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(54) CAPSULE FOR BEVERAGES

(57) The object of the invention is a capsule for beverages subjected to the processes of extracting, dissolving and diluting its content by injecting liquid under pressure into the capsule in an appliance for preparing beverages, comprising a casing containing such a substance closed with barriers which can be punctured at the top and the base, designed for the preparation of hot, cold or chilled beverages, liquid food and liquid additives to food, especially such drinks as cappuccino, coffee, chocolate, Latte Machiatto, Ice Frappe, soups, teas, juices, desserts, sauces/dressings, alcoholic drinks and beer.

The capsule for beverages is characterised in that there is the mixing unit (15) guide (13) located in the separator (4) seated in a recess (14) made in the mixing unit (15), whose arms (20) have outflow holes (21) at the ends placed in the walls (40) of the recess (14), connected to the central hole (22) of the punch (23) that punctures the lower barrier (3) and which has at least one notch (45) in the centre of the casing (1) and being the part of the casing (1), where the punch (23), in its working position, after puncturing through the lower barrier (3) seals the resulting hole with its outer surface during the outflow of the prepared mix, while the generating line (a) of the punch (23) is longer than half the length (d) cut on the inside of the barrier (3), and the height (h) of the punch (23) is shorter than the height (H) of the casing (1) outflow duct (41).

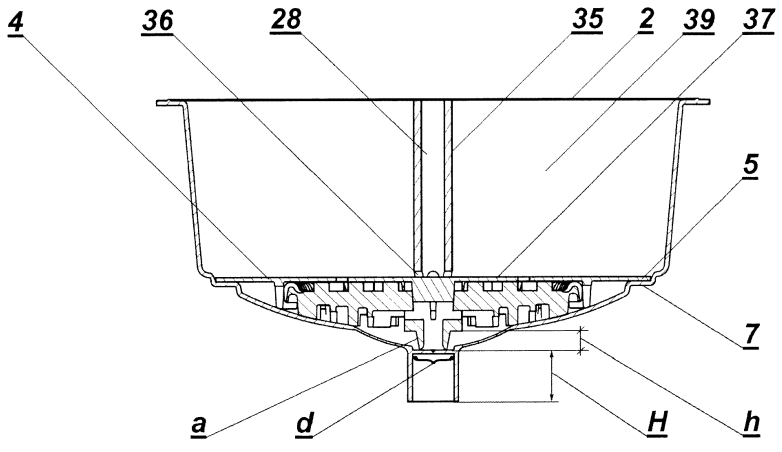

Fig. 3

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Description

[0001] An object of the invention is a capsule for beverages subjected to the processes of extracting, dissolving and diluting its content by injecting liquid under pressure into the capsule in an appliance for preparing beverages, comprising a casing containing such a substance closed with puncturable barriers at the top and the base, designed for the preparation of hot, cold or chilled beverages, liquid food and liquid additives to food, especially such drinks as cappuccino, coffee, chocolate, Latte Machiatto, Ice Frappe, soups, teas, juices, desserts, sauces/dressings, alcoholic drinks and beer.

[0002] There is an appliance for extracting a food substance contained in a sealed cartridge and the method of extracting a food substance contained in a sealed cartridge known from the Polish Patent No. 196425. The appliance has a hollow body with a chamber for inserting the cartridge, a water feeding duct running through the body and connected to the chamber and many puncturing elements distributed across the chamber. The puncturing elements puncture the cartridge in many separate places enabling water to flow into the cartridge and these are spaced across the chamber along the direction of water inflow. Furthermore, each puncturing element comprises a basic component that is connected to the body and protrudes into the chamber, and this basic component enters the cartridge at least partially forming in it the surface of water inflow inside the cartridge, and the basic component is a solid part with a closed cross-section while each puncturing member has a cutting face that cuts the basic component at an acute angle. The cross-section of the basic component narrows down gradually towards the cutting face at the "β" angle smaller than the "α" angle of the cutting face.

[0003] There is a replaceable cartridge known from the Polish Patent No. 171494 for a beverage brewing appliance that has a rigid, cylindrical casing which is hollow inside for placing beverage powder, with a non-perforated side wall and perforated central part that constitutes the casing inlet and the opposite perforated base that constitutes the casing outlet. There is an outer plastic ring-shaped protrusion around the central part that touches an external heat source in the form of the heated plate of the beverage brewing appliance. The outer plastic circumferential protrusion is subject to plastic deformation by the action of the external heat source and its front wall is formed in such a manner that it is part of the side surface of a truncated cone with an obtuse vertical angle, with its vertex located in the axis of the casing, and the temperature of protrusion softening is lower than the boiling point of water while the temperature of its melting is higher than the boiling point of water.

[0004] There is a container known from the Polish Patent Application No. P-385854 submitted according to the publication WO 2007/054479 A1 of the Application PCT/EP2006/068121 that has several chambers and contains at least one beverage ingredient for beverage preparation, used to prepare a beverage by mixing it with liquid input to the container, and the container inside is divided into at least two separate chambers.

This container may be in the form of a capsule or bag containing at least one ingredient for preparing a beverage, and such a beverage is prepared by mixing liquid input to the capsule, while the capsule inside is divided into at least two separate chambers, the first and the second one, and each chamber contains a beverage ingredient or beverage ingredient mix, while the first chamber is adapted to release the ingredient or ingredient mix at a time lag versus the second chamber when the liquid is input inside the capsule to make the beverage.

[0005] There is a capsule that is subjected to extraction and the method of improving hygiene and reducing contamination when preparing a beverage from the capsule known from the Polish Patent Description No. 201325. The capsule according to that invention is subjected to extraction by injecting liquid under pressure into the capsule in an appliance for preparing a beverage, and the capsule contains a substance for preparing the beverage in a sealed chamber and a means of opening the capsule applied, where the opening of the capsule permits the beverage to flow out as a results of the interaction of the opening means and the chamber wall under the influence of the liquid pressure increase in the chamber.

[0006] There is a capsule for beverages known from the Polish Patent Description No. 219698 subjected to extracting, dissolving and diluting its content by injecting liquid under pressure into the capsule in an appliance for preparing beverages, comprising a casing containing such a substance closed with puncturable membranes at the top and the base, which is characterised in that there are at least two internal concentric chambers inside the casing sealed with the membrane at the top, fitted with a cap with a ring turned inside fitted with reinforcements spaced along its internal side, while at the base the cap has a ring turned outside fitted with passages that adhere to a spacing insert, and there is a frothing insert placed inside the area surrounded by the ring and fitted at the top with slots spaced around the ring perimeter and spacing mandrels and fitted at the base with concentric segmented rings of variable thickness and with a preferably centrally placed punch partly located in the outflow duct hole covered with the outflow membrane, where part of the casing base is rounded outwards within the outflow duct. The spacing insert has concentric rings on the inside, where there are indentations on the perimeter of the inner ring and passages on the rim of the outer ring, and there is a passage in the base of the spacing insert, while the rim of the spacing insert is clasp locked along its whole perimeter with a flange inside the casing. The frothing insert has a flexible sealing lip turned out along its perimeter.

[0007] There is a capsule for beverages known from the Polish Patent Description No. 220172 subjected to extracting, dissolving and diluting its content by injecting liquid under pressure into the capsule in an appliance for

preparing beverages, comprising a casing containing such a substance closed with puncturable membranes at the top and the base, which is characterized in that there is one internal chamber inside the casing which has a spacing insert in its lower part, and there is a frothing insert placed inside the area surrounded by the ring and fitted at the top with slots spaced around the ring perimeter and a row of spacing mandrels and fitted at the base with a row of concentric segmented rings of variable thickness and with a preferably centrally placed punch partly located in the outflow duct hole covered with the outflow membrane, where part of the casing base is rounded outwards within the outflow duct. The spacing insert is fitted with a passage and has concentric rings on the inside, where there is a row of indentations on the perimeter of the inner ring and the rim of the insert is clasp locked along its whole perimeter with a flange inside the casing. In the locking area with the rim, the flange has the shape of a reversed letter "J". The frothing insert has a flexible sealing lip turned out along its perimeter.

[0008] The biggest disadvantages of the capsules currently used for beverages is the incomplete dissolution of the ingredients and the residue of mixed ingredients on the surfaces of capsule components after the capsule has been emptied as well as the difficulty in recycling due to the material used for the top and base membranes, which are made of various types of foils, most often aluminium foil, which means that these foils must be manually removed in order to recycle the capsule.

[0009] The purpose of the invention is to design a capsule for beverages that enables laminar outflow of the mixed ingredients and is made completely of a homogeneous material, and guarantees the complete emptying of its content.

[0010] The capsule for beverages that comprises the casing sealed tightly with the upper barrier at the top and the lower barrier at the base, where there is a separator located in the casing with at least one hole and connected to the casing along its perimeter, and in the upper part of the capsule casing between the upper barrier and the separator, there is a substance subjected to the processes of extracting, dissolving and diluting its content by injecting liquid under pressure into it within the appliance for preparing beverages, and that contains a mixing unit located between the separator and the lower barrier which seals the outflow duct, through which the prepared content flows out, and the mixing unit is located inside the area surrounded by a centric ring fastened to the separator from the base and fitted with an undetachable punch, according to the invention is characterised in that there is a mixing unit guide in the separator seated in a recess made in the mixing unit, whose arms have outflow holes at the ends placed in the walls of the recess, and connected to the central hole of the punch that punctures the lower barrier which has at least one notch in the centre of the casing, and is part of the casing where the punch, in its working position, after puncturing the lower barrier, splits the barrier into parts causing additional sealing of the outflow duct during the outflow of the prepared mix, and the generating line of the punch is longer than half the length cut on the inside of the barrier, and the height of the punch is shorter than the height of the casing outflow duct. There is a bush between the upper barrier and the separator surface fitted with a central hole and the holes at the base allowing the liquid to flow out to dilute the substance in a direction from the separator towards the upper barrier. The bush which is connected to the separator may or may not be detached.

[0011] The advantage of the capsule according to the invention is that owing to the notch, specifically a radial one, made on the inner surface of the lower barrier, which, because of its separation into parts, additionally seals the outflow duct in its upper part with the outer surface of the punch base, thus ensuring the outflow of the mixed substance through the central hole in the punch only and enabling the laminar outflow of the mixed substance without it splashing onto the inner walls of the outflow duct, while the application of the additional bush enables the thorough mixing of the ingredients contained in the upper part of the capsule in a direction from the upper surface of the separator towards the upper barrier. As the capsule is made of a homogeneous material this eliminates aluminium foils which are currently used and guarantees total recycling of the capsule.

[0012] The object of the invention has been shown in a sample embodiment in the drawing, where Fig. 1 - shows a side view of the capsule, Fig. 2 - shows an axial section of the capsule, Fig. 3 - shows an axial section of the capsule fitted with the bush, Fig. 4 - shows a top view of the separator, Fig. 5 - shows a base view of the separator, Fig. 6 - shows an axial section of the separator, Fig. 7 - shows a top view of the separator connected to the bush, Fig. 8 - shows an axial section of the separator fitted with the connected bush which may be detached Fig. 9 - shows an axial section of the separator fitted with the undetachable connected bush, Fig. 10 - shows a top view of the separator connected along its rim with the lower part of the capsule, Fig. 11 - shows a top view of the middle of the capsule without the separator and the mixing unit, Fig. 12 - shows an axial section of the mixing unit, Fig. 13 - shows a base view of the mixing unit, Fig. 14 - shows a top view of the mixing unit, Fig. 15 - shows an axial section of the capsule placed in the tray of the appliance for preparing beverages before emptying it, Fig. 16 - shows an axial section of the capsule placed in the tray of the appliance for preparing beverages during emptying it, Fig. 17 - shows an axial section of the capsule fitted with the bush and placed in the tray of the appliance for preparing beverages before emptying it, Fig. 18 - shows an axial section of the capsule fitted with the bush and placed in the tray of the appliance for preparing beverages, and Fig. 19 - shows an axial section of the capsule fitted with the bush and placed in the tray of the appliance for preparing beverages during emptying it.

[0013] As shown in the drawing, the capsule for beverages has the casing **1,** made of a homogeneous ma-

terial, as are all capsule components, which is sealed with the upper barrier **2** at the top and with the lower barrier **3** at the base, especially of a circular shape, which act as tight closures of the separated capsule zones (Fig. 2). The lower barrier **3** has at least one radial notch **45** from the centre of the casing **1,** and on splitting into parts it additionally seals the outflow duct **41** in its upper part with the outer surface of the punch **23** base **46,** thus forcing the outflow of the prepared mix through the central hole 22 and preventing the uncontrolled outflow of the prepared mix along the inner surface **42** of the outflow duct **41** (Fig. 2, Fig. 11 - 12). There is a separator **4** inside the casing **1** fitted with the rim **5**, which is connected by welds **6** to the outer ring-shaped surface **7** in the central part of the casing **1** (Fig. 3, Fig. 10). The separator **4** has at least one passage **12** inside the area **8** surrounded by the centric ring **9** consisting of segments **10** with gaps **11** between them, and the guide **13** placed in the geometric centre of the area **8** (Fig. 5). The guide **13** is inserted in the cruciform hole **14**, which can have other geometric shapes, and this prevents the rotation of the mixing unit **15** inside the casing **1** (Fig. 5, Fig. 14 - 15). The cruciform hole **14** is made from the side of the surface **16** of the mixing unit **15** fitted with a row of spacing protrusions **17** and has arms **20** with outflow holes **21** at the ends placed in the walls **40** of the punch **23** base **46** (Fig. 11, Fig. 14, Fig. 17). The outflow holes **21** are connected with the central hole **22** of the punch **23** that punches the lower barrier **3**, and after punching through the lower barrier **3** presses its torn parts along the inner notches **45** and on splitting into parts it additionally seals the outflow duct 41 in its upper part with the outer surface of the punch 23 base **46**, thus forcing the outflow of the prepared mix through the central hole **22** and preventing the uncontrolled outflow of the prepared mix along the inner surface **42** of the outflow duct 41 (Fig. 2, Fig. 11 - 12). The generating line **a** of the punch **23** is longer than half the length **d** cut on the inside of the lower barrier **3**, and the height **h** of the punch is shorter than the height **H** of the casing **1** outflow duct **41** (Fig. 3).

At the periphery of the surface **16** of the mixing unit **15**, there is a ring **29** with a lip **30** at its end comprising the protrusions **18** located between the holes **19**, while the concentric rings **25** made of shaped segments **26** and holes **27** are seated on the side of the base **24** and may not be disconnected from it (Fig. 12, Fig. 13, Fig. 14).

The option of the capsule for beverages has, between the upper barrier **2** and the surface **37** of the separator **4**, a bush **35** fitted at the base with the openings **36** in the shape of holes or slots, and the said bush **35** supports the upper barrier **2**, which is significant for the process of pasteurization of the content in the upper part **39** (Fig. 3). The openings **36** ensure the flow of the liquid under pressure delivered through the central hole **28** to the upper part **39** of the capsule **1,** and the said liquid dissolves/dilutes the content (Fig. 3, Fig. 19). The flow inside the upper part **39** of the capsule **1** is in the direction from the upper surface **37** of the separator **4** towards the upper barrier **2**, and the outflow is through the passage **12** to the mixing unit **15** labyrinth and then to the outflow duct **41** (Fig. 3 - 4, Fig. 12, Fig. 19). The bush **35** which is connected to the separator **4** (Fig. 8 - 9 may or may not be detached.

[0014] To empty the capsule of beverage ingredients it is placed in the removable tray **31,** which is then locked inside the appliance for preparing beverages **32** used for preparing hot or cold beverages and by means of lifting the tray **31,** the capsule is additionally sealed on its whole surface and thus the rounding **33** moves towards the punch **23,** which punches through the barrier **3** along at least one notch **45**, and on splitting into parts it additionally seals the outflow duct **41** in its upper part with the outer surface of the punch 23 base **46,** thus forcing the outflow of the prepared mix through the central hole 22 and preventing the uncontrolled outflow of the prepared mix along the inner surface **42** of the outflow duct 41 (Fig. 11 - 12, Fig. 15 - 16). At the same time or slightly later, the upper barrier **2** is punched through by the nozzle **34** fitted with the inner hole **38,** through which cold or hot water is delivered under pressure into the capsule or into the hole **28** of the bush 35, causing the dissolution/dilution of the content in the upper part **39** of the capsule **1** and the outflow of the prepared mixed content through the holes **12**, outflow holes **21,** mixing unit 15 labyrinth, central hole 22 and the outflow duct **41** outside to a receiving vessel, namely a cup, a glass or another container (Fig. 2, Fig. 5, Fig. 8 - 9, Fig. 17 - 18).

Claims

1. The capsule for beverages that comprises a casing (1) sealed tightly with an upper barrier (2) at the top and a lower barrier (3) at the base, with a separator (4) located in the casing (1) with at least one hole (12) and this separator connected to the casing (1) along its perimeter (6), and in the upper part (39) of the capsule casing (1) between the upper barrier (2) and the separator (4), there is a substance subjected to the processes of extracting, dissolving and diluting its content by injecting liquid under pressure into it within the appliance for preparing beverages, and that contains a mixing unit (15) located between the separator (4) and the lower barrier (3) which seals an outflow duct (41), through which the prepared content flows out, and the mixing unit (15) is located inside the area (8) surrounded by a centric ring (9) fastened to the separator (4) at the base and fitted with an undetachable punch (23), **characterised by** that there is a mixing unit (15) guide (13) in the separator (4) seated in a recess (14) in the mixing unit (15), whose arms (20) have outflow holes (21) at the ends placed in the walls (40) of the recess (14) and connected to the central hole (22) of the punch (23) that punctures the lower barrier (3) which has at least one notch (45) in the centre of the casing (1) and is

part of the casing (1), and where the punch (23), in its working position, after puncturing through the lower barrier (3), splits the barrier (3) into parts causing additional sealing of the outflow duct (41) during the outflow of the prepared mix, and the generating line (a) of the punch (23) is longer than half the length (d) cut on the inside of the barrier (3), and the height (h) of the punch (23) is shorter than the height (H) of the casing (1) outflow duct (41).

2. The capsule according to Claim 1, **characterised by** that there is a bush (35) between the upper barrier (2) and the surface (37) of the separator (4), fitted with a central hole (28) and openings (36) at its base for the liquid to flow out to dilute the substance in a direction from the separator (4) towards the upper barrier (2).

3. The capsule according to Claim 2, **characterised by** that the bush (35) and the separator (4) cannot be detached from each another.

4. The capsule according to Claim 2, **characterised by** that the bush (35) and the separator (4) can be detached from each another.

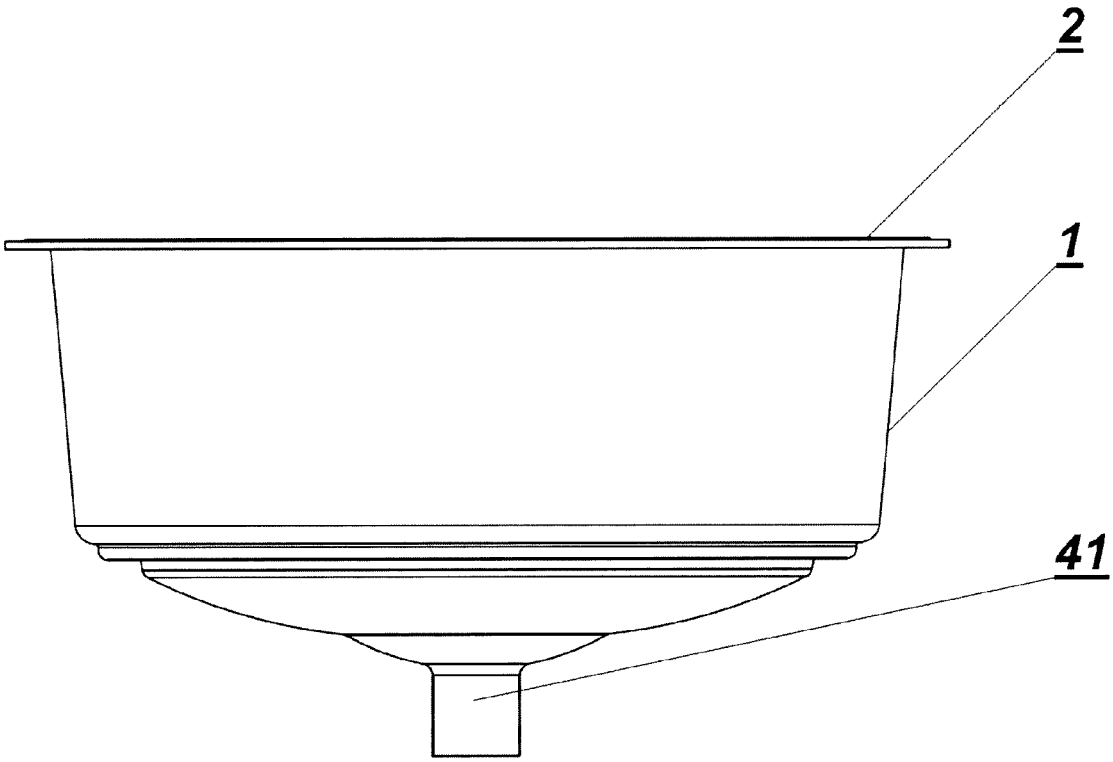

Fig. 1

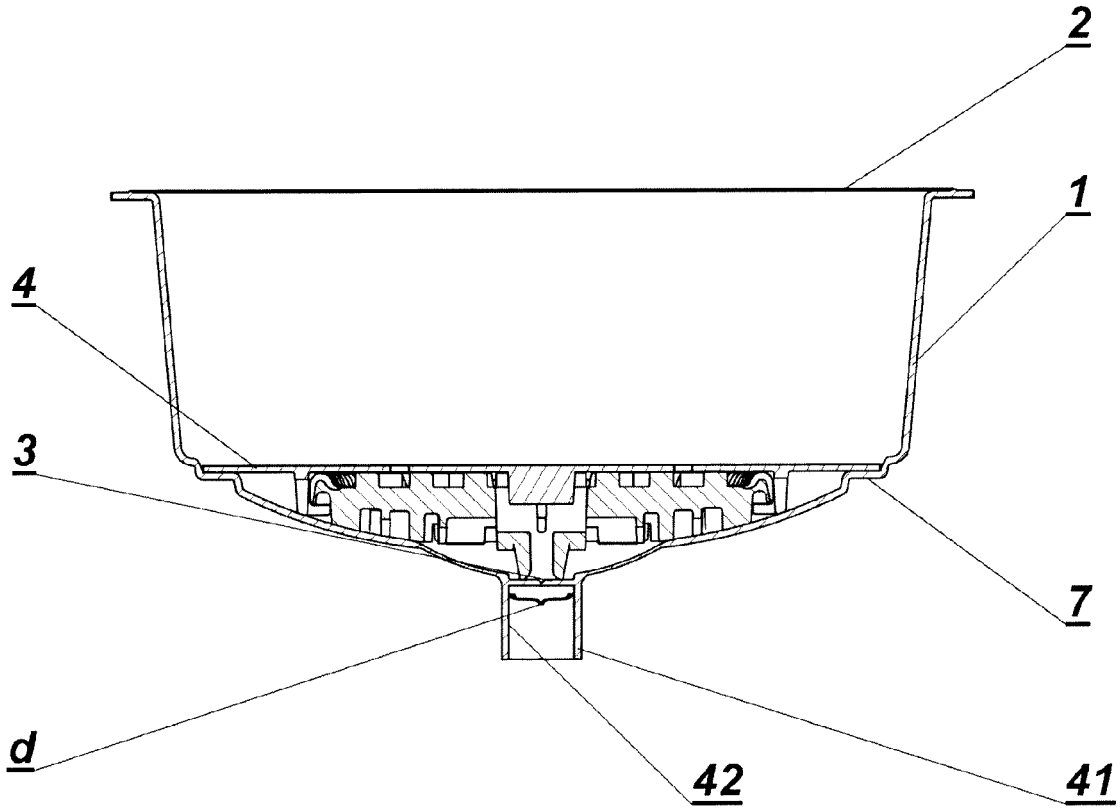

Fig. 2

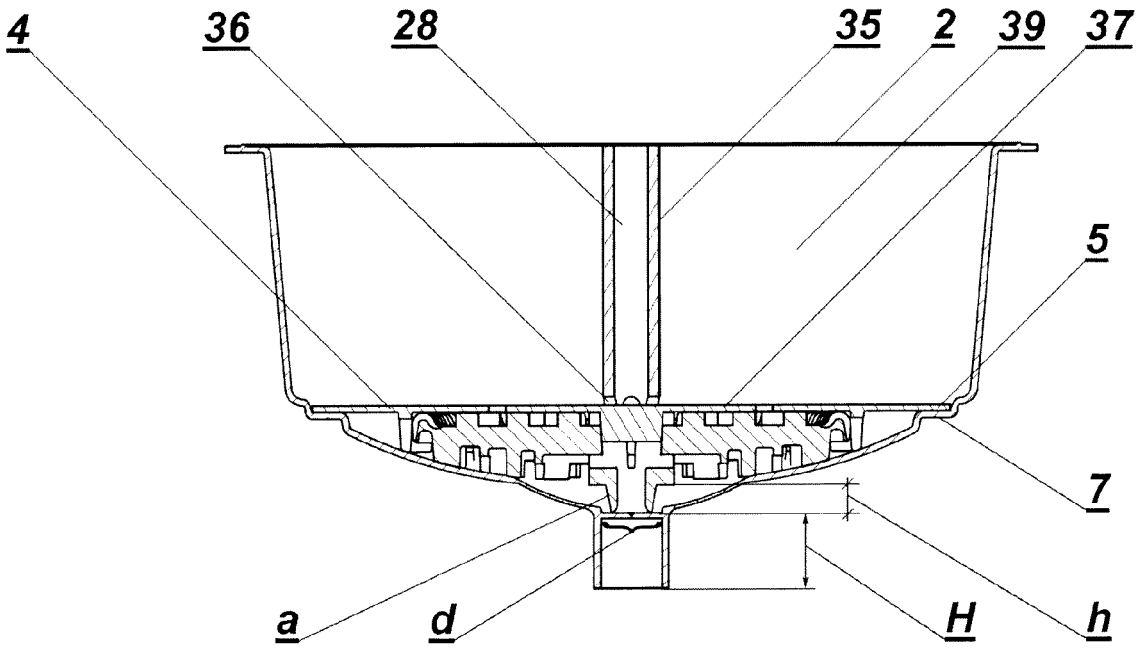

Fig. 3

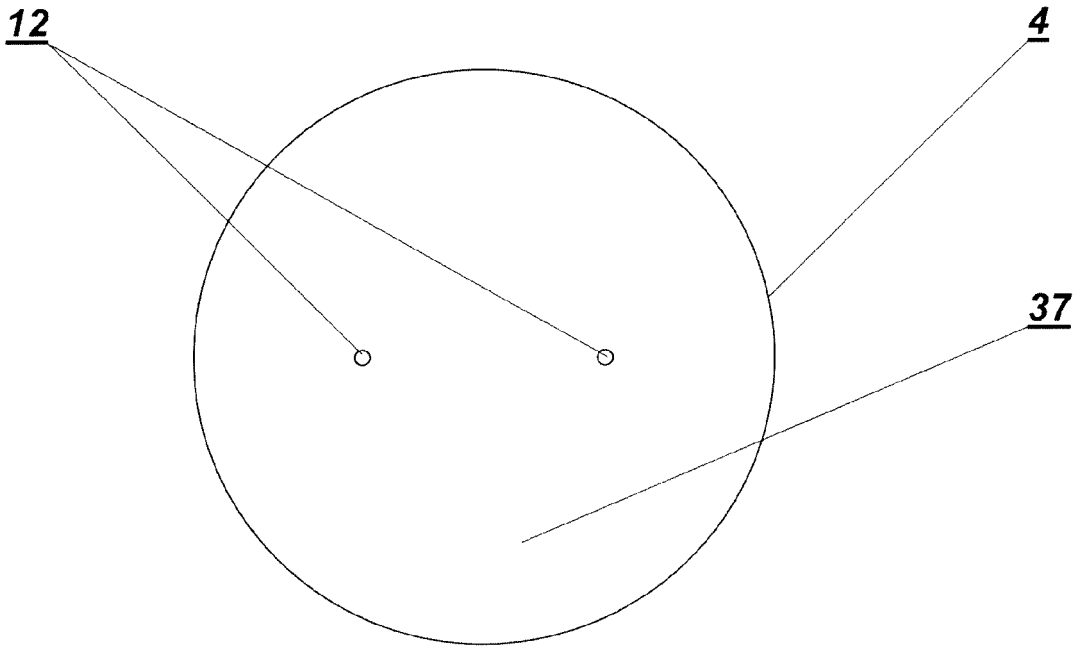

Fig. 4

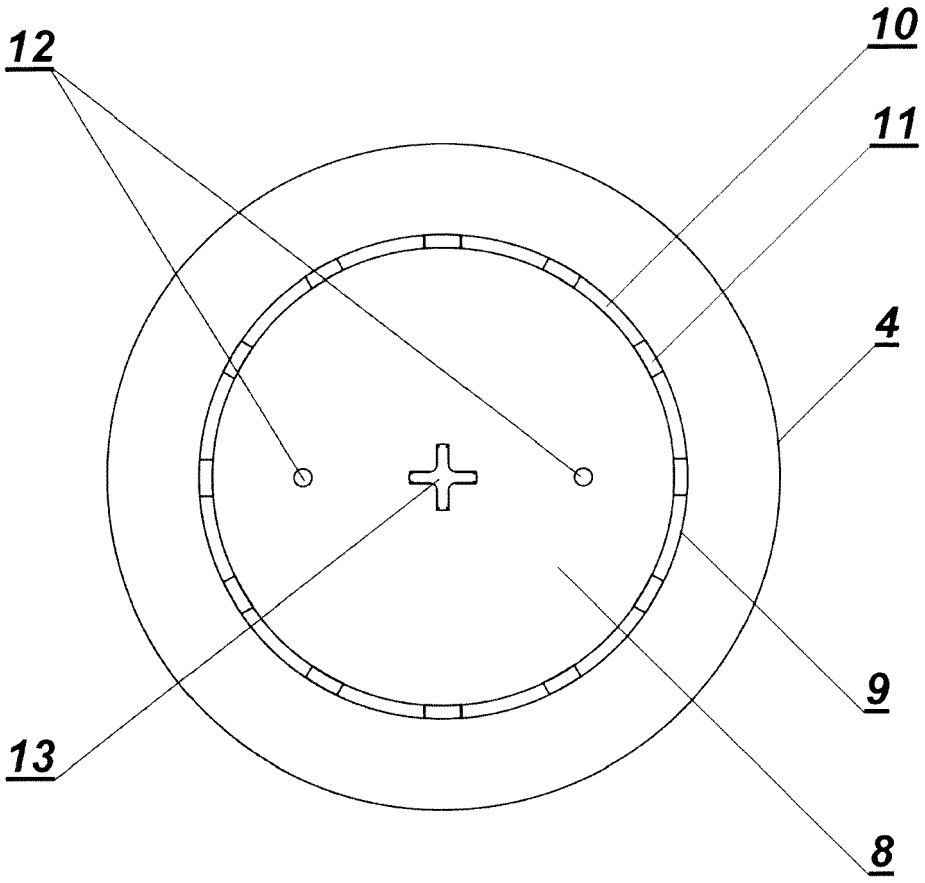

Fig. 5

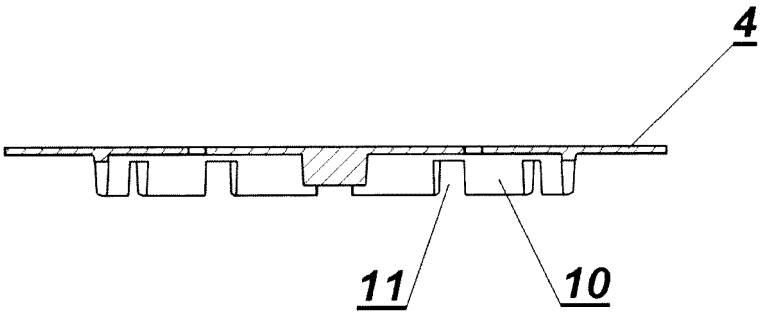

Fig. 6

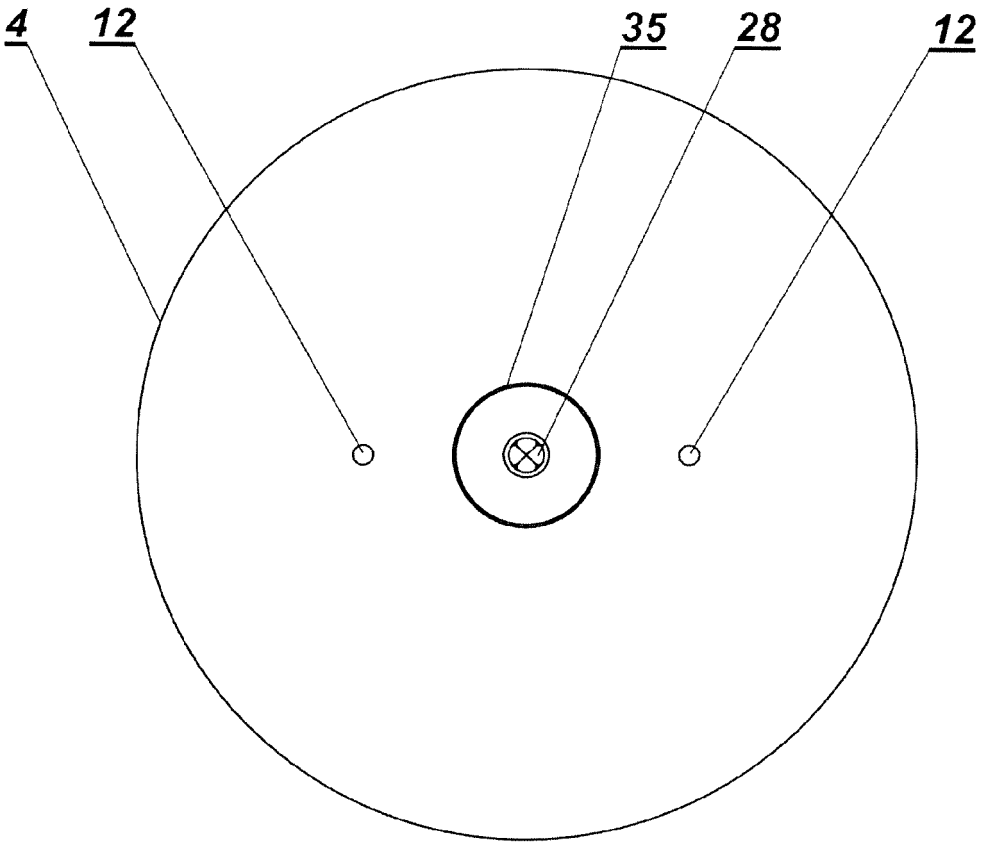

Fig. 7

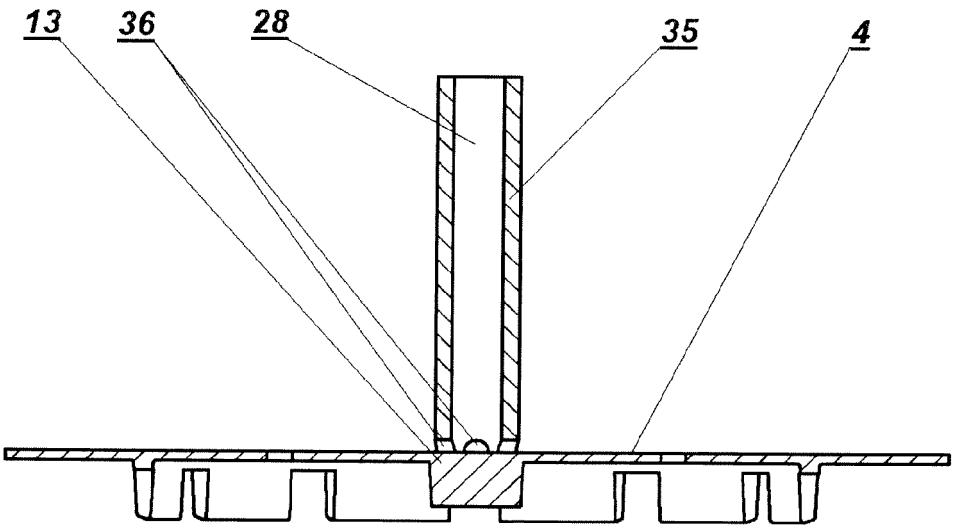

Fig. 8

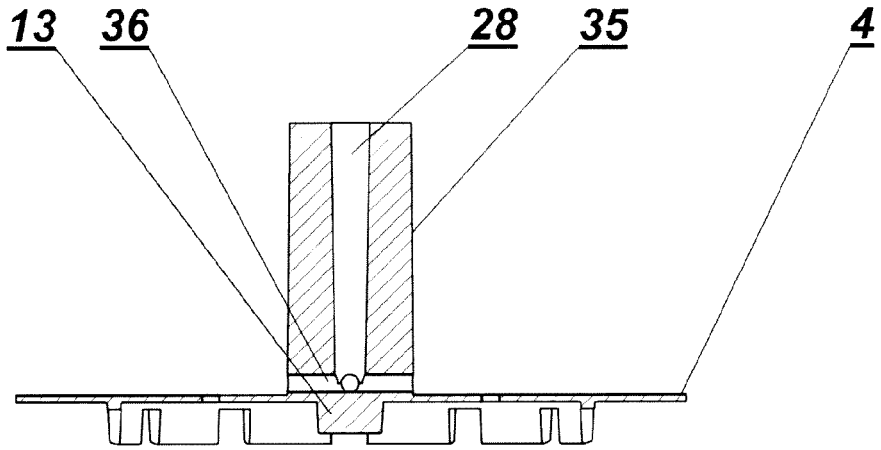

Fig. 9

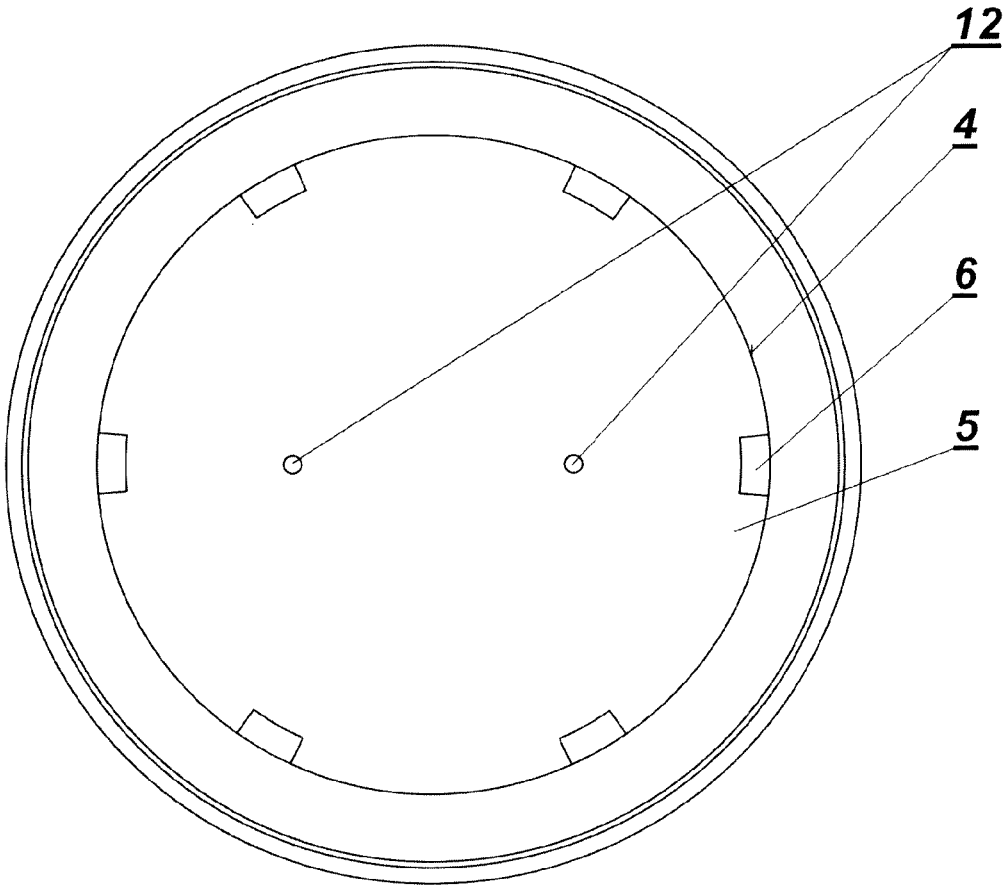

Fig. 10

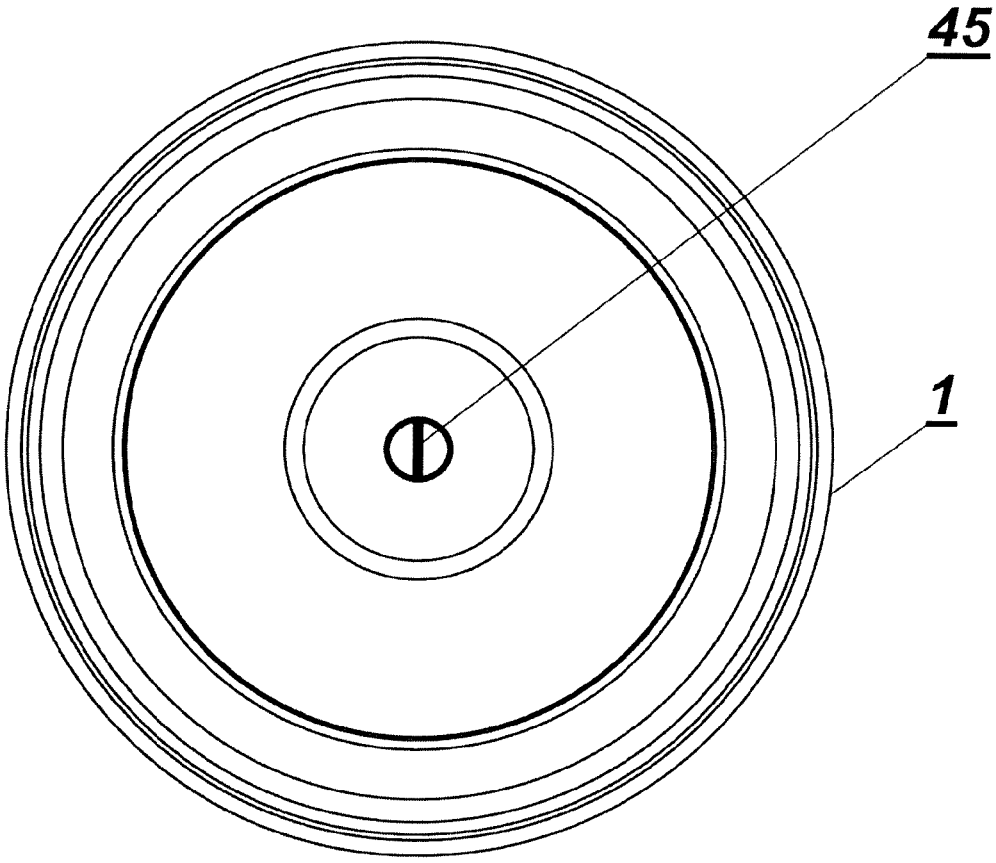

Fig. 11

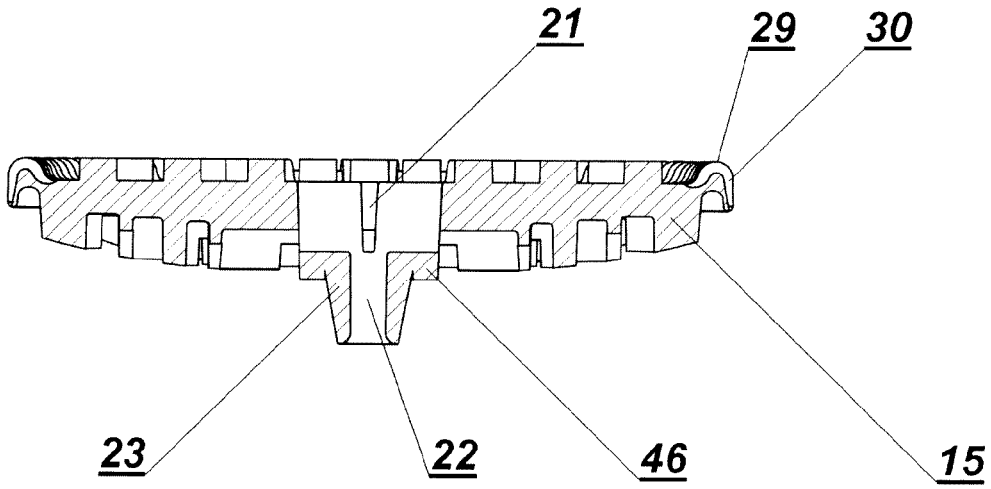

Fig. 12

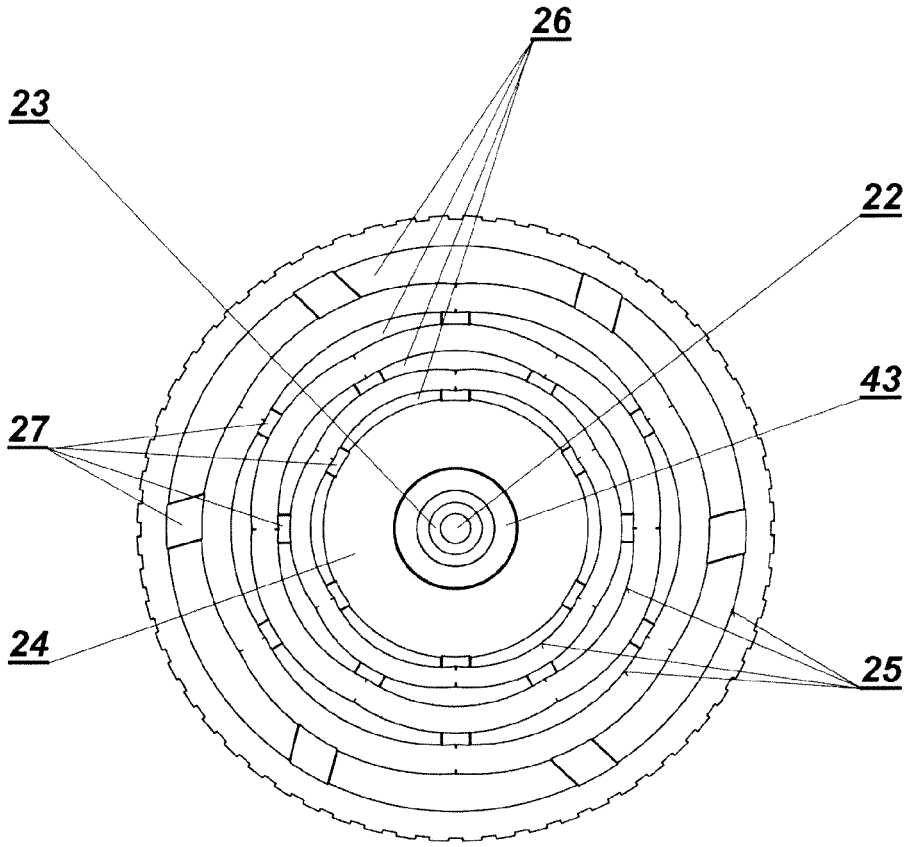

Fig. 13

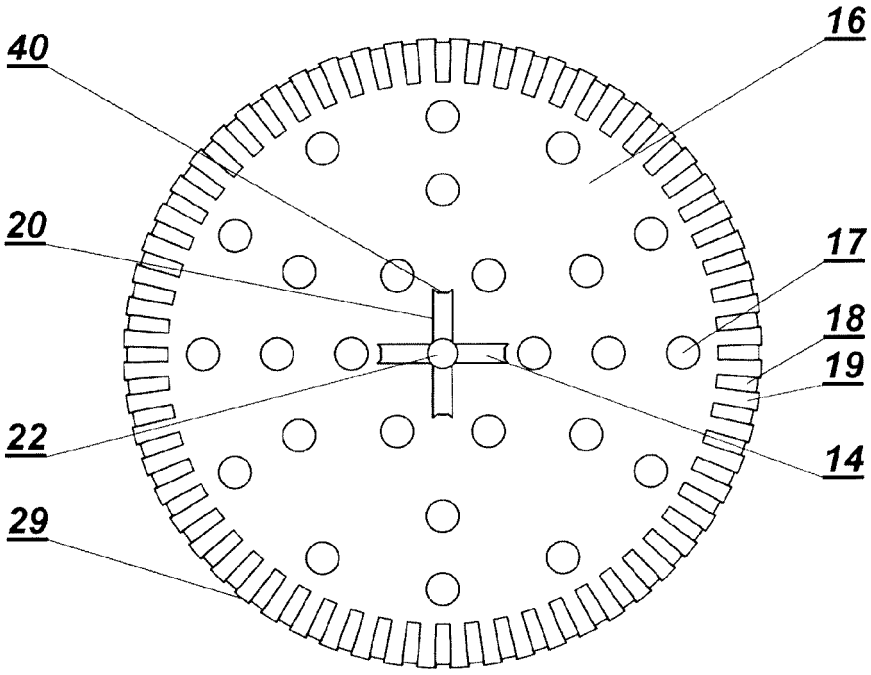

Fig. 14

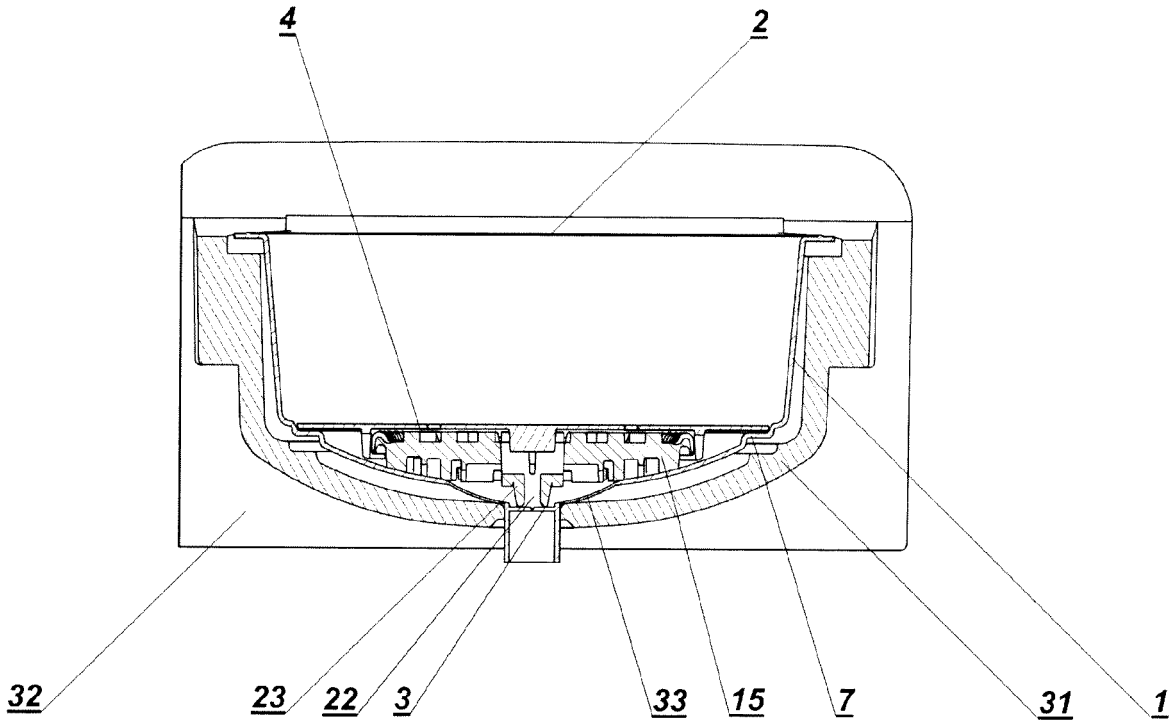

Fig. 15

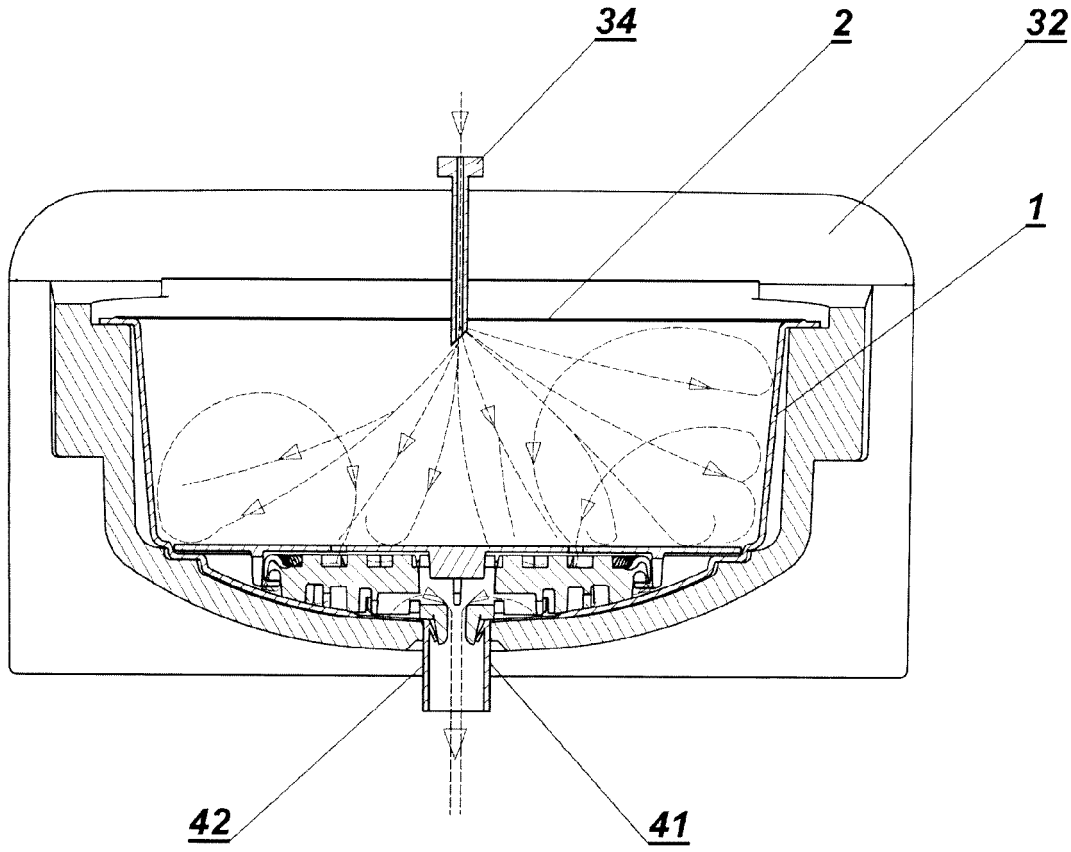

Fig. 16

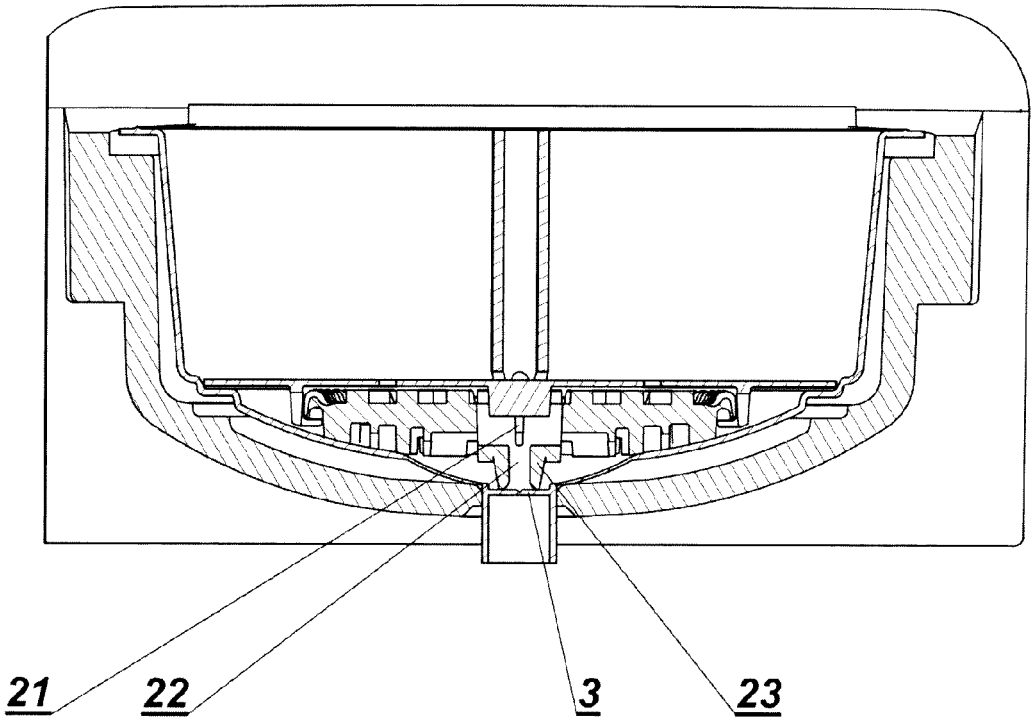

Fig. 17

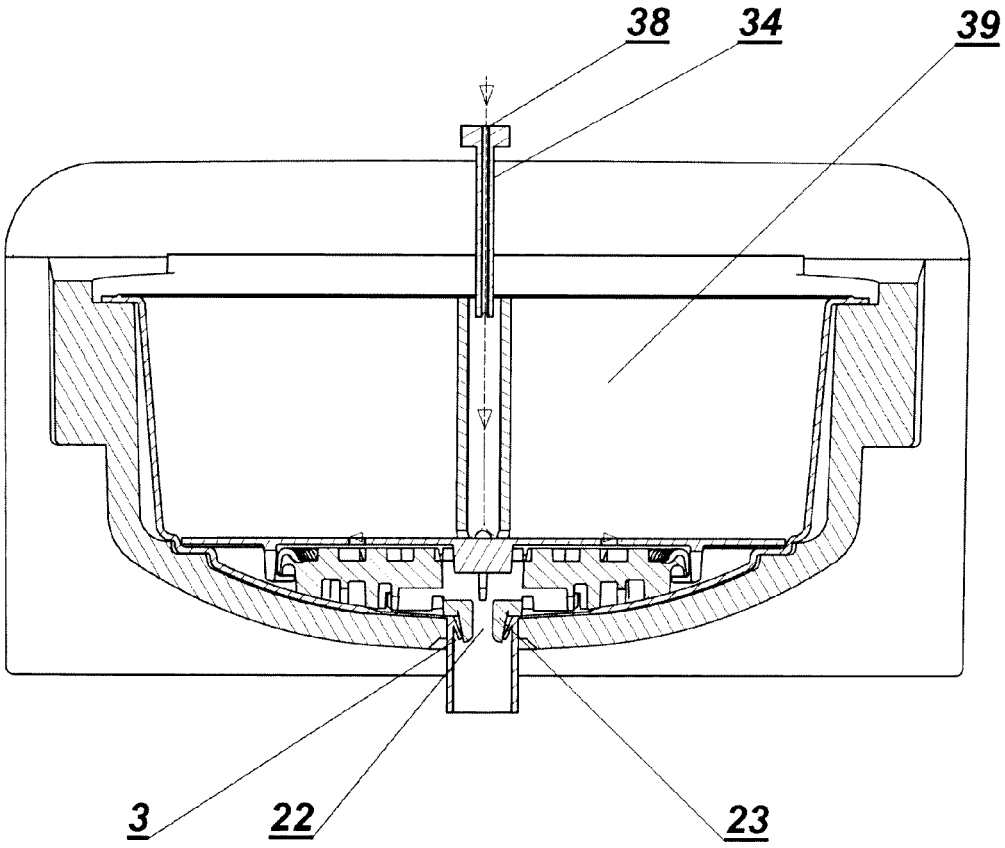

Fig. 18

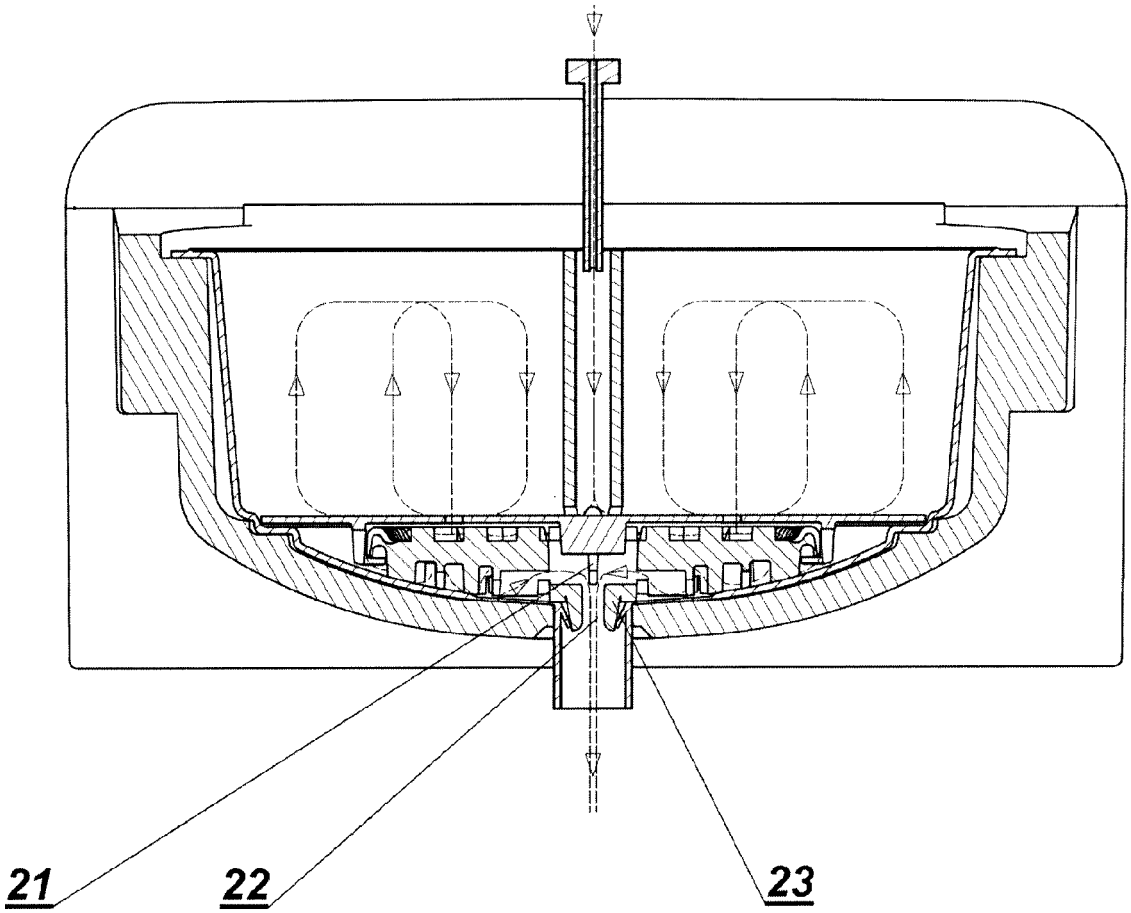

Fig. 19

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 15 46 0025

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 2013/124234 A1 (ILLYCAFFE SPA [IT]) 29 August 2013 (2013-08-29) * page 4 - page 14 * * figures 1-10 *	1-4	INV. B65D85/804
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Place of search	Date of completion of the search	Examiner
Munich	31 August 2016	Rodriguez Gombau, F

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