INFLATABLE MATTRESS GUARD

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ABSTRACT

An inflatable mattress guard is provided. The present invention relates to a mattress guard having a sheet with side pockets on the top surface of the sheet wherein inflatable bladders can be inserted into the pockets and selectively inflated and deflated by the user of the mattress depending on the user's needs and preferences. The invention has application to bed safety devices for hospitals and nursing homes, as well as to general use for toddlers and young children in a home environment.
INFLATABLE MATTRESS GUARD

FIELD OF THE INVENTION

[0001] The present invention relates to an inflatable mattress guard. More particularly, the present invention relates to a mattress pad having side pockets on the top surface of the pad wherein inflatable bladders can be inserted and selectively inflated and deflated depending on the needs of the user of the mattress. The inflation and deflation of the bladders can be controlled by the user, thereby eliminating any undue restraint or restriction of movement against the user of the mattress. The inflatable mattress guard of the present invention has application to hospitals, and nursing homes, where selective patient mobility and safety is a priority. The invention also has application to bed safety restraints for toddlers and young children, among other uses.

BACKGROUND OF THE INVENTION

[0002] Beds with restraint systems are well known in the art. The obvious purpose of providing a restraint system or guard with a bed is to prevent a person from accidentally falling out of bed. The common crib is a well-known bed with a restraint system. In a crib, the child or infant is protected through side rails that are raised or lowered from the outside of the crib by a parent or caretaker. There have been many inventions in the art associated with different methods of bed safety; these inventions generally involve placing cushions or specifically fashioned foam cores around the edges of the bed.

[0003] U.S. Pat. No. 2,644,173 (James) discloses an impervious sheet with inflatable sides for babies. In this invention, the sheets of the baby bed are formed into a rounded, tubular shape that is filled with air and sealed, thereby forming an inflatable bladder located on the sides of the bed. The safety sheet with rounded sides can be used both on and off the bed, depending on the wishes of the parent. In a similar manner, U.S. Pat. No. 4,873,734 (Pollard) disclose[s] a bed bumper sheet having an array of pockets in which soft foam cores are inserted to provide a bed guard system to prevent a person from falling out of bed. Pollard's guard system provides a bumper area within the confines of an enclosed sleeping area such as a crib or bed with rails. United States Patent No. 5,421,046 (Streek) also discloses a bed guard system, where an inflatable pad is attached to the rails of a baby crib to form a four-sided bumper encircling the interior of the baby crib.

[0004] U.S. Pat. No. 6,848,130 B1 (Wilson) teaches a restraint system wherein foam wedges are inserted into a pocket sewn along the long sides of the edge of a bed sheet. The foam wedges provide a mild, yet continuous form of restraint. More recently, U.S. Pat. No. 7,107,635 B2 (Henry et al.) discloses a fitted bed sheet with bolsters mounted to the sheet. The bolsters are round, soft cores that can be selectively raised up and attached to the top sides of the sheet or, alternatively, lowered to the side of the bed, where they dangle off the side of the bed.

[0005] One problem not solved by these prior inventions is the need for the person using the bed to individually choose the operability of the restraint or guard system. This problem is particularly acute in hospitals and nursing home facilities, where laws impose strict guidelines on the restraining of patients. There exists a need in the art for a bed guard or bed restraint system that can effectively prevent a person from falling out of bed, yet is selectively operable by the user of the bed. There also exists a need in the art for a bed guard or bed restraint system that can quickly and easily turned on or off. There further exists a need in the art for a bed guard or bed restraint system that can selectively restrain portions of a side of a bed instead of the entire side of a bed.

SUMMARY OF THE INVENTION

[0006] It is an object of the present invention to provide a bed guard system that is selectively operable by the person using the bed.

[0007] It is a further object of the present invention to provide a bed guard system that can be quickly and easily engaged or disengaged, depending on user preference.

[0008] It is further desirable to provide a bed guard system that can selectively restrain or guard portions of a side of a bed rather than block the entire side of the bed.

[0009] The above-described features and advantages of the present invention, as well as additional features and advantages, will be set forth or will become more fully apparent in the description that follows. Furthermore, the features and advantages of the invention may be learned by the practice of the invention, or will be obvious to one skilled in the art after referring to the invention description, as set forth hereinafter.

BRIEF DESCRIPTION THE DRAWINGS

[0010] Various embodiments of the present invention are shown and described in reference to the numbered drawings wherein:

[0011] FIG. 1 shows a top angle view of the inflatable mattress guard of the present invention;

[0012] FIG. 2 shows a view of the underside of a mattress employing the inflatable mattress guard of the present invention;

[0013] FIG. 3 shows a side perspective view of the inflatable mattress guard of the present invention;

[0014] FIG. 4 shows a side perspective views of various inflatable bladders configured for use with the present invention;

[0015] FIG. 5 shows a top-side perspective view of an adjustable bed employing one embodiment of the inflatable mattress guard of the present invention; and

[0016] FIG. 6 shows the inflation tubes, motor, and controller of the present invention.

[0017] It will be appreciated that the drawings are illustrative and not limiting of the scope of the invention which is defined by the appended claims. The embodiments shown accomplish various aspects and objects of the invention. It is appreciated that it is not possible to clearly show each element and aspect of the invention in a single figure, and as such, multiple figures are presented to separately illustrate the various details of the invention in greater clarity.

DETAILED DESCRIPTION THE INVENTION

[0018] The present invention relates to an inflatable bed guard. In one embodiment of the invention, a mattress pad (10) (referred to FIG. 1) is provided. The mattress pad (10) has a top portion (14) upon which a user may rest or sleep. The top portion (14) is edged on four sides by a head piece (18) at the head of the pad, a foot piece (20) at the foot of the pad, and two side pieces (22) along each longitudinal edge of the pad. The head piece (18), foot piece (20), and side pieces (22) extend downward from the top portion (14) of the pad and are sewn together to make a rectangular fitted sheet-like mattress pad (10) for placement on top of a mattress (12). The mattress
pad (10) can be made of any suitable fabric or material with known properties of longevity when used in bedding applications. It is preferable that the material from which the mattress pad (10) is made be cotton, polyester, or any combination of the two. These materials are comfortable to sleep on and can easily be cleaned or laundered.

To assist in securing the mattress pad (10) to the mattress (12), an underskirt (30) can be sewn on the free edges of the head piece (14), foot piece (20), and side pieces (22) (referred to FIG. 2). The underskirt (30) can be made of a stretchable fabric such as spandex, elastane, or the like to allow the mattress pad (10) to be more securely placed on the mattress (12). The underskirt (30) can be of any width convenient for easily securing and removing the pad (10) from the mattress (12). A preferred width for the underskirt (30) is from two to four inches. Further, the present invention contemplates securing straps (32) being placed on the underside (16) of mattress (12) for connecting underskirt (30) across the longitudinal sides (22) of the pad (10). Securing straps (32) can be made of any suitable fabric or elastic material and can be either sewn onto the underskirt (30) or can be attached to either underskirt (30) or to the bottom edges of side pieces (22) by velcro attachments.

According to the present invention, longitudinal pockets (26) are sewn along the top portion (14) of pad (10) coterminous along one edge with side pieces (22) (referred to FIGS. 1 and 3). Pockets (26) are configured for securely accepting air bladders (40) and for keeping said bladders position along the longitudinal sides of the bed. End caps (27) are sewn onto the ends of pockets (26) and provided with zippers, snaps, velcro, or other closure means for closing pockets (26) after insertion of air bladders (40). Air bladders (40) are provided with nozzle ports (42) for automatic inflation or deflation, as described more fully below. In addition, pockets (26) have access ports (28) for allowing inflation tubes (58) to be connected to air bladders (40) while the bladders are located within the pockets.

One novel aspect of the present invention is the disclosure of air bladders having an effective flat edge (44) (referred to FIG. 4). The flat edge (44) of the air bladder (40) provides for more secure guarding of the patient when the bladder is inflated. Prior art air bladders have rounded configurations that place too much strain on the pad or sheet, causing the pad or sheet to dislodge from the mattress. By providing air bladders (40) with a flat edge (44), the patient can be more securely retained on the mattress (12). According to the present invention, air bladder (40) can have a cross-sectional shape of a semicircle, with the diameter of the circle forming the required flat edge (44). Another possible configuration for air bladder (40) is a triangle with one edge forming the flat edge (44). Yet another possible configuration of air bladder (40) is to use three round tubes in the shape of a triangle or pyramid (referred to FIG. 4), where the bottom layer of tubes forms an effective flat edge (44). The tubes are interconnected such that they can be inflated or deflated through a single nozzle port (42).

Yet another unique aspect of the present invention is the ability for the user to selectively inflate or deflate air bladders (40) depending on need or preference. To accomplish this, air bladders (40) are connected via inflation tubes (58) to a motor (50) and blower (52) (referred to FIGS. 5 and 6). Motors and blowers are well known in the art and one of skill in the art could achieve any number of motor/blower configurations for successfully building the present invention. According to one embodiment of the present invention, a motor (50) with a power source is connected to a blower (52) for driving air through central tube (57). Central tube (57) is provided with a three-way solenoid valve (56) for splitting the airflow along adjoining inflation tubes (58), which run to each longitudinal sides of mattress pad (10) for connection with air bladders (40). Inflation tubes (58) are provided with nozzle ports (42) of air bladders (40) through access ports (28). In addition, nozzle ports (42) can be further configured with two-way solenoid valves for controlling the inflation or deflation of individual bladders (40). For example, if the bed is placed against a wall, then there is need for only one air bladder (40) to inflate or deflate. By providing two-way solenoid valves at each nozzle port (42) of air bladders (40), the user can selectively inflate or deflate the individual bladders.

Yet another novel aspect of the present invention, and an improvement over the prior art, is the ability to quickly and easily install the guard features of the present inflatable mattress guard. An electronic controller (64) is provided for selectively activating the motor (50) and blower (52) as well as for selecting individual air bladders (40) for treatment. Controller (64) has bladder selector buttons (70) (which may also be configured as a selector knob), an inflation button (66), and a deflation button (68) (referred to FIG. 6). The controller (64) allows the user of the bed to ensure his or her own safety through selective application of the inflatable mattress guards. In this manner, the user of the bed is not trapped or otherwise impermissibly restrained within the bed.

In further accordance with the present invention, it is contemplated that each side of the bed may be protected by a plurality of air bladders (40) (referred to FIG. 3). This provides a unique advantage for use with hospital beds or nursing home beds, where the head and foot portions of the bed may be raised or moved according to the needs of the patient. By segmenting air bladders (40) into contiguous yet separate portions, the present invention accommodates a variety of bed shapes instead of just the single, common bed with a flat surface. For example, with the present invention, someone in a hospital or nursing home bed that has raised both the chest and foot portions of the bed can selectively deflate the middle air bladder (40) (shown in FIG. 5) for more easily sitting up and moving out of the bed without affecting the head and foot portions of the inflatable bed guard. This selective use of air bladders provides for quicker inflation and deflation of the desired air bladder and also save wear and tear on the motor (50) ad blower (52).

Yet another example of the beneficial advantages of the present invention is its use on a toddler’s or young child’s bed. By providing control of the inflation/deflation features of the inflatable bed guard to the child, the child is empowered with his own relative safety. This speeds the child’s development in sleep training habits. Further, through the use of segmented side bladders (40), the invention allows portions of the bed to be protected, which benefits young children with shorter body lengths. The segmented air bladders (40) also allows a parent to sit on the edge of the bed for reading stories or for attending to the child’s needs during the night while still maintaining the safety features inherent in the inflatable air bladder segments.

It is further provided that the air bladders (40) may house pressure sensors or similar movement or pressure detectors such that if the patient is lodged against air bladders (40) for a certain period of time that a signal is generated. In
this manner, a nursing staff or parent can monitor whether the
user of the bed needs help or other assistance during the night.

[0027] The present invention may be embodied in other
specific forms without departing from its spirit or essential
characteristics. The described embodiments are to be consid-
ered in all respects only as illustrative and not restrictive. The
scope of the invention is, therefore, indicated by the appended
claims rather than by the foregoing description. All changes
that come within the meaning and range of equivalency of the
claims are to be embraced within their scope.

What is claimed is:
1. A mattress guard fitted for placement on the top side of
a mattress, the mattress guard comprising:
a mattress sheet having a longitudinal pocket along the top
edge of a long side of the mattress;
an air bladder configured for placement within the longi-
tudinal pocket;
an inflation device operably connected to the bladder; and
a control unit in communication with the inflation device
for a user of the mattress to selectively inflate and deflate
the bladder.
2. The mattress guard of claim 1, wherein the air bladder
comprises a pressure sensor for sensing when the user is in
contact with the air bladder.
3. The mattress guard of claim 1, wherein the air bladder
has a flat surface aligned, within the pocket, along the top
dge of the long side of the mattress.
4. The mattress guard of claim 3, wherein the air bladder
has a cross-sectional shape of a semicircle.
5. The mattress guard of claim 3, wherein the air bladder
has a cross-sectional shape of a right triangle, the right tri-
gle comprising a short leg, a long leg, and a hypotenuse,
and wherein the long leg is placed, within the pocket, along
the top edge of the long side of the mattress and the short leg
is placed on an outer edge of the mattress.
6. A mattress guard fitted for placement on the top side of
a mattress, the mattress guard comprising:
a mattress sheet having more than one longitudinal pockets
along the top edge of a long side of the mattress;
air bladders configured for placement within the longitudi-
nal pockets;
an inflation device operably connected to the bladders; and
a control unit in communication with the inflation device
for a user of the mattress to selectively inflate and deflate
the bladders.
7. The mattress guard of claim 6, wherein the air bladders
comprise pressure sensors for sensing when the user is in
contact with the air bladders.
8. The mattress guard of claim 6, wherein the air bladders
have a flat surface aligned, within the pockets, along the top
dge of the long side of the mattress.
9. The mattress guard of claim 8, wherein the air bladders
have a cross-sectional shape of a semicircle.
10. The mattress guard of claim 8, wherein the air bladders
have a cross-sectional shape of a right triangle, the right tri-
gle comprising a short leg, a long leg, and a hypotenuse,
and wherein the long leg is placed, within the pockets, along
the top edge of the long side of the mattress and the short leg
is placed on an outer edge of the mattress.
11. A method of guarding against a user of a mattress
accidentally falling off the mattress, the method comprising
the steps of:
securing a mattress sheet to a top surface of the mattress,
the mattress sheet having longitudinal pockets along a
top edge of a long side of the mattress and air bladders
configured for placement within the longitudinal pock-
et;
connecting an inflation device to the bladders, the inflation
device and bladders being in communication with a
control unit;
allowing the user of the mattress to selectively inflate and
deflate the bladders using the control unit depending on
the user's needs and preferences.