TO: KSI/Scientific & Technical Information Division
Attention: 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.: 3,744,794

Government or Corporate Employee: U.S. Government

Supplementary Corporate Source (if applicable):

NASA Patent Case No.: MPS-24,046-1

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

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 ..."

Elizabeth A. Carter
Enclosure
Copy of patent cited above
A restraint system for securing a person to an ergometer while exercising under zero gravity conditions or while operating the ergometer in earth environment in a position other than the upright position. A padded, form-fitting body belt fits around the operator's waist and suspenders are attached to the body belt. The body belt is secured to the ergometer forwardly and rearwardly of the ergometer seat by adjustable belts joined to the body belt and releasably hooked to the ergometer frame.

3 Claims, 3 Drawing Figures
RESTRAINT SYSTEM FOR ERGOMETER

ORIGIN OF THE INVENTION

The invention described herein was made by employees 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 exercising equipment and more particularly to a device for securing a person on an ergometer while operating the ergometer in a zero gravity environment or while exercising in a position other than the upright position.

Ergometers are currently used for laboratory testing and training of astronauts so that the physical effects on an astronaut of a measured amount of exertion can be determined. These exercising machines will also be installed on future orbiting space stations to provide a means for crewmen to regularly engage in known levels of exertion during long duration space flights. The operators of the ergometers will be fitted with instruments for obtaining medical data to permit doctors to monitor and vary the energy required to rotate the pedals.

When operating an ergometer of a type that is similar to a bicycle frame in having a seat and handle bars a system is required for securing the operator to the ergometer when operating the ergometer in a zero gravity environment or when operating in a non-upright position in an earth environment. The system for securing the operator to the ergometer must provide firm securement while being comfortable, easy to don and remove, and must avoid undue restriction of body movement and blood circulation. The system must also enable the operator to be fitted with the necessary medical instruments such as EKG electrodes and wiring.

Prior art systems for restraining a person on a chair or seat do not satisfy the requirements indicated in that the number and location of straps and tethers causes intolerable interference with medical instruments, blood circulation, body motion and comfort and are too complicated for easy donning and removal.

SUMMARY OF THE INVENTION

The invention comprises a padded form-fitting body belt adapted to fit around the waist of the ergometer operator. Suspenders are attached to the body belt for extending over the operator's shoulders. The end portions of the body belt are releasably fastened to each other and to an adjustable belt at the front portion of the ergometer seat while the center of the body belt is releasably secured to the ergometer rearwardly of the ergometer seat.

Accordingly, it is an object of the present invention to provide a restraint system for securing a person on the seat of an ergometer while operating the ergometer in a zero gravity environment or in an earth environment while the operator is in a non-upright position.

Another object of the present invention is to provide a comfortable, easy to use restraint system for securing an ergometer operator on the ergometer seat which restraint system will provide firm securement but will not unduly restrict body motion or blood circulation and will not interfere with placement of medical instrumentation on the operator's body.
shoulder straps 48 and 49 are adjustable in length and has a slidable pad 55 thereon for bearing on the operator's shoulder.

As shown in FIG. 3 a second flexible strip in the form of a belt section 57 is joined by sewing to the rear central portion of the body belt 33 and passes through a slot in a guide 59 anchored to the rear underside of the seat 13. The belt section 57 extends below the seat 13 and is joined to a second belt section 61 by a seat belt type buckle 62. The belt section 61 is fastened to the seat pedestal 25 through a snap hook 63 attached to the belt section 61 and an eye hook 65 connected to the pedestal 25. When the belt section 57 is drawn tight through the buckle 62 the ergometer operator is comfortably secured on the back portion of the seat 13.

A thin metal plate 67 (indicated in phantom line in FIG. 3) is placed inside the back portion of the body belt 33 to rigidize the area where the suspenders 48 and 49 and the belt section 57 are joined to the body belt 33.

As is apparent from the preceding description, the restraint system 31 positively secures the operator to the ergometer seat while permitting maximum comfort and body movement. Blood circulation is not significantly restricted since a minimum number of body contacting straps are employed. Moreover, the restraint equipment is quickly and easily put on and adjusted.

We claim:

1. In combination with an exercising machine having a frame and a saddle type seat mounted on a frame pedestal, a restraint system for securing the operator of said machine on said seat comprising:
   a padded body belt having opposite end portions and being adapted for encircling the operator's waist;
   a first flexible strip having one end connected to said frame at a point below said seat and having the other end extending to the vicinity of the front portion of said seat;
   means for releasably connecting said opposite end portions of said body belt to each other and to said other end of said first flexible strip when said body belt is encircling the operator's waist;
   means for adjusting said first flexible strip whereby said strip may be drawn to and maintained in a taut condition;
   a second flexible strip having one end releasably connected to said frame pedestal at a point below said seat and having the other end connected to said body belt in the rear central portion of said body belt when said belt is encircling the operator's waist;
   means for adjusting said second flexible strip whereby said second strip may be drawn to and maintained in a taut condition.

2. The invention as defined in claim 1 wherein said means for releasably connecting said ends of said body belt and said other end of said first flexible strip comprises an apertured projecting stud attached to said first flexible strip, a row of holes in each of said end portions of said body belt, said end portions being adapted to cross with two of said holes in alignment, said projecting stud being adapted to extend through said aligned holes with said aperture being clear for receiving a fastening pin.

3. The invention as defined in claim 1 wherein said exercising machine comprises a pair of pedals adapted to be actuated by the operator's legs and a handle bar adapted for the operator to hold, said handle bar being mounted on a tubular member of said frame, said one end of said first flexible strip being connected to said tubular member.

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