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(54) Spider for high speed washing machine baskets, a washing machine basket provided with this spider and a method for making the basket

(57) A spider for high speed washing machine baskets comprises a ring element (6) with a plurality of spokes (8) coupling the ring element to a central hub (7). The ring element (6) is provided with projections (10) engaging in slots of the basket bottom. The coupling of the basket to the spider is performed by clamping.

With respect to prior washing machine baskets, the inventive basket has the advantage that it can resist against mechanical stresses generated at high centrifugation speeds, while having a very simple construction, owing to the absence of coupling rivets and the like.

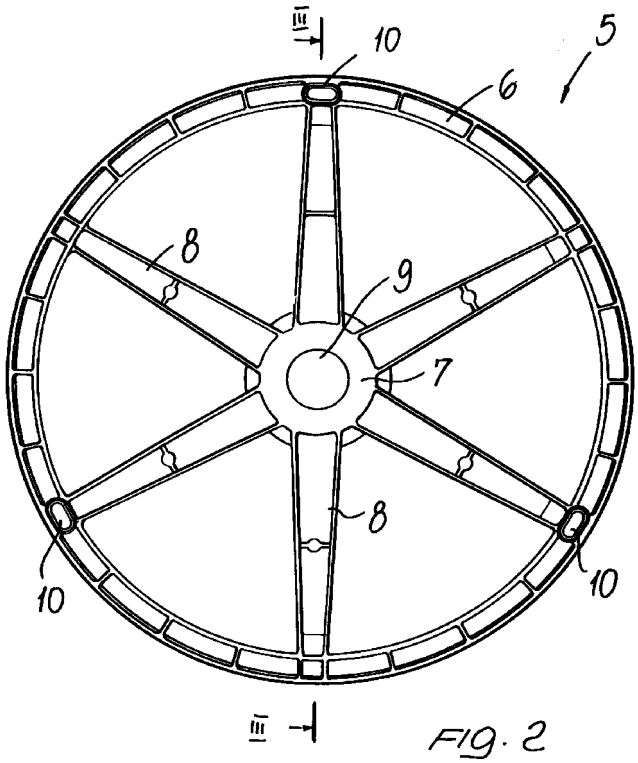

FIG. 2

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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a spider specifically designed for washing machine baskets with high speed centrifugation operation.

[0002] The invention relates moreover to a washing machine basket including the inventive spider, as well as a method for making the basket.

[0003] More specifically, the present invention relates to a method for making washing machine baskets, i.e. cylindric or drum vessels, in which are held cloth articles to be washed and dried.

[0004] In particular, the drying operation requires to operate the basket with a very high spinning rate or speed, thereby quickly and efficiently drying the washed articles.

[0005] Prior washing machine baskets, conventionally made with the spider spokes coupled by rivets to the basket bottom, directly at their end portions, do not allow to exceed a rate limit of 1,000-1,200 RPM's.

[0006] Actually, at greater spinning rates, the basket construction, mainly if fully loaded, tends to be deformed, i.e. to deform the more stressed surfaces thereof.

SUMMARY OF THE INVENTION

[0007] Accordingly, the aim of the present invention is to provide a novel washing machine spider and basket, adapted to efficiently operate at spinning rates of the order of 1,000, 1,200, 1,400, 1,600 RPM's and more.

[0008] Within the scope of the above mentioned aim, a main object of the present invention is to provide such a washing machine basket adapted to efficiently resist up to a spinning speed or rate of 1,600 RPM's, while having a construction much more simple and unexpensive than that of prior washing machine baskets.

[0009] Another object of the present invention is to provide an efficient method for making the inventive basket.

[0010] 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 the spider, basket and method according to the independent claims 1, 7 and 12 respectively.

[0011] Further preferred embodiments of the invention are defined in the remaining claims.

[0012] With respect to prior washing machine baskets, the inventive basket provides the advantage that it can resist against stresses generated at rate values of 1,000, 1,200, 1,400, 1,600 RPM's and more, while having a much more simple and unexpensive construction.

[0013] In fact, the engagement of the spider through the overall bottom edge of the basket, obtained owing to the specifically designed construction of the ring element forming the spider, prevents any deformations from occurring as the washing machine is operated at a high speed in a fully loaded condition.

[0014] Moreover, the clamping connection of the spider to the basket, and of the basket to the driving elements therefor, will simplify the overall construction of the washing machine, since no rivets or other auxiliary coupling means are required.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The invention will be disclosed hereinafter with reference to the accompanying drawings, showing a preferred though not limitative embodiment of the inventive basket.

[0016] In the drawings:

Figure 1 is a perspective view illustrating the washing machine basket according to the present invention;

Figure 2 is a front view illustrating the spider mounted on the basket of Figure 1;

Figure 3 is a cross-sectional view of the spider of Figure 2, substantially taken along the section line III-III;

Figure 4 illustrates a bottom mounted on the basket of Figure 1;

Figure 5 is an axial cross-sectional view illustrating the basket of Figure 1 during its starting assembling step;

Figure 6 illustrates the basket shown in Figure 5, as cross-sectioned at an angular position corresponding to that of a driving element therefor;

Figures 7 and 9 illustrate further assembling operations or steps for assembling the washing machine basket according to the present invention;

Figure 10 illustrates the basket shown in Figure 9, as cross-sectioned at the level of a projection of the ring element thereof; and

Figure 11 illustrates a detail of Figure 10 as seen from A.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] The washing machine basket according to the present invention has been generally indicated in Figure 1 by the reference number 1.

[0018] Said basket, as shown, comprises a substantially drum-like body, including a stainless steel perforated sheet mantle 2, provided, on a side thereof, with a bottom 3 and, on the opposite side thereof, with an inlet 4 (Figures 5 to 9).

[0019] On the side of the basket 1 closed by the bottom 3 a spider 5, clearly shown in Figure 2, is arranged. Said spider, made as a single-piece, comprises a ring element 6, coupled to a central hub 7 by a plurality of radially extending arms or spokes 8 (six spokes being shown in the considered embodiment). A shaft 9 is provided at said hub 7, so as to connect said spider 5 and, accordingly, the basket 1, to a motor-reducing unit of the washing machine (not specifically shown).

[0020] The ring element 6 is provided, on a side thereof facing the basket bottom 3, with a plurality of projections or lugs 10, provided for engaging in corresponding elongated slots 11 of the bottom 3 (see Figure 4).

[0021] As the spider 5 is assembled to the basket 1, the ring element 6 is abutted against the bottom 3, so as to engage the projections 10 in their corresponding elongated slots 11 of the bottom (Figures 10 and 11).

[0022] Moreover, as clearly shown in Figure 5, the peripheral edges 12 of the mantle 2 and 13 of the bottom 3, are at the start overlapped in a raised position thereof, thereby providing at least a portion thereof transversely arranged with respect to said bottom 3. Owing to the disclosed arrangement, the peripheral edges will provide self centering means for self centering the ring element 6 of the spider 5 with respect to the axis 18 of the basket (Figure 1).

[0023] On the opposite side, i.e. on the basket inlet 4 side, there is provided a like arrangement of the edge 12 of the mantle 2 and of the edge 14 of the inlet 4.

[0024] The connection of the ring element 6 to the bottom 3 and, accordingly, of the spider 5 to the basket 1, is made by clamping, by deforming the edges 12 and 13, at first by bending said edges under a recess 15 provided on the outer edge of the ring element 6 (Figure 7) and then by forming a curled portion 16 of the overlapping edges 12 and 13 (Figure 8) and, finally, by pressing the curled portion on itself and inside said recess 15, thereby providing a firm connection (Figure 9).

[0025] On the opposite side, by providing a like clamping 17 of the edges 12 and 14 (Figures 7 and 8), the inlet 4 is connected to the mantle 2 of the basket 1.

[0026] As already stated, the connection of the ring 6 at the elongated slots 11 of the bottom 3 is carried out at the level of the projections 10 of said ring element 6 (Figures 6, 10 and 11).

[0027] Owing to the disclosed coupling, any mutual slipping of the spider and basket will be prevented from occurring, mainly during the turning or spinning of the basket with a high spinning rate.

[0028] The coupling of the driving element 19 for driving the basket 1, also performed at the level of the elongated slots 11 (Figures 6 and 10), is advantageously also obtained by a clamping operation.

[0029] Such a clamping operation is made by upturning the edge 20 of the elongated slots 11 about the corresponding end portion 21 of said driving elements 19, which portion has a substantially L-shape configuration.

[0030] The driving or entrainment elements, moreover, can be of any suitable desired type, as commercially available, or they can be provided at separate fittings, i.e. detached from the basket (for example of any suitable plastic materials) or they can be made as a single-piece on said basket.

Claims

1. A spider for a high speed washing machine basket, characterized in that said spider comprises an outer peripheral ring element (6) coupled to a central hub (7) of said spider by a plurality of coupling spokes (8).

2. A spider according to Claim 1, characterized in that said spider comprises a plurality of projections (10) arranged on a surface of said ring element (6) facing said basket.

3. A spider according to Claims 1 or 2, characterized in that said ring element (6) is provided, in its cross-section and on a side thereof opposite to a basket engagement side thereof, with a recess (15).

4. A spider according to one or more of the preceding claims, characterized in that said spider comprises at least three and preferably six radially extending spokes (8).

5. A spider according to one or more of the preceding claims, characterized in that said spider is made as a single piece.

6. A basket for high speed centrifugation washing machines, characterized in that said basket comprises a spider according to one or more of the preceding claims.

7. A basket according to Claim 6, characterized in that said basket is provided with a clamping pattern (16) for connecting the ring element (6) of said spider (5) to said basket, said clamping pattern being formed at and inside said recess (15).

8. A basket according to Claims 6 or 7, characterized in that said projections (10) of said ring element (6) of said spider (5) are housed in elongated slots (11) of the bottom (3) of said basket.

9. A basket according to one or more of the preceding

claims, characterized in that said basket comprises driving elements (19) clamped to the bottom (3) of said basket at said elongated slots (11).

10. A basket according to Claim 9, characterized in that said driving elements are provided with a "L"-shape end portion (21) for clamping to the bottom and centering said projections (10).

11. A basket according to one or more of the preceding claims, characterized in that said basket is adapted to be used in washing machines having centrifugation speeds of 1,000, 1,200, 1,400, 1,600 RPM's and more.

12. A method for making a washing machine basket according to one or more of the preceding claims, characterized in that said method comprises the steps of:

- preassembling said basket (1) with the edges (12, 13) respectively of the mantle (2) and bottom (3) mutually overlapping and provided with at least a portion thereof extending transversely of said bottom (3);
- applying, in a self centering manner, the spider (5) on said basket (1), by engaging said ring element (6) under and against said edges (12, 13) and housing said projections (10) in said elongated slots (11) of said bottom (13); and
- clamping said edges (12, 13) in said projection (15) of said ring element (16).

13. A method according to Claim 12, characterized in that said method comprises the further step of clamping the edge (20) of said elongated slots (11) on the end portion (21) of said driving elements (19).

14. A method according to Claim 12, characterized in that said method comprises the further step of providing a clamping pattern (17) for mutually coupling the edges (12, 14) respectively of said mantle (2) and inlet (4) of said basket (1).

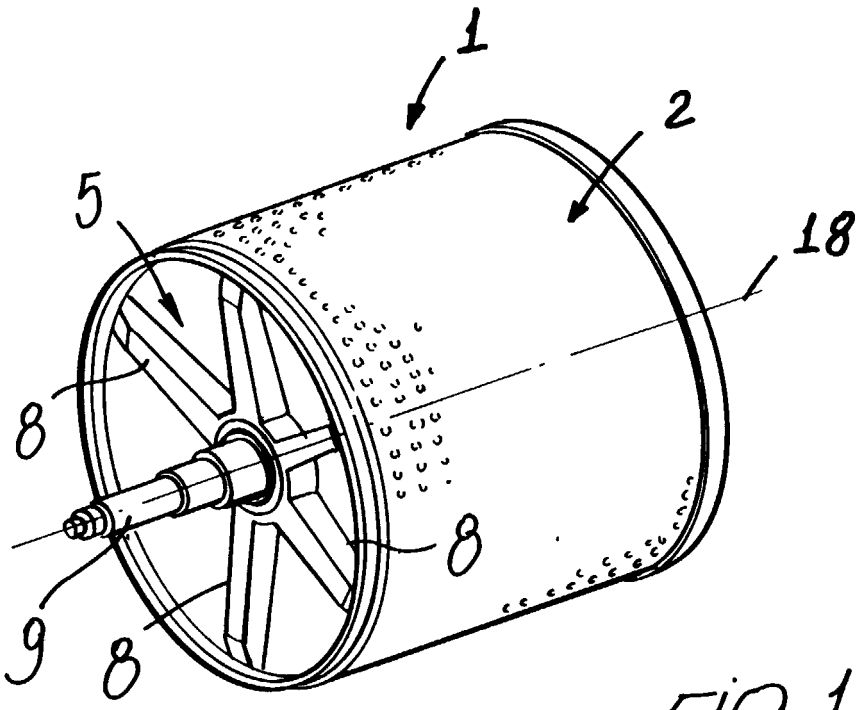

FIG. 1

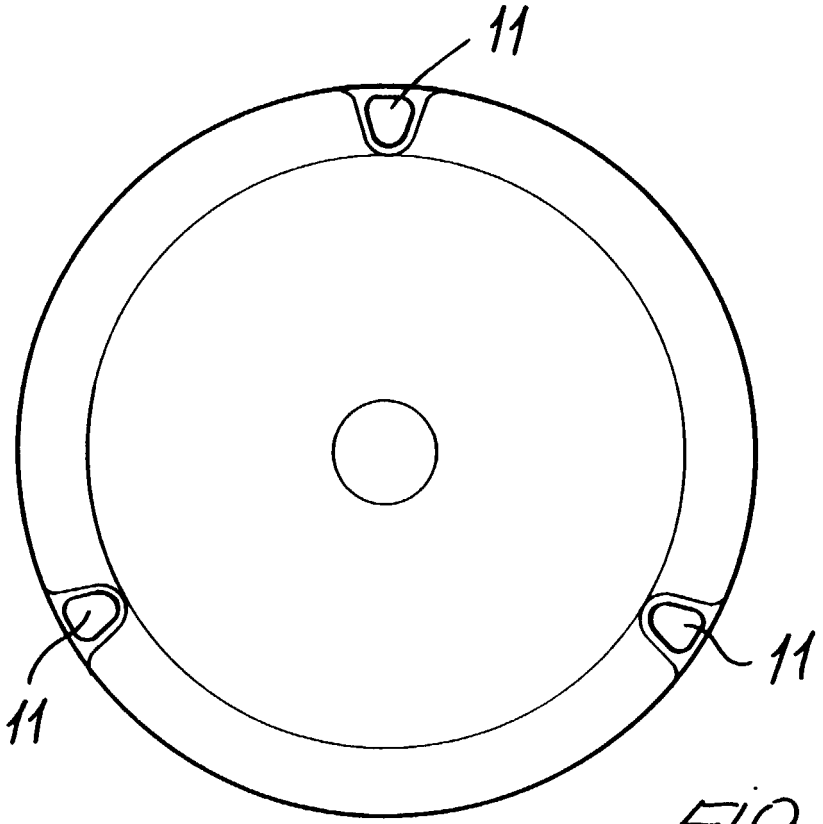

FIG. 4

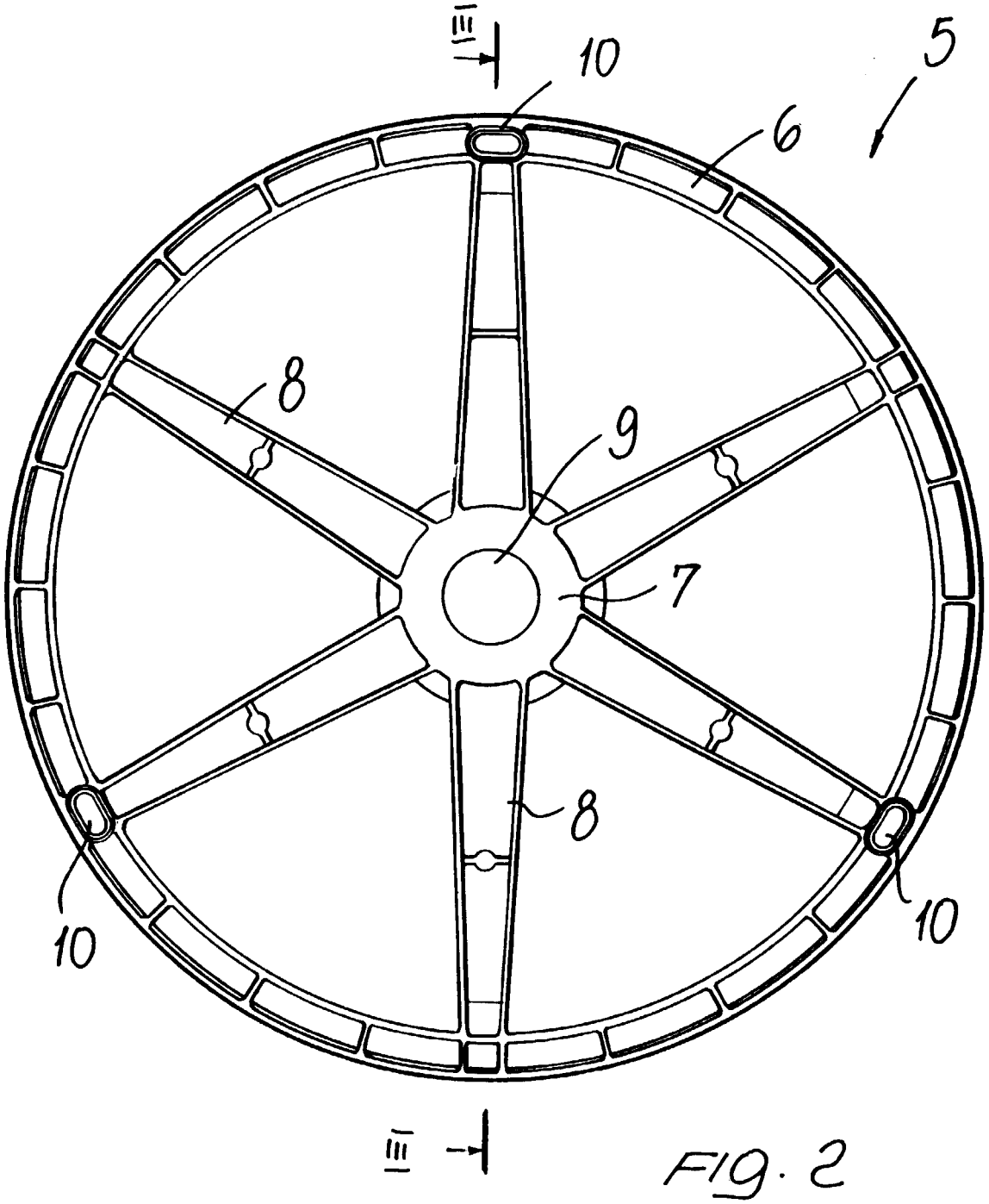

FIG. 2

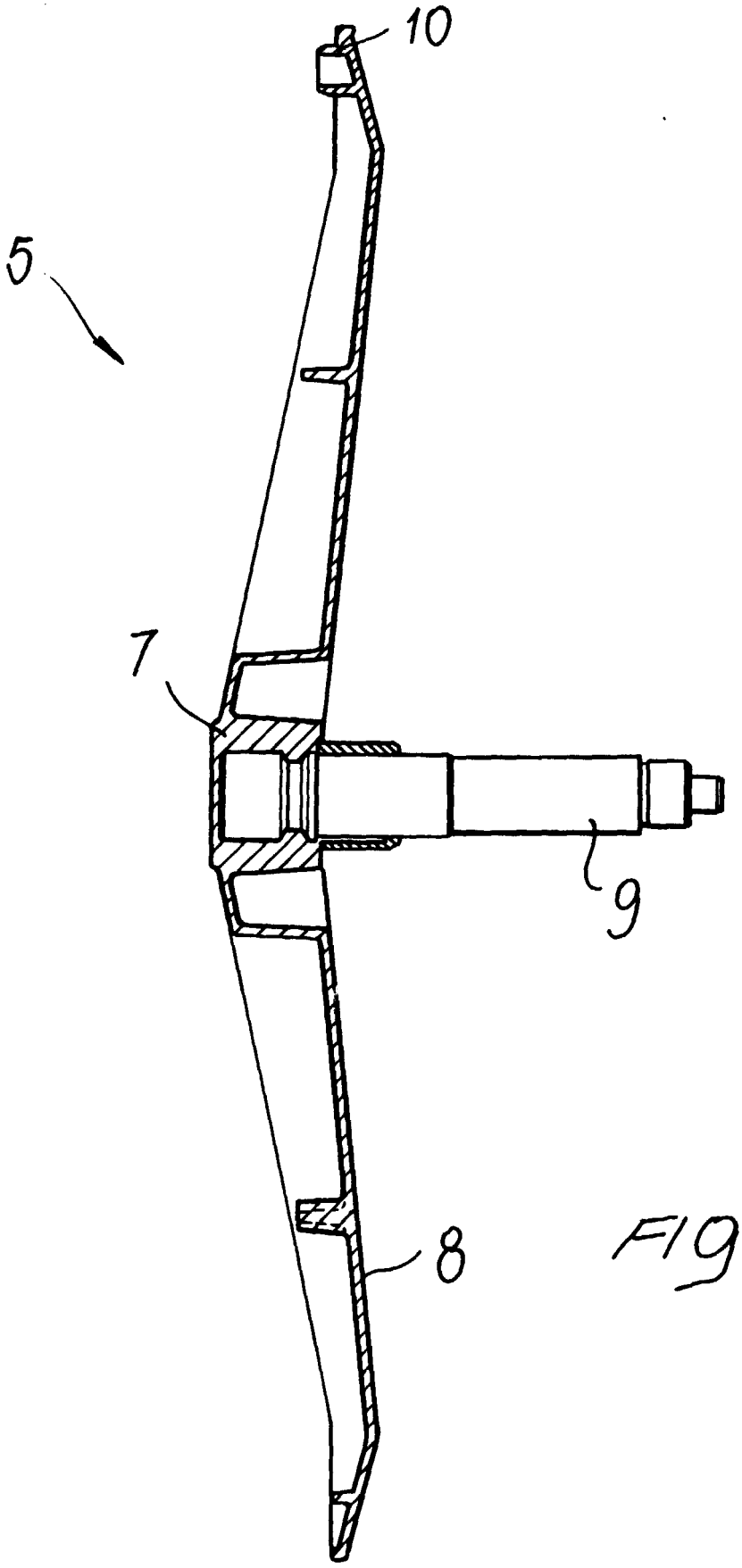

FIG. 3

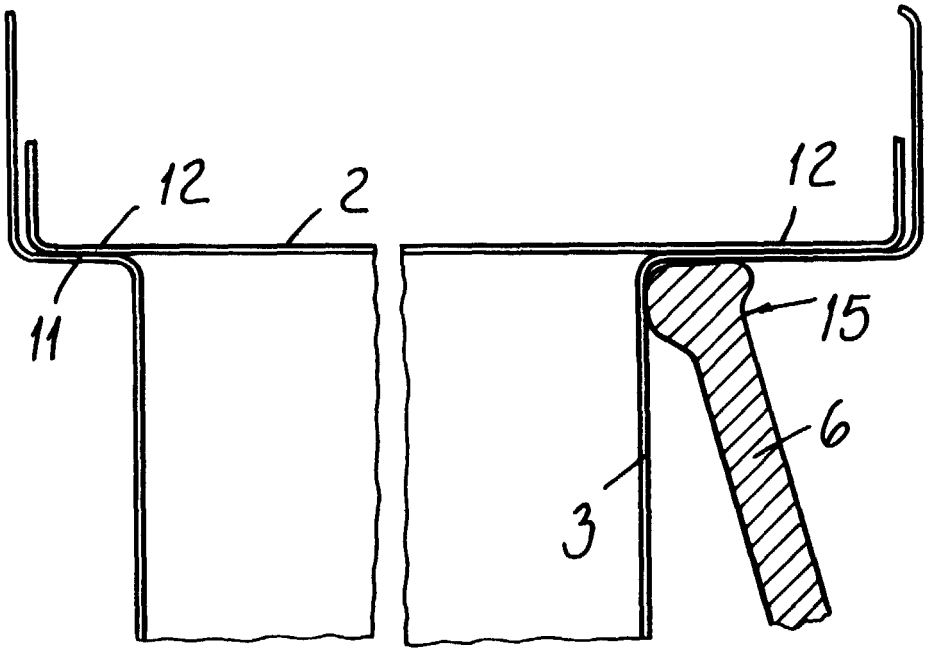

FIG. 5

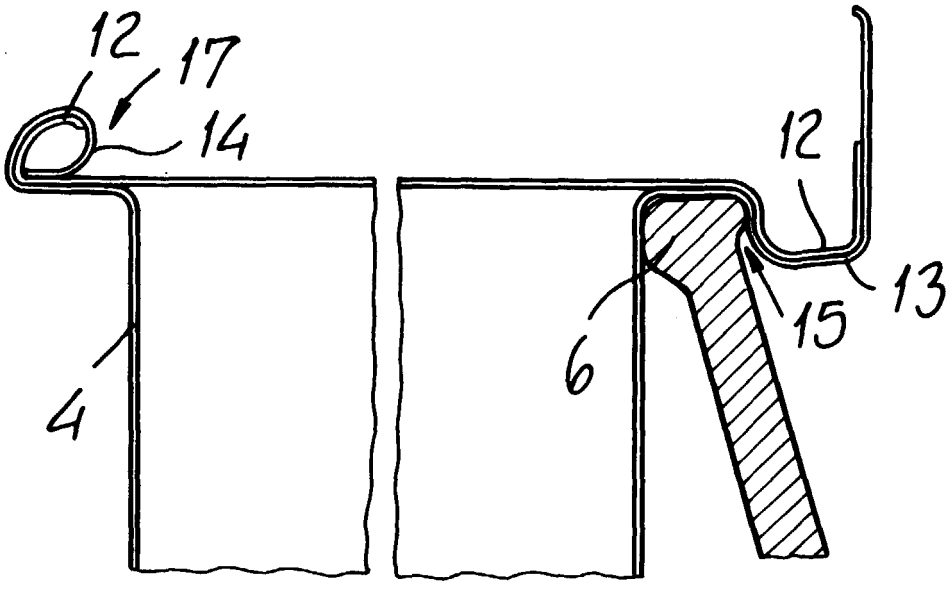

FIG. 7

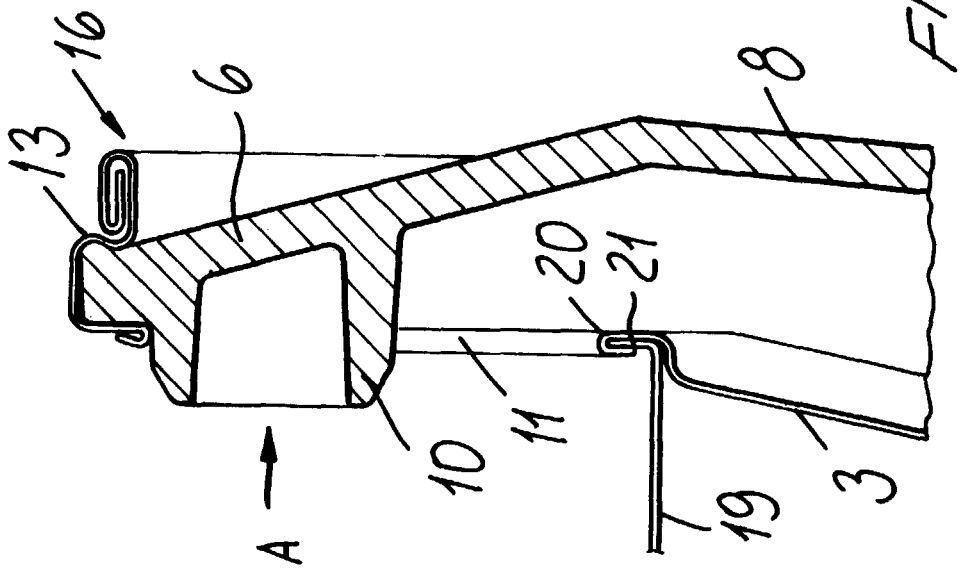

FIG. 10

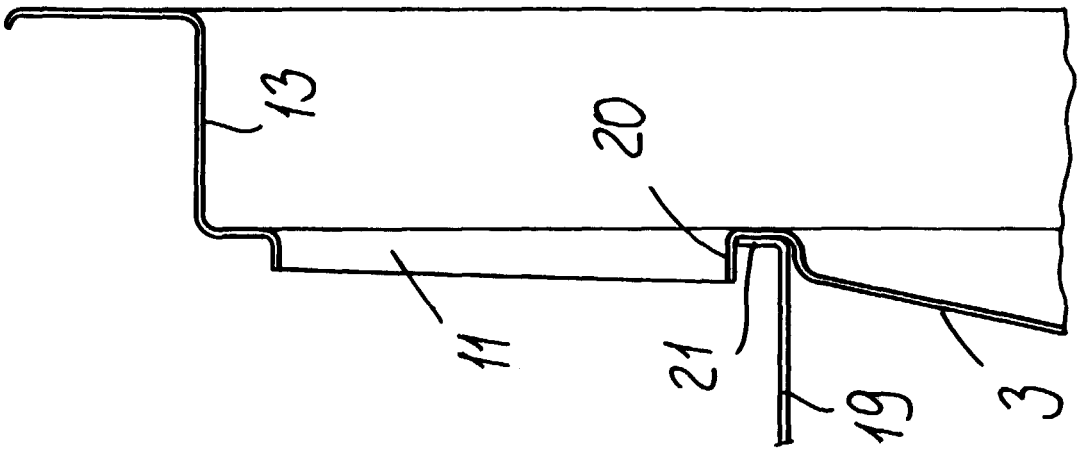

FIG. 6

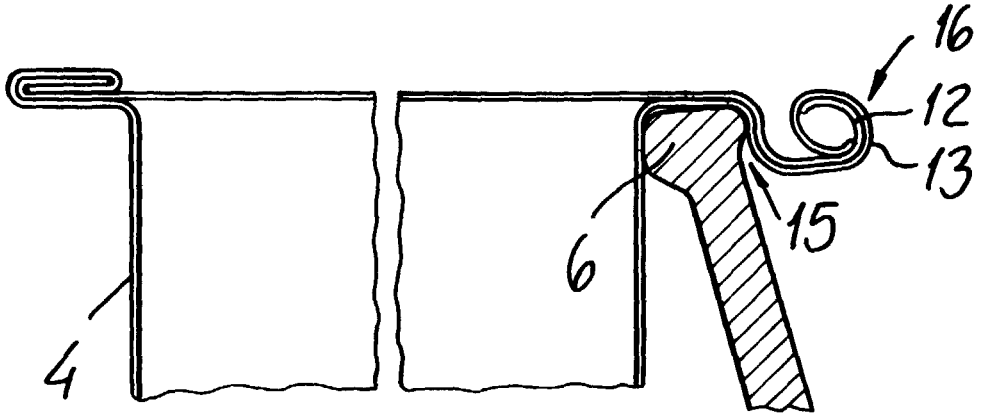

FIG. 8

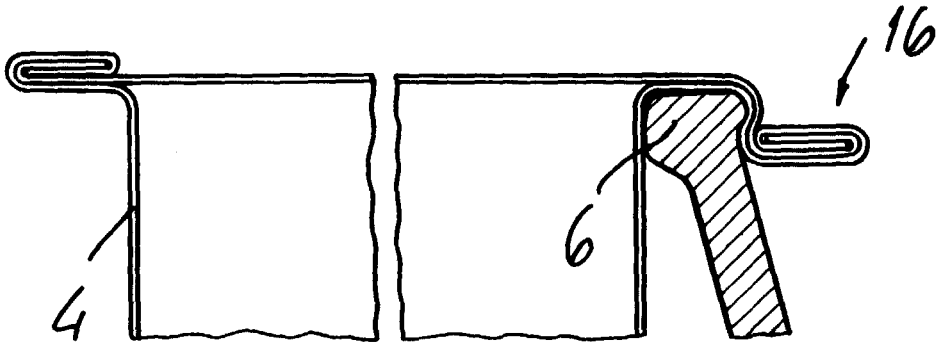

FIG. 9

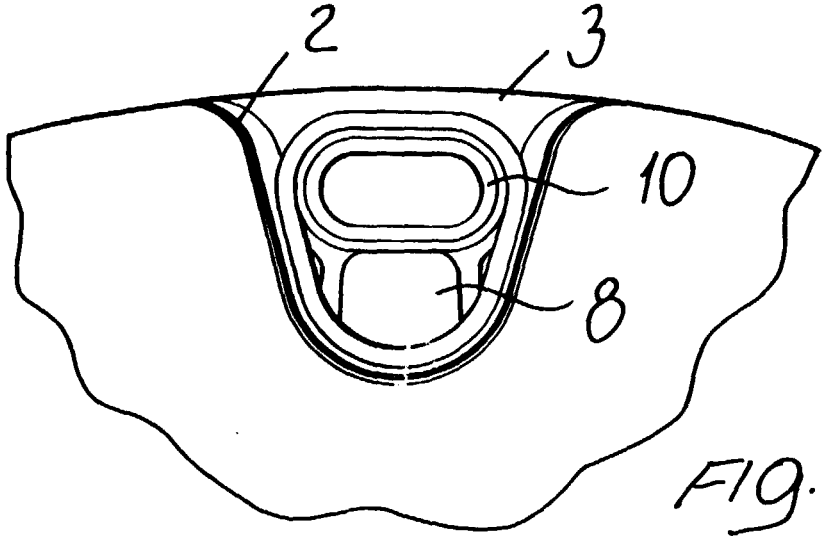

FIG. 11

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 11 2732

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	17 November 2000	Norman, P

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