

DESCRIPTION

AUTOMATIC CLEANLINESS SYSTEM FOR PHYSICALLY HANDICAPPED PERSONS

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Technical Field

This invention relates to a system for physically handicapped persons which enables adjusting of ergonomic and anatomic sitting position, washing, wiping, drying and cleaning of dirt formed on the anus region after defecation by automatically controlling.

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Background Art

In the prior art German Patent Application No. DE 19612264, a sitting part developed for physically handicapped persons is disclosed wherein it is made up of soft material and placed on the toilet covers. Said sitting part is not in a suitable shape for enabling comfortable defecation of the physically handicapped persons since it is applied on standard toilets.

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In US Patent No 5603130, a special seat system developed for physically handicapped persons being designed for enabling to answer the call of nature is disclosed. In this system, there is provided a convenience for washing after defecation.

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In the documents mentioned above, only sitting and washing conveniences are supplied for physically handicapped persons. However in the prior art, since there isn't any universal system enabling to answer the call of nature and subsequent cleaning of physically handicapped persons without any need for the help of others, inconveniences still continue and there is a need for assistant in anyway.

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Object of the invention

The object of the invention is to enable a physically handicapped person to answer the call of nature and subsequent cleaning without any help of anybody. It is aimed by the system of the invention to enable washing, cleaning and drying in the clean up following defecation as if there is one (nurse, medical attendant), which is normally done with a helper.

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Objects of the invention are to enable physically handicapped person to perform washing, wiping and drying automatically without help of anyone as well as sitting position and mechanism to provide this for complete cleaning. It is aimed by the system according to the invention to solve the problems of wiping way of the dirt deposited on the anus region, washing process, drying process, pre-treatments for cleaning and how the function is controlled.

Description of the Drawings

The system of the invention is illustrated in the appended figures, in which:

Figure 1 is a top view of the ergonomic toilet cover ;

Figure 2 is a side view of the toilet during its use.

Figure 3 is a perspective view of the paper pulling mechanism.

Figure 4 is a perspective view of the artificial hand mechanism.

Figure 5 and Figure 6. are perspective views of the structures of the mechanisms simulating artificial hand and paper pulling mechanism.

Figures 7-12. are schematic views of simulated positions for the operation of the artificial hand.

In figures, each part is numbered individually and corresponds to the numbers given below:

1. Ergonomic Toilet Cover
2. Soft Material
3. Urine Reservoir Housing
4. Opening
5. Toilet
6. Moveable Platform
7. Paper Roll
8. Top Holder Clip
9. Bottom Holder Clip
10. Artificial Hand
11. Paper clamps
12. Cutter
13. Nozzle

- 14. Disinfecting liquid container
- 15. Paper taking (pulling) mechanism
- 16. Artificial hand mechanism
- 21. Front region
- 5 22. Back Region
- 23. Left edge of the toilet cover
- 24. Right edge of the toilet cover
- 30. Toilet paper

10 Aim of the invention is to provide personal hygiene after defecation. It is required to take some ergonomic and anatomic measures before defecation to provide more hygienic cleaning. Primarily sitting position is important. The best defecation position is crouching (position of the sitting type toilet) position. During crouching, both easy defecation and cleaning position is provided by separation of buttocks by leg's opening.

In Figure 1 an ergonomic toilet cover (1) with a special form used in the system of the invention which provides separation of buttocks is shown. Ergonomic toilet cover (1) minimizes spreading of feces to the buttocks by its special form. In contrast with existing normal toilet covers, ergonomic toilet cover (1) has a larger form at the front region (21) and a narrow form at the back region (22). This form of ergonomic toilet cover (1) is formed by narrowing and slanting from left edge (23) and right edge (24). Therefore, legs are moved apart from each other and separation of buttocks is maximized consequently. Another property of the ergonomic toilet cover (1) is that the blood circulation of the user is not interrupted by the soft material (2) hereof. The soft material (2) is shaped in two parts which are close to the right edge (24) and the left edge (23) of the ergonomic toilet cover (1) and shaped to provide wide sitting surfaces for easy positioning of buttocks. Owing to the special form of the urine reservoir housing (3) located at the middle of the front region (21) of the ergonomic toilet cover (1), urine is prevented from splashing or coming out of the toilet (5) for any reason. The opening (4) at the back region of the ergonomic toilet cover (1) is deliberately left open to enable dropping of the feces into the toilet (4) during defecation.

To adjust the crouching position of the sitting person, firstly the legs must be raised. By rising of the legs, buttocks reach to the maximum separation. All of these operations are anatomic precautions to minimize spreading during defecation. In the system of the invention as in Figure 2, process of rising the legs is provided by the up-and-down moveable platform (6) at the front of the toilet (5) after the user have sat on the ergonomic toilet cover (1). Moveable platform (6) is always in upward position until all steps such as oil spraying, water spraying, wiping and warm air blowing are completed.

Additional precautions are taken with the system of the invention to provide cleaning and hygiene after defecation besides ergonomic and anatomic measures. The oil sprayed to buttocks before defecation helps cleaning process by preventing adhesion of feces particles. Oil spraying process is done before defecation and prior to taking off the toilet paper (30) from paper roll (7) or the process of taking off the toilet paper (30) can be done without oil spraying. The process for taking off the toilet paper (30) is carried by the paper pulling mechanism (15) of the system according to the invention in Figure 3.

In Figure 4, the artificial hand mechanism (16) of the system according to the invention is seen. Oil spraying can be done by the nozzle (13) at the end of the artificial hand (10) or nozzle anywhere (at the end, on or near) on the artificial hand. The structure of the nozzle (13) could be in a form capable to allow different applications. In one of these embodiments, it has three fluid jets owing to the oil, water and air channel. In other embodiments, it has two fluid jets owing to oil-air or water-air channels. Even if all said spraying processes are done with the same opening, feeding channels transferring the fluid outside and nozzle outlets are totally independent and there is no possibility to be mixed with each other since one fluid is sprayed at a time, i.e. while oil is being sprayed, another fluid is not sprayed simultaneously in operations. However this spraying process can be done with independent nozzles, in this case again there is no possibility to be mixed with each other.

Oil spraying process is done with the nozzle (13) at the end of the artificial hand (10) or anywhere on the artificial hand (10). In addition, buttocks are substantially cleansed from solid particles by warm or cold water spraying from the nozzle (13) at

the end of the artificial hand (10) or anywhere on the artificial hand (10). Or, water spraying process is skipped over when desired. Subsequent to these processes, buttocks must be wiped out to completely remove the remaining particles upon which. Thus, artificial hand (10) takes off the toilet paper (30) from the roll (7) and
5 wiping process continues until the used toilet paper (30) is completely white by taking off repeatedly the toilet paper (30) from the roll (7) in each time.

Although, warm or cold washing can be done after each wiping, i.e. after buttocks are completely cleansed by wiping; washing process can be left undone. Dirty paper
10 is dropped into the toilet (5) by air blowing or water spraying from the nozzle (13) through opening of the paper clamps (11). Cleanness of the paper and the decision to continue for cleaning process are controlled by the mini camera installed in the toilet (5). After the wiping process with the artificial hand (10), cleaning process is completed by washing with warm or cold water or washing with warm or cold water is
15 left undone. If washing with warm and cold water is done, after drying process is done by means of the artificial hand (30) with toilet paper (30) upon which or by means of warm air, cleaning process is completed when the moveable platform comes down.

As in Figure 4, it is aimed to perform wiping process by means of the artificial hand (10) as if using natural hand and to provide maximum hygiene during this process. Moreover to ensure better cleaning and less irritation, the form of artificial hand is fitting the shape of buttocks and made of sponge. If said sponge body is used directly for the cleaning it must be replaced after each use then firstly toilet paper
25 must be rolled over the artificial hand (10). In addition, artificial hand must be disinfected after each use to clean bacteria and particles which may pass behind the toilet paper in order to prevent bacteria growth due to external factors on the artificial hand in the course of time. This disinfection process is performed by immersing the artificial hand into sterile liquid or soapy water with sterile property. Thus artificial
30 hand is disinfected after each use. In addition, artificial hand (10) is easily detached and replaced.

Flush can be automatically operated before or after the repetitions of wiping process are completed depending on the intensity of the paper used or can be automatically
35 operated once after wiping process is totally completed. Moreover flush is

automatically operated when the moveable platform came down after the cleaning process is completed and the user is away from the toilet.

As in Figure 3, although the location of the paper rolls (7) could be at the top, it could be at the side or at the bottom. These fitting styles can be configured to provide easy paper replacement and to keep paper rolls from the environmental effects at maximum degree.

Paper taking mechanism is mounted at the back of the toilet. As in Figure 3 toilet paper (30) is automatically pulled down from the paper roll (7) with the paper taking mechanism (15) without manual intervention. Bottom holder clip (9) is moved up to take the toilet paper (30) from the roll (7), when it is reached to the highest point, holders of the bottom holder clip (9) grasp the toilet paper (30) by compressing and bottom holder clip (9) pulls down the toilet paper by moving down. Thus toilet paper (30) is ready for use.

After that artificial hand (10) moves and pushes the toilet paper by passing to outside from the inside of the paper taking mechanism (15). Toilet paper (30) on the paper roll (7) is firstly held and secured by the top holder clip (8), then bottom holder clip (9) moves upward to the bottom of the top holder clip (8) and is compressed by the bottom holder clip (9). Top holder clip (8) releases the paper coming from the roll (7) and since the paper is compressed by the bottom holder clip (9) it opens as it rotates and covers the top and bottom surfaces of the artificial hand (10). Covering process continues until the artificial hand (10) is completely exited from the toilet. When the artificial hand (10) is completely exited, paper clamps (11) of the artificial hand compress the toilet paper both from bottom and top and bottom holder clip releases the paper at the same time. The reason for this process is to avoid paper to remain on the bottom holder clip (9).

Thus toilet paper (30) covers the surroundings of the artificial hand (10) and stays fixed to the artificial hand (10). Cutters (12) located just behind the paper clamps (11) at the top cut the toilet paper (30) during fixing and toilet paper (30) is separated from the roll (7). Therefore, paper roll (7) is kept clean and hygiene is provided by means of the separation of the toilet paper (30) on the artificial hand (10) from the roll (7). Toilet paper (30) free from the roll (7) and covering the artificial hand (10)

provides ease of movement to the artificial hand (10). After the toilet paper (7) is torn away, free artificial hand (10) is ready for the cleaning. Cleaning process is performed by wiping buttocks from back to front eccentrically in vertical position. Therefore cleaning is done without spreading the particles on sensitive regions.

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After the cleaning process is completed, paper clamps (11) on the artificial hand (10) are opened and the dirty toilet paper (30) is dropped down into the toilet by the air blowing or water spraying from the nozzle (13) at the end or anywhere of the artificial hand (10). Then, the system washes the buttocks again by warm or cold water.

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Wet buttocks are dried by blowing warm or hot air from the nozzle (13) at the end or anywhere of the artificial hand (10). Following the process, the artificial hand (10) is disinfected and returned to initial position. Then moveable platform (6) designed to provide crouching position moves down and the cleanliness process is completed.

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In Figure 5 and Figure 6, a structure of mechanism simulating the movements of the artificial hand (10) and paper taking mechanism (15) is shown.

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The drive of moveable platform (6), artificial hand (10) and paper taking mechanism (15) can be done by a single motor or operated by independent drive motors or by a hydraulic system or simply manual drive mechanism can also be used.

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In Figures 7-12, the operation of the artificial hand mechanism (16) is shown. In Figure 7, initial position of the artificial hand (10) is seen. In Figure 8, the second position of the artificial hand (10) in which it moves and takes the paper is seen. In this position, toilet paper (30) is stretched by means of top holder clip (8) and bottom holder clip (9) and covered on the artificial hand. Then, it is torn away from the roll (7). In third position, the artificial hand (10) moves out in Figure 3 and takes the cleaning position. In this position, artificial hand (10) performs wiping process from back to front of the toilet by an eccentric movement. In fourth position of Figure 10, the artificial hand (10) moves in after completing its all functions and dirty toilet paper is released in this position. In fifth position of Figure 5 the artificial hand (10) is seen as completed its all functions and moved in. This position is same as the initial position namely first position. In Figure 12, the sixth position of the artificial hand

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(10) when it is in the disinfecting liquid container (14) is seen. Then the artificial hand (10) again returns to fifth position and waits until the next use.

5 The automatic cleanliness system of the invention is used to enable a physically handicapped person to answer the call of nature and subsequent cleaning without any help of anybody. The convenience of the physically handicapped persons are provided by this invention by means of washing, wiping and drying automatically as well as required sitting position and mechanism to provide this for complete cleaning.

10 Preferred automatic cleanliness system above is not intended to limit the protection scope of the invention. In view of the described knowledge by the invention, all modifications on this preferred automatic cleanliness system should be interpreted in the protection scope of the invention.

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CLAIMS

- 1- A system which provides cleaning of the physically handicapped persons after defecation characterized in that it comprises an ergonomic toilet cover (1), a
5 moveable platform (6), a paper taking mechanism (15), an artificial hand (10) and an artificial hand mechanism (16) for this process.
- 2- An ergonomic toilet cover (1) according to claim 1 characterized in that it has a larger form at the front region (21) and a narrow form at the back region (22) and
10 his form is provided by narrowing and slanting from left edge (23) and right edge (24).
- 3- An ergonomic toilet cover (1) according to claim 2 characterized in that it has a soft material (2) whereon which blood circulation of the user is not interrupted
15 when the user is seated on.
- 4- An ergonomic toilet cover (1) according to claim 3 characterized in that the soft material (2) is shaped in two parts which are close to the right edge (24) and the left edge (23) of the ergonomic toilet cover (1) and shaped to provide
20 wide sitting surfaces.
- 5- An ergonomic toilet cover (1) according to claim 4 characterized in that the urine reservoir housing (3) is located in the middle of its front region (21).
- 6- An ergonomic toilet cover (1) according to claim 5 characterized in that an opening is located on its back region.
- 7- A moveable platform (6) according to claim 1 characterized in that it is fitted in the front of the toilet (5).
- 8- A moveable platform (6) according to claim 7 characterized in that it enables user to take crouching position by rising his/her legs in use.
- 9- A moveable platform (6) according to claim 8 characterized in that it performs
35 up-and-down movement in vertical by its drive mechanism.

10-A paper taking mechanism (15) according to claim 1 characterized in that it is fitted at the back of the toilet (5).

5 11-A paper taking mechanism (15) according to claim 10 characterized in that it has top holder clips (8) and bottom holder clips (9).

10 12-A paper taking mechanism (15) according to claim 11 characterized in that it compresses and grasps the toilet paper (30) by top holder clips (8) and bottom holder clips (9), pulls away from the paper roll (7) and makes toilet paper ready for the artificial hand (10).

15 13-An artificial hand (10) according to claim 1 characterized in that it becomes ready for use by moving from the back of the toilet (5).

14-An artificial hand (10) according to claim 13 characterized in that it is firstly attached with the paper and covered with a sponge body.

20 15-An artificial hand (10) according to claim 14 characterized in that processes of oil spraying, warm air blowing and warm or cold water spraying are performed by the nozzle (13) located in front of the artificial hand or said processes are performed by separate nozzles.

25 16-Nozzle (13) or separate nozzles according to claim 15 characterized in that it/they prevents adhesion of particles on the buttocks by oil spraying before defecation, provides washing by warm or cold water spraying and provides drying and dropping of the dirty toilet paper after it is used into the toilet after clamps (11) on the artificial hand mechanism (16) are opened by air blowing.

30 17-An artificial hand mechanism (16) according to claim 15 characterized in that paper clamps (11) are located on its bottom and top region.

18-Paper clamps (11) according to claim 17 characterized in that they provide compressing of the toilet paper (30).

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19- An artificial hand mechanism (16) according to claim 17 characterized in that a cutter (12) exists beside the paper clamps (11).

20- A cutter (12) according to claim 19 characterized in that it provides separation of the toilet paper (30) from the paper roll (7).

21- An artificial hand (10) according to claim 19 characterized in that it provides dropping of the dirty toilet paper (30) after its use into the toilet (5) by opening of the paper clamps (11) on the artificial hand.

22- A drive mechanism of the artificial hand (10) according to claim 21 characterized in that it moves artificial hand (10) to make a wiping movement from back to front eccentrically in vertical.

23- A wiping process with the artificial hand (10) according to claim 22 characterized in that the artificial hand (10) continues the wiping process until the used toilet paper (30) is completely white by taking off repeatedly the toilet paper (30) from the roll (7) in each time.

24- A wiping process with the artificial hand (10) according to claim 23 characterized in that the flush can be automatically operated before or after the repetitions of wiping process are completed depending on the intensity of the paper used.

25- A wiping process with the artificial hand (10) according to claim 23 characterized in that the complete cleanness of the toilet paper (30) is controlled with a mini camera installed in the toilet (5).

26- A drive mechanism according to claim 22 characterized in that, it provides artificial hand (10) according to claim 13 to move out from the back into the toilet (5) for being used and to return to its place at the back of the toilet (5).

27- An artificial hand (10) according to claim 21 for hygiene it is disinfected or replaced after its use.

28- A moveable platform (6), an artificial hand (10) and a paper taking mechanism (15) according to claim 1 characterized in that drives can be done by a single motor or operated by independent drive motors or by a hydraulic system or simply manual drive mechanism can also be used.

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