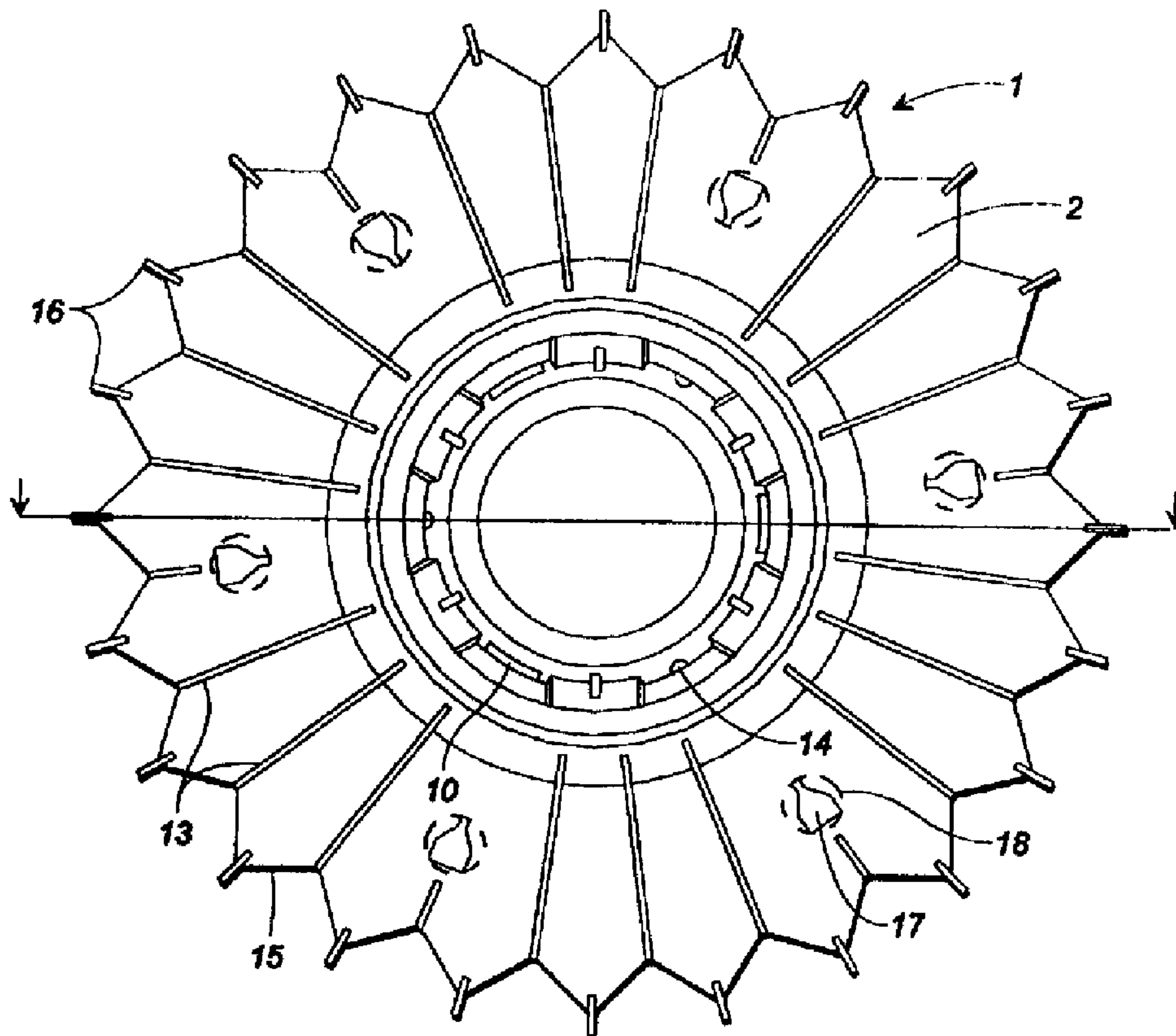




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(54) Titre : ELEMENT DESTINE A UN DISPOSITIF DE NETTOYAGE DE PISCINE
(54) Title: SWIMMING POOL CLEANER COMPONENT



(57) Abrégé/Abstract:

An integrally-moulded foot (3) and disc (2) for a swimming pool cleaner is disclosed. The disc (2) optionally may include tapering holes (17) at spaced intervals.



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(54) Title: SWIMMING POOL CLEANER COMPONENT (57) Abstract An integrally-moulded foot (3) and disc (2) for a swimming pool cleaner is disclosed. The disc (2) optionally may include tapering holes (17) at spaced intervals.		

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SWIMMING POOL CLEANER COMPONENT**FIELD OF THE INVENTION**

- 5 This invention relates to a component for a suction operated automatic swimming pool cleaner.

BACKGROUND OF THE INVENTION

- 10 Several kinds of swimming pool cleaners have been developed which operate on suction generated by the swimming pool filtration plant. Usually these cleaners require a flexible disc to hold the cleaner against the surface being cleaned and a wear resistant foot which runs over the surface. The foot is moulded to have a stepped configuration so that water can pass under the disc and foot carrying detritus into the cleaner body
15 and thence to be caught in a collection trap or the pool filter.

The foot is firmly resiliently engaged on the body and the disc engaged in a peripheral recess around the foot so that it can rotate around the foot. The components are made of different materials and are costly components of the cleaner.

20

- U.S. Patent No. 5,617,606 discloses an exemplary disc for a swimming pool cleaner. Designed to receive a separate footpad in its central aperture, the disc includes arched protrusions extending upward from its upper surface. In use, the lower surface of the disc is adjacent the surface of the pool or other structure to be cleaned. U.S. Patent
25 Nos. 4,351,077, 4,642,833, and 4,193,156 illustrate automatic, water-interruption-type suction swimming pool cleaners having flexible annular discs typically mounted near their inlets, with the disc of the latter patent having numerous "concertina-like," "circumferentially spaced folds."

OBJECT OF THE INVENTION

The Applicant has monitored the wear and tear on many cleaners and the object of this
5 invention is to provide a component which will materially reduce the cost of
manufacture of the pool cleaner while in no way reducing its efficacy in use.

SUMMARY OF THE INVENTION

10 According to this invention there is provided a swimming pool cleaner component
comprising a foot and flexible disc moulded as an integral unit. In one aspect of the
invention, the foot is formed as a central boss part with a base which, in use, contacts
the surface to be cleaned, the boss part having a rim for connection to the body of the
swimming pool cleaner, and the disc formed as an integral outer annular part
15 surrounding the boss part.

Further features of this invention provide for the foot to be rotatable on and supported by the body of the pool cleaner, for the shape of the foot to generally conform to a truncated conical shape and for the inner edges of the surface engaging parts of the foot to be more rigid than the outer edges.

5

The invention also provides for the disc to have a ring of reduced thickness around the foot and to have radially extending ribs of reduced thickness and a series of venturi openings spaced apart from the foot symmetrically there around. The surface of material around the openings in contact in use with a surface being cleaned will preferably be dished to ensure a very thin suction at the opening.

10

The invention also provides for the upper surface of the foot to provide a series of sand traps facilitating the transport of sand cleaned from the pool through the cleaner.

15

The outer edge of the disc will preferably be of serrated shape with short upward projections extending from the peaks of the serrations.

It is a feature of this invention that the component can be moulded from a polyvinyl chloride composition.

20

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of this invention will become apparent from the following description of two examples illustrated in the accompanying drawings in which:

25

Fig. 1 is a plan view of the cleaner component in accordance with a first embodiment of the invention;

Fig. 2 is a diametral section through the central part of the component;

Fig. 3 is a plan view of a second embodiment of the invention;

30

Fig. 4 is an underneath view of the second embodiment;

Fig. 5 is a diametral sectional elevation on section C-C;

- Fig. 6 is an enlarged partial diametral sectional elevation on section B-B;
Fig. 7 is an enlarged diametral section through the central part on section C-C;
Fig. 8 is an enlarged diametral section through the central point on section B-B;
Fig. 9 is a partial sectional elevation showing a hinge detail; and
5 Fig. 10 is a plan view showing a detail of venturi holes.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown the component 1 for a swimming pool cleaner is preferably moulded of
10 polyvinyl chloride material. This material is chosen to be cross-linkable to enable wear resistance characteristics to be varied to predetermined degrees. The component is designed so that this material can be used without distorting hoop stresses developing in the component during curing. This is achieved by the construction described below.

15 The component 1 consists of a peripheral annular disc part 2 integrally moulded with a central boss part forming a foot 3 for the pool cleaner. The foot is of truncated conical shape as indicated at 4. This gives a stability to the structure while allowing the base 5 of the foot 3 to be flexible around its outer edges. The conical section emphasises the ability of the foot to deform at the surface being cleaned and so tend to cling to
20 projections and corners formed, for example, by steps on the surface to be cleaned. The normally circular opening into the foot can be given different elongated shapes to assist the facility. Gussets 6 are provided symmetrically spaced around the foot 3 extending between the central and horizontal sections.

25 An annular inwardly facing rim 7 is provided to rotatably engage in a groove provided around the bottom of a pool cleaner body (not shown).

The base of the foot 3 is of stepped configuration with the lower sections 8 providing the parts of the foot engaging the surface being cleaned during use of the pool cleaner.
30 The indented stepped sections 9 on the bottom surface provide flow openings into the

body of the pool cleaner from underneath the foot and disc. The outer part of the surface engaging sections is more flexible than the smaller diameter inner sections.

Further openings 10 through the wall of the base part of the foot 3 allow flow of water
5 above the disc into the pool cleaner body.

The foot 3 is joined to the flexible annular disc 2 by a ring 12 of thin sectioned material which provide great flexibility of the disc 2 relative to the foot 3.

10 Radially extending upstanding hinge sections 13 of reduced section material are symmetrically distributed across the upper surface of the disc 2 providing both flexibility to the disc and guide paths for sand and other detritus over the top surface of the disc towards the pockets formed between the stepped sections of the foot 3. These hinge sections also enable the effects of hoop stresses occurring during
15 moulding and curing to be overcome. Escape holes 14 are provided through the walls of the pockets not providing flow openings 10 into the body of the cleaner. The intention is to allow escape of sand which may otherwise accumulate.

These hinge sections 13 and the ring 12 of reduced sectioned material ensure a
20 flexibility to the dish which enables it to move over or around obstacles encountered during cleaning of a pool and substantially prevents the cleaner from becoming jammed.

The edge 15 of the disc 2 is serrated and short upstanding and outwardly projecting
25 fins 16 extend from the apices of the serrations.

Venturi shaped holes 17 are provided through the disc at spaced intervals. The disc below these holes 17 is dished as indicated at 18 to provide thin edges around the periphery of the holes. These holes improve the flow characteristics of the water over
30 the surface of the disc into the body of the pool cleaner.

It will be appreciated that the construction described above results in a highly flexible and efficient disc and foot combination which has a central part providing adequate support to hold the body of a pool cleaner properly orientated during use. It further provides substantial cost savings in the manufacture of the components by reduction
5 both in the amount of material required and in the kind of material that can be used in the moulding of the combined components.

Referring to Figures 3 to 10, many features are the same as are shown in Figures 1 and 2 and the same reference numerals for these features are used. The description of
10 Figures 1 and 2 is referred to. No escape holes 14 are provided in this second embodiment. They are not important to have. The venturi shaped holes 17 are so called because they provide a narrowing passage for the radially inward flow of water through the holes, accelerating this flow. Hence the comment that they improve the flow characteristics of the water over the disc into the body of the pool cleaner.

15

The view of Figure 4 of the underneath of the disc shows a circle 20 which is the position at which the thickness of the disc 2 commences to reduce radially outwardly to the edge 15. Radially inwardly of the circle 20 the thickness of the disc remains constant.

Claims:

1. For a swimming pool cleaner which consists of a body which has first structure for connection to a flexible suction pipe, second structure for intermittent
5 interruption of a flow of water into the suction pipe and third structure for connection to a foot and flexible disc, a component which comprises:

a foot and a flexible disc moulded as an integral unit, the foot formed as a central boss part with a peripheral base;

- the boss part having an upper rim for connection to the third structure of the
10 body part; and

the disc formed as an integral outer annular part.

2. A component for a swimming pool cleaner as claimed in claim 1, in which the foot has a truncated conical shape and the rim is inwardly facing.

15

3. A component for a swimming pool cleaner as claimed in claim 1, in which the boss has indented stepped sections which provide flow openings into the body of the pool cleaner from underneath the integral foot and disc.

20

4. A component for a swimming pool cleaner as claimed in claim 1, which is provided with openings through the wall of the boss part of the foot above the integral disc to allow flow of water above the disc into the body of the pool cleaner.

5. A component for a swimming pool cleaner as claimed in claim 1, in which
25 gussets are provided symmetrically spaced around the boss of the foot and the inner part of the foot is less flexible than the outer part of the foot.

6. A component for a swimming pool cleaner as claimed in claim 1, further comprising a ring of sectional material between the disc and the foot which provides
30 flexibility of the disc relative to the foot.

7. A component for a swimming pool cleaner as claimed in claim 1, in which the disc comprises radially extending upstanding hinge sections symmetrically distributed

across the upper surface of the disc, providing flexibility to the disc and guide paths for sand and other detritus.

8. A component for a swimming pool cleaner as claimed in claim 1, in which the
5 outer edge of the disc is serrated and short upstanding and outwardly projecting fins extend from the apices of the serrations.

9. A component for a swimming pool as claimed in claim 1, in which tapering
10 holes are provided in the disc at spaced intervals and the material of the disc is dished around the holes to provide thin edges around the periphery of the holes.

10. For a swimming pool cleaner which includes a body which has first structure
for connection to a flexible suction pipe, second structure for intermittent interruption
of a flow of water into the suction pipe and third structure for connection to a foot and
15 flexible disc, a component which comprises:

a foot and a flexible disc molded as an integral unit, the foot formed as a
central boss part with a peripheral base;

the boss part having an upper rim for connection to the third structure of the
body part and indented stepped sections which provide flow openings into the body of
20 the pool cleaner from underneath the integral foot and disc; and

the disc formed as an integral outer annular part.

11. An automatic swimming pool cleaner for cleaning a surface of a swimming
pool, comprising:

25 a. a body; and

b. an integrally-moulded foot and disc, the foot formed as a central boss
part with a base which, in use, contacts the surface to be cleaned, the boss part having
a rim for connection to the body, and the disc formed as an integral outer annular part
surrounding the boss part.

30

12. An automatic swimming pool cleaner according to claim 11 in which the disc
is flexible and has an outer edge which is serrated.

13. An automatic swimming pool cleaner according to claim 12 in which the disc has an upper surface and a lower surface and at least part of the rim is above the upper surface of the disc when the disc is oriented horizontally with its lower surface adjacent the surface to be cleaned.

5

14. An automatic swimming pool cleaner according to claim 12 in which, in use, the integrally-formed foot and disc can rotate about the body.

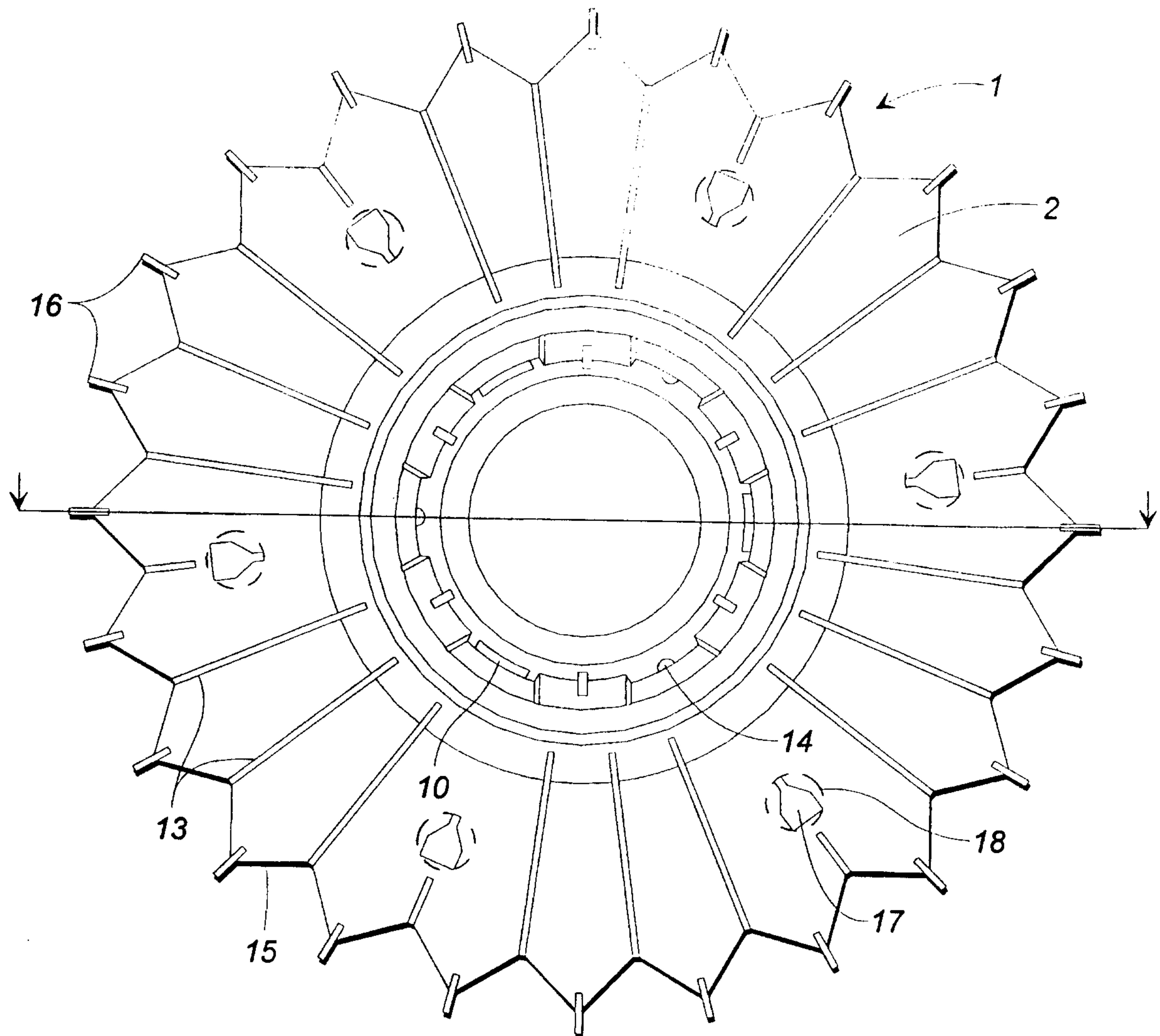
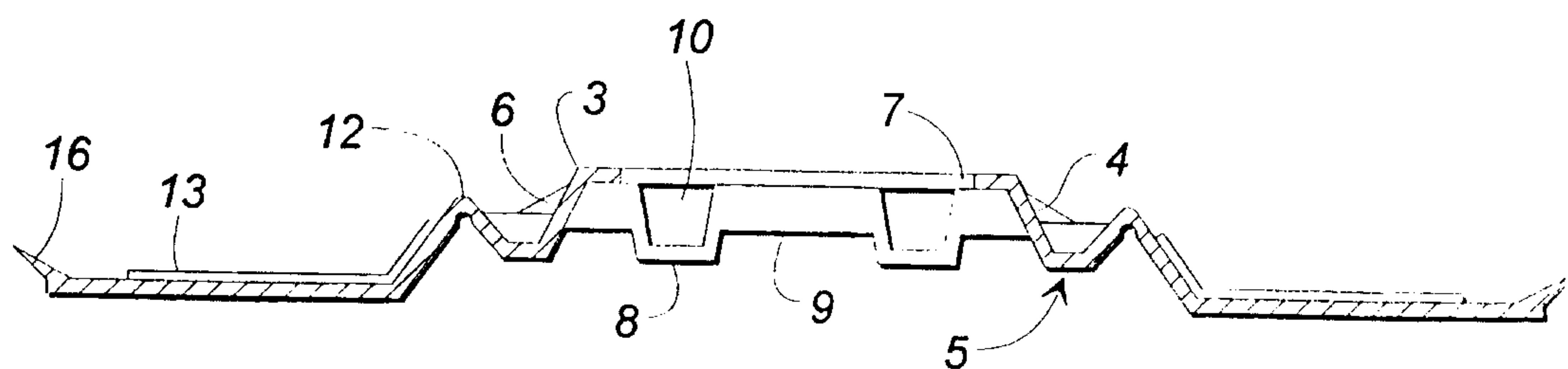
15. An automatic swimming pool cleaner according to claim 14 in which the disc
10 has an upper surface and a lower surface and at least part of the rim is above the upper surface of the disc when the disc is oriented horizontally with its lower surface adjacent the surface to be cleaned.

16. An automatic swimming pool cleaner according to claim 11 in which, in use,
15 the integrally-formed foot and disc can rotate about the body.

17. An automatic swimming pool cleaner according to claim 16 in which the disc has an upper surface and a lower surface and at least part of the rim is above the upper surface of the disc when the disc is oriented horizontally with its lower surface
20 adjacent the surface to be cleaned.

18. An automatic swimming pool cleaner according to claim 11 in which the disc has an upper surface and a lower surface and at least part of the rim is above the upper surface of the disc when the disc is oriented horizontally with its lower surface
25 adjacent the surface to be cleaned.

1/4

**FIG. 1****FIG. 2**

2/4

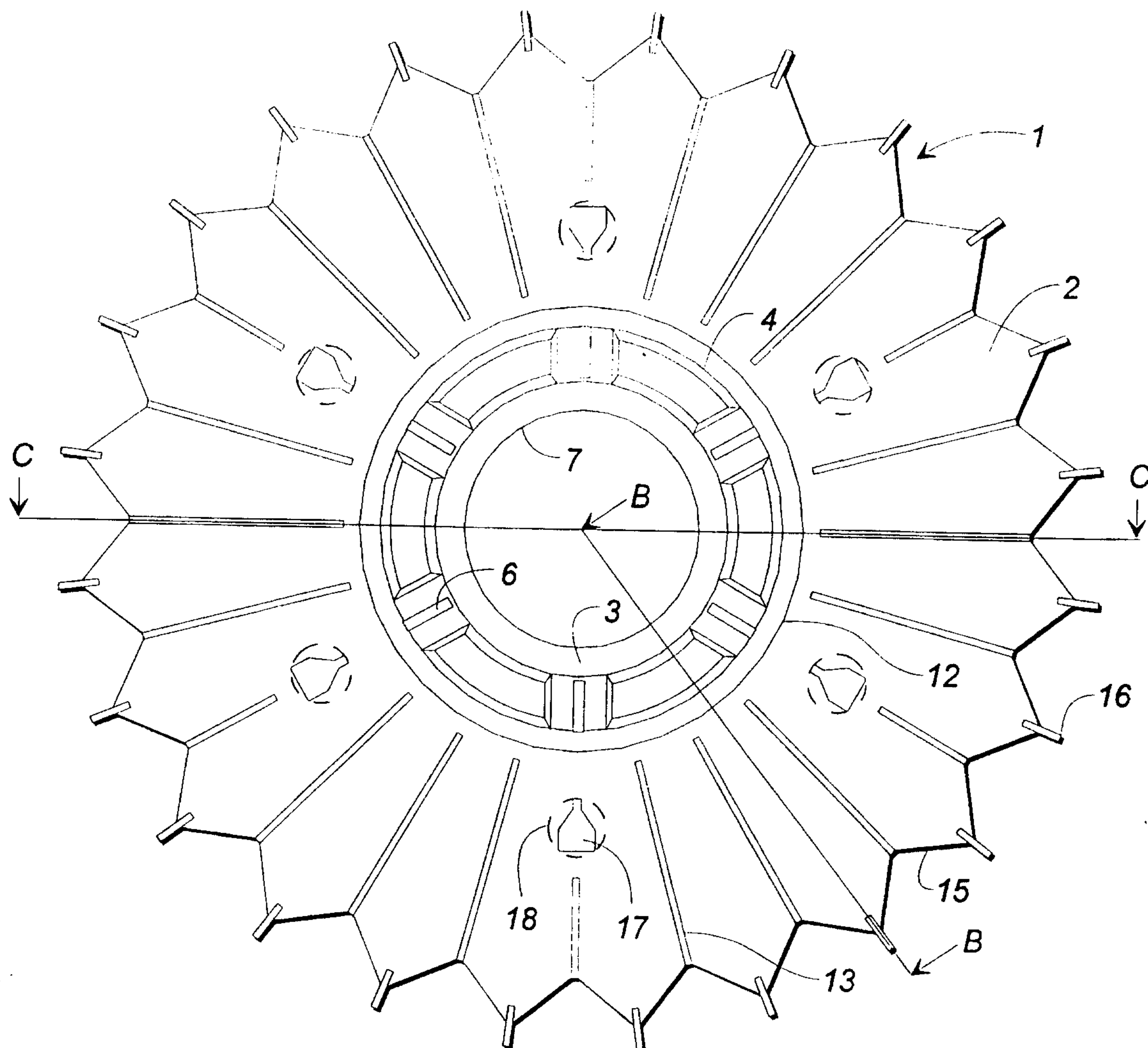


FIG. 3

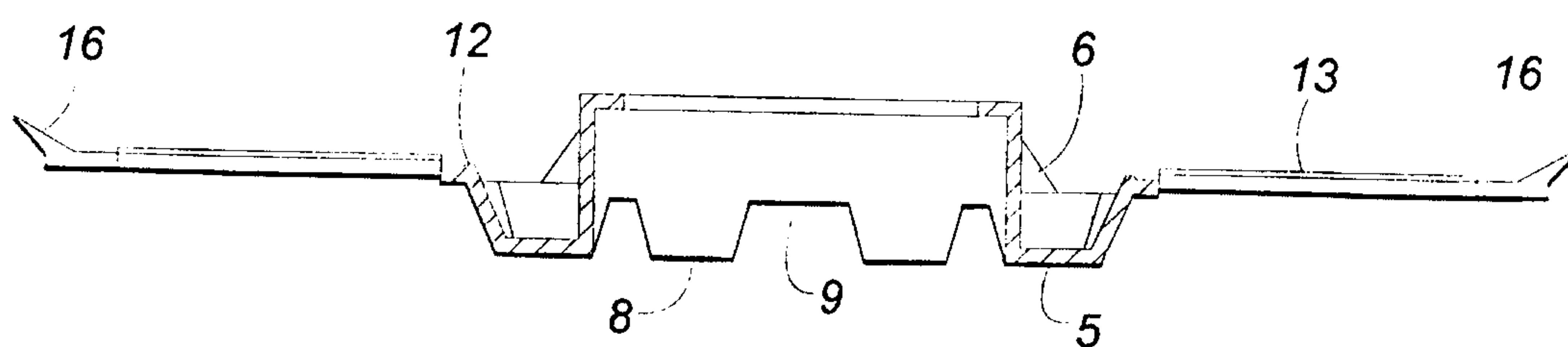
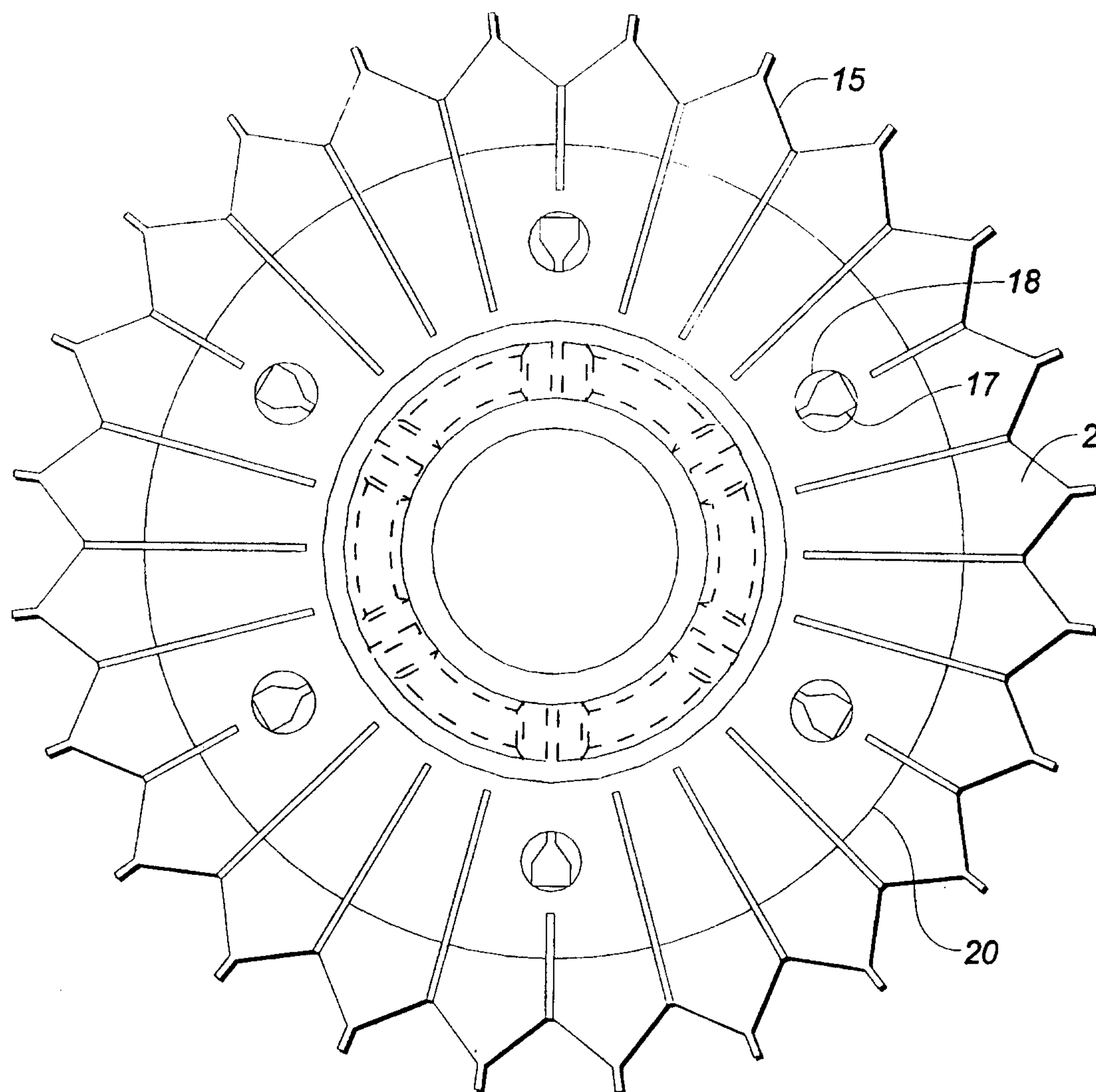
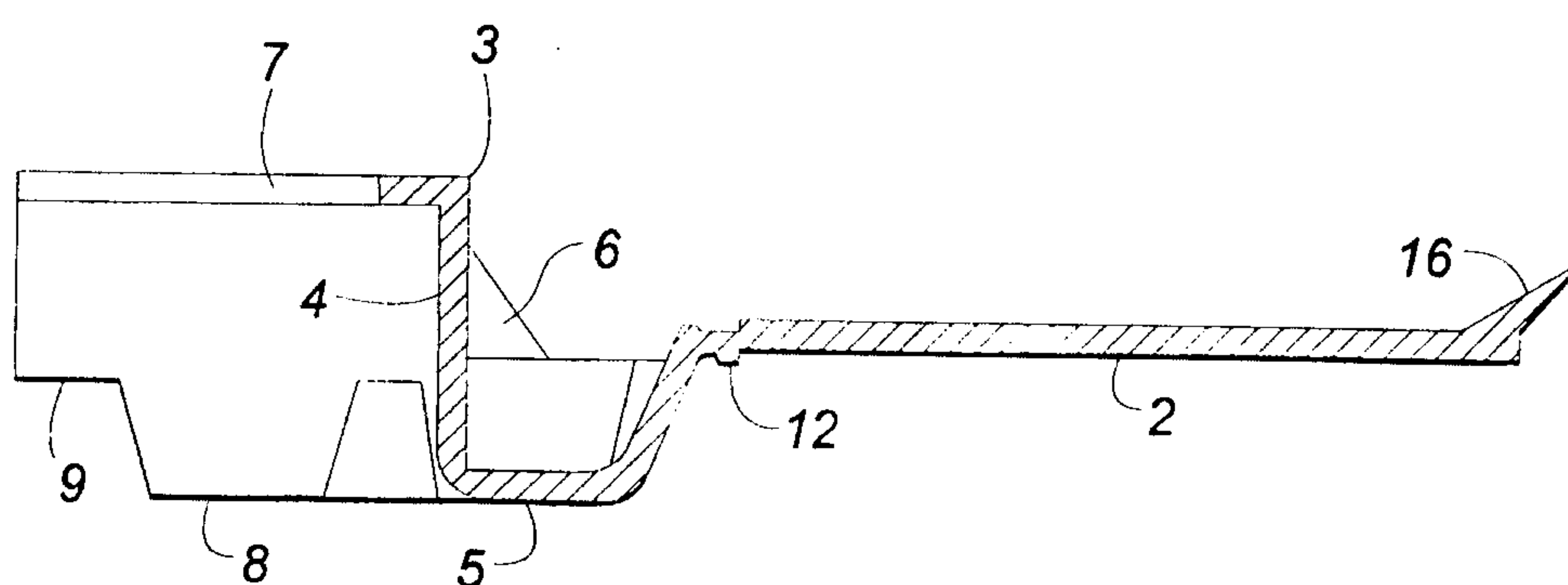


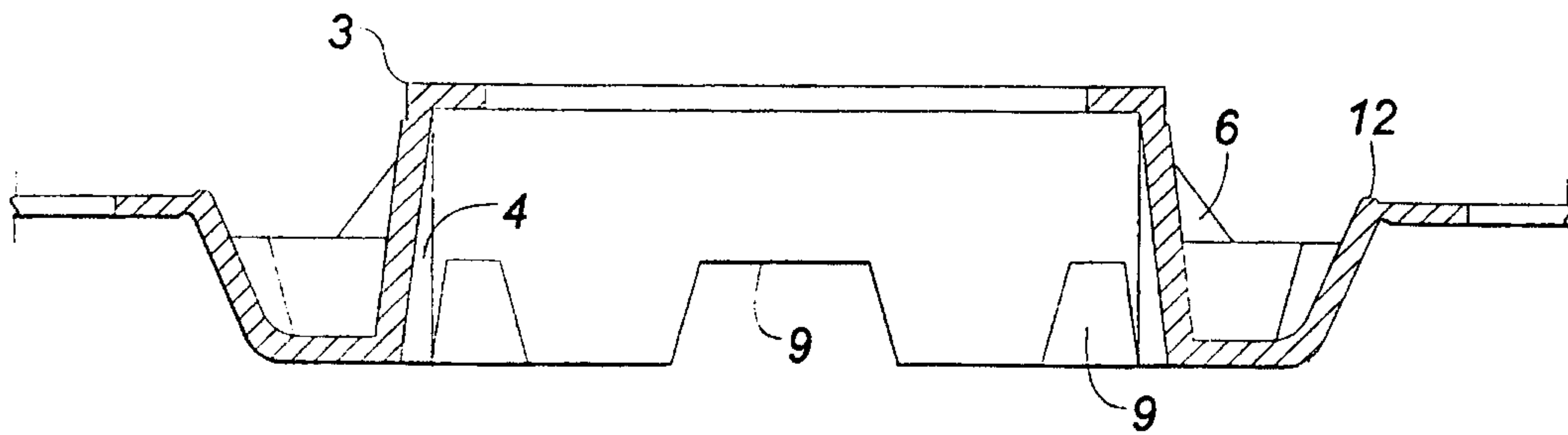
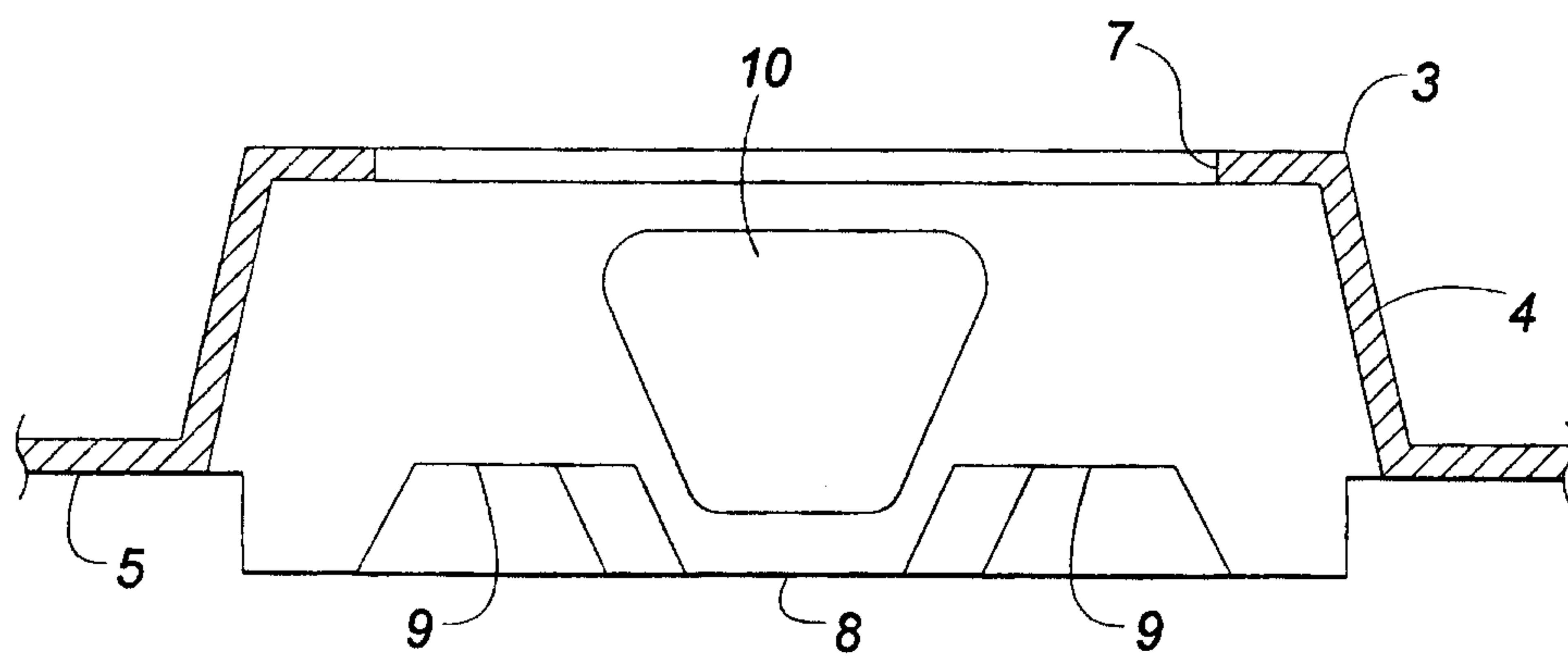
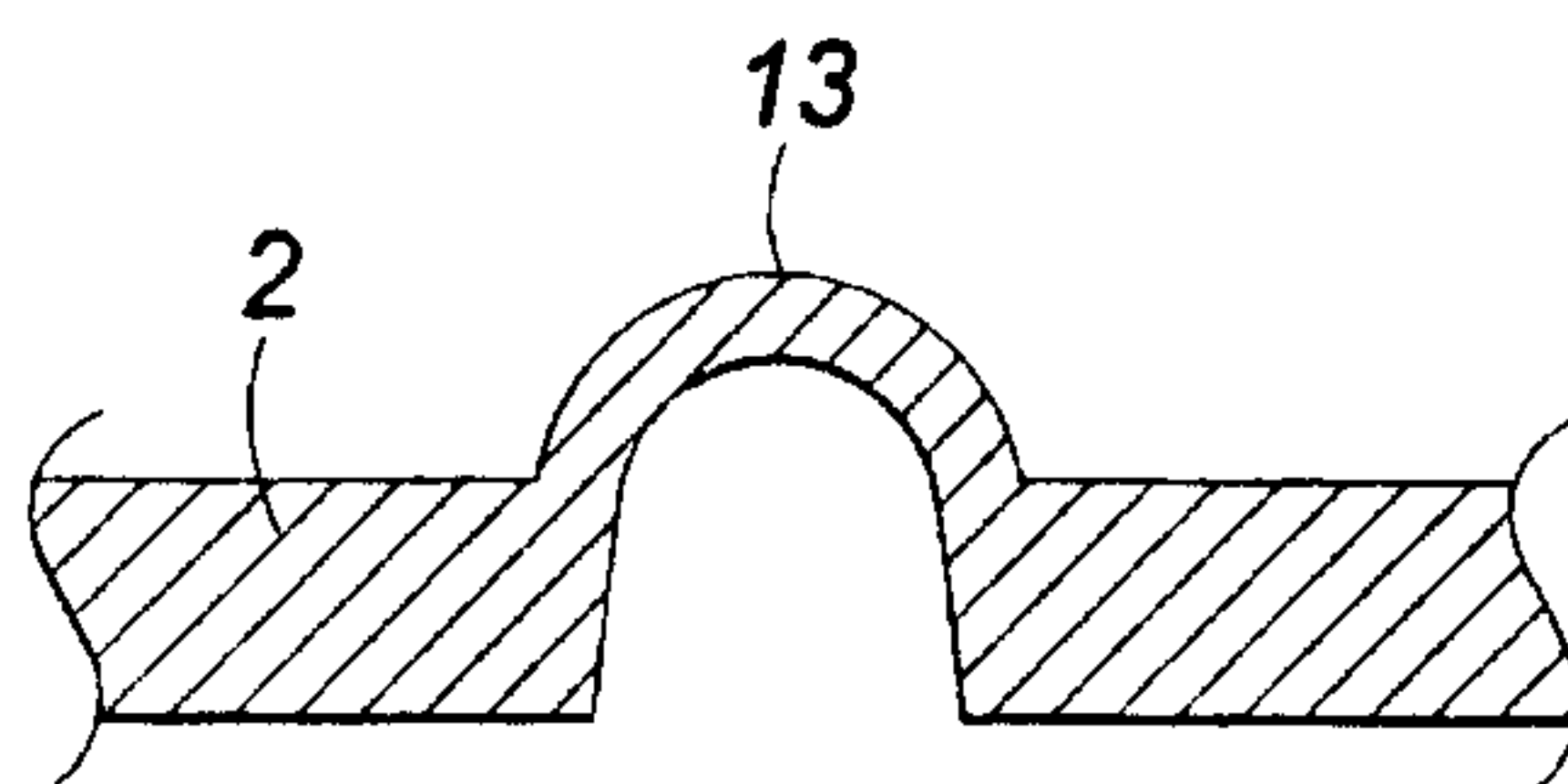
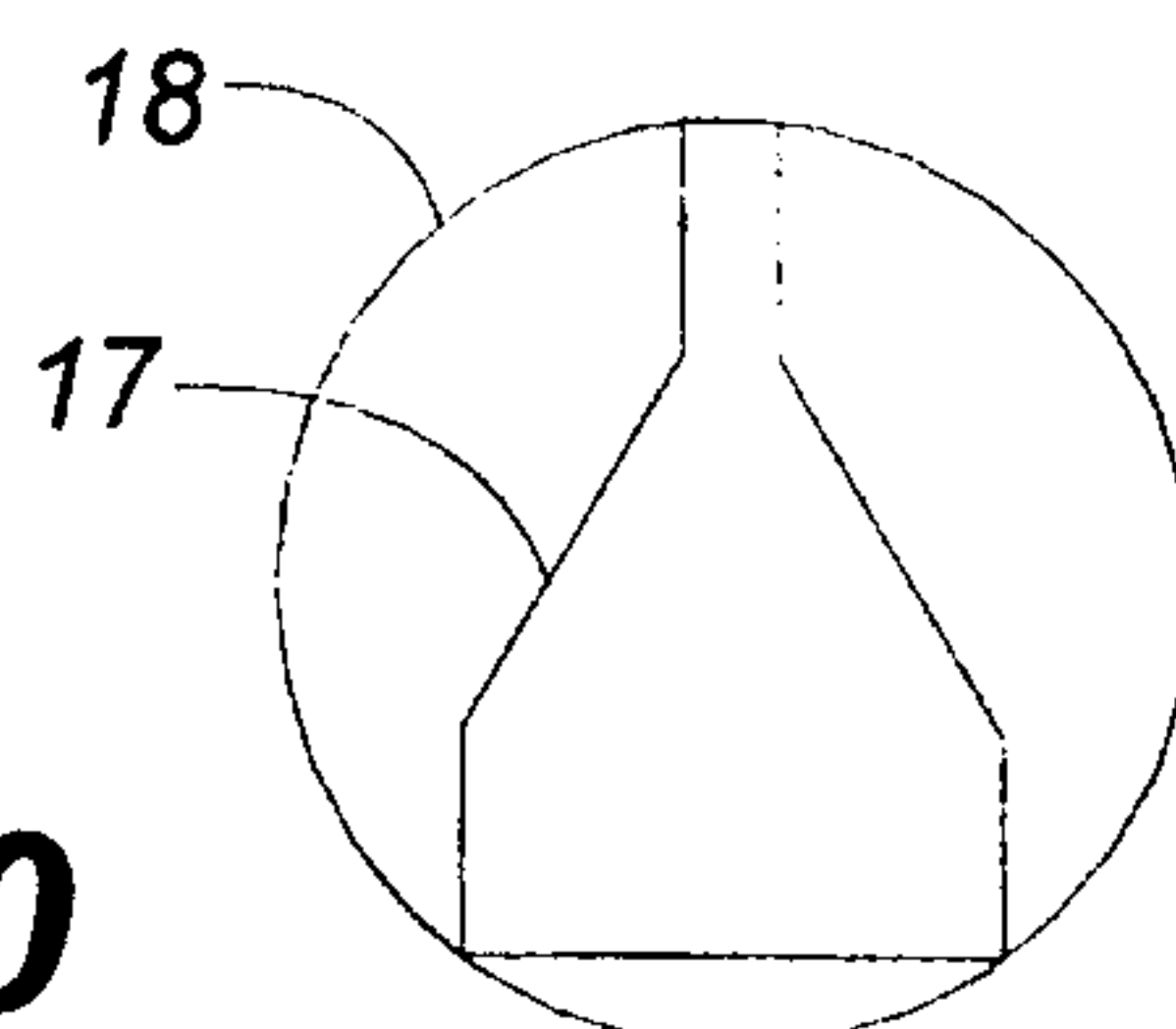
FIG. 5

3/4

**FIG. 4****FIG. 6**

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4/4

**FIG. 7****FIG. 8****FIG. 9****FIG. 10**

