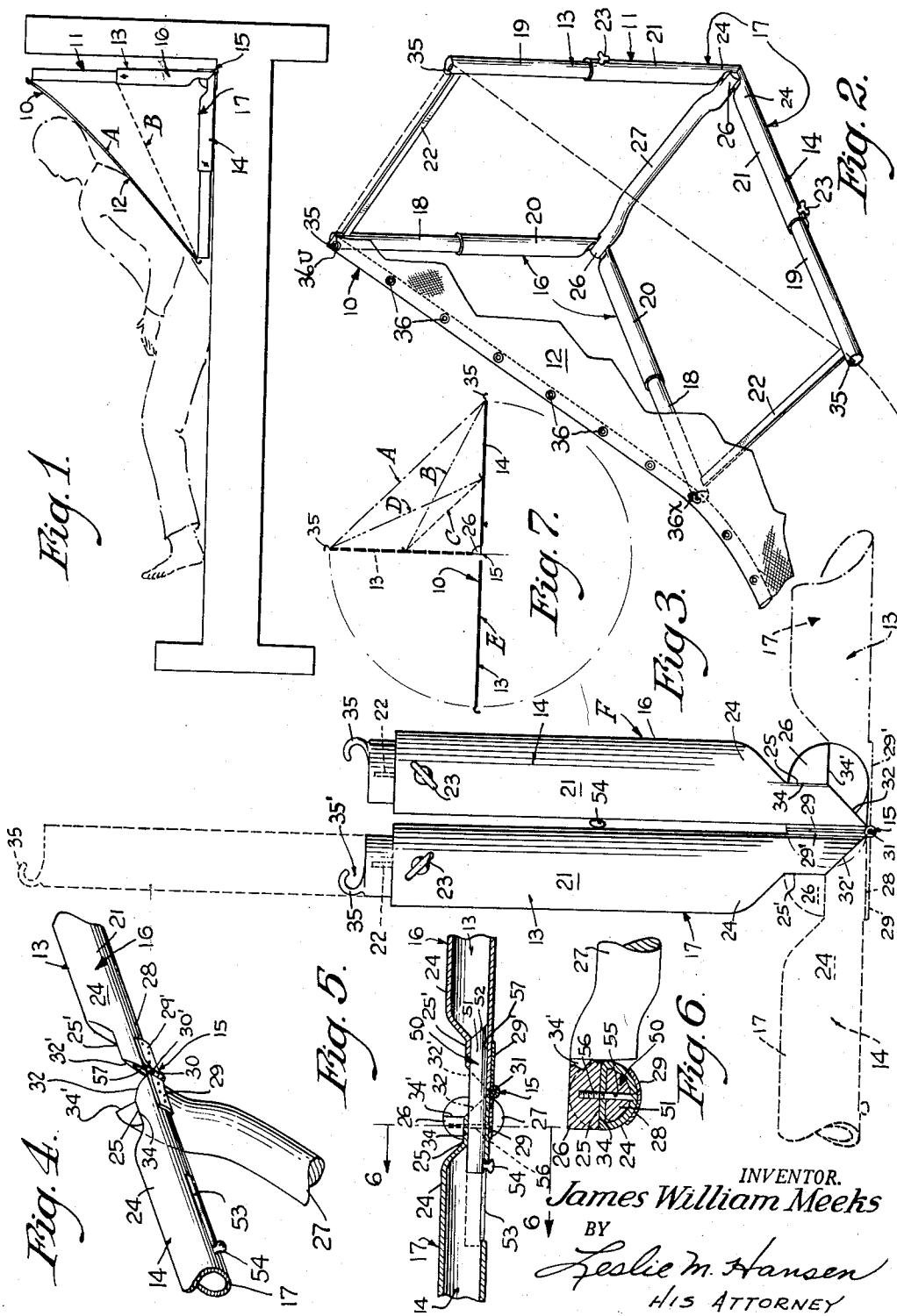


Dec. 29, 1953

J. W. MECKS
COLLAPSIBLE BACK REST

2,663,880

Filed May 3, 1952



INVENTOR.
James William Meeks
BY
Leslie M. Hansen
HIS ATTORNEY

UNITED STATES PATENT OFFICE

2,663,880

COLLAPSIBLE BACK REST

James W. Meeks, Salinas, Calif.

Application May 3, 1952, Serial No. 285,952

9 Claims. (Cl. 5—327)

1

This invention relates to back rests and more particularly to certain novel improvements in a collapsible type back rest for supporting the torso of a human body seated on the ground, a chaise longue or bed.

Numerous devices of this character have been proposed but all of them are fraught with complicated mechanical features and are cumbersome in handling as well as limited in setting at various angles or for various sized individuals. The present invention contemplates the provision of a collapsible type back rest which is simple in construction, easily assembled into various positions and compact when folded and not in use.

Another object is to provide a frame for a collapsible type back rest with a novel hinge construction cooperable with a body supporting stretch band for securing the latter and the frame in a desired body supporting position.

It is another object to provide the back rest frame of this invention with extensible or retractible arms facilitating disposition of the stretch band at various angles relative to horizontal in a simple yet effective manner.

A further object of this invention is to provide the collapsible hinged frame of the present back rest with a means for rendering the hinged portion thereof ineffective for supporting the stretch band in parallel relation therewith so as to support a human body in lying down or horizontal position.

These and other objects of the present invention will become apparent from a reading of the following description in the light of the drawing in which:

Fig. 1 is a side elevation of a bed having the back rest of the present invention disposed thereon.

Fig. 2 is a perspective view of the back rest shown in Fig. 1 at slightly greater scale with parts thereof broken away for purposes of illustration.

Fig. 3 is a detailed enlarged side elevation of the frame structure of the back rest shown in Figs. 1 and 2 in fully collapsed condition.

Fig. 4 is a fragmentary perspective view of the hinge portion at one side of the frame shown in Fig. 3.

Fig. 5 is a section through one set of companion arms at the hinged connection thereof and illustrating the mode of rendering the hinge ineffective for maintaining said arms in axial alignment.

2

Fig. 6 is a cross section of Fig. 5 taken substantially along line 6—6 thereof.

Fig. 7 is a diagram illustrating the various positions in which the stretch band can be supported by the frame in accordance with the present invention.

In the drawings, the back rest embodying the present invention is generally designated 10. It comprises a frame member 11 and a stretch band 12 adapted to cooperate with the frame member in maintaining the latter in opened condition.

The frame 11 is preferably, although not necessarily, made of metal. It comprises two sets of arms 13 and 14 connected together by a hinge 15. Each set of arms 13 or 14 comprises a pair of side legs 16—17 each of which is of tubular construction and preferably consists of tubular extensible portions 18—19 which slidably fit into larger tubular or main portions 20—21 in telescopic fashion.

The extreme ends of the extensible portions 18—19 are joined by a transverse strap or bar 22 for simultaneous movement toward and from the main portions 20—21 and for maintaining the free ends of the extensible portions in axial alignment with the main portions of the legs 16—17. Each main portion 20—21 is provided with a wing bolt 23 adjacent its outer end for securing the extensible portions 18—19 at desired positions of extension or retraction relative to the main portions. The opposite or inner end 24 of each main portion 20—21 is especially constructed for connection to and operation with the hinge 15. The inner end 24 is accordingly flattened on its upper edge 25—25' to receive a quadrantal block in the form of a projection 26 on a central cross brace 27. The lower surface 28 of each inner end 24 of the main arm has secured to it one wing 29 or 29' of the hinge 15 as the case may be. In this connection the surface 28 may be built up or milled out to provide a flat surface for receiving the respective hinge wing 29—29'; or these wings themselves may be curved to conform to the circumference of the tube forming the main arm in which event the interlocking pivot housings 30—30' of the hinge are disposed in axial alignment for reception of the hinge pin 31.

As best illustrated in Figs. 3, 4 and 5, the extreme end 32—32' of the inner end 24 of each leg is cut on the bias, i. e., at 45° from the axis of the central cross brace 27 toward the axis of the pin 31 of the hinge 15. The quadrantal projection 26 of the cross brace has two faces 34—34', the face 34 being welded or otherwise fixedly

secured to the upper surface 25 of one set of arms 13 (Fig. 6). The other face 34' of the quadrantal projection 26 is adapted to butt against the upper surface 25' on the other set of arms 14 to limit swinging movement of the two sets of arms in one direction for disposition at right angles with respect to each other. However, the two sets of arms 13—14 are free to swing in an opposite direction about the axis of the hinge 15 into parallel relation with each other as illustrated in Fig. 3.

The extreme end of the extensible portions 18—19 of each set of arms 13—14 is provided with a hook 35 to form an anchor for securing to the stretch band 12. The stretch band 12 has seamed edges provided with grommets 36 at predetermined spaced intervals along its lengthwise edges. As best seen in Fig. 2 each hook 35 is adapted to be received by one of the grommets 36. The hooks 35 are so disposed on the extremities of the several legs 16—17 that their open sides 35' face away from each other on opposite sets of arms 13—14 when the latter are disposed at right angles with respect to each other. In this manner, when the upper set of grommets 36U are anchored on the hooks of the upright set of arms 13 and the stretch cloth or band 12 pulled tight to anchor another opposite set of grommets 36X to the hooks of the horizontal set of arms 14, the stretch band 12 will be tightly stretched between the respective anchorages.

It should here be noted that in pulling the stretch band 12 tight when hooking it to the lower set of arms 14 both sets of arms are sprung slightly toward each other. Hence, the tendency of the two sets of arms to return toward right angle disposition relative to each other aids in maintaining the stretch band tight between the hooked extreme ends of the legs 16—17 of the two sets of arms.

The results are the same irrespective of the adjustment of the telescoping legs as best illustrated in the diagram Fig. 7. The frame member 11 for various purposes may be adjusted into the following positions:

- | | |
|-----------------|-------------------|
| A—45° Long | D—60° Sit-up |
| B—30° Reclining | E—180° Lying down |
| C—45° Short | F—0° Collapsed |

Position A (45° Long) is that shown in Figs. 1 and 2 with the telescoping legs of both sets of arms fully extended.

Positions B (30° Reclining) would be similar to that of Fig. 2 with the telescoping legs of the upright set of arms 13 retracted and the legs of the horizontal set of arms 14 fully extended. It should here be noted that the spacing of the grommets 36 along the lengthwise edges of the stretch band 12 is calculated to fit the foreshortening of the hypotenuse of the triangle formed by the frame and band. Consequently, the stretch band functions as stated above in connection with the fully opened frame irrespective of the angular disposition of the stretch band. In other words, regardless of whichever position the frame is set it tends to yield or give under hand pulling of the stretch band.

Position C (45° Short) is for a person with a shorter torso or if one's head alone is to be supported above a horizontal surface.

Position D (60° Sit-up) is the converse of position B in that the legs of the horizontal arms 14 are retracted while the legs of the upright arms 13 are fully extended.

Position E (180° Lying down) is that position in which the legs of each set of arms 13—14 are horizontally disposed and in axial alignment at each side of the frame 11. Herein lies the purpose of the latch means 50 illustrated in Fig. 5 comprising a bolt 51 having a semi-circular shape (or one conforming to the internal passage of the inner end 24 of the legs on either set of arms).

The bolt 51 has one end 52 cut at a 45° angle to register with the 45° cut at the extreme inner end 32 of each of the main portions 20 of the legs 16 on one set of arms.

The lower face 25' of this pair of legs 16 are provided with a slot 53 having a pin 54 extending therethrough and secured to the bolt 51 for manipulating the latter between retracted and extended condition. If desired, the bolt too may be slotted as at 55, see Fig. 6, to allow a rivet pin 56 to extend therethrough from the hinge wing 29 into the quadrantal projection 26 of the central cross brace 27.

From the foregoing it will be seen that when the frame is to be disposed in any of its positions other than position E, i. e., 180°, the bolt 51 is retracted well within the leg portion containing it so that the extreme end 52 of the bolt is in register with or behind the 45° extreme end 32 of such leg. However, when the two sets of arms 13—14 are disposed at 180 degrees relative to each other, i. e., with their respective side legs in axial alignment with each other (see Figs. 4 and 5), the bolt 51 is slid into a position to extend its extreme end into the passage 57 provided within the extreme end 24 of the other leg. Thus the two sets of arms 13—14 are latched together in position E to support the stretch cloth 12 in parallelism with the frame.

It should here be noted that the cross brace 27 is bowed slightly in a direction away from the axis of the quadrantal ends thereof, i. e., away from the stretch band so that even though the latter yields somewhat under the weight of a person's body no contact or discomfort will occur.

Position F (0° Collapsed) is best illustrated in Fig. 3 wherein the stretch band is removed from the frame and its two sets of arms 13—14 in parallel relation and their extensible portions 18—19 fully retracted. This makes a neat compact package which can be easily transported, stored or otherwise handled with ease in homes, hospitals, institutions, clubs, on the beach, or in an automobile.

While I have described the foregoing device in specific detail herein, it will be apparent that it is capable of being modified, altered or varied without departing from the spirit of my invention. I, therefore, desire to avail myself of all modifications, alterations, and/or variations as come within the purview of the appended claims.

What I claim as new and desire to protect by Letters Patent is:

1. A back rest of the type described comprising two sets of arms hingedly connected together for swinging movement toward and from each other, a stretch band, means on the extreme ends of said arms opposite the hinged ends thereof for securing said stretch band to said arms, a cross brace secured to one set of said arms adjacent the hinged ends thereof, and a projection at each end of said cross brace having angularly disposed faces engageable by said hingedly connected arms for limiting movement of said arms beyond substantially right angle disposition when said arms

5

are swung in one direction about said hinged connection thereof.

2. A back rest of the type described comprising two sets of arms hingedly connected together for swinging movement toward and from each other, a stretch band, means on the extreme ends of said arms opposite the hinged ends thereof for securing said stretch band to said arms, limiting means cooperating with said hingedly connected arms for limiting movement of said arms beyond substantially right angle disposition when said arms are swung in one direction about said hinged connection thereof, said limiting means comprising a quadrantal block having one of its quadrantal faces secured to one of said sets of arms and its other quadrantal face disposed to abut the other of sets of arms upon movement thereof in said one direction.

3. A back rest comprising two sets of arms each including parallel side legs having extensible end portions, the inner ends of said legs being cut on a bias for disposition radially of a common point, a hinge having its wings secured to a respective one of said leg portions and its hinge pin disposed congruent to said common point whereby said two sets of arms are adapted to swing from parallel relation into right angle disposition with respect to each other, a stretch band having anchoring grommets at predetermined spaced intervals along its lengthwise edges, anchor means on the extensible end portions of said legs for anchoring reception by certain of the grommets in said stretch band for maintaining said stretch band taut between the extensible ends of said two sets of arms.

4. A back rest comprising two sets of arms each including parallel side legs having extensible end portions; a transverse strap having its ends secured to said extensible end portions for supporting the latter in substantial axial alignment with the parallel legs of the set of arms from which they are to extend, a hinge having its wings secured to the inner end of a respective one of said leg portions and its hinge pin so disposed that said two sets of arms are adapted to swing from parallel relation into right angle disposition with respect to each other, said inner ends of said legs being cut at a 45° angle and disposed radially of the hinge pin adjacent to it, a stretch band having anchoring grommets at predetermined spaced intervals along its lengthwise edges, anchor means on the extreme end of each said extensible end portions of said legs for anchoring reception by certain of the grommets in said stretch band, said legs tending to yield due to anchoring of said stretch band on said anchor means for maintaining said stretch band taut between the extensible ends of said two sets of arms.

5. A back rest of the type described comprising two sets of arms connected together by hinges for swinging movement toward and from each other, a stretch band, means on the extreme ends of said arms opposite the hinged ends thereof for securing said stretch band to the latter, a cross brace adjacent the hinged connection of said arms having a quadrantal projection at each of its ends, each said quadrantal projection having a pair of faces disposed at right angles with respect to each other, means securing one of said quadrantal faces to the inner end of one of said pairs of arms with the point at which said quadrantal faces converge disposed at substantially 45° inwardly of the extreme inner end of said one pair of arms, the extreme inner ends of said pairs of arms being cut on a bias from said point of convergence of

6

said quadrantal faces to the axes of said hinges whereby the quadrantal faces on said quadrantal projections opposite the ones secured to said one set of arms are disposed for abutment against the inner ends of the other set of said arms for limiting movement thereof in one direction beyond right angle disposition relative to said one set of arms.

6. A back rest of the type described comprising two sets of arms connected together by hinges for swinging movement toward and from each other, each of said pair of arms having extensible end portions, a stretch band, means on the extreme ends of the extensible ends of said arms opposite the hinged ends of said arms for securing said stretch band to the latter, a cross brace adjacent the hinged connection of said arms having a quadrantal projection at each of its ends, said quadrantal projection having a pair of faces disposed at right angles with respect to each other, means securing one of said quadrantal faces to the inner end of one of said pairs of arms with the point at which said quadrantal faces converge disposed at substantially 45° relative to the axes of said hinges, the extreme inner ends of said pairs of arms being cut on a bias congruent to a line from said point of convergence of said quadrantal faces and the axes of said hinges whereby the quadrantal faces on said quadrantal projections opposite the one secured to said one of said pair of arms are disposed for abutment against the inner end of the other set of said arms for limiting movement thereof in one direction beyond right angle disposition relative to said one set of arms when said stretch band is secured to said means at the extreme ends of said extensible end portions of each of said pairs of arms.

7. A back rest comprising two sets of arms each including a pair of tubular main portions having extensible end portions telescopically related thereto and means for securing said extensible end portions at desired positions extended or retracted relative to their respective main portions, a transverse bar for the extensible end portions of each said set of arms having its ends secured to the respective extensible end portions for maintaining the latter in substantial axial alignment with the main portions of said set of arms with which they are related, a cross brace having quadrantal projections at each of its ends, the inner ends of each of said main portions being flattened on their upper faces and having their extreme ends cut on a bias of substantially 45°, means for securing the one quadrantal face of each of said quadrantal projections to the flattened inner end of each main portion of one set of said arms with the point of convergence of the two quadrantal faces of the particular quadrantal projection disposed congruent to the biased face of the extreme end of the respective main portion to which said quadrantal projection is secured, a hinge having each of its wings secured to the under surface of the inner end of each of said main portions so that the biased faces of the same are radially disposed relative to the axis of said hinge, a hook at the extreme end of each of said extensible portions of said arms, and a stretch band having a plurality of grommets spaced at predetermined intervals along the lengthwise edges thereof for the reception of the hooks on said extensible portions of said arms irrespective of the extended or retracted disposition of the latter relative to the main portions of said arms.

8. A back rest of the type described comprising two sets of arms hingedly connected together for swinging movement toward and from each other, each of said pair of arms having extensible end portions, a stretch band, means on the extreme ends of the extensible ends of said arms opposite the hinged ends of said arms for securing said stretch band to the latter, a cross brace adjacent the hinged connection of said arms having a quadrantal projection at each of its ends, said quadrantal projection having a pair of faces disposed at right angles with respect to each other, means securing one of said quadrantal faces to the inner end of each of said pairs of arms whereby the other of said quadrantal faces on said quadrantal projections are disposed for abutment against the other set of said arms for limiting movement thereof in one direction beyond right angle disposition relative to said one set of arms when said stretch band is secured to said means at the extreme ends of said extensible end portions of each of said pairs of arms, and latch means mounted at the inner ends of said pairs of arms for projection therefrom into latching engagement with the inner ends of the other of said pairs of arms when the latter are in axial alignment with each other for maintaining said pairs of arms in a common plane.

9. A back rest comprising two sets of arms each including a pair of tubular main portions having extensible end portions telescopically related thereto and means for securing said extensible end portions at desired extended or retracted positions relative to their respective main portions, a transverse bar having its ends secured to the respective extensible end portions for maintaining the latter in substantial axial alignment with the main portions of said arms with which they are related, a cross brace having quadrantal projections at each of its ends, the inner ends of each of said main portions being

flattened on their upper faces and having their extreme ends cut on a bias of substantially 45°, means for securing the one quadrantal face of each of said quadrantal projections to the flattened inner ends of the main portion of one set of said arms with the point of convergence of the two quadrantal faces disposed congruent to the biased face of the extreme end of the respective main portions to which said quadrantal projection is secured, a hinge having each of its wings secured to the under surfaces of the inner end of each of said main portions so that the biased faces of the same are radially disposed relative to the axis of said hinge, a hook at the extreme end of each of said extensible portions of said arms, a stretch band having a plurality of grommets spaced at predetermined intervals along the lengthwise edges thereof for the reception of the hooks on said extensible portions of said arms irrespective of the extended or retracted disposition of the latter relative to the main portions of said arms, and latch means disposed within the hollow flattened portion of one of said main portions and adapted for extension into the hollow flattened portion of the other one of said main portions for maintaining the opposing pairs of main portions in axial alignment and said two sets of arms in a common plane.

JAMES W. MEEKS.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
373,555	Fiske	Nov. 22, 1887
645,745	Gibson et al.	Mar. 20, 1900
744,126	St. John	Nov. 17, 1903

FOREIGN PATENTS

Number	Country	Date
9,683	Great Britain	1910
758,007	France	Oct. 23, 1933