(19) DANMARK

(10) **DK/EP 3501269 T3**

Patent- og
Varemærkestyrelsen

(12) Oversættelse af
europæisk patentskrift

(51) Int.Cl.: ***A 01 J 25/15 (2006.01)*** ***A 01 J 25/13 (2006.01)***

(45) Oversættelsen bekendtgjort den: **2020-12-21**

(80) Dato for Den Europæiske Patentmyndigheds
bekendtgørelse om meddelelse af patentet: **2020-09-16**

(86) Europæisk ansøgning nr.: **18213289.4**

(86) Europæisk indleveringsdag: **2018-12-18**

(87) Den europæiske ansøgnings publiceringsdag: **2019-06-26**

(30) Prioritet: **2017-12-21 CH 15852017**

(84) Designerede stater: **AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR**

(73) Patenthaver: **Kalt Maschinenbau AG, Letziwiesstrasse 8, 9604 Lütisburg, Schweiz**

(72) Opfinder: **Waldburger, Peter, Austrasse 3, 9246 Niederbüren, Schweiz**

(74) Fuldmægtig i Danmark: **Patrade A/S, Ceresbyen 75, 8000 Århus C, Danmark**

(54) Benævnelse: **Pressedæksel**

(56) Fremdragne publikationer:
EP-A1- 2 710 889
DE-A1- 2 317 594
GB-A- 2 132 131
US-A1- 2006 175 224

Description

The invention relates to a press cover which corresponds with a cheese mould, in particular for a cheese mould which is disposed in a cassette press or the like.

An apparatus for the industrial production of cheese loaves is known, for example, from EP-A-350777. This apparatus comprises a cheese press having a rectangular and upwardly open tray for the reception of moulds, a column mount for the arrangement of a raisable and lowerable press head and of a distribution head for the supply and metering of the raw cheese mixture into the moulds, and a portal carriage, displaceable on the tray, for guiding the distribution head and for manipulating a turning mechanism for the moulds. Distribution head as well as turning mechanism must here be manually provided and changed respectively. The wall of the mould consists of a perforated plate and a plurality of moulds can be arranged in sets. On the end faces of a set, cylindrical pins are provided for the docking of a manipulation device.

EP-A-406899 shows a refinement of such an apparatus, in which the moulds are accommodated in cassettes, which, in turn, are arranged compactly in rows in the tray. Above the moulds is provided a press head having compression plungers, which are aligned with the moulds, for pressing the raw cheese mixture.

The actual press mould is here surrounded by a cup-shaped casing having an air supply duct (EP-B-1269832). As a result, an air duct is formed and, by virtue of the supplied air, the cheese mixture adhering to the sieve holes of the perforated plate of the mould can be removed from the circumferential side after the pressing.

According to EP-B-543185, a mould or press cover can be connected (in a self-centring manner) to the compression plunger via a tilting device, so that the mould cover is prevented from being sucked against the cheese mixture as a consequence of possible tilting motions. The mould itself is round or square and can consist of an outer container and an inner, perforated casing.

BR 9300409 discloses a double-walled mould which is provided with ribs which cross on its base. However, these ribs serve merely as a stop for a baseplate and are unsuitable as stiffening elements, nor are they intended for this purpose.

In US 3838955A is disclosed a mould for the production of cheddar, which has a mould and a press cover. The mould, and in particular the press cover, are of solid construction. The press cover and the base of the mould are provided with a small number of holes 5 for the outflow of whey. The press cover is of plate-like construction and consists of PP or PE. It is provided with a raised, solid flange, which has eyelets for suspension purposes. The plate-like press cover is provided with a second, mould-facing, substantially thinner perforated plate for the removal of whey from the cheese mixture.

In order to achieve the necessary mould stability when the whey is pressed out, plate-like press covers of this kind, made of plastic, have a thickness of about 10 mm.

A further cheese mould having a perforated, metal mould wall is disclosed in DE-B-1030612. This mould wall has on its inner surface evenly distributed, low elevations and depressions up to about 1 mm, which should not damage the cheese rind upon removal of the cheese loaf, even if the cheese is knocked out of the mould. According to DE-C-2823182, such a cheese mould with perforated wall can also consist of plastic, on the inner side of which are provided mutually parallel grooves of triangular cross section. In the transition region and one-piece base region, the grooves are separated by ribs with interruptions. Mould walls or double bases of this type are laborious to clean.

In EP 2710889 A1 is disclosed a press cover which is formed of a perforated plate having a thereon located, stiffening rib structure made of a stainless steel. The rib structure is, at thin division bars, non-detachably connected, in particular welded, to the perforated plate.

The object of the invention is to develop a press cover which corresponds with a cheese mould and which is suitable for arrangement on the press head of a cassette press or the like, which press head is of simple construction, withstands a forming pressure and also meets high hygienic requirements.

The object is achieved with the features of Patent Claims 1 and 6.

A press cover according to the invention substantially comprises a one-piece perforated plate, which is made of a food-approved plastic and the cross section of which corresponds to the inner cross section of a cheese mould with which the press cover corresponds under normal use, with thereon moulded rib structure which lends the press cover the necessary mould stability and stiffness.

The press cover is made in one piece, for example by milling from a plate or by 3D-printing.

The press cover according to the invention on the one hand enables a good whey outflow, and on the other hand is easily and fully cleanable from both sides. The press cover according to the invention is produced in a single operation in one piece from a foodstuff-approved plastic, for example from PE or PP.

Preferred embodiments are disclosed in the dependent claims.

The perforated plate preferably has a thickness of about 3-5 mm and is provided with a perforation, apart from the regions below the rib structure, which remain unperforated. The hole diameter of the perforation preferably is 0.4-1.0 mm. Smaller hole diameters are less easily cleanable. The individual holes are arranged at a distance of 2-5 mm from one another.

In the case of round cheese moulds, individual ribs in the form of struts extend over the centre point of the press cover such that they run preferably radially, starting from the longitudinal axis of the cheese mould, over the perforated plate up to the periphery. They hereupon cross annularly arranged transverse ribs and are connected to these, wherein a plurality of rings of different diameters can be

provided spaced apart from one another. In the case of polygonal cheese moulds, struts parallel to the outer edges are also possible in place of the rings.

The rib structure further has upwardly directed eyelets or the like, which enable the press cover to be arranged on a compression plunger, for example.

The press cover according to the invention can be designed with any chosen cross section, in particular a round or square cross section. Special shapes, such as, for example, a heart-shaped cross section, would also be possible, however.

Correspondingly, the rib structure too can be applied to moulds of any chosen cross sections, in particular to round as well as angular moulds, with appropriate adaptions.

The ribs are dimensioned such that the external measurements of existing cassettes can remain unaltered for the receptions of cheese moulds.

Such a shaping, material choice and manufacturing method does not obviously ensue from the prior art. On the contrary, previously known press covers consist, for example, of a rigid cover plate made of steel or plastic, corresponding in shape and dimensions to the inner cross section of a cheese mould, and of a thin perforated plate disposed on the underside of the cover plate. Moreover, the cover plate has a number of larger openings for the outflow of whey when the raw cheese mixture is pressed out

In the prior art, whey and cheese remnants or other impurities which are not visible and are removable only with difficulty can be deposited in the unperforated regions of the cover plate.

The invention is described in greater detail below in an illustrative embodiment. In the drawing,

Fig. 1: shows a press cover according to the invention;

Fig. 2: shows the press cover according to Fig. 1 in side view, and

Fig. 3: shows the press cover according to Fig. 1 in top view.

In the example of a round cheese mould, a press cover 1 according to the invention (Fig. 1), made of PE, comprises a single-walled, circular perforated plate 10, which in its cross section corresponds to the inner cross section of the cheese mould (likewise circular).

Formed onto the perforated plate 10, on the side facing away from the cheese mould, is a thereon located, stiffening rib structure 12, 13, which lends the press cover 1 the necessary stiffness for the pressing-out of whey. The rib structure 12, 13 comprises division bars 13 (longitudinal ribs) and annularly arranged rings 12 (transverse ribs). The division bars 13 are designed such that they run over the centre point of the press cover, preferably radially from the centre point or from the longitudinal axis of the cheese mould over the perforated plate 10 up to the periphery of the perforated plate 10. They hereupon cross the annularly arranged rings 12 and are connected to these at the crossing points, wherein a plurality of rings 12 of different diameters can be provided spaced apart from one another.

In the example, the perforated plate has a wall thickness (thickness) of about 3 mm and, in the example, is provided on the periphery with a cheese-mould-facing rim 14 (Fig. 2). In the example, this rim 14 is flexible and, when the whey is pressed out, is contiguous to the inner wall of the cheese mould. Except for the rib structure 12, 13, the perforated plate 10 is provided with a perforation 11 (represented by way of example in Fig. 1 and 3). The regions below the rib structure 12, 13 remain unperforated. The hole diameter is 0.4-1.0 mm. In the case of smaller hole diameters, problems can arise in respect of the cleaning, whilst hole diameters larger than 1 mm are not necessary for a good whey outflow.

The rings 12 are provided between two division bars 13 with openings 16 for the outflow of liquids. In the example, three hooks 15 are also welded on the division

bars 13 for arrangement on a compression plunger.

The press cover 1 according to the invention is produced in one piece, in the example milled from the solid from a plate made of PE (or another foodstuff-approved plastic). The perforated plate 10 and the rib structure 12, 13 are thus connected to one another in an integrally bonded and positive-locking manner, non-detachably and without connecting elements. This ensures on the one hand a high dimensional stability, and on the other hand very good cleanability. No gaps or the like exist in which cheese mixture or dirt could be deposited.

In the regions of the rib structure 12, 13 no perforation 11 is provided, which further improves the sanitation of the press cover 1.

Instead of a metal-cutting manufacture of the press cover 1, this could also be produced in one piece from a plastic in a 3D-printer. However, the perforation 11 would have to be made retrospectively.

A round cheese mould, with which the press cover 1 according to the invention corresponds and as is disclosed, for example, in EP 2845469 A1 of the Applicant, comprises a cylindrical casing having an upper basket and a base. For cheese which is to be highly pressed, i.e. hard cheese, the casing wall and, where appropriate, also the base, consists of finely perforated plate Conidur®. Due to the specific perforation, the formation of "hairs", as arises in plastics moulds or normal, thicker perforated plates, can be avoided.

In the pressing-out of soft cheese or semi-hard cheese, a conventional perforation, by contrast, can be sufficient.

The perforated plate can have below the basket a whey rim having a coarser perforation than the rest of the casing, in particular in the production of hard cheese. In the case of softer cheese, a different perforation of the casing is not essential.

The cheese moulds can in principle also consist of a plastic.

The cheese moulds can be used in known cassette presses (not represented). Such a cassette press serves, in a manner which is known per se, for the liquid-reducing pressing of raw cheese mixture and comprises in particular:

- an, in top view, rectangular and upwardly open tray with, in top view, rectangular, upwardly open cassettes, which are arranged next to one another in rows, transversely to the longitudinal direction of the tray,

- cheese moulds for receiving the raw cheese mixture to be pressed, which are disposed in the cassettes, and at least a base and a casing having at least one outlet for the liquid which is to be pressed out, wherein a cassette comprises at least one cheese mould and at least the base of the cheese mould can be provided with a rib structure, and wherein the cheese mould can be part of the cassette,

- a press head, mounted on end columns and having a multiplicity of compression plungers aligned with the cheese moulds and with press cover 1 located thereon, for pressing the raw cheese mixture, for example configured in accordance with the disclosure of EP 543899 B1, as well as, where appropriate, hold-down devices for pushing down the press head of the cassettes,

- a pipe distribution system or a filling apparatus for pouring the raw cheese mixture into the cheese moulds,

- at least one manipulating device, which is displaceable along the longitudinal sides of the tray, for raising, displacing and depositing a cassette on a conveyor device outside the tray,

- a device for rotating/turning the cassette or row of cassettes about the longitudinal axis thereof.

Preferably, the cassette press can additionally be assigned a vibrator, which is arranged horizontally above the conveyor device and is spring-mounted, in the form of a clamping frame for receiving a cassette, which clamping frame is

provided with unbalance motors. Only after a vibration are the cheese loaves emptied onto the conveyor device.

Reference symbol list

1	Press cover
10	Perforated plate
11	Perforation
12	Transverse rib, ring
13	Longitudinal rib, division bar
14	Rim
15	Hooks, eyelets
16	Opening

PATENTKRAV

1. Pressedæksel til en osteform, hvorved pressedækslets (1) tværsnit svarer til osteformens indre tværsnit, hvorved det består af et til levnedsmiddel godkendt kunststof og er i eet stykke, henholdsvis én del og omfatter en een-vægget hulplade (10) samt en, på den bort fra osteformen vendende side af hulpladen (10) dannet ribbestruktur (12, 13), og hvorved ribbestrukturen (12, 13) omfatter langsgående ribber med form som lister (13) samt ringformede tværribber (12), der er arrangeret som krydsende.

2. Pressedæksel ifølge krav 1, **kendetegnet ved, at** listerne (13) over pressedækslets (1) midtpunkt fortrinsvis er dannet med stråleform, henholdsvis radialt strækkende sig over hulpladen indtil hulpladens (10) periferi og derved krydser tværribberne (12), hvorved en flerhed af ringformede tværribber (12) med forskellig diameter kan være tilvejebragt med en indbyrdes afstand.

3. Pressedæksel ifølge krav 1 eller 2, **kendetegnet ved, at** hulpladen (10) er udstyret med en perforering (11), bortset fra områderne neden under ribbestrukturen (12, 13).

4. Pressedæksel ifølge et af kravene 1 til 3, **kendetegnet ved, at** huldiameteren for de enkelte huller i perforeringen (11) fortrinsvis er 0,4-1,0 mm, og at hullerne er arrangeret med en indbyrdes afstand på 2-5 mm.

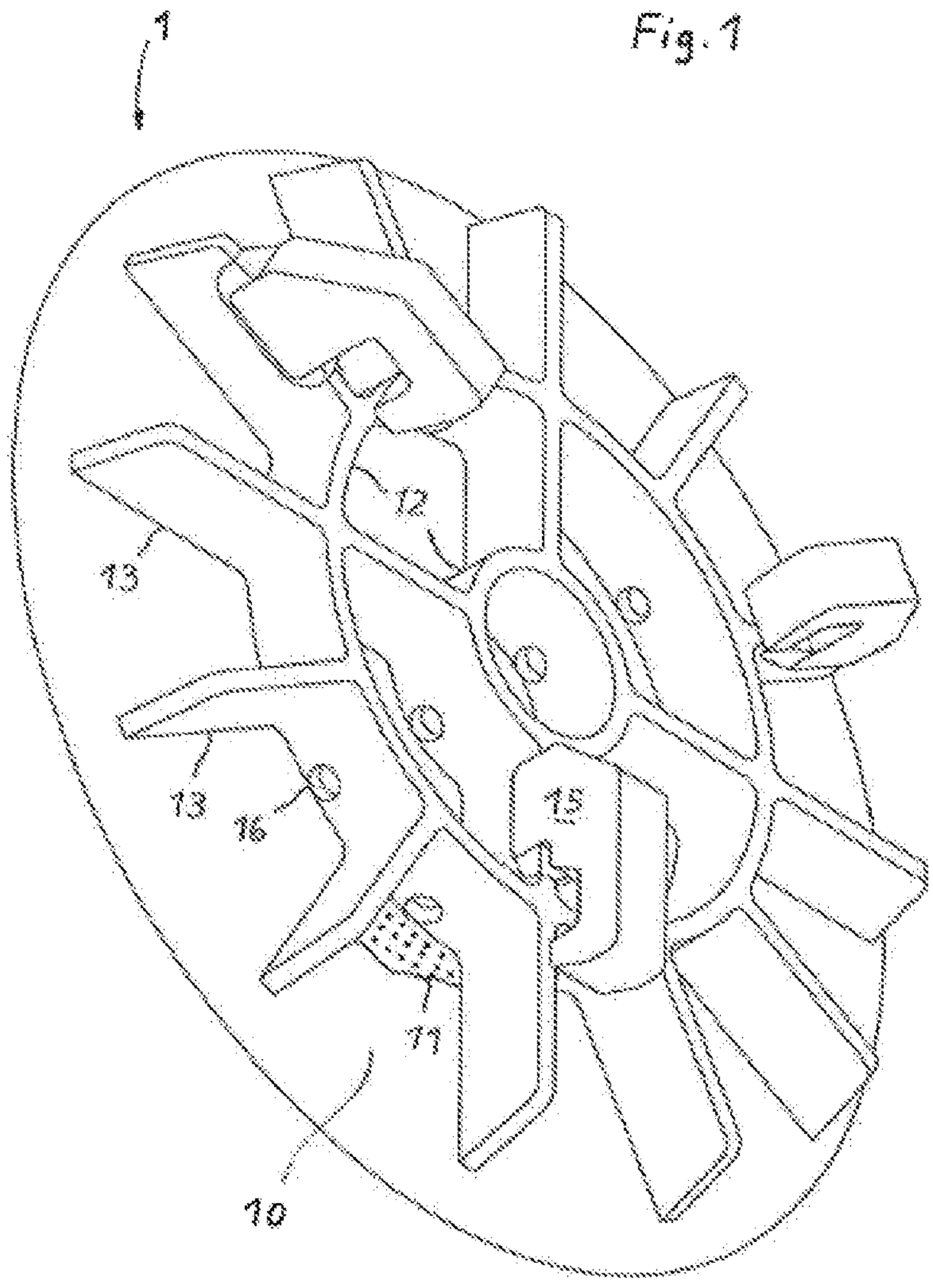
5. Pressedæksel ifølge et af kravene 1 til 4, **kendetegnet ved, at** hulpladen (10) har en vægtykkelse på 3-5 mm.

6. Fremgangsmåde til fremstilling af et pressedæksel (1) til en osteform, og som består af et til levnedsmidler godkendt kunststof og omfatter en een-vægget hulplade (10) samt en ribbestruktur (12, 13), hvorved pressedækslet (1) er fremstillet i eet stykke, hvorved ribbestrukturen (12, 13) stofflugtende er påstøbt på hulpladen (10).

7. Fremgangsmåde ifølge krav 6, **kendetegnet ved, at** pressedækslet er udfræset af en kunststofplade.

8. Fremgangsmåde ifølge krav 6, **kendetegnet ved, at** pressedækslet fremstilles i en 3D-printer.

Fig. 1



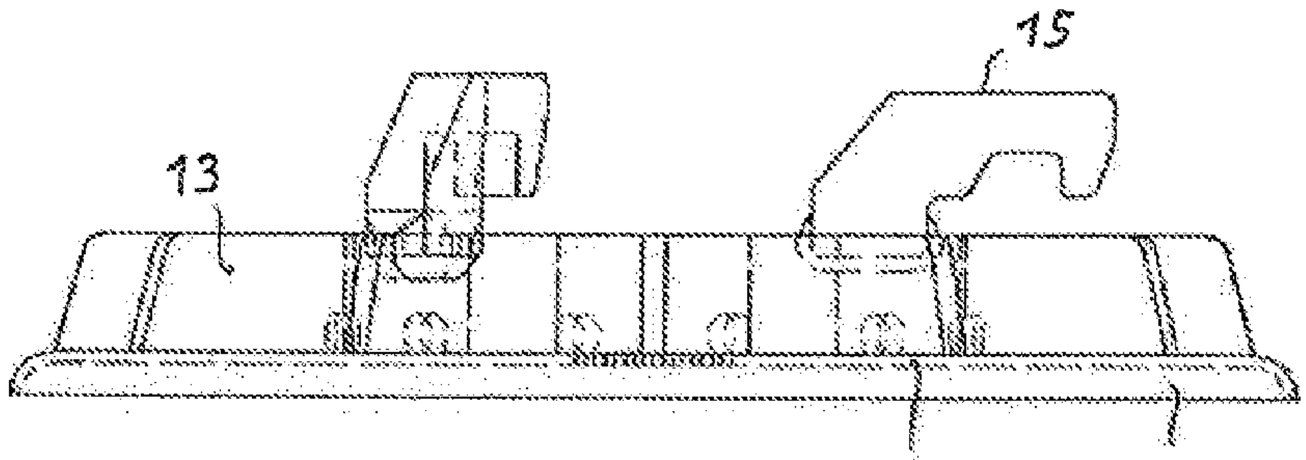


Fig. 2

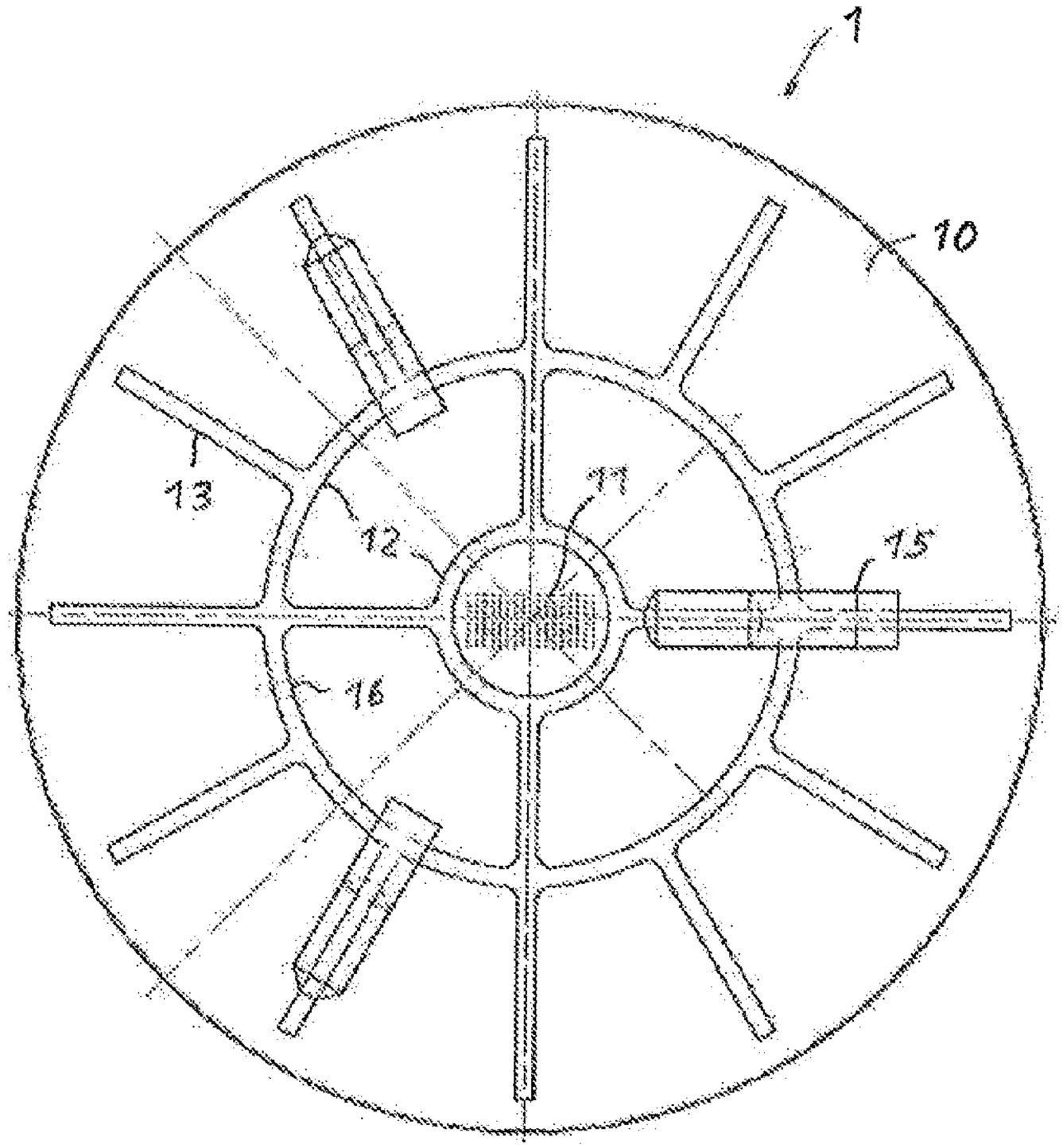


Fig. 3