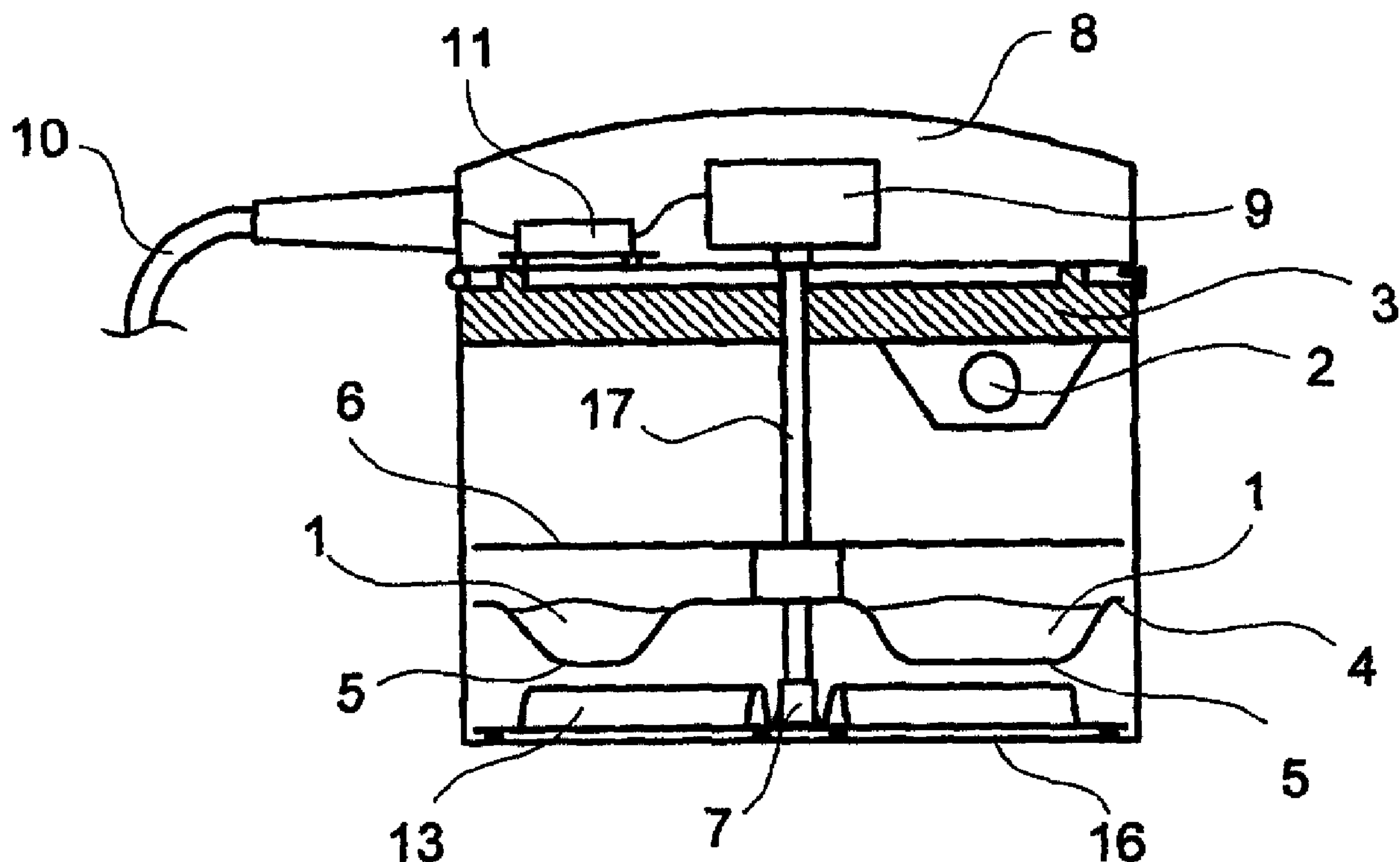




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(54) Titre : DISPOSITIF POUR FAIRE CUIRE DES OEUFS SANS LA COQUILLE
(54) Title: DEVICE FOR COOKING EGGS WITHOUT THEIR SHELL



(57) Abrégé/Abstract:

When cooking eggs (1) without the egg shell while using heat radiation, there is a risk that the heat radiation will burn the surface of the eggs (1). In order to cook the eggs (1) without burning them, the invention provides a shielding which is placed between the egg (1) to be cooked and the heat radiation source (2) such that it is not in contact with the egg (1) to be cooked so that the egg can also be cooked in a shape resembling that of a fried egg. The eggs (1) are advantageously cooked in enclosures (5) of a preparation shell (4), whereby the shielding (6) frees areas of the preparation shell (4) between said enclosures (5) for direct heat radiation. In order to accelerate the cooking process, the heat absorbed in these areas can be transferred to the eggs (1) by a heat conductive connection of the preparation shell (4) to the enclosures (5).

Abstract

When cooking eggs (1) without the egg shell while using heat radiation, there is a risk that the heat radiation will burn the surface of the eggs (1). In order to cook the eggs (1) without burning them, the invention provides a shielding which is placed between the egg (1) to be cooked and the heat radiation source (2) such that it is not in contact with the egg (1) to be cooked so that the egg can also be cooked in a shape resembling that of a fried egg. The eggs (1) are advantageously cooked in enclosures (5) of a preparation shell (4), whereby the shielding (6) frees areas of the preparation shell (4) between said enclosures (5) for direct heat radiation. In order to accelerate the cooking process, the heat absorbed in these areas can be transferred to the eggs (1) by a heat conductive connection of the preparation shell (4) to the enclosures (5).

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Device for Cooking Eggs Without Their Shells

The present invention relates to a device for cooking eggs without their shells, using thermal radiation.

In order to cook eggs in their shells, it is known that they can be cooked in a hot water bath or in steam. Additionally , DE 1 429 788, DE 733 36 78 U1, DE 1 869 125 U1, and US 3,227,065 describe egg cookers in which the eggs are cooked by means of a heating device that emits thermal radiation or convective heat. Eggs without their shells are usually cooked in pans or other vessels that are heated externally and conduct the heat to the egg content that they contain. US 5,203,252 describes a toaster with additional functions, in which a semicircular pan-like dish can be heated from below. This known method entails the particular disadvantage that a relatively long cooking time can be required until heat is transferred to the receptacle that is used to accommodate the egg and the eggs that are contained therein. In addition, US 3,831,508 describes containers for eggs without their shells,

which totally enclose the eggs, and in which the eggs can be heated in an oven, a toaster, or in boiling water. However, these containers that completely enclose the eggs entail the disadvantage that during the cooking process the egg lies against the wall of the container on all sides, and thereby assumes a shape that is unnatural and attractive as compared to the shape of eggs that are prepared in containers that are open at the top.

It is the objective of the present invention to create a device for cooking eggs without their shells, of a type described in the introduction hereto, and with which the eggs can be prepared quickly and so as to be attractively shaped.

According to the present invention, this objective has been achieved by a device that incorporates shielding that shields the egg content that is to be cooked against direct thermal radiation and does not come into contact with the egg content that is to be cooked. The shielding can be so connected to the cooking pan that it is located at a sufficient distance above at least the one cup and thereby shields the egg content in the cup against the thermal radiation that, as a rule, comes from above. Materials that are either thermally insulating or thermally conductive can be used as the material for the shielding; if a material such as metal, which conducts heat very well, is

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used, the thermal radiation that is absorbed can to a certain extent be transferred downward to the egg content.

Depending on the thermal radiation that is used and the conditions within the egg cooking device, the transfer of heat to the egg content can be influenced by the selection of the material and the thickness of the shielding.

The cups in the cooking pan can be formed, for example, by ridges that are set onto the cooking pan or by a smaller dish that is set onto the cooking pan.

The cooking pan can be so shaped that the cup only covers a part of it and the shielding exposes the portion that is not covered by the cups to direct thermal radiation, at least in part. In this way, the transfer of heat to the egg content can be increased because direct thermal radiation is conducted to the areas of the cooking pan adjacent to the egg content, so that any burning of the egg content on the surface caused by direct thermal radiation is avoided. More advantageously, the portion of the cooking pan that is not covered by the cup is connected to the bottom of the cup so as to be thermally conductive. In this way, the heat that is picked up from the areas

of the cooking pan adjacent to the egg content is conducted to the egg content from below, so that the cooking process is accelerated.

Part of the cooking pan can be used to form the bottom of the receptacle, so that a cost advantage can be achieved and the heat can be conducted more effectively from the existing edge areas into the bottom of the cup. In one particularly simple embodiment, the cup is formed as a depression in the cooking pan.

In one egg cooking apparatus with a device according to the present invention, a source of thermal radiation can be arranged above, and this radiates downwards onto a cooking pan that is arranged below it and which is moved beneath the source of thermal radiation by a drive system that is arranged, in particular, above it, the shielding being arranged between the source of thermal radiation and the cooking pan. By rotating the cooking pan, in particular with the shielding, it can be ensured that a larger cooking pan, in particular one with a plurality of cups, can be heated by a small, less costly source of thermal radiation. Even more advantageously, commercially available and economical lamps, such as halogen bulbs or halogen tubes, can be used as sources of thermal radiation.

The shielding can incorporate wings that are associated with the cups of the cooking pan, the shielding being connectable to the cooking pan so as to the rotate in unison with it, in order to ensure that the individual cups are shielded by the associated wing. The thermal radiation can warm the cooking pan directly, between the individual wings, and this accelerates the cooking process. If the cooking pan is connected to the cups in a thermally conductive manner, and if, in particular, the cups are formed as depressions in the cooking pan, the heat is conducted more advantageously from the edge areas of the cooking pan that are heated directly by the thermal radiation into the bottoms of the cups and thus to the egg content. The wings of the shielding can be configured so as to fold in order to simplify access to the cooking pan that is located beneath them and to the egg content that is contained within the cups.

In addition, the shielding can incorporate one or a plurality of eyelets or openings into which an elongated object such as, for example, the handle of a spoon, can be inserted and with which the shielding can be removed. In this way, a user can remove the shielding without having to touch it.

The cooking pan and shielding can be configured so as to be removable, and, in addition, provision can be made such that as an alternative to the cooking

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pan and the shielding, a device to turn eggs in their shells can be incorporated in the egg cooking apparatus, when this is also driven by the rotary drive system. To this end, the drive system can be provided with a coupler with which both the cooking pan and the shielding, as well as a device for turning the eggs with shells, can be driven. The device that is used to turn the eggs with shells can, for example, be formed from a disc with openings in which the eggs are held and which is guided in a rotary movement over turning ribs that are arranged in a star shape, so that the parts of the egg that project beneath the disc from within the openings are guided against the upper edges of the turning ribs, are raised somewhat within the openings by these ribs, and then roll off the turning ribs. Given this configuration of the egg turning device, the eggs are rotated by rolling across the turning ribs and simultaneously moved along a circular path within the egg cooking apparatus, so that the individual eggs are moved beneath the source of thermal radiation, one after the other.

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According to one aspect of the present invention, there is provided an apparatus for cooking eggs without eggshells by heat radiation, comprising: a preparation dish having a top and at least one receptacle open at said top
5 for receiving egg contents; a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents; a shield connected to said preparation dish at a distance above said at least one receptacle and shielding the egg contents to be cooked
10 from direct heat radiation; said heat radiation source radiates heat from above said shield towards said preparation dish; a rotary drive is disposed above said shield and is removably connected to said preparation dish and to said shield for rotating said preparation dish
15 together with said shield.

According to another aspect of the present invention, there is provided an apparatus for cooking eggs without eggshells by heat radiation, comprising: a preparation dish having a top and at least one receptacle
20 open at said top for receiving egg contents; a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents; a shield connected to said preparation dish at a distance above said at least one receptacle and shielding
25 the egg contents to be cooked from direct heat radiation; said preparation dish is round; said at least one receptacle is a plurality of receptacles disposed along a circular path; and said shield: is connected in a rotationally fixed manner to said preparation dish; and has vanes each
30 associated with a respective one of said receptacles.

According to still another aspect of the present invention, there is provided an apparatus for cooking eggs without eggshells by heat radiation, comprising: a

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preparation dish having a top and at least one receptacle open at said top for receiving egg contents; a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents; a shield connected to said preparation dish at a distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation; said preparation dish is round; said at least one receptacle is a plurality of receptacles disposed along a circular path; and said shield: is removably and rotationally fixedly connected to said preparation dish; and has vanes each associated with a respective one of said receptacles.

According to yet another aspect of the present invention, there is provided an apparatus for cooking eggs without eggshells by heat radiation, comprising: an upper housing part; a lower housing part; a preparation dish having a top and at least one receptacle open at said top for receiving egg contents; a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents; a shield connected to said preparation dish at a distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation a rotary drive is disposed above said shield and is removably connected to said preparation dish and to said shield for rotating said preparation dish together with said shield; and said preparation dish and said shield removably disposed in said lower housing part.

According to a further aspect of the present invention, there is provided an apparatus for cooking eggs without eggshells by heat radiation, comprising: an upper housing part; a lower housing part; a preparation dish having: a top; and at least one receptacle having a bottom; said at least one receptacle: open at said top for

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receiving egg contents; covering only a portion of said preparation dish; and said bottom of said at least one receptacle heat-conductively connected to at least one portion of said preparation dish not covered by said at
5 least one receptacle; a heat radiation source disposed in said upper housing part above said preparation dish, said heat radiation source radiating heat towards the egg contents; a shield removably connected to said preparation dish at a distance above said at least one receptacle, a
10 rotary drive disposed in said upper housing part above said shield and being removably connected to said preparation dish and to said shield for rotating said preparation dish together with said shield; shielding the egg contents to be cooked from direct heat radiation originating from above
15 said at least one receptacle; and at least partially exposing said at least one portion of said preparation dish not covered by said receptacle to direct heat radiation originating from above said at least one receptacle; and said preparation dish and said shield removably disposed in
20 said lower housing part.

Additional details, features, and advantages of the present invention are set out in the following description of an egg cooking apparatus with a device according to the present invention, this being done with
25 reference to the drawings appended hereto. These drawings show the following:

Figure 1: a diagrammatic side view through the egg cooking apparatus with an insert used for cooking eggs without shells;

Figure 2: a plan view of the cooking pan that is used for cooking eggs without shells;

Figure 3: a plan view of the shielding;

Figure 4: a diagrammatic side view through the egg cooking apparatus, with a device for turning eggs with shells;

Figure 5: a plan view of the lower part of the device for turning eggs with shells;

Figure 6: a plan view of the upper part of the device for turning eggs with shells.

The egg cooking apparatus shown in Figure 1 and Figure 4 comprises a lower part 16 of the housing, in which the eggs 1, either with or without shells, are arranged, and an upper part 8 of the housing. The upper part 8 of the housing comprises an electrical connecting cable 10 for supplying electrical energy, a source of thermal radiation 2 in the form of a halogen tube, a rotary drive system 9, a control device 11 for the source of thermal radiation 2 and the rotary drive system, and thermal insulation 3 that is installed between the source of thermal radiation 2 and the remaining electrical components 9, 10, and 11. The shaft of the rotary drive system

incorporates a coupler that can be installed on different shafts and can drive these in a rotary direction.

Figure 1 shows the egg cooking apparatus configured for preparing eggs 1 without their shells. Below, on the bottom of the lower part 16 of the housing, there is the lower part 13 of the turntable; this is made up of a round disk, on which turning ribs are arranged in the shape of a star, and a bearing sleeve 7 that is open at the top and arranged at the center of the turning ribs. A cooking pan 4 is arranged above the lower part 13 of the turntable, and cups used to accommodate the eggs 1 are formed in this, in the form of depressions. In addition, a shaft 17 is secured at the center of the circular cooking pan 4 and the lower projecting end of this is supported in the bearing sleeve 7. The shielding 6 is installed on the end of the shaft 17 that extends above the cooking pan 4; this shielding is formed from three wings 12 that corresponds to the three cups 5 in the cooking pan 4, and these are secured to a hub by their narrow ends. This ensures that the wings 12 are spaced sufficiently apart from the eggs 1 and that the shielding 6 rotates in unison with the cooking pan 4 such that a wing 12 is located above each cup 5. To this end, the shaft 17 can have a cross section that is in the form of a regular polygon, the number of corners of which corresponds to the number of cups 5, and that the hub has an opening with

an appropriate cross section so as to form an interlocking, positive fit between a hub and the shaft 17.

The upper end of the shaft 17 is so configured that the coupler of the shaft of the rotary drive system 9 can be fitted to it and so drive the shaft 17 in the direction of rotation. The connection between the rotary drive system 9 and the shaft 17 is automatically broken or established when the upper part 8 of the housing is opened or closed.

In order to cook eggs 1 without their shells, the upper part 8 of the housing is raised or removed, the cooking pan 4 with the shielding 6 on the shaft 7 is removed, and the eggs that are to be cooked are placed in the cups, when, in order to simplify this operation, the shielding is removed from the shaft 17. The connection between the shaft 17 and the rotary drive system 9 is established when the cooking pan 4 with the shielding 6 is placed in the lower part 16 of the housing and the upper part 8 of the housing is lowered.

In order to cook the eggs 1, the source 2 of thermal radiation and the rotary drive system 9 are switched on so that the cups with the wings 12 of the shielding 6 that are located above them are rotated slowly beneath the source 2 of thermal radiation, when the eggs 1 are shielded against direct thermal radiation. The wings 12 and the areas of the cooking pan 4 that lie

between and beneath them are acted upon directly by the thermal radiation.

The heat that is absorbed by the cooking pan 4 when this is done is conducted to the cups 5 through the material of the cooking pan 4 which is, in particular, of metal with good heat-conducting properties. The heat that is absorbed by the wings 12, which are similarly of material that is a good thermal conductor, is transmitted downwards onto the eggs by heating the air and, to a lesser degree, by thermal radiation.

With respect to control of the cooking process, provision can be made such that the source 2 of thermal radiation is not operated throughout the whole cooking period. The eggs 1 still continue to cook for a certain time once the egg cooking apparatus has been closed and when the source 2 of thermal radiation is switched off. The rotary drive system can be either switched on or switched off during this subsequent cooking period.

Figure 4 shows an egg cooking apparatus with the parts required to cook eggs with shells. Once again, the lower part 13 of the turntable is arranged within a lower part 16 of the housing but this time the shaft 18 of the egg carrier 14 is supported in the bearing sleeve 7. In addition to the shaft 17, the egg carrier 14 comprises a round disk with openings 15, in which the eggs are held in such a way that they extend beneath it. The space between the egg carrier 14 and the lower part 13 of the turntable is such that when

the egg carrier 14 is rotated, the lower protruding parts of the eggs 1 are moved against the turning ribs on the lower part 13 of the turntable, so that they are raised by the turning ribs and roll across said turning ribs within the openings 15. In this way, as the egg carrier 14 is rotated, each egg is turned about its longitudinal axes and moved beneath the source 2 of thermal radiation on a circular path.

Figure 5 shows the lower part 13 of the turntable with the turning ribs that are arranged in a star shape on it, and with the sleeve bearing 7 arranged at its center. Figure 6 shows the carrier 14 with the openings 15 and the shaft 18, the upper end of which has a section on which the coupler for the rotary drive system 9 can be installed as in the case of the shaft 17 of the cooking pan 4, so as to drive the shaft 18 in the direction of rotation.

As in the foregoing case, the connection between the shaft 18 and the shaft of the rotor drive system 9 is automatically broken or established when the upper part 8 of the housing is either raised or lowered. The egg carrier 14 on its shaft 17 can be removed from the lower part 16 of the housing. In order to cook the eggs 1, the rotary drive system 9 and the source 2 of thermal radiation are switched on so that, as they roll over the turning ribs, the eggs 1 are turned and moved beneath the source 2 of thermal radiation.

When this is done, provision can be made such that the rotary drive system remains switched on after the source 2 of thermal radiation has been switched off, so that the eggs continue to be turned and moved during a subsequent cooking phase.

More advantageously, the control system 11 emits an optical and/or acoustic signal at the end of the cooking process for the eggs 1, both with and without their shells, in order to provide an indication that the eggs 1 are to be removed and, if necessary, to be cooled.

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CLAIMS:

1. An apparatus for cooking eggs without eggshells by heat radiation, comprising:

5 a preparation dish having a top and at least one receptacle open at said top for receiving egg contents;

a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents;

10 a shield connected to said preparation dish at a distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation;

said heat radiation source radiates heat from above said shield towards said preparation dish;

15 a rotary drive is disposed above said shield and is removably connected to said preparation dish and to said shield for rotating said preparation dish together with said shield.

2. The apparatus according to claim 1, wherein:

20 said receptacle covers only a portion of said preparation dish; and

said shield at least partially exposes at least one portion of said preparation dish not covered by said receptacle to direct heat radiation.

3. The apparatus according to claim 2, wherein:

25 said receptacle has a bottom; and

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said portion of said preparation dish not covered by said receptacle is heat-conductively connected to said bottom of said receptacle.

4. The apparatus according to claim 1, wherein:

5 said receptacle has a bottom; and

said bottom of said receptacle is a part of said preparation dish.

5. The apparatus according to claim 1, wherein:

said receptacle has a bottom; and

10 said bottom of said receptacle is integral with said preparation dish.

6. The apparatus according to claim 1, wherein said receptacle is a recess in said preparation dish.

7. The apparatus according to claim 1, wherein said
15 shield is removably connected to said preparation dish.

8. The egg cooker according to claim 1, wherein said preparation dish and said shield are removable.

9. The egg cooker according to claim 1, wherein said drive has a couple selectively driving one of:

20 said preparation dish and said shield; and

an egg turning device for turning eggs with shells.

10. The egg cooker according to claim 9, wherein said shield has one of a breakthrough and at least one eye for removal of the eggs with an elongate article.

25 11. An apparatus for cooking eggs without eggshells by heat radiation, comprising:

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a preparation dish having a top and at least one receptacle open at said top for receiving egg contents;

a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat
5 towards the egg contents;

a shield connected to said preparation dish at a distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation;

said preparation dish is round;

10 said at least one receptacle is a plurality of receptacles disposed along a circular path; and

said shield:

is connected in a rotationally fixed manner to said preparation dish; and

15 has vanes each associated with a respective one of said receptacles.

12. An apparatus for cooking eggs without eggshells by heat radiation, comprising:

a preparation dish having a top and at least one
20 receptacle open at said top for receiving egg contents;

a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents;

a shield connected to said preparation dish at a
25 distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation;

said preparation dish is round;

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said at least one receptacle is a plurality of receptacles disposed along a circular path; and

said shield:

is removably and rotationally fixedly connected to
5 said preparation dish; and

has vanes each associated with a respective one of said receptacles.

13. The egg cooker according to claim 12, wherein said vanes are foldable.

10 14. An apparatus for cooking eggs without eggshells by heat radiation, comprising:

an upper housing part;

a lower housing part;

a preparation dish having a top and at least one
15 receptacle open at said top for receiving egg contents;

a heat radiation source disposed above said preparation dish, said heat radiation source radiating heat towards the egg contents;

a shield connected to said preparation dish at a
20 distance above said at least one receptacle and shielding the egg contents to be cooked from direct heat radiation a rotary drive is disposed above said shield and is removably connected to said preparation dish and to said shield for rotating said preparation dish together with said shield;
25 and

said preparation dish and said shield removably disposed in said lower housing part.

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15. An apparatus for cooking eggs without eggshells by heat radiation, comprising:

an upper housing part;

a lower housing part;

5 a preparation dish having:

a top; and

at least one receptacle having a bottom; said at least one receptacle:

open at said top for receiving egg contents;

10 covering only a portion of said preparation dish;
and

said bottom of said at least one receptacle heat-conductively connected to at least one portion of said preparation dish not covered by said at least one
15 receptacle;

a heat radiation source disposed in said upper housing part above said preparation dish, said heat radiation source radiating heat towards the egg contents;

a shield removably connected to said preparation
20 dish at a distance above said at least one receptacle, a rotary drive disposed in said upper housing part above said shield and being removably connected to said preparation dish and to said shield for rotating said preparation dish together with said shield;

25 shielding the egg contents to be cooked from direct heat radiation originating from above said at least one receptacle; and

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at least partially exposing said at least one portion of said preparation dish not covered by said receptacle to direct heat radiation originating from above said at least one receptacle; and

5 said preparation dish and said shield removably disposed in said lower housing part.

16. The egg cooker according to claim 15, wherein:

 said preparation dish is round;

 said at least one receptacle is a plurality of
10 receptacles disposed along a circular path; and

 said shield:

 is rotationally fixedly connected to said preparation dish; and

 has foldable vanes each associated with a
15 respective one of said receptacles.

17. The egg cooker according to claim 15, wherein said drive has a couple selectively driving one of:

 said preparation dish and said shield; and

 an egg turning device for turning eggs with
20 shells.

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PATENT AGENTS

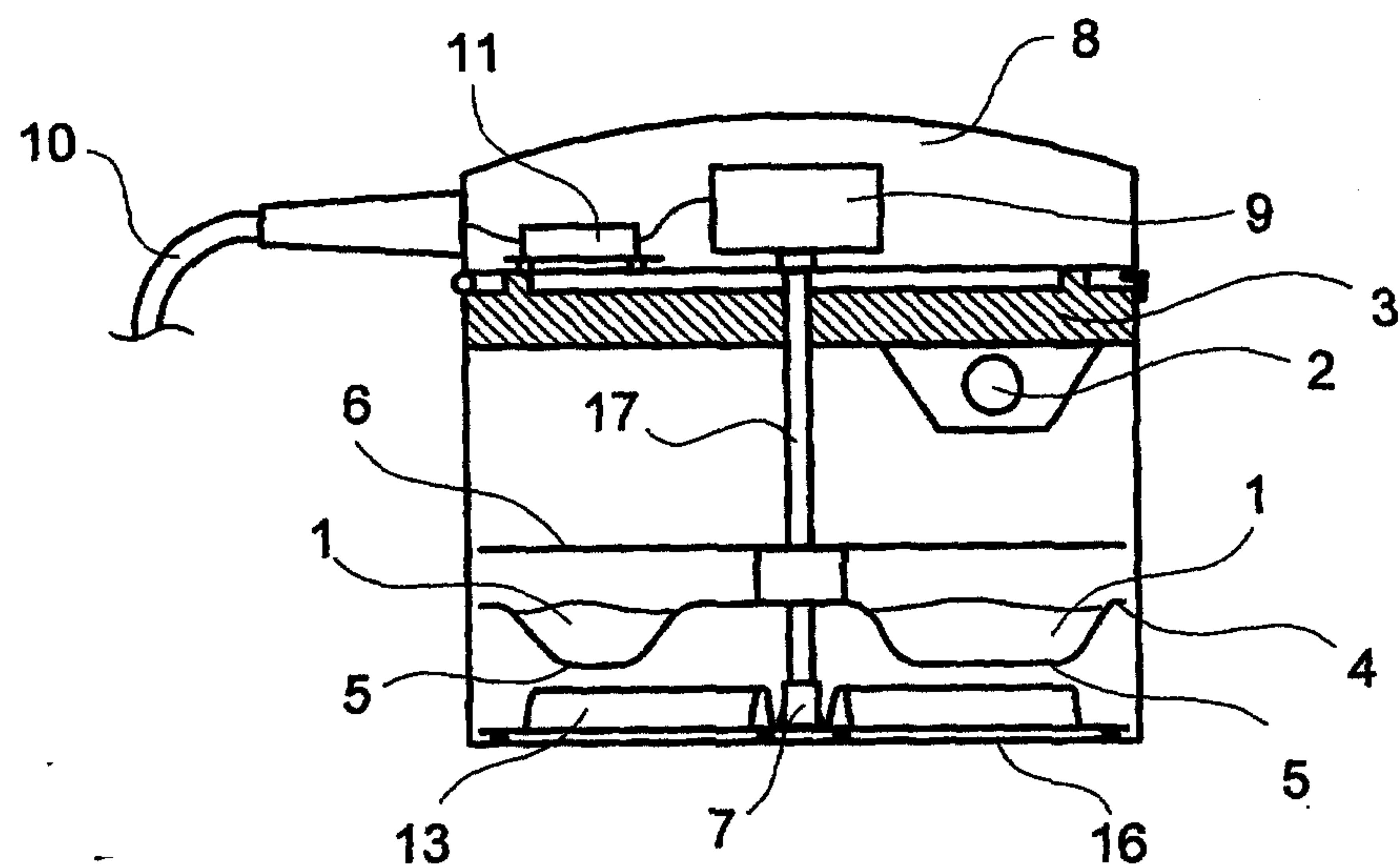


Fig. 1

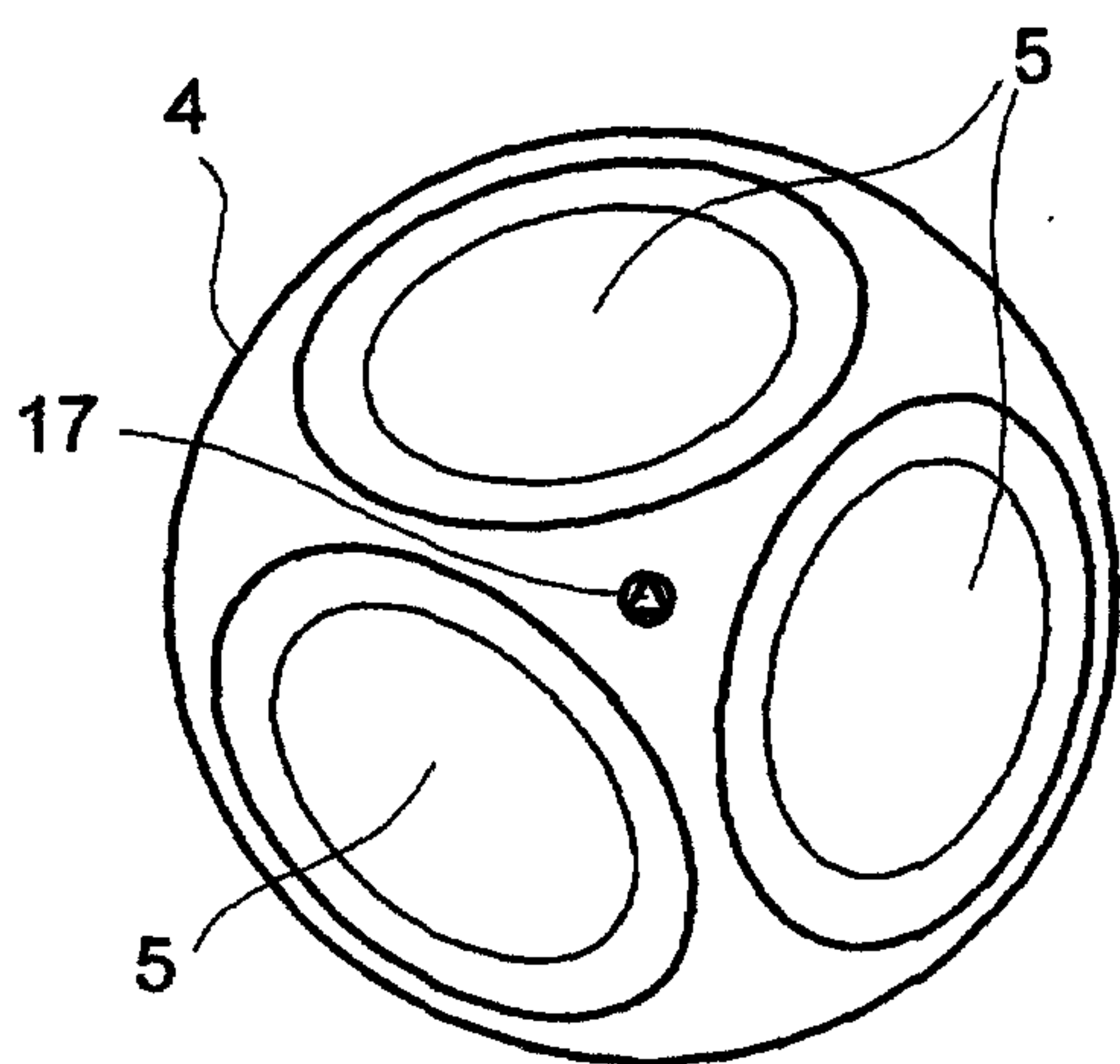


Fig. 2

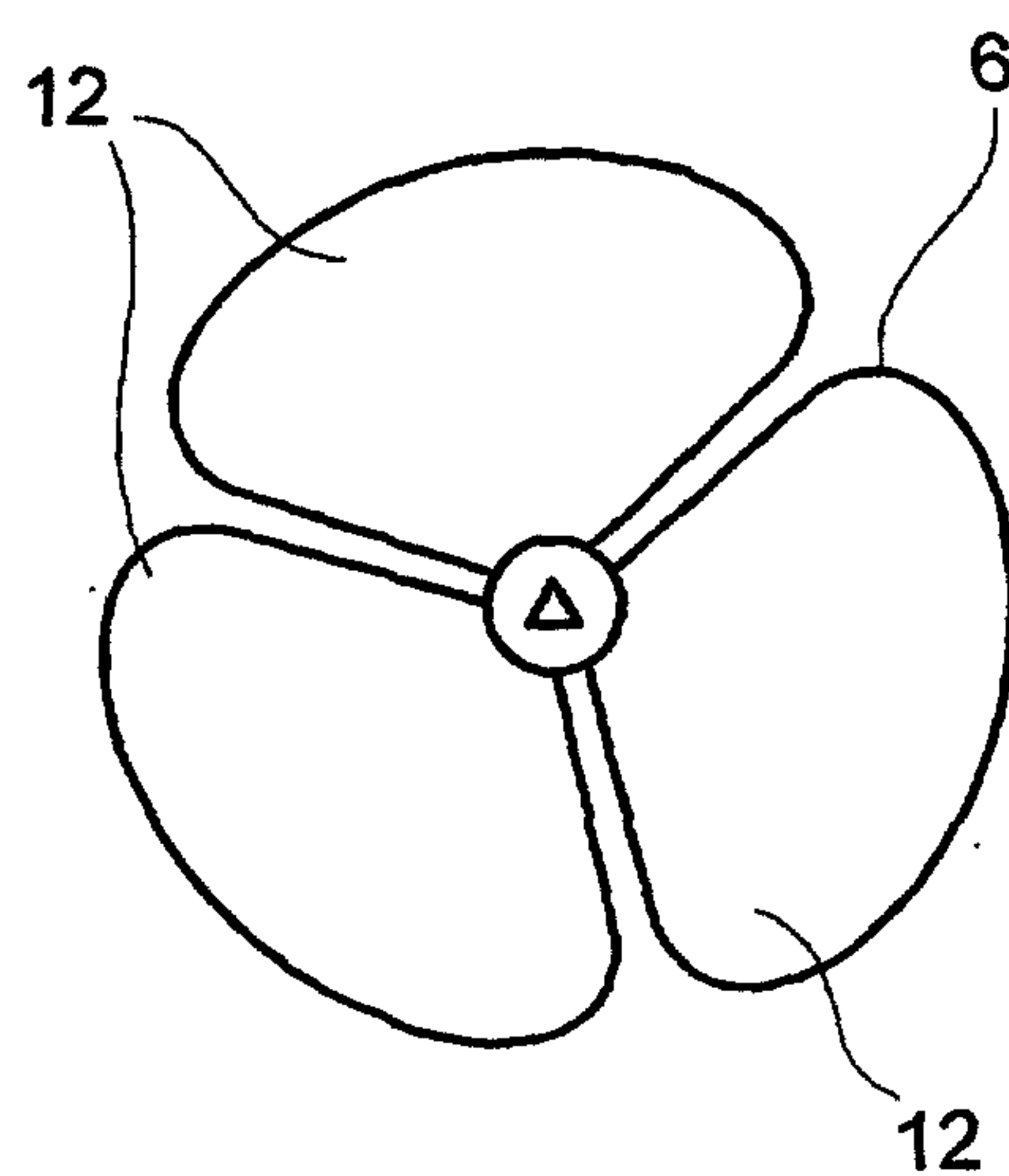


Fig. 3

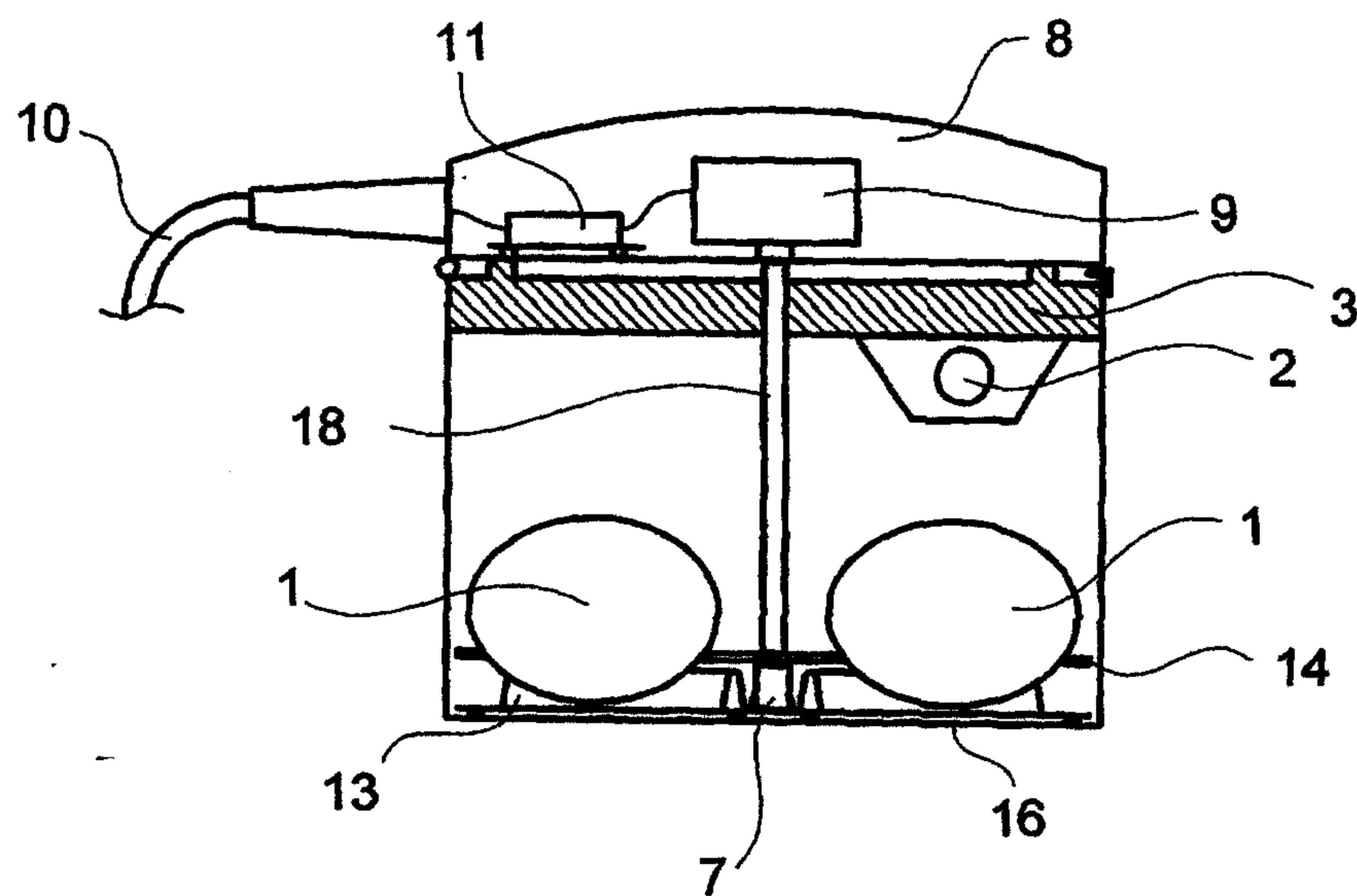


Fig. 4

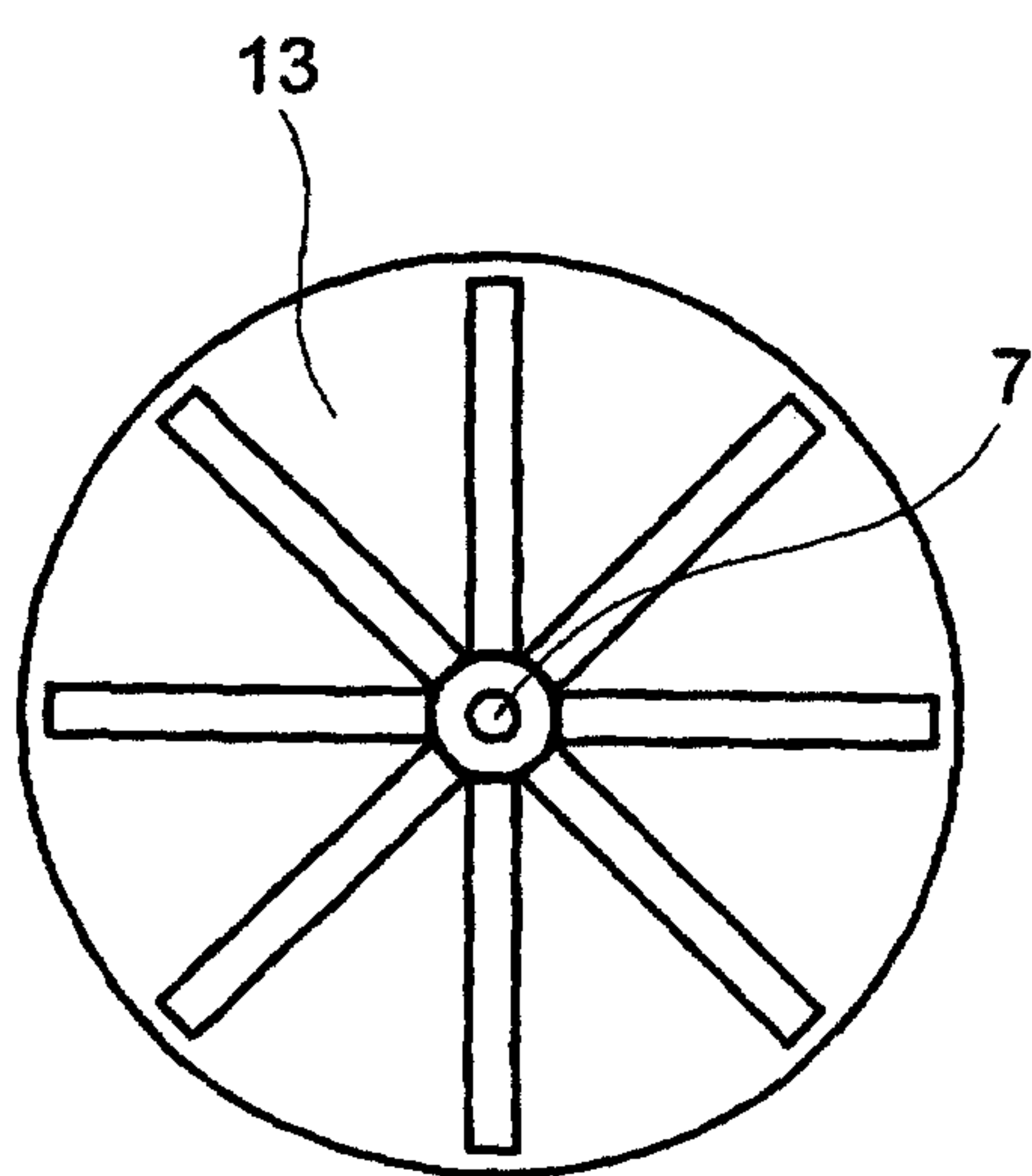


Fig. 5

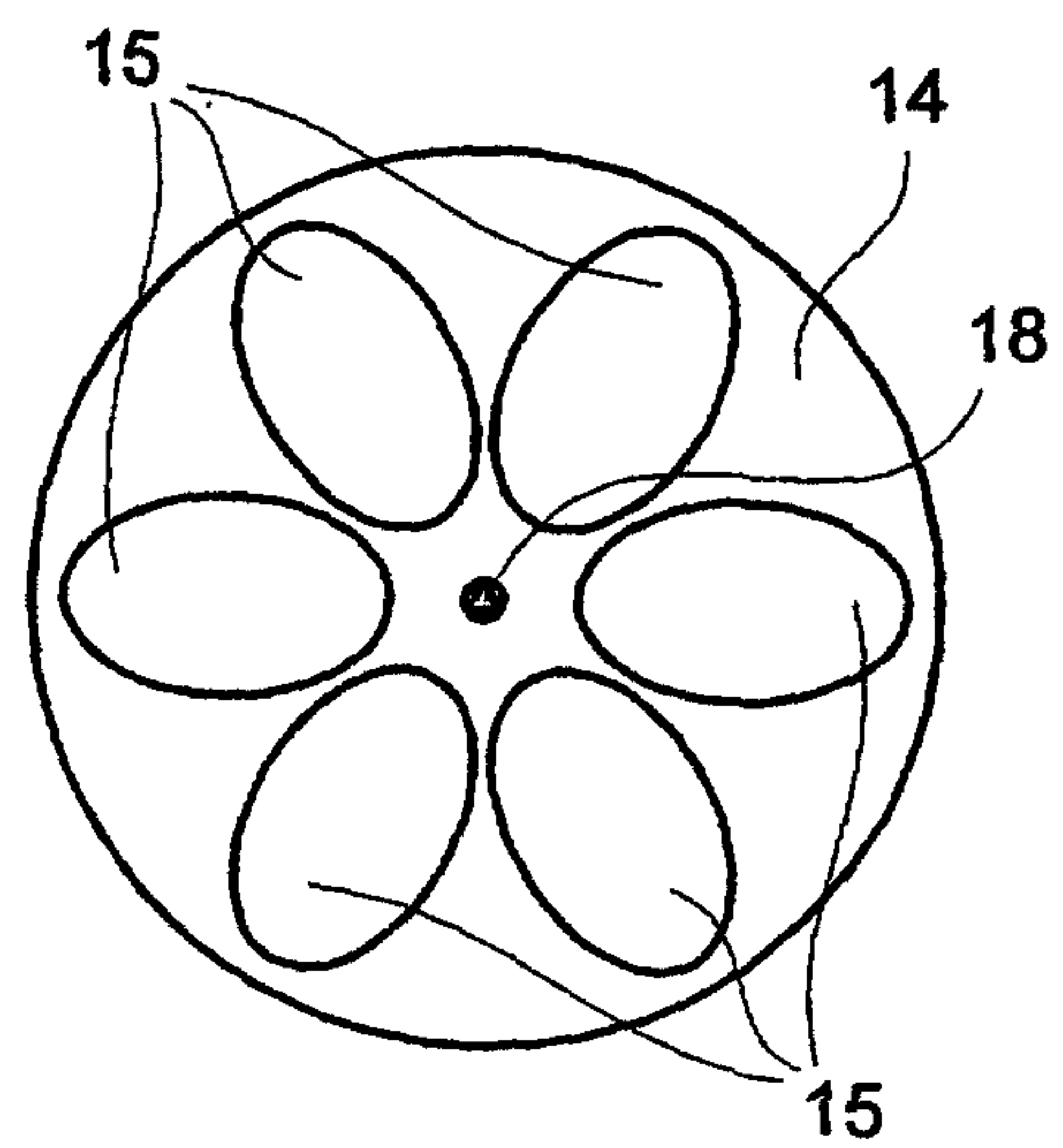


Fig. 6

