

Title (en)

Process and apparatus for continuous drying of material, especially sewage sludge.

Title (de)

Verfahren und Vorrichtung zum kontinuierlichen Trocknen von Gut, insbesondere Klärschlamm

Title (fr)

Procédé et dispositif pour sécher en continu de matériaux, notamment de boues d'épuration

Publication

EP 1473533 B1 20150617 (DE)

Application

EP 04009190 A 20040419

Priority

AT 6602003 A 20030430

Abstract (en)

[origin: EP1473533A2] To supply material onto the sieve belt (2) a distribution screw (4) is arranged over the belt. A level sensor (6) is located near the belt, and a height-adjustable calibration roller (5) is mounted over it, rotating against the belt direction. Its rotary speed exceeds the belt velocity. The distribution screw is connected to a mixer (19) for recycled mixed material, especially the dried end product, but also fresh material, especially dilute sludge. The mixer is a plug- double-shaft-, or paddle mixer. The mixer is connected to a silo extraction screw supplying granules. A drying hood covers the belt and the distribution screw. The entire dryer casing or parts of it are in concrete construction. Supply lines (7) along both sides of the dryers have openings for drying gas and are connected by adjustable tie-bars. Below the belt, a distribution system of e.g. spray pipes condense or saturate the vapors. An independent claim is included for the corresponding method.

IPC 8 full level

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CPC (source: EP US)

F26B 1/00 (2013.01 - EP US); **F26B 17/04** (2013.01 - EP US); **F26B 21/04** (2013.01 - EP US); **F26B 25/002** (2013.01 - EP US); **F26B 25/005** (2013.01 - EP US); **F26B 2200/18** (2013.01 - EP US)

Citation (examination)

- DE 4205619 A1 19930826 - GEA CANZLER GMBH & CO [DE]
- WO 9734679 A1 19970925 - ECO TECHNOLOGY INC [US]
- JP H1059534 A 19980303 - NIPPON CATALYTIC CHEM IND
- GB 1013632 A 19651215 - FRIEDRICH HAAS GMBH MASCHF

Citation (opposition)

Opponent : Sülzle Klein GmbH

- VONPLON A.: "Klärschlamm aktuell 2", 2001, ATV-DVWK, Würzburg, article "BDS-Bandtrocknungssystem mit Rückmischung", pages: 407 - 415, XP055429538
- THOME-KOZMEINSKY K. J.: "Klärschlamm Entsorgung", 1998, pages: 151-152,287,289 - 297, XP055429542
- "Merkblatt ATV-DVWK-M 379 - Klärschlamm Trocknung", ATV- DWA REGELWERK, February 2004 (2004-02-01), pages 1 - 34, XP055429544
- BEVER, JÜRGEN: "Perspektiven der Klärschlamm Entsorgung", 1994, VERLAG, article "Technische Trocknung von Klärschlamm", pages: 39 - 47, XP055429547
- KRÖLL, KARL: "Trocknungstechnik", vol. 3, 1989, article BAUER A. ET AL: "Kap. 8.8 Trocknen von Klärschlamm", pages: 467 - 477, XP055429553
- DR. TOMALLA, MANFRED: "Kalt- und Umlufttrocknung", ATV DVKW, 2001, Würzburg, pages 1 - 15, XP055429160
- DR. TOMALLA, MANFRED: "Klärschlamm Trocknung am Beispiel der Kalt- und Umlufttrocknung", UMWELTPRAXIS, vol. 12, no. 1, December 2001 (2001-12-01), pages 16 - 18, XP008023285
- "W. KUNZ DRYTEC AG Engineering von industriellen Trocknungsanlagen", SWISS COMBI PROSPEKT, 2002, XP055429560
- VORTRAG DR. TOMALLA, MANFRED: "Sludge Drying - How can it be safe and economic?", 8TH EUROPEAN BIOSOLIDS AND ORGANIC RESIDUALS CONVERENCE AND EXHIBITION, 23 November 2003 (2003-11-23), pages 1 - 24, XP055429574
- CLEMENS M. MARB ET AL: "Schadstoffverhalten bei der Klärschlamm Trocknung: Ergebnisse der Untersuchungen an einem Kaltlufttrockner", KORRESPONDENZ ABWASSER, vol. 44, no. 8, 1997, Augsburg, pages 1386 - 1393, XP055429581

Opponent : Sülzle Klein GmbH,

- DE 3616966 A1 19871126 - DORNIER GMBH LINDAUER [DE]
- DE 9307012 U1 19930715
- EP 0573885 A1 19931215 - DORNIER GMBH LINDAUER [DE]
- DE 4235422 C2 19970123 - DORNIER GMBH LINDAUER [DE]
- DE 3531748 A1 19870305 - GFD GES FUER DOSIERTECHNIK MBH [DE]
- US 4245396 A 19810120 - MAFFET VERE
- DE 2255771 A1 19730614 - KRUEGER AS I
- DE 7202548 U 19730614 - SANDCO LTD [CA]
- DE 4320170 A1 19941222 - BAT CIGARETTENFAB GMBH [DE]
- DE 947450 C 19560816 - AUGUST GRONERT
- DE 2351097 A1 19750417 - INDBERATUNGS AG

Cited by

DE102012207884A1; US2017211883A1; CN113531537A; CN112777915A; DE102012207884B4; US10337795B2; WO2012113601A1; WO2015128547A1

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