# United States Patent

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[33] **France**
[31] **No. 105,602**


[54] **MEDICAL APPARATUS FOR TRANSPORTATION, TREATMENT AND HOSPITALIZATION OF POLYTRAUMATIZED PERSONS**
**18 Claims, 5 Drawing Figs.**


[52] **U.S. Cl.** ..... **128/1,** 128/71, 128/369, 128/373, 250/54
[51] **Int. Cl.** ..... **A61b 11/00**
[50] **Field of Search** ..... 128/1, 369, 371, 373



[56] **References Cited**

UNITED STATES PATENTS

2,633,842 4/1953 Higgs ..... 128/1

FOREIGN PATENTS

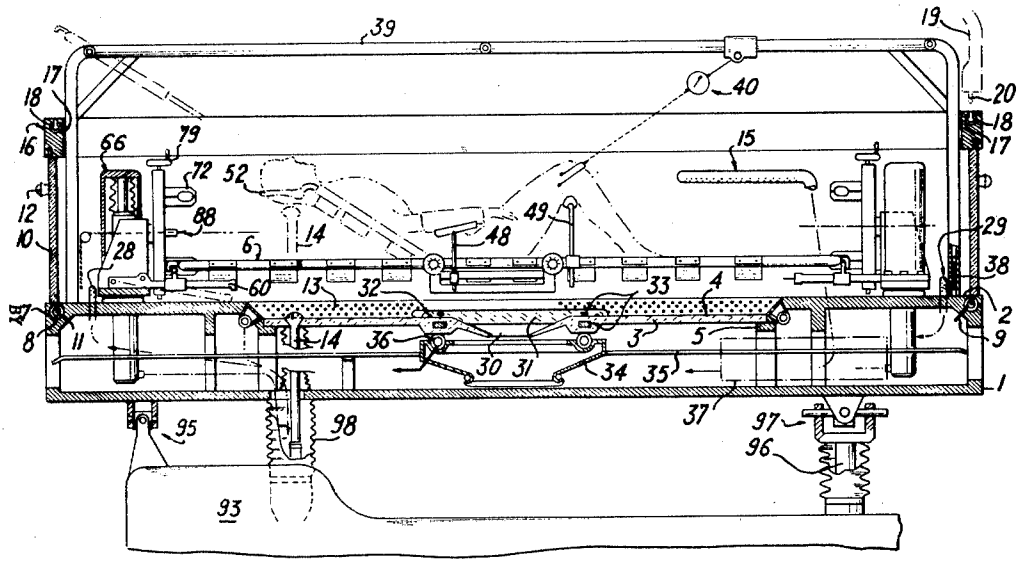
1,492,056 7/1967 France ..... 128/1



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**ABSTRACT:** A medical apparatus comprising a fluid-tight box-mattress unit, an enclosure which can be fitted around the periphery of said box-mattress unit, a system of leak-tight attachment of said enclosure to the box-mattress unit, means intended to supply said enclosure with liquids and gaseous mixtures, a removable stretcher which is placed on the box-mattress unit inside the enclosure, and lifting mechanisms intended to carry out different manipulations of said stretcher.

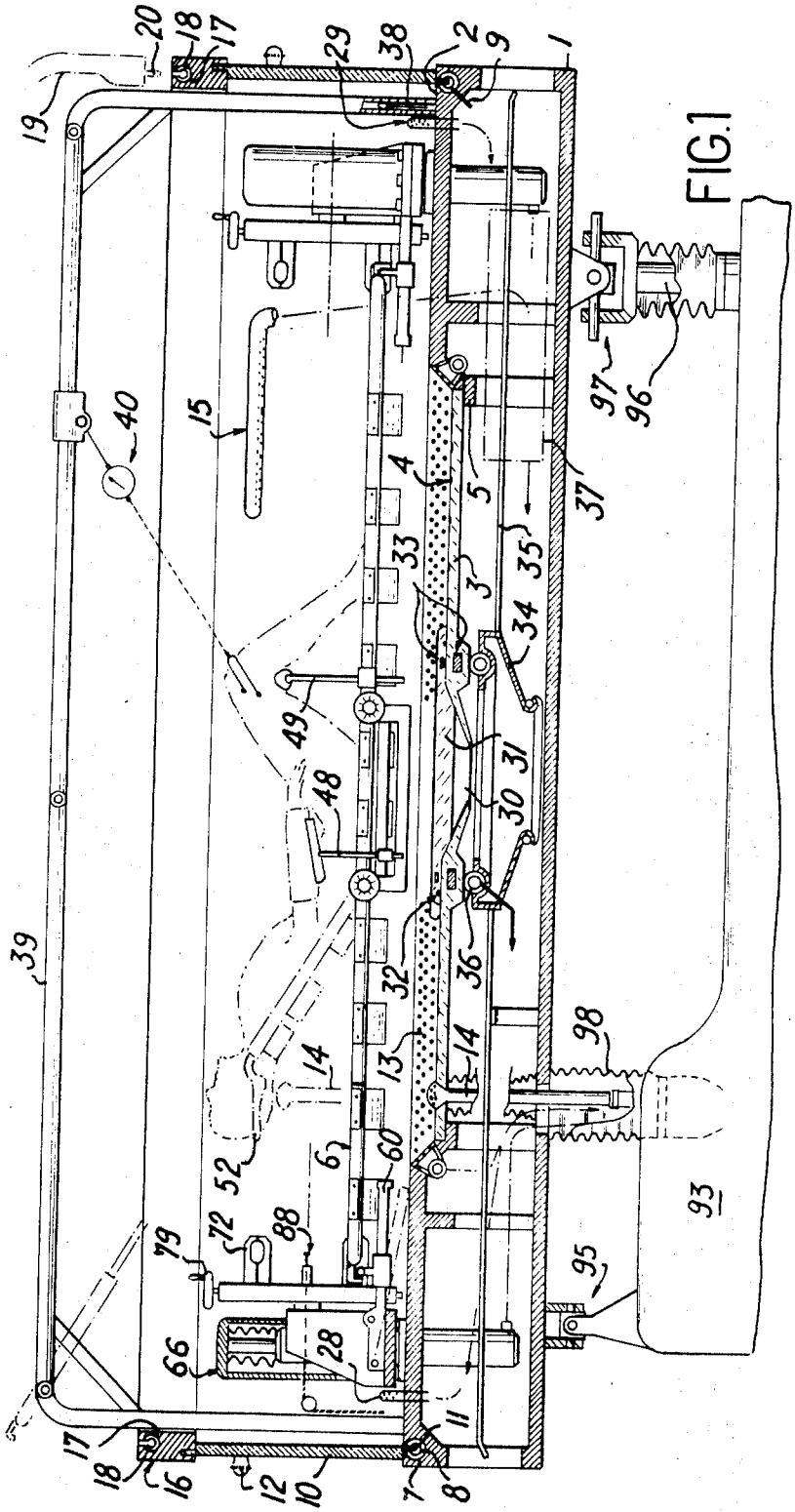

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FIG. 1

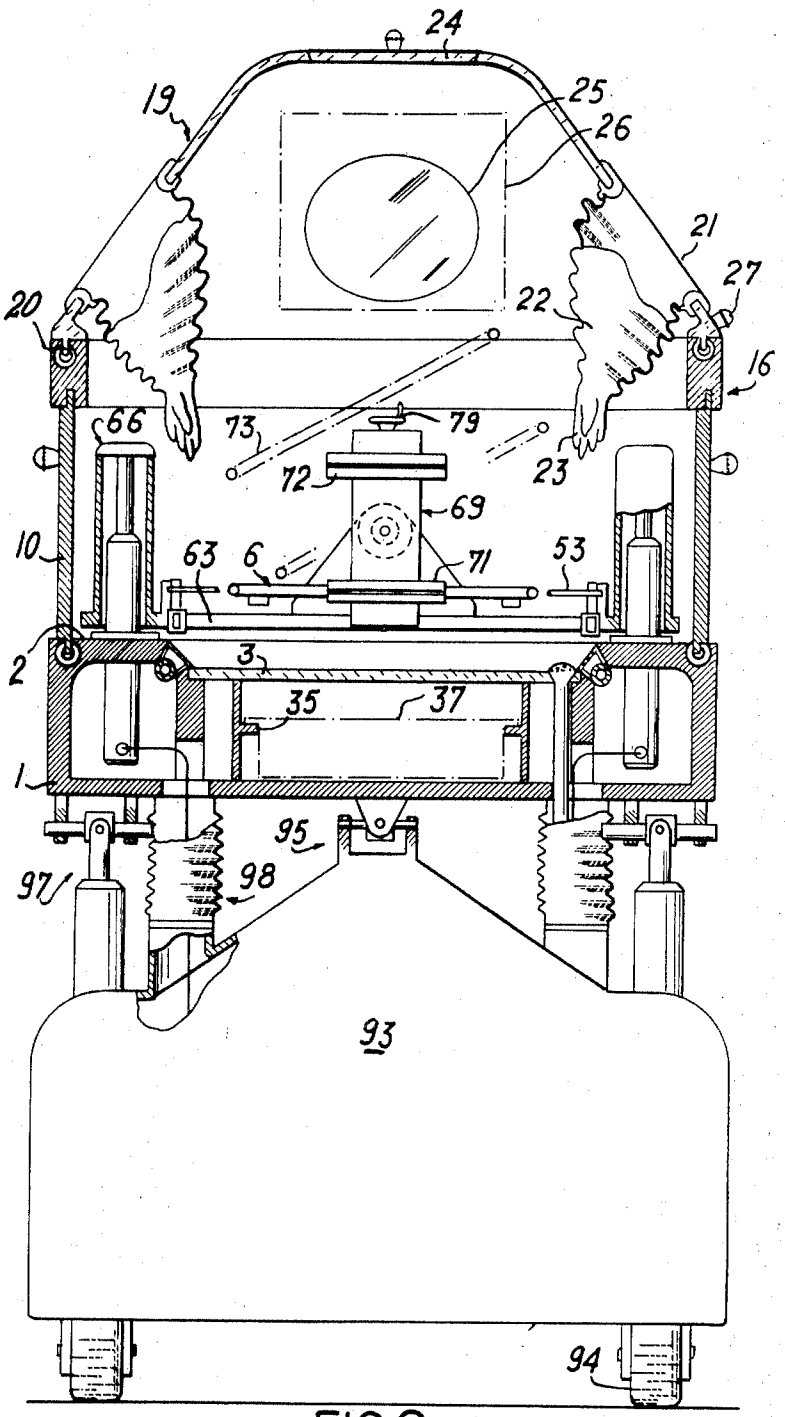

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FIG.2

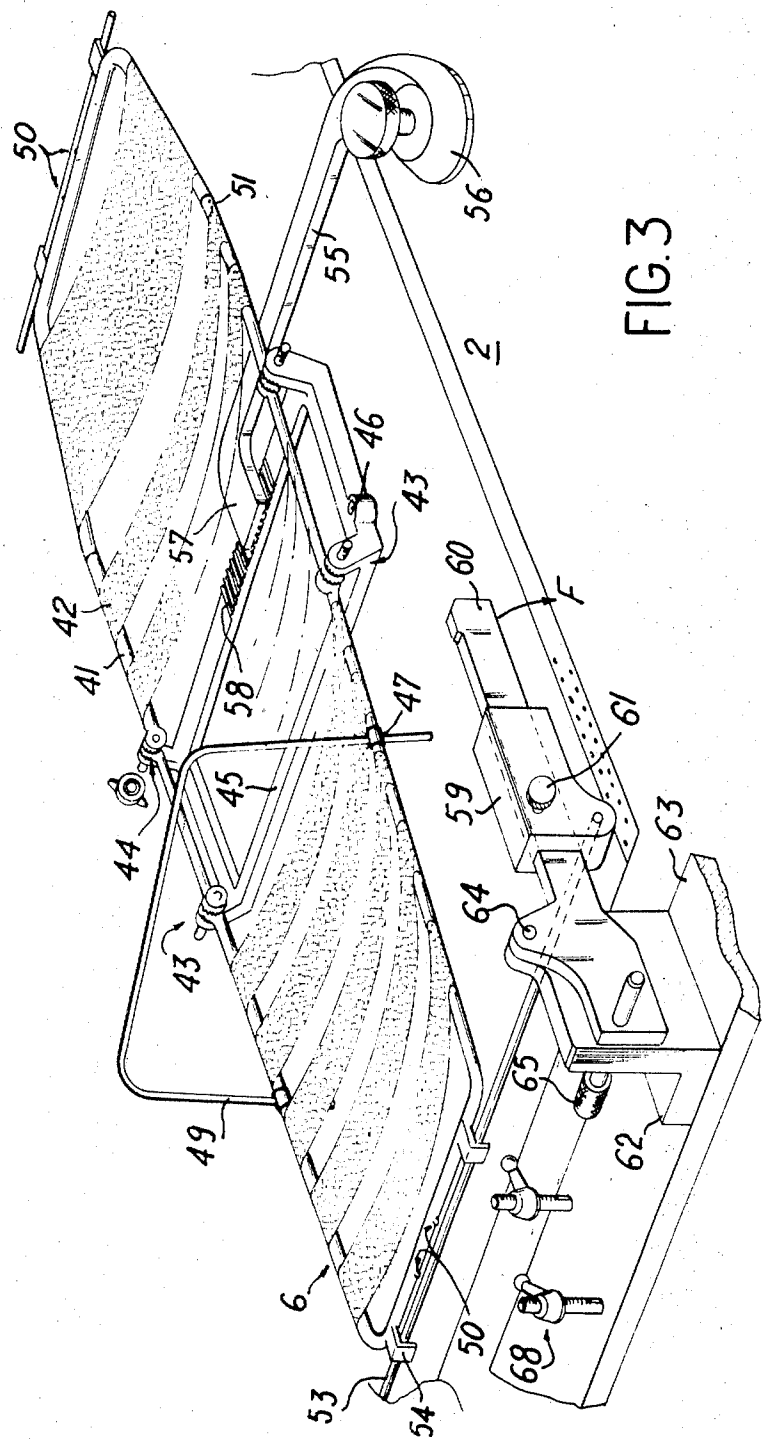

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FIG. 3

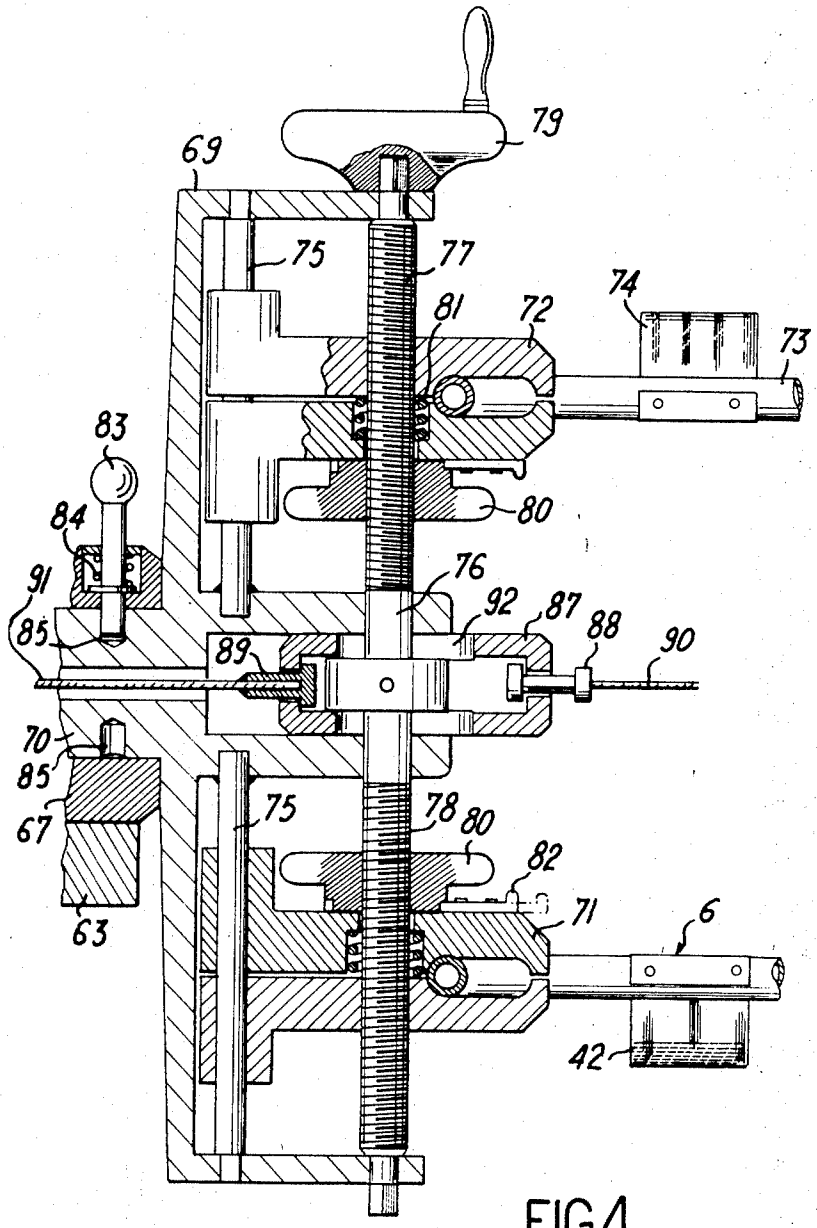

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FIG.4

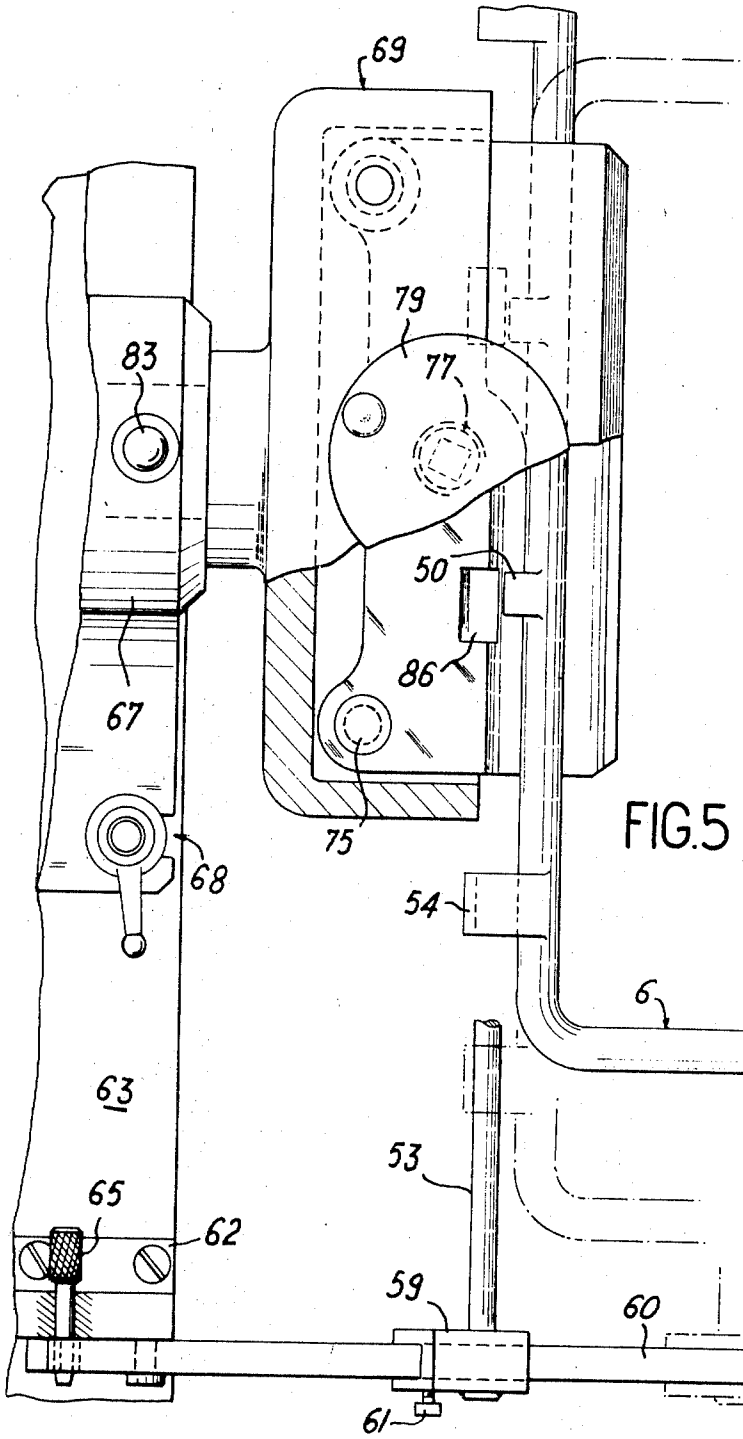



FIG.5

# MEDICAL APPARATUS FOR TRANSPORTATION, TREATMENT AND HOSPITALIZATION OF POLYTRAUMATIZED PERSONS

The present invention is concerned with a medical apparatus which is intended for the transportation, treatment and hospitalization of polytraumatized persons, persons suffering from burns and radiation injuries, patients who have undergone operations and sick persons suffering from serious ailments. This apparatus is designed to support the polytraumatized person from the time of causation of the injury to the time of recovery without any essential need to remove the patient from the enclosure in which he is resting in order to render all the medical assistance which his condition demands. In particular, the apparatus forms an orthopedic bed, X-ray table, operating table and hydrotherapy appliance.

A characteristic which is common to many fields of modern industry (the petrochemical industry, nuclear power stations, handling of propergols), to modern warfare techniques (nuclear armaments, rockets, napalm, phosphorus) and to road, rail or air accidents is the fact that they give rise to particular types of injuries resulting from the association in one person of pathological phenomena having different causes, as in persons suffering from fractures and burns, from fractures and blast injuries, wounds and burns, fractures and intoxications, wounds and radiation injuries, and so forth.

Under such circumstances, the effectiveness of surgical and reanimation techniques depends on their speed of application as well as on the quality of the first aid given at accident locations but above all on the number of handling operations and modes of transportation of injured persons.

In point of fact, the different types of equipment which exist at the present time are usually designed solely for the purpose of treating a single type of injury or for applying a single kind of reanimation, that is to say for simple and well-defined cases. In consequence, satisfactory treatment of complex injuries is made correspondingly more difficult as the types of equipment referred-to are incompatible with respect to each other and therefore necessitate a fairly large number of handling and carrying operations.

It follows from the foregoing, for example, that a road accident victim who has been thrown from his car and suffers from an open fracture of the thigh and abdominal contusions has to undergo between ten and fourteen manipulations and between five and seven carrying operations on a trolley before finally being laid in bed. Now it is well known that manipulations, low temperatures, noises and changes of position aggravate the condition of a polytraumatized patient to a marked degree.

Moreover, polytraumatized persons who have been exposed to radiation give rise to particularly serious and complex problems, taking into account their sensitivity to infection and the hazards to to which they themselves expose attending physicians and nursing staff. In point of fact, there is no equipment at present in existence which meets the requirements of this particular form of pathology.

The present invention provides a solution to these different problems, and is accordingly concerned with a general-purpose apparatus which provides the following main advantages:

1. Operations involving handling and transferring the patient on trolleys are almost completely dispensed with.
2. The most elaborate reanimation techniques can be applied simultaneously.
3. Technical means which are demanded by the particular state of the injured person can be brought to actual accident locations.
4. Patients can be transferred from an accident location to the hospital center or from one hospital to another under the best possible conditions without thereby incurring any risk of modification of temperature and without any interruption of the care and treatment being given at the time of transfer.

More specifically, the present invention is concerned with a medical apparatus which is intended for the transportation, treatment and hospitalization of polytraumatized persons, persons suffering from burns, radiation injuries, operated persons and patients suffering from serious injuries and ailments, which forms in particular an orthopedic bed, X-ray table, operating table, hydrotherapy appliance, and which permits both the positioning and turning of the patient, the said apparatus being characterized in that it comprises:

- a fluid-tight box-mattress unit;
- an enclosure which can be fitted around the periphery of said box-mattress unit;
- a system of leak-tight attachment of said enclosure to the box-mattress unit;
- means intended to supply said enclosure with liquids and gaseous mixtures;
- a removable stretcher which is placed on the box-mattress unit inside the enclosure;
- and lifting mechanisms intended to carry out different manipulations of said stretcher.

The stretcher is advantageously constituted by an articulated frame fitted with flexible and detachable crossbands, at least one end of which is rigid. Said stretcher can be associated with lifting systems permitting of both angular positioning and longitudinal reversal thereof. In the case last mentioned, the stretcher is rigidly fixed to a second stretcher or so-called ventral stretcher.

Further properties and advantages of this invention will become apparent from the description which now follows in reference to the accompanying drawings and in which one form of construction of the apparatus is given by way of explanation but not in any limiting sense.

In these drawings:

FIG. 1 is a longitudinal sectional view of the apparatus according to the invention which is shown without its handling hood;

FIG. 2 is a transverse sectional view of the apparatus which is fitted with its handling hood;

FIG. 3 is a view in perspective of the main stretcher;

FIG. 4 is a sectional diagram of the mechanism for longitudinal reversal of the stretchers; and finally,

FIG. 5 is a top view of said mechanism.

From FIGS. 1 and 2, it is apparent that the apparatus according to the invention comprises a box-mattress whose frame 1 which is formed of light alloy and can readily be decontaminated is presented in the form of a flat parallelipipedal box. The top plate 2 of the box-mattress unit forms a table and is provided with a central depression of rectangular shape having a chamfered periphery and dimensions which are substantially those of a patient who is lying in the horizontal position. The bottom of said depression is constituted by a transparent plate 3 formed of Plexiglas, for example, and provided with drainage channels 4; said plate 3 is supported on a bearing member 5 which is provided at the base of the chamfered portion to which it is secured in fluid-tight manner by means of bolts and neoprene seals (not shown).

The patient rests on an articulated stretcher 6 which is associated at each end, namely at the head end and foot end, with a complex mechanism which makes it possible in particular to place the patient in the desired angular position and to turn the patient over longitudinally. Detailed descriptions both of said stretcher and of said mechanism will be given hereinafter.

The table 2 is completely surrounded by a cylindrical channel 7 which has an opening at the top and contains an air-seal 8, the inflation valve of which is shown at 9. Said air-seal is formed in one piece and may be made of flexible neoprene, for example. The rigidity of the seal must be sufficient to enable it to retain its shape and to permit of its ready extraction from the channel 7 by means of a device of the tire-lever type.

A Plexiglas frame 10 without either base or cover and having a substantially parallelipipedal shape is attached to the table 2 in fluid-tight manner. To this end, the lower end 11 of the frame walls is molded in the form of a beaded edge and is fitted in the air-seal 8 which, after inflation, locks the frame in

position in a fully leak-tight manner. Handles **12** are provided for the purpose of fitting or removing the frame.

Provision is thus made for a fluid-tight enclosure which can serve in particular as a bath or shower chamber. With this object in view, perforated spray-tubes **13** are disposed along the chamfered portion of the central depression of the table **2**. The design function of said spray-tubes is to douche the patient from underneath, dry the patient with dry air or simply to fill the bath.

A discharge pipe with strainer **14** is adapted to slide in leak-tight manner through the transparent plate **3**. In the bottom position (as shown in full lines), said pipe permits the complete emptying of the bath; in the top position (shown in chain-dotted lines), the strainer makes it possible to maintain the liquid at a constant and adjustable level within the enclosure.

A perforated horizontal spray-tube **15** can be fitted at the foot end of the table **2**; said tube can be fed with either liquid or air in the same manner as the spray-tubes **13**.

The Plexiglas frame **10** is fitted at the top with a stainless steel band **16** which clamps the frame walls and opens at the top into a channel **17** of cylindrical section which is similar to the channel **7** and in which is held an air-seal **18** of the same type as the seal **8**, the valve for the inflation of said seal having been omitted from the figure.

The seal **18** permits the leak-tight attachment of an open-bottomed hood **19** to the frame **10**, the bottom of the hood walls being cut so as to form a beaded edge **20**. Inasmuch as the systems of leak-tight attachment of the frame **10** to the box-mattress table **2** and of the hood **19** to the frame **10** are strictly identical, the hood **19** can therefore also be fixed directly to the box-mattress.

The hood, or so-called handling hood, is provided (as shown in FIG. **2**) with ports **21** fitted with sleeves **22** and gloves **23** and at the top with inspection doors **24**. Another glove port **25** is provided at the head end of the hood whilst provision is made at the foot end for an inwardly-opening door **26**. When so required, said door is designed to permit the connection of a sterilization lock-chamber, not shown in FIG. **2**. Handles **27** are provided in order to permit fitting and removal of the hood.

When the patient is within the sealed enclosure, he is supplied with respiratory mixtures by means of a pipe **28** fitted in the table **2** at the head end. The vitiated air is discharged via two other pipes which are also fitted in the table **2**, one at the head end (not shown), and the other at the foot end, as shown at **29**. Holes (not shown) are intended to permit spraying of germicidal aerosols for the purpose of sterilizing the chamber prior to use. Sterilization can also be carried out by introduction of ultraviolet lamps within said chamber.

The box-mattress unit is additionally provided with a device which performs the function of a bed-pan. To this end, the Plexiglas plate **3** is provided substantially at the level of the seat with a circular opening **30** which can be closed by means of a cover **31**, also formed of Plexiglas. Said cover is fitted around its periphery with an O-ring seal **32** which ensures leak-tightness under the action of small magnets such as **33** which are embedded in the cover **31** and the plate **3**. The bed-pan, which is designated in the figure by the reference **34**, can be inserted at one end of the box-mattress unit and is designed to slide on rails **35** up to the opening **30**. Said bed-pan is fitted around its periphery with an annular air-seal **36** which ensures leak-tightness after inflation. The same rails **35** also serve for the displacement along the entire length of the plate **3** of a drawer **37** containing sensitized X-ray films.

The box-mattress table **2** is provided at the four corners with small vertical rods **38** for the engagement thereon of the four feet of an orthopedic frame **39** having dimensions which make it possible to fit said frame within the chamber walls. Said frame is provided in particular with a spring system (which is similar to a dynamometer) as shown diagrammatically at **40**, whereby a tractive force of adjustable intensity may be exerted on a fractured limb. In the apparatus according to the invention, said spring system advantageously replaces the weight systems usually employed for this purpose by virtue of its small overall size.

As shown in detail in FIG. **3**, the stretcher **6** is made up of a main frame **41** fitted with detachable cross-bands **42**. Said cross-bands each have one rigid extremity in order to slide them beneath a seriously injured patient to be transported without any need to handle the patient.

The main frame **41** therefore comprises two identical articulations at the points shown in the figure at **43**. Toothed locking systems such as the system **44** which are associated with the articulation points serve to hold the patient in the horizontal position as well as in any raised position.

A small additional frame **45** can be adapted beneath the frame **41** at the level of the central portion thereof. The points of attachment of said additional frame to the frame **41** coincide with the articulation points **43**. By this means, the stretcher is endowed with rigidity when an injured person is resting thereon.

The two frames can also be provided at different points with drilled holes such as the holes **46** and **47** in order that different types of appliances for immobilizing the patient's limbs in a predetermined position may be fitted on the stretcher. By way of example, two appliances of this type are shown diagrammatically in FIG. **1** at **48** and **49**: the appliance **48** which is attached to the frame **45** can serve to immobilize one of the patient's arms; the appliance **49** is designed in the form of a bridge and is attached to the two side members of the main frame **41** for the purpose of supporting the patient's knees.

At both ends of the main frame, provision is made for two bosses **50**, the function of which will be explained in the description which follows.

A part of the main frame **41** can be disassembled at the head end by means of a system which is shown diagrammatically at **51** so as to permit the adaptation of a special support for cranial surgery. This support is shown at **52** in FIG. **1**.

The stretcher is supported at both ends, namely at the head end and foot end, on transverse rails **53** by means of hooks **54**. It is thus possible to displace the stretcher laterally along said rails for such a purpose as to make the patient more accessible for any care and treatment required. A locking mechanism serves to secure the stretcher in any desired position. Said mechanism comprises a member **55** which is fitted at one end with a suction cup **56** permitting its attachment to the top plate or table **2** of the box-mattress unit and, at the other end, with a toothed portion **57** which is brought to bear on one of the cross-bars of the frame **45**, said cross-bar being provided with a series of identical teeth **58**.

The rails **53** are rigidly fixed at each end to a shoe **59** which is slidably mounted on a longitudinal rail **60** and which can be locked on said rail by means of a screw **61**. There is thus provided a possibility of lateral displacement of the stretcher as well as a possibility of longitudinal displacement.

The rail **60** is pivotally attached to a vertical support bracket **62** by means of a pin **64**, said vertical bracket being rigidly fixed to a base-plate **63** which also serves as a support for the opposite rail. Said rail **60** is secured to said support bracket in the horizontal position by means of a locking-pin **65**.

The base-plates **63** at the head end and foot end are supported at both extremities thereof on two jacks **66** (shown in FIGS. **1** and **2**) which are attached to the top plate **2** of the box-mattress unit through which they pass. Since the jacks can be operated independently both at the head end and foot end, the injured patient may be placed in all the positions required both by his physical condition and by the type of medical treatment to be given. As and when said jacks perform different movements, the shoes **59** slide freely along their rail **60** so as to compensate for the lack of metal which results from the different movements of rotation about the articulations **43**.

The removal of the locking-pin **65** causes the rail **60** to swing about the pivot-pin **64** in the direction of the arrow F.

Thus, the hooks **54** are released from the rail **53** and the two reversal mechanisms shown diagrammatically at the two extremities of the stretcher in FIG. **1** can then be connected. A description of these mechanisms will now be given in detail with reference to FIGS. **4** and **5**.

The two mechanisms referred-to are identical: they each comprise a bearing **67** which is attached to the base-plate **63** by means of bolts (shown at **68** in FIG. **3**) and in which a frame **69** is capable of rotating about its shaft **70**. The dorsal stretcher **6** (illustrated in FIG. **3**) is gripped at both ends by means of clamps **71**. In the same way, identical clamps **72** imprison the extremities of a second stretcher **73** or so-called ventral stretcher. This stretcher is not shown in the drawings, but consists of a simple non-articulated frame fitted with cross-bands **74** which are identical with the cross-bands **42** of the stretcher **6**.

Columns **75** which are rigidly fixed to the frame **69**, serve to guide the clamps **71** and **72**. A screw **76**, whose upper pitch **76** and lower pitch **78** are opposite, is held to the frame **69** at the two extremities thereof and traverses the clamps. Said screw is actuated by means of a removable handwheel **79**. A nut **80** serves to close the clamps whilst the separation of the clamp jaws is facilitated by means of an oppositely-acting spring **81**. By means of a small latch **82** which is intended to engage in a recess formed at the base of each of the two nuts **80**, the nut-clamp assembly can be locked in position in such a manner that the stretchers can be moved towards or away from each other simply by operating the screw **76**.

A locking system makes it possible to immobilize the two stretchers in different positions, one stretcher being shown diagrammatically in chain-dotted lines in FIG. **2**. This system is constituted by a retractable locking-pin **83** fitted with an oppositely-acting spring **84** fixed to the bearing **67**, the extremity of said pin being adapted to engage in holes such as the hole **85** which are disposed around the entire periphery of the frame shaft **70**.

In addition, in order to prevent sliding of the stretchers at the time of reversal operations, the bosses **50** which are provided at both ends of the dorsal stretcher are centered in recesses **86** (shown in FIG. **5**) which are formed in the clamp **71**. The same bosses and the same recesses can also be provided on the stretcher **73** and the clamps **72**.

The member which is shown at **87** in FIG. **4** is centered around the screw **76**; said member comprises two retaining heads **88** and **89**; the head **88** serves to attach a cable **90** which can be employed, for example, for applying tractive efforts on the patient's spine, whereas the head **89** is coupled to the cable **91**, from the end of which is suspended a traction device (which is identical in design to that which is shown diagrammatically at **40** in FIG. **1**). Elongated slots **92** which are formed at the center of the member **87** permit of sufficient displacement of said member at the time of application of traction.

The frame **1** of the box-mattress unit is supported on a carrier-frame **93** (FIGS. **1** and **2**) fitted with shock-absorbers (not shown) and with wheels **94** by a mechanism which permits the inclination of the box-mattress frame in a large number of different positions. Said mechanism is constituted by a universal-joint assembly **95** which is disposed at the head end and at the center of the box-mattress frame **1** and by two lifting plungers **96** which are associated with a universal-joint assembly **97** and which are disposed at the foot end at an equal distance from the center.

The carrier-frame **93** contains different conditioning devices for air-purification and sterilization, oxygen cylinders, a unit for supplying the bath with water at different temperatures as well as the motors for actuating the jacks together with their feed systems. The different feed systems are passed in fluid-tight manner through the base-plate of the box-mattress frame by means of bellows seals **98**. The apparatus thus constitutes a fully self-contained unit.

The apparatus according to the invention can additionally comprise a series of small open-ended asepticizable casings, not shown in the figures. Said casings, which are movable and interchangeable, can be mounted in a fluid-tight manner by means of air-seal systems of the type hereinabove described, either directly on the box-mattress table **2** or on the Plexiglas frame **10**. The intended function of said casings is to provide separate chambers in which different forms of local therapy may be applied simultaneously.

The advantages of the apparatus according to the invention over existing equipment will become more readily apparent from the following description of one example of operation when it is employed for a road accident victim who is in a state of shock and unconscious, who is suffering from burns, open fractures, contusions and multiple wounds.

In the present state of the art, the injured person is lifted by hand and placed on the ambulance stretcher. A perfusion is then carrried out by cutting a part of the patient's clothing and oxygen therapy is then applied with a mask. The stretcher is carried into the ambulance, then removed from the ambulance into the open air upon arrival at the hospital. Throughout this transportation period, the patient is liable to suffer from the cold and the burned tissues are liable to become infected. At the hospital, the patient is first carried to an admission table, undressed, washed with dispatch, treated for shock and then given a blood transfusion. The patient is then transported into an X-ray room, placed on the X-ray table and transported once again to the operating room in which he undergoes the different treatments which are necessary (dressing of burns, osteosynthesis, etc.) before being finally laid in bed. Under such conditions, it is difficult to give a patient the simultaneous advantages of a sterile enclosure, an oxygen tent and an appliance for retaining fractures in place. Difficulties are involved in providing the proper medical care, washing of the patient is virtually impossible and atmospheric contamination will frequently arise. When the nature and extent of the injuries make it necessary to transfer the patient to a distant center for special treatment, retention of fractures must be stopped, the patient must again be handled a number of times, placed again in an ambulance and transported under unfavorable conditions; all equipment and appliances must again be reinstalled in the new center which may in turn be inadequately equipped for treating fractures.

The apparatus in accordance with the invention dispenses with the need for such an excessive number of handling operations and makes it possible under the best conditions to carry out all the medical care, treatment and surgical operations which a patient's condition requires. Thus, when a wounded person is lying on the ground, the main frame **41** of the stretcher is placed round the person's body. The cross-bands **42** are then passed under the body, sliding of the bands along the ground being facilitated by their rigid extremities. The cross-bands are then attached and the small central frame **45** is fitted in position: the wounded person then rests on a rigid stretcher which can be placed on the rails **53** by means of the hooks **54**. The Plexiglas frame **10** is fitted on the box-mattress unit and locked by inflation of the air-seal **8**. After preliminary sterilization, the handling hood **19** is also locked on said frame. The patient is then immediately placed in an air-conditioned, sterile and superoxygenated atmosphere. From this moment, most forms of medical and surgical treatment which are necessitated by the patient's condition can be carried out in any location without entailing any need to open the chamber. The patient can be undressed, douched, bathed and then dried with dry and sterile air. X-ray photographs can be taken and fractures can be immobilized. The combined operations of the jacks **66** and of the mechanism for inclining the box-mattress unit (plungers **96** and universal joint assembly **95**) make it possible to hold the patient in any desired position.

In some cases, it proves necessary to turn the patient over to the ventral position. The two reversal mechanisms are accordingly placed in position on the plates **63** by means of the nuts **68**; the locking-pins **65** are removed and permit the downward motion of the rails **53**. The main stretcher is taken

at both ends within the clamps **71**, the bosses **50** being centered within the recess **86**. The ventral stretcher **73** is also secured within the clamps **72**. The small locking bolts **82** are thrust within their recesses and the hand-wheel **79** is then operated so as to move the two stretchers towards each other so that the patient is fully supported.

It then only remains to actuate the four jacks **66** simultaneously in order to lift the complete assembly, thereby permitting the movement of reversal about the axis **70** and in such a manner that the main stretcher **6** is not hindered in its movement of rotation by the Plexiglas plate **3**.

Thus, the patient will have been handled only once at the time of placing in the apparatus. Should an anuria or skin graft justify transportation of the patient to a specialized center, it would accordingly be possible to effect such transportation without the need of any further handling or interruption of the treatment in progress.

It is apparent that the foregoing description has been given by way of explanation but not in any limiting sense and that any detail modifications could be contemplated without thereby departing either from the scope or the spirit of the invention.

For example, it will be readily understood that different forms of distribution tubes which can be supplied either with air, respiratory mixtures or various liquids can also be fixed on the apparatus and that it would also be possible to make provision for a system for weighing the patient, said system being fitted either beneath the universal joint assembly **95** or beneath the jacks **96**.

I claim:

**1**. A medical apparatus which is intended for the transportation, treatment and hospitalization of poly-traumatized persons, persons suffering from burns, radiation injuries, operated persons and patients suffering from serious injuries and ailments, which forms in particular an orthopedic bed, X-ray table, operating table, hydrotherapy apparatus, which permits both the positioning and turning of the patient, and which comprises:

a fluid-tight box-mattress unit;

an enclosure which can be fitted around the periphery of said box-mattress unit;

a system of leak-tight attachment of said enclosure to the box-mattress unit;

means intended to supply said enclosure with liquids and gaseous mixtures;

a removable stretcher which is placed on the box-mattress unit inside the enclosure; and

lifting mechanisms intended to carry out different manipulations of said stretcher.

**2**. An apparatus according to claim **1**, including a table for said box-mattress unit constituted by a plate of transparent material.

**3**. An apparatus according to claim **1**, wherein said box-mattress unit is equipped with rails permitting lateral and longitudinal displacements of the stretcher.

**4**. An apparatus according to claim **1**, wherein said enclosure is constituted by a coverless frame forming a fluid-tight container which can perform the function of a bath.

**5**. An apparatus according to claim **1**, wherein said enclosure is constituted by a sealed hood which is provided in particular with viewing windows and glove ports and which forms a sterile handling dome.

**6**. An apparatus according to claim **1**, wherein said enclosure is constituted by a series of small sealed and separate casings providing aseptic isolated treatment chambers in which different forms of local therapy may be applied simultaneously.

**7**. An apparatus according to claim **1**, wherein said enclosure comprises a coverless frame, a sealed hood which can be fitted on said frame and a system for the fluid-tight attachment of said hood to said frame.

**8**. An apparatus according to claim **1**, wherein said enclosure comprises a coverless frame, a series of sealed and separate casings which can be fitted on said frame and a system for the fluid-tight attachment of said casings to said frame.

**9**. An apparatus according to claim **8**, wherein the system of fluid-tight attachment is constituted by an air-seal disposed at the periphery of the lower element for the purpose of imprisoning the bottom edge of the upper-element wall.

**10**. An apparatus according to claim **1**, wherein the stretcher is constituted by an articulated frame fitted with flexible and detachable cross-bands having at least one rigid extremity so that said cross-bands may be passed along the ground underneath an injured person without handling the patient's body.

**11**. An apparatus according to claim **1**, wherein the box-mattress unit is coupled to a mechanism for producing the lateral or longitudinal inclination thereof and rigidly fixed to a carrier frame.

**12**. An apparatus according to claim **11**, wherein said carrier frame is equipped with shock absorbers and wheels.

**13**. An apparatus according to claim **11**, wherein the mechanism for producing the inclination of the box-mattress unit is constituted by a universal joint assembly which is disposed at one extremity thereof and by two separately-actuated plungers disposed at the other extremity thereof.

**14**. An apparatus according to claim **1**, wherein said apparatus includes a device which performs the function of a bed-pan and is fitted in fluid-tight manner beneath the table-wall of the box-mattress unit.

**15**. An apparatus according to claim **2**, wherein said apparatus includes an X-ray device which is slidably mounted beneath the transparent table of the box-mattress unit.

**16**. An apparatus according to claim **1**, wherein said apparatus includes a structure fitted on the box-mattress unit inside the enclosure and constitutes an orthopedic frame which is intended to receive appliances for retaining fractures.

**17** An apparatus according to claim **1**, wherein said apparatus comprises an assembly for air-conditioning, purifying and sterilizing as well as an assembly for supplying the enclosure with liquids at different temperatures.

**18**. An apparatus according to claim **1**, wherein said apparatus includes a system for weighing the patient.