(19) Europäisches Patentamt
European Patent Office
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(11) EP 1 808 113 A3

# (12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
**19.08.2009 Bulletin 2009/34**

(43) Date of publication A2:
**18.07.2007 Bulletin 2007/29**

(21) Application number: **06008559.4**

(22) Date of filing: **25.04.2006**

(51) Int Cl.:
***A47L 9/02*** *(2006.01)* ***A47L 9/00*** *(2006.01)*

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**
Designated Extension States:
**AL BA HR MK YU**

(30) Priority: **13.01.2006 KR 20060004025**

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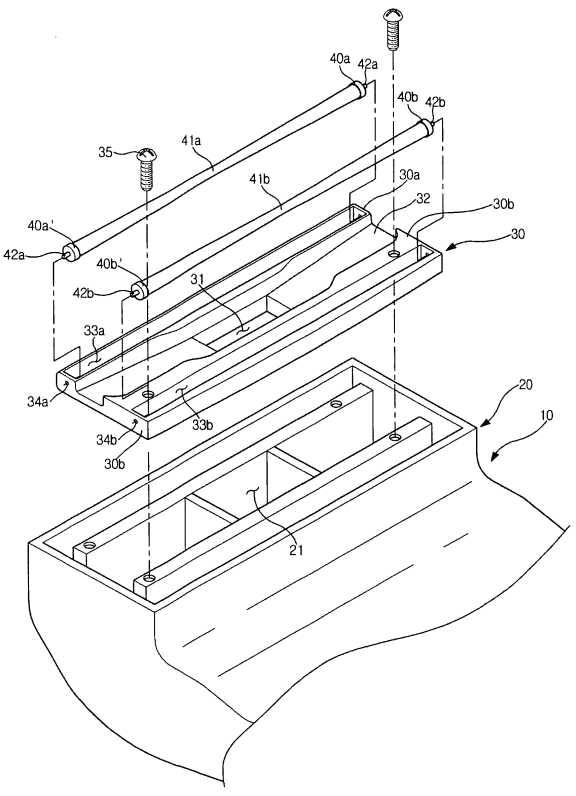
## (54) Vacuum cleaner

(57) A vacuum cleaner comprises a suction unit (10) optimally structured to reduce noise, and can maneuver the suction unit with a small maneuvering force. The vacuum cleaner comprises a body (11) to generate suction force, and the suction unit (10) connected with the body (11) to suck dust. The suction unit (10) comprises a case (20) defining an outer appearance, a base plate (30) constituting a bottom surface of the suction unit (10) and being formed with a suction port (31) through which the dust is sucked into the suction unit (10), a plurality of wheels (40a,40b) attached to at least one of front opposite sides and rear opposite sides of the suction unit (10) to allow the suction unit (10) to roll on a floor, and a connecting rod (41b) connecting the wheels (40a,40b) with each other and having a reversed arch-shaped outer periphery gradually decreased in diameter towards a center of the connecting rod (41b).

FIG.2

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# EUROPEAN SEARCH REPORT

Application Number
EP 06 00 8559

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (IPC) |
|---|---|---|---|
| X<br>Y | US 1 654 186 A (NULSEN MARVIN E)<br>27 December 1927 (1927-12-27)<br>* page 1, line 90 - page 2, line 113; figures 1-5 * | 1<br>2,3,9 | INV.<br>A47L9/02<br>A47L9/00 |
| Y | US 2006/005350 A1 (KIM KYOUNG-WOUNG [KR])<br>12 January 2006 (2006-01-12)<br>* paragraph [0036]; figure 3 * | 2,3,9 | |
| X | US 2 620 506 A (WEILAND EDWARD A)<br>9 December 1952 (1952-12-09)<br>* column 1, line 39 - column 2, line 17; figures * | 1 | |
| X | US 1 560 400 A (VANDER PUTTEN JOHN R)<br>3 November 1925 (1925-11-03)<br>* page 1, lines 73-105 * | 1 | |
| X | EP 1 488 726 A (SEB SA [FR])<br>22 December 2004 (2004-12-22)<br>* paragraphs [0025] - [0027], [0031], [0032]; figures 2,9 * | 1-3,9 | TECHNICAL FIELDS SEARCHED (IPC)<br>A47L |
| A | US 4 238 870 A (FAHLEN KARL L [SE])<br>16 December 1980 (1980-12-16)<br>* column 2, lines 25-37; figure 1 * | 4 | |

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| Munich | 9 July 2009 | Lopez Vega, Javier |

CATEGORY OF CITED DOCUMENTS

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EPO FORM 1503 03.82 (P04C01)

## ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 00 8559

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09-07-2009

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---|---|---|
| US 1654186 A | 27-12-1927 | NONE | |
| US 2006005350 A1 | 12-01-2006 | CN 1718150 A | 11-01-2006 |
| | | DE 102004061855 A1 | 02-02-2006 |
| | | FR 2872693 A1 | 13-01-2006 |
| | | GB 2415890 A | 11-01-2006 |
| | | JP 2006021019 A | 26-01-2006 |
| US 2620506 A | 09-12-1952 | NONE | |
| US 1560400 A | 03-11-1925 | NONE | |
| EP 1488726 A | 22-12-2004 | AT 343956 T | 15-11-2006 |
| | | CN 1572216 A | 02-02-2005 |
| | | DE 602004002991 T2 | 28-06-2007 |
| | | ES 2274404 T3 | 16-05-2007 |
| | | FR 2856267 A1 | 24-12-2004 |
| | | HK 1072354 A1 | 26-01-2007 |
| | | PT 1488726 E | 28-02-2007 |
| | | RU 2331353 C2 | 20-08-2008 |
| US 4238870 A | 16-12-1980 | AU 517085 B2 | 09-07-1981 |
| | | AU 3557478 A | 01-11-1979 |
| | | CA 1092759 A1 | 06-01-1981 |
| | | DE 2818847 A1 | 09-11-1978 |
| | | GB 1588397 A | 23-04-1981 |
| | | SE 405200 B | 27-11-1978 |
| | | SE 7705003 A | 30-10-1978 |

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82