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**Datasheet for the decision
of 25 June 2013**

Case Number: T 1160/11 - 3.2.03

Application Number: 07008523.8

Publication Number: 1816270

IPC: E03D 5/10, G01S 13/50,
G01S 13/88, G01F 1/00,
E03D 13/00, G01S 13/56

Language of the proceedings: EN

Title of invention:
Toilet cleaning device

Applicant:
TOTO LTD.

Headword:
-

Relevant legal provisions:
EPC Art. 123(2), 56

Keyword:
"Added subject-matter (no)"
"Inventive step (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 1160/11 - 3.2.03

D E C I S I O N
of the Technical Board of Appeal 3.2.03
of 25 June 2013

Appellant:
(Applicant)

TOTO LTD.
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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 27 December 2010
refusing European patent application
No. 07008523.8 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: U. Krause
Members: G. Ashley
E. Kossonakou

Summary of Facts and Submissions

- I. European patent application EP-A-07 008 523.8 (EP-A-1 816 270) is a divisional application of European patent application EP-A-02 762 771.0 (EP-A-1 428 947) and relates to an automatic flushing device for toilets. The Examining Division considered that the amended claims of the main and auxiliary requests did not meet the requirements of Article 123(2) EPC, hence decided to refuse the application.

Although it was not a reason for the decision, the Examining Division nevertheless expressed the opinion that the subject-matter of the main and first auxiliary requests lacked inventive step, whereas the subject-matter of claim 1 of the second auxiliary request seemed to be novel and inventive.

- II. The decision of the Examining Division was posted on 27 December 2010. The Appellant (the Applicant) filed notice of appeal on 7 March 2011, paying the appeal fee on the same day. A statement containing the grounds of appeal was filed on 29 April 2011.

- III. In accordance with Article 15(1) of the Rules of Procedure of the Boards of Appeal (RPBA), the Board issued a preliminary opinion of the case. In response the Appellant filed new description pages.

- IV. Requests

The Appellant requests that the above decision be set aside and a patent be granted on the basis of the following documents:

- Claim 1, as filed as the main request with the letter of 17 June 2013;
- Description pages 1 to 45, filed with the letter of 3 June 2013;
- Drawing sheets 1/28 to 28/28, as originally filed.

V. Claim

Compared to claim 1 of the application as filed (EP-A-1 816 270), the sole claim of the main request contains the following deletions and underlined additional text:

"1. A toilet cleaning device for controlling the opening/closing of a valve provided in cleaning water pipe which enables cleaning water to be supplied to a toilet main body, ~~characterized in~~ the toilet cleaning device comprising:

transmission means ~~for~~ (20) configured to transmitting ~~radio~~ oscillatory waves toward a space in the vicinity of a bowl portion interior space or an opening portion of the bowl portion of a toilet stool (10; 60; 90);

reception means ~~for~~ (21) configured to receive ing reflected waves of the ~~radio~~ oscillatory waves transmitted by said transmission means;

a Doppler sensor (11; 61; 91) provided for configured to generate ing and output a differential ~~signal~~ frequency corresponding to the difference between the

frequency of a signal received by said reception means and the frequency of a signal transmitted by said transmission means;

frequency analysis means ~~for~~ (32; 51) configured to analyze ~~ing~~ the frequency of the output of said Doppler sensor;

liquid flow condition calculation means ~~for~~ (33) configured to calculate ~~ing the~~ a liquid flow condition in the bowl portion interior space based on the output of said frequency analysis means; and

control means ~~which perform~~ (34; 44; 53) configured to control ~~of~~ said valve in accordance with the calculation result of said liquid flow condition calculation means

characterized in that

said frequency analysis means ~~are~~ is constituted by a filter which passes and outputs only signals with a frequency in a ~~specific~~ range corresponding to urine flow as the liquid flow, and said liquid flow condition calculation means is configured to determine the presence of the liquid flow by comparing the output of the filter with a predetermined threshold,

wherein said liquid flow condition calculation means comprises time measuring means configured to measure the time period during which it is determined that the liquid flow is present."

VI. Prior Art

D1: EP-A-0 783 058
D2: US-B1-6 250 601
D3: JP-A-2001 231716

D1 was mentioned in the contested decision; D2 and D3 were cited in the search report.

VII. Submissions

(a) Article 123(2) EPC

The feature giving rise to the refusal has been omitted from the claim of the main request, hence the Appellant submits that the reasons given by the Examining Division for the refusal have been overcome.

(b) Inventive Step (Article 56 EPC)

The present claim is based on that of the first auxiliary request before the Examining Division, which was of the opinion that a skilled person applying standard knowledge of Fast Fourier Transform (FFT) analysis would arrive at the subject-matter of the claim without any inventive activity (page 8, point 2 of the contested decision).

The Appellant submitted that the reasons given by the Examining Division are not well-founded, as the present claim limits the frequency analysis means to a filter that passes and outputs only signals in a specific range and not to a FFT.

It was argued that D1 does not disclose any means by which the reflected signal can be used to calculate the quantity of urine and provide a corresponding amount of cleaning water, hence this is the objective problem to be solved.

The solution defined in the claim comprises the steps of firstly, determining a urine flow based on the frequency outputted by a filter (feature 1) exceeding a predetermined threshold (feature 2) and secondly, determining the time period during which a urine flow is detected (feature 3).

Since none of the prior art references leads the skilled person to features 1 to 3, the claimed subject-matter has an inventive step.

Reasons for the Decision

1. The appeal is admissible.
2. Article 123(2) EPC
 - 2.1 The claims of the application as originally filed had been amended such that the claims of all three requests before the Examining Division contained the following feature:

"the liquid flow condition calculating means (33) is configured to calculate the flow rate of the liquid flow based on the differential signal, wherein the liquid flow rate is set as a representative value, and to calculate the liquid flow quantity as the

calculation result by multiplying the representative value with the time period during which it is determined that a liquid flow is present."

This feature was present in dependent claim 3 of the main request, in dependent claim 2 of the first auxiliary request and in the characterising part of claim 1 of the second auxiliary request. The Examining Division held that this feature had not been disclosed in the application as originally filed (see point 4 on page 6 of the decision).

2.2 The sole claim before the Board does not contain the above feature, hence the objection raised by the Examining Division has been overcome.

2.3 The remaining amendments to the claim are supported by the original application for the reasons set out in the grounds of appeal, which are summarised as follows:

- The features making up the characterising part of the claim are derived from the embodiment shown in Figure 15, which is described *inter alia* in paragraphs [0017], [0018], [0092] and [0093] and defined in dependent claims 3 and 4 of the published application.

- The substitution of "radio waves" by "oscillatory waves" is disclosed in paragraphs [0068] and [0069] of the application.

- On reading the application the skilled person would realise that the transmission means, reception means, Doppler sensor etc must be configured to receive a reflecting wave, hence replacement of the terminology

"for" by "configured to" can be derived from the application.

- That the Doppler sensor is configured to generate and output a differential frequency rather than a differential signal can be derived from claim 1 of the application as filed, which defines the frequency analysis means as analysing the frequency output of the Doppler sensor.

It is noted that the above amendments were not objected to by the Examining Division.

2.4 Claim 1 of the main request thus meets the requirements of Article 123(2) EPC.

3. Inventive Step (Article 56 EPC)

3.1 Novelty was not in issue and the opinion of the Examining Division regarding inventive step is set out in section III, starting on page 7 of the decision. The Board is therefore in a position to consider inventive step.

3.2 Starting Point for Assessing Inventive Step

Document D1, which is seen as being the closest prior art, discloses a toilet cleaning device that employs a Doppler sensor and corresponds to the preamble of the claim (see D1, column 2, lines 49 to 56, column 10, lines 13 to 27 and column 11, lines 8 to 17, and also point 1.1 on page 7 of the contested decision).

3.3 Differences

As argued by the Appellant, the subject-matter of claim 1 differs in terms of the following features:

Feature 1:

The frequency analysis means is defined in claim 1 as being a filter (bandpass filter) to output only signals having a frequency in a range corresponding to urine flow.

Feature 2:

The liquid flow condition calculation is configured with a predetermined threshold range (V1 - V2 in Figure 16). This is relevant for determining the beginning and end of urination and for opening the cleaning water supply when urination starts and after urination has been completed (see the published application, paragraphs [0097] and [0098] with Figures 26 and 17).

Feature 3:

A time measuring means is incorporated in the liquid flow condition calculation, which determines the period during which the flow of urine is detected, and thus the quantity of cleaning water.

3.4 Objective Problem to be Solved

D1 states that the sensor can be used to determine the appropriate amount of cleaning water on the basis of the amount of urine (see column 10, lines 19 to 27 and

column 11, lines 4 to 7 and 14 to 17). Exactly how this is to be achieved is not mentioned in D1. Therefore, starting from the disclosure of D1, the objective problem to be solved is how to determine the quantity of cleaning water on the basis of the output of the Doppler sensor.

3.5 Solution

3.5.1 The solution is provided by the features of the characterising part of the claim, which are set out above. The Examining Division was of the opinion that the steps of using high- and/or low pass filters, predetermining a threshold range and measuring the time, would be part of the knowledge of the skilled person analysing the signals by means of a Fast Fourier Transform (FFT). However, the toilet cleaning device of claim 1 does not use FFT, but instead uses a bandpass filter (see paragraph [0092] of the application), and there is no indication in the available prior art that such an approach should be adopted for this purpose.

3.5.2 In particular, documents D2 and D3 were cited in the European search report as being relevant to dependent claims 2 to 6, which now form the basis of present claim 1.

3.5.3 D2 discloses use of a Doppler sensor where the signal is bandpass filtered to detect the movement of a user (column 5, lines 16 to 29; column 6, lines 54 to 61; column 11, lines 42 to 65). However, the volume of water required for flushing is determined on the basis of the amount of urine deposited in the urinal, ie by

monitoring the change in water level in the urinal
(column 16, lines 38 to 49).

3.5.4 D3 also discloses the use of a Doppler sensor, but
there is no indication of measuring urine flow using a
bandpass filter.

3.6 A skilled person starting from D1 would not, without
further instruction, adopt the steps of the
characterising part of the claim as a means for solving
the objective problem. The subject-matter of claim 1
thus has an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Examining Division with the order to grant a patent on the basis of:

Claim 1, as filed as the main request with the letter of 17 June 2013;

Description pages 1 to 45, filed with the letter of 3 June 2013;

Drawing sheets 1/28 to 28/28, as originally filed.

The Registrar:

The Chairman:

C. Spira

U. Krause