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(54) Device for dispensing powders

Vorrichtung zum Dosieren von pulverigen Stoffen

Appareil pour doser des poudres

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Description

BACKGROUND OF THE INVENTION:

Field of the invention

[0001] The invention relates to a device for dispensing substances, comprising a support in which there are a number of vertically placed storage cylinders, which are provided with an outlet at the bottom, as well as a means of dosing for taking measured quantities of the substances from the storage cylinders and a drive unit for moving the support and the means of dosing with respect to each other, in which there is a screw spindle near the outlet in each storage cylinder, and in which the means of dosing comprises an additional drive unit for driving the screw spindles, which additional drive unit can be coupled to each screw spindle in turn. In particular, the invention relates to a device for dispensing precise amounts of various powders or granular substances, such as grain, flour, spices and all other non-liquid substances, which are used in production processes in the food or non-food industries.

Prior art

[0002] Such a device is known from the French patent application no. 2.582.912. The screw spindles are situated here in horizontal sections of the tube at the outlets on the underside of the storage cylinders and can be coupled to a stationary electric motor set up next to the storage cylinders, which is a part of the means of dosing. The support is here a disc to which the storage cylinders are attached. This disc is a part of a carousel and is rotated by the drive unit, as a result of which each storage cylinder can cooperate in turn with the means of dosing. Another device of this kind is disclosed in US-A- 3015415.

Summary of the invention

[0003] An objective of the invention is to provide a device of the type described in the preamble in which precise amounts of different powders can be dispensed and which takes up less floor area than the known device. To this end, the device according to the invention is characterized in that each storage cylinder's outlet is a vertical section of the tube in which the screw spindle in this storage cylinder is situated. By placing the outlet and the screw spindle under the storage cylinder, there are not any parts which protrude beyond the storage cylinder as seen from above as a result of which the device according to the invention takes up less floor area than the known device.

[0004] By making the diameter of the outlet and/or the screw spindle's pitch small, it is possible to make a precise dosing. In this way dosing of the powders from the storage cylinders can be done in a simple way.

[0005] A favourable coupling of the screw spindles to the additional drive unit is obtained by an embodiment of the device according to the invention, in which there is a vertical bar in each storage cylinder, which is coupled at its lower end to the screw spindle's top, and at its upper end is situated near the storage cylinder's top and is provided with a means of coupling for coupling to the additional drive unit. The additional drive unit comprises, for example, one half of a coupling that can move downwards and can be coupled to the other half of the coupling situated on the screw spindle in the storage cylinder below. The additional drive unit can therefore be situated in this embodiment above the storage cylinder as a result of which it takes up no extra floor area, as is the case with the known device.

[0006] Preferably, there is a stirring device on the bars in order to prevent the powder in the cylinders from clodding.

[0007] In order to make a dosing even more precise, the means of dosing comprises an electronic scales, which is situated with the additional drive under the storage cylinder on the support.

[0008] Still a further embodiment of the device according to the invention is characterized in that the means of dosing also comprises a control unit that is coupled to the electronic scales and to the additional means of driving. Because of this, dosing of the powders desired can be carried out automatically.

[0009] The device can be executed in such a way that the support is in a fixed position and the means of dosing can move with respect to the support. However, it is preferable that the support can move and that the means of dosing is in a fixed position.

[0010] The support can be a support that moves in a straight line, however, in order to save space, it is preferably a part of a carousel. In this case, the support preferably comprises a disc that is provided with openings in its periphery through which the storage cylinders protrude, in which each storage cylinder is provided with a flange that rests on the disc and is fastened to the disc by one bolt or pin. Through this construction, the storage cylinders can easily be put in and taken out of the carousel.

[0011] Preferably, in this embodiment there are wheels under the disc for supporting it.

Brief description of the drawings

[0012] The invention will be elucidated more fully below on the basis of drawings in which embodiments of the device according to the invention are shown. In these drawings:

Figure 1 shows a first embodiment of the device according to the invention in a perspective view;
Figure 2 is a vertical cross-section of the device shown in figure 1;
Figure 3 is a horizontal cross-section of the device shown in figure 1; and

Figure 4 shows a second embodiment of the device according to the invention in a perspective view.

Detailed description of the drawings

[0013] In figures 1, 2 and 3 a first embodiment of the device for dispensing substances according to the method is shown in a perspective view, a vertical cross-section and a horizontal cross-section respectively. The device 1 has a carousel 3 in which there are a number of vertically placed storage cylinders 5. The carousel 3 has a support for carrying the storage cylinders 5. This support is a disc 7 that is provided with openings 9 in its periphery, through which the storage cylinders protrude. Each storage cylinder 5 is provided with a flange 11 that rests on the disc 7 and is fastened by one bolt 13 to that disc. There are wheels 14 under the disc 7 that are attached to a frame 15 and which support the disc 7. In order to rotate the carousel 3, the device 1 has a drive unit 17, which is an electric motor with a reduction gearbox.

[0014] The device has a means of dosing for taking precise quantities of the substances from the storage cylinders 5. This means of dosing can cooperate with the screw spindles 19 situated in the storage cylinders 5. These screw spindles 19 are situated in a section of the tube 21 of the storage cylinders 5, which is also the outlet of the storage cylinders. The screw spindles 19 are attached to bars 23, which at their upper ends protrude beyond the tops of the storage cylinders 5 and are provided with a means of coupling 25 (shown schematically).

[0015] In order to prevent arching of the powder in the storage cylinders 5, a stirring device 31 is attached to the bar 23.

[0016] The means ofdosing has an additional drive unit 27, which is also an electric motor with a reduction gearbox and which is in a stationary position with respect to the carousel 3 for driving the screw spindles 19. By rotating the disc 7 each storage cylinder 5 can be brought under the additional drive unit 27. The additional drive unit 27 also has a means of coupling 29 (shown schematically) for cooperating with the means of coupling 25 of the bars 23. Known coupling devices can be selected for the means of coupling 25 and 29, for example, a disc with two holes in it on the one coupling and an additional disc with two pins on the other that can be inserted in the holes. The additional drive unit 27 can move vertically and thus can be coupled to and uncoupled from a bar.

[0017] The means of dosing, furthermore, has an electronic scales 33, which is situated under the carousel 3 straight under the additional drive unit 27 and which is coupled to a control unit 35, which is also a part of the means of dosing. The control unit 35 is in turn coupled to the additional means of driving 27.

[0018] The control unit 3 5 can be provided with data concerning which powders are desired and what quantities of each of them. The control unit then brings consecutively the storage cylinders 5 in which the powders desired are situated one by one above the scales 33 and sends the additional drive unit 27 downwards in order to couple to the bar 23 of the storage cylinder 5 concerned. The screw spindle 19 is then rotated slowly and the processed powder falls onto the scales 33 and its weight is measured until the quantity desired has been obtained.

[0019] In figure 4 a second embodiment of the device 41 according to the invention is shown. Here, the support 43 is an elongated plate that is provided with openings in which the storage cylinders 45 are placed in the same way as in the first embodiment. The support 43 in this embodiment can be moved by a drive unit 47 in a straight line (see arrow 49) with respect to the means of dosing. The means of dosing in this embodiment is also made up of an additional drive unit 51, an electronic scales 53 and a control unit 55. In the same way as in the first embodiment, the additional drive unit 51 can also be coupled to a means of coupling 57 that is connected to the screw spindles in the storage cylinders 45.

[0020] Although in the above the invention is explained on the basis of the drawings, it should be noted that the invention is in no way limited to the embodiments shown in the drawings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the context defined by the claims. Thus, for example, it is also possible to make the additional drive unit in such a way that it can move horizontally in order to couple to a bar, for example, should the coupling be obtained by meshing two gear wheels.

Claims

1. Device for dispensing substances, comprising a support in which there are a number of vertically placed storage cylinders, which are provided with an outlet at the bottom, as well as a means of dosing for taking measured quantities of the substances from the storage cylinders and a drive unit for moving the support and the means of dosing with respect to each other, in which there is a screw spindle near the outlet in each storage cylinder, and in which the means of dosing comprises an additional drive unit for driving the screw spindles, which additional drive unit can be coupled to each screw spindle in turn, **characterized in that** the outlet of each storage cylinder is a vertical section of the tube in which the screw spindle in this storage cylinder is situated.

2. Device according to claim 1, **characterized in that** there is a vertical bar situated in each storage cylinder, which is coupled at its lower end to the top of the screw spindle and the upper end of which is situated near the top of the storage cylinder and is provided with a means of coupling for coupling to the additional drive unit.

3. Device according to claim 2, **characterized in that** a stirring device is attached to the bar.

4. Device according to one of the preceding claims, **characterized in that** the means of dosing, furthermore, comprises an electronic scales that is situated with the additional drive under the storage cylinder on the support.

5. Device according to claim 4, **characterized in that** the means of dosing also comprises a control unit that is coupled to an electronic scales and to the additional means of driving.

6. Device according to one of the preceding claims, **characterized in that** the support can move and the means of dosing is in a fixed position.

7. Device according to one of the preceding claims, **characterized in that** the support is a part of a carousel.

8. Device according to claim 7, **characterized in that** the support comprises a disc that is provided with openings in its periphery through which the storage cylinders protrude, in which each storage cylinder is provided with a flange that rests on the disc and is fastened to the disc by one bolt or pin.

9. Device according to claim 8, **characterized in that** there are wheels under the disc for supporting it.

Patentansprüche

1. Vorrichtung für die Abgabe von Stoffen, die einen Träger umfasst, in dem sich mehrere vertikal angeordnete Aufbewahrungszylinder befinden, die an der Unterseite mit einer Auslauföffnung versehen sind, sowie Dosiermittel für die dosierte Entnahme von Stoffen aus den Aufbewahrungszylindern und eine Antriebseinheit, mittels derer die relative Lage des Trägers und der Dosiermittel zueinander verändert werden kann, wobei in jedem Aufbewahrungszylinder in der Nähe der Auslauföffnung eine Förderschnecke vorhanden ist und wobei die Dosiermittel eine weitere Antriebseinheit für den Antrieb der Förderschnecken umfassen, die abwechselnd an jede der Förderschnecken gekoppelt werden kann, **dadurch gekennzeichnet, dass** die Auslauföffnung eines jeden Aufbewahrungszylinders als vertikales Röhrenteil ausgebildet ist, in dem sich die in diesem Aufbewahrungszylinder vorhandene Förderschnekke befindet.

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet, dass** sich in jedem Aufbewahrungszylinder ein vertikaler Stab befindet, der mit einem unteren Ende mit einem oberen Ende der Förderschnekke verbunden ist und der sich mit einem oberen Ende in der Nähe der Oberseiten des Aufbewahrungszylinders befindet und mit Kupplungsmitteln für die Verbindung mit der weiteren Antriebseinheit versehen ist.

3. Vorrichtung nach Anspruch 2, **dadurch gekennzeichnet, dass** an dem Stab ein Rührwerk befestigt ist.

4. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** die Dosiermittel ferner eine elektronische Waage umfassen, die sich unter dem an dem Träger vorhandenen Aufbewahrungszylinder im Bereich der weiteren Antriebseinheit befindet.

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet, dass** die Dosiermittel ferner eine Steuereinheit umfassen, die mit der elektronischen Waage und mit den weiteren Antriebsmitteln verbunden ist.

6. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** der Träger beweglich ausgeführt ist und die Dosiermittel ortsfest aufgestellt sind.

7. Vorrichtung nach einem der vorangegangenen Ansprüche, **dadurch gekennzeichnet, dass** der Träger Teil eines Karussells ist.

8. Vorrichtung nach Anspruch 7, **dadurch gekennzeichnet, dass** der Träger eine runde Scheibe umfasst, die entlang ihrem äußeren Rand mit Öffnungen versehen ist, in denen die Aufbewahrungszylinder eingesetzt sind, wobei jeder Aufbewahrungszylinder mit einem Flansch versehen ist, der auf der Scheibe ruht, und mit einem einzigen Bolzen oder Stift auf der Scheibe fixiert ist.

9. Vorrichtung nach Anspruch 8, **dadurch gekennzeichnet, dass** sich unter der Scheibe Räder befinden, welche die Scheibe abstützen.

Revendications

1. Dispositif pour la distribution de substances, comprenant un support dans lequel est placé un certain nombre de cylindres de stockage, lesquels, dans leur partie inférieure, sont pourvus d'une ouverture de sortie, comprenant également des moyens de dosage pour le soutirage dosé des substances des cylindres de stockage, et une unité d'entraînement pour le déplacement, dans un rapport réciproque, du support et des moyens de dosage, dispositif dans lequel est présent, dans chaque cylindre, à proximité de l'ouverture de sortie, un arbre fileté de réglage à vis et, dans lequel également les moyens de dosage comportent, en outre, une unité d'entraînement pour

l'entraînement des arbres de réglage fileté à vis, laquelle unité d'entraînement se laisse, tour à tour, coupler avec chaque arbre de réglage à vis, la caractéristique étant que l'ouverture de sortie de chaque cylindre de stockage est constituée d'un élément tubulaire dans lequel se trouve l'arbre de réglage fileté à vis présent dans le cylindre de stockage en question.

2. Dispositif conforme à la revendication 1, **caractérisé en ce que** dans chaque cylindre de stockage est présente une tige, couplée par son extrémité inférieure au bout supérieur de l'arbre de réglage fileté à vis et dont l'extrémité supérieure, située à proximité de la partie supérieure du cylindre de stockage, est équipée de moyens de dosage pour le couplage, de l'unité d'entraînement située plus avant.

3. Dispositif conforme à la revendication 2, **caractérisé en ce qu'**est fixé un agitateur à la tige.

4. Dispositif conforme à l'une des revendications précédentes, **caractérisé en ce que** les moyens de dosage contiennent, de plus, une balance électronique, laquelle est présente sous le cylindre de stockage présent sur le support, à l'endroit où se trouve l'unité d'entraînement située plus avant.

5. Dispositif conforme à la revendication 4, **caractérisé en ce que** les moyens de dosage comprennent également une unité de commande qui se trouve reliée à la balance électronique et aux dispositifs d'entraînement situés plus avant.

6. Dispositif conforme à l'une des revendications précédentes, **caractérisé en ce que** le support est déplaçable et les moyens de dosage mis en place de manière fixe.

7. Dispositif conforme à l'une des revendications précédentes, **caractérisé en ce que** le support fait partie d'un carrousel.

8. Dispositif conforme à la revendication 7, **caractérisé en ce que** le support comporte un disque circulaire, pourvu, sur son pourtour, d'ouvertures dans lesquelles sont fichés les cylindres de stockage, dispositif dans lequel chaque cylindre de stockage est pourvu d'une bride reposant sur le disque et fixée à ce dernier au moyen d'un boulon ou d'un tenon.

9. Dispositif conforme à la revendication 8, **caractérisé en ce que** des roues sont présentes sous le disque, pour le supporter.

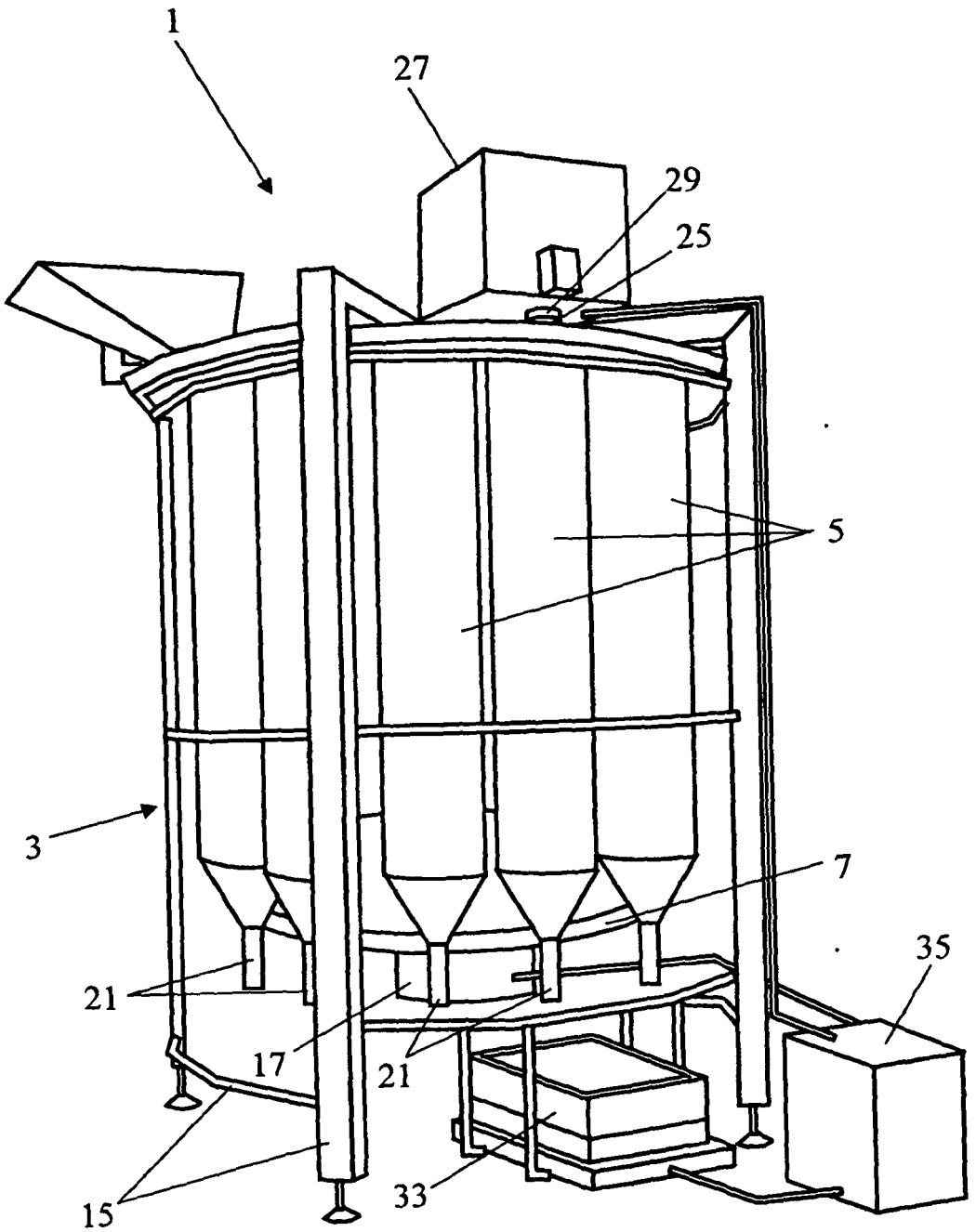

FIG. 1

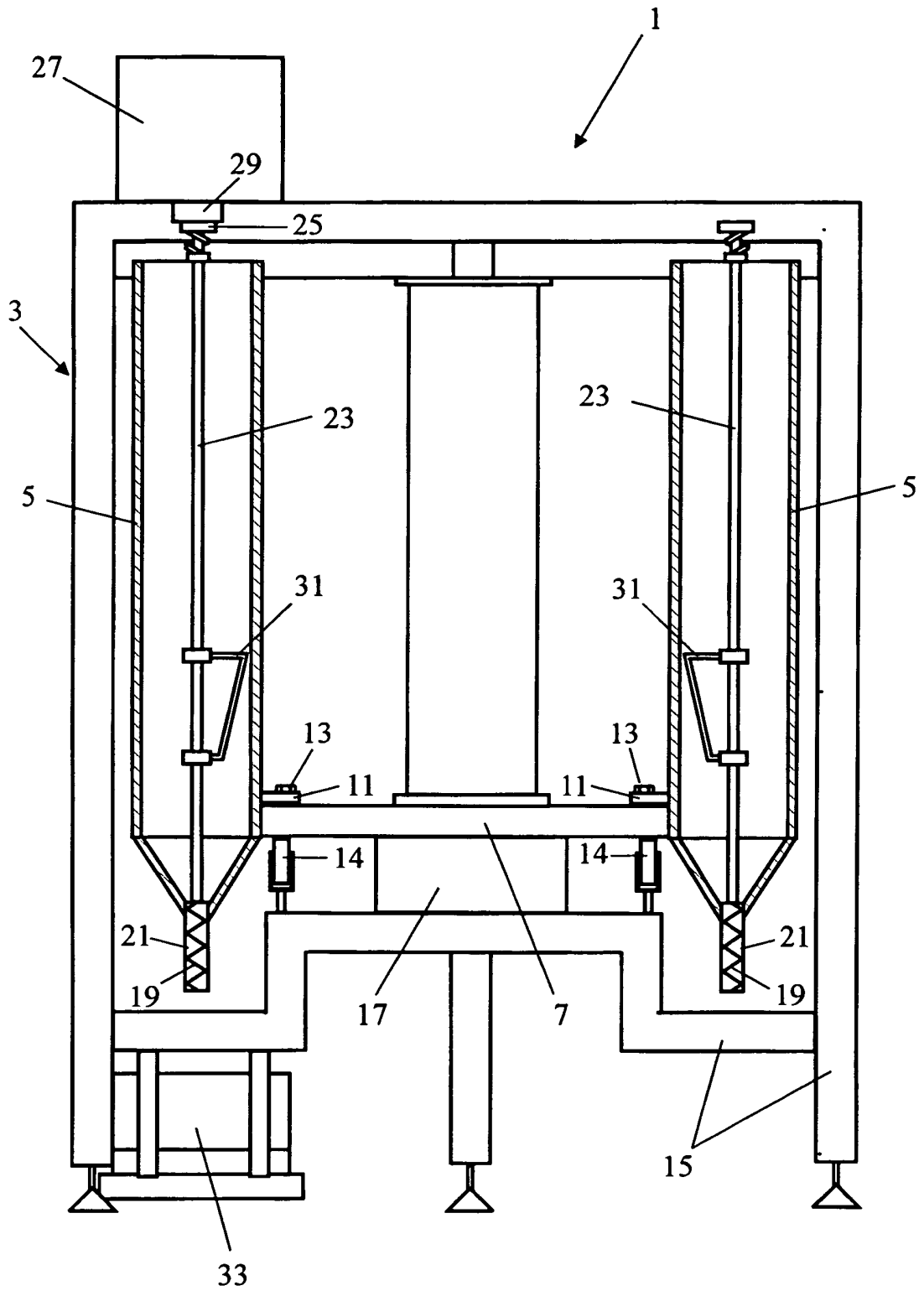

FIG. 2

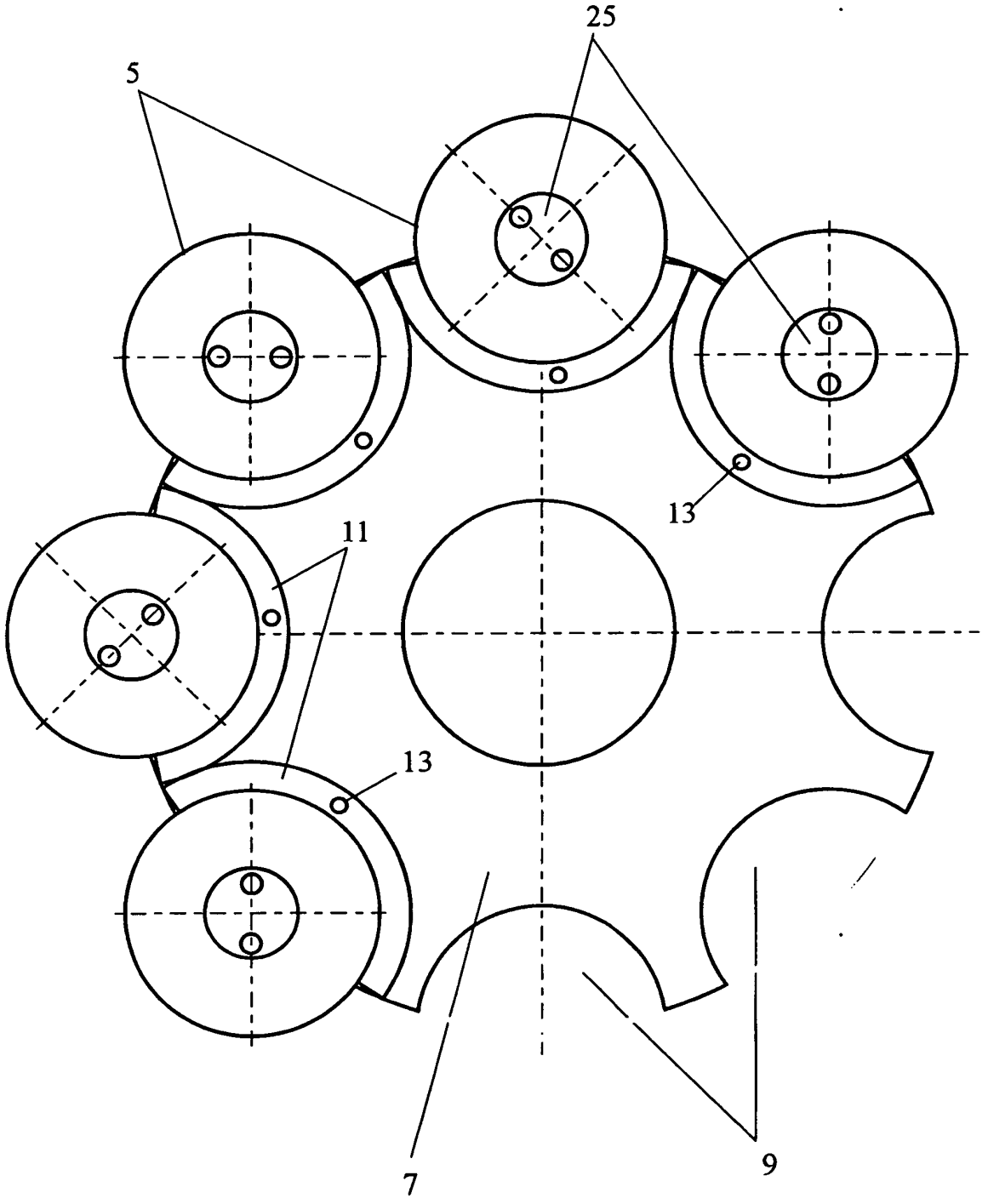

FIG. 3

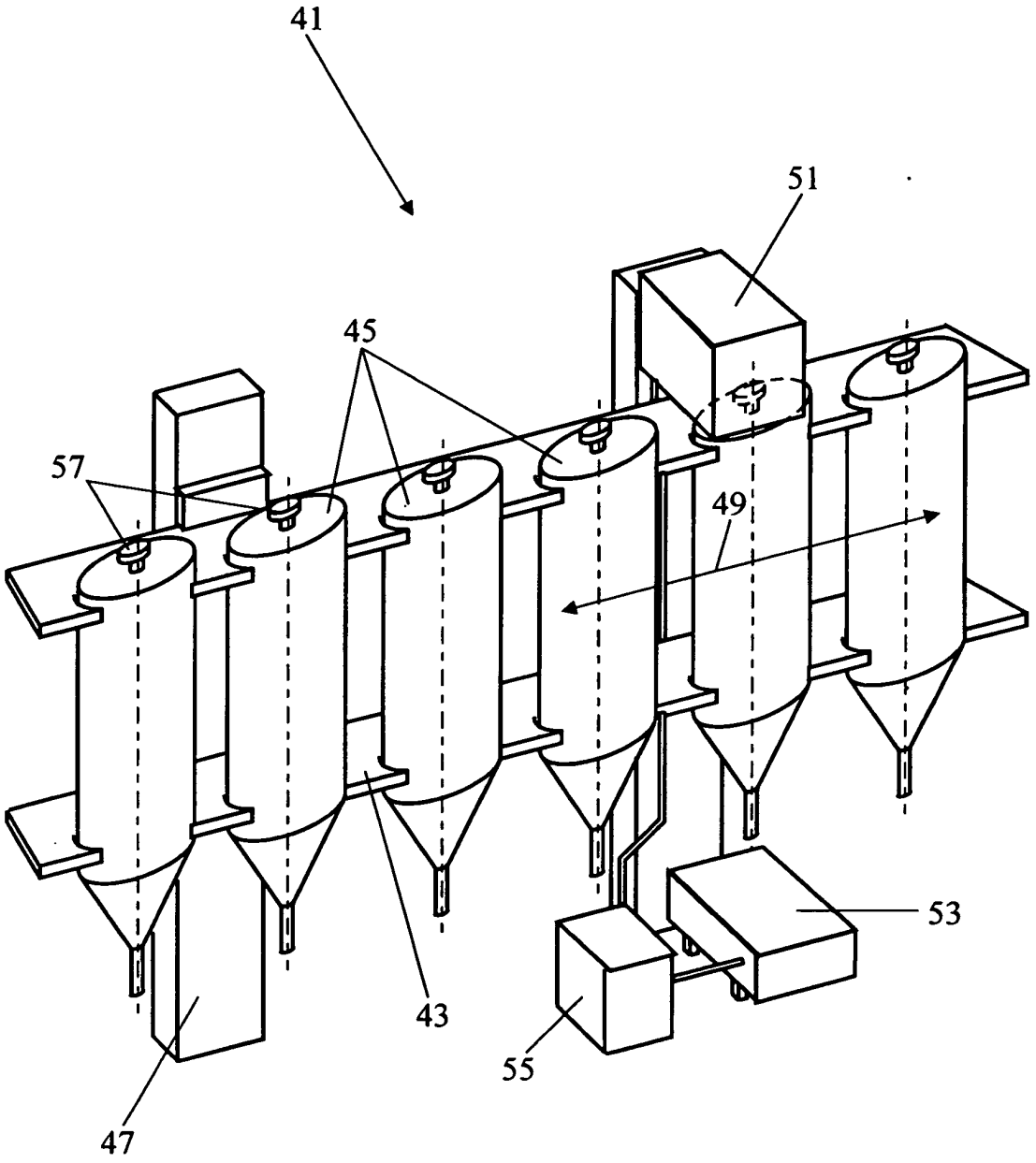

FIG. 4