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Datasheet for the decision of 11 December 2009

Case Number: T 1983/08 - 3.3.05

Application Number: 02784254.1

Publication Number: 1438265

IPC: C02F 3/00

Language of the proceedings: EN

Title of invention:
Fixed-film anaerobic digestion of flushed manure

Applicant:
University of Florida Research Foundation, Incorporated

Headword:
Anaerobic water treatment/UNI FLORIDA

Relevant legal provisions:
EPC Art. 56

Relevant legal provisions (EPC 1973):
-

Keyword:
"Inventive step (no): trivial features; predictable advantages"

Decisions cited:
-

Catchword:
-

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Case Number: T 1983/08 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 11 December 2009

Appellant: University of Florida Research Foundation, Incorporated
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 30 April 2008 refusing European patent application No. 02784254.1 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: G. Raths
Members: J.-M. Schwaller
S. Hoffmann

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division refusing European patent application No. 02 784 254.1 in particular on the ground that the subject-matter of claim 1 of the second auxiliary request did not involve an inventive step in view of the disclosure in

D1: US 4 531 974 alone,

or alternatively in view of what was taught in

D2: US 3 4052 103 alone.

II. With the grounds of appeal dated 10 September 2008, the appellant submitted three sets of claims as a main, first and second auxiliary request, respectively. The claims of these requests were identical to those on which the first instance decision was based, with the independent process claim of each request on file reading as follows:

Main request:

"16. A process for treating flushed livestock waste and/or wastewaters comprising:
a. providing a fixed-film anaerobic system for treating flushed livestock waste according to any of claims 1 to 15, whereas uninterrupted channels having a population of anaerobic microorganisms retained therein;
b. directing the flushed livestock waste into the digester tank via the influent line;

c. passing the flushed livestock waste through the media channels in the absence of oxygen for a sufficient time to allow the anaerobic microorganisms to digest the organic matter and produce biogas;
d. collecting and discharging the biogas; and
e. discharging the treated flushed livestock waste from the digester via the effluent line."

First auxiliary request:

"16. A process for treating flushed livestock waste and/or wastewaters comprising:
a. providing a fixed-film anaerobic system (10) for treating flushed livestock waste according to any of claims 1 to 15, whereas uninterrupted channels having a population of anaerobic microorganisms retained therein;
b. directing the flushed livestock waste into the digester tank via the influent line (30, 31);
c. passing the flushed livestock waste through the media channels (33) in the absence of oxygen for a sufficient time to allow the anaerobic microorganisms to digest the organic matter and produce biogas;
d. collecting and discharging the biogas; and
e. discharging the treated flushed livestock waste from the digester (10) via the effluent line (35, 36).

Second auxiliary request:

"1. A process for treating flushed livestock waste and/or wastewaters comprising:
a. providing a fixed-film anaerobic system (10) for treating flushed livestock waste consisting of

a.' closed digester tank (20) having a floor and a roof, and having an upper and a lower region;

b.' a media (34) supported within the digester tank consisting of substantially vertically-oriented, uninterrupted channels in single or multiple layers to immobilize anaerobic microorganisms;

c.' an influent line (30, 31) to direct the flushed livestock waste into the digester tank;

d.' an effluent line (35, 36) to remove treated flushed livestock waste from the digester tank;

e.' an access hatch to facilitate inspection and maintenance below the media; and

f.' a means for collecting biogas produced as a by-product of anaerobic digestion of the flushed livestock waste and/or wastewaters,

whereas uninterrupted channels having a population of anaerobic microorganisms retained therein;

b. directing the flushed livestock waste into the digester tank (20) via the influent line (30, 31);

c. passing the flushed livestock waste through the media channels (33) in the absence of oxygen for a sufficient time to allow the anaerobic microorganisms to digest the organic matter and produce biogas;

d. collecting and discharging the biogas; wherein the biogas is used for producing energy, and

e. discharging the treated flushed livestock waste from the digester (10) via the effluent line (35, 36)."

III. Oral proceedings took place on 11 December 2009.

IV. The appellant requested to set aside the decision of the examining division and to grant a patent on the basis of one of the sets of claims filed on 10 September 2008 as main, first and second auxiliary request, respectively.

Reasons for the Decision

1. Preliminary remark

As explained hereinafter all the requests on file fall under the ground of lack of inventive step. For the sake of efficiency, the assessment of the inventive step will be started on the basis of claim 1 of the second auxiliary request, as the process according to this claim has the narrowest scope of protection among the process claims on file and it comprises furthermore all the features of the process claims of the other requests at issue.

2. Inventive step - Second auxiliary request

2.1 Claim 1 at issue concerns a fixed-film anaerobic process for treating flushed livestock and/or wastewaters.

2.2 The closest state of the art to this claim is represented - as acknowledged by the appellant - by document D1, which discloses (column 1, line 58 to column 2, line 26) an apparatus for the anaerobic filtration of waste water, which includes a filter - comprising upper and lower superposed layers of filling material separated by an intermediate layer of filling

material - through which the waste water to be treated is passed from bottom to top, with biogas being produced and means for collecting the latter above the filter. The lower layer of filling material comprises a plurality of vertical parallel tubes or corrugated plates which define vertical channels through which passes the water being treated. The tubes or corrugated plates have a large specific surface up to 200 m^2/m^3, thereby permitting the fixing and accumulation of the micro-organisms. The channels are approximately from 50 to 100 mm wide, and the tubes or plates and channels have a height of for example from 1 to 6 meters. The filling material of the upper layer comprises a loosely packed and random arrangement of a plurality of rings having a specific surface larger than that of the tubes or plates of the lower layer. The material of the intermediate layer comprises a plurality of loosely packed hollow cylindrical bodies supporting the upper layer and arranged, shaped and/or dimensioned in such a manner as to not shut off or close the channels defined by the tubes or plates of the lower layer.

2.3 The appellant stated that in the light of the above disclosure, the problem to be solved was to be seen in the provision of an efficient process for treating wastewater and manure which was more versatile in use - since the fluid to be treated could be fed either from the top or the bottom of the reactor - and which provided ease of maintenance and manufacture of the media structure. According to the application, the above process also reduces the emission of methane as a greenhouse gas (paragraph [0020]).

2.4 As a solution to the above problem, the application proposes the process according to claim 1 at issue, which is characterised in that:

(a) the media immobilising the anaerobic microorganisms consists of substantially vertically-oriented, uninterrupted channels in single or multiple layers;

(b) an access hatch to facilitate inspection and maintenance is located below the media; and

(c) biogas is used to produce energy.

2.5 Having regard to Figure 1 (versatile operability), constructional details (ease of maintenance) and Table IV (methane production rate), the board is satisfied that the problem underlying the invention has been successfully solved.

2.6 It remains to be decided whether the proposed solution to the technical problem, namely the process according to claim 1 of the second auxiliary request, is obvious or not in view of the prior art.

2.6.1 Concerning features (b) and (c), the board is of the opinion that no specific document is necessary to establish that these features form part of the common general knowledge of any person skilled in the art, as it is trivial, on the one hand, that a methane-containing gas - such as a biogas - can be used for producing energy and, on the other hand, that an access hatch can be used for inspection and maintenance purposes of a closed vessel.

2.6.2 Bearing this remark in mind, a skilled person concerned with the process of document D1 and faced with the problem of reducing the emission of methane to the atmosphere and of facilitating inspection and maintenance of the closed vessel used in said process, would manifestly consider the above features (b) and (c) as a solution to his problem, since the advantages achieved by these features can be readily contemplated in advance. So, he would arrive without inventive skill at a process from which the subject-matter of claim 1 at issue differs only in that the media immobilising the microorganisms consists of substantially vertically-oriented, uninterrupted channels in single or multiple layers, whereas D1 discloses a media having three superposed layers of filling material, with the upper layer consisting of loosely packed and randomly arranged rings, the intermediate layer of loosely packed hollow cylindrical bodies and the lower layer of vertical parallel tubes or corrugated plates defining vertical channels.

2.6.3 The appellant argued that the skilled person faced with the above problem would not arrive at the subject-matter claimed starting from D1, because the filtering media used in this document would be rapidly clogged if the process was run in a reverse manner with the water flowing downwardly.

The board does not accept this argument because D1 (column 1, lines 21 to 48) explicitly discloses that loose packings have a strong propensity for clogging, while tubes or corrugated plates substantially eliminate the danger of clogging. So, in view of this strong teaching, the skilled person having as objective

a process which is more versatile - in the sense that it might be used in both an upflow and downflow manner - would readily contemplate not using any loose packings, such as those of the upper and intermediate layers, and he would choose the tubes or corrugated plates as the filling material for the anaerobic filter, as the advantages achieved by such a material are explicitly disclosed in D1. In other words, the advantages of using tubes or corrugated plates can be readily predicted in advance.

The appellant argued that D1 would teach away from such a choice. This argument is also not accepted by the board because even if D1 (column 1, lines 42 to 48) discloses that tubes or corrugated plates of plastic material have the drawback of a very slow colonisation of the media by microorganisms, the sole requirement in claim 1 is that anaerobic microorganisms be immobilised on the media, so it does not matter whether the media is colonised slowly or not.

2.6.4 The media used in the process according to claim 1 at issue being furthermore a simplification of the media known from Dl, its manufacture will obviously be easier in comparison with the media of D1. However, this advantage being also trivial and predictable, the choice of this specific media cannot involve an inventive step.

2.6.5 In view of the above considerations, the board concludes that the skilled person charged with the problem identified in item 2.3 above would arrive in an obvious way at the combination of process steps of claim 1 at issue in view of the teaching of document D1

taken in combination with common general knowledge. It follows that claim 1 of the second auxiliary request does not meet the requirements of Article 56 EPC.

3. The main and first auxiliary requests fall for the same reasons, because the subject-matter of the process claims 16 of these requests encompasses all the features of claim 1 of the auxiliary request II and is broader than the latter.

4. In conclusion, since both claims 16 of the main and first auxiliary requests and claim 1 of auxiliary request II do not meet the requirements of the EPC, none of the requests on file is allowable.

Order

For these reasons it is decided that:

The appeal is dismissed

The Registrar: The Chairman

C. Vodz G. Raths