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(54) **Apparatus for the production of spun mozzarella or other soft dairy product, starting with frozen raw material**

Vorrichtung zur Produktion von geknetetem Mozzarella oder einem anderen weichen Milchprodukt, aus einem gefrorenen Rohmaterial

Appareil pour la production de mozzarella enroulée ou d'un autre produit laitier mou, en partant d'un matériau cru surgelé

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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] US 3,473,896 discloses an apparatus according to the preamble of claim 1.

[0005] The object of the present invention was the one of making an alternative apparatus allowing the cutting and mixing to be obtained with a single machinery, which may replace the current plurality of machineries for converting the frozen blocks and other ingredients into ready-to-use spun mozzarella.

[0006] In accordance with the present invention, such an object was achieved by an apparatus as defined in claim 1.

[0007] 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).

[0008] The apparatus shown in the drawings comprises a base frame 1, which carries a tub 2 equipped with a top closure lid 3.

[0009] The tub is substantially divided into three parts: a top part 4, a middle part 5 and a bottom part 6.

[0010] 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/scrapper 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.

[0011] 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).

[0012] 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).

[0013] 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.

[0014] The apparatus shown in the drawings is operated as follows.

[0015] 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.

[0016] 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.

[0017] 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).

[0018] 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.

[0019] 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 positioned on plug 21 (figures 1 and 6).

[0020] 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.

[0021] 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 production of spun mozzarella or other soft dairy product, starting from frozen raw material, comprising an admission tub (2) for the frozen raw material and other ingredients, a closure lid (3) for said tub and, inside said tub (2), a first mixing device (10) for mixing the frozen raw material and other ingredients, a cutting and mincing device (15) and a second mixing device (12) for mixing the cut and minced product, and means (18) for feeding heating steam over the cut and minced product, wherein said second mixing device (12) consists of a double screw (12) constituted of two mixing screws (13) with parallel horizontal axes which rotate in opposite senses and said cutting and mincing device (15) consists of a knife rotated around a vertical axis below said first mixing device (10) and above said second mixing device (12), **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 mixing 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 second mixing device (12)

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

Patentansprüche

1. Gerät für eine Produktion von gesponnenem Mozzarella oder einem anderen weichen Molkereiprodukt, welches eine Einlasswanne (2) für das gefrorene Rohmaterial und andere Zutaten, einen Verschlussdeckel (3) für die Wanne sowie innerhalb der Wanne (2) eine erste Mischvorrichtung (10) zum Mischen des gefrorenen Rohmaterials und anderen Zutaten, eine Schneide- und Zerkleinerungsvorrichtung (15) sowie eine zweite Mischvorrichtung (12) zum Mischen eines geschnittenen und zerkleinerten Produkts, und Mittel (18) zum Zuführen von Heißdampf über das geschnittene und zerkleinerte Produkt, umfasst, wobei die zweite Mischvorrichtung (12) aus einer Doppelschnecke (12) besteht, welche aus zwei Mischschnecken (13) mit parallelen horizontalen Achsen, die sich zueinander gegensinnig drehen, zusammengestellt ist, und die Schneide- und Zerkleinerungsvorrichtung (15) aus einem Messer besteht, das um eine vertikale Achse unter der ersten Mischvorrichtung (10) und über der zweiten Mischvorrichtung (12) gedreht wird, besteht, **dadurch gekennzeichnet, dass** die Antriebswelle des sich drehenden Messers (15) zwischen den zwei Mischschnecken (13) hindurchgeht.
2. Gerät gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Drehbewegung des sich drehenden Messers (15) in dem Moment des Anlaufens der Mischschnecken (13) angehalten werden kann.
3. Gerät gemäß Anspruch 1, **dadurch gekennzeichnet, dass** die Schnecken (13) in einer Weise ausgelegt sind, dass deren Enden einen Vorderzapfen (21) der Wanne (2) streichen, um ein Festsetzen des Produkts oder der verschiedenen Zutaten zu verhindern.
4. Gerät gemäß Anspruch 3, **dadurch gekennzeichnet, dass** der Verschlusszapfen (21) der Wanne (2) durch Betätigen eines fluiddynamischen Zylinders (20) geöffnet werden kann.
5. Gerät gemäß Anspruch 4, **dadurch gekennzeichnet, dass** der Verschlusszapfen (21) zumindest eine kleine Klappe (22) umfasst, die per Hand geöffnet werden kann.

6. Gerät gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Mittel (18) zum Zuführen von Dampf Düsen umfassen, die in der Nähe der zweiten Mischvorrichtung (12) angeordnet sind.
7. Gerät gemäß einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es Mittel zum Ändern der Geschwindigkeit der Schneide- und Zerkleinerungsvorrichtung (15) und der zweiten Mischvorrichtung (12) umfasst.

6. Appareil selon l'une quelconque des revendications précédentes, **caractérisé en ce que** lesdits moyens (18) pour envoyer de la vapeur comprennent des buses placées à proximité dudit second dispositif de mélange (12).
7. Appareil selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend des moyens pour modifier la vitesse dudit dispositif de coupe et d'éminçage (15) et dudit second dispositif de mélange (12).

Revendications

1. Appareil de fabrication de mozzarella enroulée ou autre produit laitier mou, comprenant un récipient d'admission (2) pour la matière première et d'autres ingrédients surgelés, un couvercle de fermeture (3) pour ledit récipient et, à l'intérieur dudit récipient (2), un premier dispositif de mélange (10) pour mélanger la matière première et les autres ingrédients surgelés, un dispositif de coupe et d'éminçage (15) et un second dispositif de mélange (12) pour mélanger le produit coupé et émincé, et des moyens (18) pour envoyer de la vapeur de réchauffage sur le produit coupé et émincé, dans lequel ledit second dispositif d'éminçage (12) est constitué d'une double vis (12) constituée de deux vis de mélange (13) ayant des axes horizontaux parallèles qui tournent dans des sens opposés, et ledit dispositif de coupe et d'éminçage (15) est constitué d'un couteau tournant autour d'un axe vertical en dessous dudit premier dispositif de mélange (10) et au-dessus dudit second dispositif de mélange (12), **caractérisé en ce que** l'arbre d'entraînement du couteau rotatif (15) passe entre les deux vis de mélange (13).
2. Appareil selon la revendication 1, **caractérisé en ce que** la rotation du couteau rotatif (15) peut être interrompue au moment du démarrage des vis de mélange (13).
3. Appareil selon la revendication 1, **caractérisé en ce que** les vis (13) sont conçues de telle manière que leurs extrémités effleurent un bouchon avant (21) du récipient (2) pour empêcher la stagnation du produit ou des divers ingrédients.
4. Appareil selon la revendication 3, **caractérisé en ce que** ledit bouchon de fermeture (21) du récipient (2) peut être ouvert en actionnant un cylindre à dynamique des fluides (20).
5. Appareil selon la revendication 4, **caractérisé en ce que** ledit bouchon de fermeture (21) comprend au moins une petite porte (22) qui peut être ouverte manuellement.

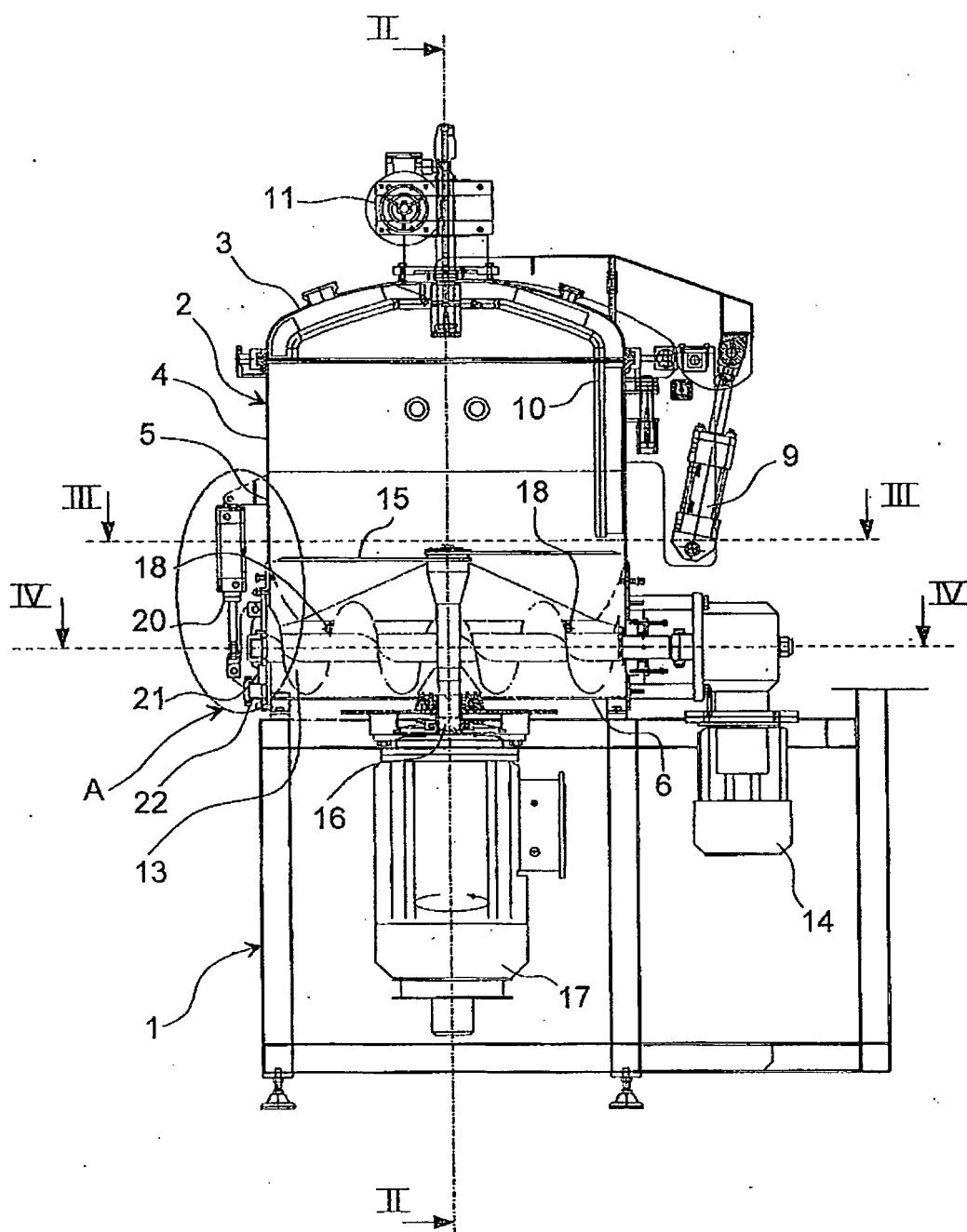


Fig. 1

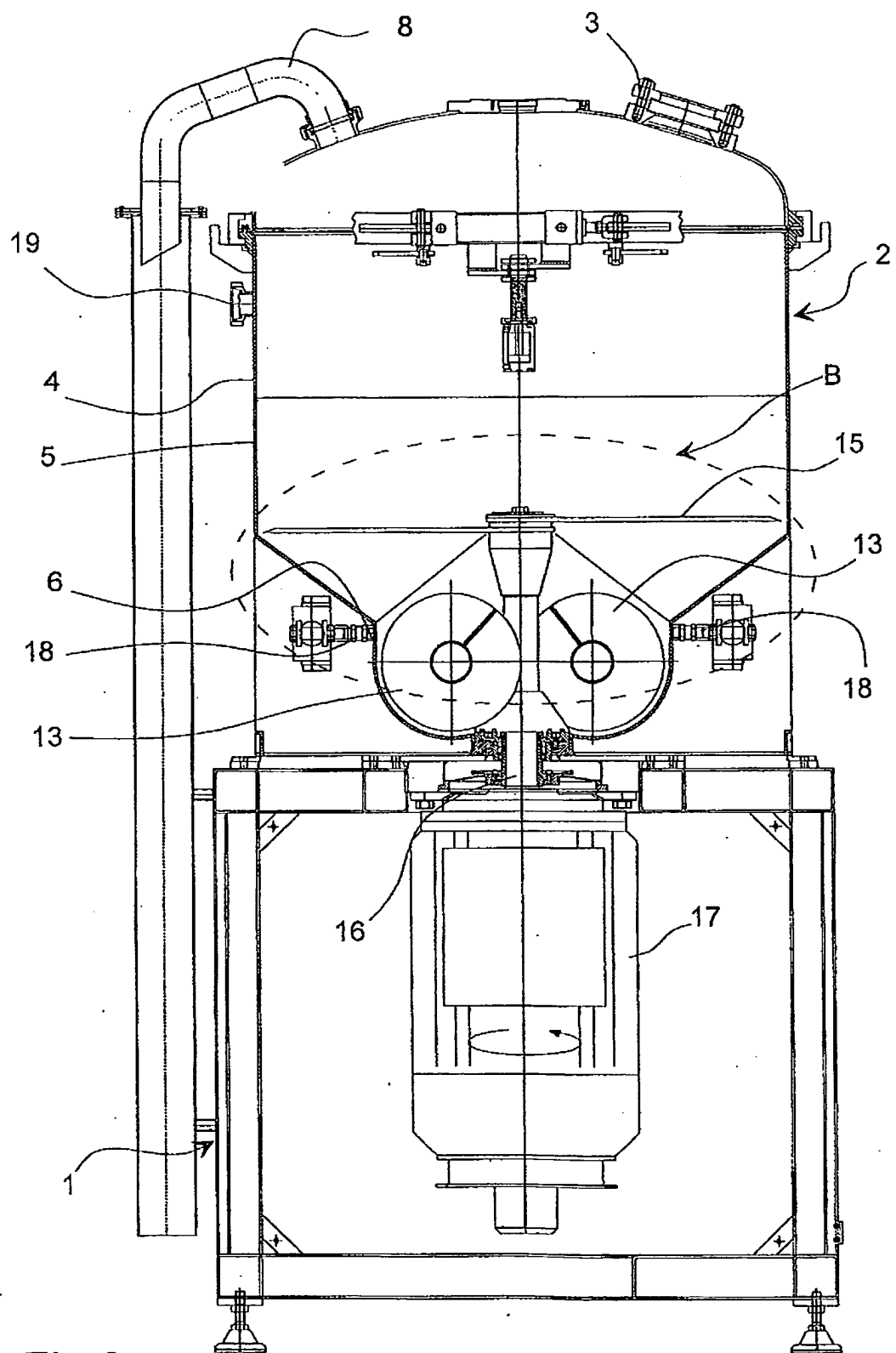


Fig.2

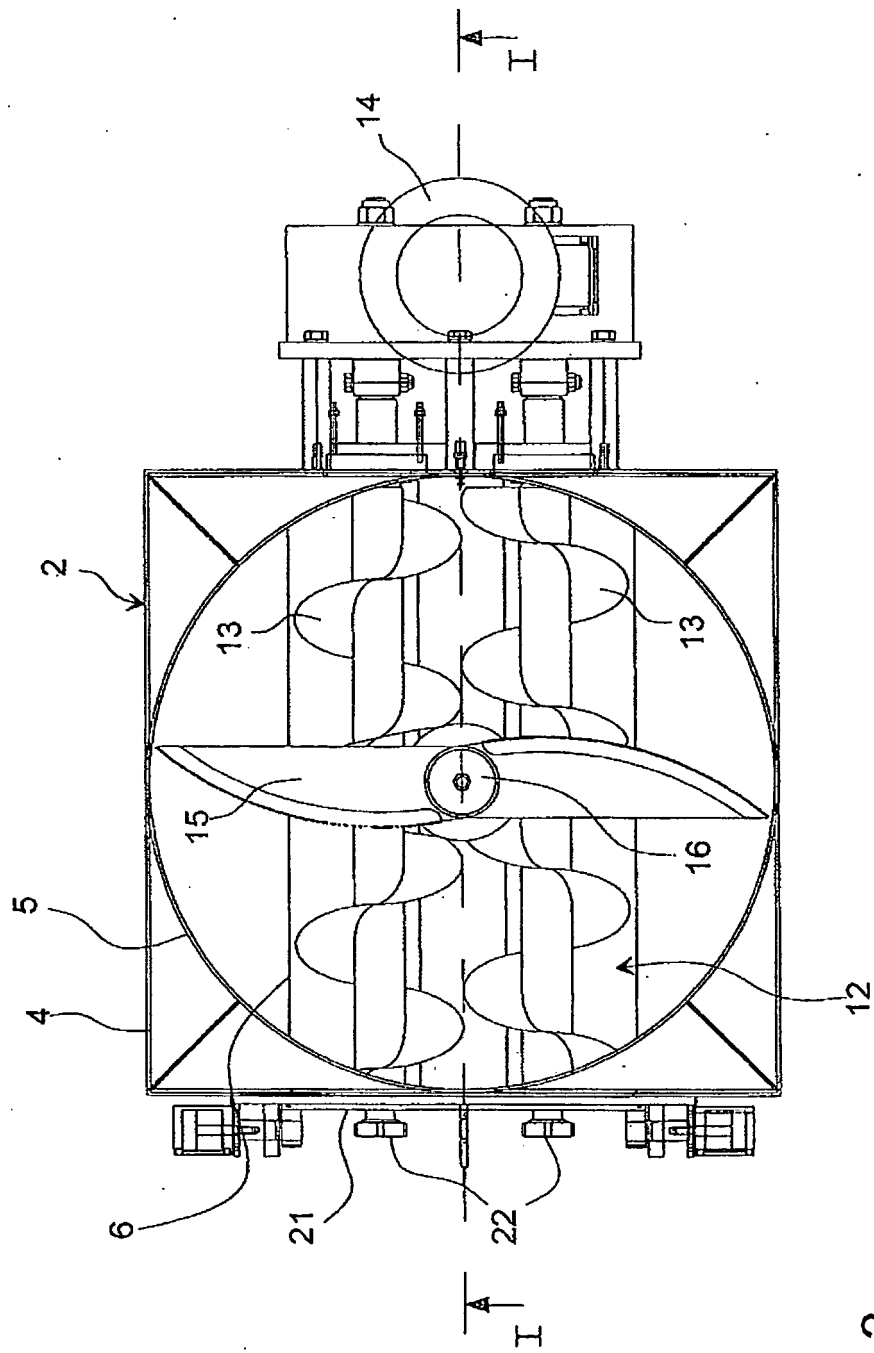


Fig.3

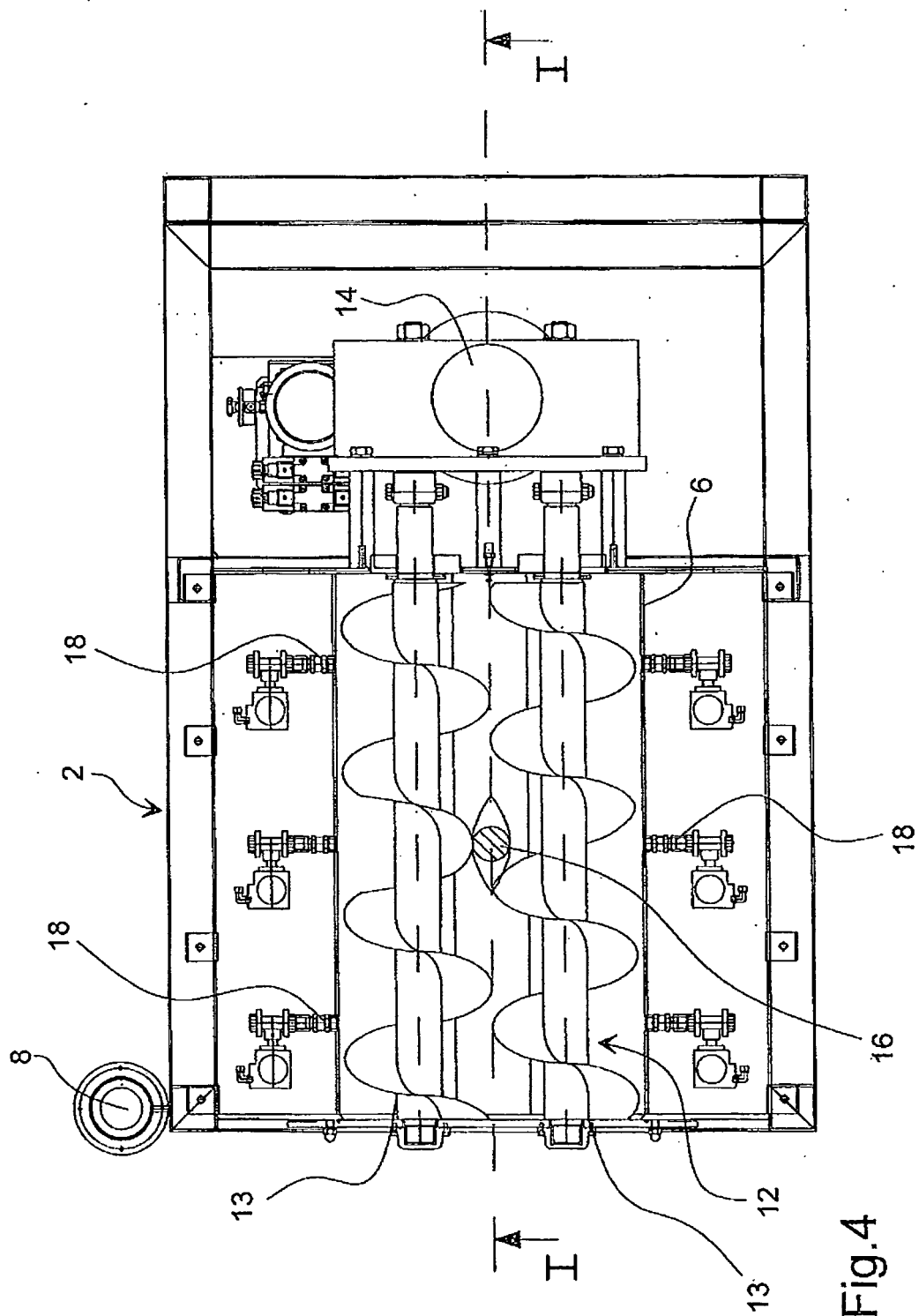


Fig. 4

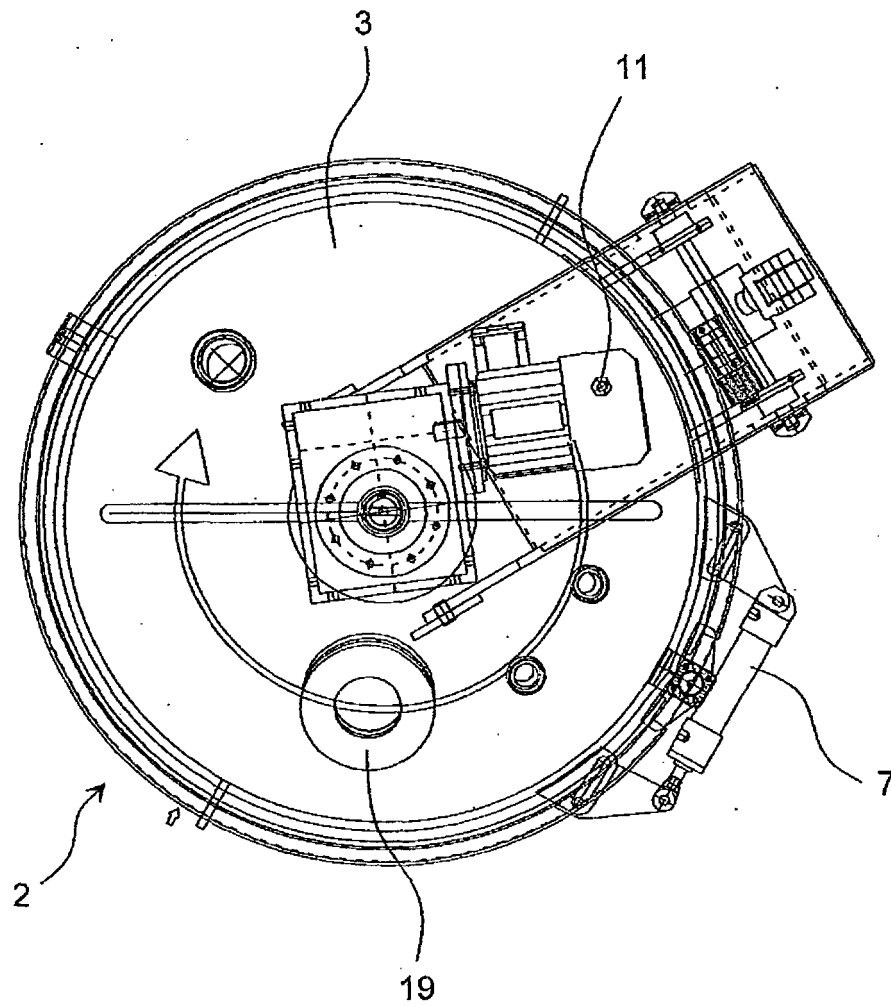


Fig.5

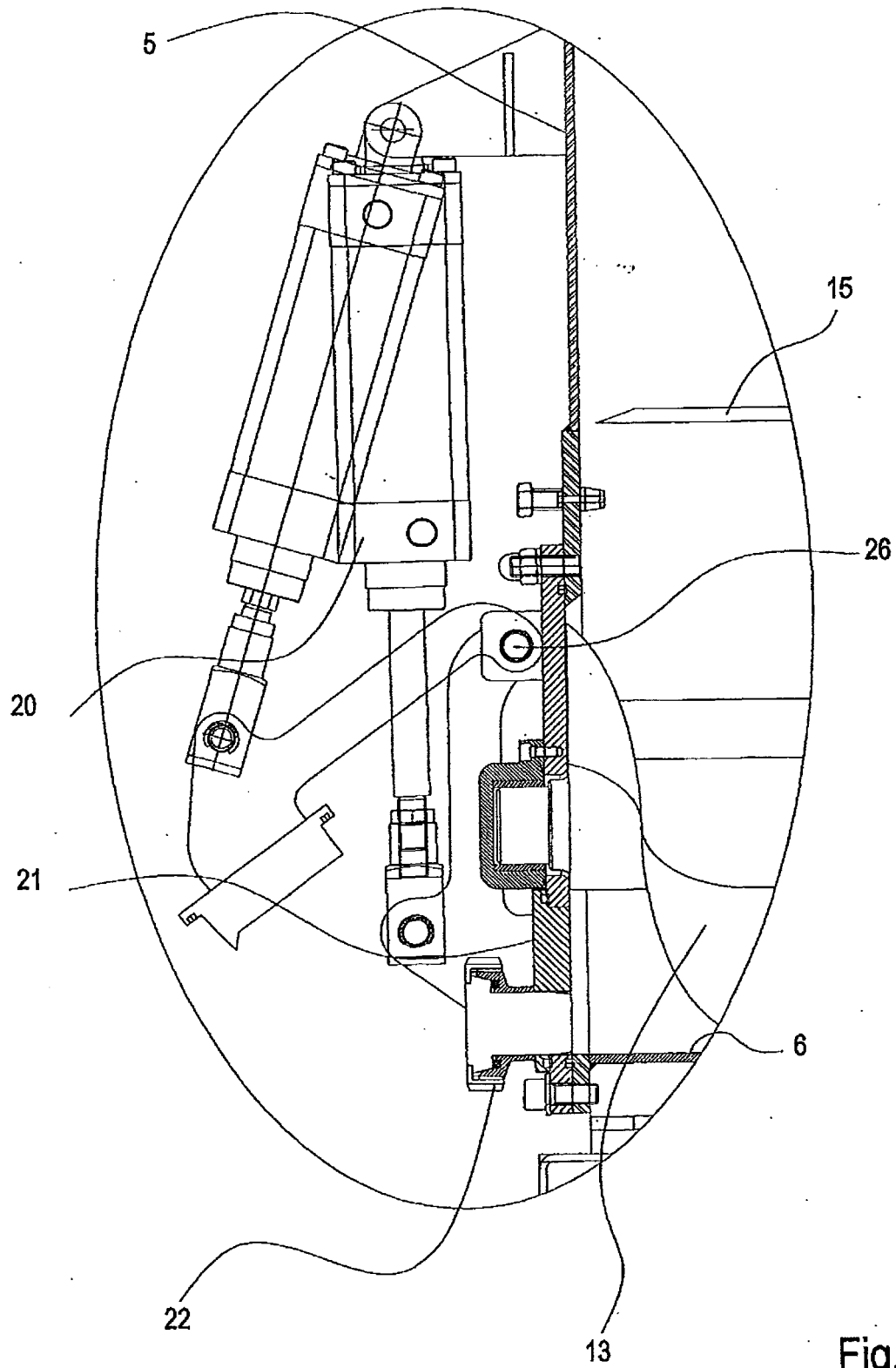


Fig.6

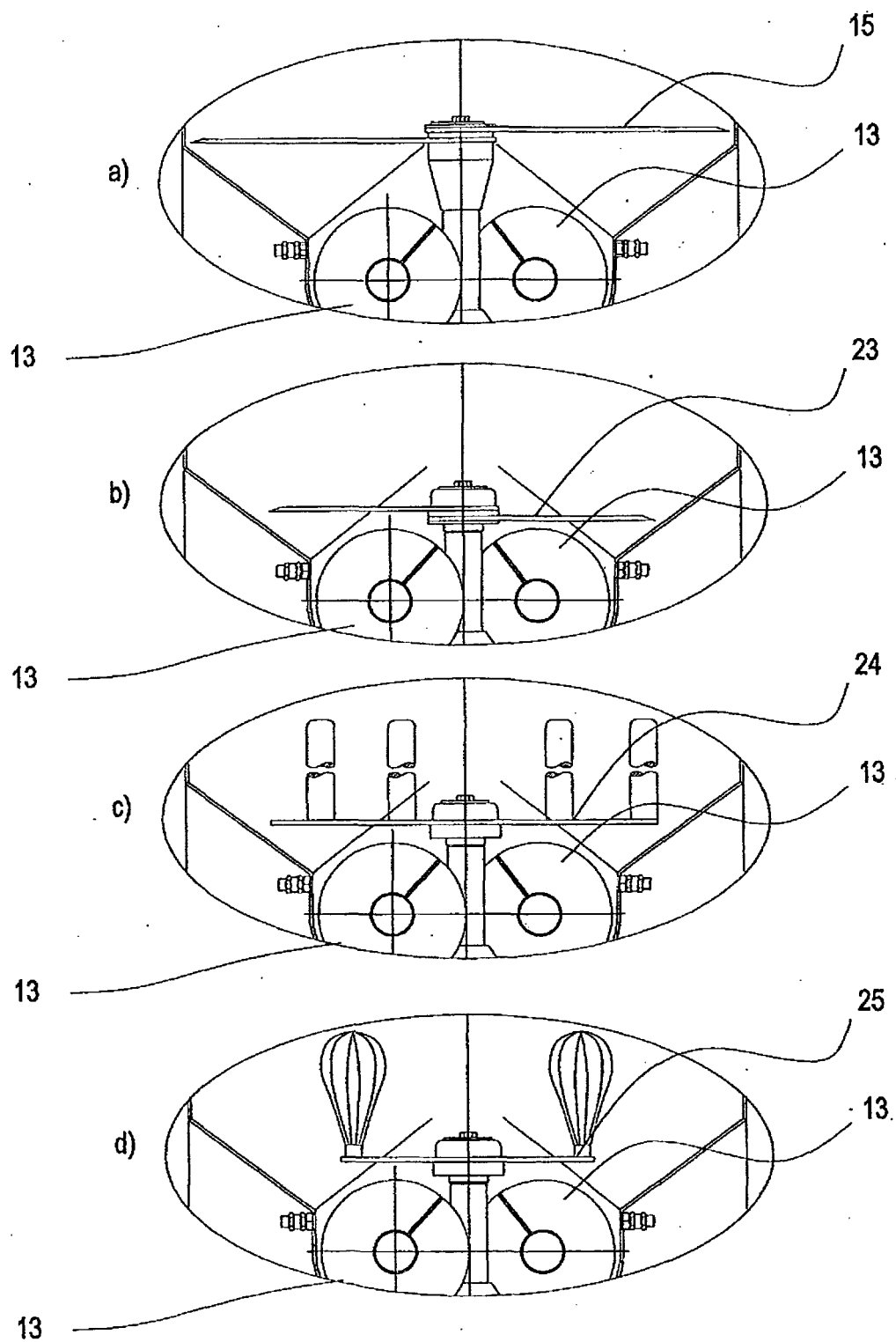


Fig.7

REFERENCES CITED IN THE DESCRIPTION

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