

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 February 2006 (23.02.2006)

PCT

(10) International Publication Number
WO 2006/019285 A1

(51) International Patent Classification⁷: **A61H 15/02**

(21) International Application Number:
PCT/KR2005/002749

(22) International Filing Date: 19 August 2005 (19.08.2005)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:
20-2004-0023705 19 August 2004 (19.08.2004) KR

(71) Applicant and

(72) Inventor: **YANG, Moon-Seok** [KR/KR]; 595,
Sangchang-ri, Andeok-myun, Namjeju-gun, Jeju-city
699-821 (KR).

(74) Agent: **Y.P. LEE, MOCK & PARTNERS**; The
Cheonghwa Bldg., 1571-18 Seocho-dong, Seocho-gu,
Seoul 137-874 (KR).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

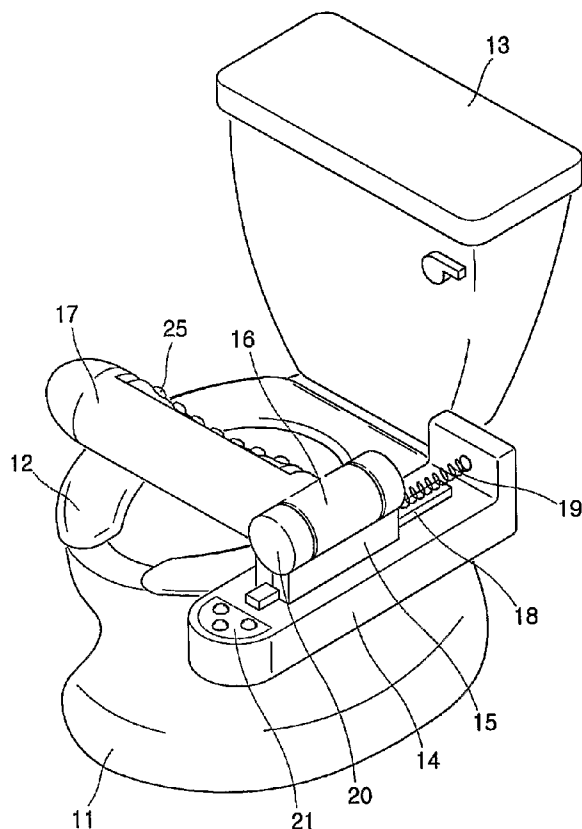
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KM, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM,
PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM,
SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN,
YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MASSAGE APPARATUS FOR BOWEL



(57) Abstract: Provided is a massage apparatus for bowels. The massage apparatus includes: a support base; a sliding body sliding over the support base; a rotation support fixed to the sliding body; a motor cover rotatable relative to the rotation support; a roller cover extending from the motor cover; a motor and a decelerator installed in the motor cover; and a roller installed in the roller cover and rotated by the motor.

WO 2006/019285 A1

MESSAGE APPARATUS FOR BOWELS

TECHNICAL FIELD

5 The present invention relates to a massage apparatus for bowels, and more particularly, to a massage apparatus for bowels, which is installed on a toilet seat and rotates a roller against a user's abdomen during evacuation.

BACKGROUND ART

10 As is well known, abdomen massage helps to improve health since it assists the organs of digestion, nutrient absorption, and evacuation, such as the stomach, the small intestine, and the large intestine. In particular, it is known that constipated people who have difficult, incomplete, or infrequent evacuation of bowels need to eat more fibrous foods and massage their abdomens. Abdomen massage is also known
15 to prevent abdominal fatness.

Nevertheless, most people find it hard to make time for massage in their busy daily life. If abdomen massage for bowels can be done during evacuation in the lavatory, time is used efficiently and people can massage their bowels regularly to improve their health.

20 Korean Utility Model Application Nos. 2001-23820 and 2001-37807 filed by the applicant of the present invention disclose a massage apparatus for bowels using belts and a massage apparatus for bowels using rollers, respectively.

The massage apparatus for bowels disclosed in Korean Utility Model Application No. 2001-23820 has a disadvantage in that the belts should be retightened for each
25 user. Since the massage can be done only by applying the belts to the user's abdomen, the user should bend forward.

Meanwhile, in spite of its high advantage, the massage apparatus for bowels disclosed in Korean Utility Model Application No. 2001-37807 has a disadvantage in that the lengths of pipes should be adjusted for each user. Besides, since the pipes
30 and the rollers are provided in closed states, a user finds it hard to sit on a seat.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a massage apparatus for bowels according to an embodiment of the present invention;

FIG. 2 is an exploded perspective view of the massage apparatus for bowels of FIG. 1, illustrating a motor cover which is rotatable relative to a rotation support unit;

FIG. 3 is a longitudinal sectional view of the roller of the massage apparatus for bowels of FIG. 1;

FIG. 4 is a longitudinal sectional view of a massage apparatus for bowels according to another embodiment of the present invention;

FIG. 5 is a plan view of a cam of the massage apparatus for bowels of FIG. 4;

FIG. 6 is a perspective view of a massage apparatus for bowels according to still another embodiment of the present invention;

FIG. 7 is a perspective view of a massage apparatus for bowels according to yet another embodiment of the present invention; and

FIG. 8 is a perspective view of a massage apparatus for bowels according to further another embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

TECHNICAL PROBLEM

The present invention provides an improved massage apparatus for bowels.

TECHNICAL SOLUTION

According to an aspect of the present invention, there is provided a massage apparatus for bowels, the massage apparatus comprising: a support base; a sliding body sliding over the support base; a rotation support fixed to the sliding body; a motor cover rotatable relative to the rotation support; a roller cover extending from the motor cover; a motor and a decelerator installed in the motor cover; and a roller installed in the roller cover and rotated by the motor.

The sliding body may slide forward and backward along a guide that is installed on the support base, and may be forced to move backward due to a spring which is fixed to the sliding body at one end and fixed to the support base at the other end.

The second end of the roller may be rotatably supported by a bearing installed in the roller cover.

The massage apparatus may further comprise: a coil spring inserted into a groove formed in a first end of the roller; a driving shaft having a stop portion by which the expansion of an end of the coil spring is checked, the driving shaft being rotated by the motor; a rotating shaft connected to a second end of the roller and having a rotary ball installed at an end thereof; a cam having a cam groove with a varying depth formed therein such that the rotary ball is inserted into the cam to roll along the cam groove; and a cam motor installed in the roller cover and rotating the cam.

The massage apparatus may be installed at a side of one selected from the group consisting of a toilet seat, a wheel chair, and a general seat.

BEST MODE

The present invention will now be described more fully with reference to the accompanying drawings, in which preferred embodiments of the invention are shown.

FIG. 1 is an exploded perspective view of a massage apparatus for bowels according to an embodiment of the present invention.

Referring to FIG. 1, a toilet seat on which the massage apparatus for bowels can be installed includes a toilet bowl 11, a seat plate 12 placed on the toilet bowl 11, and a water tank 13 in which water supplied to the toilet bowl 11 is contained. The massage apparatus for bowels may be installed on or around a general toilet seat as shown in FIG. 1. Although the massage apparatus for bowels drawn in FIG. 1 is installed at a side of the toilet seat, it can be installed in the vicinity of a wheel chair, a general seat, a hip bath, a steam bath, or a bidet.

The massage apparatus for bowels according to the present embodiment includes a support base 14, a sliding body 15 sliding over the support base 14, a rotation support 20 fixed to the sliding body 15, a motor cover 16 and a roller cover 17 rotatable relative to the rotation support 20 and extending from each other, a motor 28 (see FIG. 3) and a decelerator 27 (see FIG. 3) installed in the motor cover 16, and a roller 25 rotatably installed in the roller cover 17 and rotated by the motor. The sliding body 15 is installed on the support base 14 to move forward and backward. A front side of the support base 14 is a side where an operation panel 21 is placed and a rear side thereof is a side where a spring 19 is attached. The back-and-forth movement of the sliding body 15 can be guided by a guide 18. The guide 18 is installed on the support base 14. The sliding body 15 is forced to move backward due to the spring 19.

To use the massage apparatus for bowels, the user rotates the roller 25 relative to the rotation support 20 to erect the roller 25, and then sits on the toilet seat. Thereafter, he applies the roller 25 installed in the roller cover 17 to his belly by forwardly pushing the sliding body 15 and horizontally rotating the roller cover 17. Since the spring 19 pulls the sliding body 15 backward, the roller 25 can be more tightly attached to the belly.

The user can select a normal rotation, a reverse rotation, or a reciprocation movement of the roller 25 using the operation panel 21.

FIG. 2 is an exploded perspective view of the massage apparatus for bowels of FIG. 1, illustrating the motor cover 16 which is rotated relative to the rotation support 20.

Referring to FIG. 2, the roller cover 17 and the motor cover 16 integrally extend, and a rotating shaft 16a extends beyond both ends of the motor cover 16. The rotating shaft 16a is rotatably installed on a bearing (not shown) installed on the rotation support 20. Accordingly, the motor cover 16 can be rotated relative to the rotation support 20. The rotation support 20 is fixed to the support base 14.

FIG. 3 is a longitudinal sectional view of the roller 25 of the massage apparatus for bowels of FIG. 1.

Referring to FIG. 3, the roller 25 is installed inside the roller cover 17 and the motor cover 16 is marked by a dotted line. The roller 25 has a concave shape to increase a contact area between the roller 25 and the usually convex belly. A plurality of protrusions 25a are formed on the surface of the roller 25 to obtain kneading and rubbing effects. As one side of the roller cover 17 is opened, the surface of the roller 25 can be exposed through the opened portion of the roller cover 17.

The roller 25 is rotated by the motor 28 installed inside the motor cover 16. The motor 28 rotates the rotating shaft 26 of the roller 25 using the decelerator 27. One end of the rotating shaft 26 is supported by a bearing 29 fixed in the roller cover 17. The roller cover 17 is made of metal or strong engineering plastic, and supports the rotation of the roller 25 by means of the bearing 29. Or, the one end of the rotating shaft 26 may be a free end without the roller cover 17.

FIG. 4 is a longitudinal sectional view of a massage apparatus for bowels according to another embodiment of the present invention.

Referring to FIG. 4, the roller cover and the motor cover as illustrated in FIG. 3 are not shown for clarity. A roller 31 has a concave shape to correspond to a user's

convex belly. A groove 34 is formed in a first end of the roller 31. A coil spring 35 is inserted into the groove 34. A driving shaft 36 is inserted into the coil spring 35. A first end of the coil spring 35 is fixed to the groove 34, and coils of the coil spring 35 frictionally contact the inner surface of the groove 34. A second end of the coil spring 35 is fixed to a stop portion 36a formed on the driving shaft 36. The stop portion 36a formed on the driving shaft 36 checks the expansion of the second end of the coil spring 35.

Accordingly, when the driving shaft 36 rotates, the rotational force is transmitted through the coil spring 35 to the roller 31. Then, the roller 31 is rotated due to a frictional force generated between the coil spring 35 and the groove 34 of the roller 31 made of urethane, for example. Also, the roller 31 can be longitudinally displaced since the coil spring 35 can be compressed or expanded in the groove 34.

The same effect can be achieved by inserting a sufficiently stiff cylindrical cup made of metal or plastic into the groove 34 and fixing an end of the coil spring 35 to a bottom surface of the cup. That is, due to the coil spring 35, a rotational force can be transmitted and the roller 31 can be longitudinally displaced.

The driving shaft 36 is connected to a motor 38 through a decelerator 37. Accordingly, the rotational force of the motor 31 is transmitted through the decelerator 37, the driving shaft 36, and the coil spring 35 to the roller 31 to rotate the roller 31.

In the meantime, a rotating shaft 32 disposed on the other end of the roller 31 is inserted into a cam groove 41 formed in a cam 40. A rotary ball 45 is installed on an end of the rotating shaft 32, and the rotary ball 45 rolls along the cam groove 41 formed in the cam 40 to enable the rotating shaft 32 to be longitudinally reciprocated. The cam groove 41 formed in the surface of the cam 40 has a varying depth. The cam 40 is rotated by a cam motor 39 which is fixedly installed in the roller cover 17. Accordingly, the rotary ball 45 reaches a different position of the cam groove 41 as the cam 40 is rotated. As a result, the rotating shaft 32 and the roller 31 are longitudinally reciprocated by virtue of the coil spring 35 inserted into the groove 34. The rotating shaft 32 is supported by a control bearing 33 which is fixedly installed in the roller cover 17.

FIG. 5 is a plan view of the cam 40 of the massage apparatus for bowels of FIG.

4.

Referring to FIG. 5, the cam groove 41 is circularly formed in the surface of the cam 40. The rotary ball 45 installed on the end of the rotating shaft 32 (see FIG. 4) is inserted into the cam groove 41. The cam groove 41 has a varying depth, whose development shape may correspond to a sine curve. Accordingly, while the cam 40 is rotated about a rotation center 47, the rotary ball 45 reaches the varying depth of the cam groove 41. As a result, the rotating shaft 32 and the roller 31 are longitudinally reciprocated, and the belly is massaged through the longitudinal reciprocation of the rotating shaft 32 and the roller 31 and the rotation of the roller 31 as well. The roller 31 may only be reciprocated without being rotated.

The roller 31 may be made of various materials. For example, the inner part of the roller 31, which needs to be reinforced, may be made of metal or plastic, and the surface of the roller 31, which contacts the belly, may be made of silicon. To increase the abdomen massage effect, the roller 31 may include far-infrared material or elvan. For example, the roller 31 may be made of silicon with far-infrared material or elvan. The protrusions 25a formed on the surface of the roller 31 have kneading and rubbing effects. The rotational force of the roller 31 can be adjusted by changing the rotation speed of the motor 38, and normal rotation or reverse rotation can be selected. Also, a circuit board for controlling the motor 38 may have a melody function to increase comfortability during massage.

Although not shown, a heat line for generating heat may be installed in the roller 31. When electric power is supplied to the heat line from an electric cell that is also installed in the roller 31, the heat line generates heat. Alternatively, external electric power may be supplied to the heat line. In this case, the external electric power can be supplied to the heat line using a brush which is typically used in an electric motor.

As described above, the massage apparatus for bowels can be applied to a wheel chair or a general seat as well as the toilet seat. For example, all the structure installed on the support base 14 except the toilet seat in FIG. 1 can be mounted at a side of a wheel chair, a general seat, a hip bath, a steam bath, or a bidet to be used as a massage apparatus for bowels.

FIG. 6 is a perspective view of a massage apparatus for bowels according to still another embodiment of the present invention.

The overall structure of the massage apparatus for bowels illustrated in FIG. 6 is similar to that illustrated in FIG. 1, the same reference numeral denotes the same

elements throughout the drawings, and a detailed explanation of the same element as shown in FIG. 1 will not be given.

A supporting center 63 for supporting the roller cover 17 is installed at the free end of the roller over 17. The supporting center 63 is supported by a first support 61 and a second support 62. The first support 61 may be inserted in a telescopic manner into the second support 62, and one end of the second support 62 may be rotatably fixed to the water tank 13 or the wall of the lavatory. The supporting center 13 may be detachably fixed to the free end of the roller cover 17, such that the user can arbitrarily fix or separate the supporting center 13 to or from the free end of the roller cover 17. The supporting center 13 supports the free end of the roller over 17 while the roller 25 applied to the user's belly performs abdomen massage, thereby ensuring stable massage.

FIG. 7 is a perspective view of a massage apparatus for bowels according to yet another embodiment of the present invention.

The overall structure of the massage apparatus for bowels illustrated in FIG. 7 is similar to that illustrated in FIG. 1, and a detailed description of the same element as shown in FIG. 1 will not be given.

The massage apparatus for bowels illustrated in FIG. 7 is different from that illustrated in FIG. 1 in that the roller cover 17 is removed. That is, the roller 25 is removably installed on a shaft 77 that projects from a motor cover 76. As described above, the motor cover 76 can be rotated relative to the rotation support 20, and the shaft 77 supporting the roller 25 can be rotated accordingly.

The user can separate or install the roller 25 from or on the shaft 77 when necessary. Accordingly, the roller 25 can be easily replaced when the roller 25 is worn away. The roller 25 may have various shapes, and the user can select his preferred one of them. An end of the roller 25 can be rotated as a free end by relatively increasing the length of the shaft 77. The supporting center 63 as shown in FIG. 6 may support the free end of the roller 25.

Although not shown, a roller cover which is detachable from the motor cover 76 may be provided. That is, the massage apparatus for bowels illustrated in FIG. 7 may have the same structure as that illustrated in FIG. 1 except that the roller cover 17 can be detached from the motor cover 76. The user can easily replace the roller 25 using the detachable roller cover 17.

FIG. 8 is a perspective view of a massage apparatus for bowels according to further another embodiment of the present invention.

Referring to FIG. 8, the massage apparatus for bowels may use belts 81 and 82.

For example, the massage apparatus for bowels does not employ the support base 14, the sliding body 15 sliding over the support base 14, and the rotation support 20 fixed to the sliding body 15 shown in FIG. 1, but includes the belts 81 and 82 which are detachably installed on both ends of a roller cover 87 and motor cover 86. A roller can be rotated and reciprocated in the motor cover 86 and the roller over 87 in the same manner as described above. Each of the belts 81 and 82 may be fixed at one end to the toilet seat or the wall, and length adjusting members 88 and 89 may be provided so that the user can adjust the lengths of the belts 81 and 82. Also, the belts 81 and 82 may be partially formed with springs such that the length adjustment can be made elastically. The belt 82 can be detached from the roller 25 using a buckle 84 fixed to the belt 82 and a buckle tongue 83 fixed to the motor cover 86. Accordingly, the user can sit on or leave the toilet seat by separating the belt 82 from the motor cover 86.

To use the massage apparatus for bowels, the user holds the roller cover 87 in his hand, applies the roller cover 87 to his belly, and adjusts the lengths of the belts 81 and 82 to tighten the belts 81 and 82. Then, the roller 25 is rotated or reciprocated to massage the user's abdomen.

The massage apparatus for bowels according to the present invention can massage a user's belly while the user sits on a toilet seat, a wheel chair, or a general seat. Also, since a roller can be reciprocated as well as rotated, the user can select one among various functions for abdomen massage.

While the present invention has been particularly shown and described with reference to exemplary embodiments thereof, it will be understood by those of ordinary skill in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the following claims.

MODE OF THE INVENTION

The massage apparatus for bowels according to the present invention can be used to massage the belly of a user who sits on a toilet seat or the like.

CLAIMS

1. A massage apparatus for bowels, the massage apparatus comprising:
a support base;
a sliding body sliding over the support base;
5 a rotation support fixed to the sliding body;
a motor cover rotatable relative to the rotation support;
a roller cover extending from the motor cover;
a motor and a decelerator installed in the motor cover; and
a roller installed in the roller cover and rotated by the motor.

10 2. The massage apparatus of claim 1, further comprising:
a coil spring inserted into a groove formed in a first end of the roller;
a driving shaft having a stop portion by which the expansion of an end of the coil
spring is checked, the driving shaft being rotated by the motor;
15 a rotating shaft connected to a second end of the roller and having a rotary ball
installed at an end thereof;
a cam having a cam groove with a varying depth formed therein such that the
rotary ball is inserted into the cam to roll along the cam groove; and
a cam motor installed in the roller cover and rotating the cam.

20 3. The massage apparatus of claim 1 or 2, wherein the sliding body slides
forward and backward along a guide that is installed on the support base, and is forced
to move backward due to a spring which is fixed to the sliding body at one end and
fixed to the support base at the other end.

25 4. The massage apparatus of claim 1 or 2, wherein the second end of the
roller is rotatably supported by a bearing installed in the roller cover.

30 5. The massage apparatus of claim 1 or 2, wherein the roller is made of
silicon with elvan and far-infrared material.

6. The massage apparatus of claim 1 or 2, wherein a circuit board for driving
the motor has a melody function.

7. The massage apparatus of claim 1 or 2, wherein the roller has a concave shape to correspond to a convex belly.

5 8. The massage apparatus of claim 1 or 2, wherein a heat line is installed in the roller.

9. The massage apparatus of claim 1 or 2, wherein the roller cover is detachable from the motor cover.

10 10. The massage apparatus of claim 1 or 2, further comprising:
a supporting center detachably fixed to a free end of the roller cover to support the free end of the roller cover; and
first and second support extending from the supporting center and having
15 adjustable lengths.

11. A massage apparatus for bowels, the massage apparatus comprising:
a motor cover and a roller cover extending from each other;
a motor and a decelerator installed in the motor cover;
20 a roller rotatably installed in the roller cover and rotated by the motor; and
belts having ends detachably connected to the motor cover and the roller cover.

12. The massage apparatus of any one of 1, 2, and 11 installed at a side of one selected from the group consisting of a toilet seat, a wheel chair, a hip bath, a bidet,
25 a steam bath, and a general seat.

FIG. 1

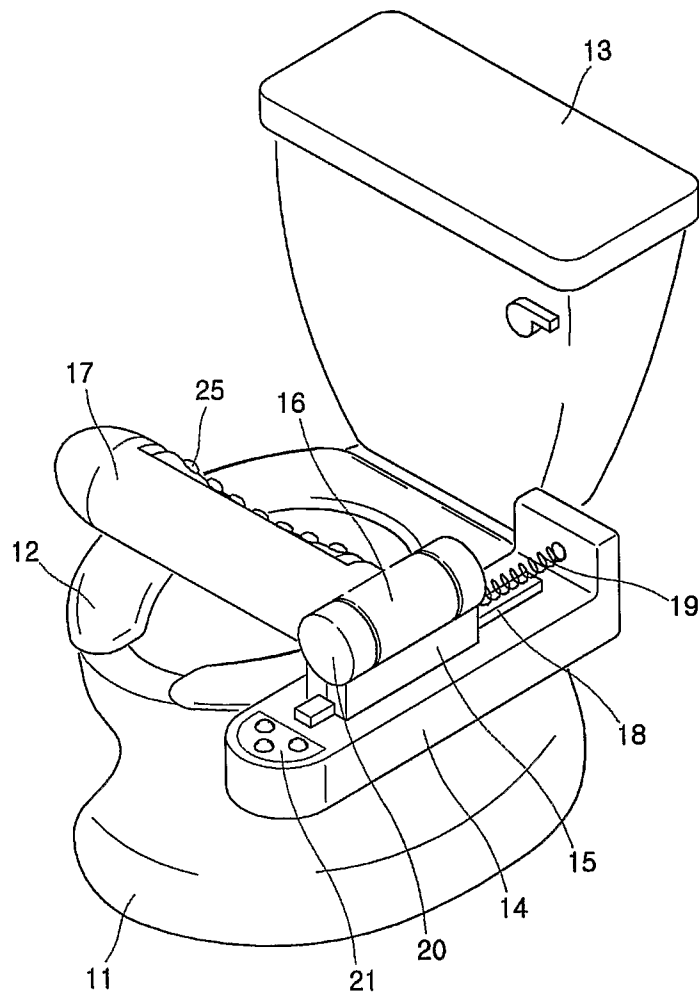


FIG. 2

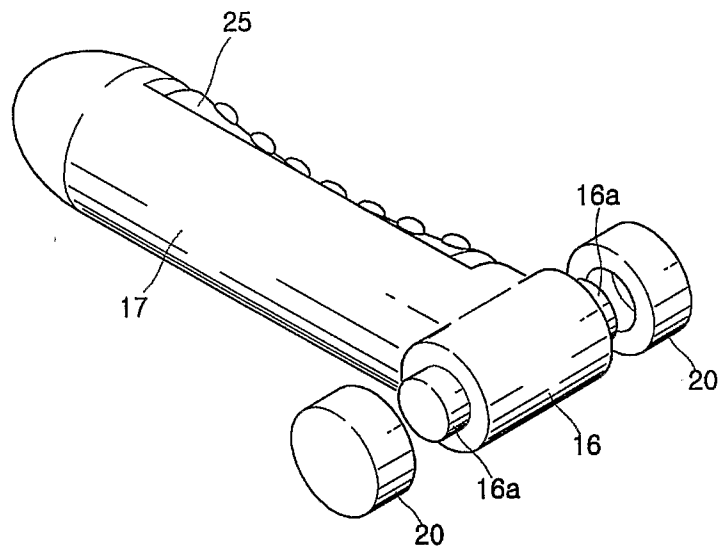


FIG. 3

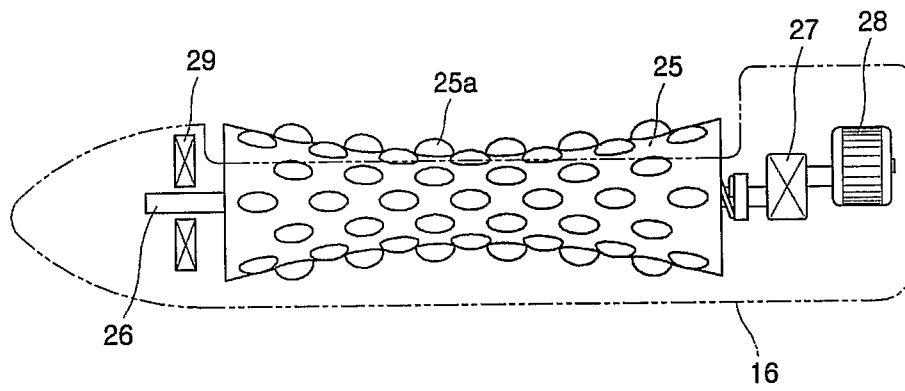


FIG. 4

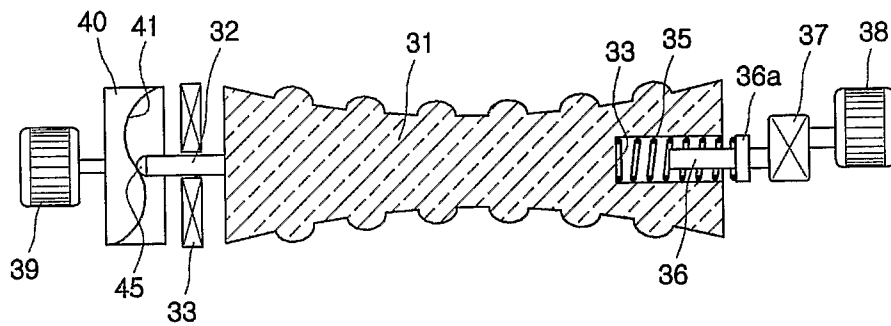


FIG. 5

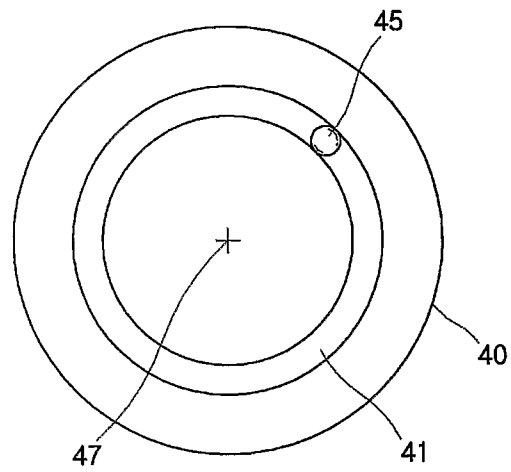


FIG. 6

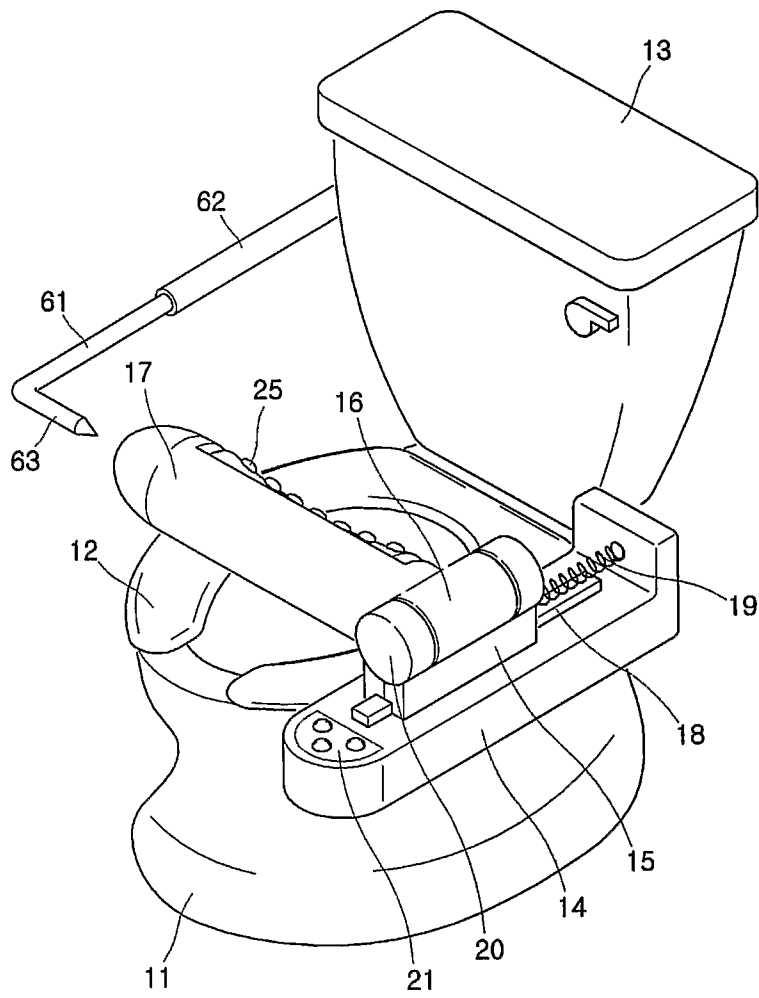


FIG. 7

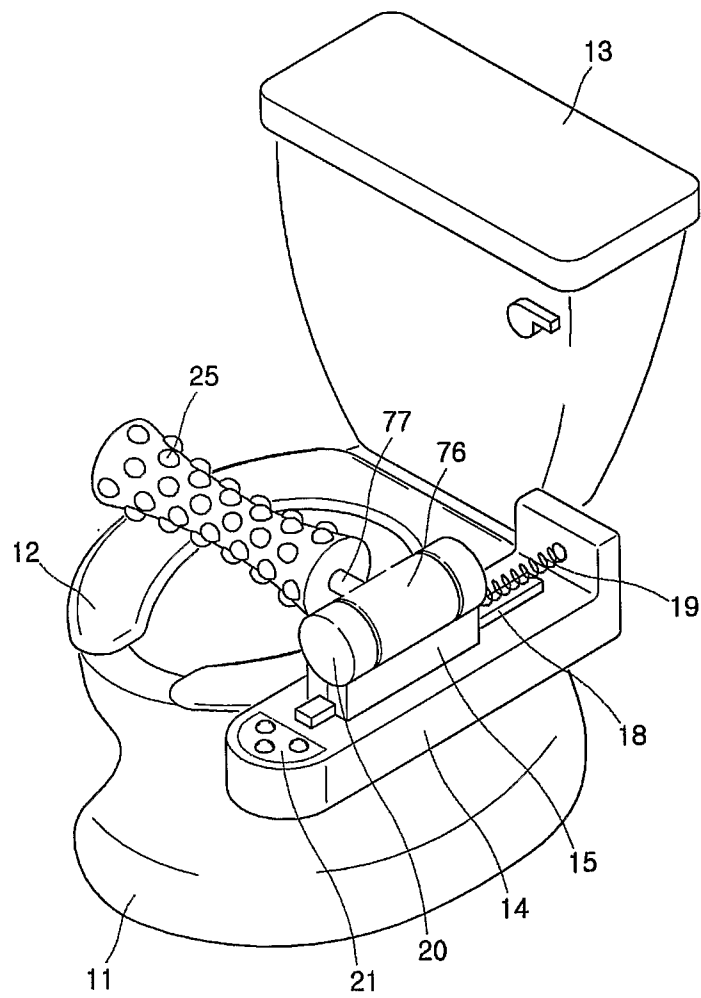
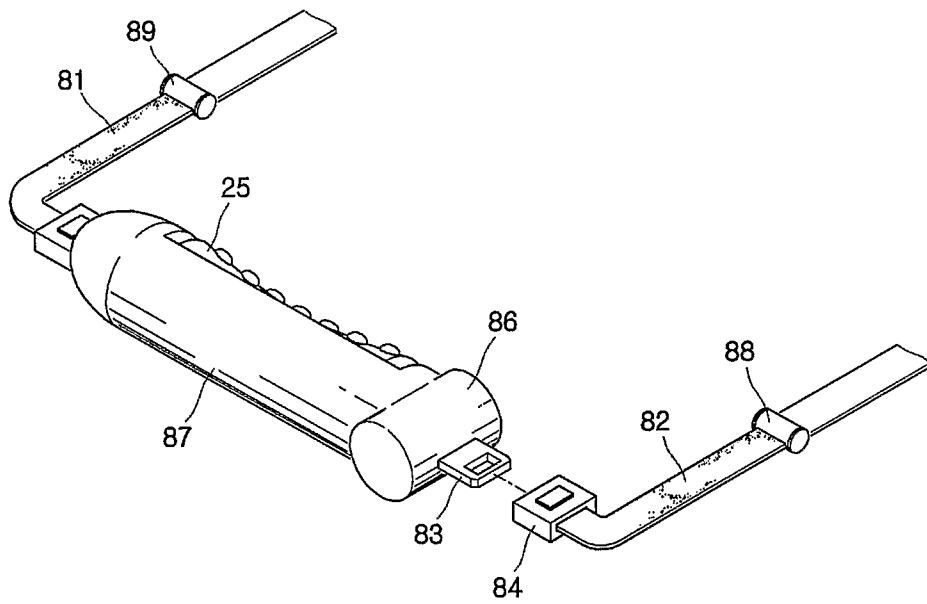


FIG. 8



A. CLASSIFICATION OF SUBJECT MATTER**IPC7 A61H 15/02**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7 A61H 15/02

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Documents on Korean Patents and Utility models since 1975

Documents on Japanese Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	KR 20-301713 Y1, (YANG, MOON-SEOK), 24 JAN 2003 see abstracts and figures	1, 4 - 12
Y	KR 20-238935 Y1, (KIM KWI OK), 10 OCT 2001 see abstracts and figures	1, 4 - 12
A	KR 20-268121 Y1, (YANG, MOON-SEOK), 15 MAR 2002 see abstracts and figures	1 - 12
A	JP 2001-252321 A, (MITSUBISHI ELECTRIC HOME APPLIANCE CO LTD , MITSUBISHI ELECTRIC CORP), 18 SEP 2001 see abstracts and figures	1 - 12
A	JP 08-280770 A, (APOLLO IRYOKI KK), 29 OCT 1996 see abstracts and figures	1 - 12

 Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

28 NOVEMBER 2005 (28.11.2005)

Date of mailing of the international search report

28 NOVEMBER 2005 (28.11.2005)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
920 Dunsan-dong, Seo-gu, Daejeon 302-701,
Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

KWON, In Sup

Telephone No. 82-42-481-5570



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2005/002749

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20-301713 Y1	24.01.2003	none	
KR 20-238935 Y1	10.10.2001	none	
KR 20-268121 Y1	15.03.2002	none	
JP13252321	18.09.2001	JP13252321 JP2001252321A2	18.09.2001 18.09.2001
JP08280770	29.10.1996	JP08280770 JP2931772B2 JP8280770A2	29.10.1996 09.08.1999 29.10.1996