



(11) **EP 2 219 952 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
27.04.2011 Bulletin 2011/17

(21) Application number: **08831039.6**

(22) Date of filing: **10.09.2008**

(51) Int Cl.:
B65B 1/06 (2006.01) B65B 37/00 (2006.01)

(86) International application number:
PCT/PL2008/000065

(87) International publication number:
WO 2009/035355 (19.03.2009 Gazette 2009/12)

(54) **A DEVICE FOR FILLING SACKS WITH LOOSE MATERIALS, ESPECIALLY WITH SAND**

VORRICHTUNG ZUR BEFÜLLUNG VON SÄCKEN MIT LOSEN MATERIALIEN, INSBESONDERE
MIT SAND

DISPOSITIF POUR REMPLIR DES SACS AVEC DES MATÉRIAUX EN VRAC, EN PARTICULIER
AVEC DU SABLE

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

(30) Priority: **14.09.2007 PL 38335507**

(43) Date of publication of application:
25.08.2010 Bulletin 2010/34

(73) Proprietor: **P.p.h.u. Plexiform Lech Michalczewski
84-207 Koleczkowo (PL)**

(72) Inventor: **MICHALCZEWSKI, Lech
81-873 Sopot (PL)**

(74) Representative: **Pomianek, Grazyna
Kancelaria Patentowo-Prawna
Pomianek Sp.j.
ul. Subisława 23 C lok. 7
80-354 Gdansk (PL)**

(56) References cited:
**EP-A- 1 338 510 DE-C- 900 795
GB-A- 2 401 357 US-A- 2 789 591
US-A- 5 425 403 US-B1- 6 374 874**

EP 2 219 952 B1

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

Description

[0001] The invention concerns a device for filling sacks with loose materials, especially with sand, designed for flood control purposes.

[0002] Devices for filling sacks with sand that have a vertical sand container, ended with a chute, equipped with a mechanism interlocking sand dump, in which a chute is not connected with a sack, which makes loaded sand scatter, are well known.

[0003] DE 900 795 C disclosed a machine for self filling with powder or granular material, where the filling lines together with the packages to be filled circulate and where the packages in the common circulation are being filled by a free feeding stream according to the time/travel-batching principle. The filling machine comprises a vibrator trays for the time/travel-batching, which are placed between the feeder trays and the feeder funnels, and which circulate together with them. Applying the vibrator trays simplifies the design of the machine. This also allows to make use of the well known property of the vibrator trays, which generate a constant and free feeding stream, streaming the material constantly from the supply containers through the filling lines to the packages to be filled, where the quantity of the fed material depends on the adjustable strength and duration of the vibration. This machine is equipped with an adjusting bar for controlling the filling of materials.

[0004] US 5 425 403 disclosed a device for filling bags with a powder-like or granular flowable material, especially sand. A device has a hopper with a bottom portion for receiving the flowable material. A filling socket is connected to the bottom portion of the hopper and has a vertically downwardly extending receiving section for receiving a bag to be filled. A worm conveyor is horizontally mounted within the bottom portion of the hopper and connected to the filling socket for conveying the flowable material from the hopper to the filling socket. An electric motor is drivingly connected to the worm conveyor. A switch positioned in the vicinity of the receiving section is activated upon slipping a bag to be filled over the receiving section to start the electric motor for the worm conveyor and the switch is deactivated upon removal of the bag after filling to stop the electric motor.

[0005] EP 1338510 disclosed a device for filling containers, especially sacks, with bulk material comprising a feed hopper and a filling pipe connected thereto at the bottom with an axially displaceable and rotatable conveying member arranged coaxially in the filling pipe, which closure member is connected fixedly to the lower end of the conveying member.

[0006] The purpose of the invention is to resolve a simple and dismountable as well as easy-to-use and to install in any place device construction for filling sacks with sand in big quantity in short period of time, especially while flood-fighting action.

[0007] In accordance with the invention, the device for filling sacks with loose materials, especially with sand is

equipped with working arms, on each of which a rotating container has been mounted at one end, and an interlocking mechanism that slows down the rotation of the container, whilst the other arm's end is connected with a head provided with a drive and settled in a rotary way on a column founded on lugs.

[0008] The container is equipped with a sack striker.

[0009] The interlocking mechanism that slows down the rotation of the container is a rod that is mounted on a working arm sliding in crossrails, subject to spring action, whose one end interacts with recess made in a resistance assembly, which is fixed to the container, whilst the other end interacts with a pulling away assembly connected with an immovable part of the device.

[0010] Axis of rotation of the container is situated between its rear wall and a plane perpendicular to edges of side walls of the container and running through its centre of gravity.

[0011] The head drive is a transmission that is mounted to the column and integrated with the engine, of which an axis has been drawn that is directly connected with the head.

[0012] To facilitate transportation, working arms are connected separably with connectors mounted to the head.

[0013] The axis of the column is inclined towards the horizontal plane of the lug cross-section at an angle of $\alpha \neq 90^\circ$.

[0014] Additionally, lugs at the free end are provided with a footing. Additionally, a weight is mounted to the rear wall of the container.

[0015] Applying this solution, according to the invention, provides with easy and secure filling sacks with loose materials.

[0016] The invention will now be described by way of example and with reference to the accompanying drawings in which:

Fig. 1 presents the device in the top view;

Fig. 2 presents the device in the side view;

Fig.3 presents the container in the side view;

Fig. 4 presents the working arm in the side view.

[0017] The device has three working arms 1. Each arm has been mounted a rotating container 2 at one end equipped with a sack striker 3 being a stretching whalebone. Axis of rotation 14 of the container 2 is situated between its rear wall 15 and a plane perpendicular to edges of side walls of the container 2 and running through its centre of gravity, what makes it automatic return to the starting position once sand is emptied to sack. Additionally, containers 2 at the rear wall 15 have a weight 18 that is mounted to the rear wall 15 of the container. Containers 2 are equipped with an interlocking mechanism that slows down the rotation of the container, which is a rod 8 mounted on a working arm 1 sliding in crossrails 9. The rod 8 is subject to spring 10 action, whose one end interacts with recess 11 made in a resistance as-

sembly 12 fixed to the container 2, whilst the other end interacts with a pulling away assembly 13 connected with an immovable part of the device. On column 6, founded on four lugs 7, a head 4 is settled in a rotary way, provided with a drive 5, which is a transmission that is mounted to the column 6 integrated with the engine, of which an axis has been drawn that is directly connected with the head 4. Arms 1 are connected separably or unseparably with connectors 16 with a head 4. Lugs 7 are favourably provided with footings 17. Axis of the column 6 is inclined towards the horizontal plane of the lugs 7 cross-section at an angle of $\alpha \neq 90^\circ$, selected so that one of the containers 2 is placed in the lowest position, almost contacts the ground and after a half-turn is placed the top position ca. 1 m.

[0018] The device is mounted and used in the following way.

[0019] It is supplied to the selected place in the trailer or manually carried by 3-4 persons, in proximity of sand prism.

[0020] Subsequently, after standing the column 6 on the ground, working arms 1 are mounted. Rod 8 end is situated in the recess 11 in a resistance assembly 12 locking motion of the container 2. The device is being engaged. From the lowest container 2 position, two loaders equipped with middle-sized sand shovels throw in ca. 25 kg of sand. After 1/3 turn is made, the next person loads a sack into the striker 3, to make it loaded at the horizontal axis of rotation 14 and be adjacent to the bottom cartridge surface and to its top edges. After the next 1/3 turn is made, the rod 8 end overlaps the pulling away assembly 13 and the rod 8 is pulled out of the recess 11 releasing the container's 2 blockage, which makes the container 2 turn under the weight of sand. Sand is automatically unloaded to the sack, which under the weight of sand falls down and is ready to be received. The empty container 2 turns automatically to the starting position. The rod 8 end slides down from the pulling away assembly 13 and the spring 10, while expanding, slides the rod 8 to the recess 11, locking the container's motion. The process is being repeated by subsequent working arms 1 of the device.

[0021] If three working arms are used, two sand loaders are involved, one person to clutching sacks and one person to removing sacks. Filled sacks are forwarded to the destination.

Claims

1. A device for filling sacks with loose materials, especially with sand, **characterised in that** it is equipped with working arms (1), on each of which a rotating container (2) has been mounted at one end, and an interlocking mechanism that slows down the rotation of the container (2) is mounted to each working arm (1), whilst the other arm's (1) end is connected with a head (4) provided with a drive (5) and settled in a

rotary way on a column (6) founded on lugs (7).

2. A device as claimed in Claim 1, **characterised in that** the container (2) is equipped with a sack striker (3).
3. A device as claimed in Claim 1 or 2, **characterised in that** the interlocking mechanism that slows down the rotation of the container (2) is a rod (8) mounted on a working arm (1) sliding in crossrails (9), subject to spring (10) action, whose one end interacts with recess (11) made in a resistance assembly (12) fixed to the container (2) whilst the other end interacts with a pulling away assembly (13) connected with an immovable part of the device.
4. A device as claimed in Claim 1 to 3, **characterised in that** the axis of rotation (14) of the container (2) is situated between its rear wall (15) and a plane perpendicular to edges of side walls of the container (2) and running through its centre of gravity.
5. A device as claimed in Claim 1 to 4, **characterised in that** the drive (5) is a transmission that is mounted to the column (6) and integrated with the engine, of which an axis has been drawn that is directly connected with the head (4).
6. A device as claimed in Claim 1 to 5, **characterised in that** working arms (1) are connected separably with connectors (16) mounted to the head (4).
7. A device as claimed in Claim 1 to 6, **characterised in that** the axis of the column (6) is inclined towards the horizontal plane of the lug (7) cross-section at an angle of $\alpha \neq 90^\circ$.
8. A device as claimed in Claim 1 to 7, **characterised in that** lugs (7) at the free end are provided with a footing (17).
9. A device as claimed in Claim 1 to 8, **characterised in that** a weight (18) is mounted to the rear wall (15) of the container (2).

Patentansprüche

1. Vorrichtung zur Befüllung von Säcken mit losen Materialien, insbesondere mit Sand, **dadurch gekennzeichnet, dass** sie Betriebsarme besitzt (1), von denen jedes an einem Ende einen Behälter (2) drehbar montiert hat und an jedem Betriebsarm (1) ist ein blockierendentriegelnder Drehmechanismus des Behälters (2) montiert wobei das andere Ende des Armes (1) mit einem Kopf (4) verbunden ist, dass mit einem Antrieb (5) ausgerüstet, drehbar auf einer Säule (6) gelagert und auf Halterungen (7) eingebet-

tet ist.

2. Vorrichtung nach dem Anspruch 1, **dadurch gekennzeichnet, dass** der Behälter (2) mit einer Sackraste (3) ausgerüstet ist. 5
3. Vorrichtung nach dem Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der blockierend-entriegelnde Drehmechanismus des Behälters (2) aus einer Stange (8) besteht, die auf dem Betriebsarm (1) verschiebbar in Führungen (9) montiert ist, der Wirkung einer Feder (10) unterliegt, und deren ein Ende mit einer an den Behälter (2) befestigten, in einem Widerstandselement (12) angefertigten Aussparung (11) zusammenwirkt, und das andere Ende mit einem Abspannelement (13), das mit einem festen Teil der Vorrichtung verbunden ist, zusammenwirkt. 10 15
4. Vorrichtung nach dem Anspruch 1 bis 3, **dadurch gekennzeichnet, dass** sich die Drehachse (14) des Behälters (2) zwischen seiner Hinterwand (15), und einer senkrecht zum Rand der Seitenwände dieses Behälters (2) liegenden Ebene befindet, und durch seinen Schwerpunkt verläuft. 20 25
5. Vorrichtung nach dem Anspruch 1 bis 4, **dadurch gekennzeichnet, dass** der Antrieb (5) aus einem an die Säule (6) montierten, mit einem Motor vereinigten Getriebe besteht, aus dem eine unmittelbar mit dem Kopf (4) verbundene Achse abgeleitet ist. 30
6. Vorrichtung nach dem Anspruch 1 bis 5, **dadurch gekennzeichnet, dass** die Betriebsarme (1) lösbar mit an dem Kopf (4) montierten Adaptern (16) verbunden sind. 35
7. Vorrichtung nach dem Anspruch 1 bis 6, **dadurch gekennzeichnet, dass** die Säulenachse (6) in Relation zur horizontalen Ebene des Halterungsquerschnitts (7) unter einem Winkel von $\alpha \neq 90^\circ$ geneigt ist. 40
8. Vorrichtung nach dem Anspruch 1 bis 7, **dadurch gekennzeichnet, dass** die Halterungen (7) am freien Ende einen Fuß (17) besitzen. 45
9. Vorrichtung nach dem Anspruch 1 bis 8, **dadurch gekennzeichnet, dass** an der Hinterwand (15) des Behälters (2) ein Gewicht (18) montiert ist. 50

Revendications

1. Le dispositif pour remplir des sacs avec des matériaux en vrac, en particulier avec du sable, **caractérisé en ce qu'il** est muni de bras de travail (1) dont chacun est équipé d'un bac rotatif (2) monté à une des extrémités et chaque bras de travail (1) est relié 55

à un système de blocage et de ralentissement de la rotation du bac (2), la deuxième extrémité du bras (1) est raccordée à la tête (4) équipée de la commande (5) et montée par une fixation rotative sur la colonne (6) qui repose sur les pattes (7).

2. Le dispositif selon la revendication 1 **caractérisé en ce que** le bac (2) est muni d'un porte-sac (3).
3. Le dispositif selon la revendication 1 et/ou 2 **caractérisé en ce que** le système de blocage et de ralentissement de la rotation du bac (2) est constitué par une barre (8) qui est montée sur le bras de travail (1) et qui se déplace dans les glissières (9), il est actionnée par un ressort (10), une de ses extrémités agit conjointement avec la sélection (11) exécutée dans la pièce de résistance (12) fixée au bac (2) sa deuxième extrémité agit conjointement avec l'élément d'écartement (13) qui est relié à la partie fixe du dispositif.
4. Le dispositif selon les revendications 1 à 3 **caractérisé en ce que** l'axe de rotation (14) du bac (2) est située entre sa paroi postérieure (15) et la surface perpendiculaire aux bords des parois latérales de ce bac (2) et traversant son centre de gravité.
5. Le dispositif selon les revendications 1 à 4 **caractérisé en ce que** la commande (5) est constituée par un engrenage fixé à la colonne (6) et relié au moteur, l'axe étant raccordée directement à la tête (4) sort dudit engrenage.
6. Le dispositif selon les revendications 1 à 5 **caractérisé en ce que** les bras de travail (1) sont assemblés de façon dissociable avec les liens (16) qui sont fixés à la tête (4).
7. Le dispositif selon les revendications 1 à 6 **caractérisé en ce que** l'axe de la colonne (6) est inclinée par rapport au plan horizontal de la section de la patte (7) d'un angle $\alpha \neq 90^\circ$.
8. Le dispositif selon les revendications 1 à 7 **caractérisé en ce que** les extrémités libres des pattes (7) sont munies d'un pied (17).
9. Le dispositif selon les revendications 1 à 8 **caractérisé en ce que** le poids (18) est fixé à la paroi postérieure (15) du bac (2).

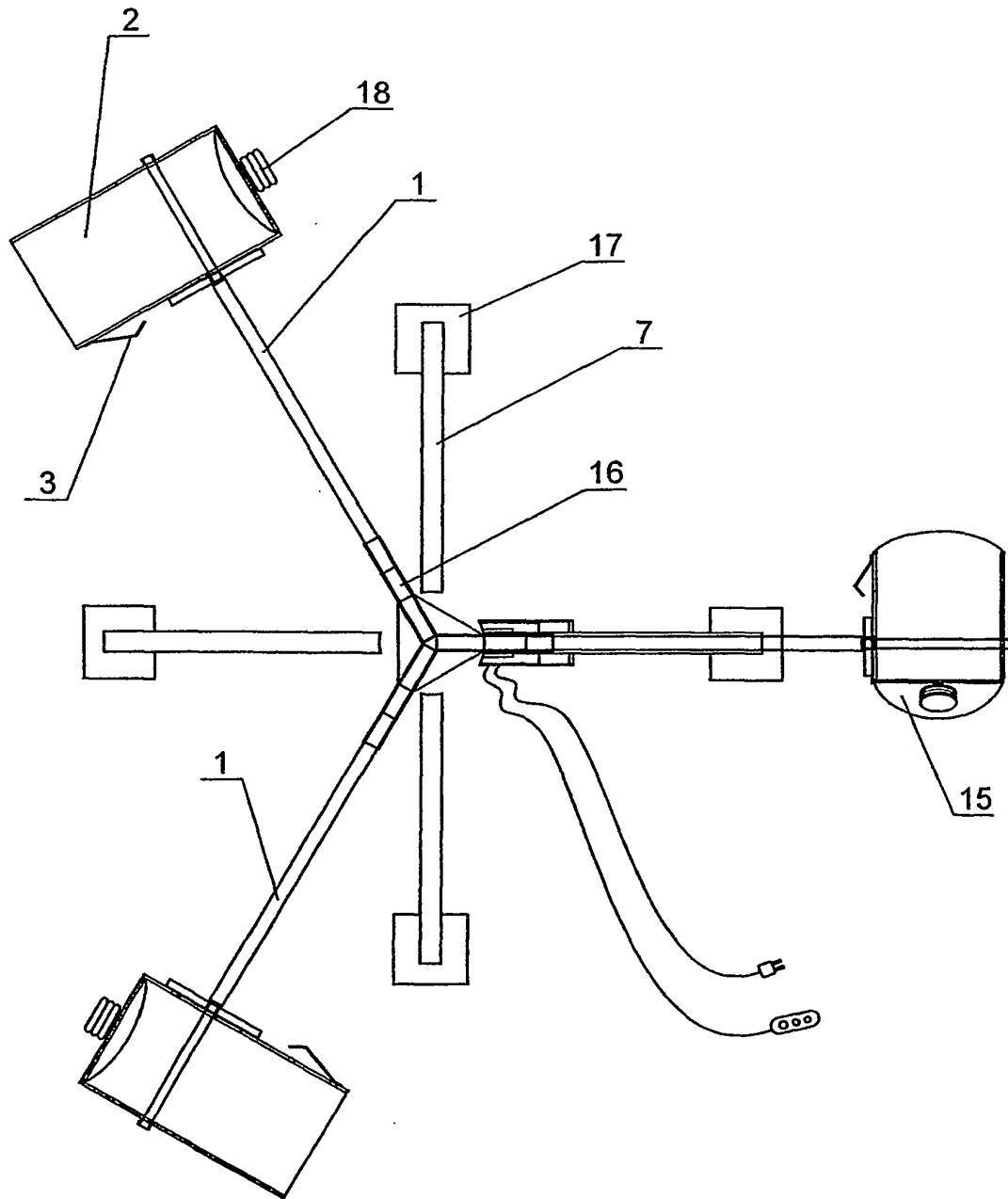


Fig.1

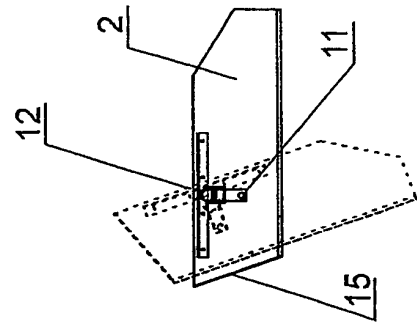


Fig. 3

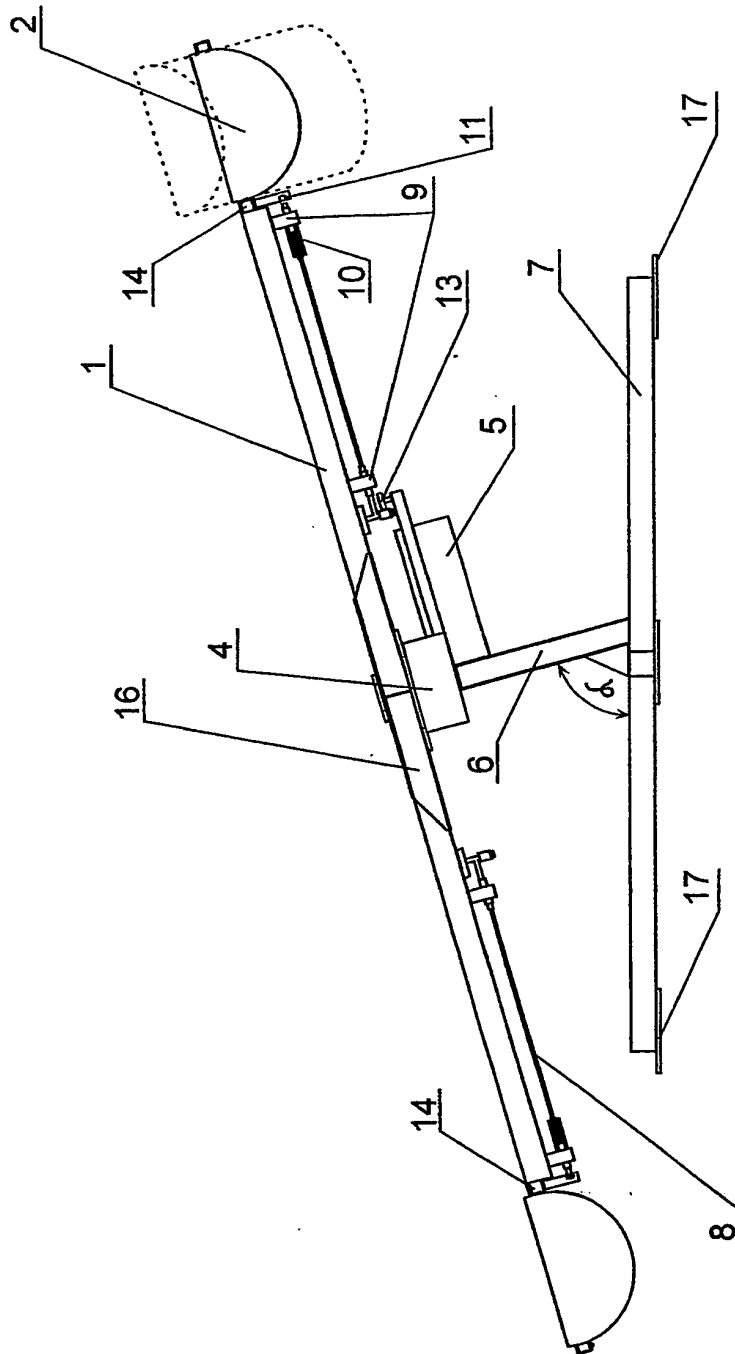


Fig. 2

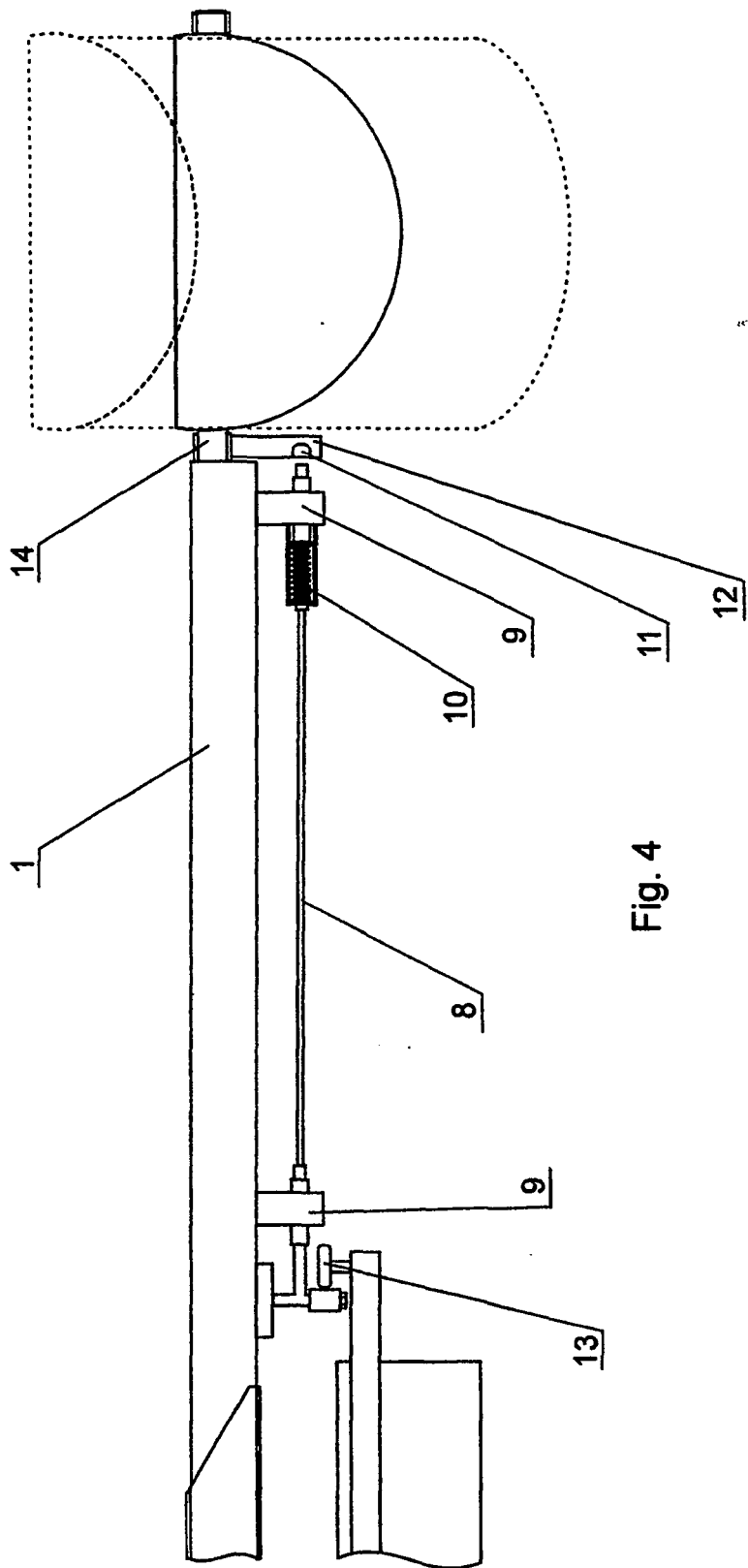


Fig. 4

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

- DE 900795 C [0003]
- US 5425403 A [0004]
- EP 1338510 A [0005]