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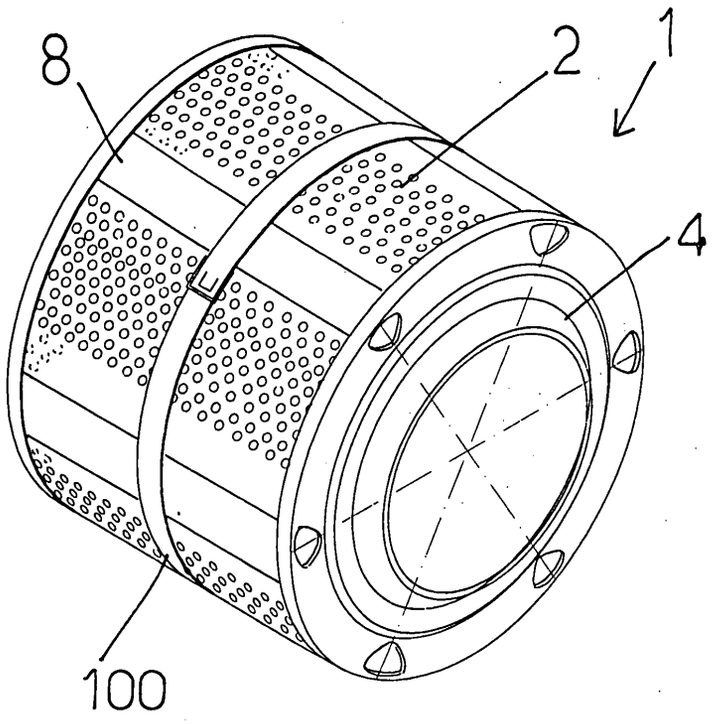
(54) Washing machine basket construction

(57) A basket construction for washing machines, dryer devices and the like, of the type comprising a cylindric band (2) including a plurality of wedge elements (8) facing the inside of the basket (1), a rear closing disc (5) and a front ring element (3), is characterized in that said basket construction comprises moreover coupling means for providing a direct mechanical coupling between the ring element (3) and band (2), at the wedge elements (8) of the latter, and at least a band holding belt (100) adapted to allow the basket to turn with a very high R.P.M.'s.

FIG 1



EP 1 505 188 A2

Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a basket construction for washing machines, dryer devices and the like.

[0002] Baskets for washing, drying machines and the like, including a basket body having a substantially drum-like configuration are already known.

[0003] Such a basket conventionally comprises a perforated metal band forming the cylindric wall of the basket, a rear closing disc for closing the drum, supporting a supporting cross arrangement for bearing the basket shaft and a front ring-element defining a front loading mouth for loading linen therethrough, to arrange the latter inside the basket.

[0004] In the case of a top loaded machine, on the other hand, the front ring is replaced by a closing or closure cover, whereas the side band comprises a linen introduction opening, for introducing linen to be washed into the basket or drum.

[0005] To provide an efficient mixing or blending of the material to be washed or dried, on the inner side of the perforated metal band defining the cylindric wall of the basket, a plurality of projections, having a substantially wedge-shaped cross-section, and operating as "entraining or driving elements" are provided.

[0006] Thus, owing to the provision of the above mentioned projections or lugs, the rotary movement applied to the basket will drive upward the linen held therein, to cause said linen to fall under gravity, to provide an efficient washing operation.

[0007] The provision of the above mentioned projections or lugs, which will be hereinafter called "wedge elements", however, causes a lot of problems or coupling difficulties between the band and front ring element or cover.

[0008] In fact, because of the provision of the above mentioned wedge elements, the edge of the band will assume an uneven arrangement, which, on the other hand, must perfectly mate or fit that of the basket front ring element or cover.

[0009] Prior approaches for providing such an attachment provide to form welding or weld points or spots between respectively the walls of the front ring element or cover and basket wedge elements, formed at mutually engaging surfaces thereof.

[0010] However, the above mentioned welding process disadvantageously modifies the required chemical-physical properties of the basket material (stainless steel-chrome material, AISI 430), which is sensible to such a welding thermal process.

[0011] Moreover, the weldment joint, which, for the above mentioned reasons, must be located at a very small spot of the basket, does not provide the required mechanical strength of the device.

[0012] In fact, the mentioned attachment points, which are generally unevenly distributed, do not provide a desired coupling structural continuity, but, owing to the above mentioned alterations of the basket material, can originate oxidation phenomena which are very noxious for the desired stability of the coupling.

[0013] In addition to the above mentioned drawbacks, the welding of the front ring element or cover on the basket wedge elements, has the disadvantage that it cannot provide the desired and required centering ratio therebetween.

[0014] In fact, as the weldment operation is performed, the ring element or cover can be displaced from a perfectly centered condition thereof, with respect to the cylindric band thereon it must be locked, with the consequence that the end product can comprise undesired clearances or gaps between the connected parts.

[0015] To the above it should be added that the additional required materials and power, involved in the above mentioned basket welding processes, negatively affect the article making overall cost.

SUMMARY OF THE INVENTION

[0016] Accordingly, the aim of the present invention is to provide such a basket construction for washing, drying machines and the like, which provides an improved constructional strength with respect to analogous prior baskets, mainly at a level of the mutual attachment sections of the wedge elements and front ring element or cover.

[0017] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a basket construction, which is devoid of any unevennesses as frequently occurring at the attachment sections of the wedge elements and front ring or cover in conventional baskets.

[0018] A further object of the present invention is to provide such a basket making method, which allows to greatly reduce the cost of a washing machine or the like basket construction.

[0019] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a basket construction for washing, drying machines and the like, of the type comprising a cylindric band including a plurality of wedge elements facing the inside of the basket, a closure rear disc and a front ring element, and being characterized in that said basket construction further comprises coupling means adapted to provide a direct mechanical coupling between said ring element and band, at the wedge elements of said band, and at least a band holding belt arrangement.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] Further characteristics and advantages of the present invention will become more apparent hereinaf-

ter from the following detailed disclosure of a preferred, though not exclusive, embodiment of the invention, which is illustrated, by way of an indicative, but not limitative example, in the accompanying drawings, where:

Figure 1 is an overall perspective view showing the basket construction according to the invention;
Figure 2 is a further perspective view, analogous to that of figure 1, but illustrating a basket construction including a holding belt arrangement;
Figure 3 shows the basket construction of figure 1, in a pre-assembled condition, in which the front ring element is assembled on the cylindric perforated band;
Figure 4 is a partial cross-sectional view illustrating the basket of figure 1;
Figure 5 illustrates a detail of the cross-section of a wedge element formed on the basket shown in figure 3;
Figure 6 illustrates a detail of a window arrangement formed through the ring element shown in figure 3;
Figure 7 illustrates a detail A of figure 4, in a pre-assembled condition of the ring element;
Figure 8 is a top plan view illustrating a detail of figure 7;
Figure 9 illustrates the detail A of figure 4, at the end of the ring assembling operation;
Figure 10 is a top plan view illustrating a detail of figure 9;
Figures 11 and 12 illustrate a modified embodiment of the basket shown respectively in figures 3 to 5;
Figure 13 illustrates the clamping of a belt arrangement;
Figure 14 is an enlarged view of a clamping point as shown in figure 13;
Figure 15 is a cross-sectional view illustrating the clamping connection of figures 13 and 14;
Figure 16 illustrates a clinched connection of the belt arrangement;
Figure 17 is a side view of the clinched connection of figure 16;
Figure 18 is a side cross-sectioned view of the clinched connection of figure 16;
Figure 19 illustrates the weldment of the belt arrangement; and
Figure 20 is a perspective view illustrating a condition prior to the weldment of figure 19.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0021] With reference to the number references of the above mentioned figures, the basket construction according to the present invention, which has been generally indicated by the reference number 1, has been specifically designed for application to a washing, drying machine or the like.

[0022] The embodiment herein illustrated and disclosed, is related to a front loaded basket construction.

[0023] However, the invention can also be extended to a top loaded basket construction.

[0024] In the latter case, the front ring element is replaced by a closure cover, and the perforated cylindric band has an access mouth for linen to be washed in the basket 1.

[0025] Said basket is preferably made of a stainless steel material, or a chrome stainless steel material, AISI 430, and substantially comprises a perforated metal band 2, a front ring element 3, and a bottom member or disc 5 for closing the basket 1 and being applied at the rear side of the latter.

[0026] The metal perforated band 2, in particular, forms the side cylindric wall 15 of the basket, whereas the front ring element 3 comprises a loading mouth 4 for front loading into the basket 1 the linen material to be washed and/or dried.

[0027] As above mentioned, for a laterally loaded basket construction, the ring element would be replaced by an internally closed disc, i.e. a disc without loading mouth 4, whereas the band 2 would be provided with a door for introducing linen material to be washed.

[0028] The bottom or disc element 5, provided for closing the basket construction 1 from its rear side, comprises a cross member 6 for supporting the drive shaft 7 for rotatively driving the basket construction.

[0029] On the band 2 of the basket 1, moreover, a plurality of entraining or driving wedge elements 8 are provided, made in a single-piece with said band.

[0030] Said driving or entraining wedge elements, in particular, are formed by a projection or lug and a deformed portion of the band 2, directed inward of the basket, and operating the latter to properly grip the linen material to be washed.

[0031] The cross section of each wedge element 8 facing the ring element 3, and provided for engaging therewith, is prepared, before assembling, with an edge 9 formed by a wall facing the inside of the wedge element and being parallel to the surface of the front ring element 3, or substantially perpendicular to the axis of said wedge element.

[0032] As is clearly shown in figure 10, the edge 9 comprises material added by the front flange element or mouth.

[0033] In particular, the surface of the ring element 3 comprises, at each wedge element 8, a window 10 substantially constituted by a hole having the configuration of the contour of the projecting edge 9 of the respective wedge element 8.

[0034] Moreover, the edge portion or contour of the window 10 is so deformed as to provide an upturned or edge portion 11 facing the inside of the basket 1, i.e. a direction substantially perpendicular to the edge 9.

[0035] The connection of the ring element 3 on the band 2, at the level of the wedge elements 8 and windows 10, is better shown in figures 7 and 8, from which it should be apparent, in particular, that the ring element

3 is applied on the band 2, by engaging the edge portion 11 of the windows 10 inside the respective wedge element 8, by overlapping it, and arranging it cross-wise, with respect to the projecting edge 9 of the wedge element 8; thus, substantially providing a bridging arrangement.

[0036] In this operation step, the connection is made, in a centered manner, by abutting the edge portion 11 of the ring element 3 against the contour of the edge 9 of the wedge element 8, which is substantially arranged at 90°, with respect to the latter.

[0037] The wedge portion 11, suitably guided by the bearing edge 9, is shown by a marked line in figure 8.

[0038] Starting from this self-centered arrangement of the edge portions 11 which are arranged inside the respective wedge element 8, the mutual clamping of these portions, and accordingly, of the band 2 and ring element 3, is performed by upsetting or riveting each individual edge portion against the projecting edge 9 of the respective wedge element 8.

[0039] This operation, which is a cold operation, provides, in particular, that the edge portions 11 of the ring element 3 are at first inward or backward folded or bent and then pressed against the projecting edge 9 of the respective wedge element 8.

[0040] Thus, a broad sealing surface between the above mentioned parts which substantially corresponds to that of the folded overlapped edge portion 11 pressed against the edge 9 of each wedge element 8 is provided.

[0041] This surface is clearly shown in figure 10.

[0042] According to the invention, to the band 2 of the basket, at least a holding belt element 100, for strengthening or stiffening the assembly, so as to allow the basket to turn with a very high R.P.M. number is applied.

[0043] The arrangement of the holding belt, with respect to the basket depth, can be changed, and will be determined by the thickness and height of the entraining or driving elements 8.

[0044] Said belt will be pre-stretched depending on the test loads the basket will be subjected to.

[0045] The joining point of the holding belt advantageously corresponds to the outer valley of the driving or entraining elements 8.

[0046] The joining method, as it should be apparent, can vary depending on requirements.

[0047] Figures 13 to 15 show a joining performed by a clamping operation 101.

[0048] This joining is advantageously carried out by performing a clamping operation at several points or spots.

[0049] Alternatively, the joining can be carried out by clinching, as indicated by the reference number 102 in figures 16 to 18, or welding, as indicated by the reference number 103 in figures 19-10.

[0050] As shown by way of an example in figure 2, it would be possible to apply two or more holding belts, according to the specific requirements.

[0051] According to a preferred embodiment, the inventive method for making the improved basket 1, as above disclosed, provides to prepare a cylindric band 2 including a plurality of wedge elements 8, having an edge 9 constituted by a wall inward projecting with respect to the wedge element and being substantially cross-oriented with respect to said wedge element, i.e. perpendicular to the surface of the above mentioned band 2.

[0052] Then, a front ring element 3 or cover including a plurality of windows 10 at each wedge element 8 is made.

[0053] Said windows, in particular, will be provided with an edge portion 11 perpendicular to the ring element 3 plane.

[0054] Then, the ring element 3 will be coupled on the cylindric band 2 by engaging the edge portions 11 inside the respective wedge elements 8, by arranging said edge portions in an overlapping relationship, substantially at 90° with respect to the related edge 9; thus the upsetting of each edge portion 11 against said edge 9, so as to be rearward bent and pressed against the surface of the latter, will provide a gripping action thereagainst; finally, one or more holding belts 100, as prestretched and joined by preferably a clamping, clinching, welding method or the like, will be applied.

[0055] The wedge elements 8 can comprise an outward axially projecting portion 12, with respect to the band 2, thereby engaging within the windows 13 of the ring element or front cover 3.

[0056] According to this embodiment, the mentioned windows are substantially analogous to the above disclosed windows, with a difference that they do not comprise projecting edge portions.

[0057] Finally, the connection is performed by upsetting the edge 12 of the wedge elements 8 inside the windows 13, by causing said edge 12 tc be rearward bent and then pressing it against the corresponding portion of the front ring element or cover 3.

[0058] The invention is susceptible to several modification and variations, all of which will come within the scope of the accompanying claims.

[0059] Thus, for example, the projecting wall 9 provided to mutually engage the wedge element 8 and ring element 3 can be replaced by a simple ridge bead, to be engaged or gripped by the above disclosed upset portion of the edge part 11 of said ring element 3.

[0060] Moreover, said edge part 11 can be also formed in an independent manner from said windows 10.

[0061] In particular, in this case, said windows 10 will provide an essential operating function only with reference to the modified embodiment shown in figures 10 and 11.

[0062] Finally, the shape of the wedge elements 8 and the windows on the front ring element or cover can be any, depending on the specific designing requirements of the machine.

[0063] With respect to prior baskets, the basket ac-

cording to the present invention provides the advantage of a mechanical direct connection of the wedge elements and ring element or front cover, i.e. without any welding spots susceptible to alter the response of the material to oxidation phenomena, and its sealing properties with respect to the made connection.

[0064] In particular, the mentioned mechanical sealing will be much more stable and efficient than conventional welded spot connections, since said mechanical sealing will extend to all the mutual attachment sections of the wedge elements and corresponding ring or front cover portion, and not only to a portion thereof, as it would occur in a conventional welding operation.

[0065] The cold anchoring connection, made by upsetting a projecting portion of the front ring or cover on the contour of the corresponding wedge element, provides the advantage of a "self-centering effect".

[0066] Thus, the assembly cab be carried out in a very accurate automatic manner, owing to the mutual engagement of the parts involved in the connection, thereby providing a very accurate basket, finished to a very high finishing degree.

Claims

1. A basket construction for washing, drying machines and the like, of the type comprising a cylindric band having a plurality of wedge elements facing an inside of the basket, a rear closure disc and a front ring element, **characterized in that** said basket construction further comprises coupling means for providing a mechanical direct connection of the ring element and band, at the wedge elements of said band, and at least a holding belt for said band.

2. A basket construction, according to claim 1, **characterized in that** said at least a holding belt comprises a joining region arranged at an outer portion of a basket driving element.

3. A basket construction, according to claim 1 or 2, **characterized in that** said belt joining region is made by a clamping operation.

4. A basket construction, according to one or more of the preceding claims, **characterized in that** said belt joining region is made by a clamping operation at a plurality of clamping points.

5. A basket construction, according to one or more of the preceding claims, **characterized in that** said joining of said belt is carried out by a clinching operation.

6. A basket construction, according to one or more of the preceding claims, **characterized in that** said joining of said belt is carried out by a welding operation.

7. A basket construction, according to one or more of the preceding claims, **characterized in that** said basket construction comprises two or more holding or restraining belts.

8. A basket construction, according to one or more of the preceding claims, **characterized in that** said coupling means comprise projecting portions formed on an engagement section of each said wedge element with said ring element, said projecting portions cooperating with corresponding projecting portions of said ring element.

9. A basket construction, according to one or more of the preceding claims, **characterized in that** said ring element projecting portions comprise a wall formed on an end portion of said wedge elements facing said ring element and oriented toward an inside of said wedge elements and at a position substantially parallel to the surface of said ring element thereon said wall is designed to be clamped.

10. A basket construction, according to one or more of the preceding claims, **characterized in that** said ring element projecting portions comprise an edge portion formed at an attachment section on each said wedge element and having a shape and size adapted to be engaged inside each said wedge element, above and beyond said projecting wall.

11. A basket construction, according to claim 10, **characterized in that** said edge portion comprises a wall oriented toward the inside of the basket.

12. A basket construction, according to claim 10, **characterized in that** said edge portion, upon performing the mechanical connection, is rearward turned and clamped against the wall of the respective wedge element.

13. A basket construction, according to claim 10, **characterized in that** said edge portion is formed by the sheared and upturned edge of a window arrangement formed on a surface portion of said ring element arranged at the level of each said wedge elements.

14. A basket construction, according to one or more of the preceding claims, **characterized in that** said coupling means comprise a portion of said wedge elements axially projecting outside said cylindric band, designed for cooperating with a corresponding window arrangement of the front ring element, so as to be locked inside the latter, at its contour.

15. A basket construction, according to one or more of

the preceding claims, **characterized in that**, in replacement of said front ring element, a closed cover is provided, and that a mouth for laterally introducing into said basket linen material to be washed is formed on said cylindric band.

FIG 2

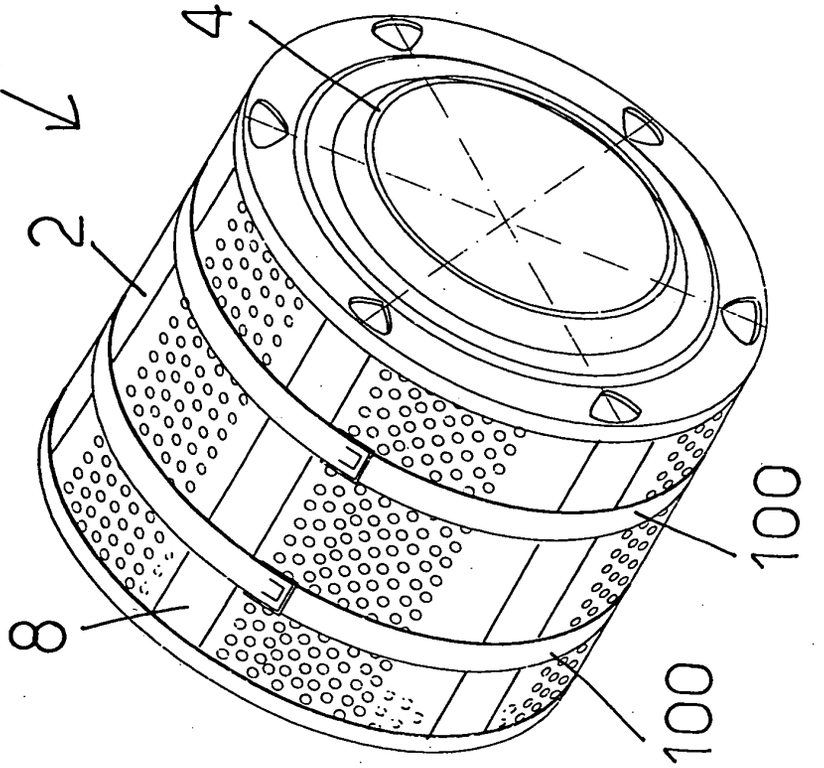


FIG 1

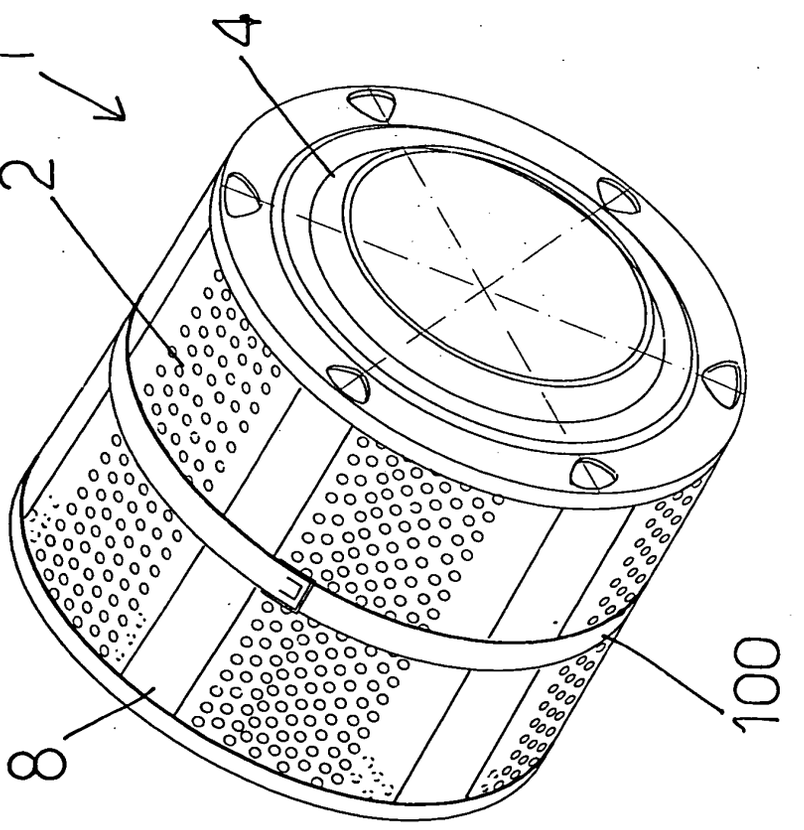
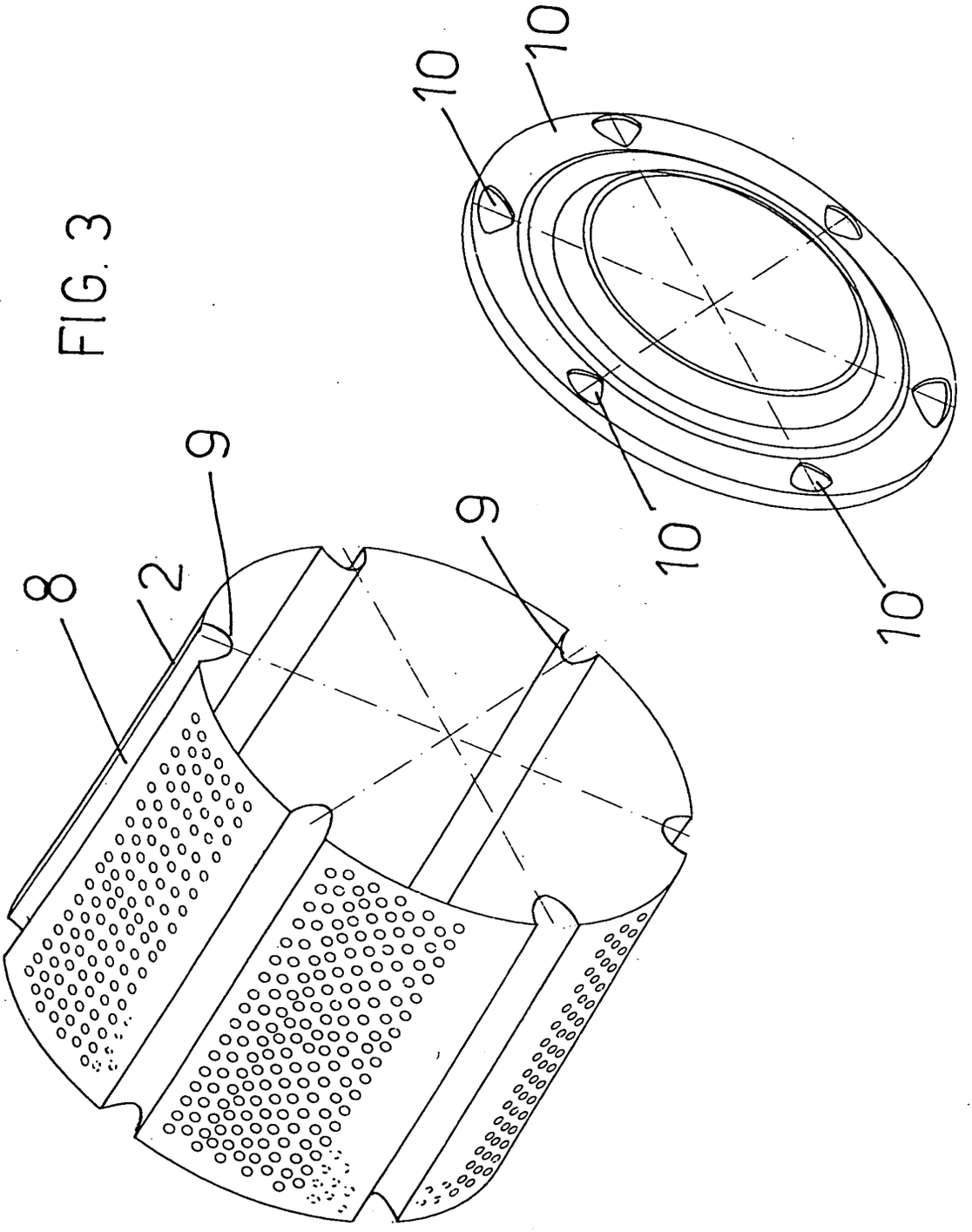


FIG. 3



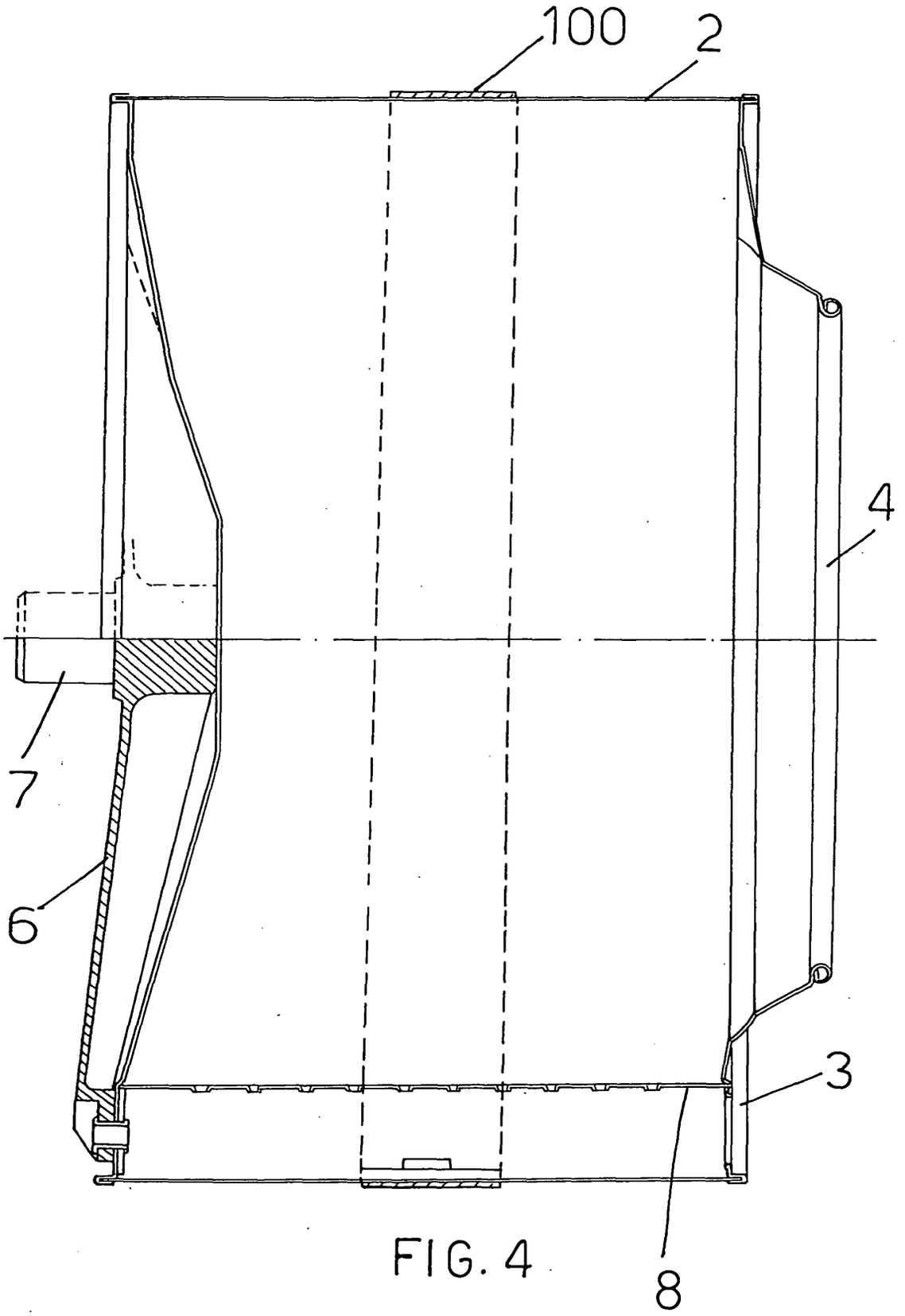


FIG. 4

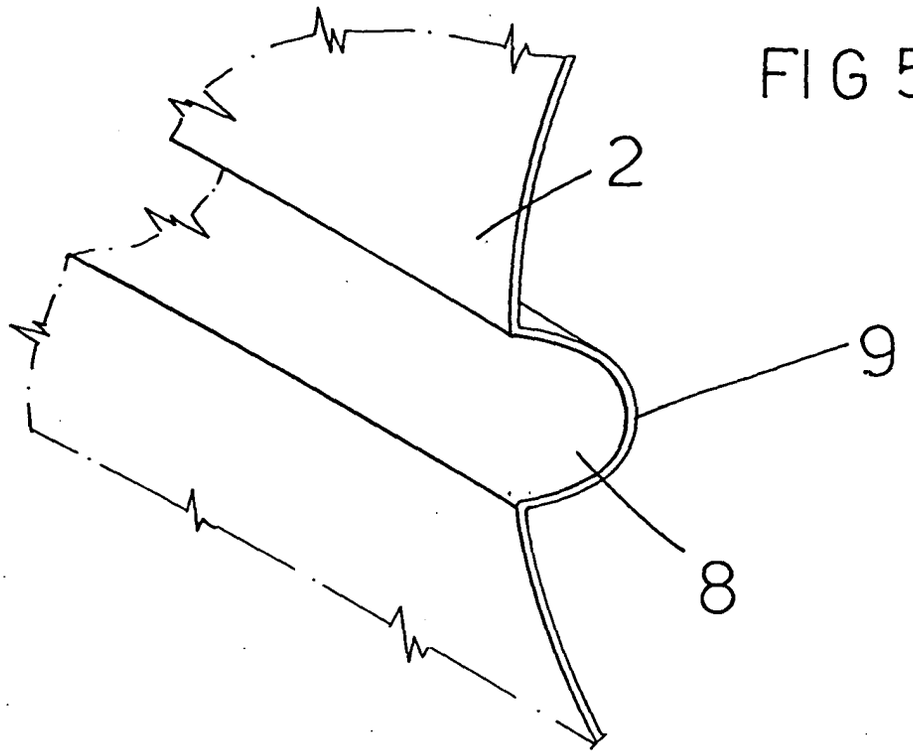


FIG 5

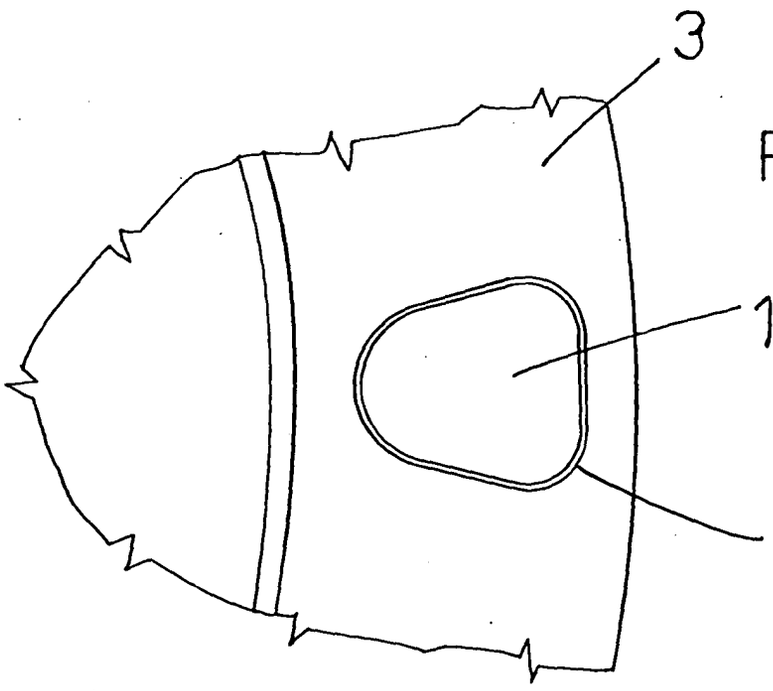


FIG 6

FIG 8

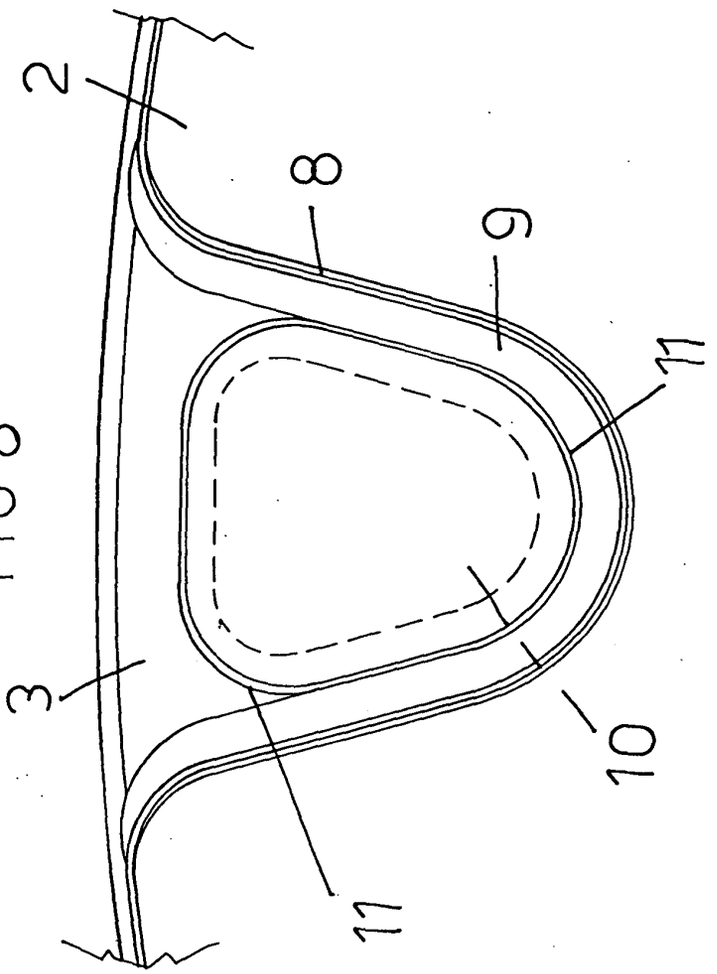


FIG 7

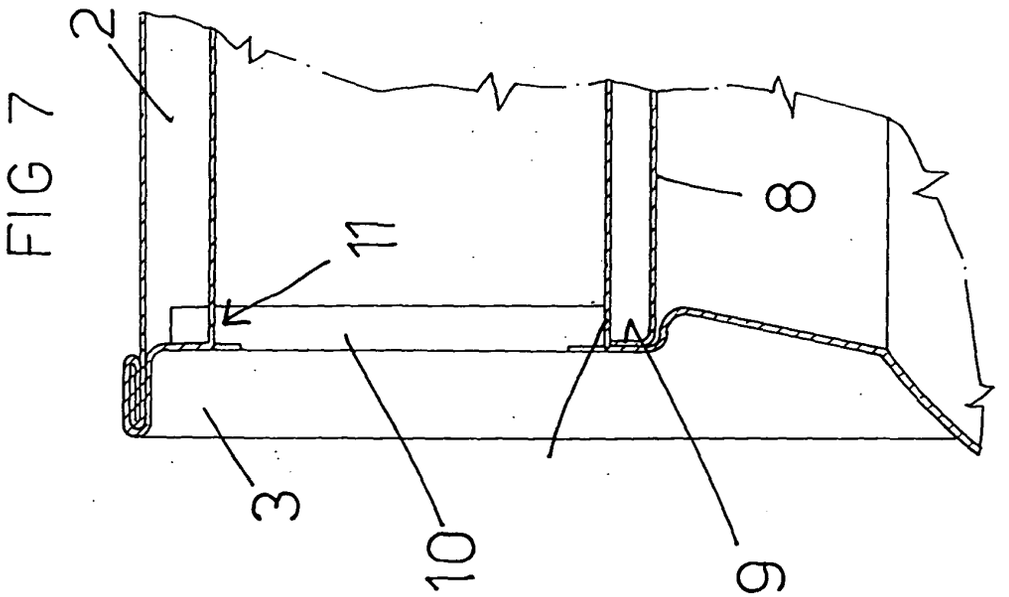


FIG 10

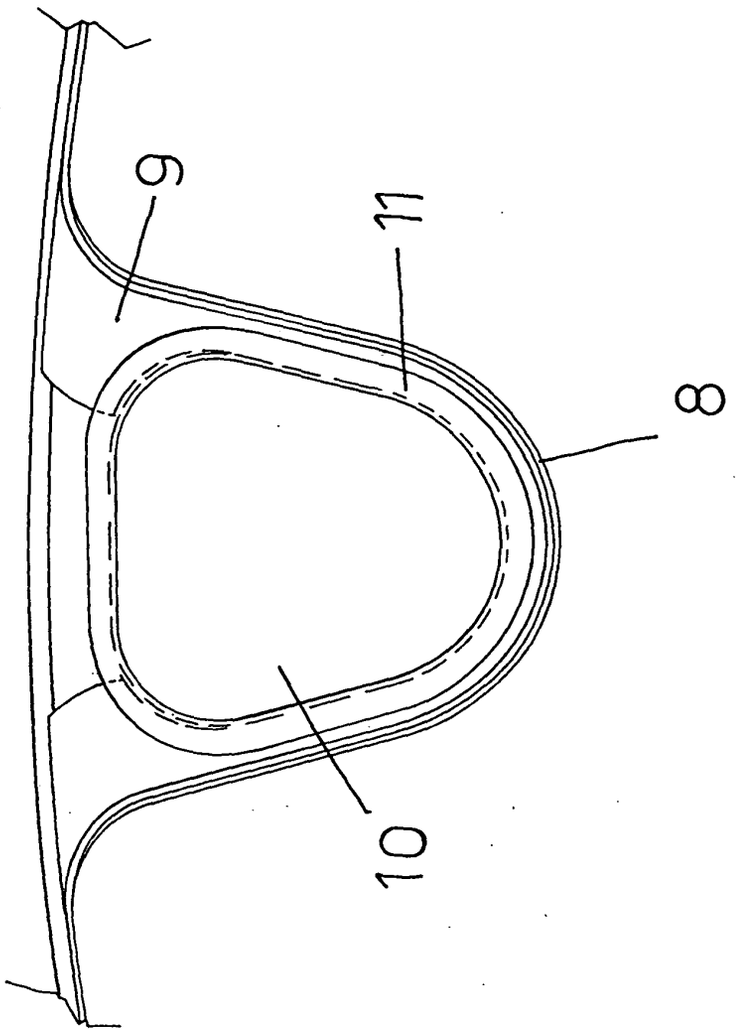


FIG 9

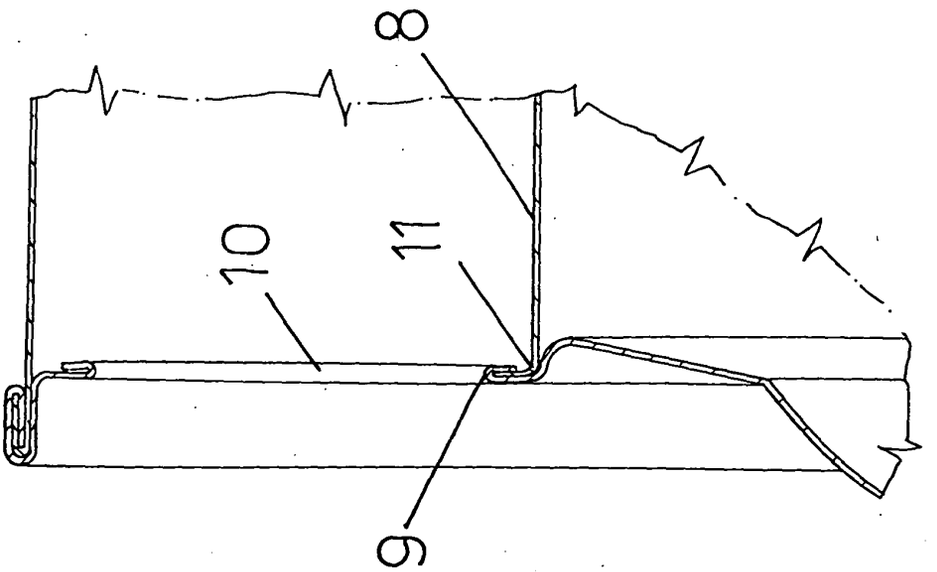


FIG 11

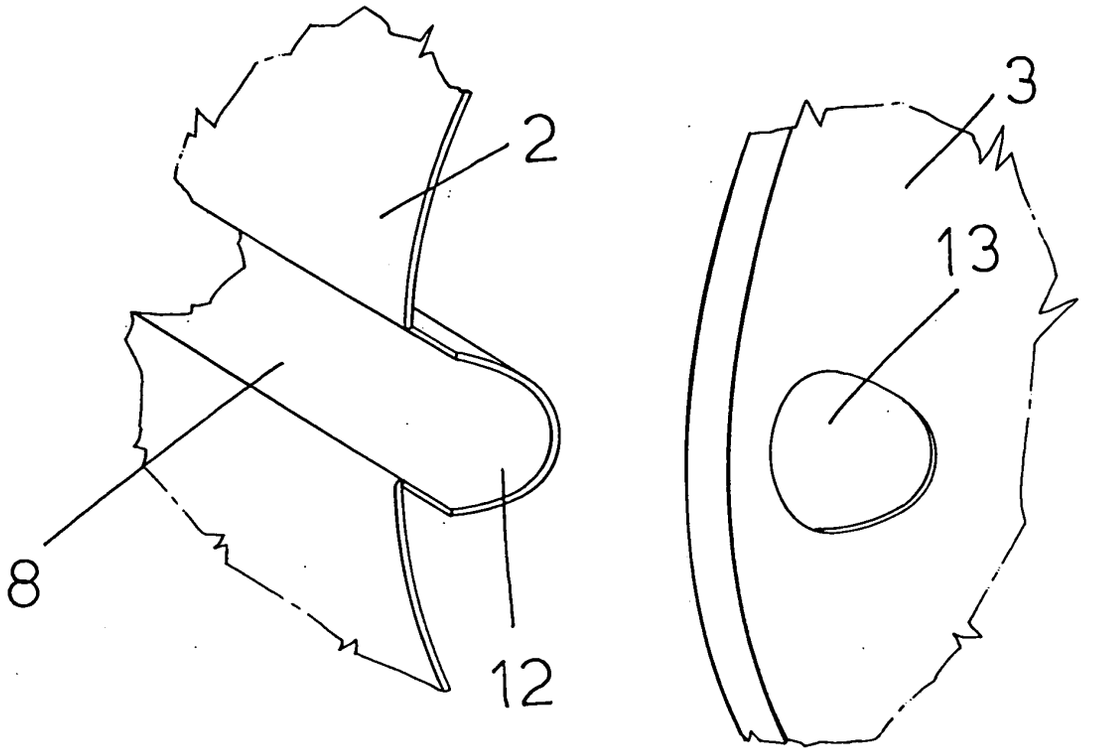


FIG 12

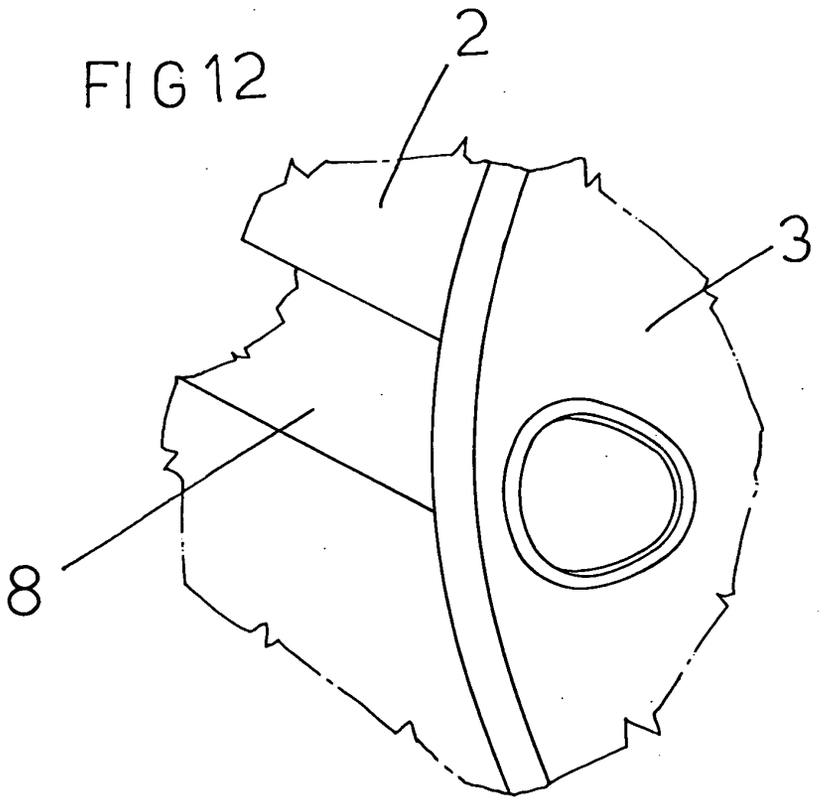


FIG 13

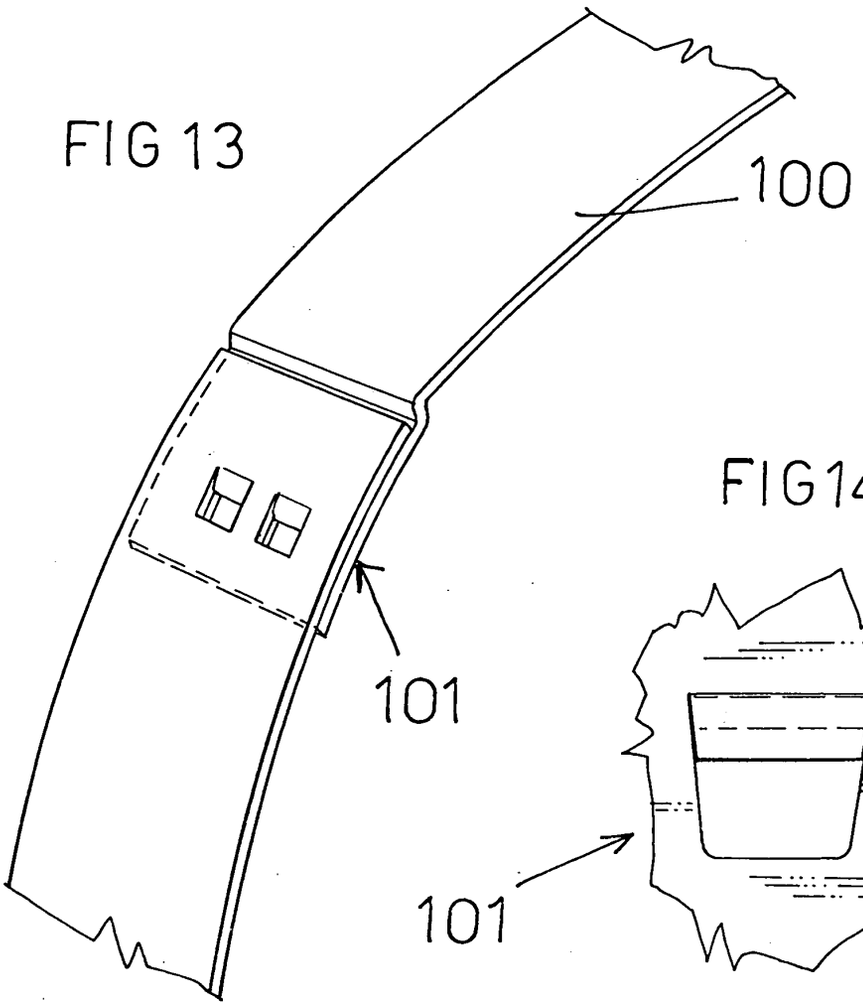


FIG14

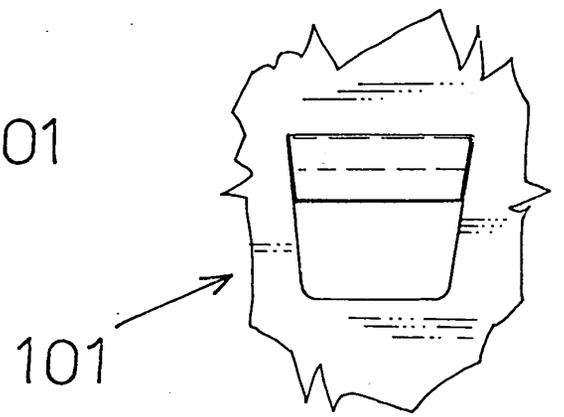


FIG 15

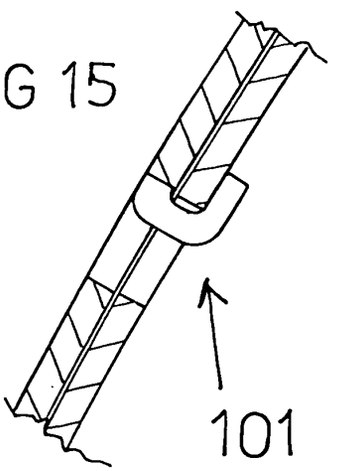


FIG 16

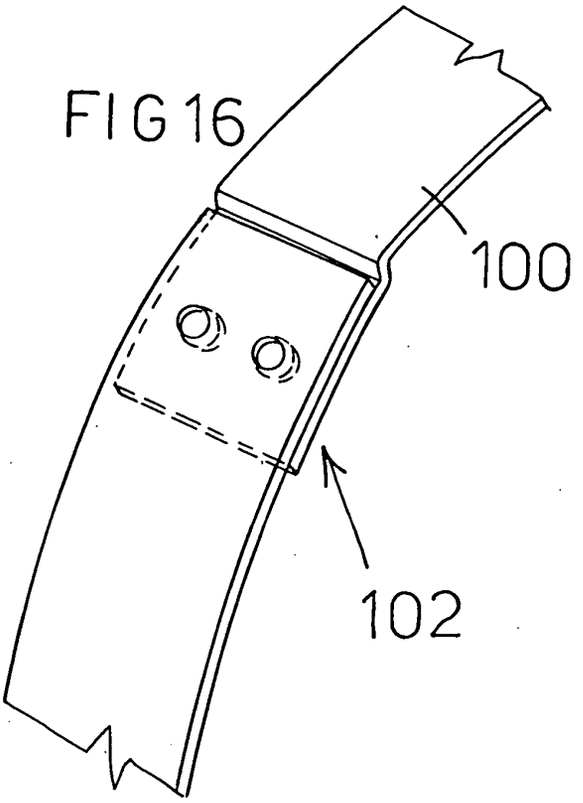


FIG 17

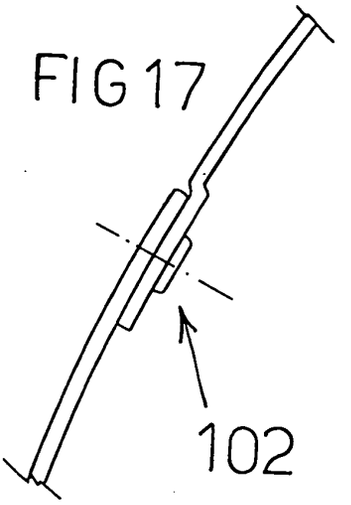


FIG 18

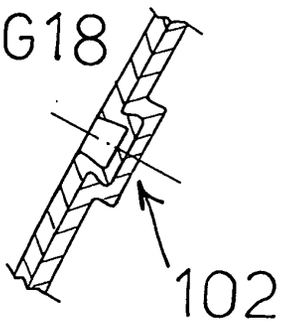


FIG 19

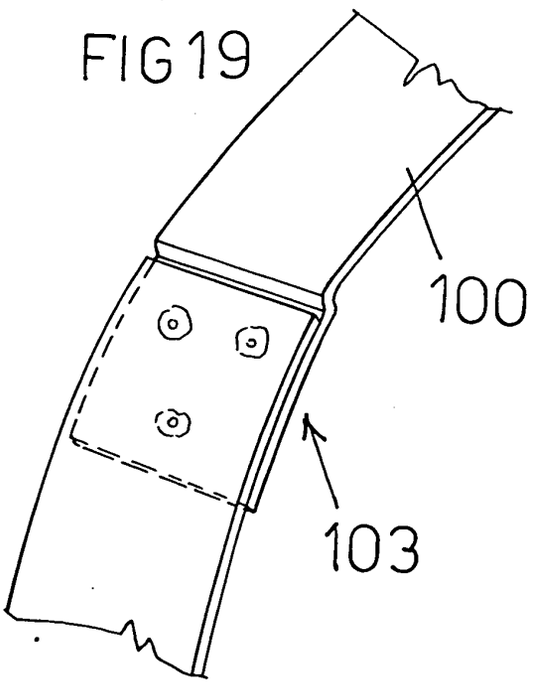


FIG 20