(19) Europäisches Patentamt
European Patent Office
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(11) EP 2 394 734 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
14.12.2011 Bulletin 2011/50

(21) Application number: **11167914.8**

(22) Date of filing: **27.05.2011**

(51) Int Cl.:
B01F 7/00 *(2006.01)* ***B01F 7/08*** *(2006.01)*
B01F 7/18 *(2006.01)* ***B01F 13/10*** *(2006.01)*
B01F 15/00 *(2006.01)* ***B01F 15/02*** *(2006.01)*
B01F 15/06 *(2006.01)* ***A23C 19/068*** *(2006.01)*

(84) Designated Contracting States:
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
Designated Extension States:
BA ME

(30) Priority: **10.06.2010 IT MI20101044**

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(54) Apparatus for the production of spun mozzarella or other soft dairy product, particularly for pizzas, sandwiches, piadinas, etc., starting with frozen raw material

(57) An apparatus for the production of spun mozzarella or other soft dairy product, particularly for pizzas, sandwiches, piadinas, etc., comprises an admission tub (2) of frozen raw material and other ingredients, a closure lid (3) of said tub and, inside said tub (2), a first mixing device (10) of the frozen raw material and other ingredients, a cutting and mincing device (15) of the frozen raw material and other ingredients and a second mixing device of the cut and minced product. Means (18) are provided for feeding heating steam over the cut and minced product in mixing step.

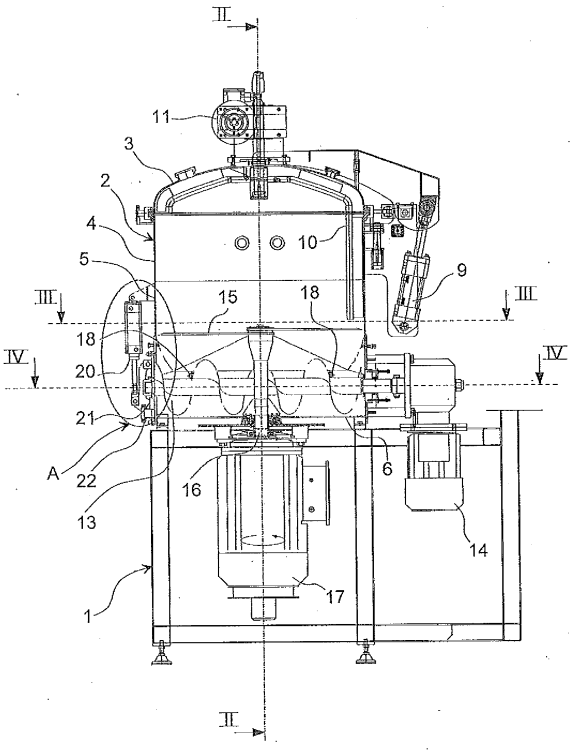

Fig.1

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Description

[0001] The present invention relates to an apparatus for the production of spun mozzarella or other soft dairy product, particularly for pizzas, sandwiches, piadinas, etc., starting with frozen raw material, and for the production of liquid and semi-liquid products such as cream, vegetable cream, etc.

[0002] Mozzarella is a widely used dairy product in the preparation of pizzas, piadinas, and sandwiches of various type.

[0003] Pizza-ready mozzarella used by pizzerias, industrial kitchens or also found in supermarkets is transformed into spun mozzarella by using various ingredients including frozen ingredients, milk powder and vegetable products, usable for the aforesaid uses, by means of passage through a series of machineries which first cut and mince the frozen blocks into small pieces and then, with the addition of recipe products such as salt, butter, etc., hot mixing it to reach the level of dissolution and amalgam wanted.

[0004] The object of the present invention was the one of making an apparatus which may replace the current plurality of machineries for converting the frozen blocks and other ingredients into ready-to-use spun mozzarella.

[0005] In accordance with the present invention, such an object was achieved by an apparatus as defined in claim 1.

[0006] A practical embodiment of the apparatus according to the invention is shown by way of non-limiting example in the accompanying drawings, in which:

figure 1 shows an apparatus according to a front view of the invention, partially cross-sectioned according to the line I-I in figures 3 and 4;
figure 2 shows an axial section of the apparatus according to the line II-II in figure 1;
figure 3 shows a plane view of the apparatus, partially cross-sectioned according to the line III-III in figure 1;
figure 4 shows a plane view of the apparatus, cross-sectioned according to the line IV-IV in figure 1;
figure 5 shows a top plan view of the closure lid of the tub, from above;
figure 6 shows the enlarged detail A in figure 1;
figure 7 shows the enlarged detail B in figure 2 according to various embodiment possibilities, indicated respectively with a), b), c) and d).

[0007] The apparatus shown in the drawings comprises a base frame 1, which carries a tub 2 equipped with a top closure lid 3.

[0008] The tub is substantially divided into three parts: a top part 4, a middle part 5 and a bottom part 6.

[0009] The top part 4 has a circular section and acts as collection compartment for the various ingredients including frozen blocks of product, which are introducible by means of the opening of the lid 3, which for such a purpose may be uncoupled from the tub by means of the opening of the tightening clamp, which is actuated by the hydraulic cylinder 7 (fig.5) and rotated about a horizontal hinging axis by means of a further hydraulic cylinder 9 (fig. 1). Rotatably accommodated within the tub is a mixer/scraper 10, which is rotated about the vertical axis of the tub by means of an external motor 11 (fig. 1) to ensure that the material does not stick to the walls of the tub.

[0010] The middle part 5 of tub 2 in turn has a circular section (fig. 3) and acts as funnel for the bottom part 6 below, which has a rectangular section and accommodates a double mixing screw 12 (figures 2-4) formed by two counter-rotating screws 13 with parallel horizontal axes which are activated by an external motor 14 (figures 1, 3 and 4). The screws are built so that the ends thereof skim a front plug 21 of the tub to prevent stagnation of the product (detail A enlarged in fig. 6).

[0011] A cutting and mincing knife 15 (figures 1-3) is accommodated in the aforesaid bottom part 6 immediately above the double screw 12, which is fixed to a vertical shaft 16 rotated by an external motor 17. Such a drive shaft passes through the two screws, thus allowing the cutting and mixing to be obtained with a single machinery. Such a knife is sized so as to operate over the entire surface of the tub, as shown in figures 3 and 7A; moreover, it is interchangeable with another type of knife 23 (figure 7b) sized to operate just above the screws 13. Other processing accessories may be provided for making creams, dough, emulsions, etc. such as mixers 24 (fig. 7c) and beaters 25 (fig. 7d).

[0012] Some nozzles 18 are provided in the vicinity of the double screw 12 to emit steam feedable with means not shown. A steam discharge 8 is also provided through lid 3.

[0013] The apparatus shown in the drawings is operated as follows.

[0014] Once the raw material made of frozen blocks is put into tub 2, lid 3 is closed and blocked and the motors 11, 14 and 17 are operated.

[0015] Mixer 10 keeps agitating and mixing the frozen blocks together, which due to gravity fall on knife 15, which cuts and minces them to allow the double screw 12 below to perform a further, finer mixing.

[0016] Various recipe products adapted to give the raw material better flavour, such as e.g. salt, butter, acidity correctors, water, etc., are added through some small gates 19 provided on lid 3 and on tub 2 (figures 2 and 5).

[0017] Then, steam is emitted into the bottom part 6 of tub 2 through the nozzles 18, and hence directly over the product in mixing step. This allows the dissolution and amalgam of the product itself, which is then further mixed without steam.

[0018] Thus a final product (mozzarella or other) in fluid, spun, liquid or semi-liquid form is obtained which is ready for the intended use. If it is solid and in any event not liquid, the final product is unloaded through plug 21 (figures 1 and 6), which is rotated by a pneumatic cylinder 20 about a pin 26; instead, if the product is liquid it is unloaded through manually openable small gates 22 po-

sitioned on plug 21 (figures 1 and 6).

[0019] It is worth noting that it is possible to vary both the cutting and mincing speed performed by knife 15 and the mixing speed performed by the double screw 12 by conveniently adjusting the speed of the respective motors 17 and 14.

[0020] It is also possible to stop the rotation of knife 15 at the start of product mixing by means of the screws 13 so as to facilitate product mixing.

Claims

1. Apparatus for the production of spun mozzarella or other soft dairy product, particularly for pizzas, sandwitches, piadinas ecc., starting from frozen raw material, comprising an admission tub (2) of the frozen raw material and other ingredients, a closure lid (3) of said tub and, inside said tub (2), a first mixing device (10) for the frozen raw material and other ingredients, a cutting and mincing device (15) for the frozen raw material and other ingredients and a second mixing device (12) for the cut and minced product, and means (18) for feeding heating steam over the cut and minced product in the mixing phase, wherein said mixing device (12) for the cut and minced product consists of a double screw (12) constituted of two counter-rotating screws (13) with parallel horizontal axes and said cutting and mincing device (15) consists of a knife rotated around a vertical axis above said mixing device (12) for the cut and minced product, **characterized in that** the driving shaft of the rotating knife (15) passes between the two mixing screws (13).

2. Apparatus according to claim 1, **characterized in that** the rotation of the rotating knife (15) can be stopped at the moment of the start of the mixing of the product by means of the screws (13).

3. Apparatus according to claim 1, **characterized in that** the screws (13) are construed in such a way that their ends skim a front plug (21) of the tub (2) to prevent stagnation of the product or of the various ingredients.

4. Apparatus according to claim 3, **characterized in that** said closure plug (21) of the tub (2) can be opened by operating a fluid dynamic cylinder (20).

5. Apparatus according to claim 4, **characterized in that** said closure plug (21) comprises at least a small gate (22) that can be opened by hand.

6. Apparatus according to any one of the preceeding claims, **characterized in that** said means (18) for feeding steam comprise nozzles placed in proximity of said mixing device (12) of the cut and minced product.

7. Apparatus according to any one of the proceeding claims, **characterized in that** it comprises means to vary the speed of said cutting and mincing device (15) and of said mixing device (12) of the cut and minced products,

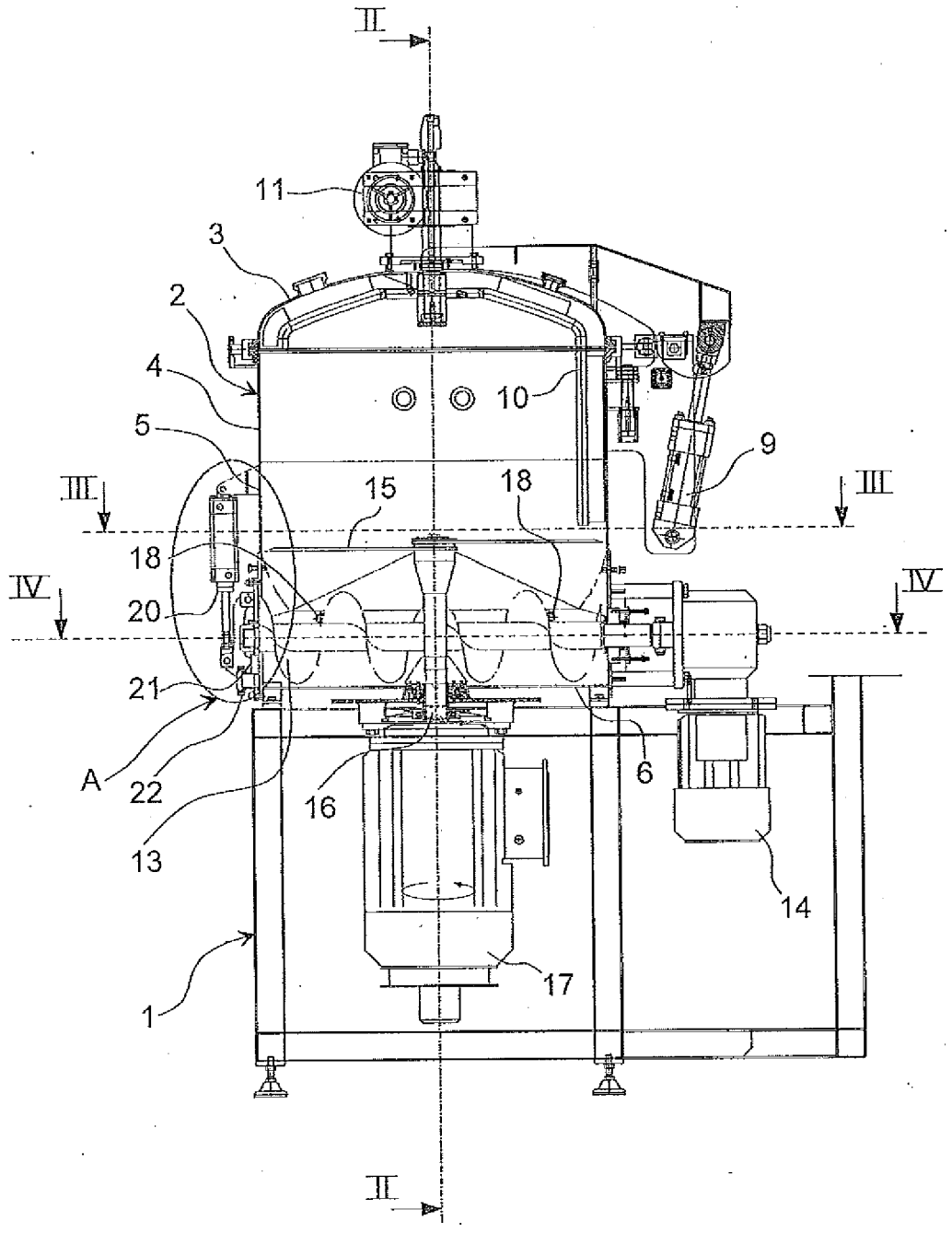

Fig.1

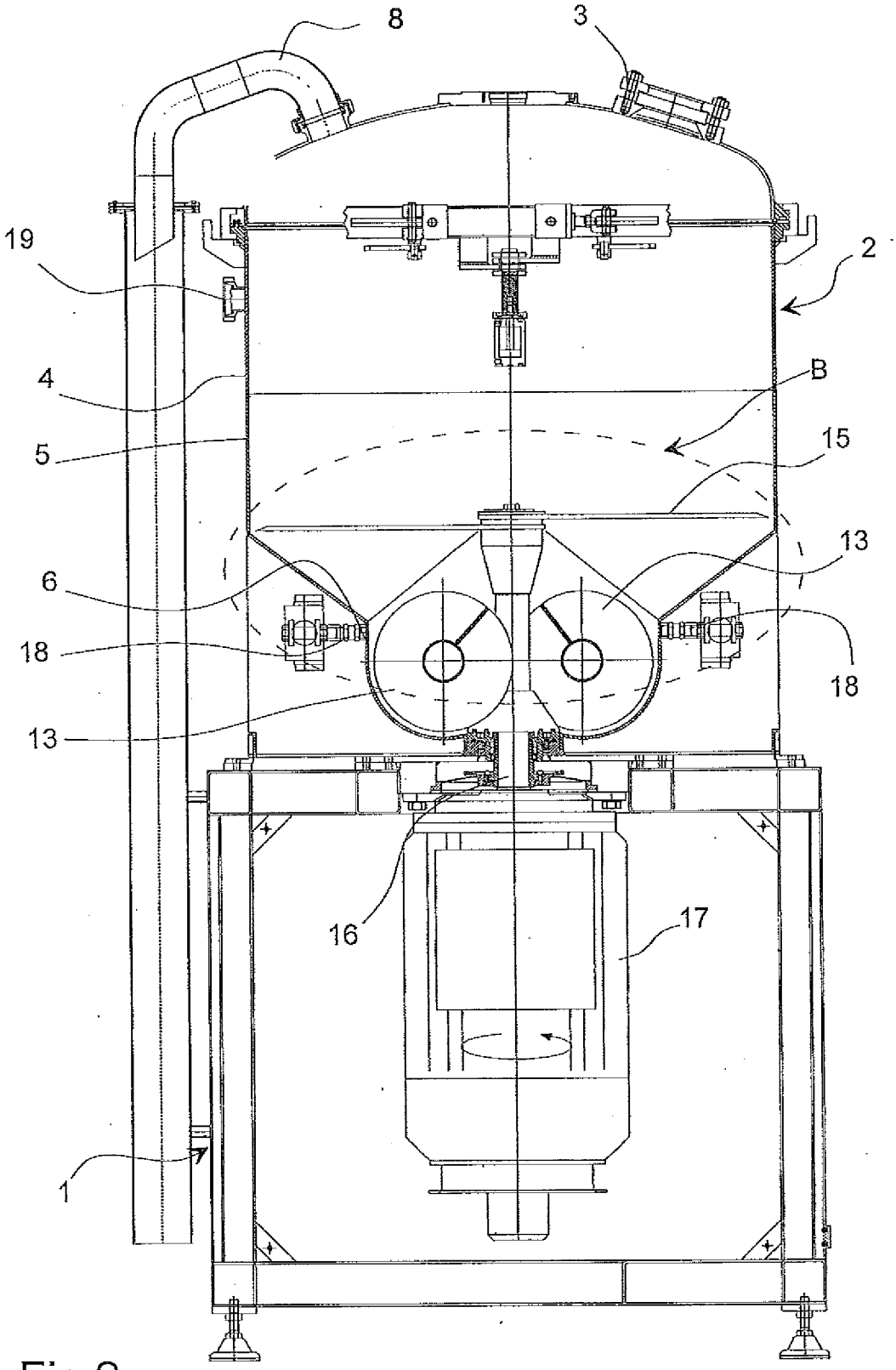

Fig.2

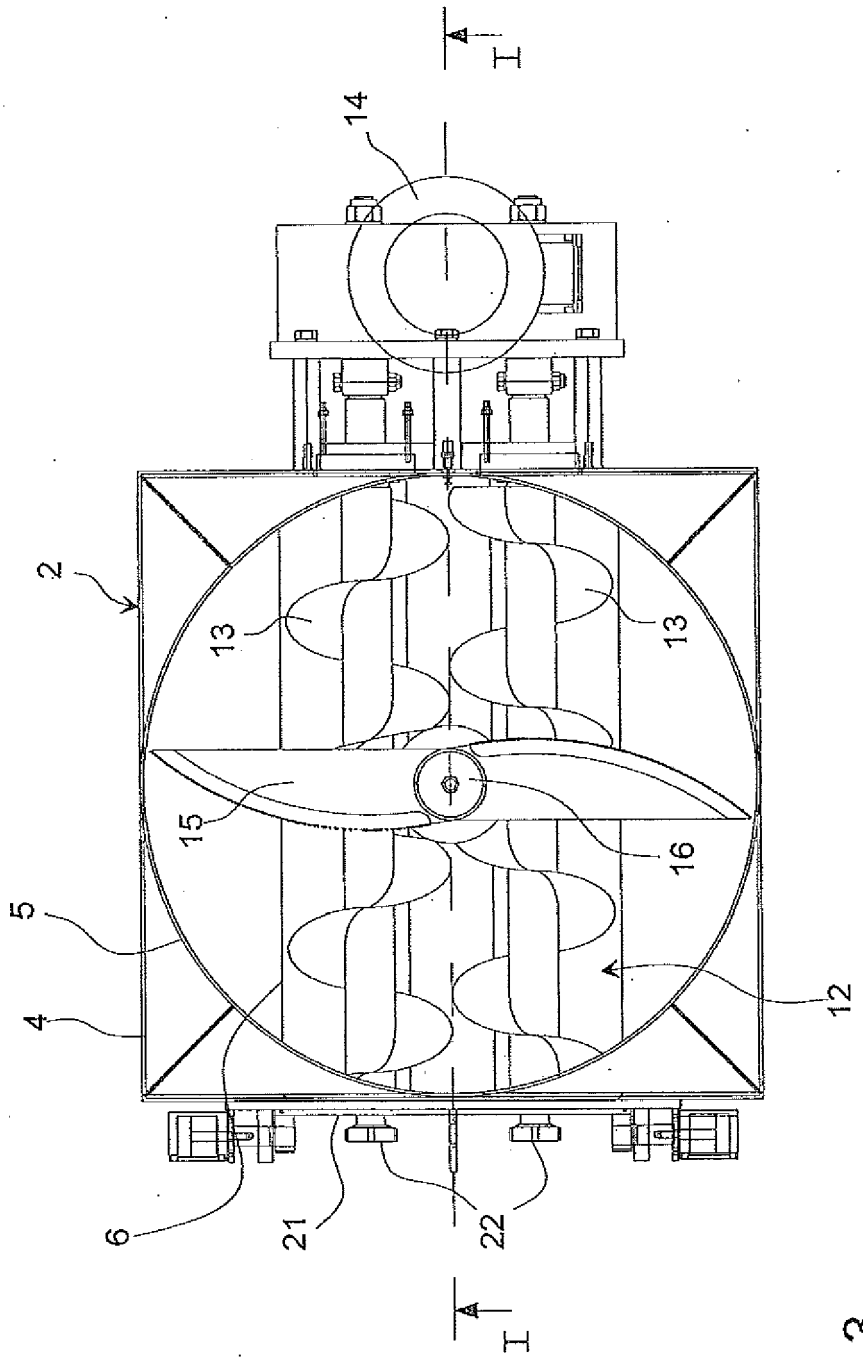

Fig.3

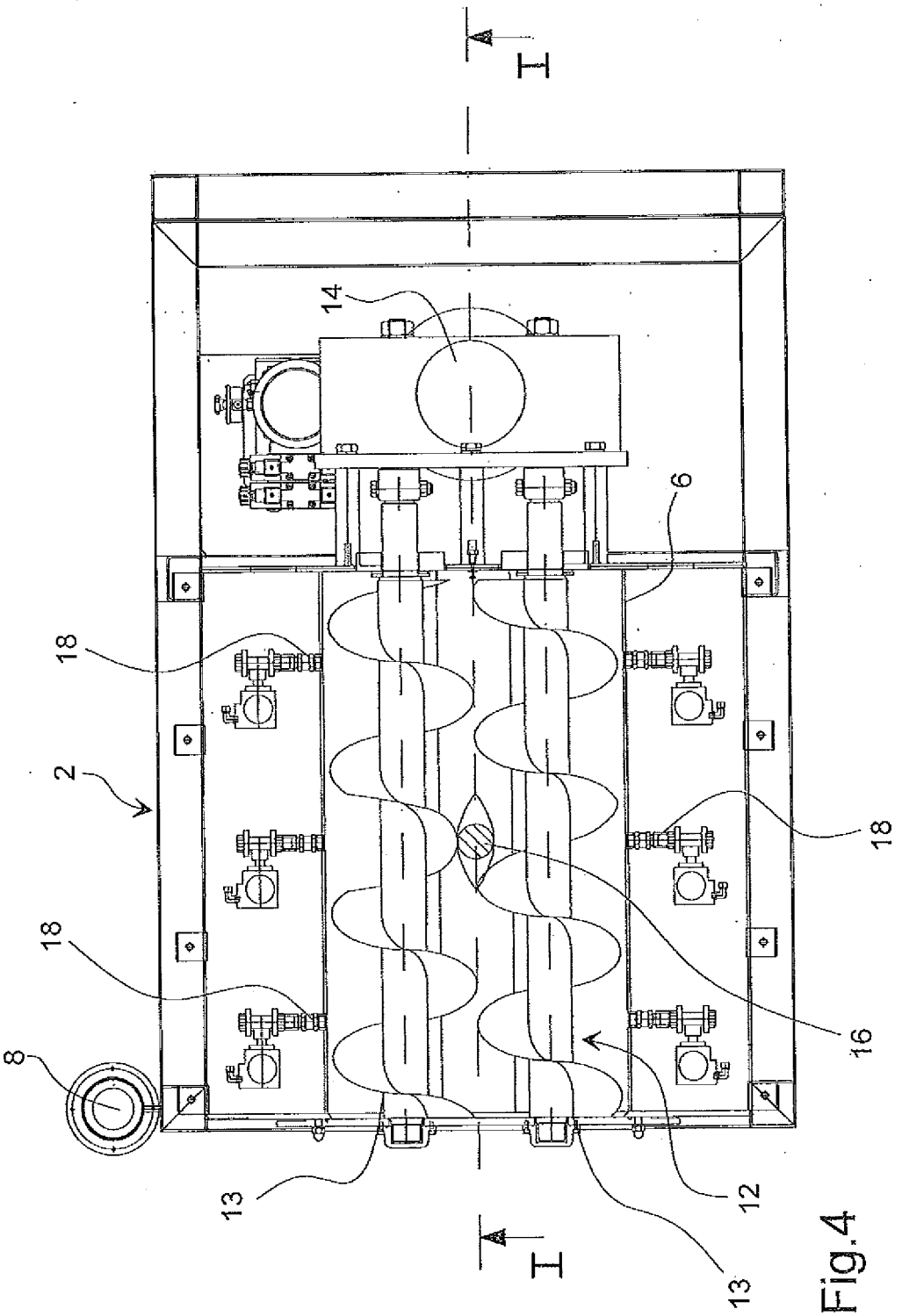

Fig.4

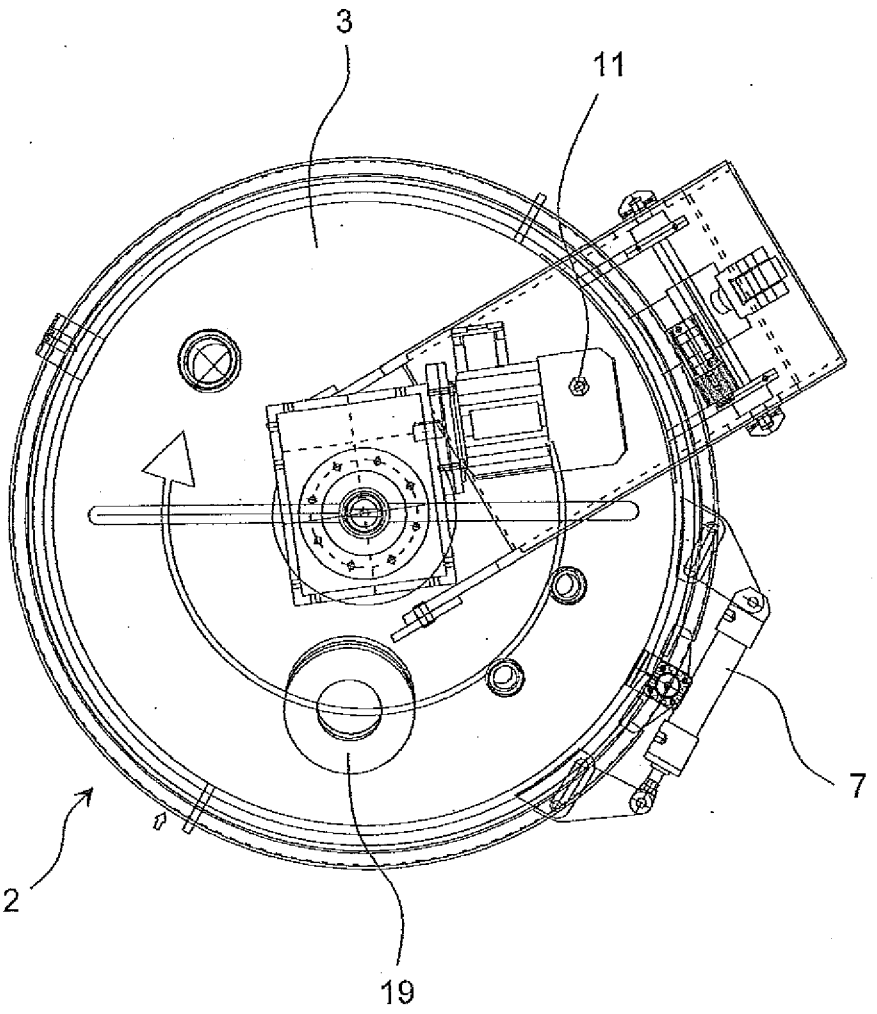

Fig.5

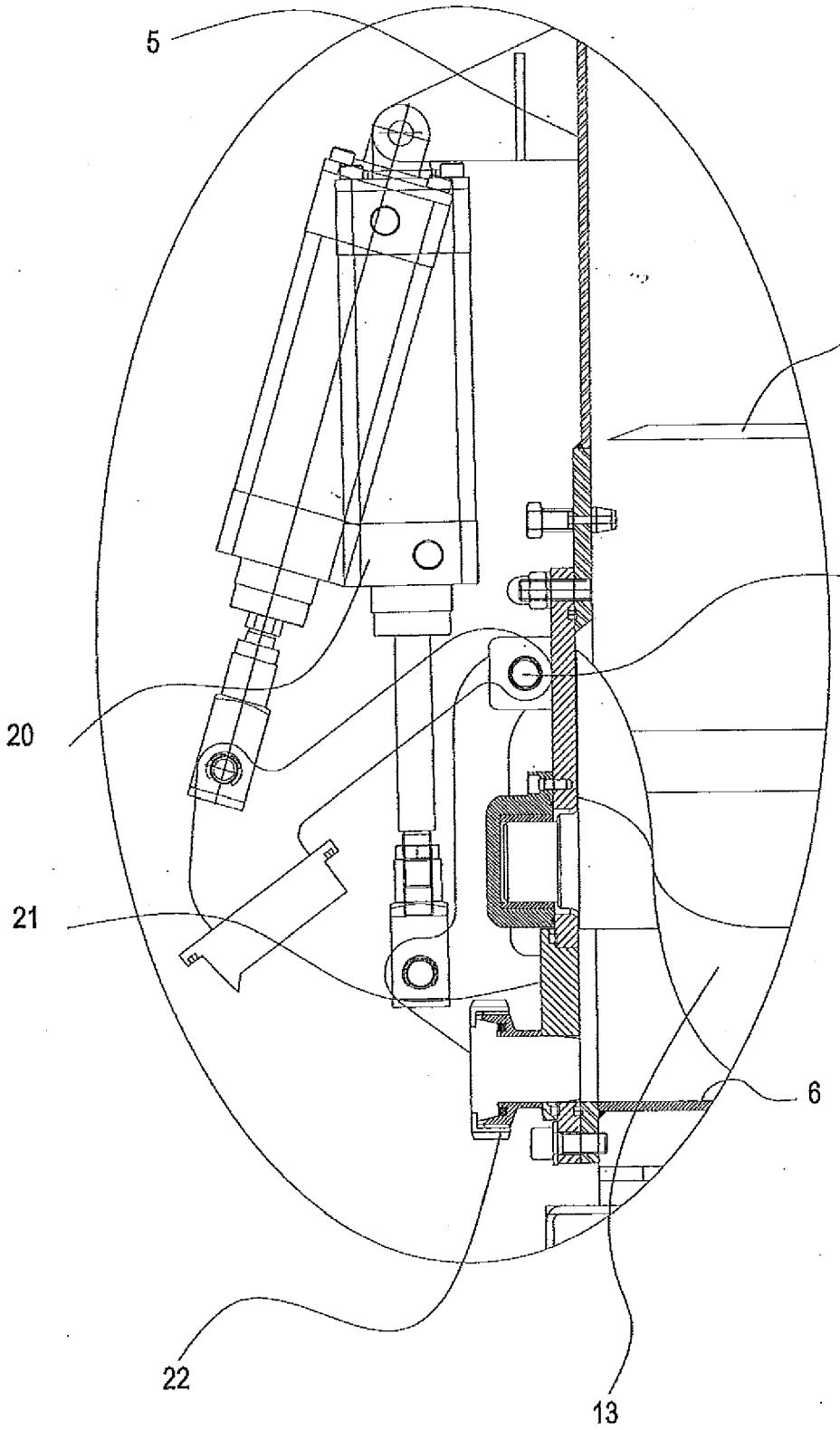

Fig.6

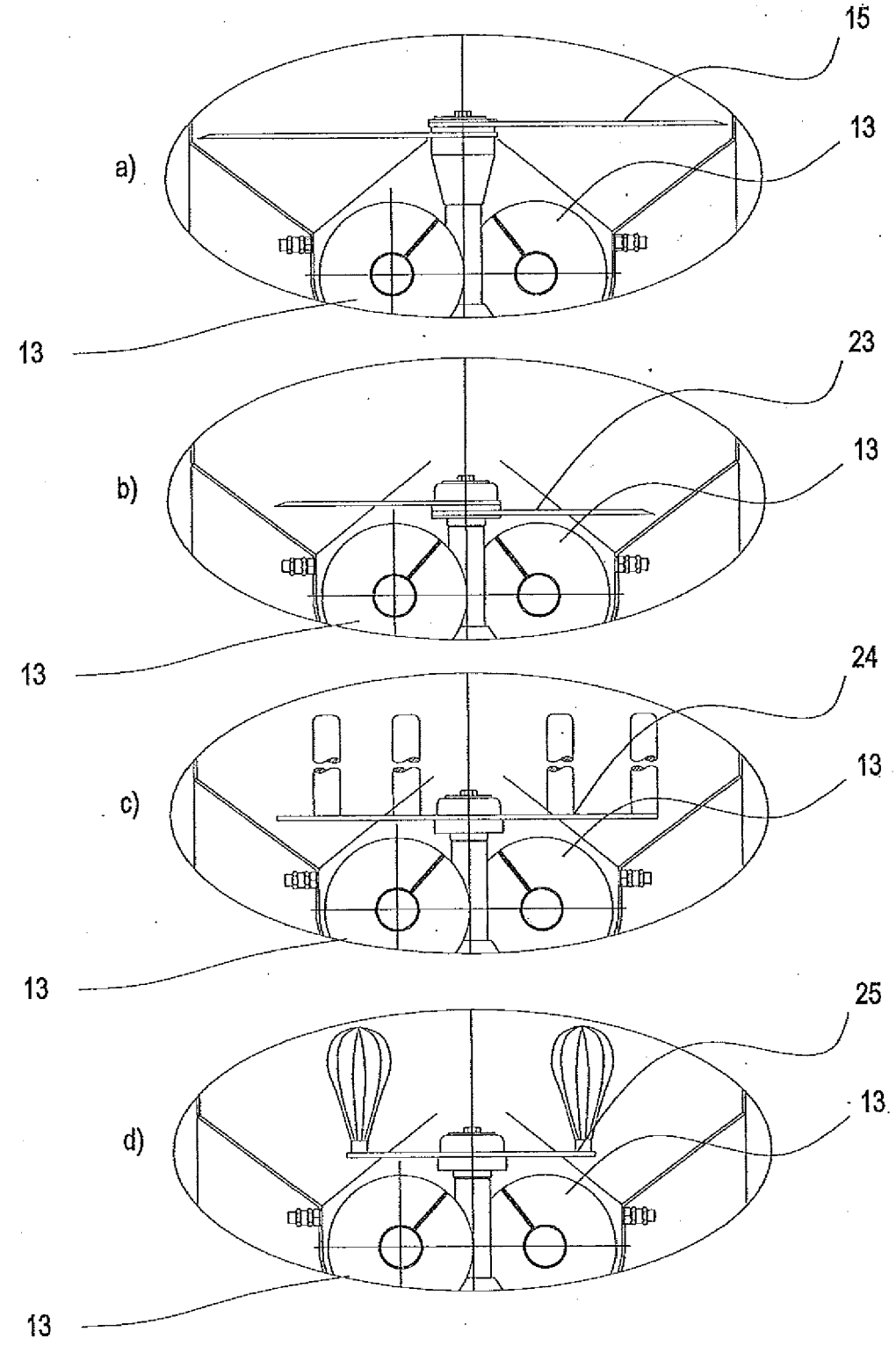

Fig.7

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EUROPEAN SEARCH REPORT

Application Number
EP 11 16 7914

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A	DE 20 2007 008256 U1 (BOHLE L B PHARMATECH GMBH [DE]) 6 September 2007 (2007-09-06) * figure 1 * * abstract * * paragraph [0011] - paragraph [0017] *	1-7	
A	GB 377 199 A (CHARLES EDWARD GARDNER) 20 July 1932 (1932-07-20) * figure 1 * * page 5, line 24 - page 6, line 40 *	1-7	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	7 September 2011	Krasenbrink, B

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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