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(54) **Mobile concrete mixing unit for providing screeds, floor foundations and mixes for the building sector in general**

(57) A mobile concrete mixing unit (10) for providing screeds, floor foundations and mixes for the building sector in general, comprising, mounted on a chassis (11) of a vehicle or of a trailer (12), a first tank (13), for sand or other similar materials, a second tank (14) for cement or other similar binders, the first tank (13) having an opening

(16) on its bottom to allow the material to fall onto underlying means for transfer toward a container (15) for mixing and dispensing, the first tank (13) comprising at least one part (17) which can be tilted with respective movement means in order to facilitate its emptying onto the underlying transfer means.

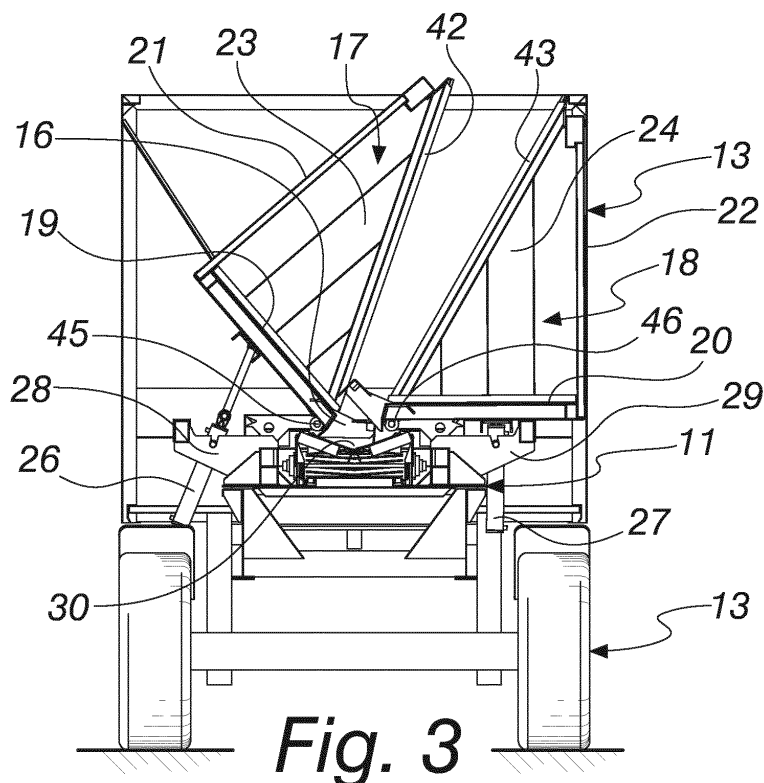


Fig. 3

Description

[0001] The present invention relates to a mobile concrete mixing unit for providing screeds, floor foundations and mixes for the building sector in general.

[0002] Mobile concrete mixing stations for providing screeds, floor foundations and mixes for the building sector in general are currently known and increasingly widespread.

[0003] Such mobile stations generally comprise, mounted on a chassis of a vehicle or of a trailer, a first tank for sand or other similar materials, a second tank for cement or other similar binders, and means for transferring the materials toward a container for mixing and dispensing the mix.

[0004] In particular, the first tank has an opening on the bottom to allow the material to fall onto underlying means for transfer toward the mixing and dispensing container, transfer means which are usually constituted by a conveyor belt.

[0005] Inside the first tank, which is usually the one having the largest capacity, the loose material is loaded from above, by means of a power loader or by making it fall from a chute, or with a conveyor belt, and is then drawn from the bottom by means of the conveyor belt.

[0006] Such tanks are usually provided with a trapezoidal transverse cross-section, i.e., so that the bottom tapers toward the opening onto the underlying conveyor belt, with a slope angle, between a horizontal reference plane and the inclined bottom, of at least 50°.

[0007] Such inclination angle is necessary in order to make all the material loaded into the tank descend from said tank to the conveyor belt.

[0008] The adoption of such tapering bottom entails, for the first tank, the loss of over 50% of the volume that might ideally be loaded at the sides of the tank if it had a flat bottom.

[0009] In order to obviate this limitation in terms of volumes that can be loaded into the first tank, for the transport of a preset volume of material that is greater than the amount that can be carried by a standard tank it is necessary to build a first tank that has an appropriately increased length.

[0010] On the other hand, the length of the first tank must also comply with the limitations set by the traffic code, since said first tank, together with the other equipment cited above, is installed on mobile vehicles, such as for example four-axle vehicles or three-axle semitrailers.

[0011] In order to increase the capacity of said first tank, the alternative solution to an increase in length is the increase in height of the containment walls.

[0012] Such remedy, however, would entail an increase in the height of the center of gravity of the vehicle, with higher risks of tipping, as well as greater difficulty in loading if the material is loaded by means of a power loader.

[0013] The aim of the present invention is to provide a

mobile concrete mixing unit for providing screeds, floor foundations and mixes for the building sector in general that is capable of obviating the cited drawbacks of stations of the known type.

[0014] Within this aim, an object of the invention is to provide a mobile unit that has a higher capacity than the background art for an equal overall space occupation and at the same time allows to use all the material loaded into the first tank.

[0015] Another object of the invention is to provide a mobile unit that is more stable than known mobile stations.

[0016] A further object of the invention is to provide a mobile unit that allows to improve significantly the maneuvering capacity of the vehicle or trailer on which it is installed, particularly in confined spaces as may occur at a building site.

[0017] Another object of the invention is to provide a mobile unit whose functionality and efficiency are not lower than the background art.

[0018] Another object of the invention is to provide a mobile concrete mixing unit for providing screeds, floor foundations and mixes for the building sector in general that can be manufactured with known systems and technologies.

[0019] This aim, as well as these and other objects that will become better apparent hereinafter, are achieved by a mobile concrete mixing unit for providing screeds, floor foundations and mixes for the building sector in general, comprising, mounted on a chassis of a vehicle or of a trailer, a first tank for sand or other similar materials, a second tank for cement or other similar binders, said first tank having an opening on its bottom to allow the material to fall onto underlying means for transfer toward a container for mixing and dispensing, said concrete mixing unit being **characterized in that** said first tank comprises at least one part which can be tilted with respective movement means in order to facilitate its emptying onto the underlying transfer means.

[0020] Further characteristics and advantages of the invention will become better apparent from the description of a preferred but not exclusive embodiment of the mobile concrete mixing unit according to the invention, illustrated by way of nonlimiting example in the accompanying drawings, wherein:

Figure 1 is a first perspective view of a mobile concrete mixing unit according to the invention in a first configuration for use;

Figure 2 is a second perspective view of a mobile concrete mixing unit according to the invention in a second configuration for use;

Figure 3 is a transverse sectional view of the concrete mixing unit according to the invention;

Figure 4 is a view of a detail of Figure 3.

[0021] With reference to the figures, a mobile concrete mixing unit for providing screeds, floor foundations and

mixes for the building sector in general, according to the invention, is generally designated by the reference numeral 10.

[0022] The concrete mixing unit 10 comprises, mounted on a chassis 11 of a vehicle or a trailer 12, a first tank 13 for sand or other similar materials, a second tank 14 for cement or other similar binders, and a mixing and dispensing container 15.

[0023] The first tank 13 has an opening 16 on the bottom, which is clearly visible in Figures 3 and 4, for the fall of the material onto underlying means for transfer toward the mixing and dispensing container 15.

[0024] The particularity of the concrete mixing unit 10 according to the invention resides in that the first tank 13 is constituted by two parts 17 and 18, each of which can be inclined with respective movement means, described in greater detail hereinafter, so as to facilitate its emptying onto the underlying transfer means, also described hereinafter.

[0025] Each part 17 and 18 has a substantially L-shaped transverse cross-section, as clearly shown in Figure 3, with a bottom surface 19 and 20 that is substantially horizontal in the transport configuration and a lateral containment wall 21 and 22 that is substantially perpendicular to the corresponding bottom surface.

[0026] The parts 17 and 18 of the first tank 13 are completed by reinforcement elements 23 and 24 that are arranged at the ends in a longitudinal direction of said parts.

[0027] In the embodiment of the invention described herein by way of nonlimiting example of said invention, the reinforcement elements 23 and 24 are constituted by triangular bulkheads that are shaped specifically so as to not interfere with the opposite corresponding reinforcement element of the other part of the first tank 13 during the movement for tilting the part of the first tank 13 to which they belong.

[0028] The tank 13 is completed by two fixed walls, a rear wall 40 and a front wall 41, which are fixed to the chassis 11.

[0029] Obviously the fixed walls 40 and 41 are arranged at right angles to the lateral containment walls 21 and 22.

[0030] The reinforcement elements 23 and 24 have scraping edges 42 and 43, in Figure 3, for removing material from said fixed walls.

[0031] The movement means for each part of the first tank 13, 17 and 18 are constituted by linear actuators 26 and 27, which are coupled between corresponding brackets 28 and 29 of the chassis 11 and the overlying bottom surfaces 19 and 20.

[0032] Each bottom surface 19, 20 is coupled by corresponding pivots 45, 46 defined at the inner edges 31, 32 of said surfaces, the facing inner edges 31, 32 defining the opening 16.

[0033] The linear actuators 26 and 27 are constituted, for example, by hydraulic cylinders; it should be understood that the linear actuators 26 and 27 may also be of another functionally equivalent type.

[0034] Each linear actuator 26 and 27 is pivoted by its jacket to a pair of close brackets 28 and 29, while the end of the stem is coupled to the corresponding bottom surface 19 or 20.

[0035] The transfer means that lie below the opening 16 on the bottom of the first tank 13 are constituted by a conveyor belt 30.

[0036] The inner edge 31 and 32 of each surface 19 and 20 has longitudinal elements 33 and 34 for absorbing impacts that have the dual function of protecting the conveyor belt 30 during the loading of the first tank 13, in the configuration shown in Figure 4 by the element 34 that is integral with the horizontal surface 20, and of throttling the flow of material that descends from the surface 19 in an inclined configuration, as shown for the element 33 that protrudes from said inclined surface 19.

[0037] The longitudinal elements 33 and 34 are each constituted by a plurality of brackets 35 and 36 that extend in a cantilever manner from the inner edge 31 and 32, each plurality of brackets supporting a protection plate 37 and 38 that is extended in the direction of the length of the opening 16.

[0038] The use of the mobile unit 10 according to the invention is as follows.

[0039] When the material inside the first tank 13 no longer descends by gravity onto the underlying transfer means, i.e., onto the conveyor belt 30, the operator activates the linear actuators of a first part of the first tank 13, for example the part 17 in Figure 3, tilting the bottom surface thereof and facilitating the progressive sliding of the remaining material on the bottom surface, a material which in known concrete mixing stations cannot be stored due to the tapering bottom.

[0040] In practice it has been found that the invention achieves the intended aim and objects.

[0041] In particular, the invention provides a mobile unit that is provided with a first tank that has a higher capacity than the corresponding tanks of known concrete mixing stations, for an equal overall space occupation; this allows, for an equal capacity, to configure vehicles or trailers that are shorter than is possible with tanks of the known type.

[0042] Moreover, the invention provides a mobile unit that is more stable than known mobile stations, since the center of gravity of the material loaded into the first tank is lower because the material rests on a horizontal bottom in the transport configuration.

[0043] Moreover, by means of the invention a mobile unit has been perfected that allows to improve significantly the maneuvering capacity of the vehicle or trailer on which it is installed, particularly in confined spaces as can occur in a building site, thanks to the shorter relative length and possibly reduced width.

[0044] Moreover, the invention provides a mobile unit whose functionality and efficiency are not lower than those of the background art.

[0045] Not least, the invention provides a mobile concrete mixing unit for providing screeds, floor foundations

and mixes for the building sector in general that can be manufactured with known systems and technologies.

[0046] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims; all the details may further be replaced with other technically equivalent elements.

[0047] In practice, the materials used, so long as they are compatible with the specific use, as well as the contingent shapes and dimensions, may be any according to requirements and to the state of the art.

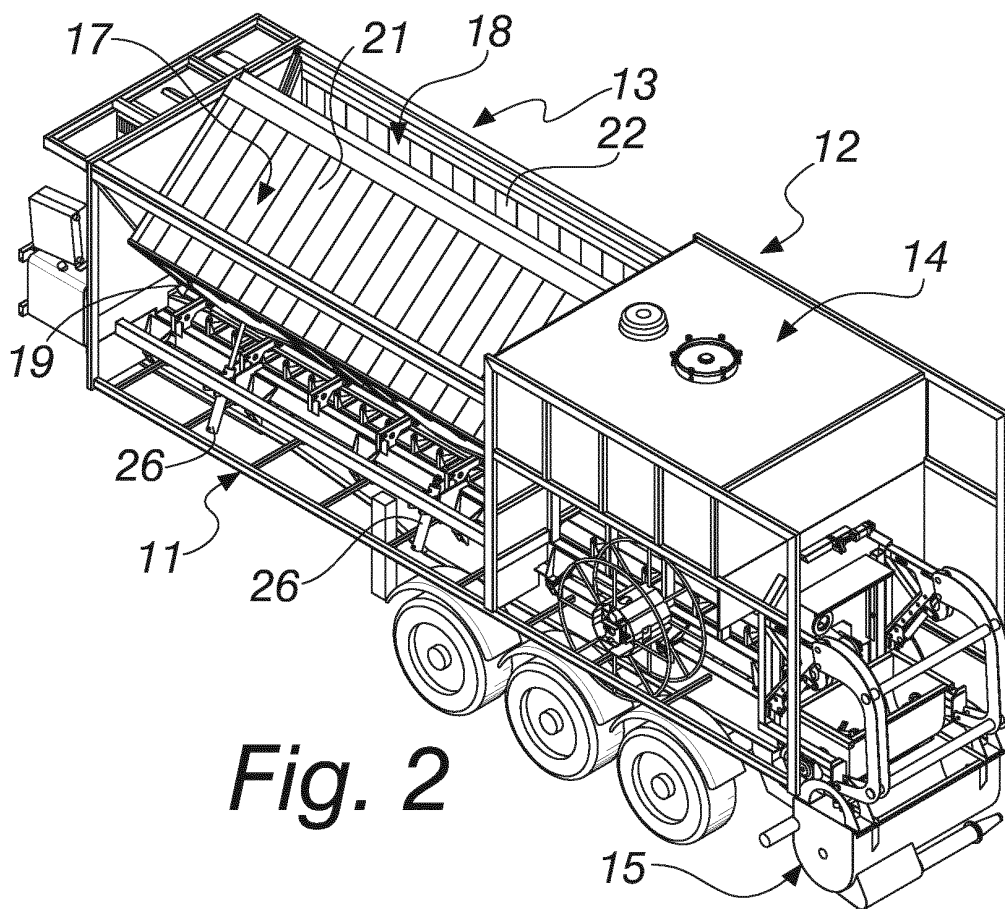
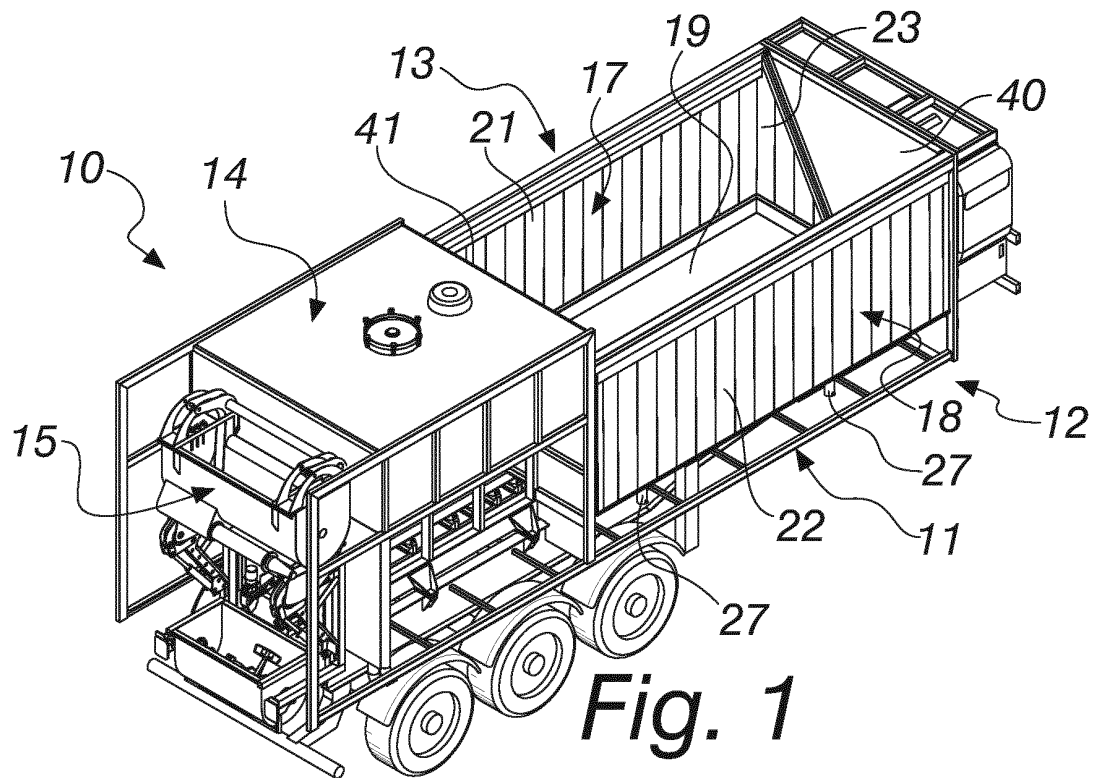
[0048] The disclosures in Italian Patent Application No. PD2012A000072 from which this application claims priority are incorporated herein by reference.

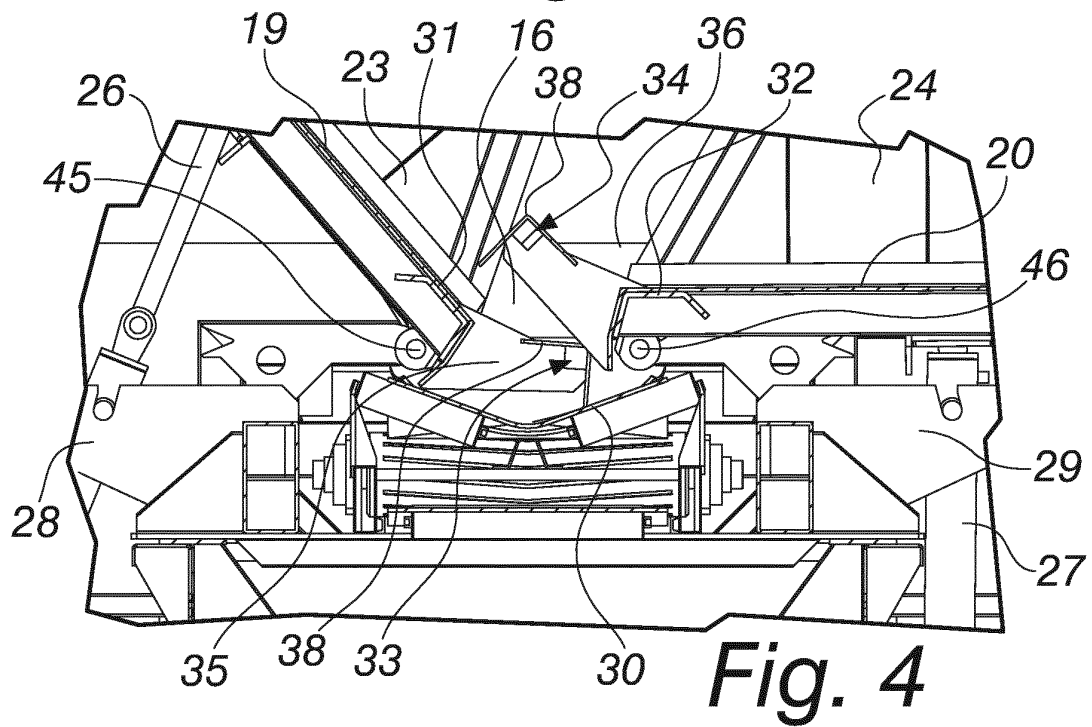
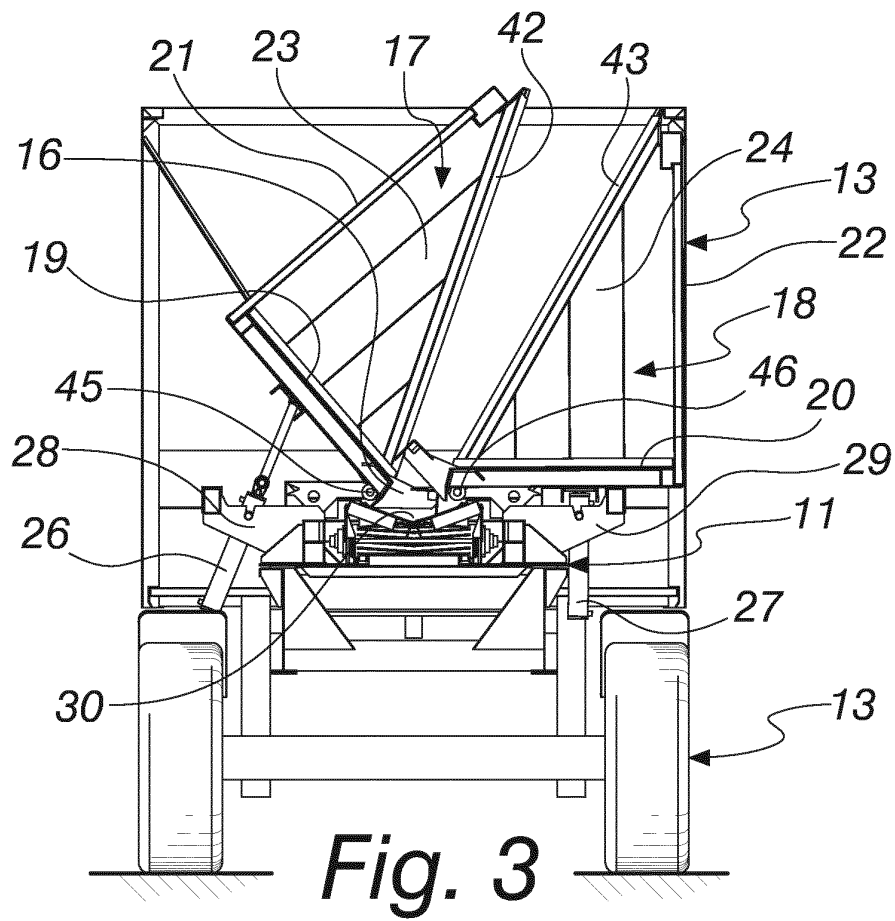
[0049] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A mobile concrete mixing unit (10) for providing screeds, floor foundations and mixes for the building sector in general, comprising, mounted on a chassis (11) of a vehicle or of a trailer (12), a first tank (13), for sand or other similar materials, a second tank (14) for cement or other similar binders, said first tank (13) having an opening (16) on its bottom to allow the material to fall onto underlying means for transfer toward a container (15) for mixing and dispensing, said concrete mixing unit being **characterized in that** said first tank (13) comprises at least one part (17) which can be tilted with respective movement means in order to facilitate its emptying onto the underlying transfer means.
2. The concrete mixing unit according to claim 1, **characterized in that** said first tank (13) comprises two parts (17, 18), each of which can be tilted with respective movement means in order to facilitate its emptying onto the underlying transfer means.
3. The concrete mixing unit according to claim 1, **characterized in that** each part (17, 18) of said first tank (13) has a substantially L-shaped transverse cross-section, with a bottom surface (19, 20) which is substantially horizontal in the transport configuration and a lateral containment wall (21, 22).
4. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said first tank (13) comprises two opposite fixed walls (40, 41), which are fixed to the chassis (11) and are perpendicular to the lateral containment walls (21, 22).

5. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said parts (17, 18) of the first tank (13) comprise reinforcement elements (23, 24), which are arranged at the ends in a longitudinal direction of said parts (17, 18) of said first tank.
6. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said reinforcement elements (23, 34) are constituted by triangular bulkheads which are shaped specifically so as to not interfere with the opposite corresponding reinforcement element of the other part of said first tank (13) during the movement for tilting the tank part on which they are fitted.
7. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said reinforcement elements (23, 24) have scraping edges (42, 43) for removing material from said fixed walls (40, 41).
8. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said movement means for each part (17, 18) of the first tank (13) are constituted by linear actuators (26, 27), which are coupled between corresponding brackets (28, 29) of the chassis (11) and the overlying bottom surfaces (19, 20), each bottom surface (19, 20) being coupled by corresponding pivots (45, 46) which are defined at the inner edges (31, 32) of the surfaces, the facing inner edges (31, 32) defining said opening (16).
9. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** said transfer means that lie below the opening (16) on the bottom of the first tank (13) are constituted by a conveyor belt (30).
10. The concrete mixing unit according to one or more of the preceding claims, **characterized in that** the inner edge (31, 32) of each surface (19, 20) has longitudinal elements (33, 34) for absorbing impacts.







EUROPEAN SEARCH REPORT

Application Number
EP 13 15 7981

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 196 02 468 A1 (PERTL PETER [DE]) 16 October 1997 (1997-10-16) * column 2, line 39 - line 60 * * column 3, line 3 - line 50 * * column 4, line 39 - column 5, line 25; claims 1,4,11 * -----	1-3,8,9	INV. B28C9/04 B60P1/38
X	DE 37 31 623 A1 (HEBERGER BAU GMBH [DE]) 30 March 1989 (1989-03-30) * column 2, line 48 - line 67; figures * * column 3, line 40 - column 4, line 17 * -----	1,2,5, 7-9	
Y	FR 2 929 877 A1 (LIANTS TECH ASSISTANCE [FR]) 16 October 2009 (2009-10-16) * page 3, line 2 - page 4, line 14; figures * -----	1-9	
Y	JP 59 053237 A (KYOKUTO KAIHATSU KOGYO CO) 27 March 1984 (1984-03-27) * abstract * -----	1-4,6,8, 9	
Y	DE 200 12 086 U1 (CLAUSEN HOORMANN AH KEE [DE]) 29 November 2001 (2001-11-29) * the whole document * -----	1,2,4,8, 9	TECHNICAL FIELDS SEARCHED (IPC) B28C B60P B65D
Y	CA 1 238 070 A1 (TENCO MACHINERY LTD) 14 June 1988 (1988-06-14) * page 4, line 17 - page 7, line 7; figures * -----	1,4,5,7	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 28 March 2013	Examiner Orij, Jack
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			

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EPO FORM 1503 03.82 (P04C01)

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

EP 13 15 7981

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The members are as contained in the European Patent Office EDP file on
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28-03-2013

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19602468	A1	16-10-1997	NONE	
DE 3731623	A1	30-03-1989	NONE	
FR 2929877	A1	16-10-2009	NONE	
JP 59053237	A	27-03-1984		
DE 20012086	U1	29-11-2001	DE 20012086 U1 EP 1174366 A1	29-11-2001 23-01-2002
CA 1238070	A1	14-06-1988	NONE	

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT PD20120072 A [0048]