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US 4966351 A	US 4958816 A	US 4579324 A
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UK CL (Edition O) A4L LAAE LBBA LBBB LBDB LBDC LBLC LBLD
INT CL^6 A61G 7/075 13/00 13/12
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(54) Patient support tables and components

(57) An operating table has two lower limb sections 10 and 11 each having a square-section bar 16 supporting a removable mattress 17 and a calf support 30. The mattress has a frame 19 at one end, encircling the bar 16, and a tongue 20 at the other end, engaging under a pin 21 on another part of the table, so that the mattress can be removed by sliding it a short distance along the bar until the frame clears the end of the bar and the tongue clears the pin. The calf support 30 has an arm 35 pivoted to a tube 31, which is also slidable along the bar 16. The arm 35 extends above and across the patient's leg while this is resting on the upper surface of the mattress 17 so that the leg can be lifted off the mattress and placed on a cradle 36 at the end of the calf support 30 after this has been swung into position.

Fig.1.

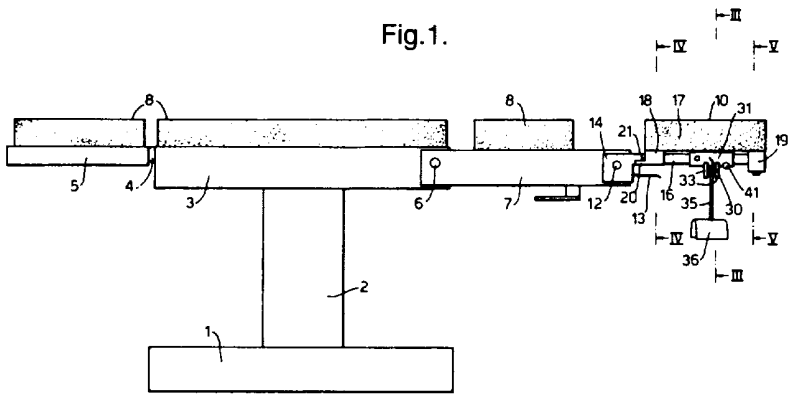
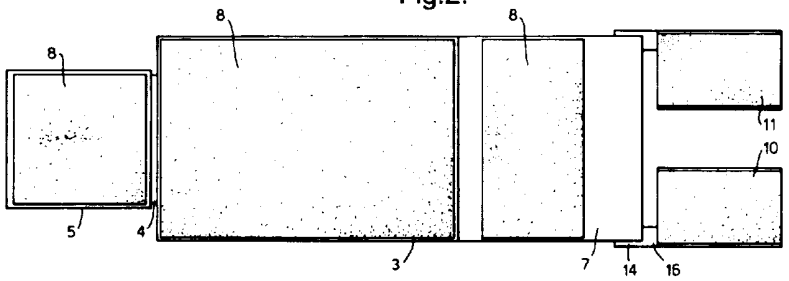


Fig.2.



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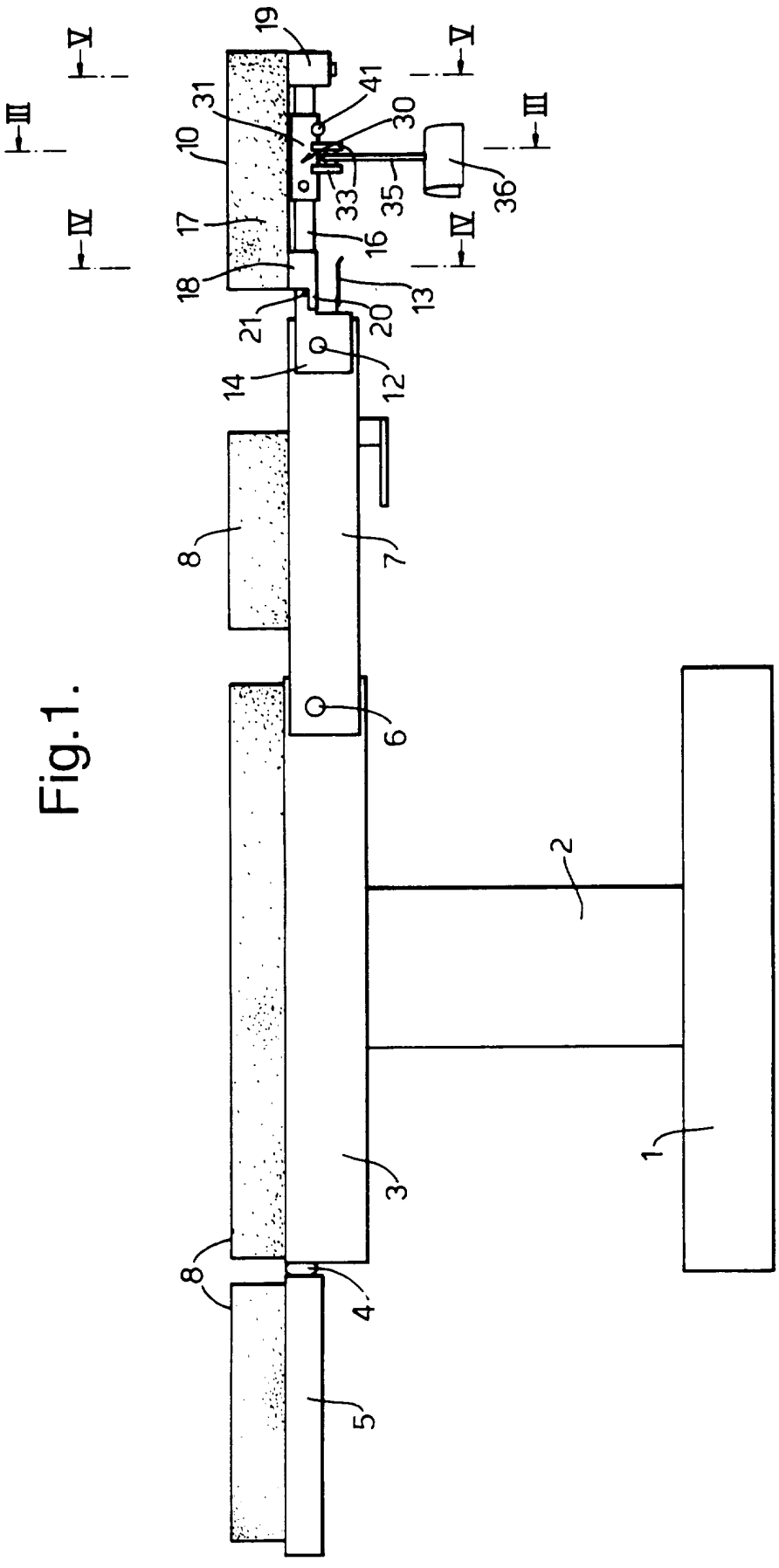
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Fig.1.

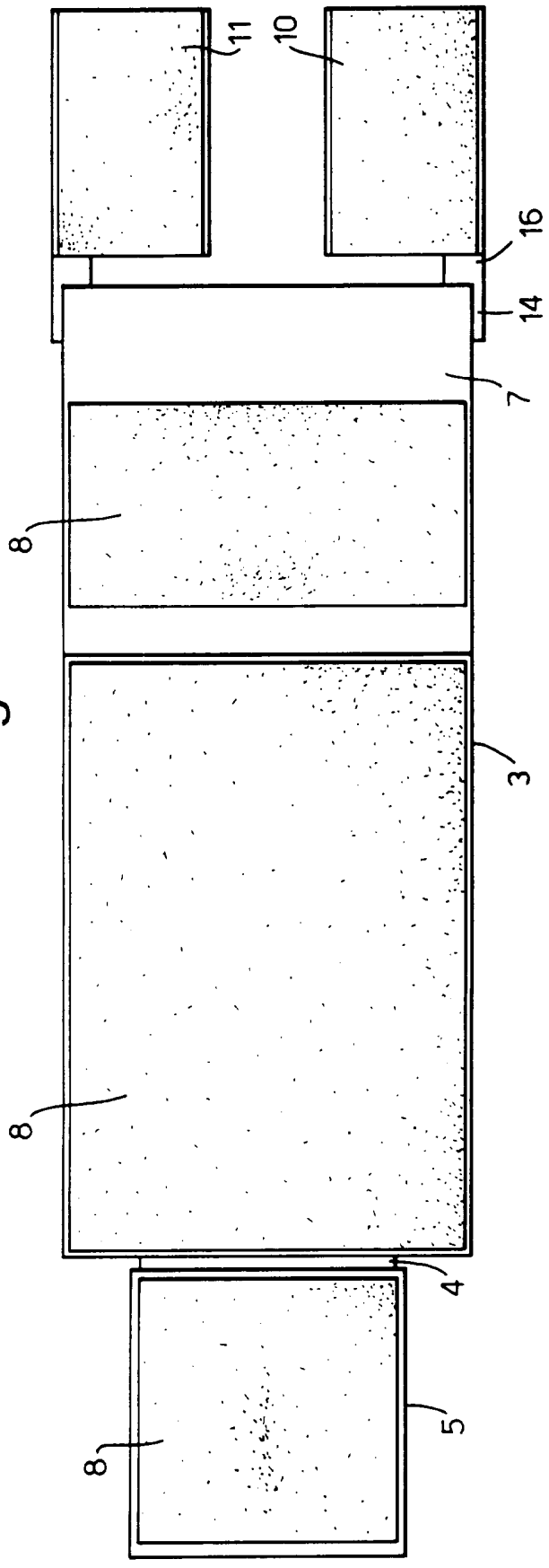


Fig.2.

Fig.3.

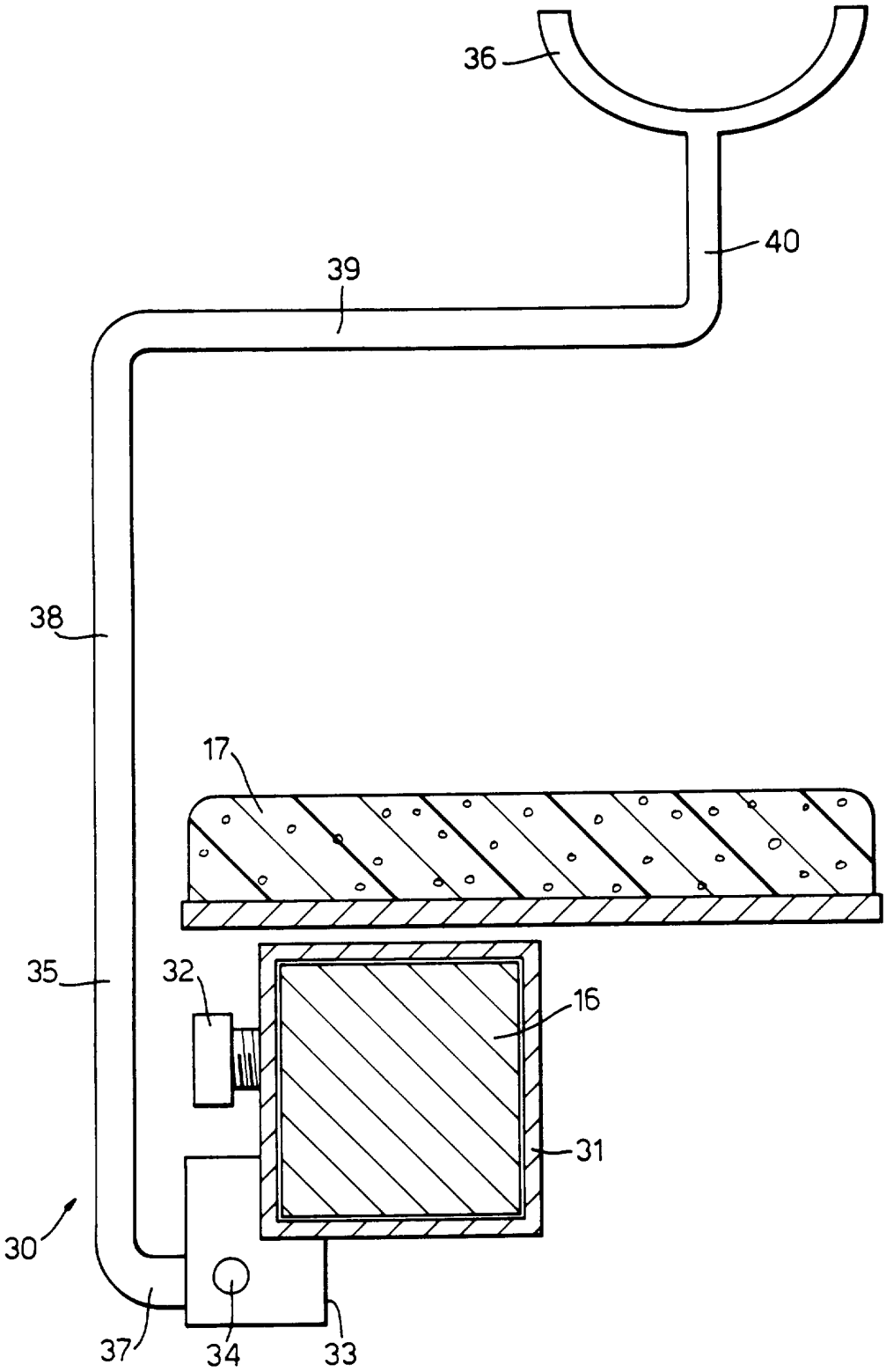


Fig.4.

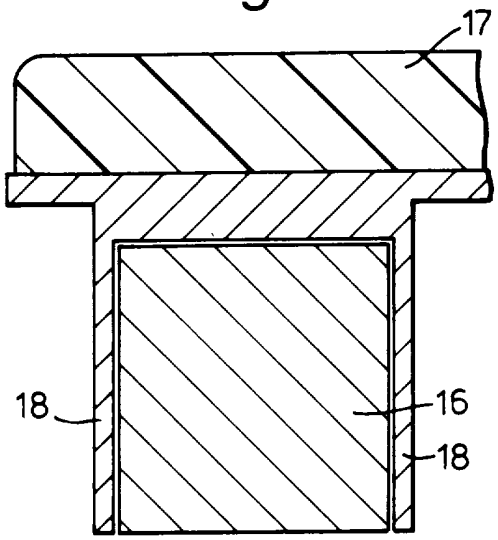
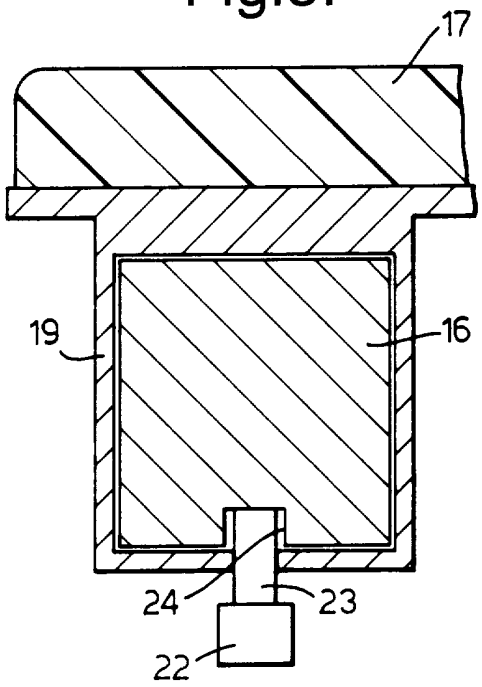


Fig.5.



PATIENT SUPPORT TABLES AND COMPONENTS

This invention relates to patient support tables and to components for such tables.

Various surgical procedures require the lower part of the leg of a patient to be raised, with the patient lying in a supine position on a surgical operating table. The usual procedure for carrying this out is as follows. First, the anaesthetised patient is placed on the operating table top with his legs resting on respective separate, horizontal leg sections. Each leg section supports a removable mattress, the patient's legs being supported initially by these mattresses. Next, the operating theatre staff raise and support the patient's leg, or both legs, so that the mattresses can be removed from the leg section. With the leg maintained in the raised position, the theatre staff attach a calf support device to the exposed framework of the leg section; this has to be done after removal of the mattresses because they obstruct access to the framework of the leg section to which the support device is attached. The patient's leg is then placed on the calf support. After the surgical procedure has been completed, the theatre staff support the patient's legs again while the support is removed. The mattresses are then replaced and the patient's legs lowered.

It can be seen that this procedure is relatively lengthy. Furthermore, the procedure typically involves one person to support the legs and a third person to remove the mattresses and fasten the leg support, so it is relatively wasteful of theatre staff. There is also a safety risk because different people are involved in supporting the legs and in securing the support, so the legs may be lowered before the support has been securely fastened.

It is an object of the present invention to provide an improved patient support table and components.

According to one aspect of the present invention there is provided a patient support table including a first member with an upper surface for supporting the lower part of a leg of the patient in a generally horizontal position and a second member that is pivotally mounted at one end on the first member such that the second member can be moved between a first position below the upper surface of the first member and a second position where the other end of the second member extends above the leg of the patient resting on the first member, the second member having a leg support element at its other end such that the patient's leg can be raised from the first member onto the support element of the second member to put the patient's leg in an elevated position.

The table may include two of the first and second members, one for supporting each leg. The or each first member is preferably hinged at one end about a horizontal, lateral axis so that the other end of the first member can be raised and lowered. The or each first member preferably has a mattress that is removable with the second member in the second position. The or each first member may have a longitudinally-extending bar, the or each mattress being slidable along the bar. The or each mattress may have a surface formation at one end adapted to engage a surface formation on another part of the table and thereby prevent said one end being lifted from said bar when it engages said surface formation. The or each mattress may have a frame towards its other end encircling the bar such that when the frame is pulled clear

of the end of the bar the mattress can be lifted off the bar. The or each mattress may have a lock preventing longitudinal displacement of the mattress along the bar. The second member is preferably slidable along the bar and may be pivotally mounted at the one end about a horizontal, longitudinal axis. The second member preferably has a rod a first part of which extends substantially vertically above the upper surface of the mattress and a second part of which extends horizontally from the upper end of the first part when the second member is in the second position.

According to another aspect of the present invention there is provided a second member for use on a table according to the above one aspect of the invention.

A surgical operating table according to the present invention will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a side elevation view of the table with the leg support in a lower position;

Figure 2 is a plan view of the table;

Figure 3 is a transverse sectional elevation of a part of the table along the line III-III of Figure 1, but showing the leg support in a raised position;

Figure 4 is a transverse sectional elevation through a part of the table along line IV-IV of Figure 1; and

Figure 5 is a transverse sectional elevation through a part of the table along line V-V of Figure 1.

With reference to Figures 1 and 2, the table has a base 1 from which extends a vertical pedestal 2 at the upper end of which is mounted a horizontal central platform 3 for supporting the torso of the patient. At the left end of the central platform 3, a joint 4 supports a head flap 5. At the right of the central platform 3, there is a second joint 6 coupled to a leg flap 7 for supporting the upper part, thigh, of the patient's two legs. Mattresses 8 are fitted to the upper surface of the platform 3, head flap 5 and leg flap 7. As so far described, the table is entirely conventional.

Two lower limb sections 10 and 11 are attached to the right-hand end of the leg flap 7 by a horizontal pivot 12 so that they can be raised or lowered about a horizontal, lateral axis at one end. A locking handle 13 enables the pivot 12 to be locked in any desired position. The pivot 12 is fixed in a square plate 14 at the left-hand end of each limb section, the plate being oriented vertically. A bar 16 of square, or other non-circular, section projects from the plate 14 to the right-hand end of each limb section 10 and 11.

With reference now also to Figures 4 and 5, each limb section 10 and 11 has a mattress 17 attached to the bar 16 by means of two fixing members 18 and 19, one at each

end of the underside of the mattress. The left-hand fixing member 18 is a metal component of inverted U-shape in section and open along its lower end so that it can be fitted onto the bar 16 from above. The fixing member 18 has a surface formation in the form of a tongue 20 projecting to the left towards its lower edge; the tongue engages beneath a short pin, or other surface formation 21, projecting laterally outwardly from the bar 16. When the tongue 20 is engaged beneath the pin 21, the mattress 17 cannot be lifted upwardly at its left-hand end. The other fixing member 19, at the right-hand end of the mattress 17, is a square frame that encircles the bar 16, as shown in Figure 5, so that the mattress cannot be lifted up at its right-hand end. The fixing member 19 has a lock 22 that engages the bar 16 to prevent longitudinal displacement of the mattress along the bar. The lock 22 may comprise a spring-loaded catch 23 on the fixing member 19, which engages in a recess 24 in the bar 16. The lock 22 engages when the tongue 20 at the other end of the mattress 17 is engaged under the pin 21. In this position, the fixing members 18 and 19 lock the mattress 17 on the bar 16 against horizontal or vertical movement. The mattress 17 can, however, be easily removed by releasing the lock 22 and sliding the mattress to the right so that the right-hand fixing member 19 clears the right-hand end of the bar 16 and the tongue 20 clears the pin 21. The mattress 17 can then be lifted upwardly off the bar 16. Similarly, to replace the mattress 17 on the bar 16, the left-hand fixing member is lowered onto the bar just to the right of the pin 21 and the mattress is pushed horizontally to the left so that the tongue 20 engages under the pin and the right-hand fixing member 19 slides onto and locks with the bar.

The lower limb sections 10 and 11 are completed by a calf support 30, as shown in Figure 3. The calf support 30 includes a short tube 31 of square section, which is a sliding fit

on the bar 16, and has a clamping screw 32 by which the tube can be fixed at any desired position along the bar. Two parallel plates 33 project from the lower, outer edge of the tube 31 and have a horizontal pivot joint 34 extending between them by which a support arm 35 is attached to the tube 31. The support arm 35 is a bent, rigid metal rod attached at one end to the pivot joint 34 and at the other end to a cradle 36 of semicylindrical shape. The arm 35 is divided into four sections 37 to 40. In the position shown in Figure 2, with the calf support 30 in its upper, operative position, the section 37 attached to the pivot joint 34 is oriented horizontally and is long enough to project outwardly just beyond the edge of the mattress 17. The adjacent section 38 extends at a right angle to the first section upwardly alongside the mattress 17 to a height sufficient to accommodate the calf of the patient when this is supported on the mattress. The third section 39 extends horizontally above the calf of the patient so that it forms a right angle with the second, vertical section 38. The third section 39 projects inwardly beyond the bar 16 so that the bar is positioned centrally along the length of the section. The fourth section 40 projects vertically upwardly by a short distance. The support 30 is locked in the vertical position by a catch, which can be released by pressing a button 41 on the tube 31.

Normally, the leg support 30 is stored swung down beneath the table, as shown in Figure 1. The anaesthetised patient is loaded onto the mattresses 8 of the table with his calves resting on the mattresses 17 of the lower leg sections 10 and 11. A member of theatre staff then swings one of the leg supports 30 up to the position shown in Figure 3 so that the cradle 36 is above one of the patient's legs. The same person can then lift the leg onto the cradle 36 and, after this, remove the mattress 17 by releasing the lock 22, sliding the mattress to the

right by about 25mm and then raising it off the bar 16. The same process can then be repeated with the other leg. When the surgical procedure has been completed, the mattresses 17 are replaced, the patient's legs are swung off the cradles 36 onto the mattresses, and the leg supports 30 are released and swung down to their stored position. The mattresses 17 can be removed and replaced without disturbing the leg supports 30. The procedure of raising and lowering the patient's legs can be carried out safely and rapidly by one person, thereby giving considerable advantages over the previous arrangement.

CLAIMS

1. A patient support table including a first member with an upper surface for supporting the lower part of a leg of the patient in a generally horizontal position and a second member that is pivotally mounted at one end on the first member such that the second member can be moved between a first position below the upper surface of the first member and a second position where the other end of the second member extends above the leg of the patient resting on the first member, and wherein the second member has a leg support element at its other end such that the patient's leg can be raised from the first member onto the support element of the second member to put the patient's leg in an elevated position.

2. A table according to Claim 1 including two of said first and second members, one for supporting each leg.

3. A table according to Claim 1 or 2, wherein the or each said first member is hinged at one end about a horizontal, lateral axis so that the other end of the first member can be raised and lowered.

4. A table according to any one of the preceding claims, wherein the or each first member has a mattress that is removable with the second member in the second position.

5. A table according to Claim 4, wherein the or each said first member has a longitudinally-extending bar and the or each said mattress is slidable along said bar.

6. A table according to Claim 5, wherein the or each said mattress has a surface formation at one end adapted to engage a surface formation on another part of the table and thereby prevent said one end being lifted from said bar when it engages said surface formation.

7. A table according to Claim 6, wherein the or each said mattress has a frame towards its other end encircling said bar such that when the frame is pulled clear of the end of the bar the mattress can be lifted off the bar.

8. A table according to Claim 7, wherein the or each said mattress has a lock preventing longitudinal displacement of the mattress along the bar.

9. A table according to any one of Claims 5 to 8, wherein said second member is slidable along said bar.

10. A table according to any one of the preceding claims, wherein said second member is pivotally mounted at said one end about a horizontal, longitudinal axis.

11. A table according to any one of the preceding claims, wherein said second member has a rod a first part of which extends substantially vertically above the upper surface

of the mattress and a second part of which extends horizontally from the upper end of said first part when the second member is in said second position.

12. A patient support table substantially as hereinbefore described with reference to the accompanying drawings.

13. A second member for a table according to any one of the preceding claims.

14. Any novel feature or combination of features as hereinbefore described.

The Patent Office

Application No:	GB 9619430.3	**Examiner:**	Martin Price
Claims searched:	1-13	**Date of search:**	18 December 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A4L - LAAE, LBBA, LBBB, LBDB, LBDC, LBLC, LBLD

Int Cl (Ed.6): A61G 7/075, 13/00, 13/12

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 1050834 A	(Thackray) - see Figure 2 and page 2 lines 47-56	1 at least
X	GB 798295 A	(Elliott) - see the Figure and page 2 lines 48-68	1 at least
X	GB 435995 A	(A&H) - see Figure 2, features 7b to 7g	1 at least
X	US 4958816 A	(Midmark) - see Figure 1	1 at least
X	US 4966351 A	(Klepacki) - see figures 1, 2 and 12	1 at least
X	US 4579324 A	(McConnell) - see the Figures	1 at least
X	US 4407687 A	(Mitchell)- see Figure 1	1 at least
X	US 4373709 A	(Whitt) - see Figure 1	1 at least
X	US 4197838 A	(Shill) - see Figure 1	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.