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**Datasheet for the decision
of 25 May 2011**

Case Number: T 1681/10 - 3.2.04

Application Number: 02700957.0

Publication Number: 1365675

IPC: A47L 9/00

Language of the proceedings: EN

Title of invention:

Wheel support arrangement for an autonomous cleaning apparatus

Applicant:

AKTIEBOLAGET ELECTROLUX

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 56

Relevant legal provisions (EPC 1973):

-

Keyword:

"Inventive step (yes) (main request)"

Decisions cited:

-

Catchword:

-



Case Number: T 1681/10 - 3.2.04

D E C I S I O N
of the Technical Board of Appeal 3.2.04
of 25 May 2011

Appellant: AKTIEBOLAGET ELECTROLUX
SE-105 45 Stockholm (SE)

Representative: -

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 15 January 2010
refusing European patent application
No. 02700957.0 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: A. de Vries
Members: C. Scheibling
C. Heath

Summary of Facts and Submissions

I. The Appellant lodged an appeal, received 4 March 2010, against the decision of the Examining Division posted 15 January 2010, refusing the European patent application No. 02 700 957.0 and simultaneously paid the required fee. The grounds of appeal were received 12 May 2010.

In its decision the Examining Division held that the application did not meet the requirements of Articles 52(1) and 56 EPC for lack of inventive step having regard to the following documents:

D1: US-A-5 815 880

D2: DE-38 39 433 C1

II. The Appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the following documents of a *main request*:

Description: Pages 1 to 7 as published

Claims: No.: 1 to 11 as filed with letter of
18 May 2011

Drawings: Figures 1 to 6 as published

Alternatively, he requests grant on the basis of claims of first and second auxiliary requests filed with the grounds of appeal.

III. The wording of claim 1 of the main request is as follows:

"An autonomous cleaning apparatus comprising: a housing (10) enclosing a dust container (V) and an electrically driven vacuum source (V); the housing having a nozzle (M) through which air and dust particles flow into the dust container; a wheel arrangement supporting the housing, the wheel arrangement having at least two individually driven drive wheels (12), wherein each drive wheel (12) is rotatably fastened to a corresponding drive wheel support, the drive wheel support (16) with the corresponding drive wheel can rise and sink in a substantially vertical motion with respect to the housing, and further the drive wheel support (16) is arranged such that the corresponding drive wheel is directed towards a floor surface by a force creating means; characterized in that the drive wheel support (16) includes an electric motor (17) connected to a transmission (18) for driving the drive wheel (12); and the drive wheel support also includes means (21) for cooperating with a guide (22) in order to achieve a linear, substantially vertical motion of the drive wheel support (16)."

Reasons for the Decision

1. The appeal is admissible.
2. *Background*

The application concerns an autonomous cleaning apparatus with dust container and vacuum source within

a housing with a nozzle supported on a wheel arrangement, effectively a vacuum cleaning robot. It focuses on the suspension and drive of its individually driven wheels, shown in detail in figure 3. Each of these is attached to its own support which moves substantially vertically and is urged towards the floor by appropriate means (spring 26). The support further includes an electromotor 17, a transmission 18 and means 20 cooperating with a guide to achieve linear, substantially vertical movement.

These features realize a self-adjusting wheel supporting arrangement that allows travel over obstacles, page 2, top.

3. *Inventive Step*

3.1 Novelty has not been disputed, nor does the Board have reason to believe that, on the basis of the evidence on hand, the claimed subject-matter might lack novelty.

3.2 It is common ground that D1 represents the closest prior art. This document, see figures 1 and 2 and column 3, lines 4 to 14, discloses a similar vacuum cleaning robot with independently motor-driven wheels 1A and 1B. Each wheel has a suspension mechanism for maintaining floor contact in the event of bumps, dips, steps etc. This suspension mechanism implies - as will immediately be clear to the skilled person - a support that rotatably mounts the wheel and which moves up and down with respect to the housing, which is suspended or hung on the suspension, under the action of some means urging the wheel downward into contact. The skilled person from his knowledge of suspension mechanisms and

their purpose to maintain floor contact thus reads these features from this passage in D1, and they are thus directly and unambiguously derivable therefrom.

- 3.3 D1 provides little or no detail of the exact driving configuration or of the suspension mechanism. A transmission or gearbox need not necessarily be present in D1, where the wheel could be direct-driven. That it might be common or obvious to use a transmission, as argued in the decision under appeal, pertains to the question of inventive step, and not to what the skilled person can derive directly and unambiguously from D1.

Nor does D1 detail the exact manner in which the motor, much less a transmission, is mounted. These components could conceivably be mounted other than on the wheel support, e.g. on the housing itself or on a support therein. This feature is thus also not directly and unambiguously derivable from D1.

Finally, though a suspension mechanism may imply certain generic features, that of a *guide cooperating means* to achieve *linear, vertical* movement is undoubtedly not one of them.

The apparatus of claim 1 therefore differs from that of D1 in that the motor and a transmission from motor to wheel are *mounted on the movable wheel support* and in that the support includes means for *cooperating with a guide so as to achieve linear, substantially vertical motion of the drive wheel support*.

- 3.4 The differing features above integrate the suspension and drive of the wheel into single unit,

cf. description page 4, lines 4 to 6. Reading that passage in conjunction with page 2, lines 5 to 6, the objective technical problem can be formulated accordingly, as how to realize in a simple and efficient way the suspension and drive in a vacuum cleaning robot as in D1. As noted the suspension mechanism in D1 already solves the problem of climbing over obstacles in its path but provides no detail as to how the mechanism is realized.

3.5 None of the cited prior art discloses the claimed solution. D2 cited in the appealed decision does integrate the wheel drive, its transmission and the suspension in a single unit, but there the suspension is a *swing* suspension, see figures 4 and 7 and Abstract ("Schwinge"). The wheel thus moves in an *arc* about an axis at A in arm 27 of the wheel support 26, which for the range of movement foreseen is substantially vertical. This differs from a linear, vertical motion required by the feature of the means cooperating with a guide in claim 1. Therefore, leaving aside the question of whether or not the skilled person would consider D2, which pertains to driverless transport vehicles, too far removed from that of vacuum cleaner robots, even if he did draw upon D2 he would not arrive at the subject-matter of claim 1. That would require a further step of redesigning the swing suspension of D2 to replace it with one with a guide allowing only of linear, vertical motion. None of the further prior art cited in the search report or the application itself show this particular feature. Nor is there any evidence to suggest that replacing a swing suspension by means cooperating with a guide to achieve linear, vertical movement might belong to the common general knowledge

of the skilled person, an engineer designing vacuum cleaner robots. The Board can but conclude that the subject-matter of claim 1 involves an inventive step, Article 56 EPC.

4. The Board concludes that the subject-matter of claim 1 meets the requirements of Article 52(1) in conjunction with Articles 54 and 56. As all further requirements of the EPC appear to be met, the application is ready for grant.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to grant a patent on the basis of the following documents:

Description: Pages 1 to 7 as published

Claims: No.: 1 to 11 as filed with letter of
18 May 2011

Drawings: Figures 1 to 6 as published

The Registrar

The Chairman

G. Magouliotis

A. de Vries