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(54) Roofing tile.

(57) A tile (1,20,30), preferably of the bent type, is disclosed which has at least one ridge (6) running lenghtwise along an extrados surface (3) and being elevated on said surface.

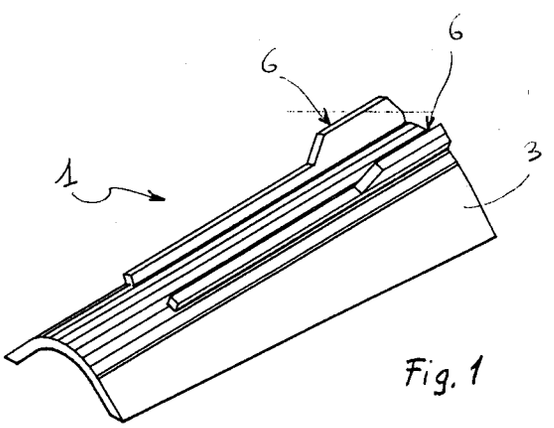

Fig. 1

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This invention relates to an improved roofing tile having an intrados surface and an extrados surface with a major longitudinal dimension. A roofing tile of this kind is identified, according to its specific shape, as a bent tile when rounded in the form of a frusto-conical segment, imbrex when tapered but almost flat in shape, and plain tile when rectangular in plan view with corrugations and rib formations. The invention applies to all these types of roofing tiles, although it is primarily and preferably directed to bent tiles.

These roofing tiles, referred to as tiles hereinafter for brevity, are laid into alternating courses wherein one tile has its extrados facing up and is flanked by another tile with its extrados down and partly overlapped by it. In their current form, tiles have two major drawbacks. A first drawback is that the tiles with their extrados down, through being arranged to rest directly on the beam and rafter framework of a roof to be covered, introduce a restriction to the free circulation of air between the roof framework and the tile covering, resulting in moisture becoming trapped and encouraging the onset of rot in the roof framework. Another drawback is that the tiles are held in their working positions almost exclusively by friction opposing their tendency to slide down. The holding action is, therefore, modest, and the tiles can easily become dislodged over time and cause the roof to leak.

The problem at the basis of this invention is that of providing improved tiles structurally and functionally designed to overcome the inconvenience considered in connection to the cited prior art.

This problem is solved by the invention, with a tile of the kind initially mentioned, being characterized in that it comprises at least one ridge running lengthwise along said extrados surface and being raised on said surface.

The features and advantages of the invention will be more clearly apparent from the following detailed description of some preferred embodiments thereof, shown, by way of example and not of limitation, in the accompanying drawings, in which:

Figure 1 is a perspective view of a first embodiment of a bent tile according to the present invention;

Figures 2 and 3 are side elevation views, taken from either sides of the tile in Figure 1;

Figures 4 and 5 are top and bottom plan views, respectively, of the tile in Figure 1;

Figures 6 and 7 are elevation views from the two longitudinal ends of the tile in Figure 1;

Figure 8 is a partial perspective view from above of a roof assembled with the tiles of the preceding Figures;

Figure 9 is a side elevation view of the roof in Figure 8;

Figures 10 to 16 are similar views to Figures 1 to 7, showing a second embodiment of the tile according to this invention;

Figures 17 to 23, 24 to 30, 31 to 37, 38 to 44, 45 to 51, 52 to 58, 59 to 65, 66 to 72, 73 to 79, 80 to 86, 87 to 93 and 94 to 100 are similar views to Figures 1 to 7, showing further embodiments of the tile according to this invention;

Figures 102 and 103 are elevation views, taken from a longitudinal end, showing respectively two further embodiments of the tile according to this invention.

With reference to Figures 1 to 9, generally indicated at 1 is a tile according to a first embodiment of this invention. The tile 1 is a bent tile with opposed intrados 2 and extrados 3 surfaces, and has a major longitudinal dimension with longitudinally opposed ends respectively indicated at 4 and 5. In view of the typical frusto-conically bent shape of the tile, the surfaces 2 and 3 are tapered from the end 4 to the opposite end 5, and said ends will also be referred to herein as the large end and small end.

Formed on the extrados surface 2, integrally with the tile 1 during the tile molding or extrusion process, are symmetrically arranged two ridges, being mirror-images of each other and both indicated at 6, which ridges are radially oriented, i.e. perpendicularly to the surface 3 and run lengthwise of the tile 1. Such ridges 6 extend in parallel at a spacing from each other, are symmetrical about a longitudinal mid-plane of the tile 1, and extend from the large end 4 to a location at a predetermined distance from the small end 5, in a region 7 which is also referred to as the covering region, i.e. the area where a tile is, within the layout of a roof generally denoted by T, in a relationship of partial overlap with a longitudinally adjacent tile 1.

The ridges 6 have first and second contiguous sections 6a, 6b, the first section having a smaller longitudinal dimension and a taller ridge on the extrados surface than the second section. The section 6a has opposed end bevels, both indicated at 8. During the installation of the roof T, the section 6a of the ridges 6 provides support for the corresponding tile end raised over the roof framework 10, while the free end of the section 6b, by abutting against the large end of the longitudinally adjacent tile, forms a stop for the latter, thereby preventing it from sliding relatively. Notice that, in assembling the roof T (or the like covering), functional advantages can be secured by using tiles configured according to the invention at least for those tiles whose extrados surface is to be laid facing the roof framework 10. While it is preferred that the whole covering be formed of tiles 1 ac-

cording to this invention, it is also contemplated that the other tiles having their extrados facing up may have a traditional bent tile shape.

The other embodiments of this invention will now be described limited to those features by which they differ from the tile 1, it being understood that similar parts to those of the previous embodiment will be denoted by the same reference numerals.

In Figures 10 to 16, a typical tile 20 is shown which is also a bent type, and only differs from the tile 1 by the ridges 6 having a uniform height on the surface 3.

Shown in Figures 17 to 23 is a tile 30, similar to the tile 20, except that the ridges 6, instead of being oriented radially, lie parallel to each other, that is perpendicular to the plane of the roof T.

Figures 24 to 30 show a tile 40, similar to the tile 20, except that the ridges 6 are tapered from the small end 5 toward the large end 4.

A tile 50 is shown in Figures 31 to 37 which is similar to the tile 40, except that the ridges 6, instead of having a radial orientation, lie parallel to each other, that is perpendicular to the plane of the roof T.

In Figures 38 to 44, a tile 60 is shown which is similar to the tile 1, except that the ridges 6 include each a taller section 6a on the surface 3, a lower section 6c of shorter longitudinal dimension, and an intermediate section 6b of still lower height interconnecting the two sections 6a and 6c.

A tile 70 is shown in Figures 45 to 51 which is similar to the tile 1, except that the ridges 6 are not provided with bevel 8 at the large end 4.

Figures 52 to 58 show a tile 80 which is similar to the tile 70, except that its ridges 6, instead of being radially oriented, extend parallel to each other, that is perpendicular to the plane of the roof T.

Shown in Figures 59 to 65 is a tile 90, similar to the tile 30, except that its ridges 6, rather than extending continuously in the longitudinal direction, are each comprised of two sections 6d in longitudinally spaced apart and aligned relationship.

In Figures 66 to 72, a tile 100 is shown which is similar to the tile 90, with the exception that the sections 6d of the ridges 6, instead of lying parallel to each other, are oriented radially like the embodiment of Figures 10 to 16.

Figures 73 to 79 and Figures 80 to 86 respectively show tiles 110, 120 which are similar to the tiles 90 and 100, respectively, except that the sections 6d of the ridges 6, rather than having a constant height on the extrados surface 3, follow a tapering pattern consistent with that of the respective tiles 50 and 40 previously described.

Shown in Figures 87 to 93 is a tile 130, similar to the tile 30 of Figure 17, but having the space between the ridges 6 partly filled and the ridges interconnected by a concave surface 131.

Figures 94 to 100 show a tile 140 similar to the tile 1, except that its extrados 3 and intrados 2 surfaces are rectangular in plan view, and instead of having a curvilinear profile, result from dihedral intersections of planar surfaces. It will be understood, however, that the tile 140 could also have any of the previous configurations in the respects of the ridge 6 construction and layout.

Finally, with reference to Figures 102 and 103, two further embodiments of the invention, respectively indicated at 150 and 160, have the intrados surface provided with rest surfaces, respectively a raised one 151 and a recessed one 161, effective to engage in bearing relationship the back side 9 of the corresponding ridges 6 of an overlying tile to facilitate stacking of the aforesaid tiles.

Among the major advantages afforded by the invention, is the improved ventilation of the roof, an optimal retention of one tile by another, and an easier and more efficient stacking of the tile for shipping.

Claims

1. An improved roofing tile having an intrados surface (2) and an extrados surface (3) with a major longitudinal dimension, characterized in that it comprises at least one ridge (6) running lengthwise along said extrados surface (3) and being raised on said surface.

2. A tile according to Claim 1, having a bent tile structure.

3. A tile according to either Claim 1 or 2, wherein at least two spaced-apart ridges (6) extend along substantially parallel directions.

4. A tile according to one or more of the preceding claims, wherein said at least one ridge (6) extends over a shorter length than the longitudinal dimension of said tile.

5. A tile according to Claim 4, wherein said at least one ridge (6) extends from one longitudinal end (4) of said tile to a location at a predetermined distance from the other tile end (5) where said tile has a covering region (7).

6. A tile according to one or more of the preceding claims, wherein said surfaces (2,3) have a near-conical pattern, and the height of said ridges over the extrados surface increases with said surface taper.

7. A tile according to one or more of the preceding claims, wherein said ridges (6) form ribs of

said tile.

8. A tile according to one or more of the preceding claims, wherein said ridges (6) have a folded line profile.

9. A tile according to one or more of the preceding claims, wherein said ridges (6) have first and second contiguous sections (6a,6b), the first section having a shorter longitudinal dimension and greater height on the extrados surface (3) than the second.

10. A tile according to one or more of the preceding claims, wherein the ridges (6) have an approximately radial orientation relative to the extrados surface (3).

11. A tile according to one or more of the preceding claims, wherein the ridges (6) are parallel to each other.

12. A tile according to one or more of the preceding claims, wherein, formed on said intrados surface (2), are rest surfaces (151,161) for the back side (9) of the corresponding ridges (6) of an overlying tile to facilitate the stacking of said tiles.

13. A covering (T) including a framework (10) and a plurality of tiles laid in side-by-side rows and alternately with the extrados (3), or respectively the intrados (2), surface facing toward said framework (10), wherein at least the tiles with the extrados surface (3) facing toward said framework (10) are as claimed in one or more of the preceding claims.

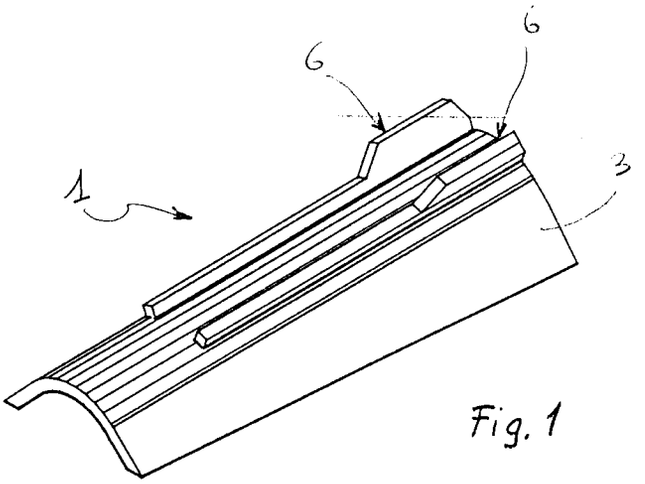


Fig. 1

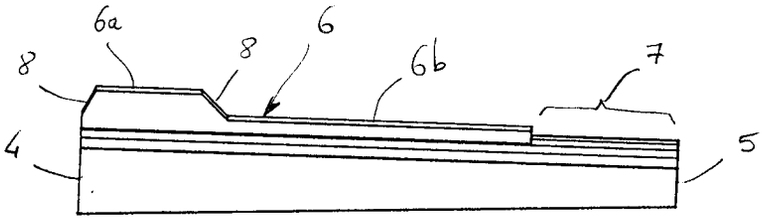
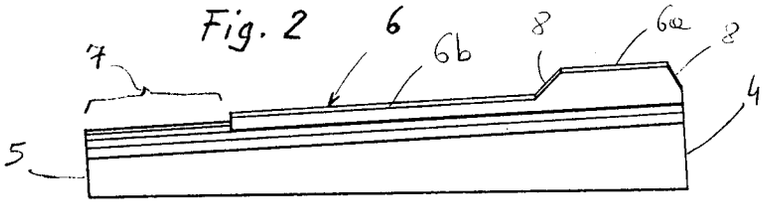


Fig. 2



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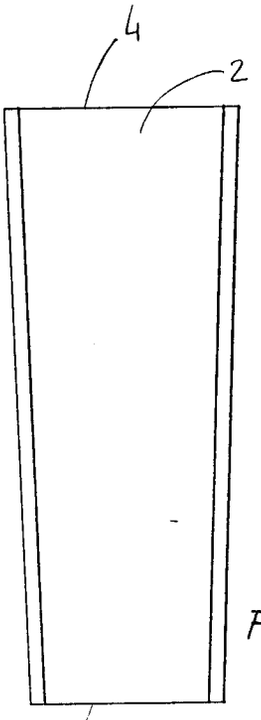

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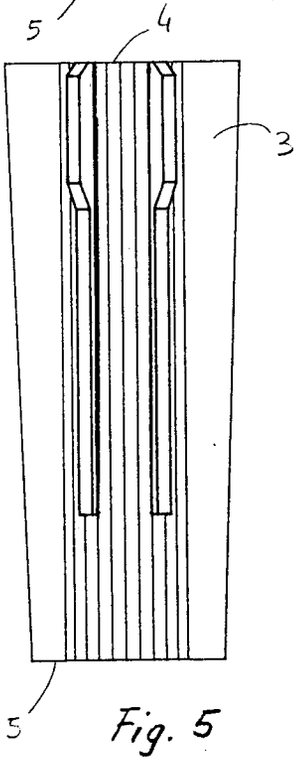

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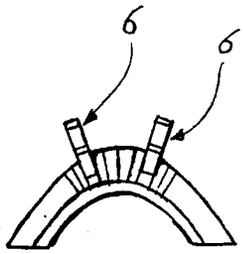

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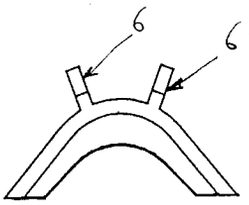

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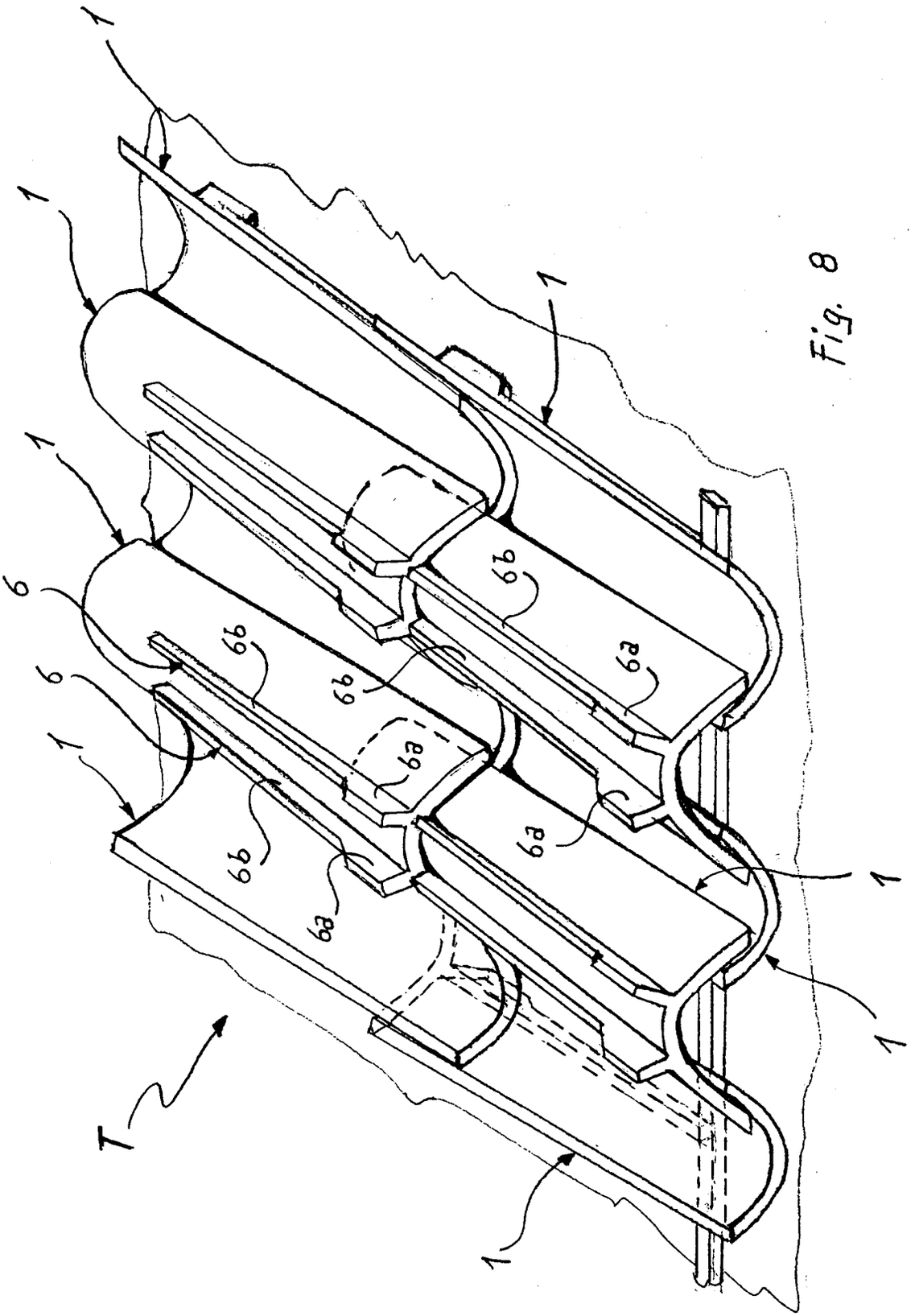

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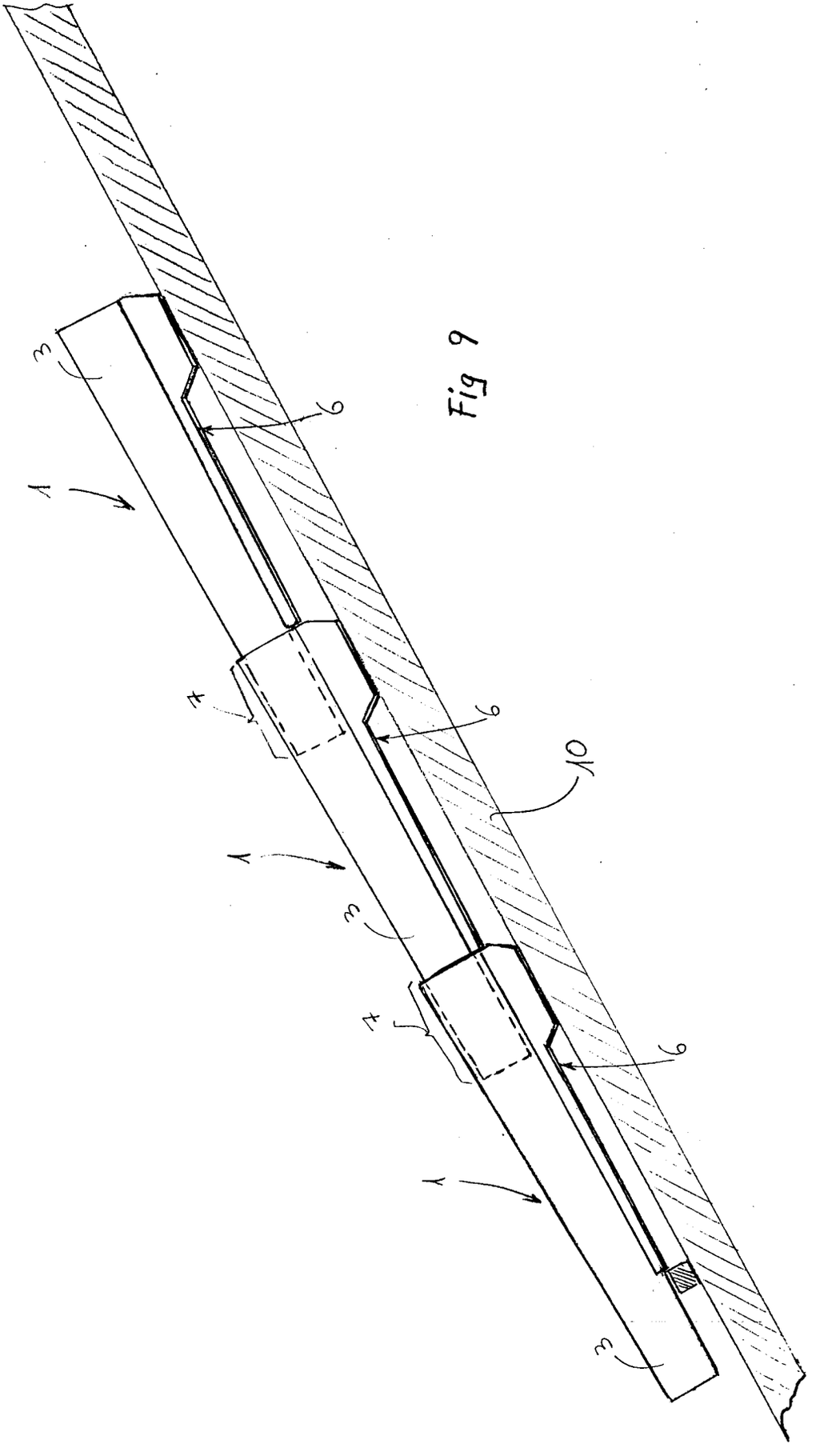


Fig 9

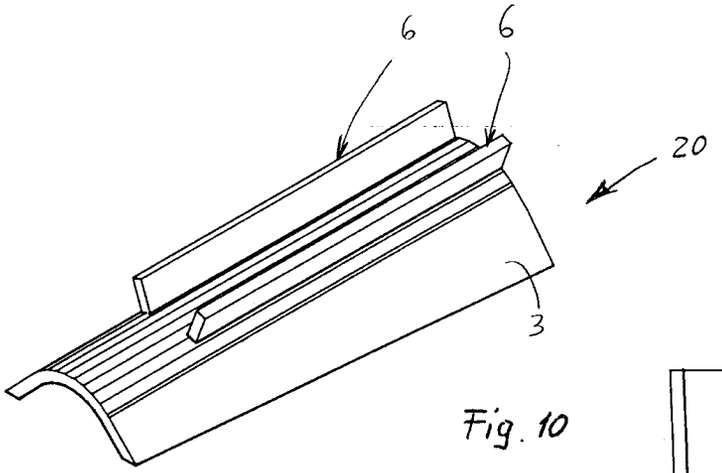


Fig. 10

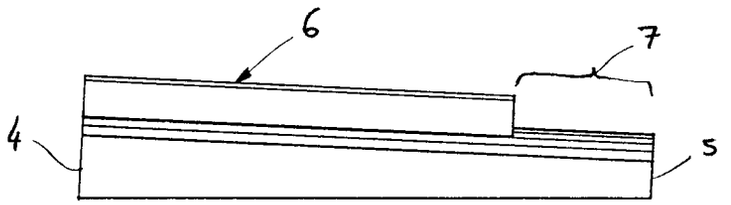


Fig. 11

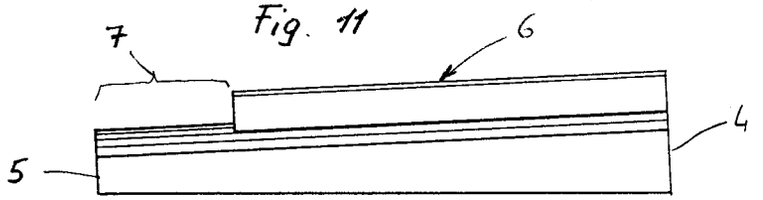


Fig. 12

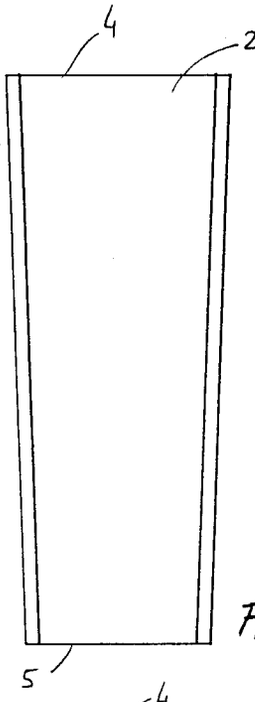


Fig. 13

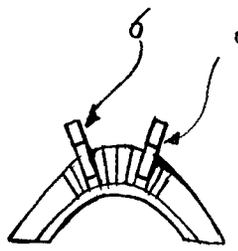


Fig. 15

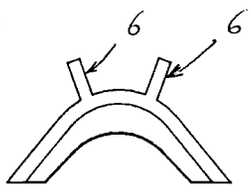
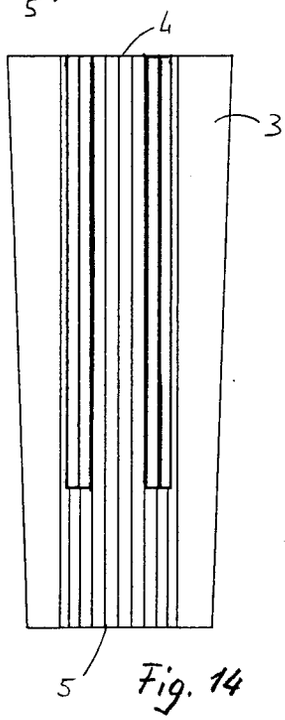


Fig. 16



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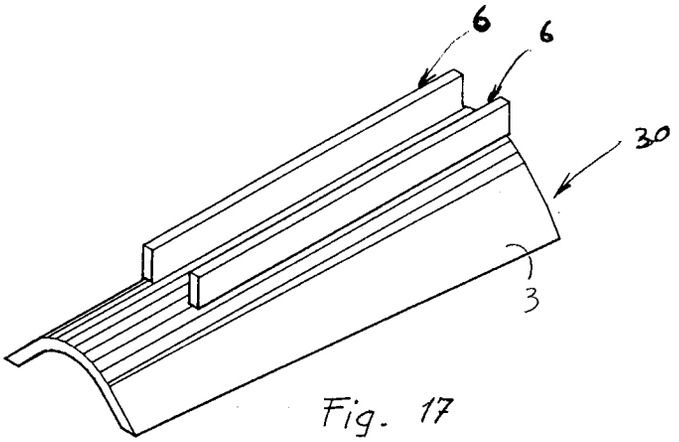

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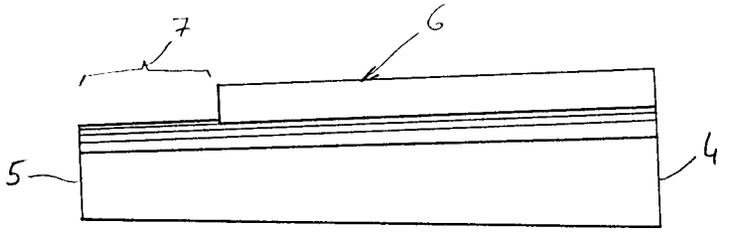

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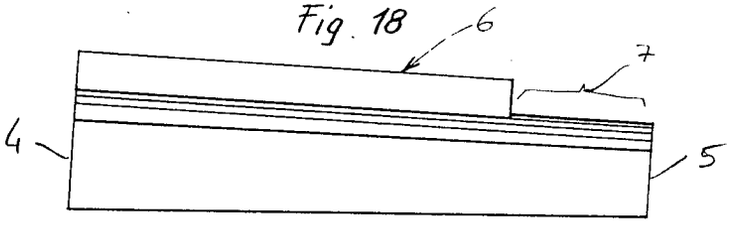

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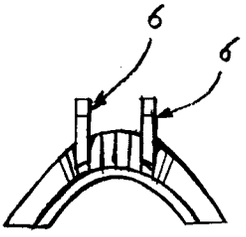

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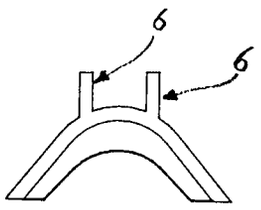

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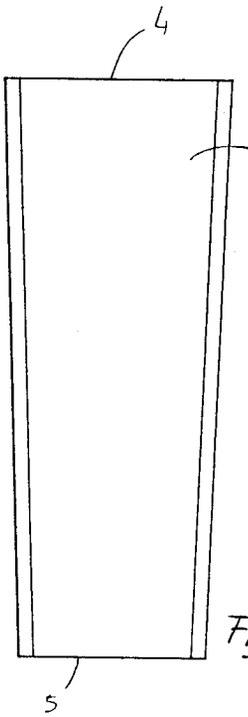

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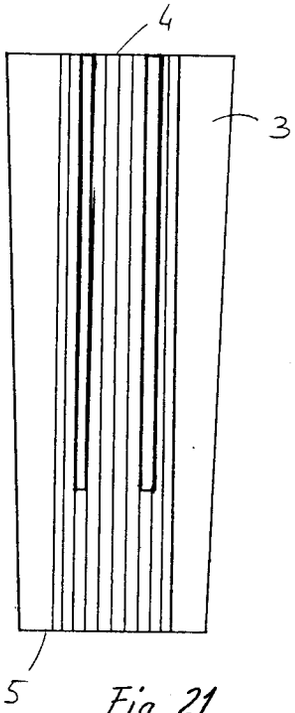

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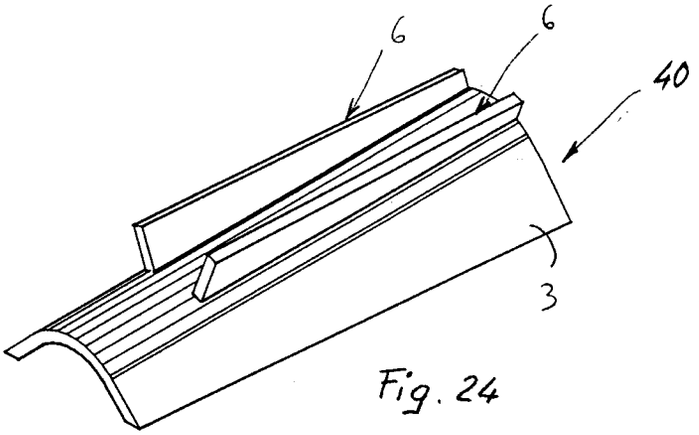

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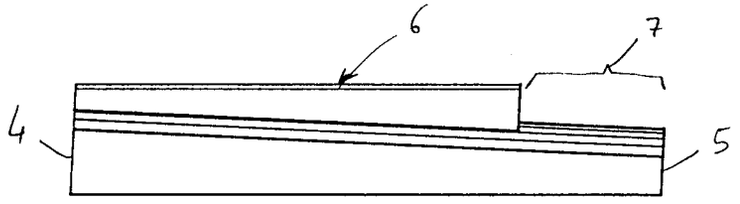

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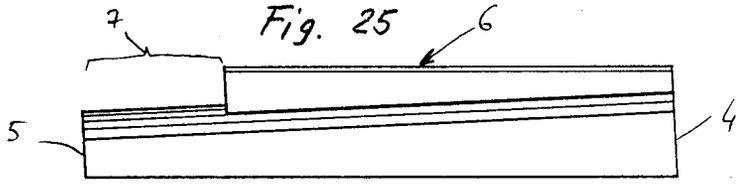

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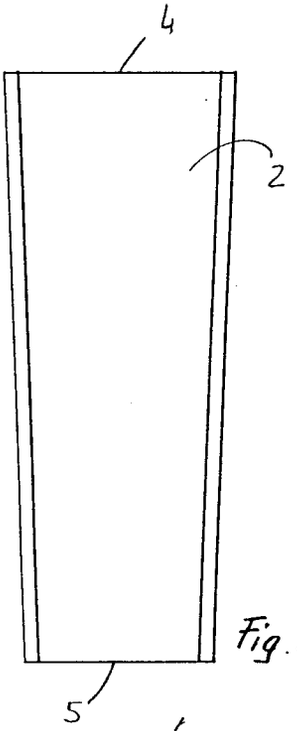

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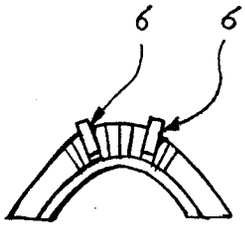

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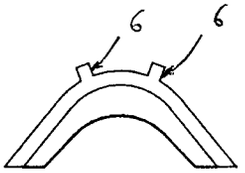

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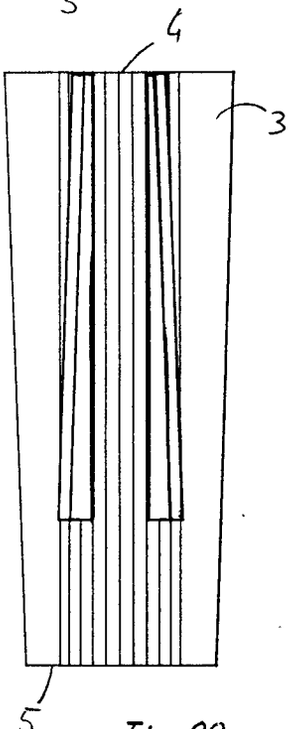

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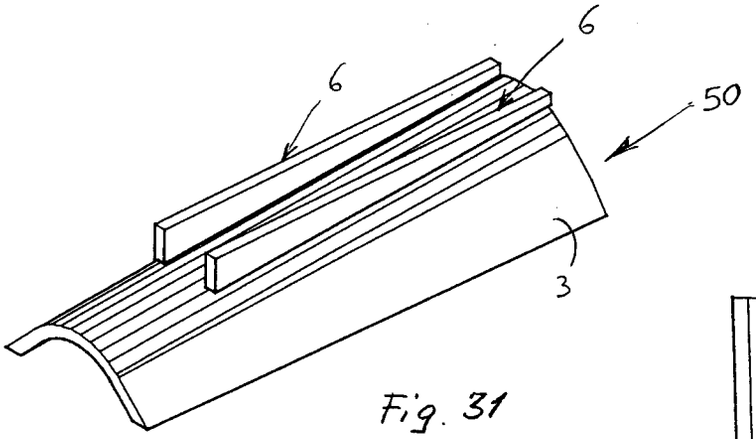

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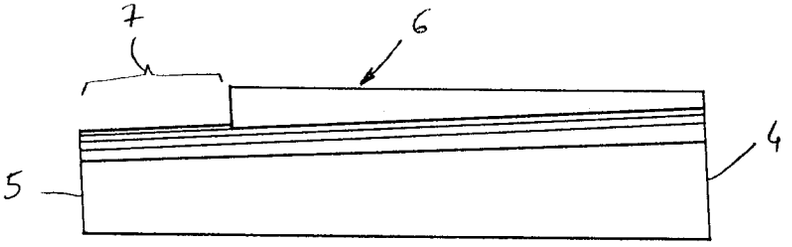

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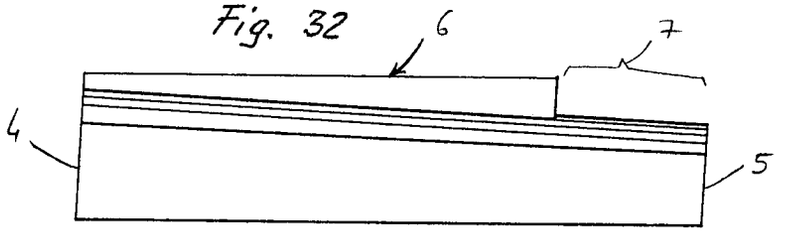
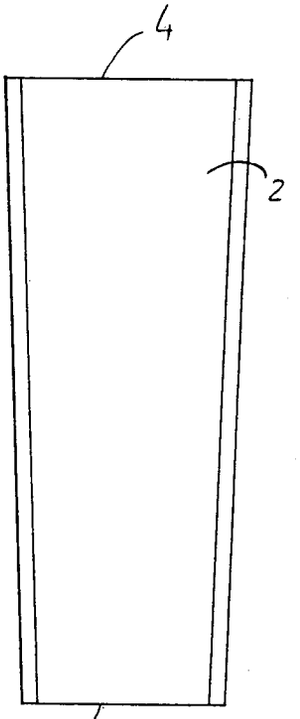


Fig. 33



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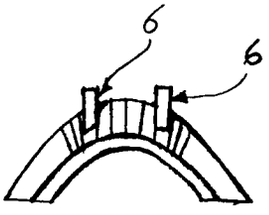

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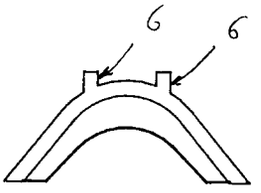

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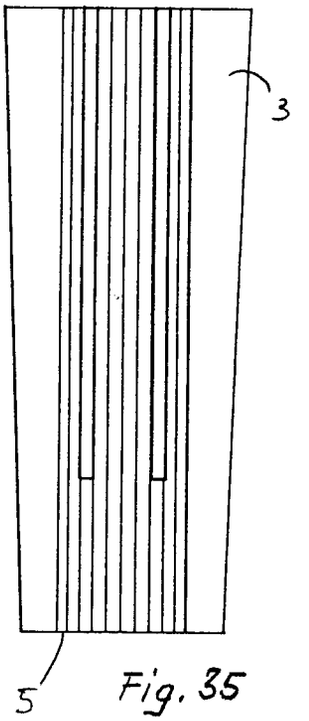

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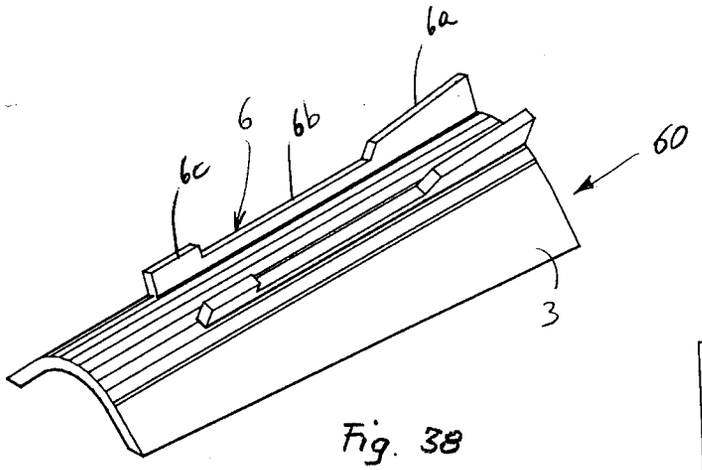
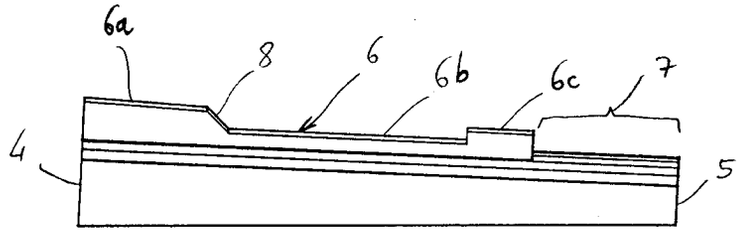


Fig. 38



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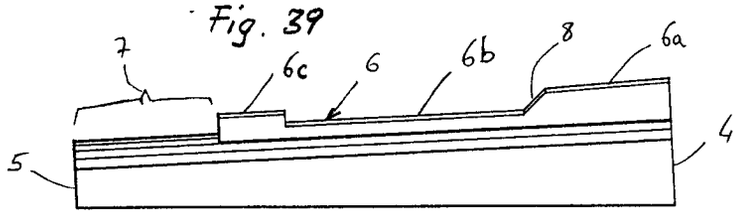

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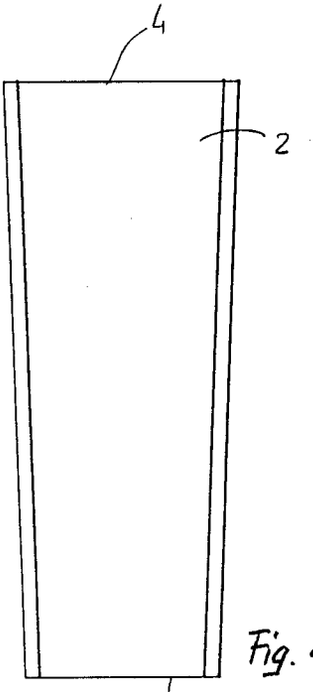

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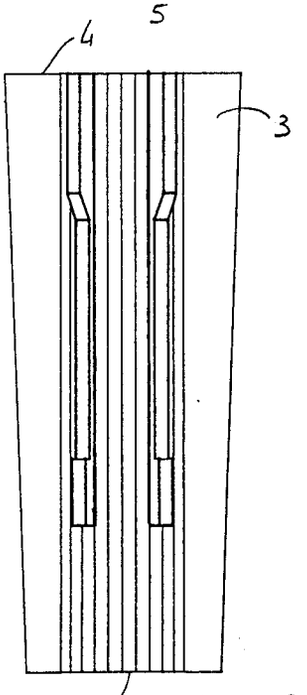

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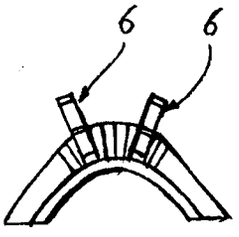

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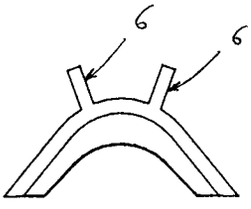

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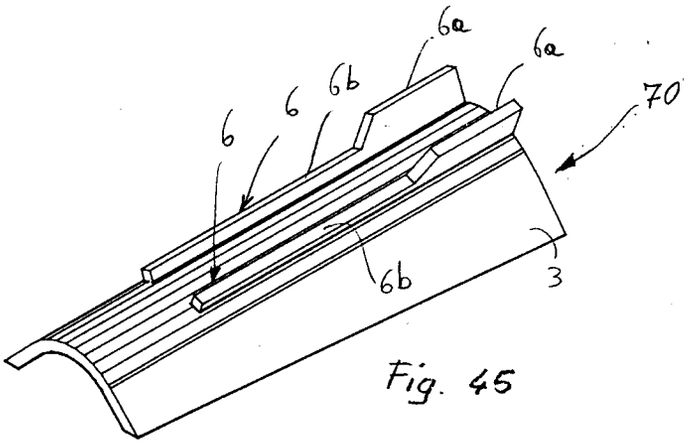

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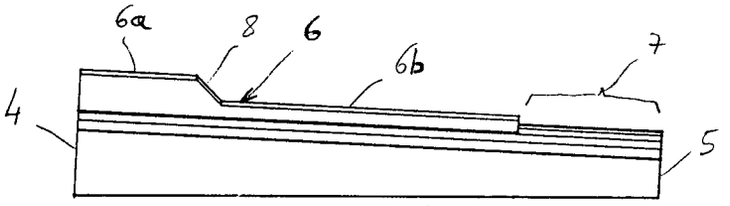

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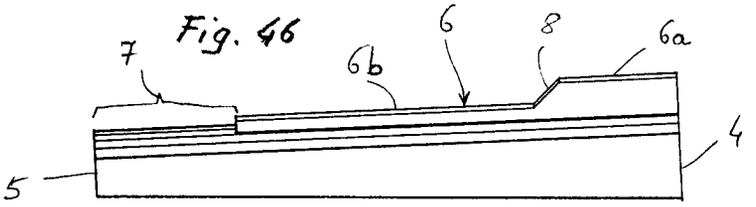

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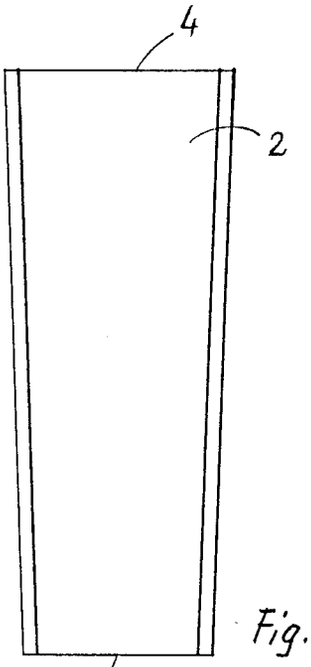

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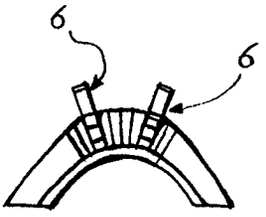

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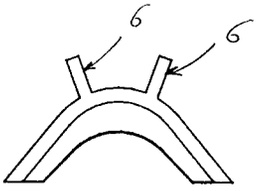

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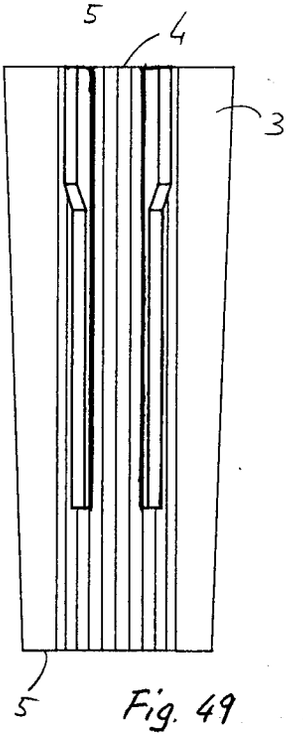

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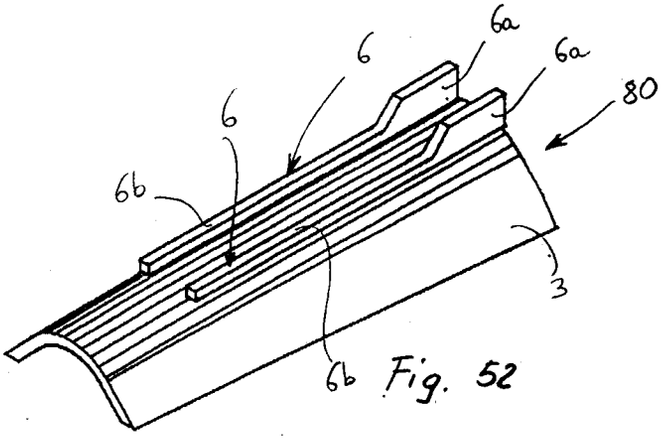

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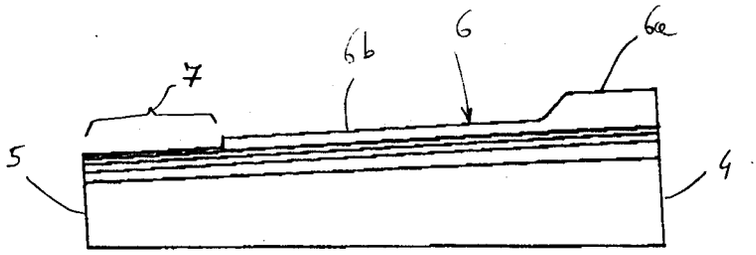

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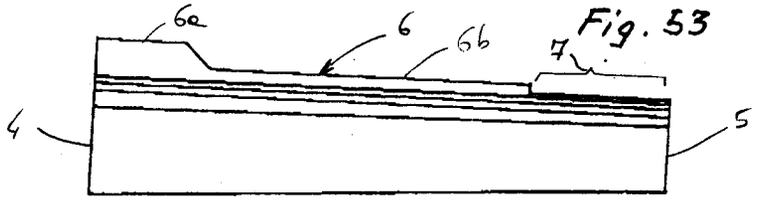

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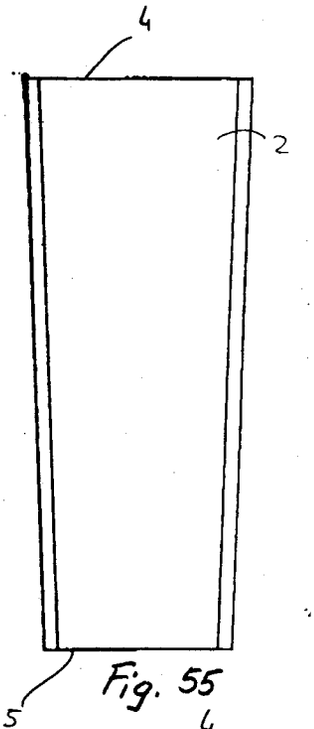

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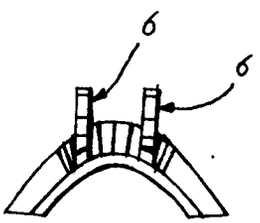

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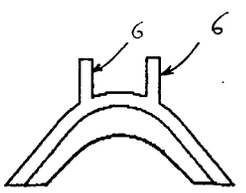

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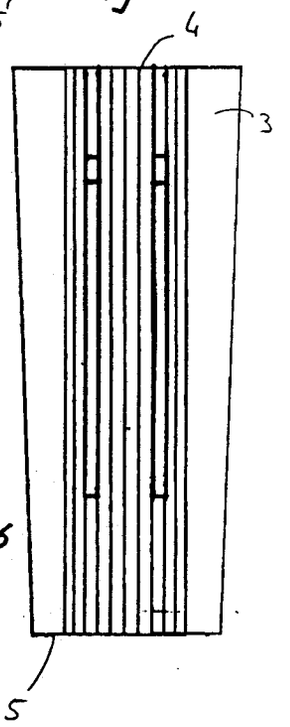

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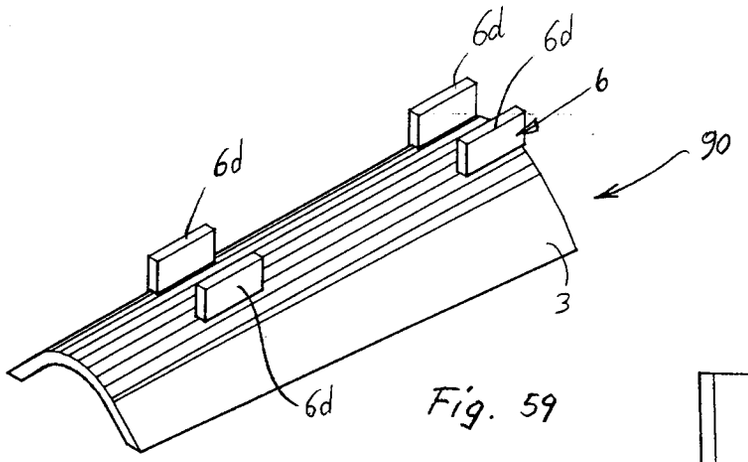

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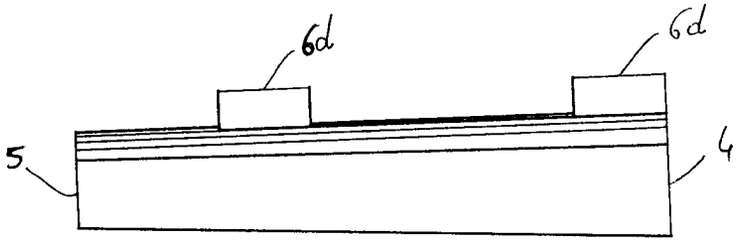

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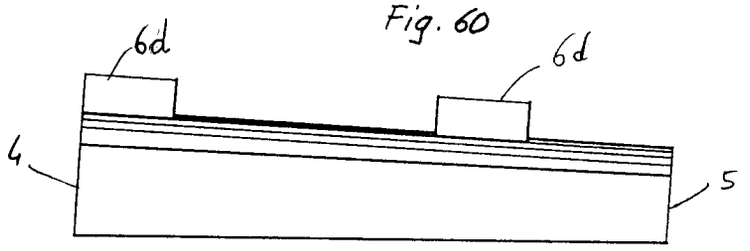

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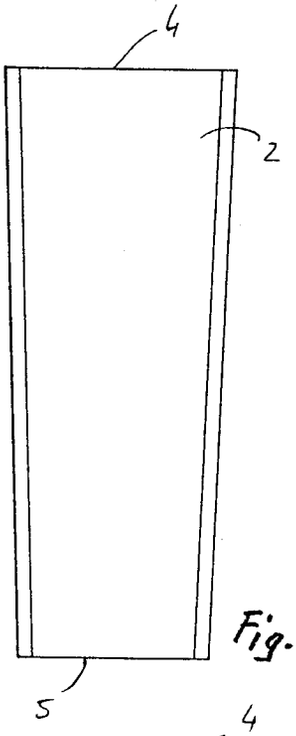

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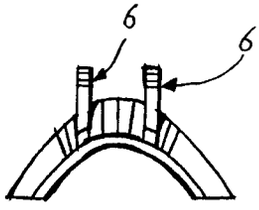

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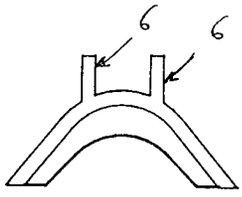

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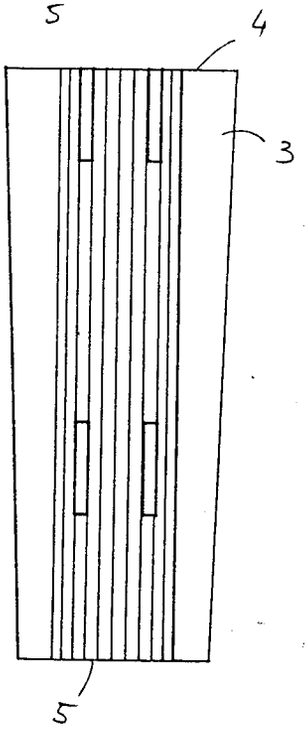

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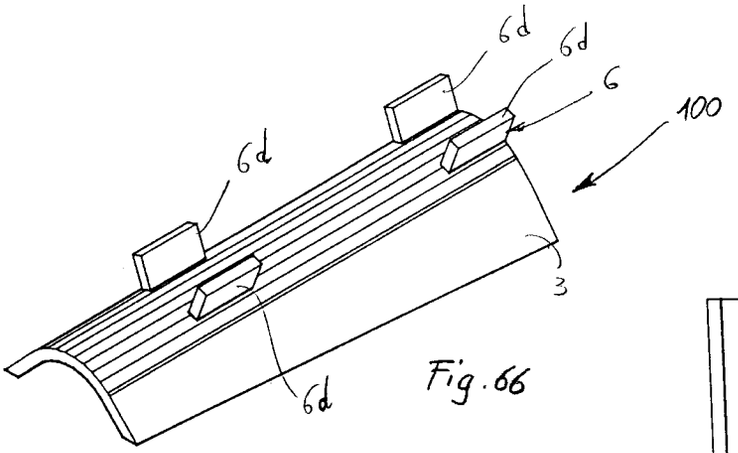

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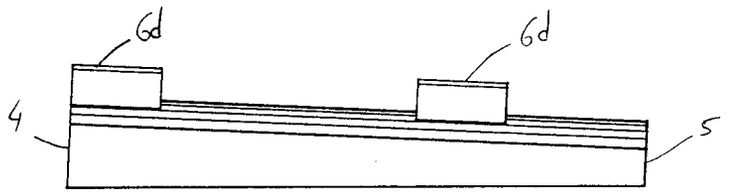

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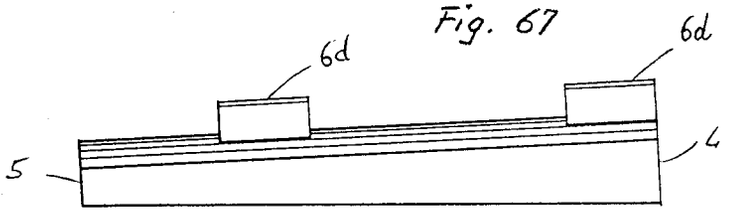

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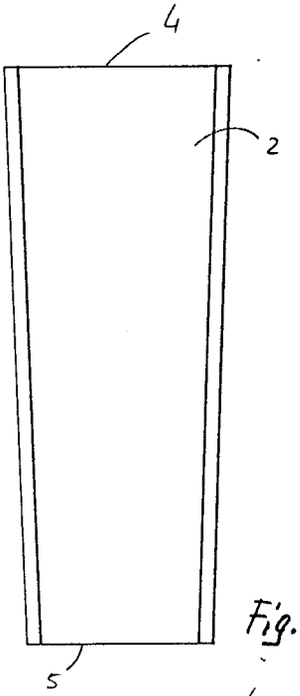

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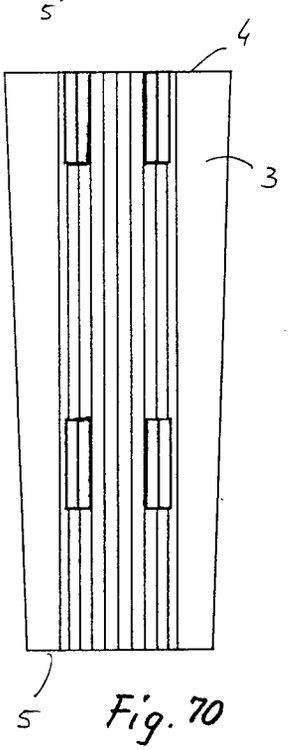
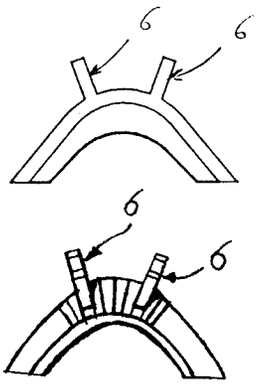


Fig. 70

Fig. 72



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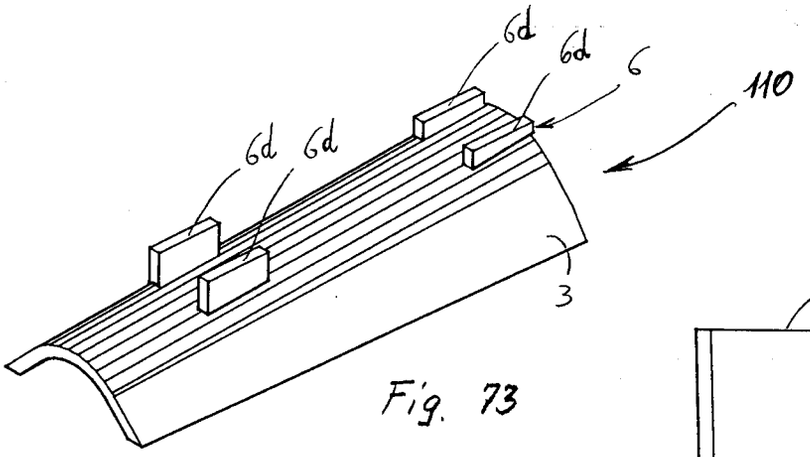

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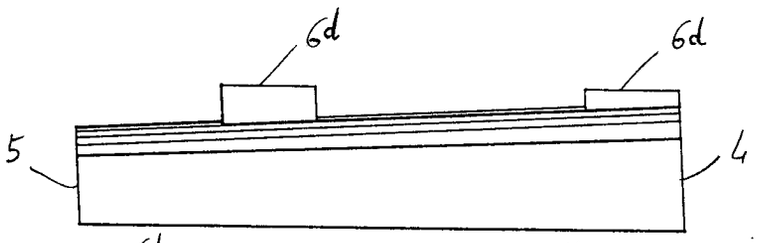

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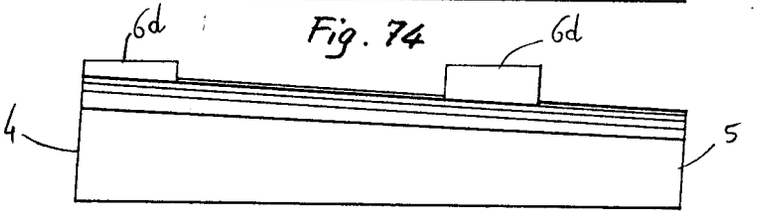

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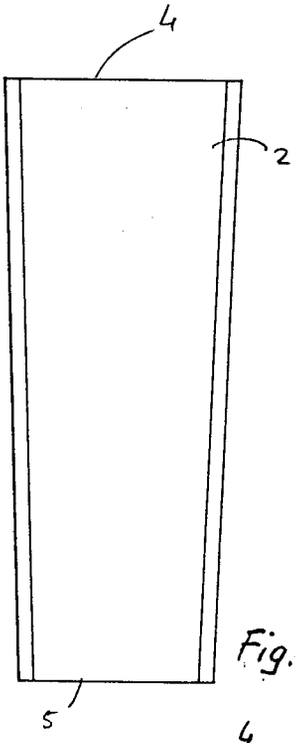

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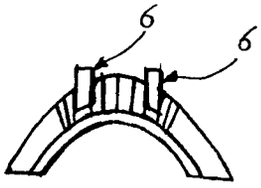

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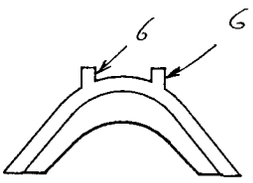

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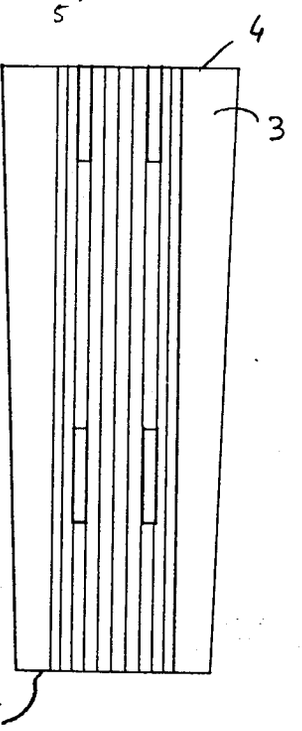

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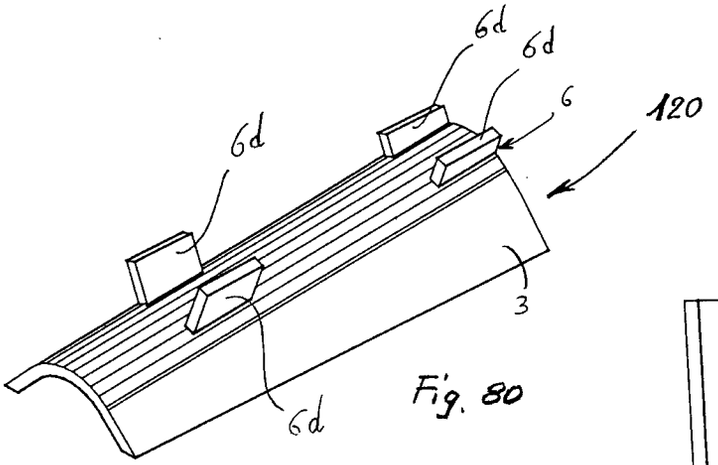

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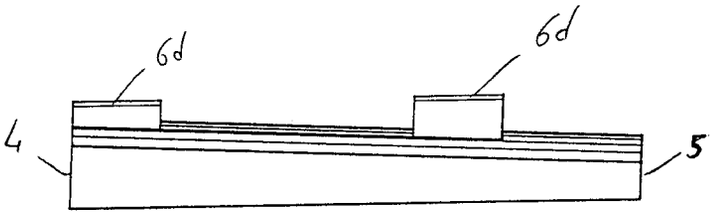

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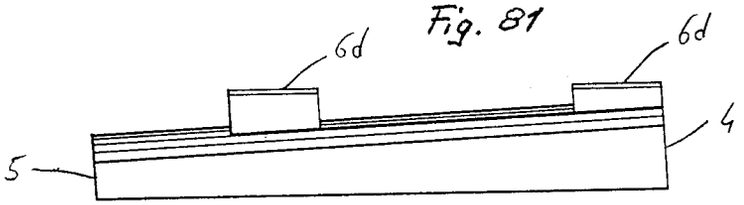
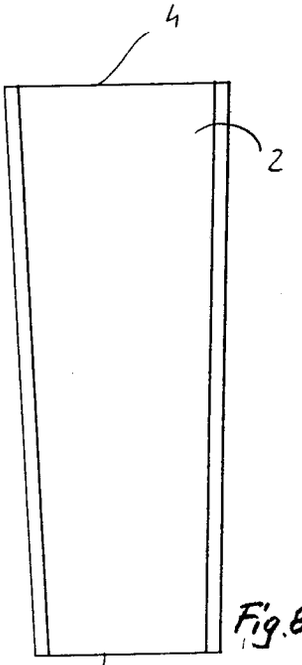


Fig. 82



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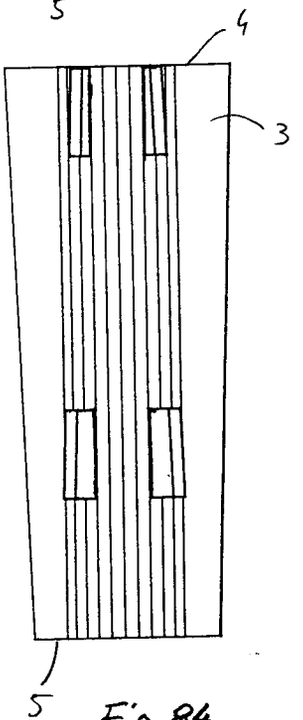

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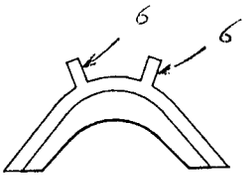


Fig. 86

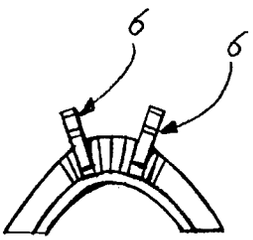


Fig. 85

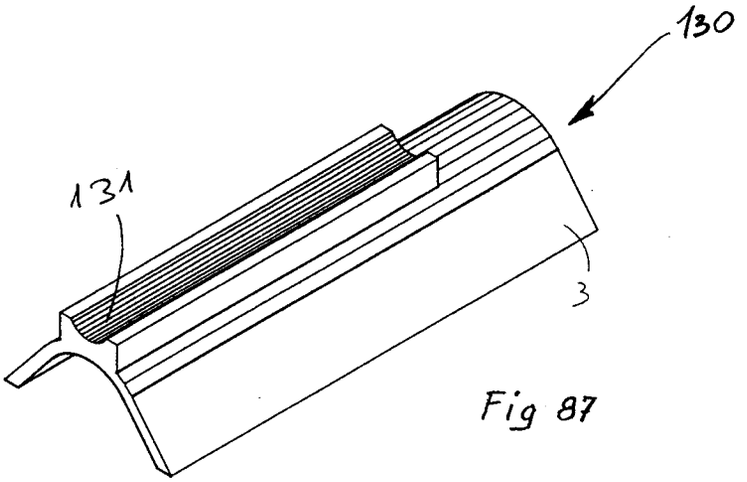
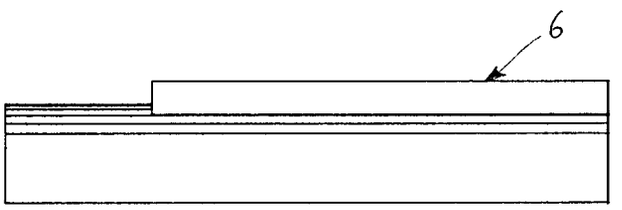


Fig 87



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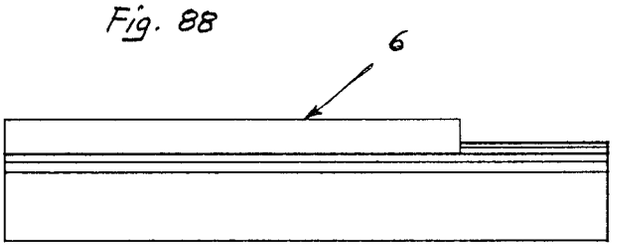

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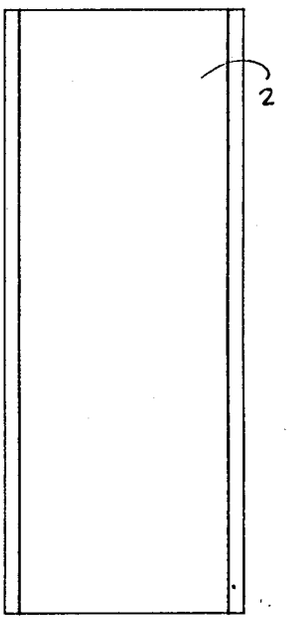

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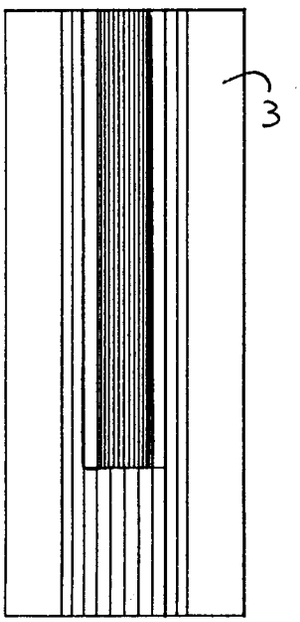
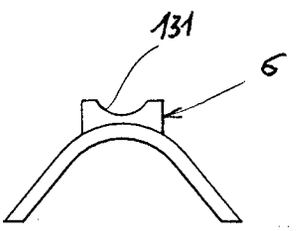


Fig. 91



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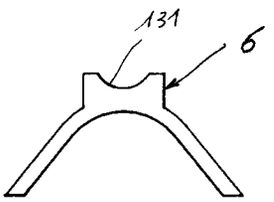

Fig. 93

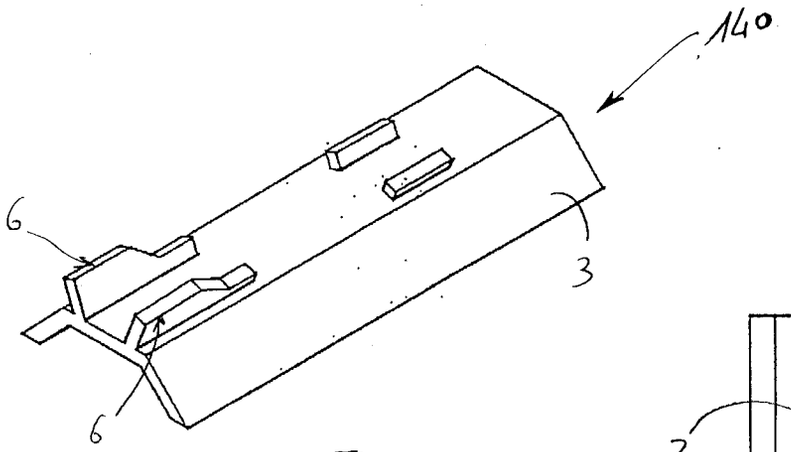

Fig. 94

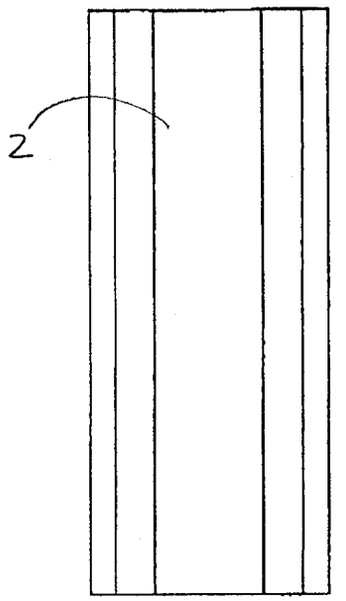

Fig 97

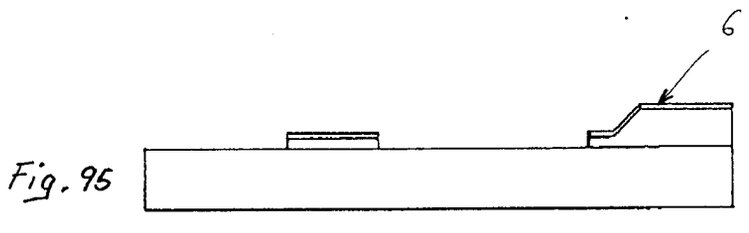

Fig. 95

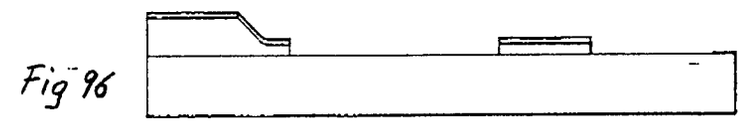

Fig 96

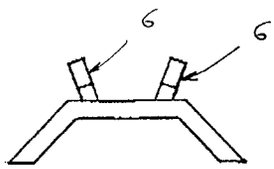

Fig 99

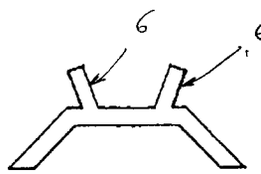

Fig 100

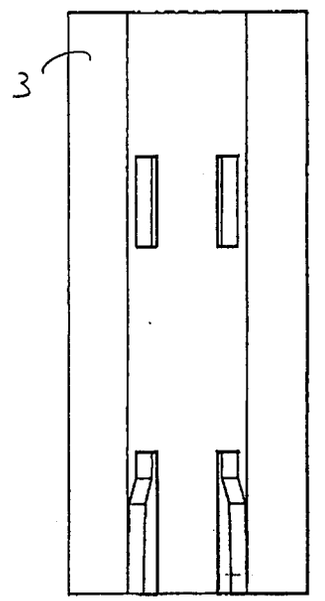

Fig 98

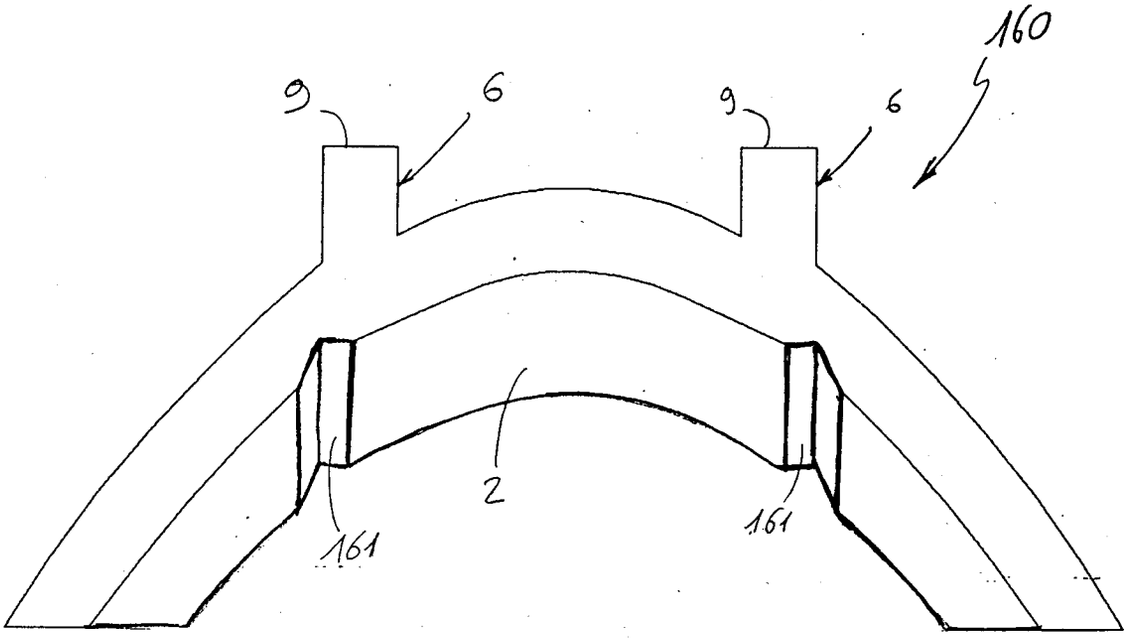

Fig 103

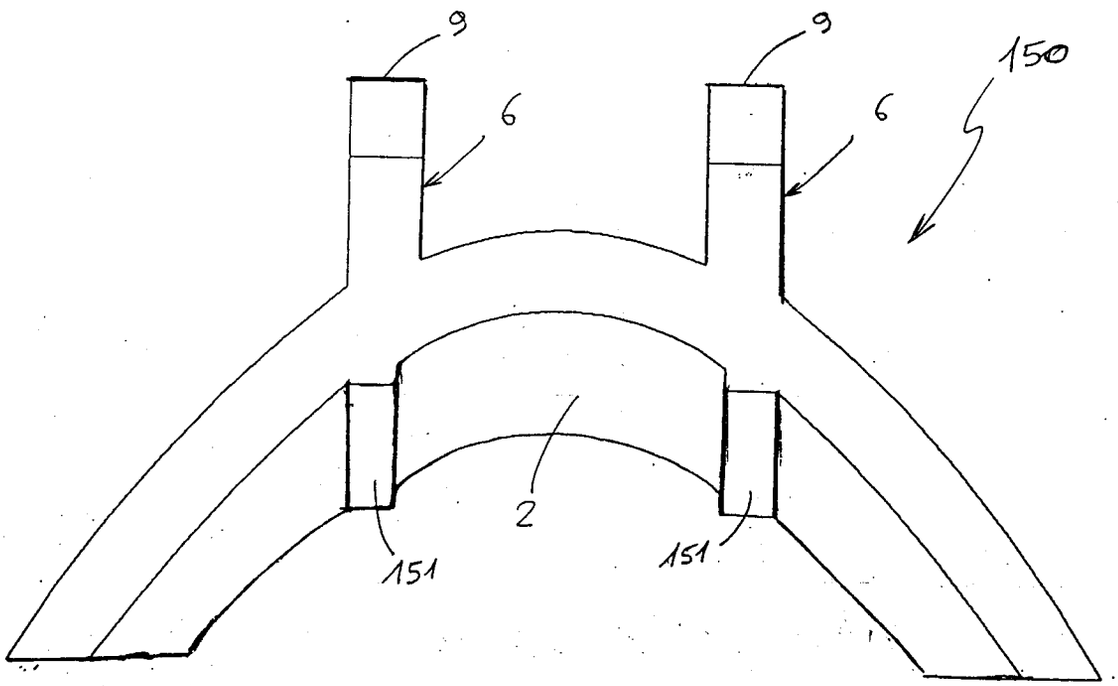

Fig. 102

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 20 3570

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE-C-840 591 (MAZELAYGUE, ERESUE)	1-5,7, 11-13	E04D1/04
Y	* page 2, line 7 - page 2, line 19 *	8,9	
A	* page 2, line 23 - page 2, line 39 *	6	
	* page 2, line 85 - page 2, line 109 *		
	* figures 1-6 *		

X	FR-A-989 570 (MAZELAYGUE, ERESUE)	1,2,4,5, 7,10-13	
Y	* the whole document *	8	
A		6	

Y	FR-A-2 223 529 (YBL MIKLOS FOISKOLA)	8,9	
	* page 3, line 18 - page 3, line 24 *		
	* figures 3,4 *		

A	FR-A-1 084 080 (GOUTTES)	1-5,7, 11-13	
	* figures 1-3 *		

A	FR-A-2 457 354 (SA TUILERIE BRIQUETERIE POUDENX)	1-4,6,7, 9,11-13	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
	* page 2, line 18 - page 2, line 25 *		E04D
	* figures 1-3,6,8 *		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	18 April 1995	Hendrickx, X

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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