



(11)

EP 3 326 922 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
30.05.2018 Bulletin 2018/22

(21) Application number: **17203717.8**

(22) Date of filing: **27.11.2017**

(51) Int Cl.:

B65B 19/34 ^(2006.01) **B65B 1/06** ^(2006.01)
B65B 1/42 ^(2006.01) **B65B 39/00** ^(2006.01)
B65B 1/36 ^(2006.01) **B65G 17/16** ^(2006.01)
B65G 17/36 ^(2006.01) **B65G 67/00** ^(2006.01)
B65B 35/30 ^(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
Designated Validation States:
MA MD

(30) Priority: **28.11.2016 IT 201600120324**

(71) Applicant: **Altopack S.P.A.**
55011 Altopascio (LU) (IT)

(72) Inventor: **PIAZZAROLI, Massimo**
55033 CASTELNUOVO DI GARFAGNANA (LU) (IT)

(74) Representative: **Mittler, Andrea et al**
MITTLER & C. s.r.l.
Viale Lombardia, 20
20131 Milano (IT)

(54) **APPARATUS FOR DOSING LONG-TYPE PASTA**

(57) It is disclosed an apparatus for transferring long pasta (200) from a production line towards a packaging machine, comprising a loader assembly (1) for long pasta (200), which includes at least one descender (2) of long

pasta (200), dosing means (6) and a rotor (11) provided with a cavity (12). Said apparatus comprises also a bucket (19) conveyor (18) positioned below the rotor (11).

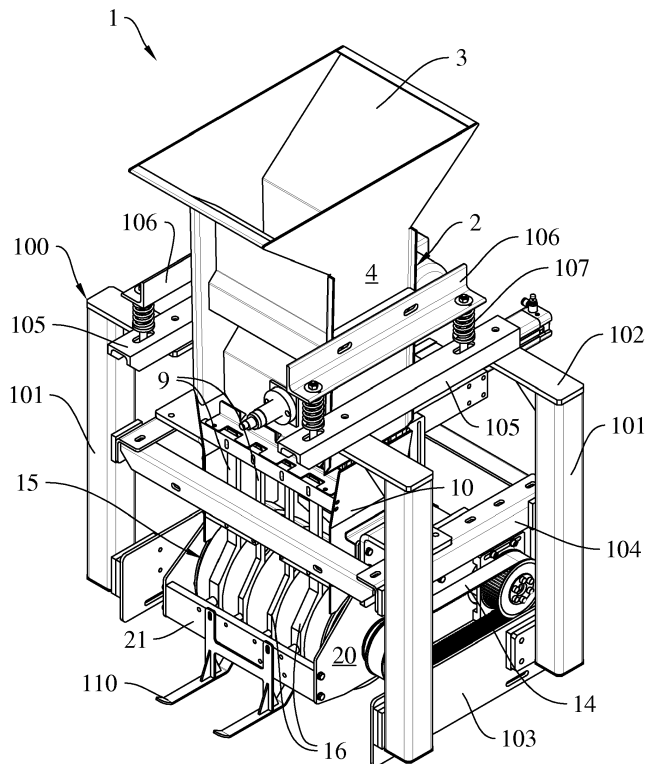


FIG.1

Description

[0001] The present invention relates to an apparatus for dosing long pasta.

[0002] Loader assemblies of long pasta are known, positioned between a production line of pasta and a conveyor adapted to guide the dosed pasta towards a packaging machine.

[0003] Typically, the loader assembly comprises a hopper sealed at the bottom by a door with controlled opening and closing, said door comprising, for example, two openable and closable shutters, so as to unload one dose of pasta at a time. The conveyor is a bucket conveyor, each of the buckets being adapted to receive a dose of pasta from the loader assembly unloaded from the hopper.

[0004] During an operating cycle, after dosing a determined amount of pasta from the overall quantity, the loader assembly unloads the aforesaid dose of pasta into one of the conveyor buckets by opening the door.

[0005] The drawbacks of known loader assemblies are that part of the dose of pasta unloaded into the buckets comes out of the bucket and also that the sudden fall of pasta from the hopper results in an uneven distribution of the pasta inside the bucket.

[0006] Such drawbacks translate into the slow movement of the conveyor and, consequently, of the loading process in general. Furthermore, there are also problems related to the packaging downstream, as the packaging machine has to manage doses of pasta which are unevenly distributed in the buckets.

[0007] WO-2015/044796 discloses a machine for weighing doses of long pasta, adapted to unload the dose of pasta directly into a packaging machine.

[0008] EP-2481674 discloses a machine for forming packs of pasta or other multicolored pasta, comprising a pasta mixing drum.

[0009] In view of the prior art, it is an object of the present invention to produce an apparatus for dosing long pasta, which overcomes the drawbacks described above.

[0010] According to the present invention, said object is achieved by an apparatus as defined in claim 1.

[0011] Advantageously, the shape of the loader assembly facilitates the precision of the unloading of the dose of long pasta into the bucket, which cooperates with said loader assembly by means of grooves coupled to the guides in each unloading step.

[0012] The apparatus according to the present invention achieves quick and precise dosing of long pasta between a production line and a packaging machine.

[0013] The characteristics and advantages of the present invention will become clear from the following detailed description of one of its practical embodiments, which is illustrated in the attached drawings, by way of example and not limiting, in which:

figures 1 and 2 show two perspective views of a load-

er assembly of an apparatus according to the present invention;

figure 3 shows a side view of the loader assembly;

figure 4 shows a section view according to the line IV-IV of figure 3;

figure 5 shows a section view according to the line V-V of figure 3;

figure 6 shows a frontal view of the loader assembly, figure 7 shows a section view according to the line VI-VI of figure 7;

figures 8-13 show section views similar to the one of figure 7, in different operating steps.

[0014] A loader assembly 1 for long pasta is shown in figures 1, 2.

[0015] The loader assembly 1 is provided with a frame 100 essentially comprising two pairs of columns 101 symmetrically arranged, each column 101 being surmounted by a respective plate 102, which is attached to the column 101 by a connection angle bracket. Also attached to each pair of columns 101 is an inferior lateral external shoulder 103, a lateral angular bar 104 and a crosspiece 105 placed on the two plates 102 to strengthen the structure of the frame 100.

[0016] The loader assembly 1 comprises at least one descender 2 adapted to vertically receive an amount of long pasta 200 from a production line (not shown in the figures). The long pasta 200 is oriented with its long side perpendicular with respect to the direction of vertical movement of the long pasta 200 inside the loader assembly 1 (figures 8-13).

[0017] In the embodiment shown in the attached figures, the loader assembly 1 comprises only one descender 2, although there can be alternative embodiments with a plurality of descenders. Furthermore, to facilitate the pasta loading operations, again in the embodiment shown in the figures, said at least one descender 2 can comprise a hopper 3 at the top and thus present a substantially truncated pyramid shape. Alternatively, and instead of the hopper 3, said at least one descender 2 can comprise different types of structures adapted to interface with the transport means from the production line.

[0018] Two sides 4 of the descender 2, parallel and opposite to each other, are attached to the frame 100. In particular, a bracket 106 is attached to each side of the descender 2, said bracket 106 being connected, in turn, by two springs 107 to one of said crosspieces 105 (figures 1, 3). An electric motor vibrator 5 (figure 2) attached to a further side of the descender 2 thanks to the elastic connection offered by said springs 107 is configured to produce a vibratory movement of the descender 2 to deliver the amount of long pasta 200, which is introduced into the loader assembly 1.

[0019] Advantageously, the descender 2 is shaped according to a serpentine path (figure 7), however, it can present different shapes; for example, alternatively there can be a descender with a rectilinear path or other.

[0020] In a position below the descender 2, the loader

assembly 1 comprises a space 8 (figure 7) for the accumulation of a dose of long pasta 200 from said amount of long pasta 200 received from the descender 2, said space 8 being defined by a plurality of lateral guides 9 and by two walls of containment 10 (figures 4, 6). The walls of containment 10 are attached to the frame 100 by support brackets 109 connected to said lateral angular bars 104.

[0021] The loader assembly 1 comprises dosing means 6 interposed between the descender 2 and the space 8, which are movable between an open position, wherein the long pasta 200 is free to access the space 8 and a closed position, wherein said dose of long pasta 200 accumulated in the space 8 is separated from said amount of long pasta 200.

[0022] Specifically, the dosing means 6 are represented by a paddle (figure 7) adapted to be inserted transversely below the conduit of the descender 2, movable between an open position (figures 9, 12), wherein the paddle 6 is extracted and the long pasta 200 from the descender 2 is free to accumulate inside the space 8 and a closed position, wherein the paddle 6 is inserted transversely and serves to separate a dose of long pasta 200 from the overall amount introduced into the loader assembly 1 (figures 10, 13) and/or prevent the descent of long pasta 200 from the descender 2 (figures 8, 11), as will be better explained below.

[0023] In the embodiment illustrated by way of example in the attached drawings, the dosing paddle 6 is moved by a pneumatic cylinder 7 with a piston, at the end of which the paddle 6 is attached. The pneumatic cylinder 7 is attached to the frame 100 by a special support 108, shown in figure 3.

[0024] The loader assembly 1 comprises a rotor 11 (figures 4, 5) placed at the bottom to close said space 8.

[0025] Said rotor 11 has a cylindrical shape and comprises a cavity 12 made on a section of lateral surface. The L axis of rotation of the rotor 11 is perpendicular to the vertical direction of movement and descent of the long pasta 200. For example, the rotor 11 can be moved by a brushless motor 13 connected by a toothed belt 14 (figure 2).

[0026] The rotor 11 is rotatably supported by a housing 15 (figures 4, 5) attached to the frame 100 of the loader assembly 1.

[0027] Said housing 15 comprises guide appendages 16 integral with a pair of crosspieces 21 supported by side panels 20 attached to the frame 100.

[0028] The rotor 11 comprises a plurality of grooves 22 on the lateral surface adapted to couple to said guide appendages 16 (figures 4, 5).

[0029] The housing 15 also has an opening 17 at the bottom (figure 7), which allows the unloading of the dose of long pasta 200 contained in the cavity 12 of the rotor 11, as illustrated below.

[0030] The rotor 11 is configured to rotate inside the housing 15, adopting at least one filling position, wherein the cavity 12 is facing upwards to receive the dose of

long pasta 200 therein (figure 11) and an emptying position, wherein the cavity 12 is facing downwards to unload the dose of long pasta 200 (figure 12), with the lateral surface of the rotor 11 opposite to said cavity 12 acting as a base for the accumulation of a subsequent dose of pasta inside the space 8 above. Following the rotating movement of the rotor 11, the unloading of the dose of long pasta 200 ensures that the long pasta 200 is unloaded by sliding along a wall of the cavity 12 (figure 12).

[0031] In particular, the rotor 11 and the dosing paddle 6 are configured to work together in such a way that the paddle 6 is only extracted when the rotor 11 is in the emptying position (figure 11), leaving the passage free, which takes the long pasta 200 from the descender 2 to the space 8 below, which is closed by the lateral wall of the rotor 11, opposite the cavity 12. Vice versa, the paddle 6 is introduced both when the rotor 11 is in the emptying position (figure 10), to dose the long pasta 200 by separating a dose from the overall amount, and when the rotor 11 is in the filling position (figure 11), so as to prevent the further descent of long pasta 200 from the descender 2 and ensure that the cavity 12 only receives the dose of long pasta 200 accumulated inside the space 8.

[0032] A bucket 19 conveyor 18 (figures 12, 13) is positioned at the bottom of the rotor 11, said conveyor 18 being adapted to transport a dose of long pasta 200 unloaded from the rotor 11 in each of the buckets 19 comprised therein towards a packaging machine (not shown in the figures).

[0033] The conveyor 18 is configured so that each time the rotor 11 is rotated with the cavity 12 facing downwards (emptying position), a bucket 19 is positioned at the bottom of the rotor 11 (figure 12).

[0034] Advantageously, the loader assembly 1 comprises guides 110 attached to said crosspieces 21 of the housing 15, said guides 110 being adapted to couple to related grooves (not shown in the figures) in each bucket of the conveyor 18 so as to position each bucket 19 below the rotor 11 with precision.

[0035] In operation, the loader assembly 1 is used in an apparatus for transferring the long pasta 200 received from a production line towards a packaging machine by the bucket 19 conveyor 18 comprised in said apparatus.

[0036] In an initial start-up step (figure 8), the dosing paddle 6 is introduced below the conduit of the descender 2, so that the long pasta 200, which is loaded from above by the hopper 3, will completely fill the descender 2, starting from the dosing paddle 6 until the top part for introducing the long pasta 200. The vibrating movement of the descender 2 implemented by the motor vibrator 5 delivers the amount of long pasta 200, which is introduced into the loader assembly 1. In the same step, the rotor 11, constantly rotated by the brushless motor 13, finds itself with the cavity 12 facing downwards, in other words in the emptying position (however, in this case, the cavity 12 is initially empty).

[0037] In a second step (figure 9), the dosing paddle 6 is extracted and the long pasta 200 will also fill the

accumulation space 8 below defined by the lateral guides 9 and the walls 10 of containment. Despite its continuous rotation, the rotor 11 is still in the emptying position and the lateral surface of the rotor 11 opposite to the cavity 12 closes the space at the bottom, blocking the long pasta 200 from the descender 2.

[0038] In a third step (figure 10), the dosing paddle 6 is introduced into the descender 2 again, to separate a dose from the overall amount of long pasta 200. The rotor 11 is still in the emptying position and the dose of pasta is the dose comprised in the section between the external surface of the rotor 11 and the dosing paddle 6.

[0039] In a fourth step (figure 11), the rotor 11, continuing its rotation, moves until the cavity 12 is positioned at the top (filling position), so that the dose of long pasta 200 falls inside the same, freeing the space 8. At the same time, the dosing paddle 6 is still inserted below the descender 2, supporting the remaining quantity of pasta contained inside the descender 2, which is blocked at the bottom by the paddle 6.

[0040] In a fifth step (figure 12), the rotor 11 moves back into the emptying position. During the rotation, the cavity 12 moves gradually in correspondence with the opening 17 at the bottom of the housing 15, allowing the long pasta 200 to slide inside one of the buckets 19 of the conveyor 18 positioned at the bottom of the rotor 11. At the same time, the dosing paddle 6 is extracted, allowing the remaining part of long pasta 200 to fall, filling the accumulation space 8 again.

[0041] In a sixth and final step (figure 13), the dosing paddle 6 is still inserted inside the descender 2 to separate a new dose of long pasta 200, similar to said fifth step. Steady operation is that comprising the steps from the third to the fifth (figures 5-7).

[0042] Thanks to the loader assembly 1 and, in particular, to the unloading of the pasta by sliding, permitted by the rotor 11, the pasta is prevented from coming out of the bucket at the time of unloading, and is evenly distributed inside the bucket 18, aspects, which translate into greater speed of the movement of the conveyor and, consequently, of the loading process in general.

[0043] The shape of the housing 15 facilitates the precision of the unloading of the dose of long pasta 200 into the bucket 19, which cooperates with said housing by grooves which couple to the guides 110 in each loading step.

[0044] The apparatus according to the present invention produces quick and precise dosing of long pasta 200 between a production line and a packaging machine.

vided with a cavity (12), said rotor (11) being adapted to adopt at least one filling position, wherein the cavity (12) is facing upwards to receive a dose of long pasta (200) therein, and an emptying position, wherein the cavity (12) is facing downwards for unloading the dose of long pasta (200),

said apparatus being **characterized in that** it also comprises

a bucket (19) conveyor (18) positioned below the rotor (11), said conveyor (18) being adapted to transport in each of the buckets (19) comprised therein the dose of long pasta (200) unloaded from the rotor (11) for being transported towards a packaging machine,

said loader assembly (1) comprising guides (110) adapted to couple to related grooves in each bucket (19) of the conveyor (18) so as to position each bucket (19) below the rotor (11) with precision.

2. Apparatus according to claim 1, **characterized in that** said rotor (11) is rotatably supported by fixed housing (15) comprising guide appendages (16) and an opening (17) at the bottom, adapted to allow the unloading of the dose of long pasta (200) contained in the cavity (12) of the rotor (11), said rotor (11) comprising a plurality of grooves (22) on the lateral surface suitable for coupling to said guide appendages (16).

Claims

1. Apparatus for transferring long pasta (200) from a production line towards a packaging machine, comprising a loader assembly (1) for long pasta (200) which includes at least one descender (2) of long pasta (200), dosing means (6), and a rotor (11) pro-

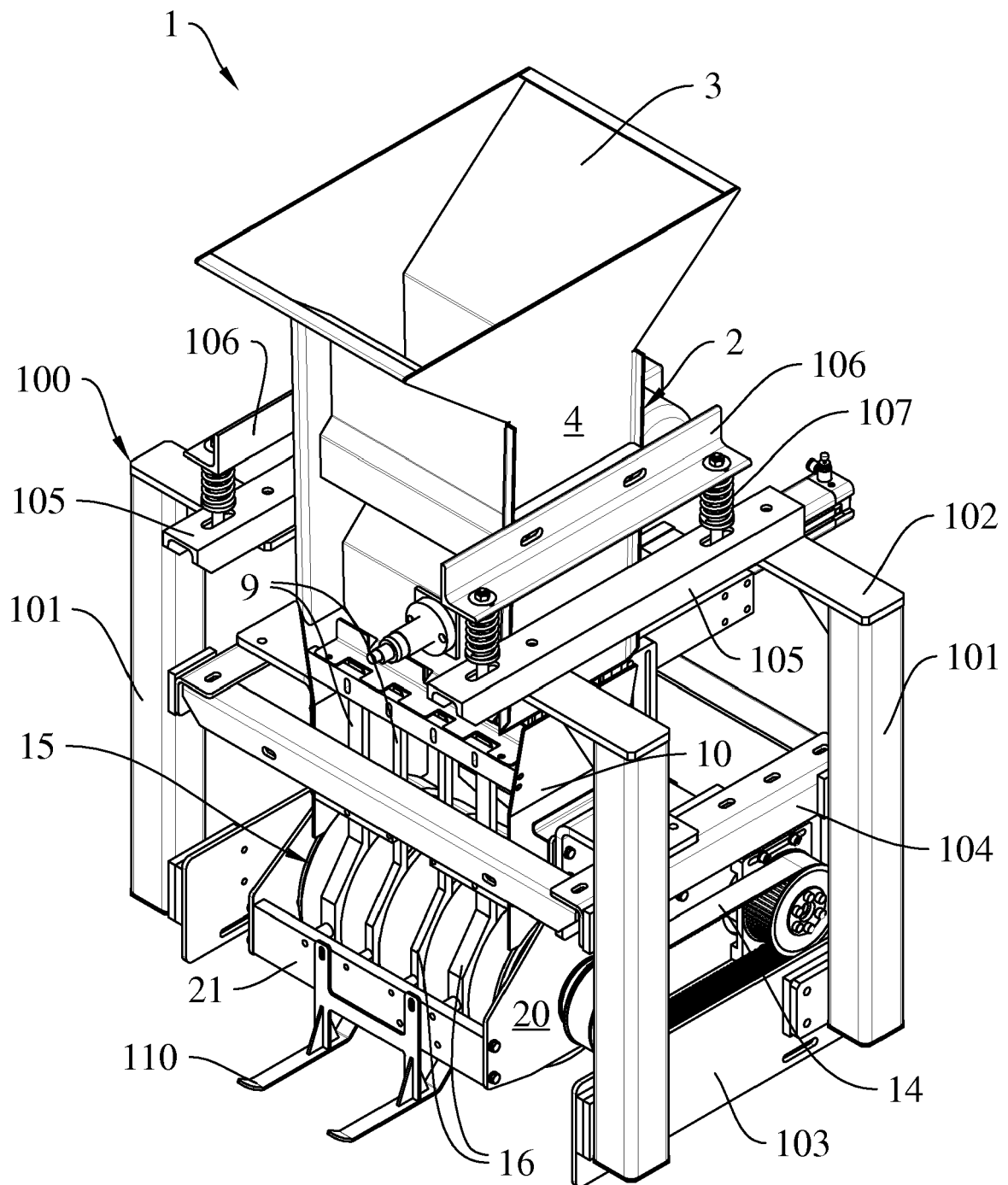


FIG.1

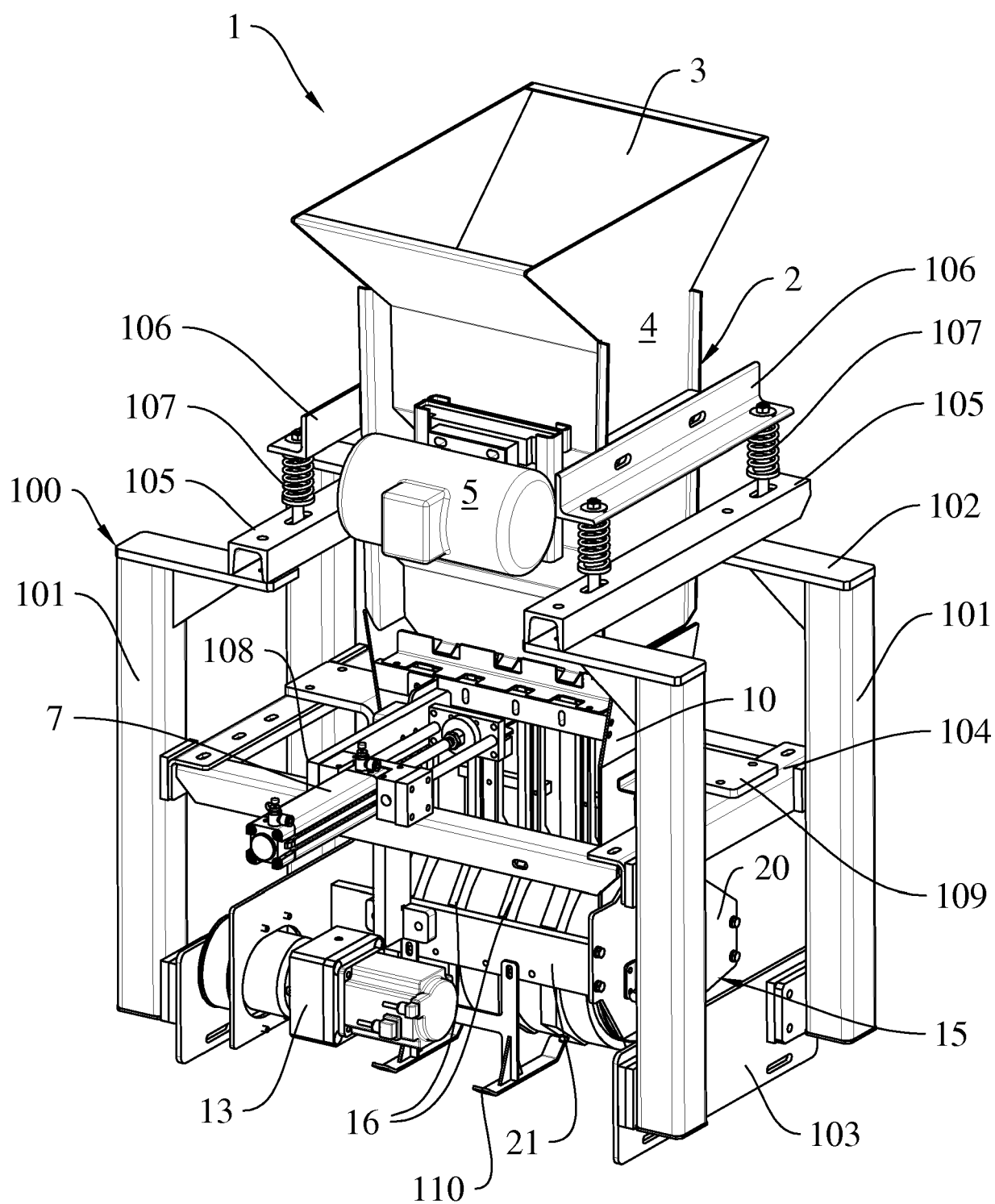


FIG.2

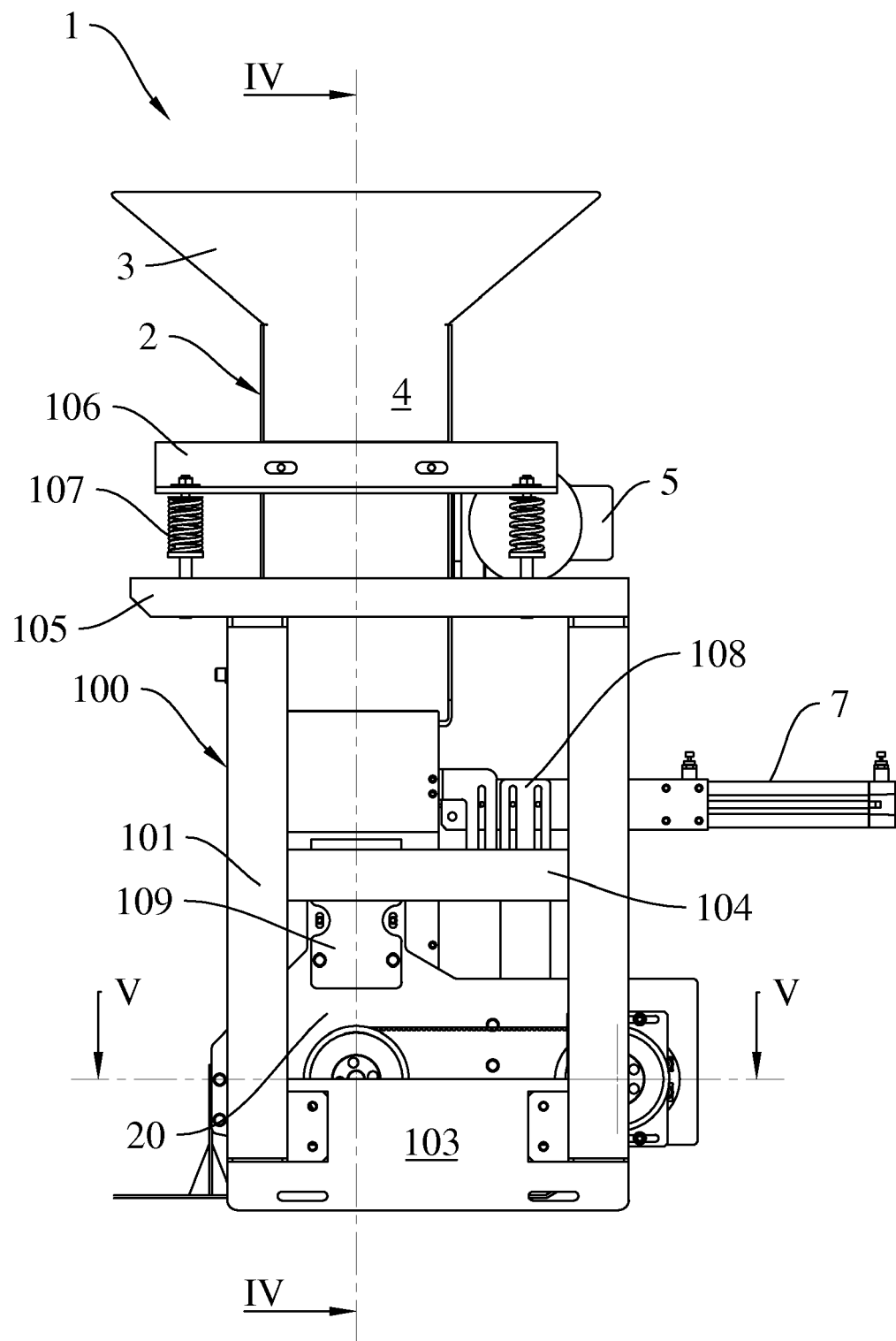


FIG.3

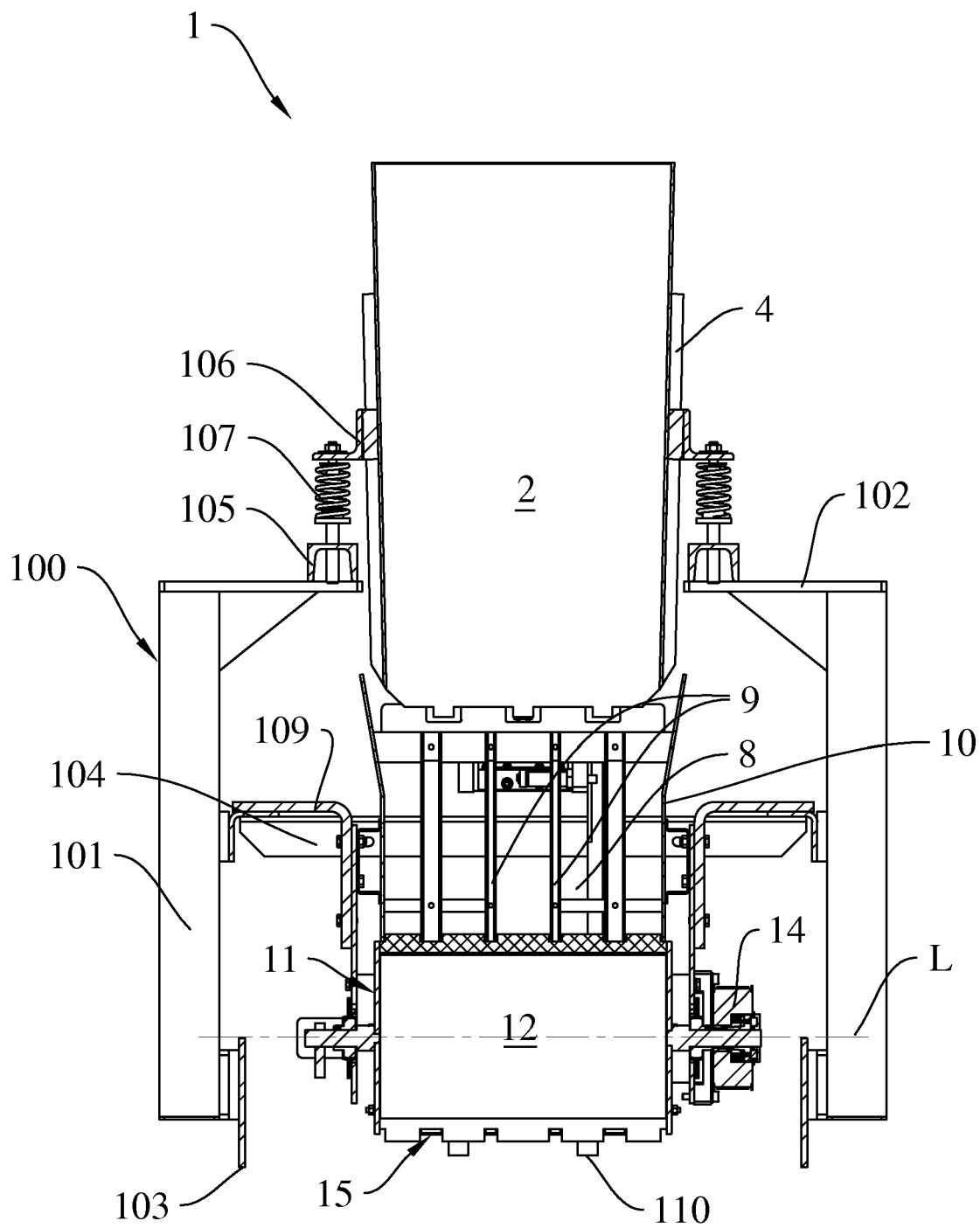


FIG.4

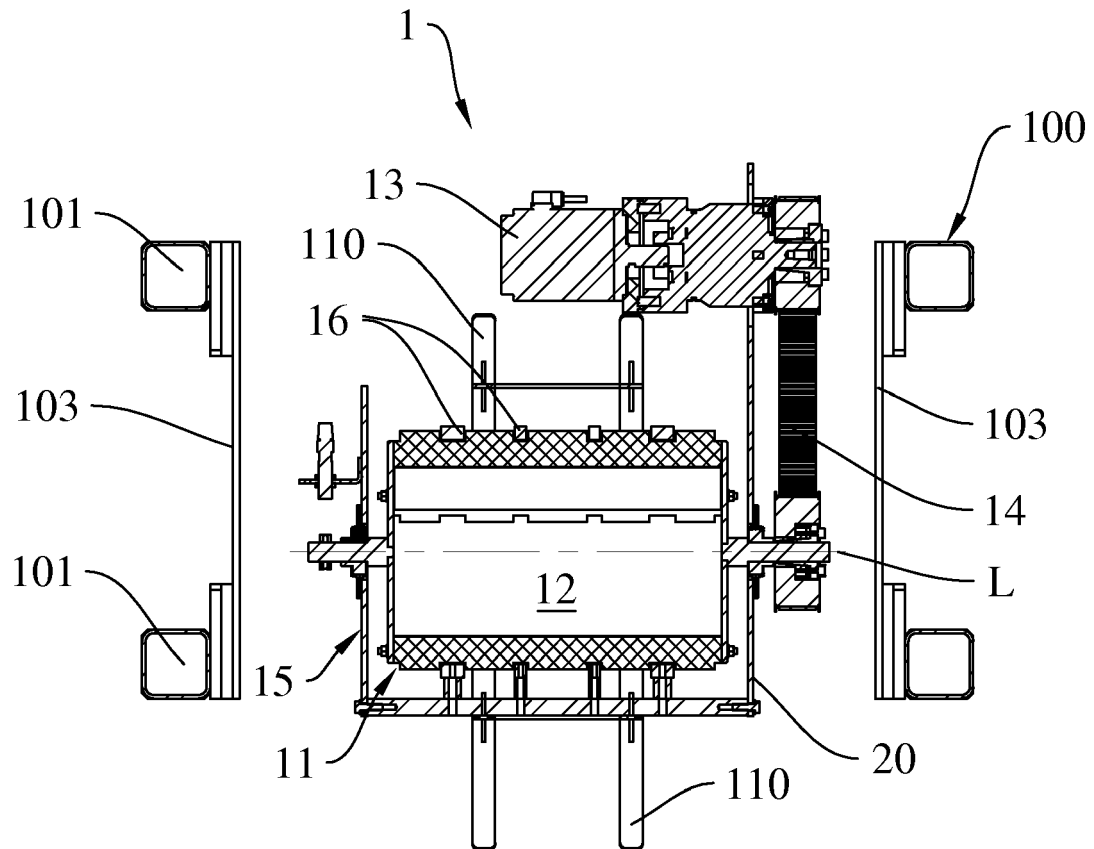


FIG.5

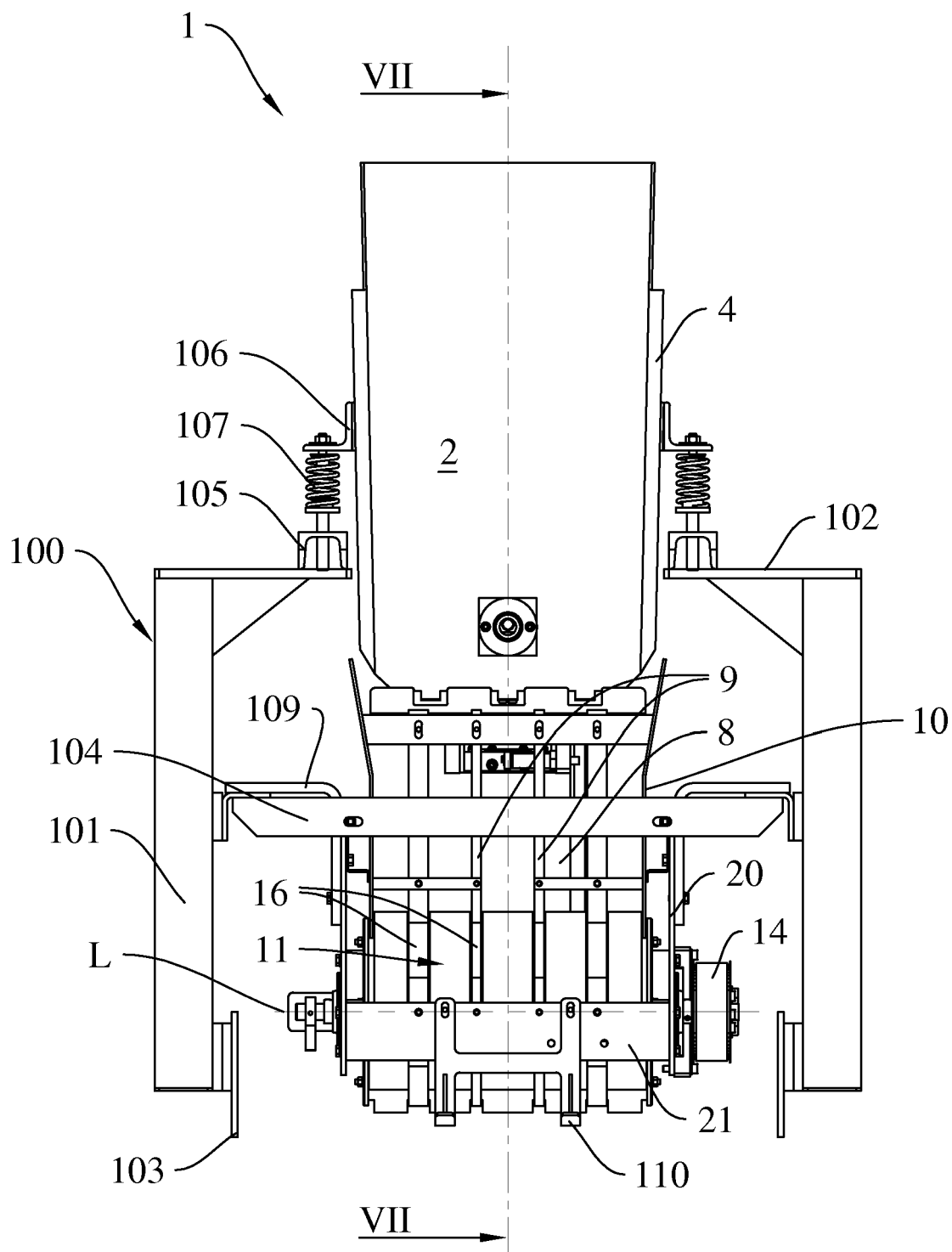


FIG.6

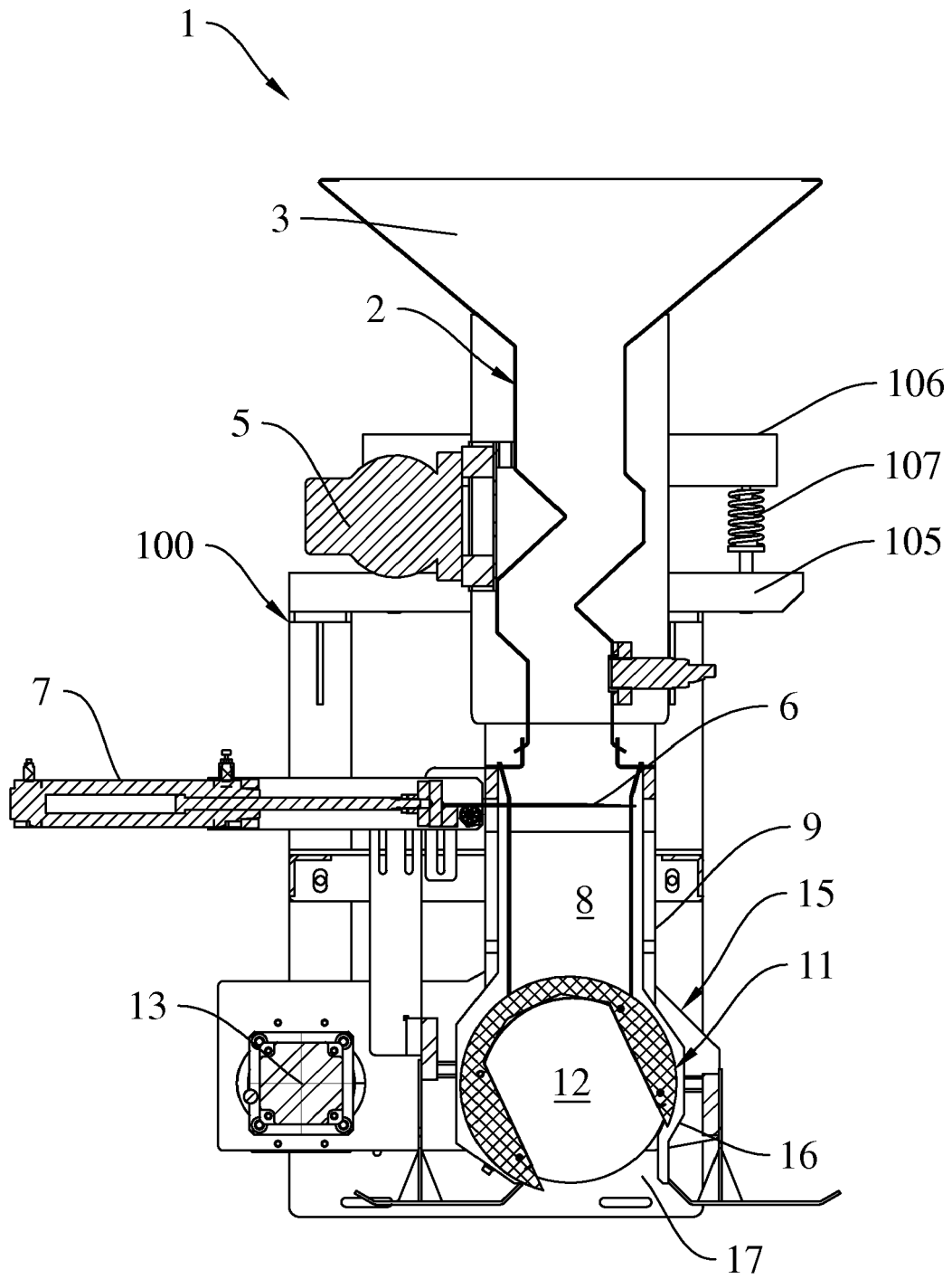


FIG.7

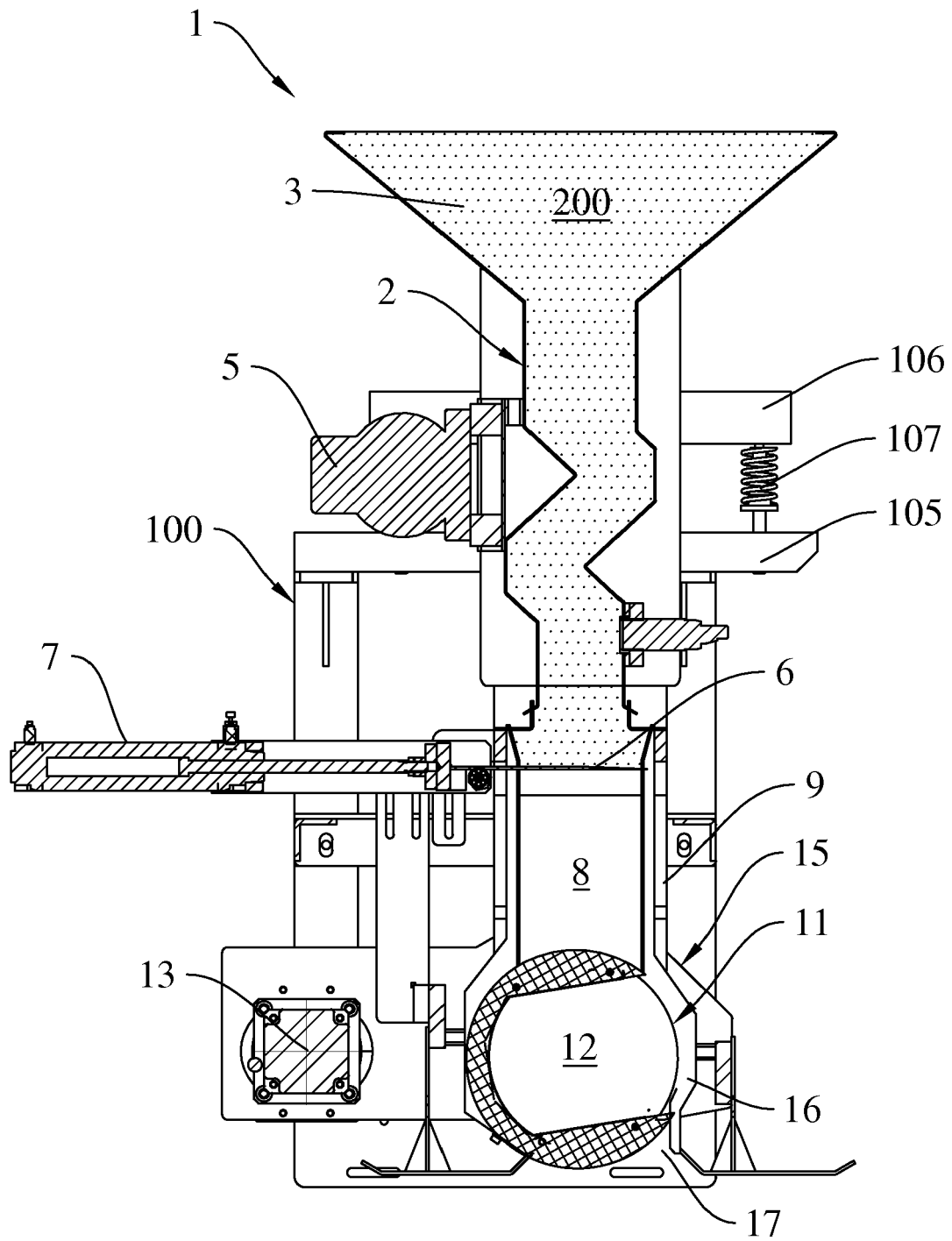


FIG.8

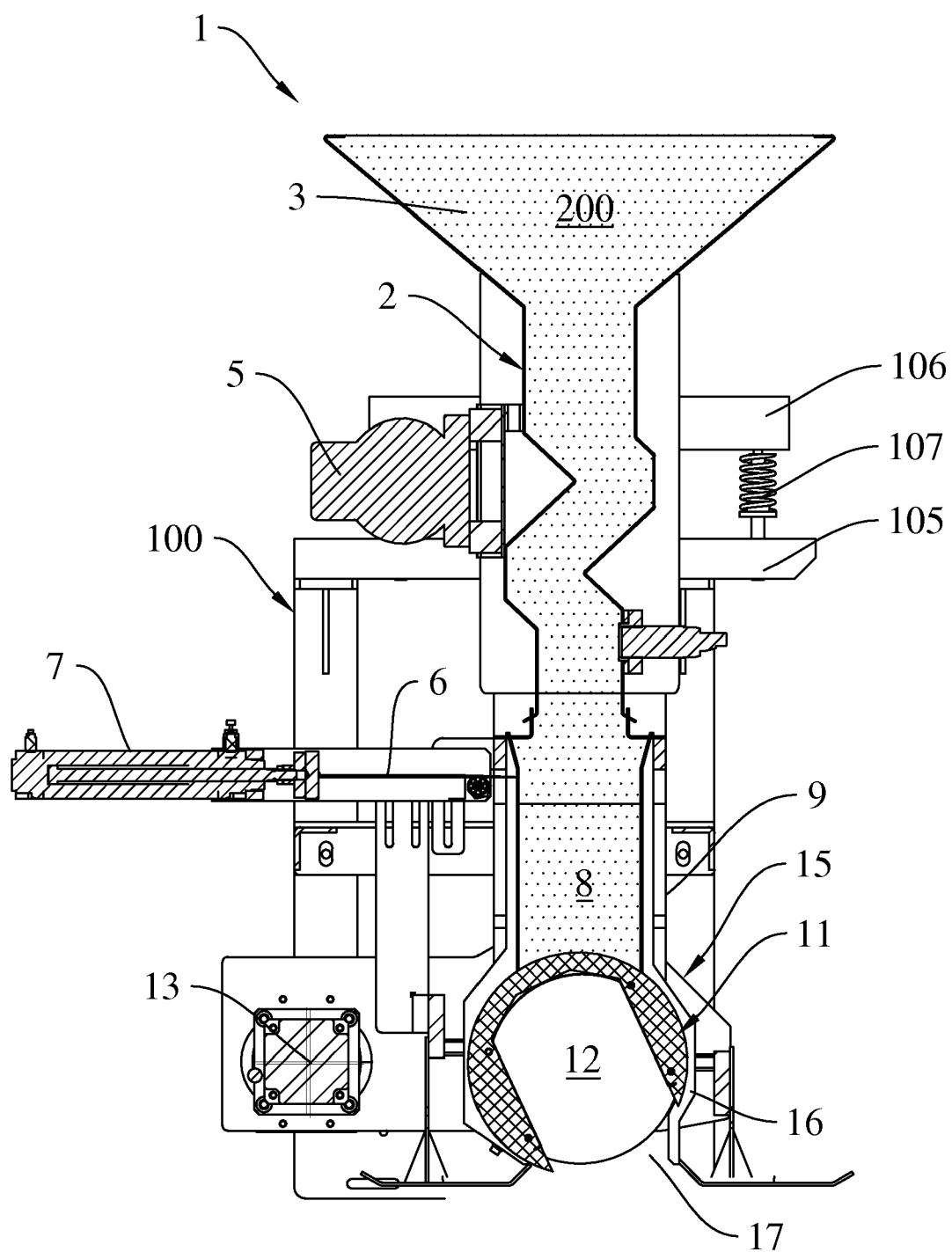


FIG.9

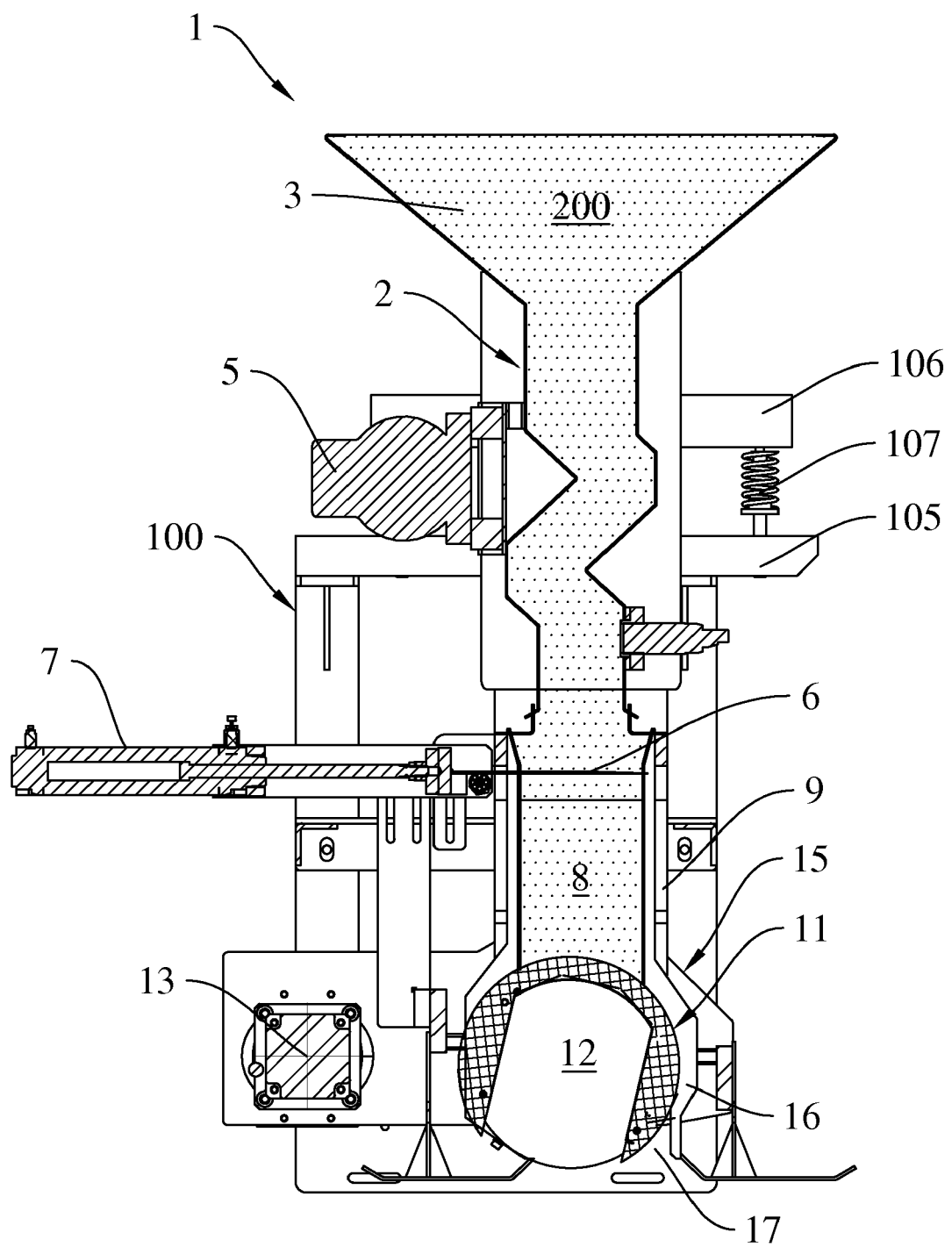


FIG.10

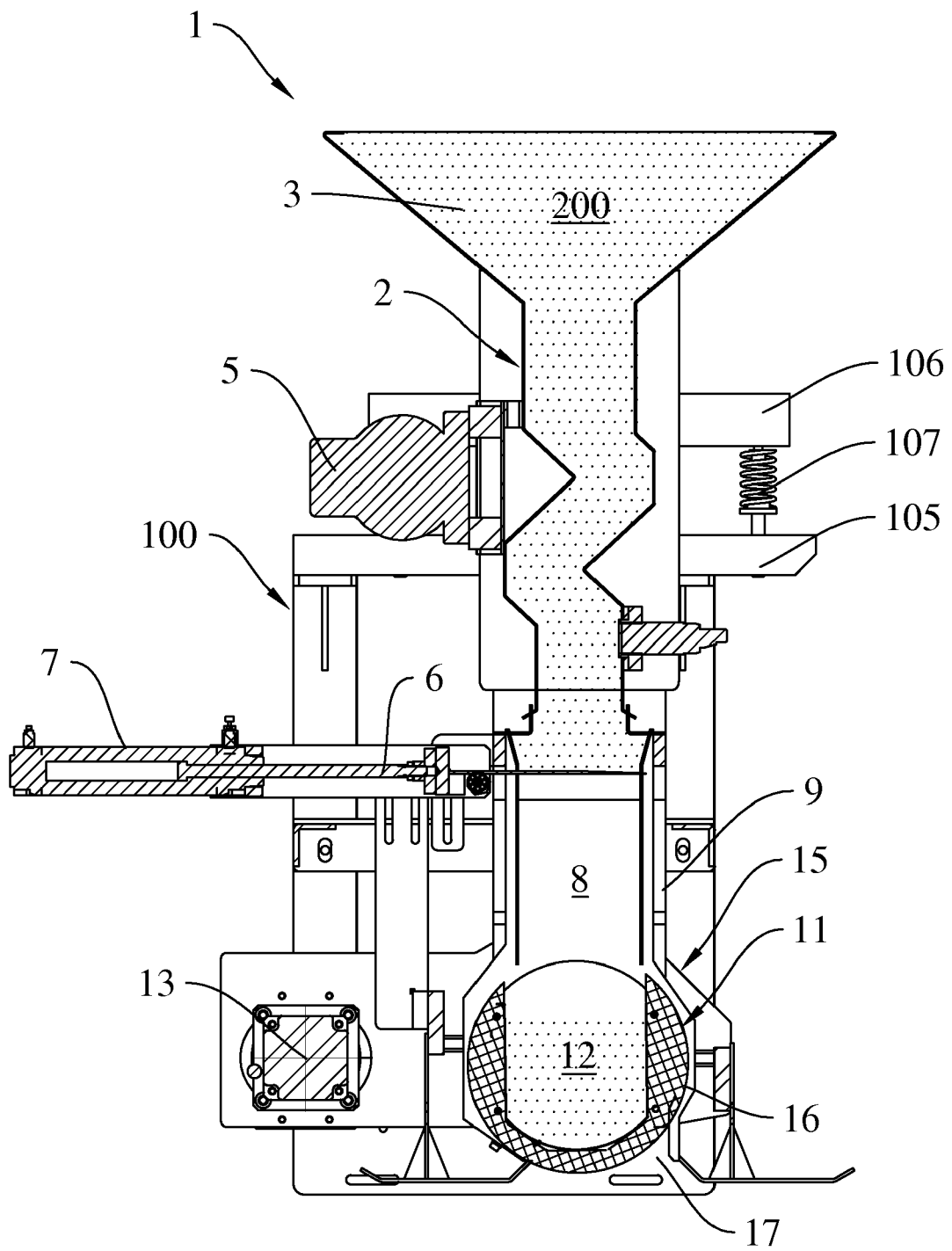


FIG.11

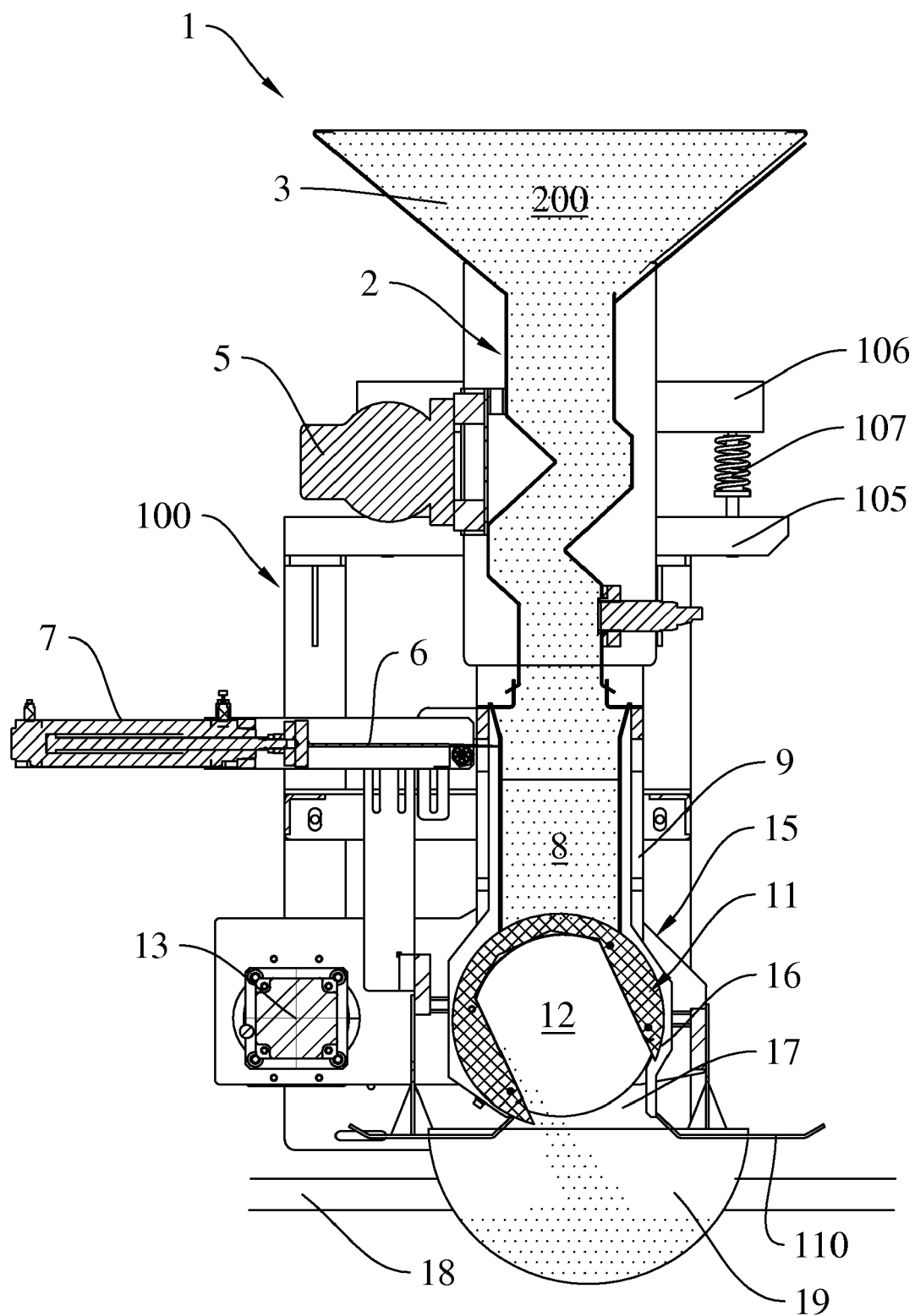


FIG.12

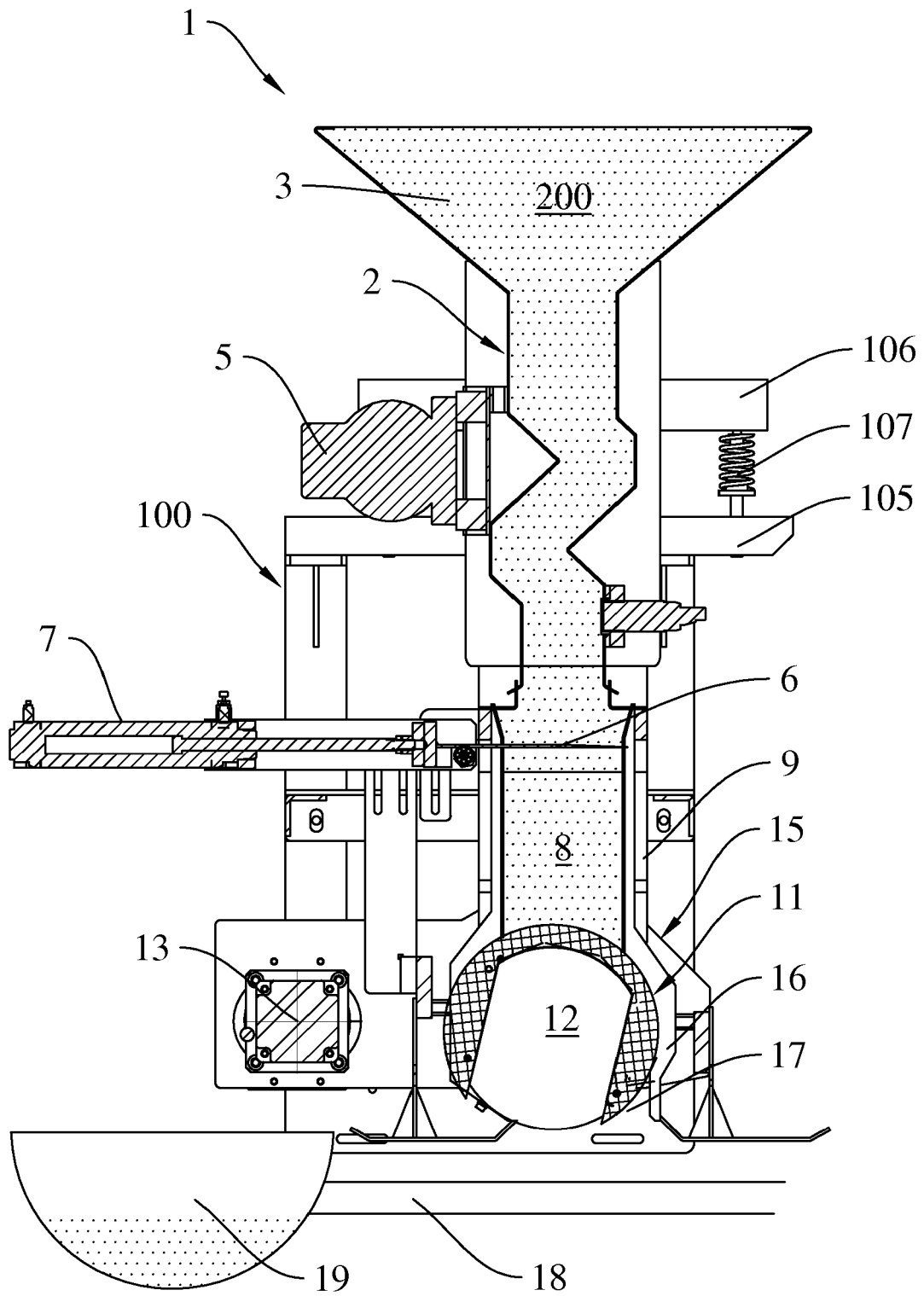


FIG.13



EUROPEAN SEARCH REPORT

Application Number
EP 17 20 3717

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	WO 2015/044796 A1 (VEZZANI GIUSEPPE [CH]) 2 April 2015 (2015-04-02) * page 3, line 6 - page 9, line 20; figures 1-11 *	1,2	INV. B65B19/34 B65B1/06 B65B1/42 B65B39/00
Y	US 2 615 557 A (HAPMAN HENRY W) 28 October 1952 (1952-10-28) * column 4, line 6 - line 9; figures 2,3 * * column 1, line 4 - line 9 * * column 2, line 32 - line 38 *	1,2	B65B1/36 B65G17/16 B65G17/36 B65G67/00 B65B35/30
Y	US 3 404 742 A (FRANCIS BONNERIC) 8 October 1968 (1968-10-08) * column 1, line 30 - line 34; figure 1 *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65B B65G
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 7 February 2018	Examiner Yazici, Baris
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 17 20 3717

5

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

07-02-2018

10

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2015044796 A1	02-04-2015	EP 3142927 A1	22-03-2017
		US 2017174370 A1	22-06-2017
		WO 2015044796 A1	02-04-2015

US 2615557 A	28-10-1952	NONE	

US 3404742 A	08-10-1968	BE 657462 A	16-04-1965
		CH 416142 A	30-06-1966
		DE 1486045 B1	28-01-1971
		FR 1395611 A	16-04-1965
		GB 1096197 A	20-12-1967
		LU 47626 A1	22-02-1965
		NL 6414842 A	28-06-1965
		US 3404742 A	08-10-1968

15

20

25

30

35

40

45

50

55

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- WO 2015044796 A [0007]
- EP 2481674 A [0008]