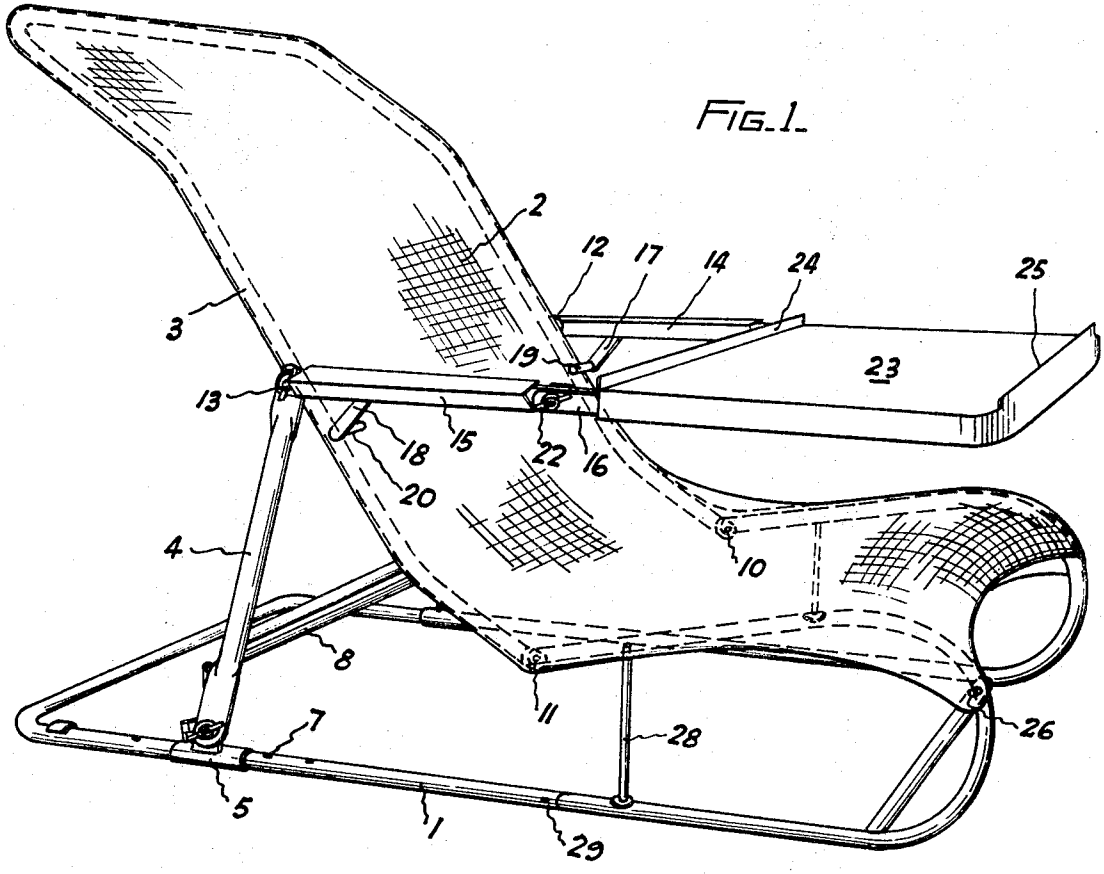
Nov. 10, 1970 J. T. ADAMS 3,538,522

BED SUPPORT

Filed June 26, 1968 3 Sheets-Sheet 1

FIG. 1.



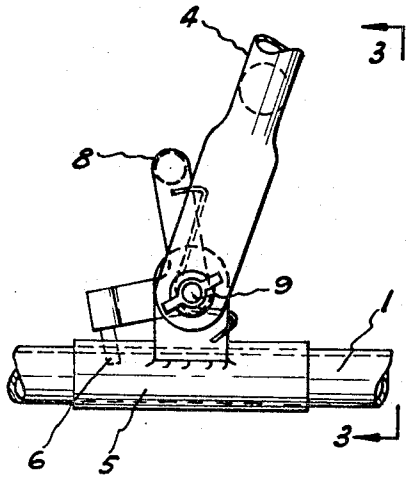


FIG. 2.

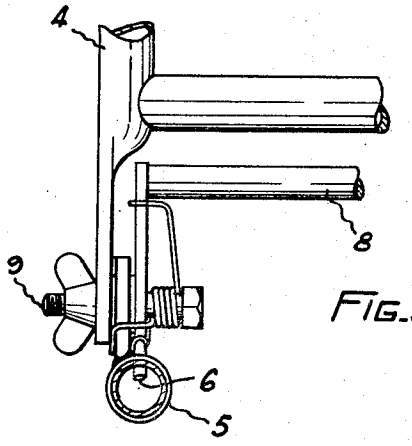


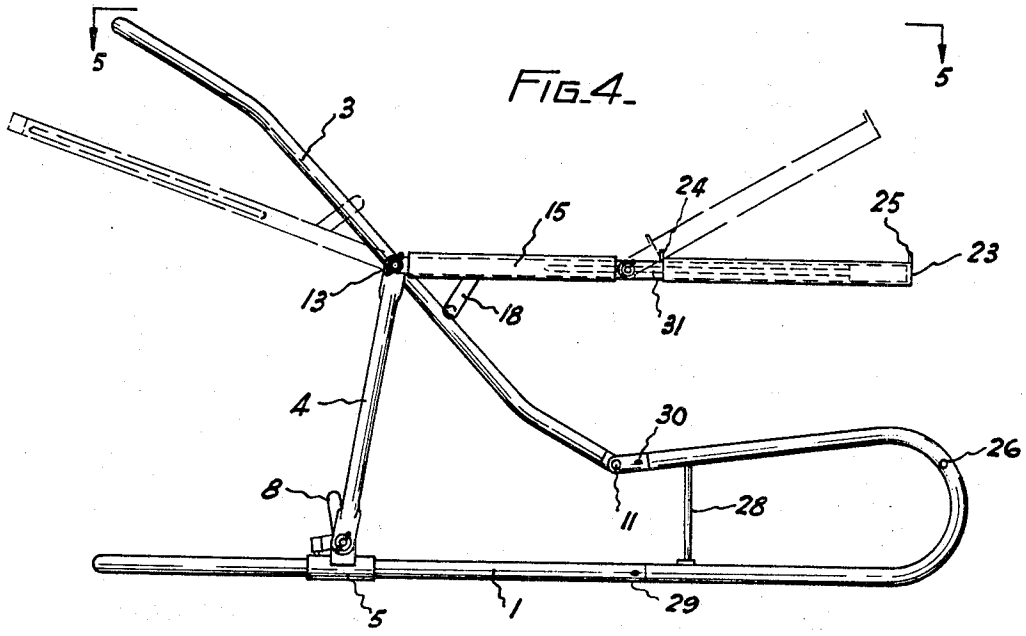
FIG. 3.

Nov. 10, 1970 J. T. ADAMS 3,538,522

BED SUPPORT

Filed June 26, 1968 3 Sheets-Sheet 2

FIG. 4.



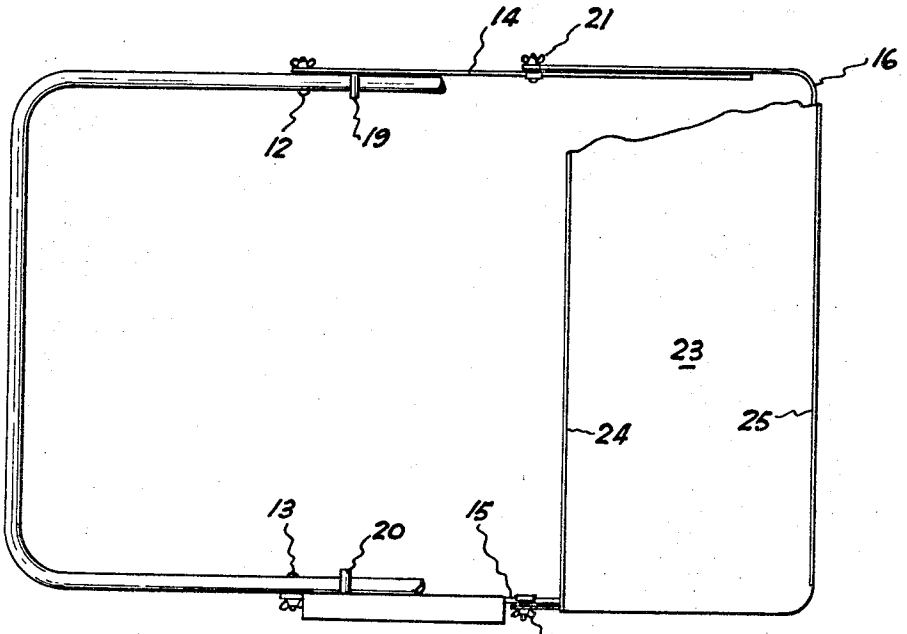
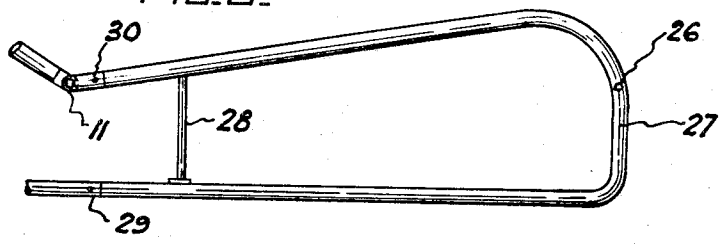


FIG. 5.

FIG. 6.



Nov. 10, 1970 J. T. ADAMS 3,538,522

BED SUPPORT

Filed June 26, 1968 3 Sheets-Sheet 3

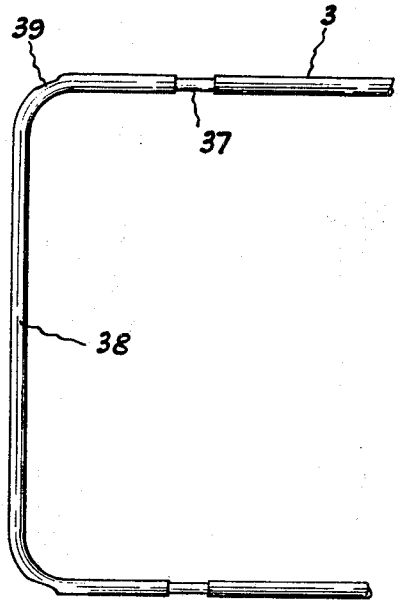


FIG. 7.

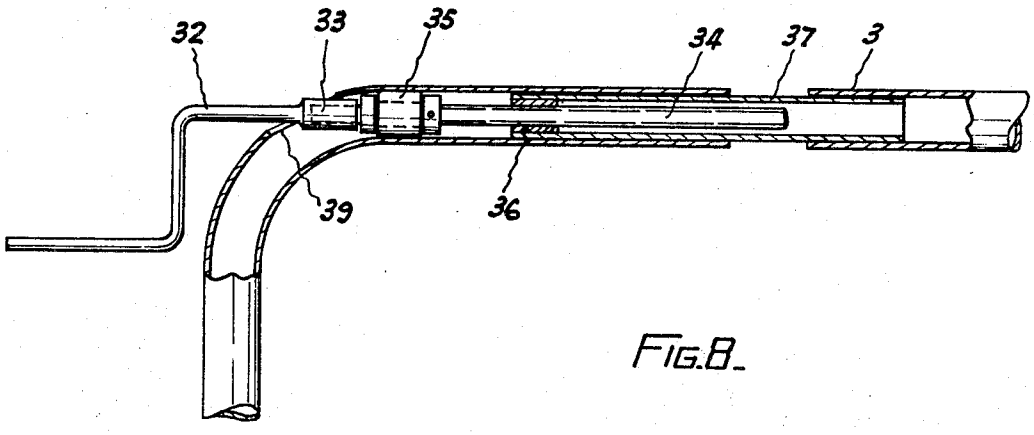


FIG. 8.

United States Patent Office 3,538,522 Patented Nov. 10, 1970

3,538,522

BED SUPPORT

James T. Adams, Lakemba, New South Wales, Australia, assignor to B. J. Ball Limited, Sydney, New South Wales, Australia

Filed June 26, 1968, Ser. No. 740,344
Claims priority, application Australia, July 26, 1967, 25,081/67
Int. Cl. A47b *23/00*; A47c *4/03*; B60n *1/06, 1/10*
U.S. Cl. 5—327 8 Claims

ABSTRACT OF THE DISCLOSURE

A support to hold a bed-ridden patient in an inclined position comprising a horizontal base member of tubular construction having a U-shaped back rest pivoted above it and a strut from the back rest to the base member which is adjustable along the length of the base member in order to change the angle of inclination of the back rest. An auxiliary frame is provided for arm rest and a food tray or reading shelf.

This invention relates to means for supporting bedridden persons, such as hospital patients or paraplegics, with comfort at a sufficient inclination of the body, so as to avoid the onset of respiratory troubles such as pneumonia.

It is known that persons who are bedridden for lengthy periods are likely to suffer from respiratory complaints under certain conditions, if they lie substantially horizontally in a bed. Attempts have been made to construct special beds having integral machinery adapted to permit a mattress or other parts of the bed to be adjusted to a desired inclination, but this is not only expensive but is often undesirable because a special bed of the last-mentioned kind may only be required for a part of a patient's daily regimen, and may even involve the transfer of a patient from one bed to another from time to time.

It is an object of the present invention to overcome the above and other disadvantages, and to provide a removable support which is adapted for use in an ordinary bed.

In accordance with the invention, therefore a bed support comprises an adjustable framework, the first frame of which is adapted to be locked removably in any one of a number of inclined positions with respect to a base frame, an auxiliary frame hingedly adjustable with respect to said first frame, a hinged frame which is also adjustable with respect to said auxiliary frame, and a removable resilient net adapted to cover the apertures in said first and hinged frames whereby a person reclining upon a bed mattress or the like may be supported in an inclined position, at least in part, by the net on the first frame, and whereby the net on the hinged frame may support the head of a person in an upper position wherein the hinged frame and the auxiliary frame are co-extensive with the first frame but said auxiliary frame being adapted to be rotated with respect to said first frame so that said hinged frame, in a selected one of its angular positions with respect to the auxiliary frame, is adapted to serve the person alternatively as a table or the like, and said base frame having the forward end thereof demountable so as to permit the substitution of alternative ends having predetermined sizes and/or shapes.

One particular embodiment of the invention will now be described with reference to the accompanying drawings in which similar references indicate corresponding parts and in which:

FIG. 1 shows, in perspective view, a bed support constructed in accordance with the invention,

FIG. 2 shows, in side elevation, a sliding sleeve adapted to connect the props to the sides of the first frame,

FIG. 3 shows, in front elevation and partly in section, a view along the line 3—3 of FIG. 2,

FIG. 4 shows, in side elevation, the apparatus of FIG. 1,

FIG. 5 shows, in plan view, the apparatus of FIG. 4,

FIG. 6 shows an alternative, detachable, forward end for the base frame shown in FIGS. 1, 4 and 5,

FIG. 7 shows, in plan view, an arrangement for adjusting the size of the frame 3, and

FIG. 8 shows, in plan view and partly in section, a detail of the arrangement of FIG. 7.

Upon referring to the drawings it will be seen that the base frame **1** is devoid of any cross bracing so as to be adapted to sink in part into an associated mattress. In addition the resilient net **2**, which is removable for the purpose of laundering it, is preferably constructed from some fibre having sufficient frictional qualities to prevent a patient or other person from slipping with respect to it when the first frame **3** is inclined at, say, 60° from the horizontal plane in which the base frame, ordinarily lies.

The first frame **3** has pivotted to the sides thereof a pair of struts such as **4**, each terminating in a sliding sleeve such as **5** which envelops, and is adapted to move substantially throughout the length of, the respective side rails of said base frame **1** into a number of separate lockable positions wherein a retractable detent such as **6** may be caused to engage a suitable slot or hole such as **7** in said rail. The engagement of said locking sleeve may be under the control of an actuating bar **8** which extends across the width of the aperture in said base frame, and which coacts at its outer extremities with said locking sleeve with a pivoting action about respective studs such as **9**. Thus, by a one-handed action, an operator (such as the patient himself) may free said locking means temporarily and then slide the sleeves along the respective side rails until the first frame assumes a new inclined position by virtue of the fact that it is also joined at its lowermost extremities to the forward ends of said base frame by means of the joints **10** and **11**, whereupon the release of the bar causes the sliding sleeves to relock in a new position with respect to a different detent.

At the region of attachment of the struts to the first frame via the joints **12** and **13**, a respective pair of arms **14** and **15** may also be attached, said arms extending so as to support an auxiliary frame **16**. A further pair of props **17** and **18** is also fastened by welded joints or the like respectively to said arms at intermediate regions along the lengths of said arms, and the respective remote ends or feet **19** and **20** of said props are adapted for temporary engagement with the sides of the first frame **3** at regions intermediate between the respective pairs of joints **13, 11** and **12, 10**.

In use the arms **14** and **15** may be rotated either into a position above and coextensive with the frame **3** so that an auxiliary net (not shown) stretched across the frame **16** serves as a head-rest for a person reclining upon the net **2** on the frame **3**, or said arms may be rotated down over the head of said person into any one of a number of inclined positions, or even into a substantially horizontal position. The frame **16** may, be removably attached to said arms by respective wing nuts **21** and **22** so that said frame **16** may be locked temporarily in any one of a number of angular positions with respect to the arms, so that a removable tray **23** or the like disposed in gripping relationship about the outer extremity of the frame **16** may serve, for example, as a table or a support for books or similar objects. If desired, the frame **16** may be removed entirely from the arms **14** and **15** by unscrewing both said wing nuts, or alternatively, the frame **16** may be left in a position coextensive with the arms, but with the tray removed so that the arms are swung upwardly and behind the user's head, the auxiliary net

may support the head of the user in the manner of a pillow. When the frame **16** is in position wherein it serves as a head-rest, said arms **14** and **15** cause the props **17** and **18** to be withdrawn from engagement with the respective sides of the frame **3**.

If desired the tray **23** may be provided with a rear upstanding lip **24** for the purpose of preventing a book from sliding down into the person's lap. Alternatively or in addition, the tray **23** may have a similar front lip **25** to prevent dishes or other utensils from sliding away from the person. When the frame **16** and its net are in use as a headrest, it is desirable that said net should be somewhat more resilient than the net **2** upon the frame **3**, so as to have the properties of a pillow.

It will be appreciated that the frame **16** is independent in its adjustment from any adjustment of which the struts such as **4** are capable via the sliding sleeves such as **5**. That is, the inclination of the frame **16** when in use to support a table is not dependent upon the angle at which the frame **3** has been inclined by adjusting the struts such as **4** upon manipulation of the actuating bar **8**.

The forward end of the frame **1** is so shaped that the net **2** disposed thereon curves downwardly around and about said end so that generally the net **2** is capable of supporting a patient as a combined seat and back-support means. To provide a substantially vertical termination of the depending portion of the net, a suitable pin or other fastening means such as **26** is disposed upon either side of the forwardly fastened part of the frame **1** so as to anchor the net securely with respect to said frame. Thus, in this region, although firmly held, it is sufficiently resilient, especially towards the central portion thereof, to prevent a bedridden patient, especially one who is substantially helpless, to be comfortably supported throughout the full length of his body, thereby preventing the contracting of further disabilities such as bed sores and the like.

To further assist helpless patients, such as the victims of serious injuries such as burns, who may need to be supported not only beneath the nates by the net with their heels resting on the bed, but also throughout the full length of the body, an extended forward end **27** of the frame **1** may be provided, which not only increases the total length of the frame **1** when demountably attached to the major part thereof, but causes the forward end thereof to be raised so that the legs of the patient are fully supported by the net with the feet elevated somewhat above the level of the median portion of the patient's body.

Whichever form the demountable forward end of the frame **1** takes, it is preferably supplied with a removable strut such as **28** upon each side thereof joining its respective upper and lower longitudinal members in a region just forward of the construction joints such as **29** and **30** in said members which are provided to permit sliding engagement between said forward end and the remainder of said frame.

To allow for restraint of an over-active patient, the entire device constructed in accordance with the invention may be fastened to a bed temporarily, by means of webbing or the like (not shown) which is fastened to the frame **1** side rails and adapted to be passed under the main frame of the bed. It will be seen that in such a case the immobilised frame **1** is firmly attached to the bed and also each element of the device may be firmly held with respect to the frame **1**.

Preferably the arms **14** and **15** are provided with covers as shown. Such covers, each having dimensions of approximately 6" in length and 3" in width, may be riveted to or otherwise fastened to the arms and may have a rolled edge and be constructed from off-cuts of any vinyl-covered steel or similar material which may be used to construct the tray **23**.

It will be appreciated that the wing nuts or other

fastening devices **21** and **22** may be longitudinally slidable within slots such as **31** in the frame **16** so that said frame is telescopically adjustable with respect to said arms.

All the frame and other rigid members of the device are preferably constructed from easily cleaned materials such as chromium-plated metal tubes or the like, and if desired, different ranges of angular adjustment of the frame **3** may be provided by supplying different fixed lengths of struts such as **4**, which may be substituted for each other as desired.

The net **2** may be constructed from any slip-resisting cloth such as crochered cotton mesh, which permits good air circulation. However, for winter use where it may be necessary to give protection against drafts, a woven cloth may be employed. Preferably the net, whether in open or closed form, is constructed as a bag having the general form of a pillow-case, which is adapted to be slipped over the frame **3** from above and held with respect to it by the fastening means such as **26** which are preferably connected to a lip of webbing on the net **2** which is hemmed to fit the frame **3**. However, the net itself is preferably made somewhat narrower than this webbing so as to prestress said net, thereby giving sufficient support, combined with resilience, in a manner similar to that of a trampoline. The similar but smaller net or cover when used on the frame **16** is preferably given approximately the same width as the frame **16** to ensure that it is more deformable than the net **2**. Preferably the net on the frame **16** is held in position by suitable loops in supporting edge webbing, passed over spring loaded locking members, which in turn are clamped to the frame **16**.

As best shown in FIGS. 7 and 8, the frame **3** may be provided with means near its upper extremity for varying the tension upon the net **2** so as to give different degrees of support for patients of different weight and to compensate for the shrinkage which may occur after washing the net. Said means may comprise, in combination, the crank **32** which is adapted to be detachably engaged with the rod **34** via the boss **33**. The rod **34** is journaled within a bearing **35** and is also fastened to, and adapted to turn with, the screw **36** which engages a left-hand thread upon the sleeve **37** which is, in turn, fastened with respect to, and within, the bore of the fixed part of the frame **3**. Upon rotation of the crank **32**, the end member **37** is caused to move towards or away from the fixed portion of the frame **3**, depending upon the sense or rotation of said crank. When the desired adjustment has been completed, the crank **32** may be detached from the boss **33** and removed by withdrawing it through a suitable slot **39**.

If desired, a similar adjustment means may be located upon the remote side of the frame **3**, whereby both sides of said frame may be caused to extend or contract by approximately equal amounts following a substantially simultaneous adjustment of the respective cranks.

I claim:

1. A patient support useable on bed mattress comprising:

(a) a rectangular base frame;

(b) a U-shaped first frame having means to pivotally connect its free ends to said base frame;

(c) pivot means above said base frame on the opposed long sides of said rectangle to pivotally engage the free ends of said first frame;

(d) a pair of adjustable struts pivotally connected at their upper ends to the legs of said first frame and having at their lower ends sliding sleeves which envelope and are adapted to move along the length of the base frame;

(e) an auxiliary frame hingedly adjustable with respect to said first **frame;**

(f) a removable resilient covering over said first frame whereby a person reclining upon a bed mattress may be supported in an inclined position at least in part by said covering.

2. A support as claimed in claim 1 wherein the engagement of said sliding sleeves are under the control of an actuating bar which extends across the width of the aperture in said base frame, and which coacts at its outer extremities with said sleeves near the pivotal points of attachment of said bar with said sleeves.

3. A support as claimed in claim 1 wherein a pair of armrests is fastened near the region of attachment of the struts to the first frame, said armrests extending to form said auxiliary frame a the outermost extremities of said armrests.

4. A support as claimed in claim 3 wherein a further pair of props is fastened respectively to said armrests at intermediate regions along the lengths of said armrests and the remote ends of said props are adapted for temporary engagement with the sides of the first frame at regions intermediate between the points of attachment of the struts to the first frame and the points of attachment of the forward ends of the side rails of the base frame to the first frame.

5. A support as claimed in claim 3 wherein said main frame is adjustable in length by means of at least one crank-operated screw means.

6. A support as claimed in claim 1, wherein a removable tray is disposed in gripping relationship about the extremity of said hinged frame to serve as a table or support.

7. A support as claimed in claim 1 wherein said base frame is adapted to be fastened removably to a bed mattress by webbing.

8. A patient support useable on bed mattress comprising:

(a) a U-shaped horizontal base frame having its parallel legs bend over above themselves to present two free ends vertically spaced above the base;

(b) a first U-shaped frame having its free ends pivotally connected to the free ends of the base;

(c) a pair of adjustable struts pivotally connected at their upper ends to the parallel legs of said first frame, and having at their lower ends sliding sleeves which envelope and are adapted to move along the length of the parallel legs of the base frame;

(d) an auxiliary frame hingedly adjustable with respect to said first frame;

(e) a hinged frame adjustable with respect to said auxiliary frame;

(f) a removable resilient covering over said first frame whereby a person reclining upon a bed mattress may be supported in an inclined position at least in part by said covering.

References Cited

UNITED STATES PATENTS

2,713,890	7/1955	Mack	297—376
3,146,738	9/1964	Telarico	108—135
3,185,495	5/1965	Pivacek	297—375 X
3,323,149	6/1967	DoCouto	5—327

CASMIR A. NUNBERG, Primary Examiner

U.S. Cl. X.R.

297—148, 377, 441