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SOFA-BED

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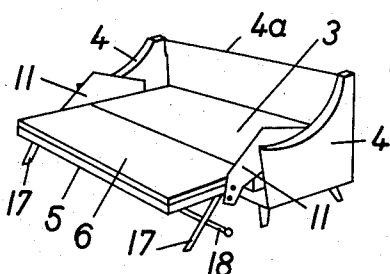


FIG. 1.

FIG. 2.

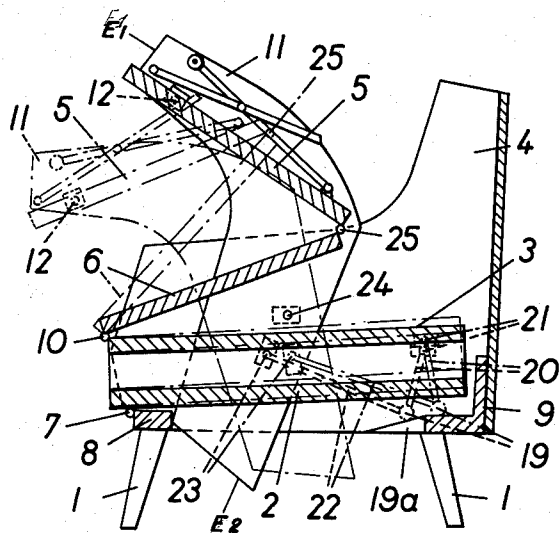
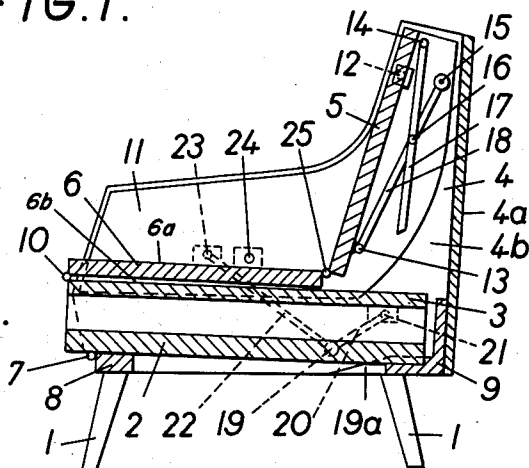
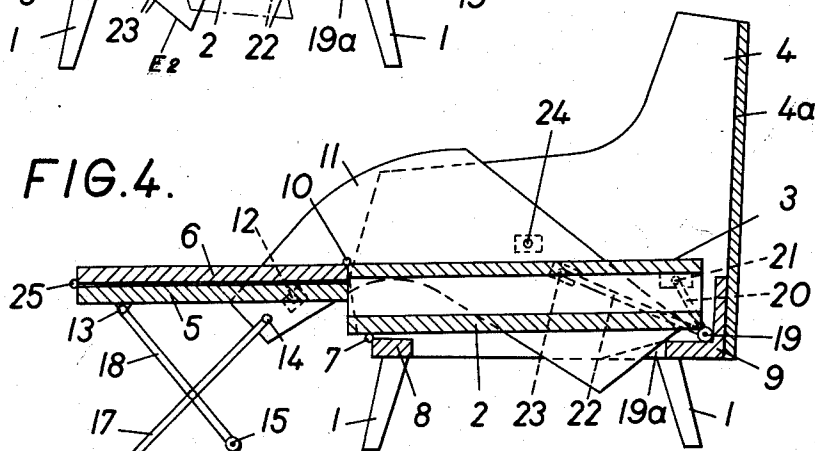


FIG. 3.

FIG. 4.



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SOFA-BED

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6 Claims. (Cl. 5—44)

This invention relates to sofa-beds of the type in which the seat portion of the sofa is composed of superposed elements hinged together at their front edges, the upper of the elements being provided on its upper side with a sofa cover, and on its under side with a bed cover, the arrangement being such that the elements can be made coplanar so as to form a bed of substantial width.

Sofa-beds of above mentioned kind are known. Compared with sofa-beds of the kind wherein the back rest of the sofa is folded down to the plane of the seat portion to form a bed and the sofa cover is, therefore, also used in the bed position, the sofa according to the invention has the advantage that it may be provided with two different covers, i.e. a sofa cover for use in the normal or sofa position, and a bed bolster for the bed position. The covers are, therefore, not subjected to double wear. Furthermore, most people prefer to rest on a bolster giving the impression of a conventional bed. Additionally, hygienic reasons favor the use of separate covers for sleeping and for sitting.

Sofa-beds of the kind with which the invention is concerned, however, suffer certain drawbacks as follows:

(1) The casing or frame is generally too high and too heavy, particularly when it provides a storage space for bed clothes, such as pillows, blankets and so forth.

(2) The converting mechanism is complicated and requires various manipulations.

(3) The back rest in a number of designs is in the way in the bed position.

(4) The storing of bed clothes is a problem due to lack of space, even when the seat frame is used for this purpose.

An object of the invention is to eliminate the difficulties mentioned above and to provide a sofa which has, despite a simple and conventional appearance, sufficient storage space for bed clothes, and which is readily convertible from sofa to bed form and vice versa by a single manipulation. Another object of this invention is to provide a converting mechanism which is reliable and provides a bed structure which is stable and has no tendency to rock. A still further object of the invention is to provide a bed-sofa, which in bed form is sufficiently wide to be used by two persons.

To achieve the above and other of its objectives, the invention contemplates the provision of a sofa-bed of the type in which the seat comprises two portions which are hinged together at their front edges, and wherein the upper portion is provided on its upper side with a sofa cover and on its lower side with a bed bolster, the lower portion being arranged to incline rearwardly when in sofa position and being lifted at its rear edge in bed position to attain a horizontal position in the same plane as the upper portion when the latter is turned forwardly to form a bed. The lifting is performed by means acting automatically during the conversion operation and, in the sofa position, space is provided for the bed clothes behind the back rest of the sofa.

The sofa-bed of the present invention is characterized substantially in that the sofa back rest is pivotally connected to a supporting cheek pivoting about a point in a fixed cheek, or in a frame portion of the sofa. The supporting cheek during conversion of the sofa into bed position lifts the upper edge of the bed cushion into a horizontal position by means of appropriate link arms

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and a caster cooperating with an inclined surface at the back edge of the supporting frame. The sofa back rest, the seat cushion and the bed cushion are pivotally connected by means of reinforced seams to a triplicate cushion body in which the seat cushion constitutes the middle portion and is positioned, when the sofa is converted into bed, on the back rest which is mounted on an appropriate support, and constitutes together with the said back rest an extension of the width of the bed.

According to another feature of this invention, the support of the back rest of the sofa in the bed position consists of cross legs provided at the rear side of the said back rest and moved to the correct supporting level by the forward movement of the pivoting supporting cheek, the cross legs being pulled by the same supporting cheek back towards the rear side of the back rest during conversion into a sofa.

These and other features of the invention will appear from the accompanying drawing, in which:

FIG. 1 is a perspective view of the sofa-bed in its extended or bed position.

FIG. 2 is a side view, partially in section, of the structure arranged to constitute a sofa,

FIG. 3 is a view, similar to FIG. 2, of the structure in an intermediate position, and

FIG. 4 is a view, similar to FIG. 2, of the structure in extended bed position.

The sofa, which is provided in accordance with the invention and is illustrated in the drawing, has a conventional support frame comprising a front ledge 8, a back edge ledge 9, legs 1 and fixed cheeks 4. The sofa is provided with a rear wall covered with a textile fabric or the like, so that the sofa can be exposed to view from all sides.

The fixed cheeks 4 have their upper edges formed as arm rests, preferably of sufficient width as to present a good appearance. At about the center of each of the fixed cheeks 4 is provided a pivot 24 supporting pivotally a support cheek 11 falling, in the sofa position, within the contours of the fixed cheeks 4. Cheeks 11 are pivotally supported between ends E1 and E2 by pivots 24. The cheeks 11 may be made from furniture plates, but other materials such as plastics may also be used. In the preferred embodiment of the invention, the pivoting cheeks 11 are disposed inside the fixed cheeks 4 and form there an aesthetic graduation towards the seat and are covered with fabric on their visible sides. The pivoting cheeks 11 may, however, also be mounted on the outside of the fixed cheeks when given an appropriate form. The pivoting cheeks 11 constitute the central pivoting mechanism and the support for the back rest 5 of the sofa. Back rest 5 comprises a rectangular frame to which there are fastened vertical rows of wave formed springs (not shown) upon which the back cushioning is mounted. Somewhat below its upper edge, the back rest frame is pivotally connected with the support cheek 11 by means of a pivotal connection or pivot 12. On its rear side the back frame is provided with cross legs 17, 18 which are pivotally connected by a pivot 16. At its end 13, the leg 18 is pivotally connected with the rear side of the back frame 5 and, at its other end, the leg 18 is provided with a caster or roller 15. The other leg 17, is at one end 14, pivotally connected with the support cheek 11, while its other end is free and may be provided with a knob of rubber or the like.

The upper portion of the sofa seat consists of a relatively thin cushion 6 which may be of expanded plastic, rubber sponge or the like. The cushion 6 is covered on its upper side with a cover material and on its under side with a bed bolster. The cushion or mattress 6 rests in the sofa position on the under-lying bed bolster member 3

having a bottom 2 and side walls. The bed bolster 3 is preferably provided with a cushion of a stronger material than the seat cushion and the back rest, since the bottom should provide all the necessary cushion effects for the bed. Coil springs might be used in the bolster, but preferably other spring means are used. It is important, however, that the cushioning property of the bed bolster 3 is equal to the sum of cushioning properties of the back rest 5 and the seat cushion 6, so that the bed has the same cushioning effect over its whole width.

The rear edge of the seat cushion 6 is hingedly connected by pivot 25 with the back rest 5 and the front edge is connected by pivot 10 with the underlying bed bolster 3. Cushion 6 has a normally upwardly facing surface 6a constituting a seating surface and a normally downwardly facing surface 6b constituting a bed bolster. Said pivots 10 and 25 may simply consist of seams which are provided with appropriate reinforcements. The hinged aggregate is shaped in such a manner that the back rest 5, the seat cushion 6 and the bed bolster 3 constitute together a flexible, cushioned body.

The means which includes the upwardly facing bed bolster 3 is movable to a certain degree in the support frame and is arranged so that it is inclined appropriately in the rearward direction when the structure is in sofa position, as is normal for a sofa seat. This means can be brought to horizontal position when the sofa is converted into a bed. Such change requires that the means be lifted at its back edge. To this end said means is pivotable about the pivot 7 on the upper front edge of the support frame. The lifting operation is performed by a control means consisting of two arms 20 and 22 which are interconnected by a roller or caster 19. The arm 20 is further pivotally connected by pivot 21 with the rear part of said means, while the arm 22 is pivotally connected with the support cheek by a pivot 23. The rear ledge 9 of the supporting frame is provided with an oblique sliding path or ramp 19a. The caster 19 moves upwardly along said sliding path 19a when pressed rearwardly by the arm 22 and the arm 20 keeps the rear of the bolster elevated when the caster is resting in its end position, as shown in FIG. 4. An accurate adjustment of the lengths of arms 20 and 22 and an appropriate positioning of the slide way 19a will result in a very short slide path along which the caster 19 is to be moved, so that the force required for the conversion is minimized and the conversion facilitated.

The converting operation is very easy. The operator simply engages the upper edge of the back rest 5 and pulls it somewhat forward. When the back rest has passed its vertical position, the operator releases the grip so that the back rest will fall forwardly by its own weight and will be folded together with seat cushion 6 to form, together with same, the mattress of the outer or foremost half of the double bed. The pivoting support cheeks 11 not only lift the rear edge of the bed bolster 3, but also cause the cross legs 17 and 18 to open in order to support that portion of the bed which consists of the seat cushion 6 on the back rest 5. The caster 15 facilitates the last step of the conversion movement since it allows the leg 18 to slide to its end position. It should be pointed out that the bilateral arrangement of the arms 22 facilitates the converting movement since the support of the bed bolster 3 provides for stabilization of both pivoting cheeks 11.

It should also be pointed out that the cross legs 17 and 18 in their folded position between the back rest 5 and the rear wall or back 4a will hold the back rest 5 steadily when the structure is used as a sofa. The upper edge of the back rest 5 may have any desired form, such as that of a cushion adapted for being gripped by its upper edge, and it may be arranged to fall, in the sofa position, below a ledge which is connected with the rear wall and the fixed cheeks 4.

When the structure is converted to bed form, the back

rest 5 is out of sight and covered by the seat position 6. In the sofa position, the bed clothes may be rolled out from the storage room 4b behind the back rest 5. There is sufficient storage room for pillows, quilts and so forth.

Some storage place is also available between the seat cushion 6 and the bed bolster 3.

Although a preferred embodiment of the invention has been disclosed above, there will be obvious to those skilled in the art many variations coming within the scope of the invention as defined by the following claims.

What is claimed is:

1. A sofa bed comprising a frame, an upwardly facing bed bolster, and a cushion adapted for normally constituting a seat pivoted to the front of said bolster, said cushion being normally superposed on said bolster and including an upwardly facing surface forming a seating surface and a downwardly facing surface forming a bed bolster, said downwardly facing surface being in face to face relation with said upwardly facing bed bolster with said cushion constituting a seat, said cushion being pivotally moved to an extended position whereat the surface of the cushion forming the bed bolster faces upwardly and is substantially coplanar with the upwardly facing bed bolster, the first said bolster normally being inclined to the horizontal, control means coupled to the first said bolster for bringing the same to horizontal position as said cushion is pivoted to said extended position, a back rest pivoted to said cushion, pivotable means pivoted to said frame and having pivotal connection with said back rest whereby the latter can be displaced between a normal position at the back of said frame and an extended position beneath said cushion with the latter in extended position, and a scissors arrangement of legs pivoted to each other and between said pivotable means and said back rest, the scissors arrangement being closed with said back rest in normal position and being opened to support said back rest with the latter in extended position.

2. A sofa bed as claimed in claim 1, wherein said control means comprises a ramp on said frame, arms pivoted to said pivotable means and the first said bolster, and a caster pivoted to said arms for displacement along said ramp whereby the first said bed bolster is brought to horizontal position.

3. A sofa bed as claimed in claim 2, wherein said frame includes a back, said back and back rest enclosing a storage space for bed clothes.

4. A sofa-bed having sofa and bed positions comprising a frame, a bed bolster on said frame, a cushion on said bed bolster and having a forward edge pivotally connected to the bed bolster, a back rest pivotally connected to said cushion at an edge remote from the first said edge thereof, said bed bolster being in backwardly inclined attitude with said sofa bed in the sofa position, means coupled to said bed bolster for moving the same into substantially horizontal position with said sofa-bed in the bed position, said back rest being adapted to be moved into face-to-face relation with the cushion and with the latter inverted and extended to form a continuous horizontal surface with the bed bolster, said means being coupled to said back rest for moving the same and said cushion simultaneous with movement of said bed bolster to provide said bed position, said means comprising a cheek having ends and being supported from said frame for pivotal movement at a location intermediate said ends, said cheek being connected to said back rest at one of said ends to move the back rest in accordance with movement of said cheek, a first arm, a caster, a further arm, said caster and further arm being coupled to said first arm at an end thereof remote from the other of said ends of said cheek, said further arm having an end which is pivotally connected to said bed bolster and, an inclined ramp adapted to guide said caster upon pivotal movement of said cheek such that said further arm is moved to displace said bed bolster into horizontal position as said cheek assumes a position corresponding to the bed position.

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5. A sofa-bed as claimed in claim 4 comprising a scissors linkage, including a leg which is pivotally connected to said cheek at a position spaced from the connection of said cheek to said back rest and a second leg pivotally connected to said back rest so that said linkage is extended with the sofa-bed in the bed position.

6. A sofa-bed as claimed in claim 4 comprising a side cheek of determinable shape on said frame, the first said cheek having a shape substantially the same as that of the side cheek and being pivotally connected thereto in parallel spaced relation so that said first cheek will coincide with said side cheek with the sofa-bed in the sofa position.

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