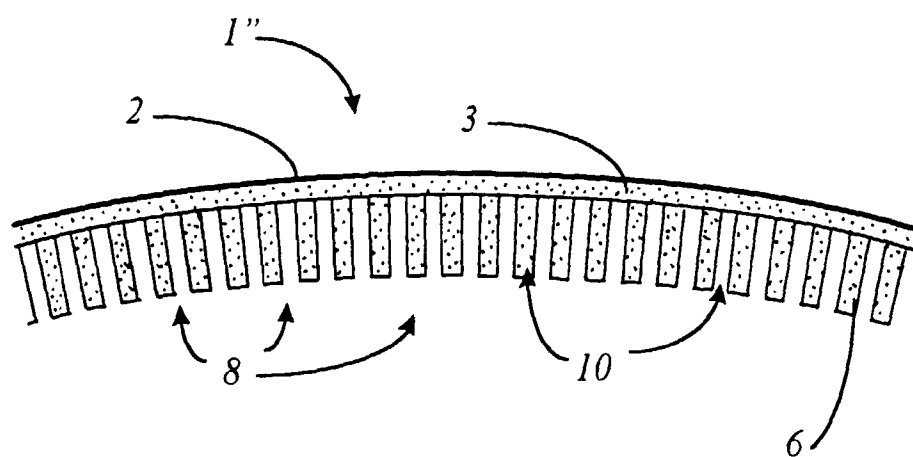


Fig. 4

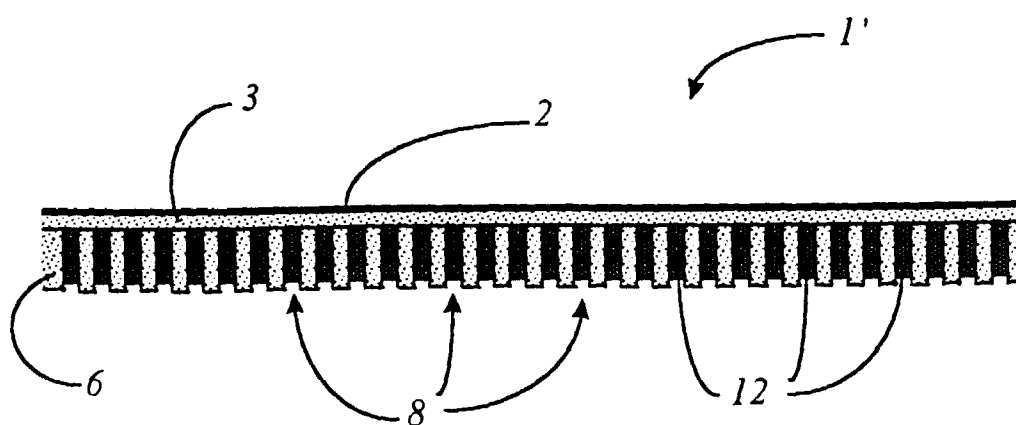


Fig. 5

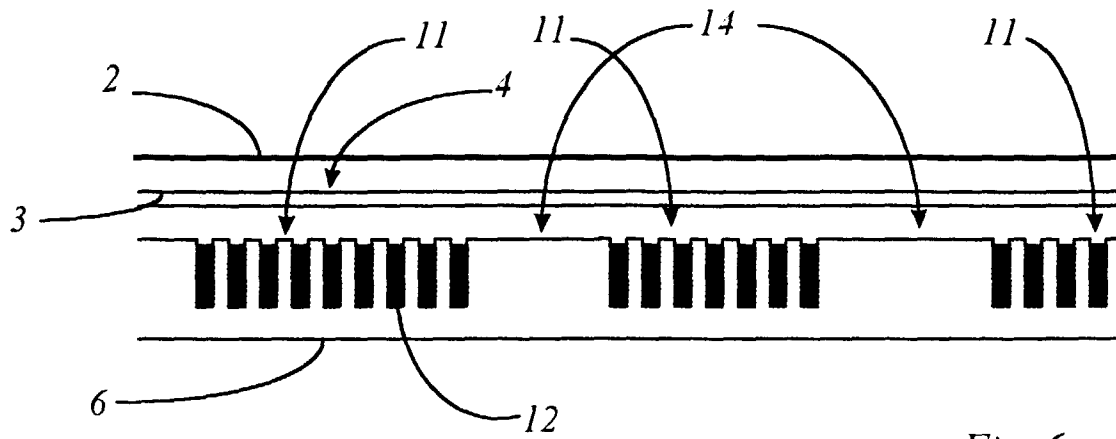


Fig. 6

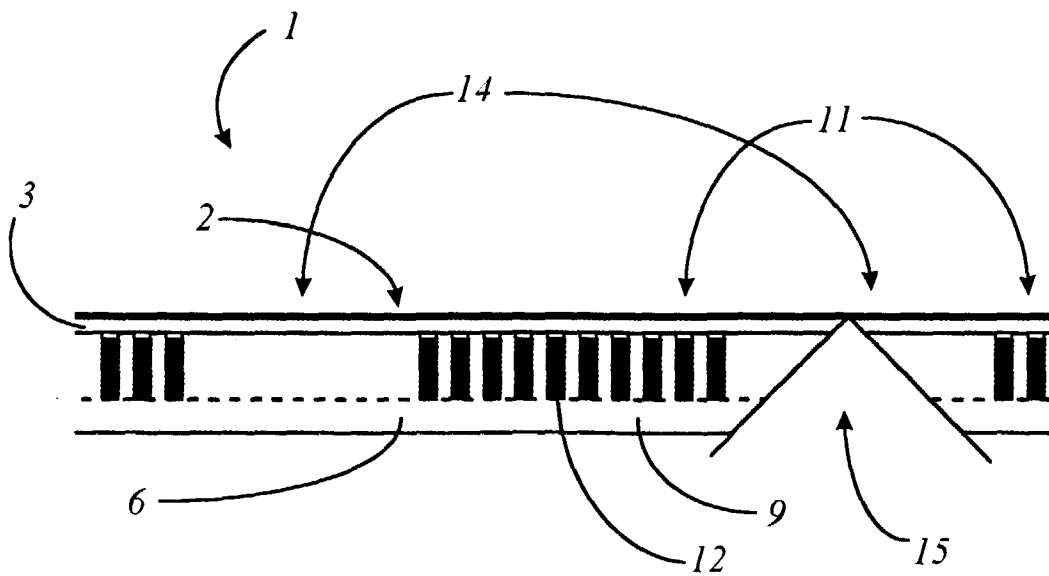


Fig. 7

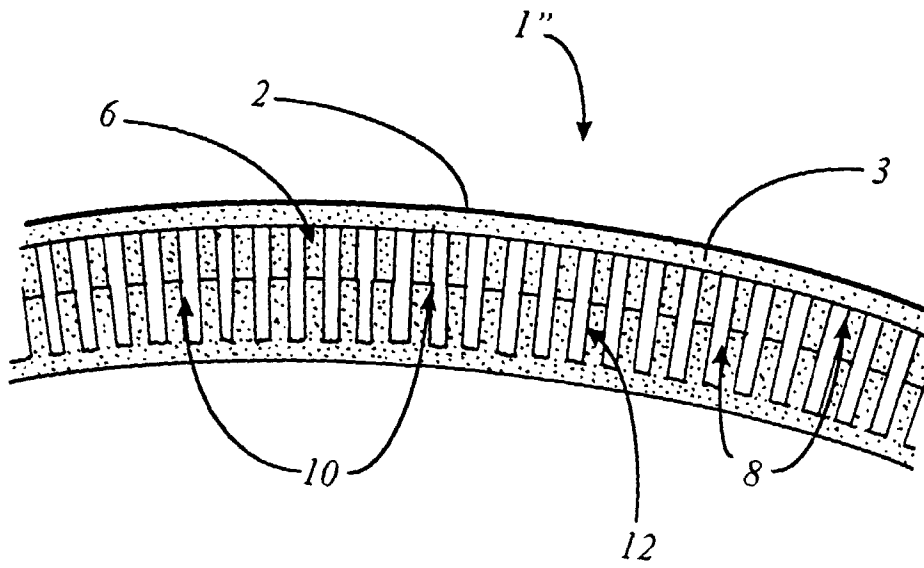


Fig. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 98 61 0008

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| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 14 August 1998 | Examiner Huggins, J |
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