

**Hi there,**

**Greetings from Turkey!**

**I am happy to participate in this contest. I will be happier if I can give you a benefit. My English is not super... I'm sorry for the language violations I've made.**

**My solution consists of 4 elements:**

- **Pad for Behind (PB),**
- **Fecal Rout out, Collection and Hygiene System (FROCHS),**
- **Male Genital Organs Hygiene System (MGOGS), and**
- **Female Genital Organs Hygiene System (FGOGS)**

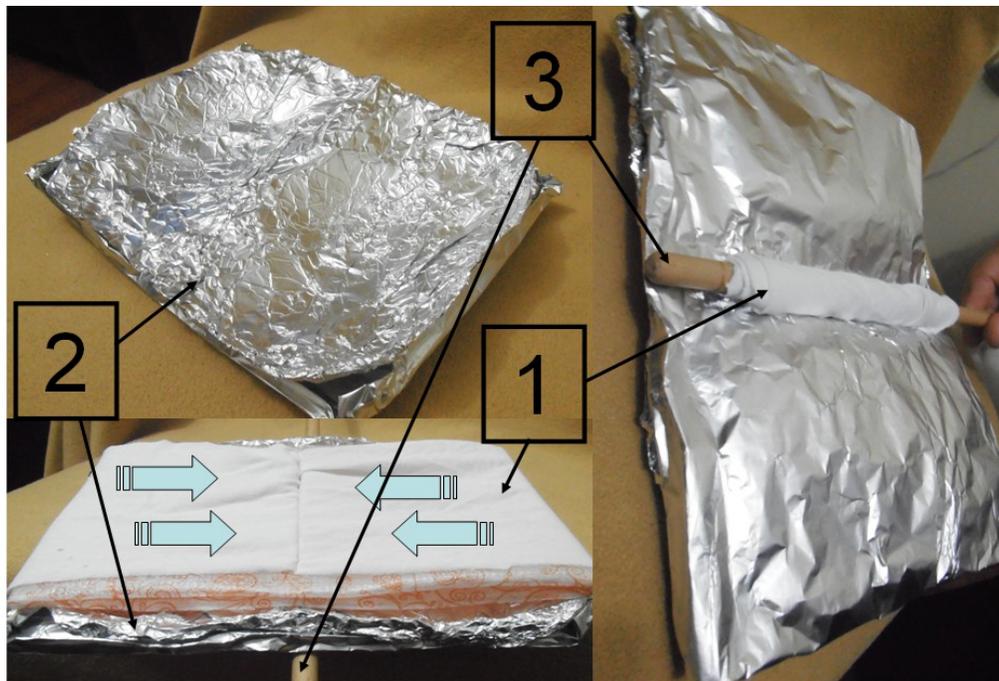
**So, let's start!**

## PAD FOR BEHIND (PB)

It is the basic part that covers the behind. It is designed to provide hygiene of the butt. It ensures that the butt keeps dry and hygienic after toilet and at all other times.

### Features of the System:

- 1. Hygienic Cloth:** It is a dry cloth which is put in order to provide hygiene. It is slid on the soft surface of the table and passed behind the table (2) from the slit by the pulling mechanism (3) to allow the bottom to be clean.
- 2. Table:** It is shaped according to the anatomical structure of the butt. The butt-side is soft and the hygienic cloth (1) can slide easily on it. There is a slit in the middle of the table and the hygienic cloth (1) is pulled with a spool through this slit. The outer edges of table, there are gaps where hygienic cloth (1) can be stored. As much as the user needs, this pulling mechanism provides the hygiene by pulling the hygienic cloth (1) and rubbing with the waist / hip movements.
- 3. Pulling Mechanism:** Operates by command of user, wraps the contaminated hygienic cloth (1), pulls the clean cloth from storage by tension effect. Thus, the butt continuously stays in touch with clean cloth. It's like changing underwear often ...



**PAD FOR BEHIND (PB):** The table (2) is shaped according to the anatomical structure of the butt.

\* All the numbers are the same as in the text.

## **FECAL ROUT OUT, COLLECTION AND HYGIENE SYSTEM (FROCHS):**

Under normal conditions, it takes place in the inner pocket of the space suit near the butt. When needed, it is placed under the butt, pushing it between the PB and the butt by hand, from the outside of the space suit. (A separate mechanism can be designed to do this operation, but doing it manually is more precise. The user can easily find the right position for him/herself.)

### **Elements of the System:**

**4. Fecal Bag:** The bag can be likened to a condom which is 3 m. (50 cm. for each defecate X 6 days) long and 8-10 cm diameter. Outside is waterproof material. The outer surface is covered with lubricant. Since the outer surface is exposed to friction with the rim (5), it must be slippery. The inner surface is covered with a fine cotton woven (not two separate bags, but a whole). Woven surface is impregnated a cleaner and a slippery material (such as wet wipes). This surface will slide on the anus and surrounding skin surfaces and clean these surfaces.

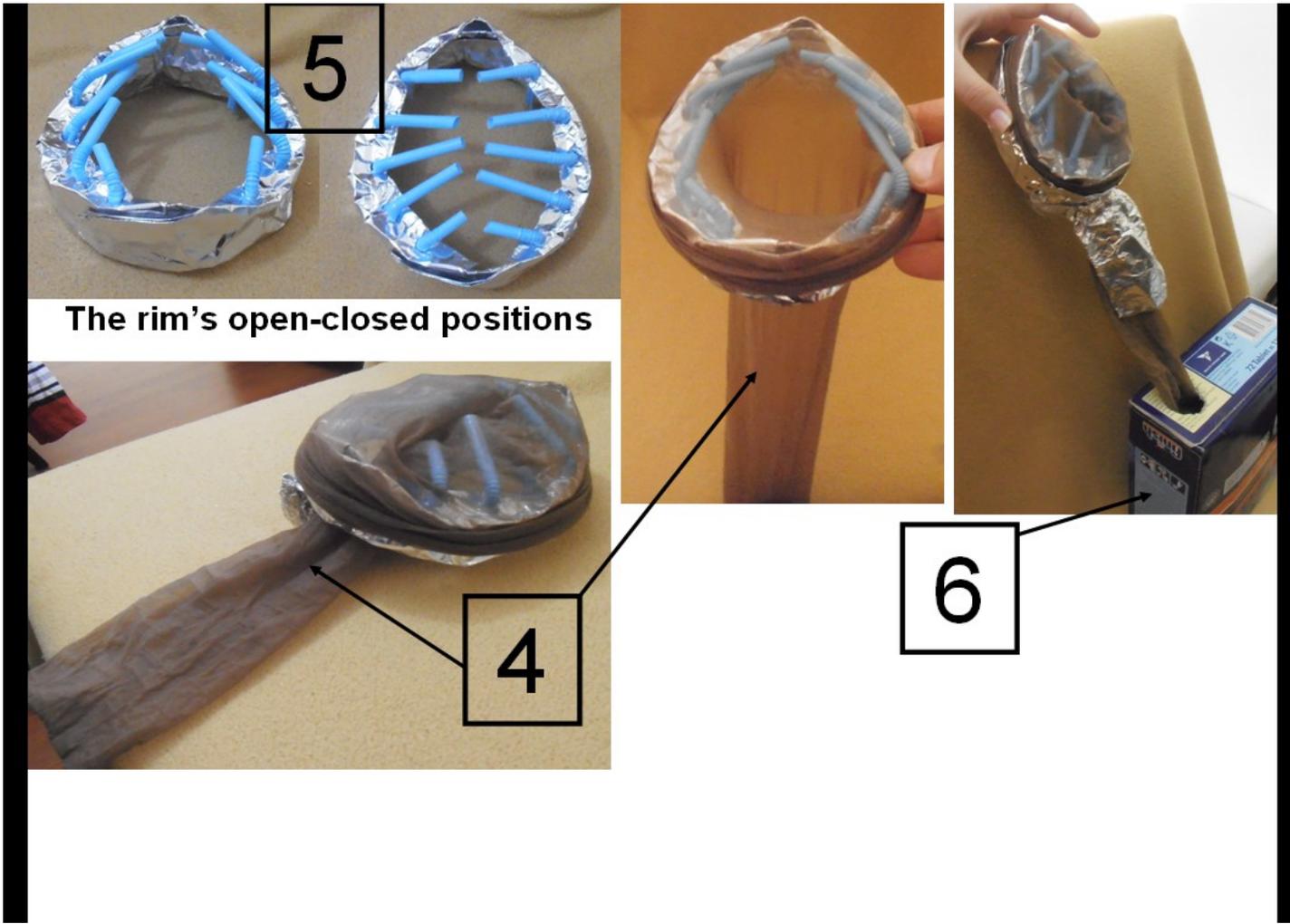
**5. The Rim and the Open-Close Mechanism:** The side touching the butt will fit the anatomy of the butt surface. There is a mechanism that allows the pulley mouth to open and close. It is turned on and off by the user's command. There is a handgrip to place the FROCHS between the butt and the PB by hand from outside the space suit. The stool will first enter the Fecal Bag (4). The bottom of the rim has a contact sensor. When the stool touches the bottom region, the pulling mechanism (6) automatically operates. Runs as long as the pressure is on, stops when the pressure is off. The user can also operate it by commanding when needed.

**6. Fecal Storage and Pulling Mechanism:** The end of the Fecal Bag (4) is connected to the storage and pulled into the storage by a pulling mechanism. The storage should be outside of the space suit.

### **To Defecate Using the FROCHS and PB Systems and Providing Hygiene After the Defecate:**

The PB normally takes place on the butt like underwear. The user provides personal hygiene by pulling the **Hygienic Cloth (1)**, rubbing the butt with the hip / waist movements when he/she needs it. The **FROCHS** stands in the inner pocket of the dress near the butt.

Defecate position is normally the position we sit on the toilet. The user takes the poop position (pulls his knees to his stomach) and places the FROCHS between the PB and his/her butt by controlling the FROCHS by hand from outside of the space suit. The anus should be in the middle of FROCHS. The user keeps the FROCHS system steady with one hand while controlling the commanders with the other. First opens FROCHS's mouth (by command). Then starts to defecate. When the stool touches the bottom region, the pull mechanism automatically operates. Runs as long as the press is on, stops when the press is off. The user can also operate it by commanding when needed. If necessary, it will be repeated a few times. After finishing this way, he/she pulls a little more at the last time and closes FROCHS's mouth. The closure of the FROCHS ensures that the contaminated surfaces be cleaned with **Fecal Bag (4)'s** inner side, which is fed with the cleansing liquid. The user can operate the pull mechanism when the mouth is closed. This allows the contaminated portion of the **Fecal Bag (4)** to be separated from the contact surface, allowing the cleaner new surfaces to penetrate into the contact area. More hygiene can be provided by rubbing with waist / hip movements, these movements can be repeated (waist / hip movements and pulling) as it is necessary. Once he/she is sure that there is enough hygiene, he/she places the FROCHS in its place. Then, by using PB, removes the remaining wetness and provides full hygiene and dryness. If the feces is farted, contact with FROCHS should not be interrupted, and the operation should continue.



The rim's open-closed positions

FECAL ROUT OUT, COLLECTION AND HYGIENE SYSTEM (FROCHS)

# MALE GENITAL ORGANS HYGIENE SYSTEM (MGOGS)

## Elements of the System:

**7. Urine Pipe, Funnel and Spraying System:** Carries male urine directly to the storage (10). There is a urine bag on the storage side of the pipe and a soft plastic funnel on the other side (near the penis). The soft plastic funnel is designed so that it does not leak urine when it becomes contacted with the penis. The funnel dock has irreversible valves (such as heart valves). There is also a thin water pipe along the urine pipe spraying water from the water storage in the main storage (10) to the penis tip. Because there is a hygienic bag (8) around and beyond the penis, leakage and spray drops can't affect the environment.

**8. Hygienic Bag:** It is designed to absorb splashing / leaking urine, which can not go through the funnel-pipe, and to provide hygiene of male genital organs (penis and testicles). The normal width of the bag is about the same as the penis but is made of material that can expand to accommodate the testicles. The outer side of the **Hygienic Bag (8)** is slippery and waterproof, the inner surface is the same as the diaper's inner cover.

**9. Male Organs Holder and Guider:** It allows the male genitals to be gripped by the **Hygienic Bag (8)** and stays in the proper position, including the testicles. It is attached to the body with straps.

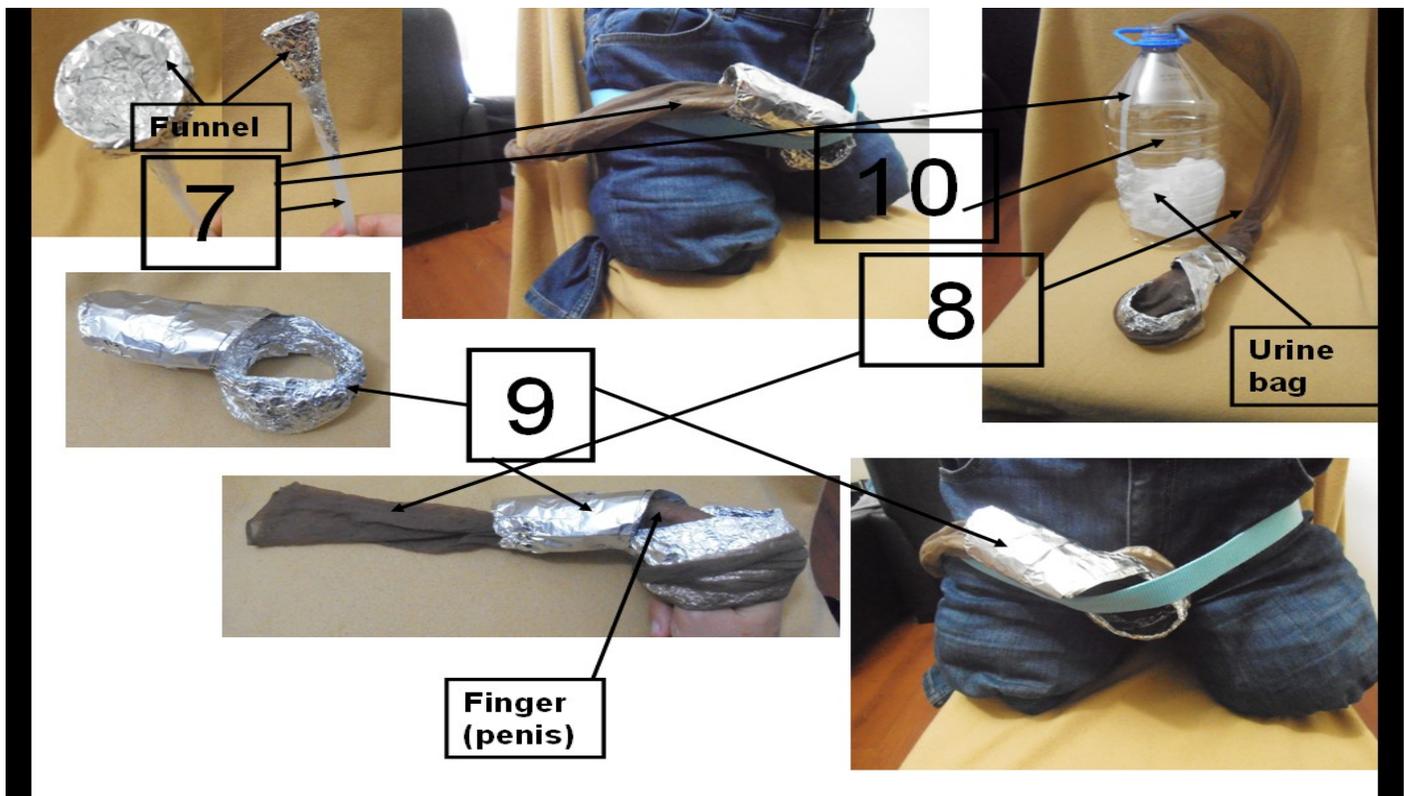
**10. Pull Mechanism and Urine / Waste Storage:** At the end of the urine pipe (7) there is urine bag (1 liter per day, 6 to 7 liters of capacity in total). This bag is contained here. The hygienic bag (8) described above is also pulled into this storage by the pulling mechanism. There is also a water storage and a pump for spraying water to the penis several times a day for hygiene of it. This pump works with the user's control.

## Using of MGOGS:

The system is fixed on the body, gripping the male genitals including the testicles. The penis and testicles are in the hygienic bag (8). The urine pipe (7) is also passing through the hygienic bag (8) and is able to be controlled manually from outside the space suit.

The user coincides the the elastic funnel (7) with his penis controlling the pipe from outside of the space wear; holds it constantly at that point and makes his urine. The urine flows through the pipe with the effect of natural pressure and accumulates in the urine bag. The valves at the funnel end prevent the return of urine. Leaked urine, which escapes out of the pipe despite the valves or funnel, is absorbed by the hygienic bag (8). The contaminated part of the hygienic bag (8) is pulled to the storage (10) side and removed from the penis. Then, the penis is moistened by spraying, cleaned and dried with manual intervention from outside to the hygienic bag (8). This process is repeated as it's necessary, and the contaminated part of the hygienic bag (8) is pulled towards the storage (10) using the pull mechanism. Thus, all the genital organs starting at the testicles are kept constantly hygienic.

For safe use, the user should not keep the urine inside for a long time, should urinate frequently.





All my solutions require the astronauts' effort. I could not find any solution to keep them not busy.

This work has improved my English. Besides, it also made me empathize with the astronauts. I figured out how difficult your job is. I will be happy if it makes your life easier.

The outer enclosure of FROCHS in illustrations can also be made in other units. Wastes can be removed from any exit of the space suit, storages can be anywhere which is easy for you.

I could not express everything I thought and everything I designed. I deliberately did not tell a few things. I think that the issues I have not covered in detail (eg.: how the open-close systems will work, how the towing mechanisms will be, etc.) can be resolved by NASA in several different ways. I did not go into more detail to extend and simplify it; I focused only on hygiene, the removal of wastes from the body and storage.

See you soon (I hope).

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