

TITLE OF INVENTION: A RETRACTABLE BED SYSTEMTHIS SHEET HAS BEEN
REPLACED**TECHNICAL FIELD**

THIS INVENTION relates to a retractable bed system and in particular relates to a retractable bed concealed in the ceiling of a room, which can be lowered from the concealed position by means of control switches.

BACKGROUND OF THE INVENTION

Home living space in the modern world has been and continued to be very expensive, especially in cities where the population is densely populated. Thus, space management has become a necessity in order to create more living space. Traditionally, it is a common practise to use retractable furniture, such as a bed, table, chair, etc in houses where limited living space is available and expensive. In use, the retractable furniture, for example a table, is extended out from its concealed position and is placed at a desired location. When it is not in use, the furniture is retracted to its concealed position and stored away in the storage room. This traditional way of retracting and extending the furniture are rather inconvenience for the reason that the furniture has to be carried from place to place and a storage space for the furniture is required. In addition, no automatic retracting control is provided to the furniture and therefore it is rather laborious and time consuming in making use of the furniture.

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is disclosed a retractable bed system comprising: (a) a housing having a first compartment and a second compartment, a retracting mechanism being mounted within said second compartment, said housing being mounted onto the ceiling of a room; (b) a platform, comprising a frame, a plurality of top plates and bottom plates, detachably mounted within said first compartment, being suspended to a rotating shaft of said mechanism via conveyor belts such that said platform is retractable upward from an extended position or extended downward from a concealed position at the ceiling; and (c) a pair of guiding track vertically mounted onto a mounting wall such that the retracting movement of the platform is guided



vertically against said mounting wall.

According to another aspect of the invention, there is provided a retractable bed, of which the structure is formed from a number of parts which are releasable joined together.

It is an object of the present invention to overcome, or substantially ameliorate, the abovementioned disadvantage by provision of a retractable bed in which the retraction of the bed can be automatically controlled.

Another object of the present invention is to provide a retractable bed having a retracting mechanism to extend the platform from a concealed position to a desirable position for use.

Another object of the present invention is to provide a retractable bed, wherein conveyor belts are provided at the edge of a platform to allow the retraction of the platform by the retracting mechanism.

It is another object of the present invention to provide a retractable bed, wherein a pair of safety belts are also provided at the edge of the frame of the platform as a safety precaution in case of accidental falls of the platform.

The invention will be more fully understood in the light of the following description of one specific embodiment. The description is made with reference to the accompanying drawings of which;

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of the housing, showing the first compartment and the second compartment, in accordance with the present invention;

Figures 2A, 2B and 2C are the perspective views of the platform in accordance with the present invention, Figure 2A being the bottom view



showing a plurality of bottom plates, Figure 2B being the top view of the platform and Figure 2C being the frame of the platform;

Figure 3 is a perspective view of the bottom plate of the platform, showing the mounting of a spotlight at the undersurface of the bottom plates;

Figure 4 is a schematic view showing the position of the housing of Figure 1 and that of the platform in accordance with the present invention;

Figure 5 is a perspective view of the track roller in accordance with the present invention;

Figure 6 shows the perspective views of the guiding track in accordance with the present invention;

Figure 7 is the perspective view of the housing, indicating the position of the retracting mechanism within the second compartment and the conveyor belts being suspended to the housing, in accordance with the present invention; and

Figure 8 is the perspective view of the shaft of the retracting mechanism, showing the mounting of the conveyor belts at one end thereof to the shaft of the retracting mechanism, in accordance with the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In accordance with the present invention and as shown in the drawings, Figures 1 to 8 and particularly in Figure 1, a retractable bed system comprises a housing (10) having a first compartment (12) and a second compartment (14), a retracting mechanism (15) (as shown in Figure 7) having a rotating shaft (24) and being mounted within the second compartment (14) of the housing (10), the housing (10) being mounted onto the ceiling of a room; a platform (16),

comprising a frame (18), a plurality of top plates (20) and bottom plates (22) releasably mounted within the frame (18), the platform (16) having the size as that of the first compartment (12), and detachably mounted within said first compartment (12); a pair of conveyor belts (71) firmly fitted at the sides of the platform (16) at one end thereof and the other ends thereof being fitted to the shaft (24) of the retracting mechanism (15); and a pair of guiding track (26) vertically mounted onto a mounting wall (40) such that the retracting movement of the platform (16) is guided vertically against said mounting wall (40) and the platform (16) is prevented from lateral swinging.

Figure 1 schematically shows the housing (10), substantially rectangular, having two shorter sides (32) and two longer sides (34). The housing (10) comprises the first compartment (12) and the second compartment (14), wherein the housing (10) can be mounted onto the ceiling (not shown) of a room or any convenient location with one longer side (34) of the housing (10) is mounted against the mounting wall (40), which is shown in Figure 7). A plurality of horizontal bars (36) are mounted across the first compartment (12) and the second compartment (14) is formed adjacent at the other longer side (34) of the housing (10). The second compartment (14) is adapted for the retracting mechanism (15) (shown in Figure 7) having the shaft (24) for rotation within the first compartment (12) so as to retract the conveyor belts (71) attached thereto. A side panel (38) is hingedly connected at the lateral side of the second compartment (14) so that the second compartment (14) can be used as a storage compartment for storing pillow, blanket, etc.

As shown in Figures 2A, 2B, and 2C, there are shown a platform (16) comprising a frame (18) having a plurality of transverse bars (19) (as shown in Figure 2C), a plurality of top plates (20) (as shown in Figure 2B), and a plurality of bottom plates (22) at the bottom face of the platform (16). The platform (16) is substantially rectangular and can have various type of sizes, such as size of the single bed, queen-size bed and king-size bed. The size of the platform (16) is adaptable to that of the first compartment (12) of the housing (10) such that the platform (16) is exactly fitted to the first compartment (12). Figure 2A shows



the bottom view of the platform (16), wherein a pair of spot light (50) are mounted at the undersurface of the platform (16) such that the spot light (50) can be used as a ceiling light when the platform (16) is retracted upward against the ceiling. Figure 2B illustrates the top view of the platform (16), wherein a plurality of top plates (20) are mounted across the frame (18). A suitable mat or the like, such as a mattress (not shown) of suitable size, is to be placed on the top plates (20) of the platform (16). In accordance with the present invention, the top plates (20) are slidably mounted and enclosed within the frame (18) of the platform (16), as shown in Figure 2B. Figure 2C indicates the frame (18) of the platform (16) having a plurality of transverse bars (19). The parts of the platform (16), such as the frame (18), the transverse bars (19), the top plates (20) and the bottom plates (22) are releasably mounted and can be easily detached from each other.

Referring further to Figure 1 and Figure 4, a pair of guiding track (26) are vertically mounted onto the mounting wall (40) and are adapted for upward and downward sliding movement of track rollers (60) (as shown in Figure 5), which is mounted in pair onto the side of the platform (16) and opposite to the guiding track (26). As shown in Figure 4, a pair of safety belts (100) are also provided at the edge of the frame (18) of the platform (16) as a safety precaution in case of accidental falls of the platform (16).

Referring to Figures 3 and 2B, a spot light (50) is mounted onto the bottom plate (22) so that when the platform (16) has retracted and contained within the compartment (12), the bottom plates (22) with the spot light (50) are functioned as the ceiling light.

Figure 4 shows the mounting of the housing (10) against the mounting wall (40) and on the ceiling. Figure 5 shows a track roller (60) which is mounted at the edge of the platform (16) such that the roller 62 is slidably fitted within the slot (28) of the guiding track (26). The detailed structure of the guiding track (26) is shown in Figure 6. When the platform (16) is descending from its original position (closely fitted against the ceiling) by means of the retracting mechanism

(15), the platform (16) smoothly slides downward and will not swing away from place to place. Figure 6 is a perspective top view of the guiding track (26).

Figure 7 shows the housing (10) having being mounted with a retracting mechanism (15) within the second compartment (14). As seen in the Figure, the retracting mechanism (15) is mounted within the second compartment (14) while the conveyor belts (71) are retractable and extendable which then lift up or lowered down the platform (16). Figure 8 shows the shaft (24) of the retracting mechanism (15), wherein the conveyor belts (71) are mounted at one end to the shaft (24) and the other end of the belts (71) is mounted to the shorter side of the platform (16) such that the retracting mechanism (15) retracts the platform (16) when a switch (not shown) is turned on. In accordance with the present invention, the shaft (24) of the retracting mechanism (15) is mounted onto a support, such as the ceiling wall or a supporting bar by means of bearing (80), which is shown in Figure 8. In accordance with the present invention, the conveyor belt (71) is a polyester belt.

Alternatively, the corners of the platform (16) are provided with a hingedly connected legs which are extended out from their respective positions and placed onto the ground as auxiliary supports to the platform (16).

In operation, a control switch (not shown) which controls the retracting mechanism (15) is turned on and the retracting mechanism (15) lowers the conveyor belts (71) from the shaft (24). Accordingly, the platform (16) is moved smoothly downward from the housing (10) which is mounted on the ceiling while the track roller (60) slides along the guiding track (26) to a desirable height from the ground. A mattress is then placed on the top plates (20) of the platform (16).

If the platform (16) is not in use, and it is to be restored to its concealed position, another switch (not shown) is turned on and the shaft (24) of the retracting mechanism (15) rotates in the direction opposite to that in the first instance. The conveyor belts (71) retract as a result of the rotation movement of the shaft (24)

and accordingly the platform (16) is lifted upward. In the process of lifting the platform (16), the track rollers (60) move upward along the guiding track (26) smoothly until the platform (16) is finally within the first compartment (12) of the housing (10).

It will be apparent from the above description that the retractable bed system according to the invention has been described in detail, it will be obvious to persons skilled in the arts, that numerous modifications and variations may be made to the illustrated embodiment, in addition to those already described, without departing from the basic inventive concepts. All such variations and modifications are to be considered within the scope of the present invention, the nature of which is to be determined from the foregoing description and the appended claims.



THE CLAIMS defining the invention are as follows:

1. A retractable bed system comprising:
 - (a) a housing having a first compartment and a second compartment, a retracting mechanism being mounted within said second compartment, and said housing being mounted onto the ceiling of a room;
 - (b) a platform, comprising a frame, a plurality of top plates and bottom plates, detachably mounted within said first compartment, being suspended to a rotating shaft of said mechanism by a pair of conveyor belts such that said platform is retractable upward to the first compartment or is lowered downward from the ceiling; and
 - (c) a pair of guiding track vertically mounted onto a mounting wall such that the retracting or lowering of the platform is guided against said mounting wall.
2. A retractable bed system as set forth in Claim 1, wherein a pair of track rollers are mounted along one edge of the platform and are corresponding to the guiding tracks.
3. A retractable bed system as set forth in Claim 1, wherein the bottom plates are provided with a spotlight.
4. A retractable bed system comprising:
 - (a) a housing having a first compartment and a second compartment, a retracting mechanism being mounted within said second compartment, and said housing being mounted onto the ceiling of a room;
 - (b) a platform, comprising a frame, a plurality of top plates and bottom plates, detachably mounted within said first compartment, being suspended to a rotating shaft of said mechanism by a pair of conveyor





belts such that said platform is retractable upward to the first compartment or is lowered downward from the ceiling;

(c) a pair of guiding track vertically mounted onto a mounting wall such that the retracting or lowering of the platform is guided against said mounting wall, and

(d) a supporting leg hingedly connected to each of the corners of the platform.

5. A retractable bed system as set forth in Claims 1 or 4, wherein the pair of conveyor belts are fitted at the sides of the platform said platform are fitted to one end of the conveyor belt.
6. A retractable bed system as set forth in Claims 1 or 4, wherein the other end of the belts are mounted to the rotating shaft of the retractable mechanism.
7. A retractable bed system as set forth in Claims 1 or 5, wherein the plurality of top plates and bottom plates are releasably connected to form the platform.
8. A retractable bed system as set forth in any of the preceding Claims 1, wherein the conveyor belt is a polyester belt.
9. A retractable bed system as set forth in Claim 1, wherein a pair of safety belts are mounted onto the side of the platform.
10. A retractable bed system as set forth in Claim 2, wherein the track rollers are slidable within the guiding track.
11. A retractable bed system as set forth in Claim 1, wherein the platform is substantially rectangular.



12. A retractable bed system substantially as described with reference to the drawings.