ABSTRACT

Frequently there is a need to have a bed extended so as to provide for additional sleeping space. Typically a horizontal extension is provided that requires a larger floor space. Alternatively double-decker beds are used but these are cumbersome and less than attractive for every-day use. A bed comprised of two frames each having a mattress where the top frame lays over the bottom frame during normal usage is provided. When additional sleeping space is required the upper frame is raised vertically over the lower frame, creating a double-decker bed.
CONVERTIBLE DOUBLE-DECKER BED

FIELD OF THE INVENTION

[0001] The present invention relates generally to extension beds, and more specifically to an extendible double-decker beds.

BACKGROUND OF THE INVENTION

[0002] Frequently there is a need to have a bed extended so as to provide for additional sleeping space. Folding beds, rollaway beds and other solutions are used many times both at home and locations such as hotels, camping sites and the likes. Sofas that transfer into beds are also common place. In many children rooms double-decker beds are used but these are cumbersome and less than attractive for everyday use. Yet another solution is having a bed that is folded into a cupboard.

[0003] A typical alternative, frequently used at homes, is a horizontal extension. A bed 100 is designed to have two portions, a lower portion 120 and an upper portion 110 as shown in FIG. 1. When the additional sleeping space is required the lower portion 120 is horizontally moved and positioned in the manner shown in FIG. 2, thereby providing the additional sleeping space. While an effective solution, conserving space, by utilizing the area under a bed, it does require the availability of a large floor space, typically doubling the area being used. Typically the additional area is not always available for use, or requires rearrangement of a room's furniture.

[0004] Therefore, there exists a need to provide a bed that maintains the minimal footprint in both its regular and extended positions. It would be further advantageous if such a bed would be easy to maintain and operate, as well as maintaining a pleasing appearance at least when in its regular position.

SUMMARY OF THE INVENTION

[0005] The invention includes a convertible double-decker bed. The bed comprises a first frame for placing a first mattress; a second frame for placing a second mattress; and a mechanism enabling the vertical motion of said second frame from said first frame, wherein said first frame and said second frame are positioned, by said mechanism, at a vertical distance from each other with a gap between them.

[0006] The invention also includes transforming a bed comprising a first frame and a second frame placed one on top of the other into a double-decker bed. The method comprises causing a mechanism to vertically move said second frame of said bed from said first frame of said bed, wherein said second frame is moved from said first frame at a distance that enables the usage of said bed as said double-decker bed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The subject matter that is regarded as the invention is particularly pointed out and distinctly claimed in the claims at the conclusion of the specification. The foregoing and other objects, features and advantages of the invention will be apparent from the following detailed description taken in conjunction with the accompanying drawings.

[0008] FIG. 1 is a horizontally extendible bed in its closed position.

[0009] FIG. 2 is a horizontally extendible bed in its opened position.

[0010] FIG. 3 is a schematic diagram of a convertible double-decker bed in its closed position constructed in accordance with an embodiment of the invention.

[0011] FIG. 4 is a schematic diagram of a convertible double-decker bed in its extended position constructed in accordance with an embodiment of the invention.

[0012] FIG. 5 is a schematic diagram of a convertible double-decker bed in its closed position constructed in accordance with an embodiment of the invention.

[0013] FIG. 6 is a schematic diagram of a convertible double-decker bed in its extended position constructed in accordance with an embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0014] It is important to note that the embodiments disclosed by the invention are only examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily limit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others. In general, unless otherwise indicated, singular elements may be in plural and vice versa with no loss of generality. In the drawings, like numerals refer to like parts through several views.

[0015] In certain embodiments of the invention a bed comprised of two frames, each of which having a mattress where the top frame lays over the bottom frame during normal usage is provided. When additional sleeping space is required the upper frame is raised vertically over the lower frame, creating a double-decker bed.

[0016] Reference is now made to FIG. 3, where a first embodiment of a convertible double-decker bed 300 is shown in its closed position. The bed 300 is comprised of an upper frame 310 that holds a mattress (not shown), a lower frame 320 that holds a mattress (not shown), and posts 330A, 330B, 330C and 330D, positioned for example at the four corners of the bed 300. At least one of the posts 330 is further equipped with a control 340.

[0017] Posts 330 are comprised of several units that operate like a telescope in that when operated under the control of control 340, the sections comprising a post 330, for example post 330A extend as is shown with respect to FIG. 4. The extension of posts 330 is performed for all posts simultaneously thereby causing the vertical motion of the upper portion 310 with respect to the lower portion 320. The extension is designed to provide for a double-decker bed 400 when at the extended position. The extension of the posts 330 may be performed by use of, but not limited to, electrical motors or pneumatically. The control 340 causes, for example, the electrical motor, to begin its operation and cease it when the desired position has been reached. Alternatively, a pure mechanical approach may be used where control 340 is replaced by a crank designed to allow the hoisting of the upper frame 310 vertically over the lower frame 320. A person skilled-in-the-art would readily understand that the invention is not limited to a double-decker bed and multiple frames may be used without departing from the scope of the invention.

[0018] Reference is now made to FIGS. 5 and 6 where another embodiment of a convertible double-decker bed 500 is shown in its closed and opened positions, respectively. Similar in principle of operation to the system shown with respect to FIGS. 3 and 4 but with a different mechanism to cause the vertical motion of the upper frame 310 with respect to the lower frame 320. The posts 530, for example post
is comprised of two sections with a joint 540, for example joint 540A. When the control activates the mechanism, and when the bed 500 is in the regular position, the sections of posts 530 mover from approximately the center of the edge of the bed towards a respective corner of the end edge of the bed 500, thereby causing the upper frame 310 to move vertically upwards with respect to the stationary lower frame 320. The opposite operation occurs when the bed is to return from its extended double-decker position into its regular position with the upper frame 320 practically laying over the lower frame 310. As noted above the mechanism for hoisting the upper frame 320 with respect to the lower frame 310 may be, but not limited to, an electric motor or a pneumatic mechanism. In yet another embodiment a mechanical crank may be used for the purpose of causing such hoisting.

In one embodiment of the disclosed invention safety latches are used to secure the bed in its extended double-decker position. This may be required to avoid accidental return into the regular position of the bed when a person or another obstacle is in place. The latches may be operative manually or automatically, and designed to prevent the movement of the posts when in a locked position. In yet another embodiment a pressure sensor is placed on the lower frame 320 to detect the possibility of the presence of a person while on the lower frame 320. In yet another embodiment of the disclosed invention a pressure sensor is used on the upper frame 310 preventing overloading of the mechanism during its motion from one position to another. Upon detection of an overload, for example, a person present on the upper frame 310, the pressure sensor will cause the control 340 not to allow the movement of the upper frame 310 with respect to the lower frame 320. The detection of an overload may be defined as a pressure greater than a predefined threshold.

The foregoing detailed description has set forth a few of the many forms that the present invention can take. It is intended that the foregoing detailed description be understood as an illustration of selected forms that the invention can take and not as a limitation to the definition of the invention. It is only the claims, including all equivalents that are intended to define the scope of this invention.

What we claim is:
1. A bed comprising:
a first frame for placing a first mattress;
a second frame for placing a second mattress; and,
a mechanism enabling the vertical motion of said second frame from said first frame;
wherein said first frame and said second frame are positioned, by said mechanism, at a vertical distance from each other with a gap between them.
2. The bed of claim 1, wherein said mechanism enables the positioning of said second frame from said first frame at a distance that enables the usage of the bed as a double-decker bed.
3. The bed of claim 1, wherein said mechanism is at least one of: electrical, mechanical, and pneumatic.
4. The bed of claim 1, further comprising:
at least a safety latch.
5. The bed of claim 4, wherein said safety latch secures said second frame position with respect to said first frame position.
6. The bed of claim 4, wherein said safety latch is manually placed in its position.
7. The bed of claim 4, wherein said safety latch is automatically placed in its position.
8. The bed of claim 1, wherein said mechanism is further configured to enable vertical motion of said first frame.
9. The bed of claim 1, further comprising at least one of: a pressure sensor for said first frame and a pressure sensor for said second frame.
10. The bed of claim 9, wherein said pressure sensor is coupled to said mechanism.
11. The bed of claim 10, when a pressure detected by said pressure sensor is above a threshold, said mechanism will not perform said vertical motion.
12. A method for transforming a bed comprising a first frame and a second frame placed one on top of the other into a double-decker bed, comprising:
causing a mechanism to vertically move said second frame of said bed from said first frame of said bed,
wherein said second frame is moved from said first frame at a distance that enables the usage of said bed as said double-decker bed.
13. The method of claim 12, wherein a first mattress is placed in said first frame and a second mattress is placed in said second frame.
14. The method of claim 12, wherein said mechanism is at least one of: electrical, mechanical, and pneumatic.
15. The method of claim 12, further comprising:
locking said mechanism in place using at least one a safety latch.
16. The method of claim 15, wherein said safety latch is placed in its position using at least one of a manual process and an automatic process.
17. The method of claim 12, wherein said vertically move comprises the use of at least one of the following forces: electrical, mechanical, and pneumatic.
18. The method of claim 12, further comprising:
causing said mechanism to vertically move said first frame with respect to a floor.
19. The method of claim 12, further comprising:
sensing a pressure on said first frame using a pressure sensor coupled to said first frame; and
sensing a pressure on said second frame using a pressure sensor coupled to said second frame.
20. The method of claim 19, further comprising disabling said vertical motion when said pressure is above a threshold.

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