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 (56) Documents cited
 GB 2030882 A GB 1026384 A EP 0214860 A2
 WO 79/00895 A1
 (58) Field of search
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(54) Slurry stirrer

(57) A slurry stirrer e.g. for aerating agricultural wastes comprises an air-lift pump having a lifting column 5 and means 6 in the column for rotating a mixture of slurry and air rising in the column, the base of the column having at least one opening 8 through which slurry can enter the column and means 9 to allow air to be bubbled into the slurry in the column to cause the slurry in the column to be lifted. The rotating means may comprise a stationary helical vane.

A method of treating a slurry comprises passing it through an air-lift pump while simultaneously rotating the resulting mixture of air and slurry, whereby the slurry is agitated and aerated.

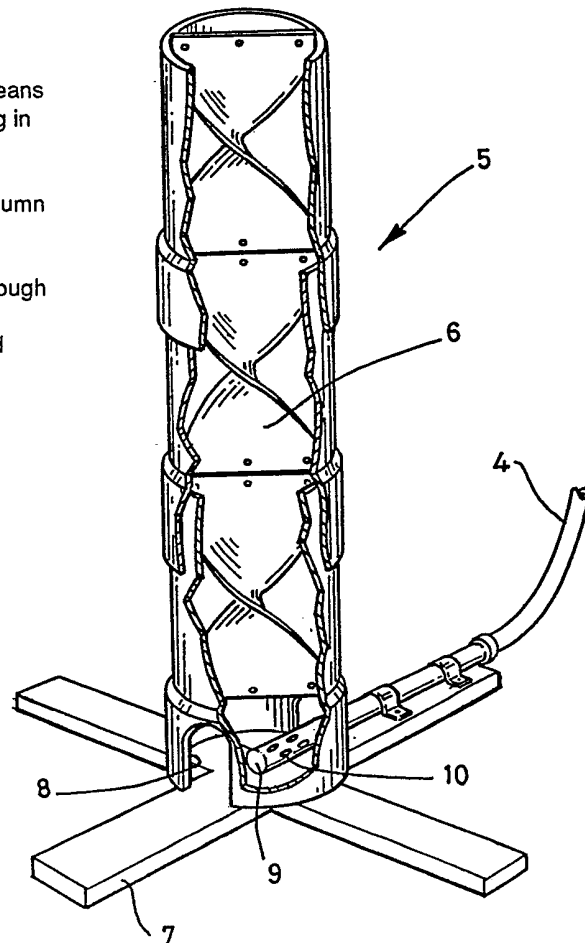


Fig. 2

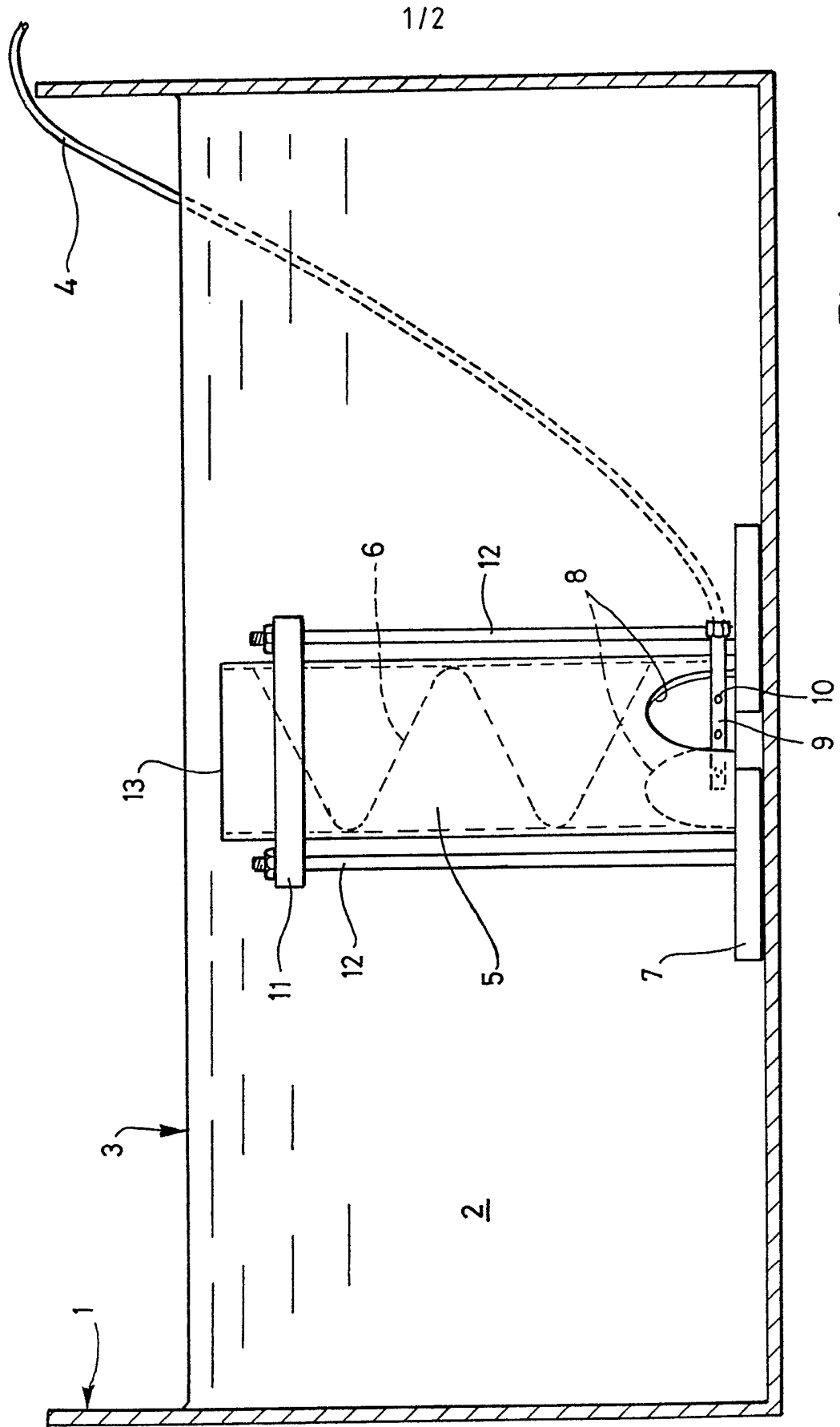


Fig. 1

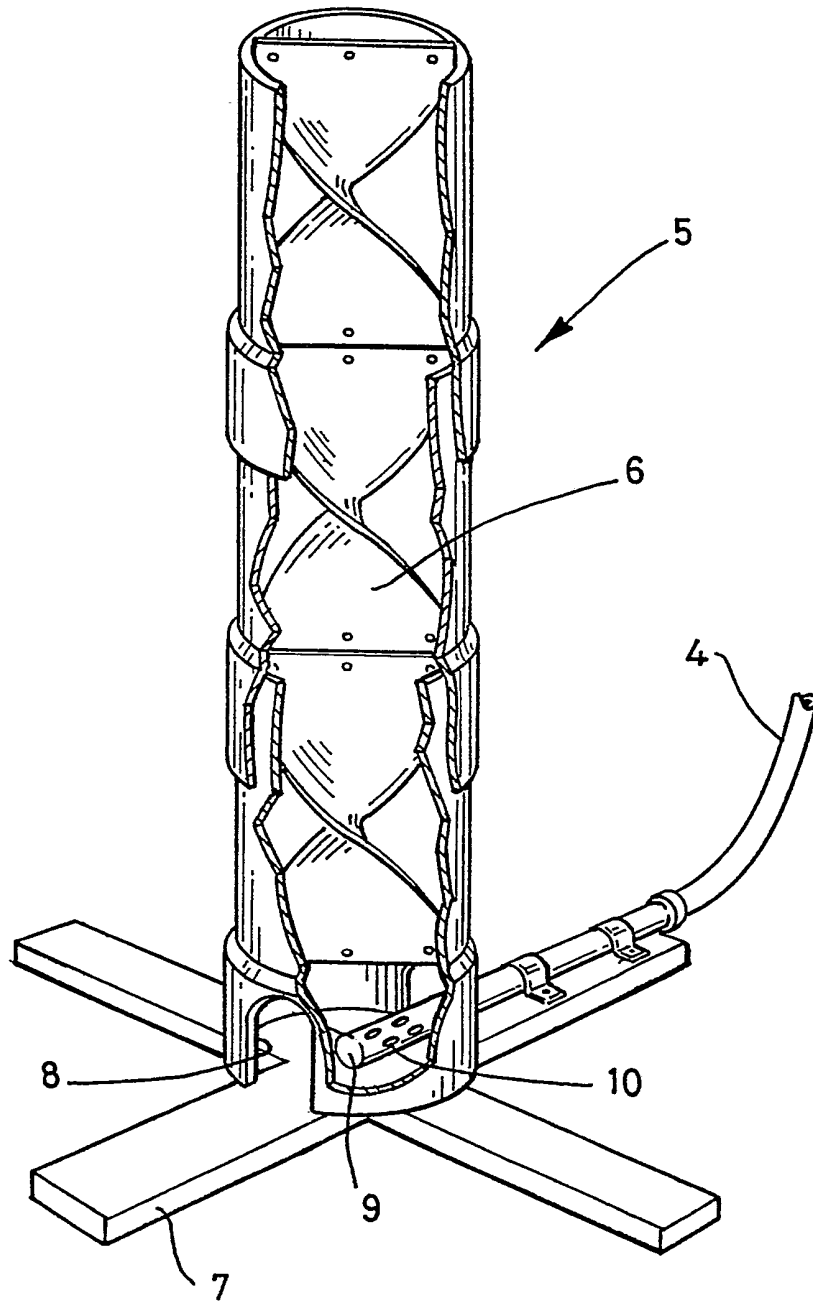


Fig. 2

TITLE: SLURRY STIRRER

DESCRIPTION

The invention relates to slurry stirrers, and more particularly to stirrers intended for use with farm wastes such as pig or cow slurry.

It is known to provide slurry stirrers which consist of a device such as a paddle which is used to agitate the slurry so that the solids are maintained in suspension, but such devices tend to have only a localised effect in the slurry tank. It is an object of the invention to provide a slurry stirrer which has few, if any, moving parts and is thus simple and which is effective in operating over a substantial area of the slurry tank while being compact in size.

According to the invention a slurry stirrer comprises an air-lift pump having a lifting column and means in the column for rotating a mixture of slurry and air rising in the column.

The rotating means may comprise one or more guide vanes in the column and preferably the rotating means is a helical vane which is stationary with respect of the column and which may extend completely across the column. The helical vane may extend throughout substantially the whole height of the column.

The column may be circular in cross-section and may be made of a material such as plastics or metal. The base of the column will be provided with at least one opening through which slurry can enter the column and

means will be provided to allow air to be bubbled into the slurry in the column to cause the slurry in the column to be lifted.

Air may be supplied from any suitable source such as a compressor, which is preferably of the kind arranged to supply air at low pressure and high volume.

From another aspect the invention is a method of treating a slurry comprising passing it through an air lift pump while simultaneously rotating the resulting mixture of air and slurry, whereby the slurry is agitated and aerated.

The invention is diagrammatically illustrated, by way of example, in the accompanying drawing.

In the drawing a slurry stirrer for agricultural use comprises a tubular column 5, which can if desired be made in short sections arranged end to end, and which is open at its top. At its base the column is supported on a stand 7 and is formed with openings 8 in its side wall through which slurry 2 in the tank 1 can enter the column. An air pipe 9 opens into the foot of the column. Air is supplied to the pipe 9 through a base 4 connected to a suitable source such as a vane pump compressor. The interior of the column is filled by a helical guide vane 6 which extends throughout the height of the column and which divides the interior of the column into two.

The sections of the column can be locked together by means of vertical tie-rods 12 extending between the stand

7 and a clamp 11 surrounding, and fixed to, the uppermost section of the column.

In use the stirrer will be stood in the slurry tank 1 with the top 13 of the columns beneath the surface level 3 of the slurry 2 in the tank. Slurry will enter the column through the openings 8. On introducing air, in bubbles, into the foot of the column via holes 10 in the pipe 9, the slurry will be lifted and agitated as it is rotated upwards through the column until it is expelled from the top of the column. This process will draw more slurry into the column for treatment. The solids in the slurry will thus be kept in suspension and the slurry will simultaneously be aerated.

The invention thus provides a simple and effective slurry stirrer for agricultural and other solids-containing liquids, and which is readily adaptable to differing slurry tanks.

CLAIMS

1. A slurry stirrer comprising an air-lift pump having a lifting column and means in the column for rotating a mixture of slurry and air rising in the column, the base of the column having at least one opening through which slurry can enter the column and means to allow air to be bubbled into the slurry in column to cause the slurry in the column to be lifted.
2. A slurry stirrer according to claim 1, wherein the rotating means comprises at least one or more guide vane in the column.
3. A slurry stirrer according to claim 2, wherein the rotating means is a helical vane which is stationary with respect to the column.
4. A slurry stirrer according to claim 3, wherein the helical vane extends completely across the column.
5. A slurry stirrer according to claim 3 or claim 4 wherein the helical vane extends throughout substantially the whole height of the column.
6. A slurry stirrer according to any preceding claim, wherein the column is circular in cross-section.
7. A slurry stirrer according to claim 6 wherein the column is sectional.
8. A slurry stirrer according to claim 6 or claim 7, wherein the column is made of plastics or metal.
9. A slurry stirrer substantially as hereinbefore described with reference to, and as illustrated in, the accompanying drawings.

10. A method of treating a slurry comprising passing it through an air-lift pump while simultaneously rotating the resulting mixture of air and slurry, whereby the slurry is agitated and aerated.

11. A method of treating a slurry, substantially as hereinbefore described.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

- (i) UK CI (Edition K) B1C (CAU) ; F1R
- (ii) Int CI (Edition 5) B01F; CO2F 3/22

Search Examiner

MRS R SHOEFIELD

Databases (see over)

- (i) UK Patent Office
- (ii) ONLINE DATABASES: WPI

Date of Search

13.1.92

Documents considered relevant following a search in respect of claims 1-11

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	GB 2030882 A (PRIMUS)	2-5
X	GB 1026384 A (ACTIVATED SLUDGE) see especially Figures 1, 6 and page 2, lines 71-90	1,6,8,10
Y	EP 0214860 A2 (RASMUSEN) see especially page 6 lines 13-31 and Figures 2, 3	2-5
X	WO 79/00895 A1 (WEBB) see especially page 7 line 9 - page 8 line 19	1,6,8,10



Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

- X: Document indicating lack of novelty or of inventive step.
- Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.
- A: Document indicating technological background and/or state of the art.

- P: Document published on or after the declared priority date but before the filing date of the present application.
- E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- &: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).