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Bonnin

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[54] **PATIENT STRETCHER TRANSPORT SYSTEM**

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[52] **U.S. Cl.** **5/82,** 5/86, 5/89

[51] **Int. Cl.** **A47b 83/04,** A61g 1/02

[58] **Field of Search** 5/81–89; 297/452, 457

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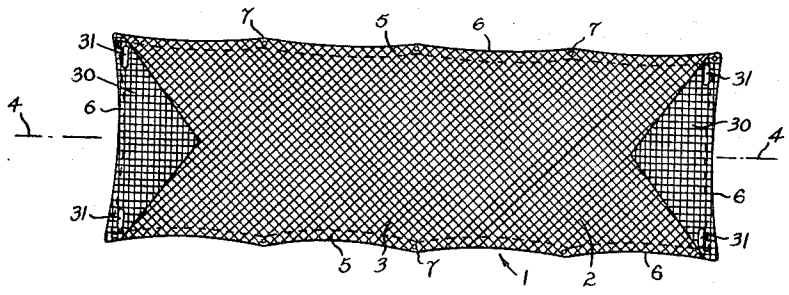
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[57] **ABSTRACT**

Patient stretcher apparatus wherein the threads of the supporting sheet are angularly positioned in relation to the length of the sheet with the edges thereof loosely attached to a peripheral reinforcement, and attaching means securing certain ends of the threads to side bars at spaced intervals, the opposite ends of said certain threads not being so fastened.

9 Claims, 8 Drawing Figures



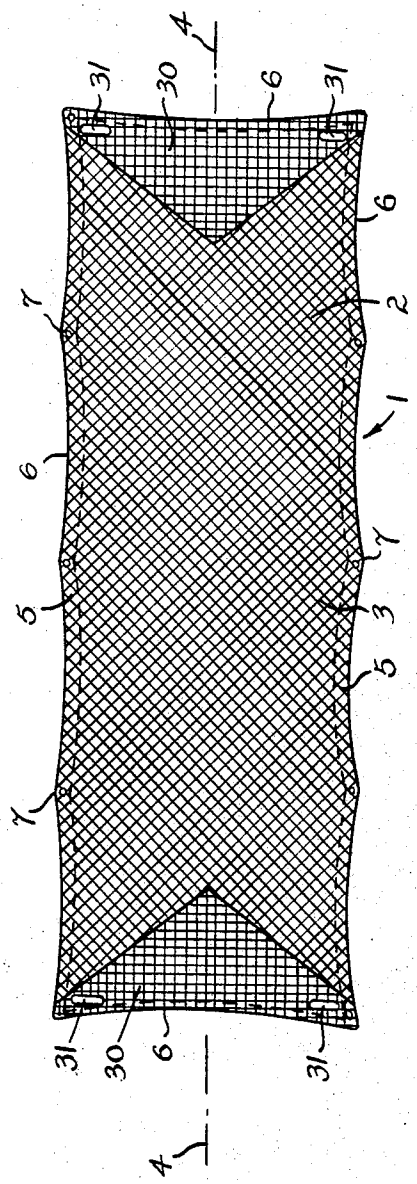

4
31
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FIG 1

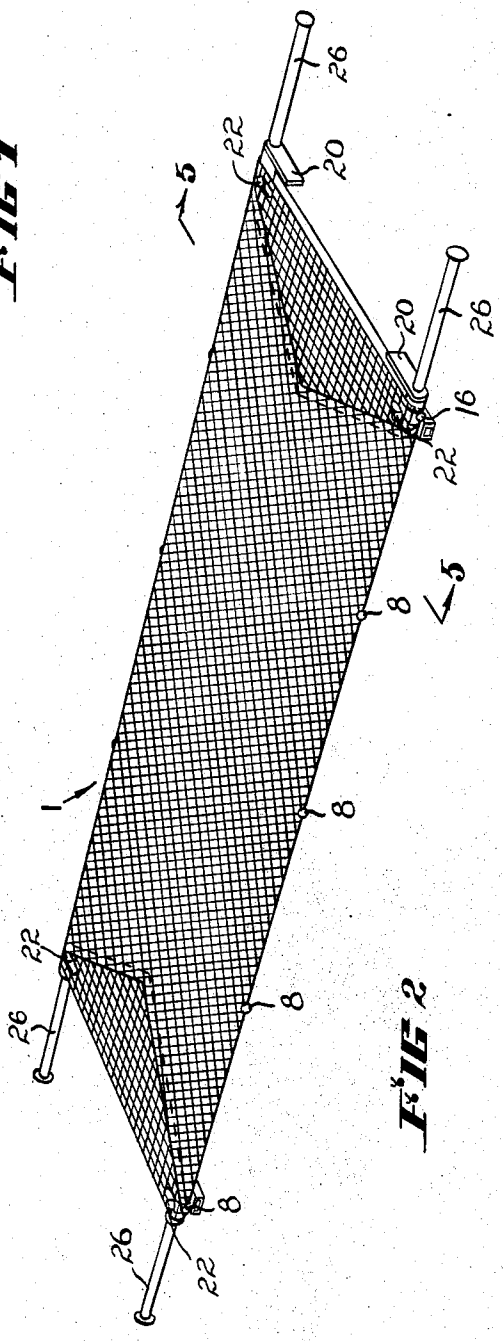

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FIG 2

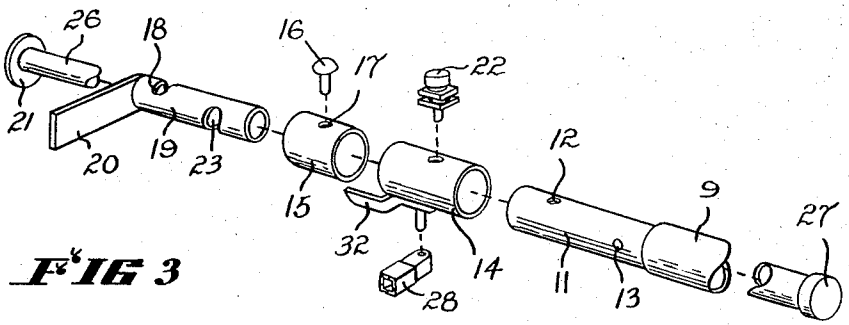


FIG 3

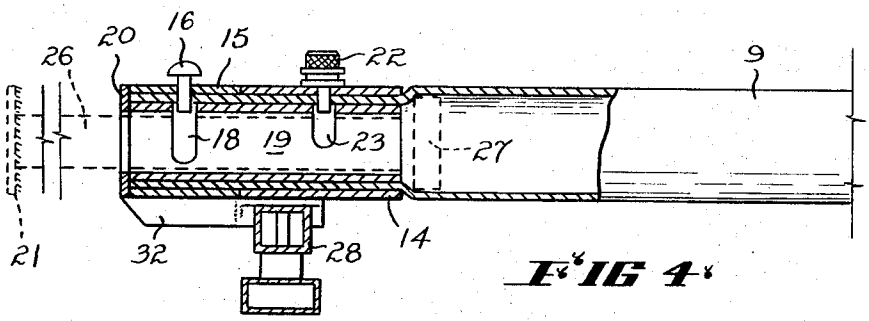
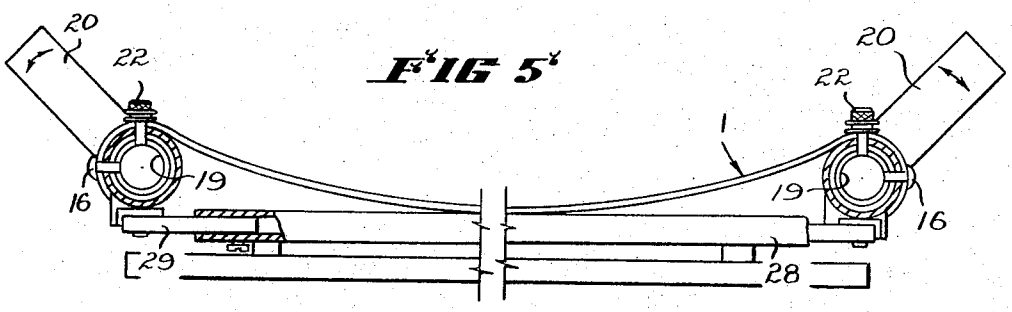


FIG 4

FIG 5



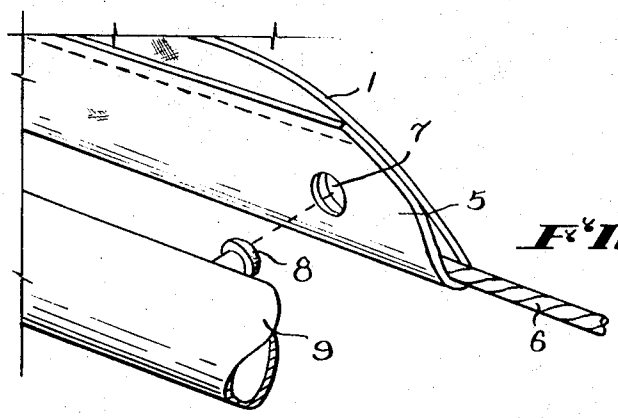


FIG 6

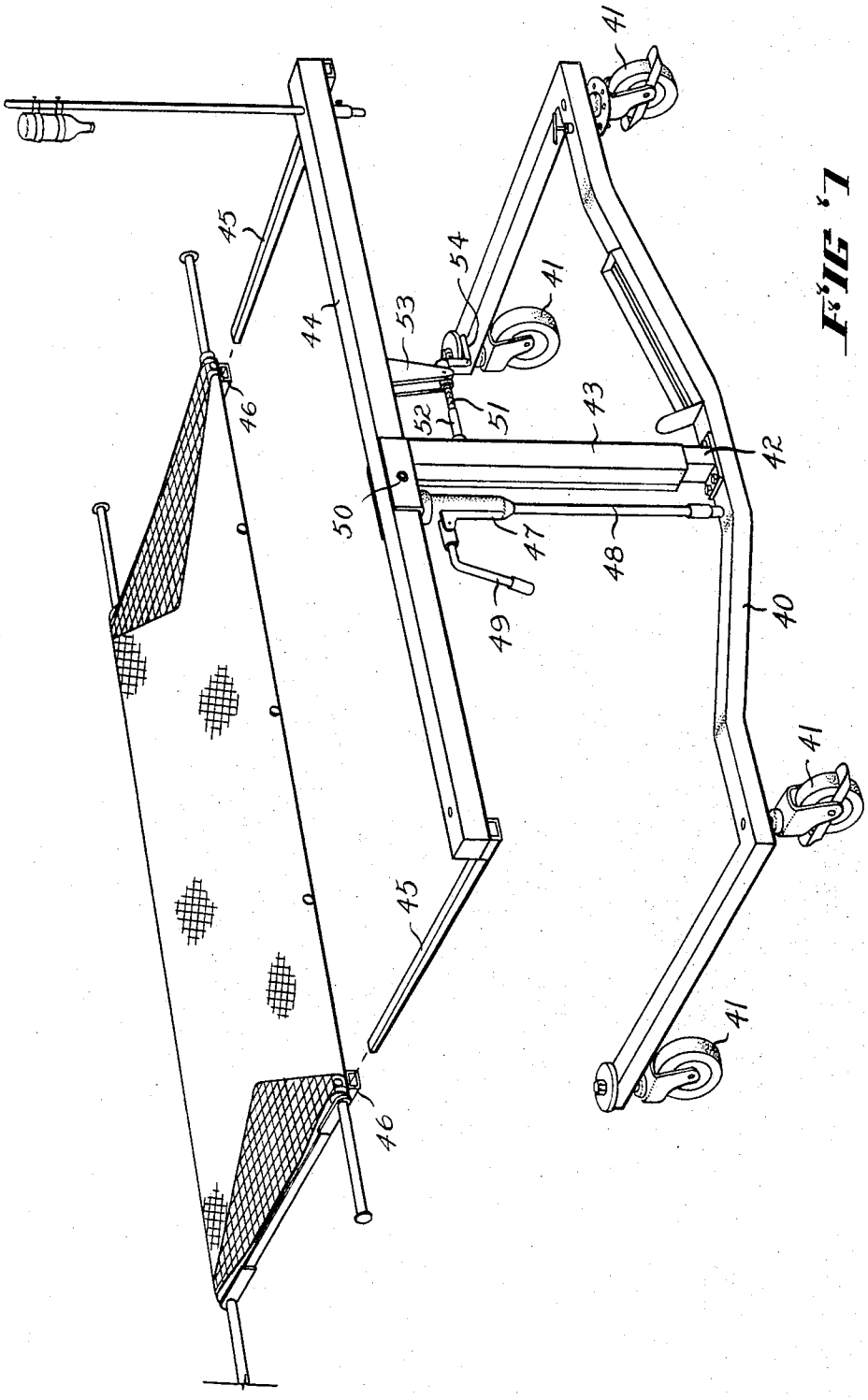


FIG. 1

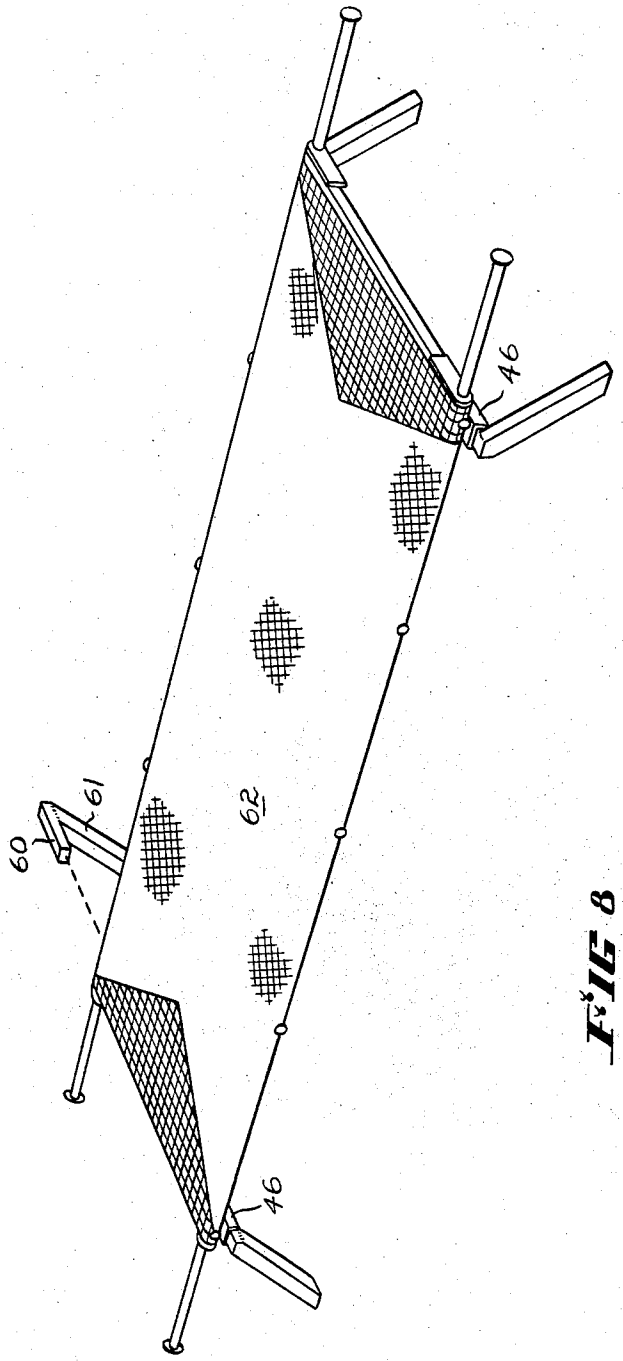


FIG 8

PATIENT STRETCHER TRANSPORT SYSTEM

This invention relates to a comfortable form fitting support.

BACKGROUND OF INVENTION

Resilient supports are well known in the art and are used in such locations as beds, stretchers, chairs and the like.

Such resilient supports according to their usual form comprise springs appropriately arranged on frames, or support members tensioned between springs, or canvas mounted on frames or plastic foam mattresses and the like, the purpose of resilient support members for personal use being to provide a support which is comfortable for the user and which accommodates itself to the user under varying conditions.

However while elastic or resilient supports will deform to fit the shape of a body lying on it, it is an inherent characteristic of all supports which depend on elasticity or resilience that it requires increasing force to produce increasing deformation. It follows that while a cushion, bed or supporting material employing the principle of resilience or elasticity may fit the form of the body accurately yet the supporting pressure is not evenly distributed because prominent parts of the body which project further into the elastic medium are inevitably subjected to correspondingly greater pressure. After a time this localised pressure produces discomfort and it is well known that if a person who is paralysed or who for other reasons does not move from time to time to relieve this localised pressure, then skin over the high pressure area will be deprived of proper blood supply and so-called pressure sores will result and this applies to all beds or supports which depend on resilience or elasticity. Localised pressure can, however, be avoided by floating a body or person in water, and a bed is in current use where a person is floated in water, but is isolated from contact with the water by a thin flexible impermeable film of a plastic material.

In the invention to be described a fabric is cut and attached to a frame in such a way that with the application of very slight force it first conforms to the shape of the body and then supports the load of the body evenly over the whole body surface in contact with it, the manner of support thus being quite comparable to that of support by a fluid such as water. If a person lying on a sheet constructed and suspended in the way to be described should move his position, the material will again move and deform in such a way as to fit the changed shape of the body surface applied to it, so that it continues to apply even support to the body lying on it.

It is the object of this invention to avoid the principle of elasticity or resilience which is employed in almost all other beds in common use, and thus to avoid the localised pressure on prominent parts of the body which is an inherent consequence of all supports which depend upon elasticity or resilience for their conformation to body shape.

Nevertheless, and to avoid an unusual or strange sensation of lying on a completely unsprung bed, some degree of elasticity can be added in a variety of ways, but if used this must be applied in such a way that it will not impede the essential feature of deformation of the supporting fabric to body shape with very light pressure followed by even support thereafter.

SUMMARY OF INVENTION

According to my invention a fabric which can be woven or otherwise formed of cords or cord like members having at least two series of such cords or cord like members placed at an angle of one or the other and such a sheet is provided with a reinforcing member around its edge which in turn is provided with attachment member such as button holes or the like whereby the sheet can be attached to a rigid or semi rigid frame, the invention however residing in the selection of the attachment points in such a manner that each cord or cord like member which extends from an attachment point on one side of the sheet or from near such an attachment point, terminates on the other side at an intermediate point between attachment points on that side so that while the attachment point adjacent the cord at one end may be fixed in position, the other end of the same cord is terminated in a reinforcing member for the sheet so that it can move.

Thus as an example the sheet could have its cords or cord like members arranged somewhat in the form of a weft and a weave of fabric, that is one series of cords or cord like member is disposed at right angles to the other series, and in use the sheet is arranged with the cords or cord like members at a 45° angle to the side and ends.

It is essential that the individual cords or cord like members can move in relation to each other at the points of crossing so that all the cords or cord like members are free to act as supports but at the same time while they may be fixed at one end, the other end can move to allow the fabric to conform to the shape it supports.

If the marginal reinforcing member is provided with button holes or hooks or other attachment means so that it can be secured to a support frame, then it will be realised that now all of the cords or cord like members, although they may be fixed at one end in relation to the frame, have their other end free to move under influence of pressure exerted on them, but as such distant ends attach only to the marginal reinforcing, the extent of their movement is now controlled by the movement permitted to the reinforcing member around the perimeter of the shee, and also by the close or open nature of the weave of the fabric since in a close woven fabric angular movement away from a right angle between crossing threads will be checked by contiguous threads packing hard one against the next. It will be realised that the extent to which the body sinks into the supporting sheet can be limited and controlled by either the tension on the marginal reinforcing member or by the density of weave of the fabric itself.

Because of this staggering of the attachment points on the reinforcing member in relation to the two sides of the sheet so far as the cords or cord like members are concerned, it will be realised that a much greater flexibility is possible than if for instance a canvas or fabric were mounted so that both ends of the individual members of the fabric were restrained in their movement, and the basis of this invention is to provide a formfitting support for stretchers, bedding, chairs, seats and the like in which this principle of using cords or cord like members is used in a manner that while one end of each cord or cord like member is is relatively fixed in relation to a support, the other end of same is relatively

free to move in relation to the support because of its termination in the mobile reinforcing member.

The reinforcing member can be of any convenient type and can consist of a specially woven edge or a reinforced edge to which however the ends of the cords or cord like members are rigidly secured.

While such a sheet can be attached directly to a rigid support by engaging button holes on to studs on the support or by any other attachment means, it would of course be possible to attach it through springs if some sensation of elasticity were required, but the same principle will be maintained namely that the crossing cords or cord like members of the fabric which forms the sheet will have one end secured at or relatively close to attachment members while the other end thereof will terminate on reinforcing means which will allow the required independent flexibility of each of the cords or cord like members.

Some elasticity could be incorporated in the reinforced edge in order to prevent permanent deformation of the shape of the fabric and thus to preserve its appearance, but it will be realised that any powerful elastic material incorporated in the edge of the supporting fabric would destroy the essential object of the invention for it would act to provide elastic resistance to deformation of the fabric and thus defeat the object of the invention.

While the invention may be applied in various ways and to a number of purposes, various uses will be referred to. It may, for instance be used in hospital work as a support for a patient, as no completely satisfactory method of moving a sick or unconscious patient from his bed to an operating or X-ray table and back to his bed again has been developed.

The use of the ordinary hospital trolley means two moves for the patient, one to the trolley from bed, then from trolley to operating table, and the same procedure is gone through when the patient returns. Moving a patient in this way can cause shock after an operation and occasional injury such as disc lesion in the neck. Back injuries to the staff have also resulted from lifting heavy patients from an awkward position.

The problem has been solved in part by the use of mobile beds which eliminates one move, but is very expensive because all doorways and corridors in the hospital have to be widened. Another method which has been adopted by manufacturers of operating tables is to provide a moble operating table top, but this does not allow for movement to an X-ray table and both these methods still involve one move of the patient.

The object of the present invention is to provide a suitable answer to the above problems, the invention consisting in means to transport the patient on a suitable sheet which is at the appropriate time attached to a stretcher frame, preferably carried on a suitable transport trolley.

As it is a routine part of nursing procedure for any patient to have the sheets replaced under him, which can be done with minimal disturbance by rolling a patient from one side to the other by a wellknown nursing technique, the present invention uses a sheet for the purpose of supporting and moving the patient, thus allowing normal handling of a patient according to known hospital routine.

There is however a problem in achieving satisfactory mounting of a stretched sheet, and one of the principle objects of the present invention is to provide an improved form of sheet and attachment to a supporting frame which will result in comfort for the patient due to the sheet being so arranged that stretch of the sheet at all appropriate places is possible, and also ensuring that should the sheet tear there will be no letting down of the patient with consequent injury.

Thus the principle object of the present invention is the provision of a stretcher and sheet which will give comfort to the patient as well as ensuring ready and simple attachment of the sheet to the stretcher frame to allow stretch of the sheet where required, a further object being to arrange the attachment to give simple tensioning of the sheet and holding of same in the required position when attached to the frame.

The stretcher according to this invention comprises a frame having rotatable side members on which are buttons, and a sheet which is formed from cloth with the threads running at an angle of approximately 45° to the sides of the stretcher sheet, that is the material is cut on the cross when the sheet is formed so that the threads do not run longitudinal or transversely but angularly, and if such a sheet is then attached to the frame by providing buttonholes on the sheet which engage buttons on the rotatable sides of the frame, the sheet will be free to flex and deform under the weight of the patient provided that the sheet is provided with reinforcing at the edges and is arranged so that each thread which has one end at or near a buttonhole has its other end positioned at a loop in the edge reinforcement.

Such a stretcher however requires to be taken from place to place and a further object of this invention is to provide a trolley by means of which such a stretcher can be conveniently handled, although it is to be clear that the trolley is not limited in its application to a stretcher of the particular type outlined and can be applied to any transportable stretcher.

The trolley according to this invention comprises a base frame having wheels on it and having a column at one side of the base frame, which column supports at its top, to be axially movable in the column, a bracket which is of U shape and therefore has a pair of members projecting at each end of the central part of the bracket which form forks adapted to engage in the end members of the stretcher to firmly hold the stretcher to the bracket.

The stretcher can also be used as a bed by providing legs or supports, or the sheet itself can be formed as part of a bed.

BRIEF DESCRIPTION OF THE DRAWINGS

In order however that the nature of the invention may be fully understood an embodiment thereof will now be described with reference to the accompanying drawings, but it is to be clear that these are by way of example only and that the invention is defined by the claims herein and is not limited by the illustrations.

In the drawings;

FIG. 1 is a plan of the sheet constructed according to this invention,

FIG. 2 is a perspective view of a sheet stretched on to a frame,

FIG. 3 is a detail of the frame prior to assembly and fixing of the parts together;

FIG. 4 is an enlarged detail showing how the rotatable bars on the frame are limited in their rotation and locked in their holding position when the sheet is engaged,

FIG. 5 is a transverse section of the sheet and frame,

FIG. 6 is a fragmentary section showing particualry the edge reinforcement of the sheet which forms loops betwen the buttonhole areas,

FIG. 7 is a perspective view showing how the stretcher of FIG. 2 can be supported on and carried by a trolley, and

FIG. 8 is a perspective view showing the stretcher applied as a bed.

The cloth of the sheet 1 is, as shown particularly in FIG. 1, cut on the cross so that one group of threads 2 runs in one direction and the other group of threads 3 runs in the opposite direction but both of these are at about 45° to the medial line 4 of the sheet.

The edges of the cloth are folded back at 5 and stitched and the loop so formed has within it a fine but strong cord 6 which extends around the sheet adjacent to its edges and forms a reinforcement for the sheet between the buttonholes 7 which are formed in the sheet and are adapted to engage buttons 8 fixed to rotatable side rails 9 of the stretcher assembly shown particularly in FIG. 2, these side rails being rotated by handles 20 as later described to allow the side rails 9 to be turned so that first of all the buttons are upwardly projecting to allow the edges of the sheet to be engaged by placing the buttonholes over the buttons after which the side rails 9 are turned to tension the sheet 1 by rolling the edges of the sheet out and around under rotation of the side rails 9.

The side rails 9 are operated as follows:

The side rails have a reduced portion 11 in which are apertures 12 and 13, the reduced portion 11 of the rail rotating in a bearing 14 which forms part of a transverse frame later to be referred to, but adjacent to this bearing 14 the reduced portion 11 has secured to it a sleeve 15 which carries a pin 16 projecting through an aperture 17 in the sleeve 15 and also through the aperture 12 in the reduced portion 11 of the side rail 9, the pin 16 projecting into a slot 18 in a sleeve 19 which has a handle 20 on it so that when the handle 20 is manipulated the sleeve 19 is turned and when the end of the slot 18 engages the pin 16 which is rigidly welded to the member 15 and locks it to the part 11 of the side rail 9, the side rail 9 is driven round by the handle 20 to the tensioning position of the sheet, such movement continuing until the lock pin 22 which is permanently carried on the bearing sleeve 14, drops into the aperture 13 in the reduced portion 11 of the siderail 9 and then locks the side rail 9 firmly in position in relation to the frame.

Once the lock pin 22 has engaged the aperture 13 the handle is free to be swung back because of the slot 18 in it so that it can be turned out of the way during handling.

Inward movement of the handle 20 is checked by contact with the projecting lug 32. With the handle in this position inward rotation of the side rail 9 is in turn checked when the pin 16 travels to the end of the slot 18 in the sleeve 19 which is attached to the handle 20. In this position the buttons on the rail 9 are upwardly projecting and cannot move further inwards. In this position when the sheet is loaded the button holes in the sheet cannot slip off the buttons, thus should the lock pin mechanism 22 fail in any way and the rail 9 be rotated inwardly by the weight of a patient's body on the sheet, then this movement will be stopped at a point where attachment of the sheet to the side rail is still secure and the patient will not be dropped.

The slot 23 in the sleeve 19 to which the handle 20 is attached is merely for the purpose of allowing the lock pin 22 to move further through an aperture 13 in the reduced portion 11 of the side rail 9, so as to ensure that there will be no accidental unlocking.

The lock pin 22 can of course be urged inwardly by spring or other means or can simply be a sufficient weight so that it remains in locked position as it is upwardly facing in the bearing member 14.

To allow the stretcher to be carried a slidable handle 26 is engaged in each end, this having a collar 27 at its inner end and an expanded portion 21 at its outer end so that the limits of movement of the grip 26 within the end of the side rail 9 is assured, the grip being normally positioned inwardly to be out of the way, but capable of being drawn out a sufficient distance to allow the stretcher to be conveniently carried. Washers of a material such as that known under the Registered Trade Mark of Velcro are fixed on the one side to the expanded portion 21 of the carrying handle 26 and on the other side to the corresponding face of the rotating handle 20 by means of their property of adhesiveness prevent the handles 26 falling out when not required, but allow them to be withdrawn early when needed.

The action of the above described mechanism is that after the button holes have been engaged over the buttons, the handles 20 are revolved outwardly and downwardly under limits of the slot 18, but when the appropriate aperture 13 is reached the latch 22 falls and then locks the side rails 9 against return until such time as the latch is withdrawn to release the appropriate side rails to allow the tension to be taken off the sheet and the sheet removed from the frame. After this the sheet can be withdrawn from beneath the patient in the manner of any normal bed sheet.

The transverse cross bars 28 which are welded to the sleeves 14 are formed of steel tubing of square cross-section, but attached at one end only and engaging a plug 29 at the other end welded to the opposite side rail 9. In this way a plug and socket joint is formed.

This joint can be locked by a spring loaded bolt carried on the tubular cross bar and engaging in a socket in the plug so that the stretcher frame can be moved and lifted without risk of falling apart.

The cross members 28 may be padded on their upper surfaces, except at each end, so that the head or feet of the patient is prevented from coming in contact with the hard cross member.

In this way one member 28 will remain attached to the head of one side rail 9 and the other member 29 to the foot end of the other side rail of a pair. This arrangement ensures that the stretcher frame can be assembled in only one way and totally prevents the possibility of improper assembly. In addition the attachment of one hinged crossed member only to each bar minimises the possibility of injury to the patient by accidental release of the pivoted cross member when the stretcher rail is being passed over a patient, because it is not difficult to pay attention to the position of one hinged member, but it is not easy to pay attention to the position of two hinged members at the same time.

When the stretcher has been attached to the carrier it has been found advantageous to have plug and socket joints at both ends of each bar.

The cross members are padded on their upper surfaces to prevent the head or feet of the patient coming in contact with the hard surface of the bar.

A stretcher sheet as described may be about 6 feet 2 inches long with five buttonholes along each side. The material is cut on the cross as stated so that the strands of the material run at an angle of approximately 45° to the sides of the stretcher sheet.

At each end of the sheet is a triangular gusset of material **30** which is let in this time with the threads of the cloth running parallet to the edges of the sheet to provide support at each end, that is the threads run longitudinally and transversely in relation to the sheet to prevent inward bowing of the ends when the sheet is stretched.

At each of the four corners of the sheet is a hole **31** which allows access to the latches **22** of the stretcher frame.

It will be noted that the spacing of the button holes is such that no thread in the material is supported rigidly at both ends, so that the distortion of the material to conform to body shape is not hampered. In a 6 foot 2 inch length with an outside width of the stretcher bars of about 26 inches this object is attained by using five buttonholes as stated spacing about 18½ inches apart.

When the sheet is loaded by a person lying on it, inward movement of the edge between buttonholes, together with movement of the threads of the woven material away from their mean woven angle of 90° to each other, allows accurate conformation to body shape with even support.

It will be apparent that the cross cut of the material allows the body, and in particular the spine, to lie in a natural undistorted position. This is particularly important for cases of spinal injury. It avoids localised pressure points or ridges. As a corollary to these two features the sheet is comfortable to lie on for long periods. As stated earlier, an additional advantage is a built-in safety factor, in that, should the material weaken and tear, the line of tear will be obliquely across the sheet so that the patient is not dropped.

In contrast, material cut with threads orientated longitudinally and transversely in relation to the stretcher frame, as has been used in the past on stretcher sheets, does not allow for a flat lie of the material unless it is supported along its whole length by poles run in along wide hems. When this type of sheet is used considerable space in a room is required in order to insert the poles into the sheet. Further more, there is no "give" so that the sheet is hard to lie on. If attachment at multiple points rather than along the whole length is used to attach the sheet to bars, then across each pair of points there will be a transverse tension ridge.

In the present invention a simple cross weave is used and the threads must be free to move and not be fused together. One material which has been found satisfactory is a polyester (terylene) material whose undesirable electrostatic properties can be prevented by a dip in an antistatic bath. The material combines the necessary features of strength, ability to withstand laundering, and acceptable texture. With this material it is possible to combine the necessary features of sufficient strength to safely support a heavy patient together with a light enough material to be acceptable as a bed sheet by the nursing staff. Tests have shown the material to have satisfactory X-ray translucency so that high quality X-rays can be obtained with the patient lying on the sheet.

The reason why buttonholes are used is that they can be built into the material and allow easy laundering. An important advantage of buttonholes is that the method of attachment of a buttonhole to stud or button is readily understood by all staff, and there is no possibility of faulty assembly as may occur with straps and buckles.

When the material is to be buttoned on the side rails **9** are rotated so that the buttons lie in a vertical position. This renders the buttons accessible, and the stretcher sheet can be buttoned on without tension. Thus whatever the position of the side rails within their possible arc of movement, if the patient is lifted it is impossible for the stretcher sheet to be detached and for the patient to be dropped.

It is envisaged that the transport system will be used in the following way:

Ambulances will be supplied each with a number of these stretcher sheets and they will also be readily available at various points in a hospital.

One of these sheets will be laid on the ambulance stretcher before the patient is put on it. When the patient arrives at the hospital the stretcher frame which has been described above will be attached to the sheet by engaging the buttonholes in the buttons and rotating the side rails, and the patient then lifted off the ambulance stretcher either manually or by means of a lifting trolley which can be attached to the stretcher frames.

The patient can then be X-rayed on the stretcher itself since the material has satisfactory properties of X-ray translucency, or the patient can be laid on a standard X-ray table and the frame detached and X-ray examinations carried out while the patient is still laying on the stretcher sheet. The frame can then be reattached and the patient transported without disturbance to operating theatre if necessary or to the bed.

If the patient has been admitted to hospital for surgery then before the usual pre-operative preparation and sedative injections are given one of these stretcher sheets will be laid under the patient. This can then be attached to a stretcher frame as previously described and the patient transported to the operating table where the frame will be detached and the patient will be operated on still laying on the stretcher sheet. This same sheet can then be used to transport the patient back to the recovery ward and again to his bed and will only be changed when circumstances render it desirable.

For certain operative procedures on the lower half of the body a full length stretcher sheet could get in the way on the operating table and a stretcher sheet divided in an upper and lower half can be employed.

It is to be noted that a major difficulty in many transport systems is the actual transfer of the patient to the trolley or mattress on which the patient is carried. This is of particular importance in cases where the patient is shocked or badly injured and especially important if there is injury to the spine.

As stated earlier, it is always possible for a nurse to place a sheet beneath a patient by a long established technique of rolling a patient sideways over half of the crumpled up sheet and then rolling the patient in the other direction while the sheet is straightened out. This is a standard nursing manoeuvre which is necessary for change of bedlinen in all cases, and in order to get the

patient on the transport system this is the only disturbance of the patient which is required.

While only a basic stretcher structure has been shown, it will be realised that the stretcher could have legs and wheels attached to it, such as by having wheeled frame members attached to the cross bars **28.**

The trolley shown particularly in FIG. **7,** has a base frame **40** have wheels **41** on it and a column **42–43** at one side of the base frame which column is telescopic by having a sleeve **43** engaged over the pillar **42.** The sleeve **43** carries a bracket **44** which has a pair of forks **45** projecting at each end of the bracket **44,** the forks **45** being adapted to engage in sockets **46** the end members of the stretcher to firmly hold the stretcher to the bracket.

The bracket is however attached to the column, as stated, by means which allow the bracket to be raised and lowered in relation to the base frame, that is the telescopic column **42–43,** and these means can conveniently comprise a small hydraulic lift mechanism comprising a cylinder **47** and piston and rod **48** which can readily be operated by a lever pump **49** to raise the bracket **44** or can allow the bracket to be lowered by appropriately bleeding the liquid within the cylinder **47** of the hydraulic lifting mechanism, so that when a stretcher is carried on the trolley the height of the stretcher is readily adjustable by this mechanism, allowing the stretcher to be lifted from a support and raised to any required height, or lowered if that is necessary, onto a further support to which the stretcher is to be taken.

Instead of the hydraulic ram a gas operated ram could be used using say carbon-dioxide.

As the stretcher is simply engaged on the forks **45** of the bracket **44,** it will be realised that when the stretcher has been deposited onto a support, the trolley can simply be pulled out sideways from the stretcher and the forks **45** will disengage from sockets **46** at the end of the stretcher, and the trolley can be taken away until again required to move the stretcher.

To enable the tilt of the stretcher to be adjusted, a hinge **50** is provided between the bracket **44** and the sleeve **43** of the column and this hinge **50** has associated with it a screw threaded rod **51** engaging a nut **52,** the rod **51** having a handle **54** and engaging arms **53** so that as the handle is turned the bracket **44** tilts about the pivot **50** in relation to the column **43.** This allows the angle of tilt about the hinge to be changed, so that for instance the head end of the stretcher can be raised in relation to the foot end or vice versa and all of this can be simply and effectively achieved by simply adjusting the angle of the bracket about the column.

It is preferred to form the base of U shape so that the two end parts of the U shaped base can have the caster wheels **41** secured thereto to make the trolley transportable, the pillar **42** being positioned at the centre of the base frame **40** and extending upwardly a sufficient distance to form as a guide for the sleeve **43** disposed over the column, which, as stated, forms the height regulating means for the bracket **44.**

From the foregoing it will be realised that a simple and effective trolley is provided which because of the U shaped base frame **40** having a telescopic column **42–43** off-set to one side, this base frame **40** can move to beneath a bed or other support because of the absence of any upstanding members other than the column **42–43,** and as the column supports a bracket **44** which is adjustable both in height and in angle, which bracket has forks **45** at its ends, it will be realised that a stretcher can readily be picked up by engaging the forks in sockets **46** of the stretcher and then raising the bracket to lift the stretcher clear of the bed or the like on which it previously rested after which the stretcher can be wheeled to any required locality and can again be lowered to its new position and the trolley simply withdrawn by moving it transversely of the stretcher to withdraw the forks engaging the stretcher.

Because of the overhang of the stretcher when supported on the bracket in relation to the column, it will be realised that the stretcher can be positioned on a table or bed or the like yet because the base frame of the trolley also projects on the same side as the stretcher, adequate balance of the structure is ensured because the wheels can be positioned approximately beneath the edges of the stretcher when the stretcher is engaged on the trolley.

It will of course be obvious that modifications of the invention can be effected and while a single column on a U shape base frame is a highly advantageous form of construction, it would be possible to use a pair of columns with raising and lowering means, in which case the two ends of the stretcher could be independently raised and lowered to achieve and effect somewhat similar to the raising and lowering and tilting previously described, and while this would obviate the need of a tilting assembly between the column and bracket, it would require a raising and lowering device on each column which would have to normally be independently actuated to allow independent lifting at each end to assume a tilt if required and therefore it is generally much more convenient to use a single column which will give a normal horizontal raising and lowering of the stretcher in a simple manner without any tilt taking place, but when tilt is required this again can be quite independently adjusted.

As stated earlier it is preferred to use such as trolley with a stretcher of the type comprising a pair of side members joined by hollow end members into which the forks of the bracket of the trolley can be engaged, the stretcher being adapted to engage a cloth in such a manner that by manipulation of the side members or means upon the side members the cloth can be tensioned and therefore the stretcher allows the cloth to be picked up with a patient thereon and transported after which the patient can be lowered to a bed or table or the like and the frame of the stretcher withdrawn with the patient remaining on the cloth which can then be readily removed by withdrawing it from beneath the patient in a manner much simpler than where the stretcher itself would need to be removed as a complete assembly.

In the case of FIG. **8** the sockets **46** of the stretcher, which as shown have square or rectangular cross-section, engage complementary shaped extensions **60** on legs **61** so that the stretcher is then self-supporting and can be used as a bed. The fabric of FIG. **1** could simply be engaged on a simple stretcher frame comprising a rectangular frame on legs carrying the studs **8** to take the fabric.

I claim:

1. A flexible support comprising a sheet and a stretcher including side bars to engage the sheet and tension same, said sheet being formed of woven fabric

having its threads angularly positioned in relation to the length of the sheet and engaged at the edges of the sheet on a flexible peripheral reinforcement, said sheet engaging attachment means on the side bars at spaced intervals, said attachment means being so spaced that at least one end of each thread engages said reinforcement at a point remote from the spaced attachment means, whereby the sheet can conform to the shape of a body due to deformation of the relevant portions of the reinforced edges of the sheet.

2. A support according to claim **1** wherein the reinforcement means comprise a cord held in a loop at the edge of the sheet formed by folding back the edge of the sheet and stitching.

3. A support according to claim **1** wherein the sheet has its ends reinforced by fabric gussets in which the threads are positioned longitudinally and transversely of the sheet.

4. A support according to claim **1** wherein the attachment of the sheet to the side bars is by spaced buttonholes on the sheet along the two side edges and correspondingly spaced buttons on the side bars.

5. A support according to claim **1** wherein the tensioning of the sheet is achieved by rotating the side bars of the stretcher after the sheet has been attached thereto and then locking the side bars in the tensioning position until the sheet is again to be removed.

6. A support according to claim **1** wherein the stretcher comprises a pair of side bars, bearing means on cross bars which bearing means engage the side bars to space them apart, means to allow limited rotation of the side bars, buttons on the side bars normally upwardly disposed for engagement of the sheet edges thereon prior to stretching of the sheet, but movable outwardly to the sheet stretching portion by rotation of the side bars, and means to lock the side bars in their sheet stretching position.

7. A support according to claim **6** wherein the cross bars include a plug and socket whereby the side bars can be disengaged one from the other.

8. A flexible support comprising a sheet and a stretcher according to claim **1** characterised by legs adapted to engage said stretcher and support said stretcher.

9. A flexible support comprising a sheet and a stretcher according to claim **1** characterised by legs and by sockets on said stretcher to engage said legs, said legs including extensions adapted to non-rotationally engage said sockets.

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