NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

REPLY TO ATTN OF: GP

MAY 1 1974

TO: KSI/Scientific & Technical Information Division
Attn: Miss Winnie M. Morgan

FROM: GP/Office of Assistant General Counsel for Patent Matters

SUBJECT: Announcement of NASA-Owned U.S. Patents in STAR

In accordance with the procedures agreed upon by Code GP and Code KSI, the attached NASA-owned U.S. Patent is being forwarded for abstracting and announcement in NASA STAR.

The following information is provided:

U.S. Patent No. : 3,805,303

Government or Corporate Employee : U.S. Government

Supplementary Corporate Source (if applicable) : ~

NASA Patent Case No. : MFS-22,102-1

NOTE - If this patent covers an invention made by a corporate employee of a NASA Contractor, the following is applicable:

YES ☐ NO ☒

Pursuant to Section 305(a) of the National Aeronautics and Space Act, the name of the Administrator of NASA appears on the first page of the patent; however, the name of the actual inventor (author) appears at the heading of column No. 1 of the Specification, following the words "...with respect to an invention of ..."

Bonnie L. Woerner

Bonnie L. Woerner
Enclosure

United States Patent [19]
Brown

[11] **3,805,303**
[45] **Apr. 23, 1974**

[54] **REDUCED-GRAVITY FECAL COLLECTOR SEAT AND URINAL**

[75] Inventor: **Jeri Wexler Brown**, Houston, Tex.

[73] Assignee: **The United States of America as represented by the Administrator of the National Aeronautics and Space Administration**, Washington, D.C.

[22] Filed: **Mar. 15, 1973**

[21] Appl. No.: **341,621**

[52] **U.S. Cl.** **4/10**, 4/120
[51] **Int. Cl.** **A47k 11/02**
[58] **Field of Search** 4/10, 119, 120, 90, 112, 4/142

[56] **References Cited**
UNITED STATES PATENTS

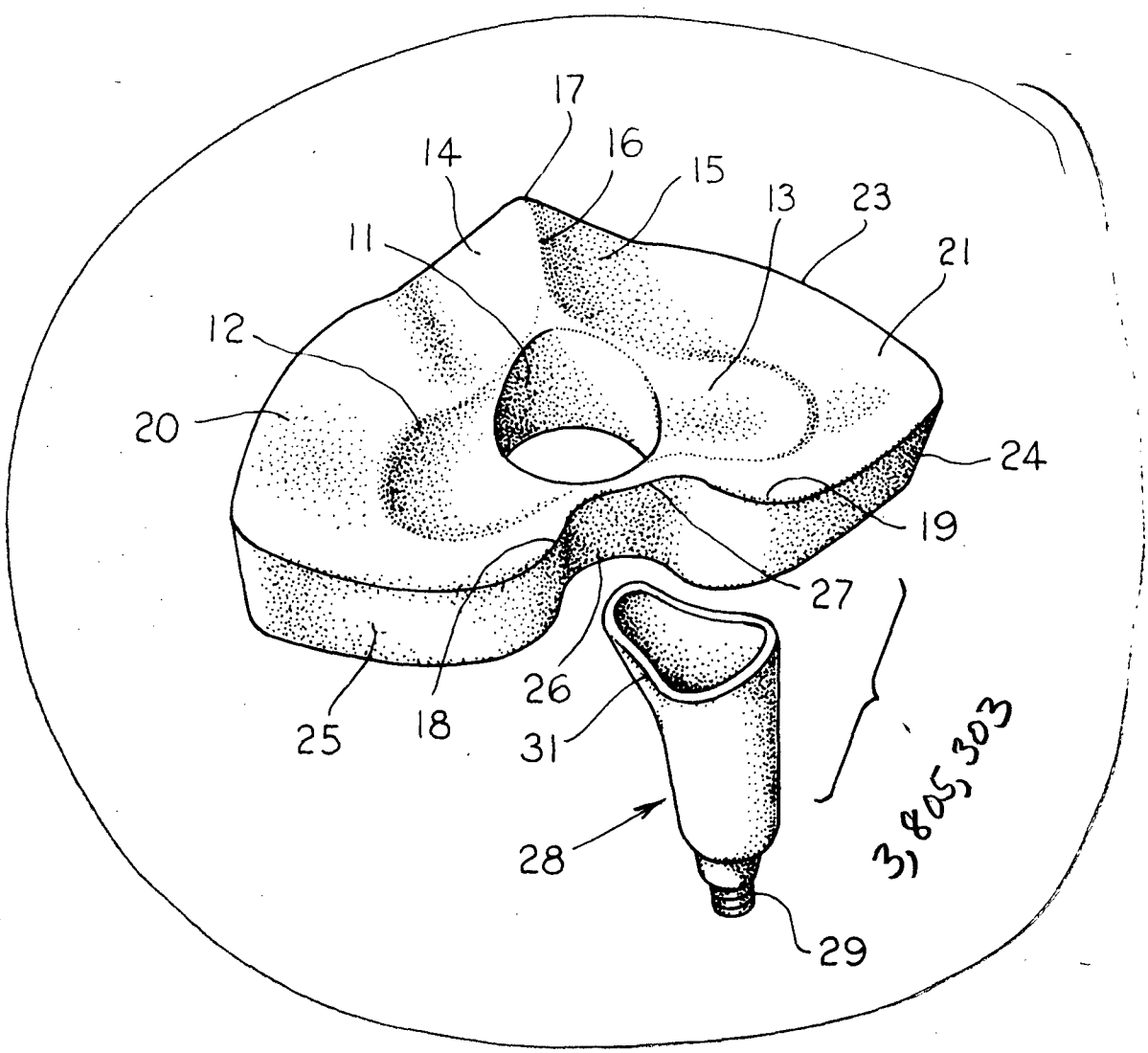
3,340,543	9/1967	Cella	4/10
3,340,544	9/1967	Cella	4/10
3,448,467	6/1969	Smith	4/10 X
3,158,874	12/1964	Bennett	4/142

Primary Examiner—John W. Huckert
Assistant Examiner—Milton S. Gerstein
Attorney, Agent, or Firm—L. D. Wofford, Jr.; W. H. Riggins; J. R. Manning

[57] **ABSTRACT**

A waste collection system for use in a reduced gravity including a seat having an opening centrally located therein, with a pair of opposed depressed valleys on opposite sides of said opening for accommodating the ischial tuberosities of a user. The seat has contoured surfaces for providing support of the user's body and includes a prominent ridge towards the rear, which provides forward-aft positioning cue to the user. A curved recess is provided adjacent the forward portion of the seat for accommodating a tubular urinal having an enlarged open mouth.

4 Claims, 5 Drawing Figures



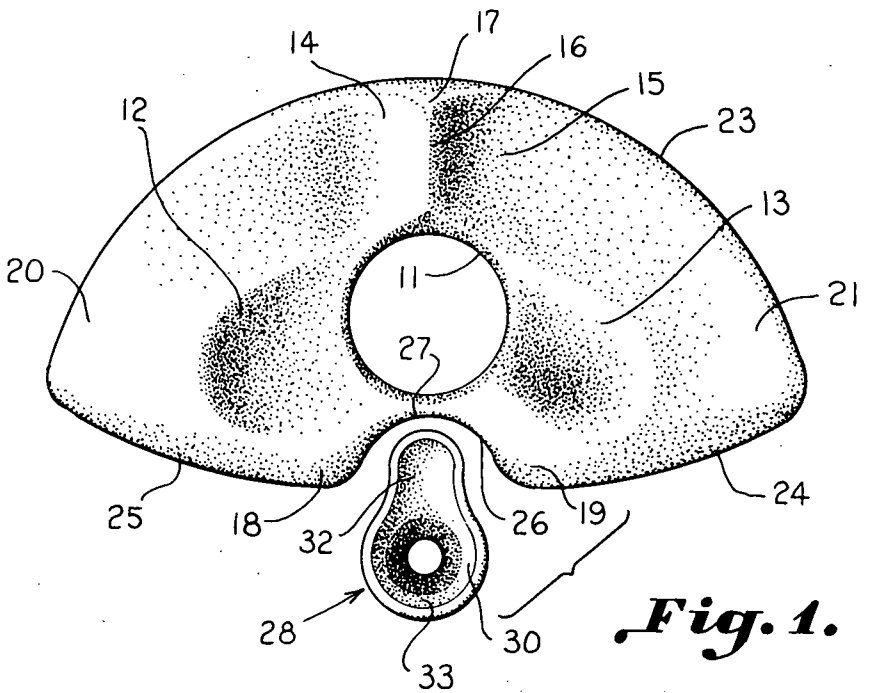

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Fig. 1.

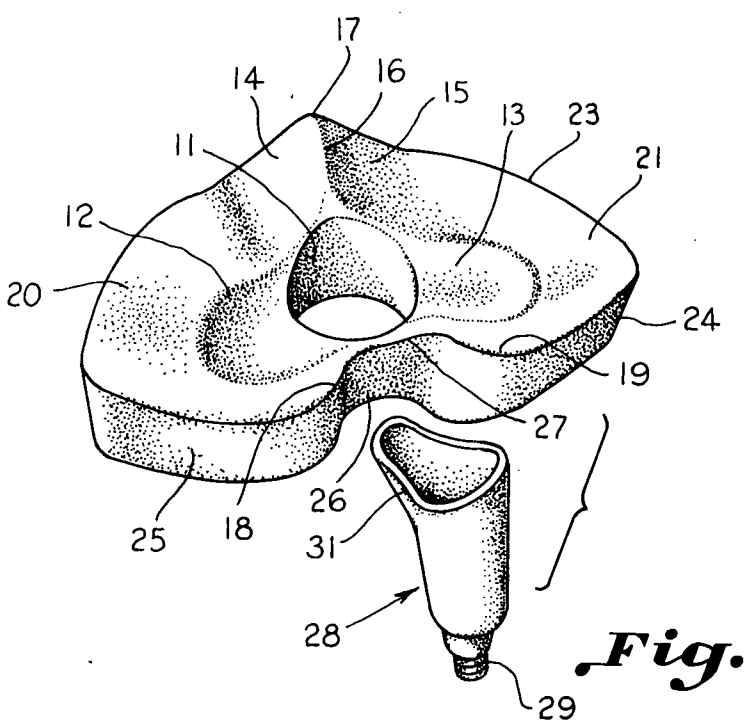
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Fig. 2.

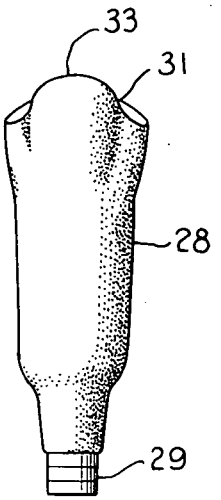

Fig. 4.

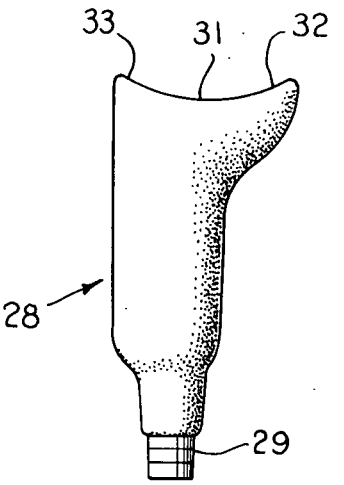

Fig. 5.

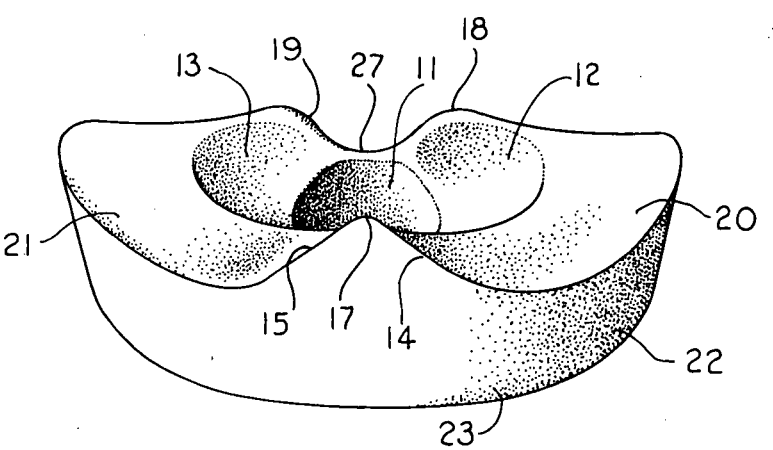

Fig. 3.

REDUCED-GRAVITY FECAL COLLECTOR SEAT AND URINAL

ORIGIN OF INVENTION

The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

BACKGROUND OF THE INVENTION

This invention relates generally to a waste collection system for use under reduced gravity, and more particularly to a fecal collector and urinal.

Heretofore, fecal collector seats and urinals designed for use in a reduced gravity environment, such as encountered by astronauts and the like in space travel, have been designed primarily for male crew members. These systems usually included a flat top cylindrical/conical urinal and a circular ring seat which are not satisfactory for accommodating female crew members. Other waste disposal systems designed for use in substantially zero gravity environments are shown in U.S. Pat. No. 3,340,543, granted to R. T. Cella on Sept. 12, 1967, and U.S. Pat. No. 3,448,467, granted to James Smith on June 10, 1969. While the seat construction illustrated in U.S. Pat. No. 3,340,543 may be satisfactory for male users, they would present considerable problems for female users.

SUMMARY OF THE INVENTION

The invention comprises a waste collection system that includes a seat and a urinal which are adapted to be used with conventional air flow systems that entrain the urine and feces for positive collection. Any suitable urinal flush could be incorporated with the urinal, if desired. The seat forming part of the system has contoured surfaces for providing support of the user's body and includes a prominent ridge towards the rear, which provides forward-aft positioning cue to the user. Sloping sides from the point of the ridge assist in spreading the buttocks of the user when seated. Such is desirable for relaxing the anal sphincter muscle. Opposed depressed valleys are carried on opposite sides of a central opening for providing positive cueing both forward and aft for the ischial tuberosities of a user. A curved recess is provided adjacent the front portion of the seat for accommodating a urinal. The urinal includes an elongated tubular member having an enlarged open mouth at the top.

Accordingly, it is a general object of the present invention to provide a waste collection system with an improved seat and urinal.

Another important object of the present invention is to provide a fecal collector seat that has contoured surfaces and valleys that enable positive cueing with the buttocks of the user and, also provides an interface between the user and a conventional waste collection system.

Still another important object of the present invention is to provide a fecal collector seat and urinal which are adapted to be used in a reduced gravity atmosphere by both male and female users.

Still another important object of the present invention is to provide a fecal collector seat and urinal which is relatively inexpensive and comfortable for users.

These and other objects of the invention will become more apparent upon reference to the following specification, attendant claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view illustrating a fecal collector seat and urinal forming a part of the waste collection system,

FIG. 2 is a perspective view of a fecal collector seat and urinal,

FIG. 3 is a perspective view taken from the rear illustrating the fecal collector seat forming part of the subject invention,

FIG. 4 is an enlarged front elevational view illustrating the urinal forming part of the subject invention, and

FIG. 5 is a side elevational view of the urinal.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1, 2 and 3, there is illustrated a seat forming part of the reduced-gravity waste collection system which has an opening 11 centrally located therein. A pair of opposed depressed valleys 12 and 13 are carried on opposite sides of the opening 11 for providing positive cueing, both forward-aft and lateral positioning, to the users. When the user places the ischial tuberosities in these depressed areas 12 and 13 proper positioning for elimination is assured. The size of the depressed valley areas 12 and 13 are designed to accommodate the range of varying anthropometric measurements of ischial tuberosities. This characteristic minimizes the possibility of misalignment between the user and the seat opening 11.

Extending outwardly from the depressed valleys 12 and 13 are contoured surfaces for providing support for the body of the user, as well as producing additional positioning cueing points. The contoured surfaces include sloping surfaces 14 and 15, which extend rearwardly and upwardly from the opposed depressed valleys 12 and 13, respectively, and terminate in a sloping ridge 16. The sloping ridge 16 extends from the rear of the seat downwardly towards the opening 11. The sloping surfaces 14 and 15, in combination with the sloping ridge 16 assist in spreading the buttocks as the user is seated. This is desirable for relaxing the anal sphincter muscle. An upper point 17 of the ridge 16 serves as a limiting boundary for how far aft the user sits.

Slightly curved forward ridges 18 and 19, respectively, are provided in front of the depressed valley areas for producing a forward-aft positioning cue. The ridges 18 and 19 are limiting boundaries for how far forward the user may sit. Laterally curved surfaces 20 and 21 disposed adjacent the outer edges of the opposed depressed valleys 12 and 13, respectively, slope upwardly for assistance in spreading the user's buttocks.

Vertical side walls surround the seat and are integral with the top surfaces 21 and 20, and include a semicircular rear portion 23 which extends into front curved portions 24 and 25 which extend inwardly. The front wall adjacent the central portion of the seat curves inwardly at 26 to define a curved recess 26. Between the curved recess 26 and the hole 11 is a relatively thin front wall portion 27. The thin separating wall 27 allows proper placement of the urinal generally

designated by the reference character **28**, within the recess **26** for female urine collection.

The urinal **28** may be used by both males and females. The position of the urinal is variable to achieve maximum accommodations for either sex by attaching a flexible hose (not shown), to a lower tubular portion **29**, or by mounting the urinal **28** on a swivel connection with a fixed pivot point. The use of a flexible hose would allow females to use the urinal while standing. The urinal **28** is tubular and has an enlarged open mouth **30** adjacent the top. An upper surface **31** of the urinal is concave, defining a seating surface which conforms to the contour of the user's body. The mouth **30** of the urinal **28** is narrower at its rear end **32** than adjacent the front end **33** so that such can be used in two positions, depending on the user's own preference. Collection is satisfactory in both positions.

In reduced-gravity modes such as encountered in outer space by astronauts seat belts and foot restraints would be used during elimination to aid the crew member in operational procedures. Air flow, such as presently being used in conventional waste collection systems, would be used to entrain the urine and feces for positive collection. As can be seen, the fecal collector seat and urinal provide capabilities for both male and female users.

The bottom of the seat, which is not shown, curves from the side walls **23, 24** and **25** inwardly towards the opening **11**, producing a flat lower surface for the seat.

What is claimed is:

1. A waste collection system for use under reduced gravity conditions comprising:

a. a seat having an opening centrally located therein;

b. a pair of opposed depressed valleys carried on opposite sides of said opening;

c. sloping surfaces extending rearwardly and upwardly from said opposed depressed valleys terminating in a sloping ridge extending from the rear of said seat to adjacent said opening;

d. said sloping ridge being centrally located between said opposed depressed valleys; and

e. a curved relatively thin front wall disposed between said opposed depressed valleys closely adjacent a front side of said opening defining a front centrally located curved recess;

f. whereby a seat is provided having depressed valleys which conform to the ischial tuberosities of a user while permitting positive cueing with the buttocks.

2. The waste collection system as set forth in claim **1** further comprising:

a. a urinal including an elongated tubular member having an enlarged open mouth adjacent the top adapted to be placed in said centrally located curved recess of said seat; and

b. an upper surface surrounding said mouth being concave defining a seating surface.

3. The waste collection system as set forth in claim **2**, wherein said: enlarged open mouth of said urinal is narrower at its rear end than adjacent its front end.

4. The waste collection system as set forth in claim **1**, further comprising: lateral surfaces disposed adjacent outer edges of said opposed depressed valleys sloping upwardly for assisting in spreading the user's buttocks.

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