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(54) **Mixing machine**

(57) Mixing machine, comprising a tank (1) apt to contain a predetermined amount of fluid material and means (2) for shaking or mixing the material inside the

tank (1). The latter can rotate about a relevant axis (x-x) on a support structure (3), and is movable about said axis (x-x) independently with respect to said shaking or mixing means (2).

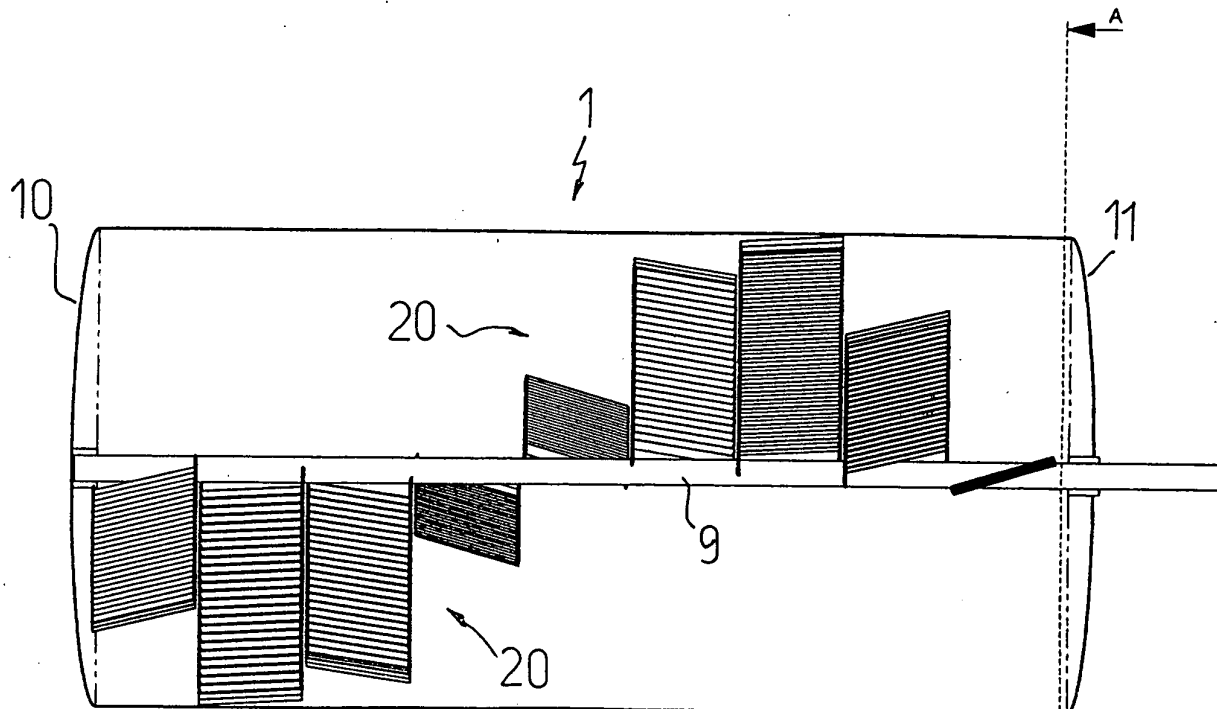


FIG.2

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Description

[0001] The present invention relates to a mixing machine.

[0002] In particular, the present machine is especially suitable for the treatment of fluid materials like paint and mortars as, for example, the lime used for painting large surfaces like walls of road tunnels and similar, i.e. materials which are subject to a relatively quick decantation of the solid phase which separates from the liquid phase in a short time.

[0003] It is known that the aforesaid materials, when contained in a tank, are subject to a substantial separation of the solid phase from the liquid one, with the formation of a particularly dense mass which deposits on the bottom of the tank. The separation of the liquid phase, which floats on the mass below, is particularly sudden, being substantially completed in a few hours. Then, the material becomes unusable if not subject to continuous shaking or mixing, even when it isn't to be used.

[0004] The main aim of the present invention is to overcome the above mentioned drawbacks.

[0005] This result has been achieved according to the invention thanks to the machine having the features described in claim 1. Other features of the present invention are the object of the dependant claims.

[0006] Thanks to the present invention, it is always possible to have the chosen material, in a ready and immediately usable form, in spite of the accumulation of the solid component on the bottom of the tank. Moreover, a machine according to the present invention is relatively simple to be realized, economic and reliable also after a prolonged use.

[0007] These and other advantages and characteristics of the invention will be best understood by anyone skilled in the art from a reading of the following description in conjunction with the attached drawings given as a practical exemplification of the invention, but not to be considered in a limitative sense, wherein:

- Fig. 1 is a schematic side view concerning a possible embodiment of a machine according to the invention;
- Fig. 2 is a schematic longitudinal section view of the tank (1) with the inner shaking means according to a possible embodiment of the present machine;
- Fig. 3 is a section view according to line A-A of Fig. 2;
- Fig. 4 is a schematic front-lateral perspective view of a of a blade of the inner mixing system of the tank (1).

[0008] Reduced to its essential structure and with reference to the figures of the enclosed drawings, a machine according to the present invention comprises a tank (1) apt to contain a prefixed amount of material in mortar form, like, for example, lime for painting particularly extended surfaces like the walls of road tunnels and similar, and means (2) for shaking the material inside the tank (1). The tank (1) can rotate about a respective longitudinal axis (x-x) on a support structure (3) and is connected to

a motor unit (4) which drives its rotation about said axis. In the example shown in Fig. 1, the support structure of the tank (1) is formed by the loading platform of a truck (5). On the loading platform (3) of the truck (5) an additional structure (6) is placed, provided with a series of rolls (7) engaging an annular rolling track (8) provided on the external surface of the tank (1). The connection with the motor unit (4), which is also placed on said loading platform (3), is of conventional type and, therefore, it is not described in greater detail. Said mixing means (2) comprise, with reference to the examples of Figs. 2-4, a set of blades (20) which are disposed along a shaft (9) to form an auger conveyor or feeder screw. Said shaft (9) is disposed along said rotation axis (x-x) of the tank (1) and extends between the two opposite bases of the tank (1). On one side, said shaft (9) is supported, free to rotate, by the inner surface of a base (10) of the tank. On the opposite side, the shaft (9) is supported, free to rotate, by the other base (11) of the tank and is connected to a hydraulic motor (13) by means of a joint (12). Said hydraulic motor is operated by means of a pump (not represented in the drawings for sake of simplicity) which is powered by the unit (4) and is supported by a correspondent structure (14) of the truck platform (3). Moreover, the output of said hydraulic motor is coaxial with the shaft (9).

[0009] Each of said blades (20) is formed, according to the example shown in the drawings, by a series of parallel and spaced stripes (21) which are joined together by a frame having a substantially triangular outline (22), an opening (23) being defined between each pair of stripes (21). This allows a better reflux of the material subject to mixing inside the tank (1). The every blade (20) is mounted onto the shaft (9) by means of two semi-collars (24, 25). A first semi-collar is solid with the lower base of the blade (20), while the second semi-collar is connected to the first one, on the opposite side, by means of bolts passing through holes (26) provided in corresponding side wings of the two semi-collars, thus determining the clamping of the blade (20) to the shaft (9) which, in turn, results between the two semi-collars, i.e. passes through the hole defined by the two semi-collars.

[0010] When the machine has been stopped for a long time, i.e. the solid component of the material contained in the tank (1) is accumulated on the bottom thereof, an operator, by acting on a corresponding control panel (15), commands the rotation of the tank (1) about the axis (x-x) and, subsequently, that is after few turns of the tank (for example, after three or four turns), he commands the rotation of the shaft (9) carrying the blades (20). The first rotation involves the tank (1) only and provokes a first rough mixing of the material contained therein, so that the rotation of the blades carried by the shaft (9) is not prevented by the dense mass previously accumulated inside the tank. Therefore, the rotation of tank (1) combined with the rotation of blades (20) eliminates the drawbacks due to the accumulation of the dense mass inside the tank.

[0011] The tank (1) is provided with an input/output

opening (16) provided with a respective door which, when the material inside the tank is to be discharged, is disposed downwardly oriented to allow the discharge for gravity with the tank being stopped. However the discharge of the material can be realized with the opening (16) disposed on top, and a suction pump can be used. While the tank (1) is stopped to allow the discharge of the material, the rotation of the blades (20) inside the tank is allowed.

[0012] Thanks to the present machine, it is possible to transport the material for a very long distance from a material-loading station to the point in which the material is to be used and, in the meantime, it is possible to keep stopped both the tank (1) and the mixing screw (2), with noticeable economical and environmental benefits due to the reduction of fuel consumption required by the respective motor units and to the reduction of pollutants.

[0013] The shaking/mixing system inside the tank (1), in the example represented by the blades (20) mounted onto the shaft (9), can be realized in any other suitable way.

[0014] According to the present invention, the motion of the tank (1) is independent from the motion of mixing means (2) inside the tank (1).

[0015] In practice, the execution details may vary as regards the shape, the size, the arrangement of the elements, the kind of material used, but they are within the limits of the solution adopted and within the limits of the protection offered by the present patent.

(9) being driven by a corresponding motor unit (13).

6. Mixing machine according to claim 5, **characterized in that** each of said blade (20) is formed by a series of stripes (21), parallel and spaced to each other, joined by a frame having a substantially triangular outline (22), so that an opening (23) is defined between each pair of stripes (21).

Claims

1. Mixing machine, comprising a tank (1) apt to contain a predetermined amount of fluid material and means (2) for shaking or mixing the material inside the tank (1), **characterized in that** said tank (1) can rotate about a relevant axis (x-x) on a support structure (3), said tank (1) being movable about said axis (x-x) independently with respect to said shaking or mixing means (2).
2. Mixing machine according to claim 1, **characterized in that** said tank (1) and said shaking or mixing means (2) are driven by two different motor units (4, 13).
3. Mixing machine according to claim 1, **characterized in that** it is mounted on a truck (5).
4. Mixing machine according to claim 3, **characterized in that** said tank (1) and said motor units (4, 13) are mounted onto a loading platform (3) of the truck (5).
5. Mixing machine according to claim 1, **characterized in that** said shaking means (2) comprise a series of blades (20) mounted on a shaft (9) disposed inside said tank (1), along said rotation axis (x-x), said shaft

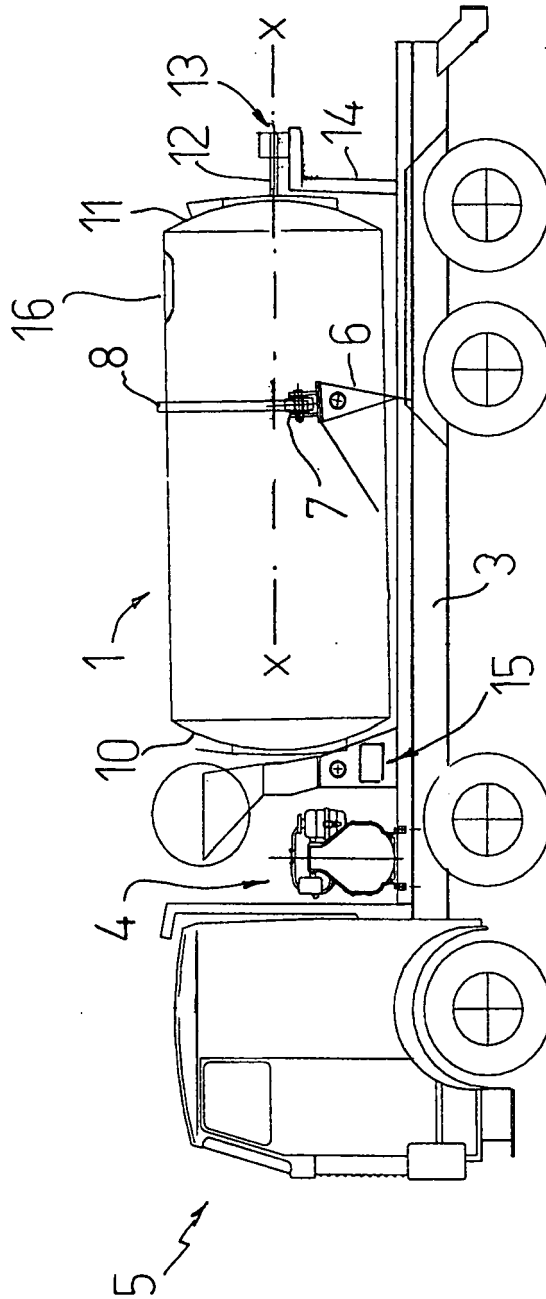


FIG. 1

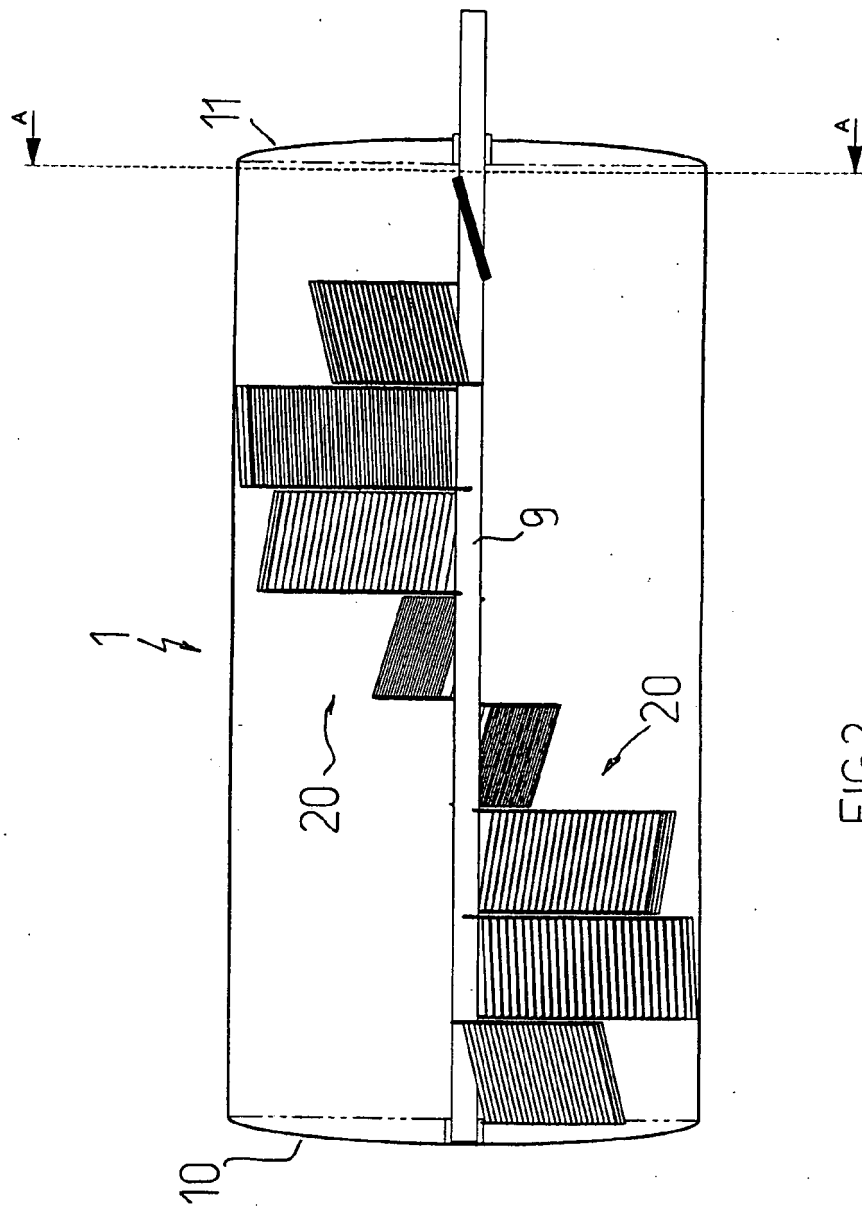


FIG. 2

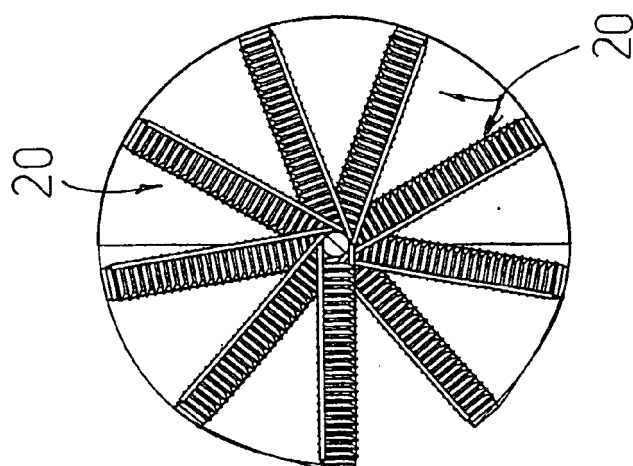


FIG. 3

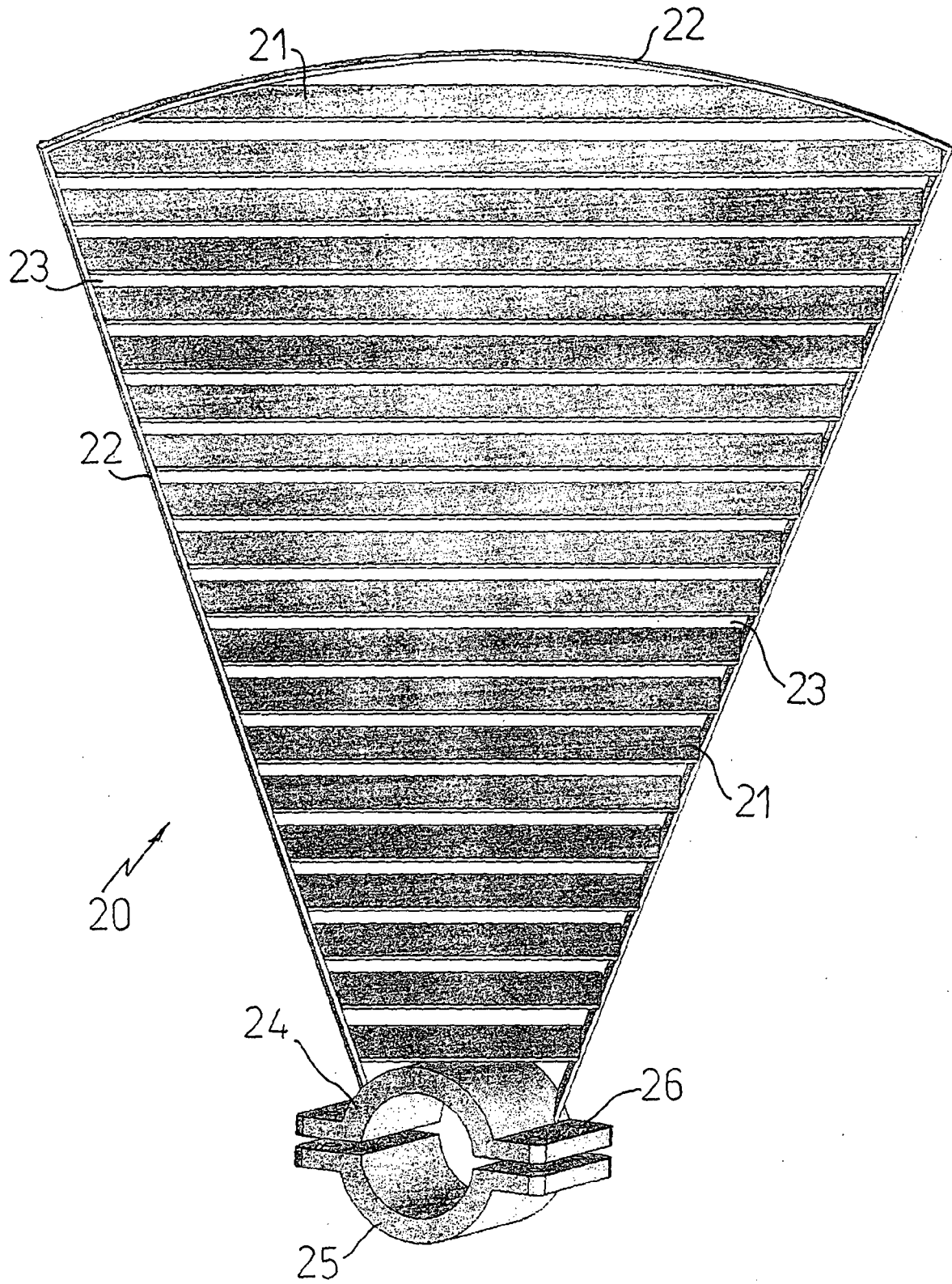


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 3067

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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 July 2007	Examiner Muller, Gérard
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
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EP 07 00 3067

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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