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(54) **First-aid ambulance equipped with suitable medical emergency room for the treatment of patients**

(57) A first-aid ambulance characterized in that in order to provide a suitable patient's treatment room there is provided an arrangement of the medical emergency room comprising in combination:

- a litter support table that can be shifted laterally;
- one or more seats for assistant doctors which can be closed and/or folded so as to provide a patient treatment room around the litter and to allow the assistant doctors to operate snugly on the patient;
- pieces of furnitures for holding drugs and medical supplies with compartment arranged and positioned so as not to occupy the treatment area.

The arrangement also provides a patient-bearing chair (SP) anchored to the floor panel which can be folded to be accommodated in a suitable holding compartment, in addition to the litter in central position which is able to be shifted laterally through a suitable shifting support means.

Beneath the litter and accommodated on the shifting table is a further spinal stretcher.

The seats of the medical emergency room are in a number of three: one (20) oriented in the forward direction and positioned on the right hand side at 2/3 of the length of the litter near the head of the patient; a second (22) oriented in the reverse direction and positioned on the left hand side; and a third (24) oriented in the reverse direction, positioned at the head of the litter and capable of revolving on its axis and moving along a circular arc.

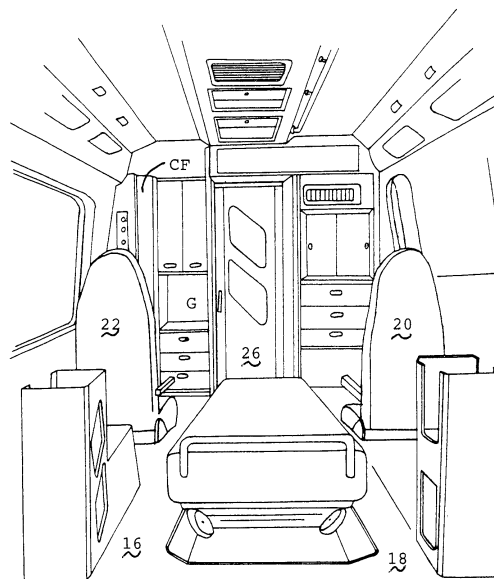


FIG. 1

Description

[0001] The present invention relates to vehicles suitable to aid one or more injured persons on the scene of an accident and to transport the same, and more specifically an ambulance in which the support table carrying the litter can be shifted and the seats of the assistant doctors can be folded and closed so as to create a patient treatment room around the litter and to allow the assistant doctors to operate snugly on the patient. It is known that the new guidance provided by the European provisional regulations prEN11789 dictate that a suitable patient's treatment room should be provided in each ambulance.

According to the present invention this is obtained by either providing a litter in central position within the ambulance able to be shifted laterally through a suitable shifting support means, or a stretcher and a patient-bearing chair anchored to the floor panel with one or more side seats for the assistants that can be folded and closed to the wall to provide free passageways or corridors around the litter.

The primary object of having seats that can be closed and a shifting litter is to obtain a patient treatment room along the periphery of the litter within the ambulance so as to allow the assistant doctors to operate snugly on the patient. Also the furniture for holding medical supplies and drugs within the ambulance is made and positioned so as not to occupy the patient treatment room in order to achieve the above result.

[0002] Further features and advantages of the ambulance according to the invention will be more readily apparent from the following detailed description of a preferred embodiment set forth only by way of a not limiting example with reference to the accompanying drawings. In the drawings:

Fig. 1 shows a partial, perspective rear view of an ambulance according to the invention which is devoid of the rear part and the closing door but provided with a litter placed in the central portion of the ambulance's body;

Fig. 2 shows the ambulance of Fig. 1 with the litter shifted to the left hand side and the patient-bearing chair in open position for its use;

Fig. 3 shows the ambulance of Figs 1 and 2 with a litter placed on the right hand side of the ambulance's body;

Fig. 4 shows the furniture placed close to the partition on the left hand side with the drawer for the medicines in the open position;

Fig. 5 shows the furniture placed close to the partition on the right hand side;

Fig. 6 shows the medical emergency room accessible through the slidable side door;

Fig. 7 shows a detail of the ceiling light fixtures;

Fig. 8 shows the rotating, shifting seat in closed position shifted to give free access to the medical emergency room from the side door;

Fig. 9 shows the control panel and the switches;

Fig. 10 shows the communication door between medical emergency room and driver's cabin;

Fig. 11 shows the places to hold patient-bearing chair and depression mattress;

Fig. 12 shows the compartments embedded in the ceiling of the ambulance;

Fig. 13 shows the outside service compartment accessible from the left door of the vehicle.

[0003] With reference to the figures that show by way of example an ambulance according to the invention obtained from a normal delivery van (for example FIAT DUCATO, FORD TRANSIT or the like), the medical emergency room consists essentially of a litter and two free side passageways or corridors 16 and 18 and a head passageway connected to each other around the litter.

In this case, passageway 16 on the left hand side and passageway 18 on the right hand side of the litter have preferably a width of 450 mm, while the head passageway has preferably a width of 600 mm, the connection between passageways having a radius of curvature of 500 mm.

The seats of the medical emergency room are preferably in a number of three: one 20 oriented in the forward direction and positioned on the right hand side at 2/3 of the length of the litter near the head of the patient; a second 22 oriented in the reverse direction and positioned on the left hand side; and a third 24 oriented in the reverse direction, positioned at the head of the litter and capable of revolving on its axis and moving along a circular arc.

In order to revolve as mentioned above backward-oriented seat 24 is rotatably secured at one end of a preferably horizontal arm 23 rotating about a journal bearing 25 connected thereto at the opposite end and secured to floor panel 27 of the medical emergency room. Thus seat 24 can be shifted to the right side to leave a free passageway between driver's cabin and medical emergency room through slidable door 26 mounted on the partition 38 between the driver's cabin and medical emergency room. Additionally, such backward-oriented seat 24 has a folding bottom 37 to leave a free passageway at the head of the litter.

Suitable compartments not occupying the patient treatment room are formed also for storing medical supplies. In particular, a mass-produced car with dual slidable, left and right side doors 30 and 32, respectively, is retrofitted so that right side door 32 is used as entrance to the medical emergency room, as usual, and left side door 30 is used as access to a compartment 34 for holding some equipment (such as three oxygen bottles 36, stretcher 39, surgical instruments to free from connective tissue, depression mattress, splint bandages, etc.). The area of the left door opening communicating with the inside of the ambulance is closed by suitable panels to form the compartment for holding the above-mentioned equipment.

The medical emergency room is closed inside by a lining wall and communicates with such outer compartment only through a little window 40 with slidable wings at the level of the adapter of the oxygen bottles so as to control the opening/closure thereof.

Another object of the present invention is to provide the use of a novel material in the field of the retrofits for ambulances. Currently produced ambulances, whether obtained from the retrofitting of mass-production vehicles or delivery vans, are made with inside linings of glass resin, silver aluminium 10/10 pre-painted of grey, silver stainless steel 10/10, ABS.

A further object of the present invention is to provide a lining and furnitures with new materials and new colour shades to make the stay time of the patient on board as less traumatic as possible.

This is accomplished by using as lining material Alucobond (registered trademark) which is a composite material formed of two sheets of aluminium connected by a central layer of rubber material. The advantages of using such a new material are manifold: a variety of colours of the surfaces in sight, smooth folding lines due to the intermediate rubber material, high insulation and soundproofing properties that provide considerable improvements of the comfort in addition to the normal insulation, greater strength of the walls and the furniture because of the thickness of 4 mm and the intermediate rubber material, greater easiness of washing and disinfecting the surface treated with plastic paints.

Two colours have been selected to provide the maximum comfort and a relaxing environment: cream-white colour for the lining of walls, ceiling, and furniture, and blue for drawers and wings of the compartments embedded in the ceiling.

Also the lighting (Fig. 7) is designed with great care by enclosing six transparent panels 42 made preferably of Plexiglas and located according to a preferred embodiment at both longitudinal sides of the ceiling, three on the left hand side, three on the right hand side. Such a lighting with enclosed panels flushing with the ceiling and not projecting downwards due to the particular material Alucobond, helps to create an atmosphere of comfort within the ambulance inducing tranquillity in addition to the elimination of any shadow all around the patient

treatment room. Each ceiling plate is provided with three lamps, one for soft light, the second for normal light, the third for strong light, which are switched on by three switches located in the control panel. Traditionally, the lights were applied in the ceiling above the litter.

Also the control panel CE is novel as it is provided with large-size switches 44 of vivid colours such as yellow, green, cyan, violet. Thus, two main purposes are achieved: greater easiness of depressing the button switch during the running of the vehicle due to its large size; greater easiness of recognizing the coloured switch performing a specific function (e.g. yellow for lights, violet for ventilation, etc.). Also in this case the room is played down due to the suitable and relaxing colour matching.

For the same reason, the seats are provided with a sky-blue covering.

Still in order to obtain a suitable patient treatment room according to the new guidance provided by the European provisional regulations prENI1789, also the furniture are made and positioned so as not to occupy such room, while ensuring an easy access. All of the furnitures are made of the composite material Alucobond described above having cream-white colour with blue drawers. The furnitures are positioned close to partition 38 leaving a central free passageway where the slidable door 26 for the communication between medical emergency room and driver's cabin is mounted.

The piece of furniture close to the left wall at the corner with partition 38 and close to the outer previously described compartment is formed by a high vertical drawer, so-called pharmacy drawer, extending to the overall height of the room. Such drawer opens in the direction to the centre of the litter grazing the left wall. Upon opening the same the operator sitting in the seat oriented in the backward direction sees a plurality of brackets made of transparent Perspex with front edge where all of the necessary drugs are held. The drawer is provided with a locking system both in opened and closed position so as to avoid back and forth movements during the running of the vehicle.

Following such drawer to the centre of the partition the piece of furniture is divided into compartments: two further pharmacy drawers similar to that described above but having small size are provided at the upper side; an open compartment G with work table and peripheral edge is provided under such drawers; at the lower side there are two further drawers for holding drugs and a further pivoting container 46 for waste.

A compartment for the air conditioning system is formed at the high end portion of the piece of furniture close to the ceiling.

On the right side of the partition there is a further piece of furniture of reduced thickness with respect to the first piece and still made of the same composite material Alucobond of cream-white colour with sky-blue drawers. Such piece of furniture is divided into compartments, one at the high portion for the electrical control panel

CE, and at the lower portion a closed compartment with intersecting slidable wings made of transparent Perspex with two inside shelves and three traditional drawers for holding drugs beneath the shelves. Moreover, an open compartment with front edge and a compartment for the unit heater are provided after each other at the end portion downwards.

Above the slidable door 26 for the communication between driver's cabin and medical emergency room there is provided a hanging piece of furniture as a connecting bridge between the two pieces of furniture described above. Such hanging piece of furniture is still made of composite material Alucobond of cream-white colour and is provided with slidable or closed wings for holding medical supplies.

Also the lining of the ceiling is made of the same composite material (Alucobond) of cream-white colour and, according to a preferred embodiment, it hangs down over the centre of the litter more than at the sides thereof. Thus a hollow space forming two compartments 48, 50 closed by horizontal slidable wings made of blue Alucobond is provided in the ceiling over the litter (Fig. 12). One compartment is used for securing two phlebohangers, the second compartment for holding an oxygen mask connected to the central system and allowing the oxygen to be supplied from the upper side directly to the patient without having pipes crossing the treatment room from the side walls. The same consideration is valid for the cables necessary for monitoring the patient and held in the above-mentioned upper compartment. Such cables falling down onto the patient do not hinder the treatment room.

Suitable compartments are also formed in the end portion of the left and right side panels between rear wheel-houses and the posts supporting the doors at the end of the side panels. Such compartments are made of Alucobond and hold a depression mattress on the right side and a patient-bearing chair SP on the left side.

In fact this area close to the feet of the patient does not need any large passageway for the treatment of the patient as the other sides of the litter do. Ultimately, the shifting table by which the litter is supported includes a spinal stretcher under such litter. Also this arrangement is intended to have a greater modularity of the environment and to avoid useless clutterings due to the housing of equipment.

The present invention has been described and illustrated according to a preferred embodiment thereof, however, it should be understood that those skilled in the art can make equivalent modifications and/or replacements without departing from the scope of the present industrial invention.

Claims

1. A first-aid ambulance characterized in that in order to provide a suitable patient's treatment room there

is provided an arrangement of the medical emergency room comprising in combination:

- a litter support table that can be shifted laterally;
- one or more seats for assistant doctors which can be closed and/or folded so as to provide a patient treatment room around the litter and to allow the assistant doctors to operate snugly on the patient;
- pieces of furnitures for holding drugs and medical supplies with compartment arranged and positioned so as not to occupy the treatment area.

2. The ambulance of claim 1, characterized in that the arrangement also provides a patient-bearing chair (SP) anchored to the floor panel which can be folded to be accommodated in suitable holding compartment, in addition to the litter in central position being able to be shifted laterally through a suitable shifting support means.

3. The ambulance of the preceding claims, characterized in that the seats of the medical emergency room are in a number of three: one (20) oriented in the forward direction and positioned on the right hand side at 2/3 of the length of the litter near the head of the patient; a second (22) oriented in the reverse direction and positioned on the left hand side; and a third (24) oriented in the reverse direction, positioned at the head of the litter and capable of revolving on its axis and moving along a circular arc.

4. The ambulance of claim 3, characterized in that backward-oriented seat (24) is rotatably secured at one end of a preferably horizontal arm (23) rotating about a journal bearing (25) connected thereto at the opposite end and secured to floor panel (27) of the medical emergency room, said seat (24) being able to be shifted to the right side to leave a free passageway between driver's cabin and medical emergency room through slidable door (26) mounted on the partition (38) between the driver's cabin and medical emergency room.

5. The ambulance of claim 3 or 4, characterized in that such backward-oriented seat (24) has a folding bottom (37) to leave a free passageway at the head of the litter.

6. The ambulance of the preceding claims, characterized in that there are provided two slidable, left and right side doors (30) and (32) so that right side door (32) is used as entrance to the medical emergency room, as usual, and left side door (30) is used as access to a compartment (34) for holding some equipment such as three oxygen bottles (36),

stretcher (39), surgical instruments to free from connective tissue, depression mattress, splint bandages, etc., the area of the left door opening communicating with the inside of the ambulance being closed by suitable panels to form the compartment for holding the above-mentioned equipment.

7. The ambulance of claim 6, characterized in that the medical emergency room is closed inside at the level of outer compartment (34) by a lining wall and communicates with said outer compartment only through a little window (40) with slidable wings at the level of the adapter of the oxygen bottles (36) so as to control the opening/closure thereof.

8. The ambulance of the preceding claims, characterized in that the lining material of the inside is Alucobond (registered trademark) which is a composite material formed of two sheets of aluminium connected by a central layer of rubber material which allow a variety of colours of the surfaces in sight, smooth folding lines due to the intermediate rubber material, high insulation and soundproofing properties, greater strength of the walls and the furniture, greater easiness of washing and disinfecting the surface treated with plastic paints.

9. The ambulance of the preceding claims, characterized in that two colours have been selected to provide the maximum comfort and a relaxing environment for patient(s): cream-white colour for the lining of walls, ceiling, and furniture, and blue for drawers and wings of the compartments embedded in the ceiling, the seats having a sky-blue covering.

10. The ambulance of the preceding claims, characterized in that the lighting provides a number of transparent enclosed panels (42) made preferably of Plexiglas and located at both longitudinal sides of the ceiling, thus avoiding any shadow all around the patient treatment room and helping to create an atmosphere of comfort within the ambulance inducing tranquillity to the patient.

11. The ambulance of claim 10, characterized in that each ceiling plate is provided with three lamps, one for soft light, the second for normal light, the third for strong light, which are switched on by three switches located in a control panel (CE), said control panel providing large-size switches (44) of vivid colours such as yellow, green, cyan, violet which facilitate identification and depression.

12. The ambulance of claim 11, characterized in that the furnitures holding drugs and medical supplies are positioned close to partition (38) leaving a central free passageway where the slidable door (26) for the communication between medical emergency

room and driver's cabin is mounted.

13. The ambulance of claim 12, characterized in that there is provided a corner piece of furniture close to the left wall and provided with a high vertical drawer, so-called pharmacy drawer (CF), which extends to the overall height of the room and opens in the direction to the centre of the litter grazing the left wall, said drawer being provided with a locking system both in opened and closed position so as to avoid back and forth movements during the running of the vehicle.

14. The ambulance of claim 13, characterized in that said corner left piece of furniture is divided into compartments with two further pharmacy drawers having small size and being provided at the upper side, an open compartment (G) with work table and peripheral edge being provided under such drawers, and two further drawers for holding drugs and a further pivoting container (46) for waste being provided at the lower side.

15. The ambulance of claim 12, characterized in that on the right side of partition (38) there is a further piece of furniture of reduced thickness, at the high portion of which the electrical control panel CE is accommodated, and at the lower portion of which there are provided in succession a closed compartment with slidable wings, three traditional drawers for holding drugs, an open compartment with front edge and a compartment for the unit heater.

16. The ambulance of claim 12, characterized in that in order to provide a hollow space above the litter in the ceiling including compartments (48, 50) closed by slidable wings it is provided an area of the ceiling hanging down more than the side areas, one compartment being used for securing two phlebo-hangers, the second compartment for holding an oxygen mask connected to the central system and patient's monitoring cables without having pipes and/or leads crossing the treatment room from the side walls.

17. The ambulance of claim 16, characterized in that suitable compartments for holding a depression mattress on the right side and a patient bearing chair (sp) on the left side are also formed in the end portion of the left and right side panels between rear wheelhouses and the posts supporting the rear doors at the end of the side panels.

18. The ambulance of the preceding claims, characterized in that the shifting table by which the litter is supported includes a further spinal stretcher under said litter.

19. The ambulance of the preceding claims, characterized in that the treatment room shows a free passageway (16) on the left hand side and a free passageway (18) on the right hand side of the litter with a width of 450 mm, while the head passageway has a width of 600 mm, and the connection between said passageways has a radius of curvature of 500 mm.

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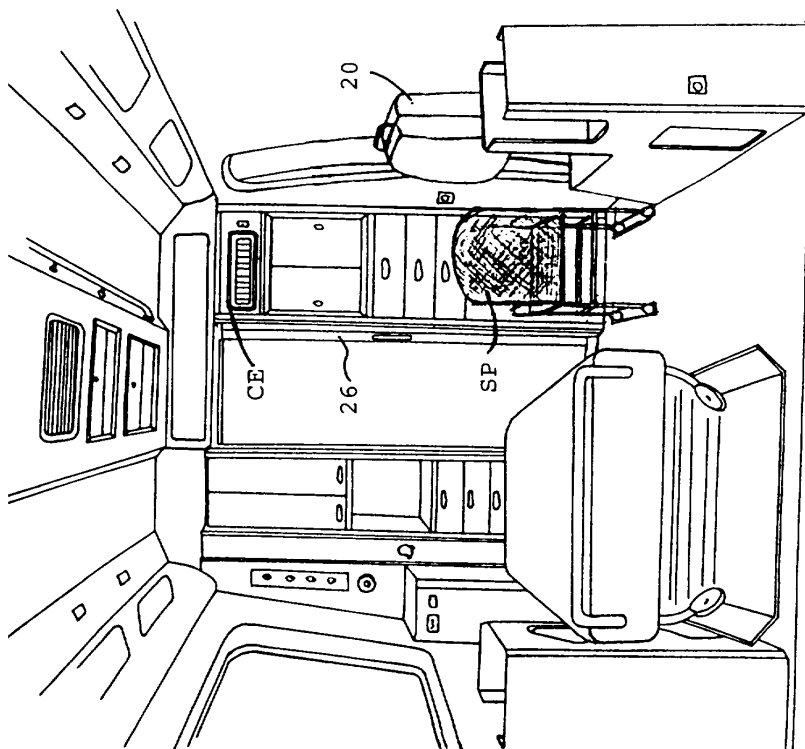


FIG. 2

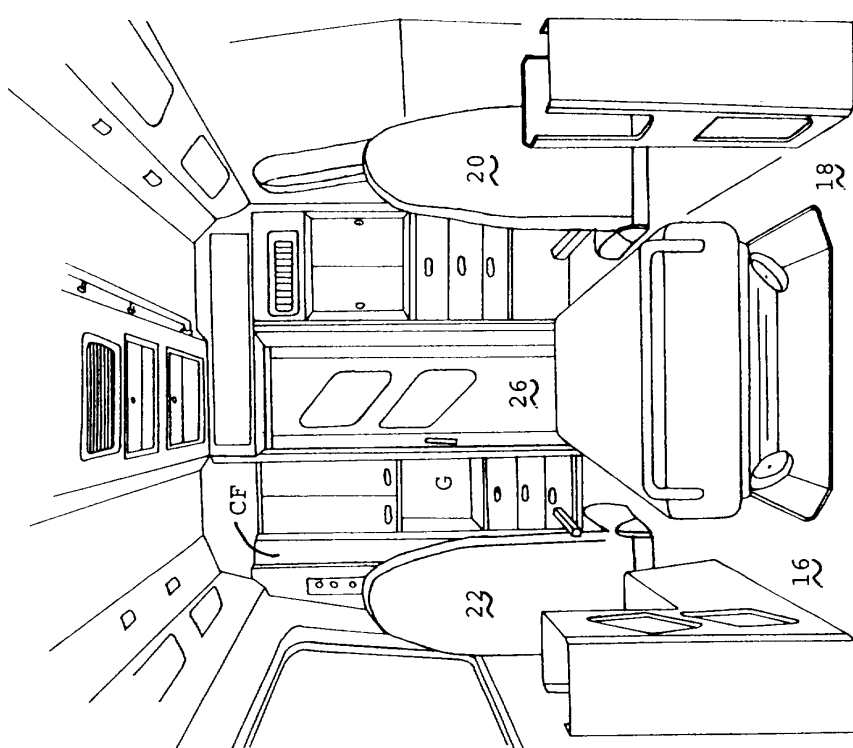


FIG. 1

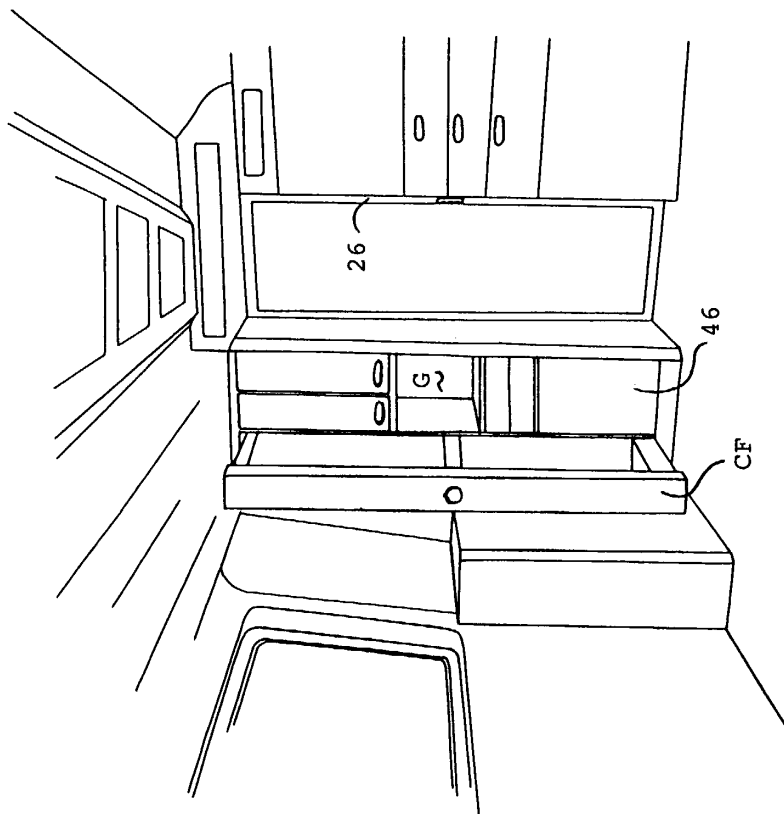


FIG. 4

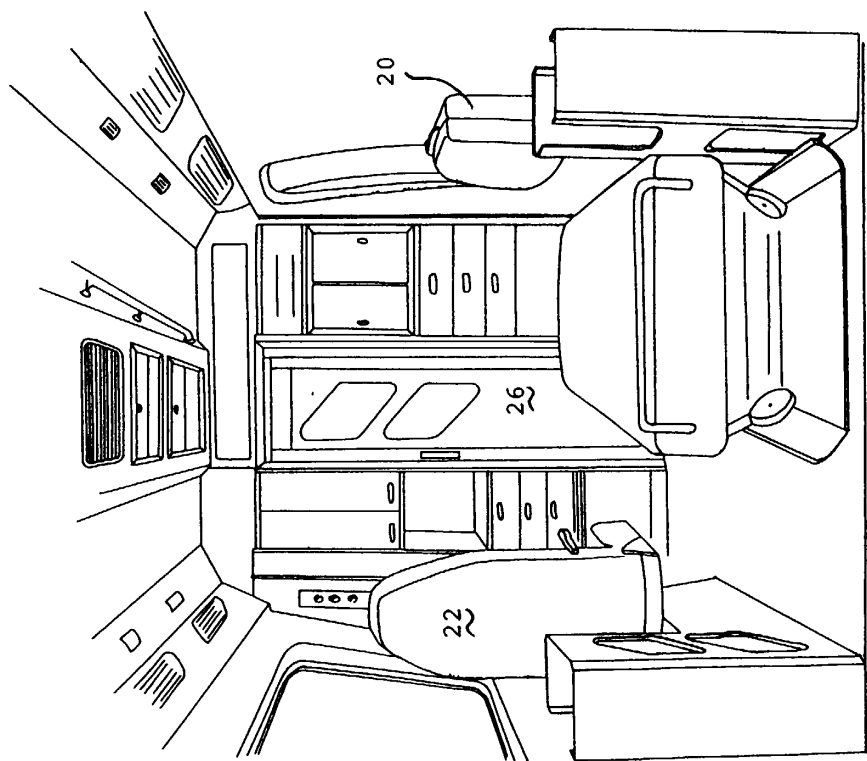


FIG. 3

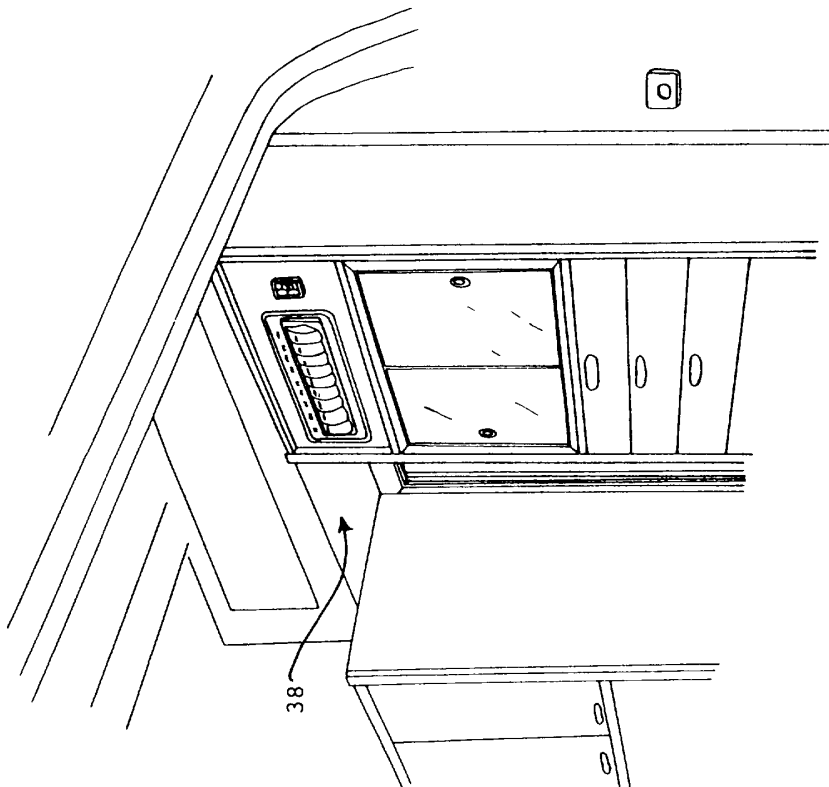


FIG. 5

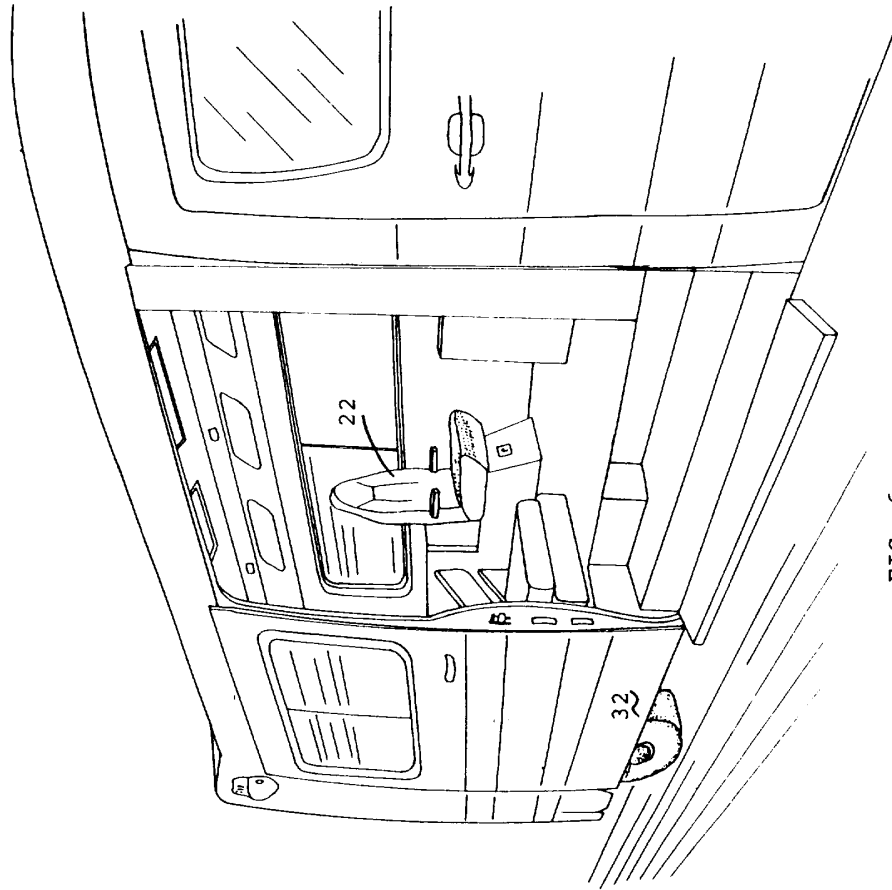


FIG. 6

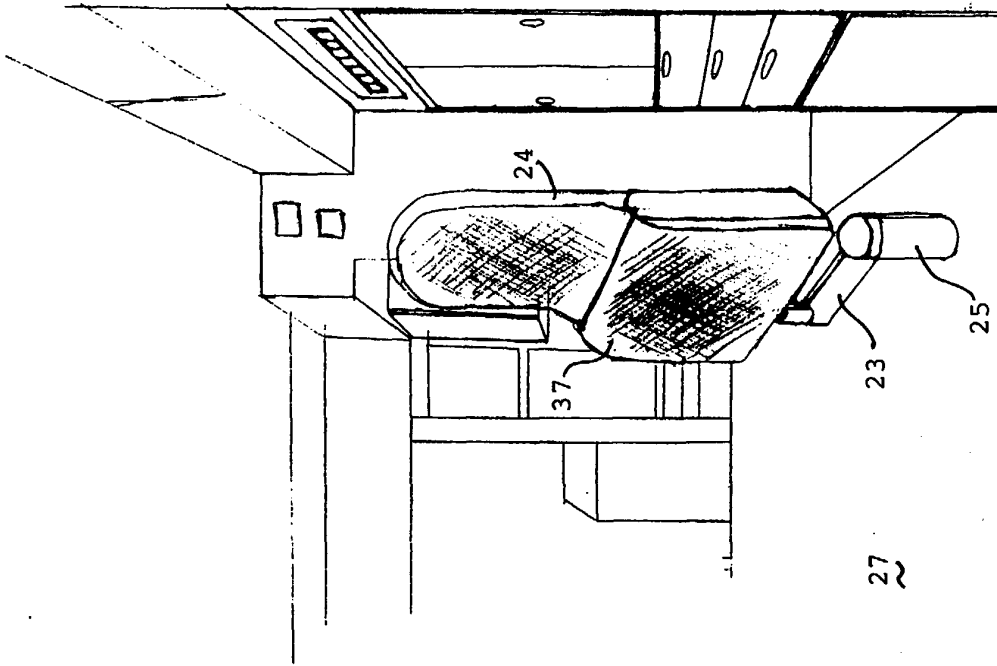


FIG. 8

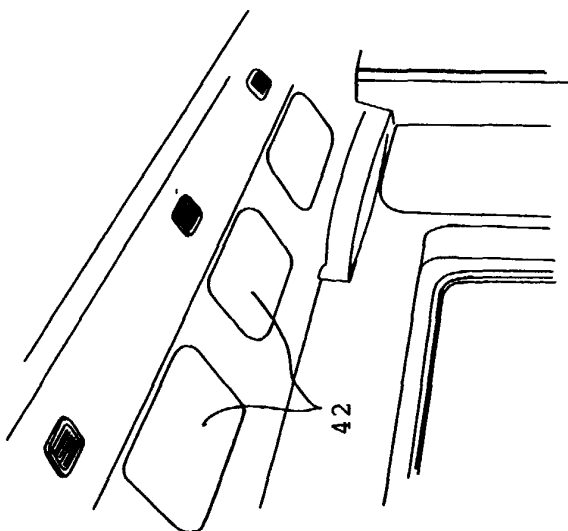


FIG. 7

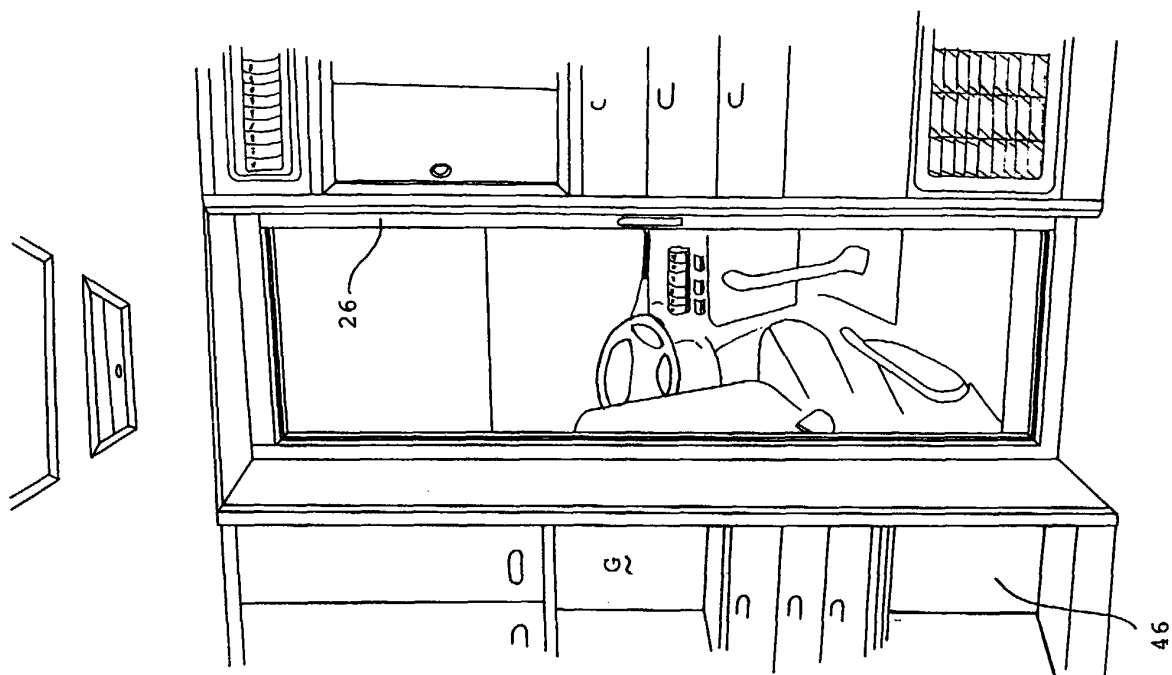


FIG. 10

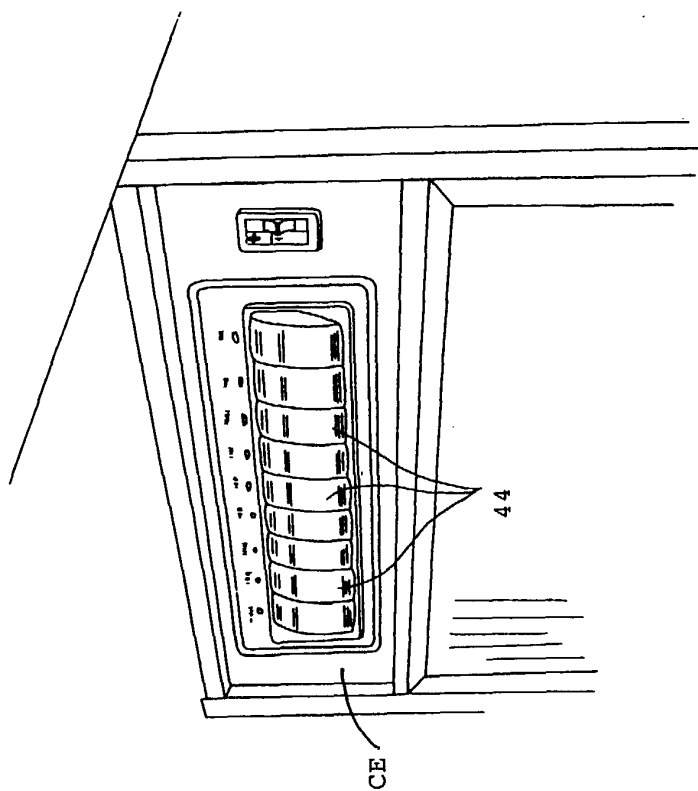


FIG. 9

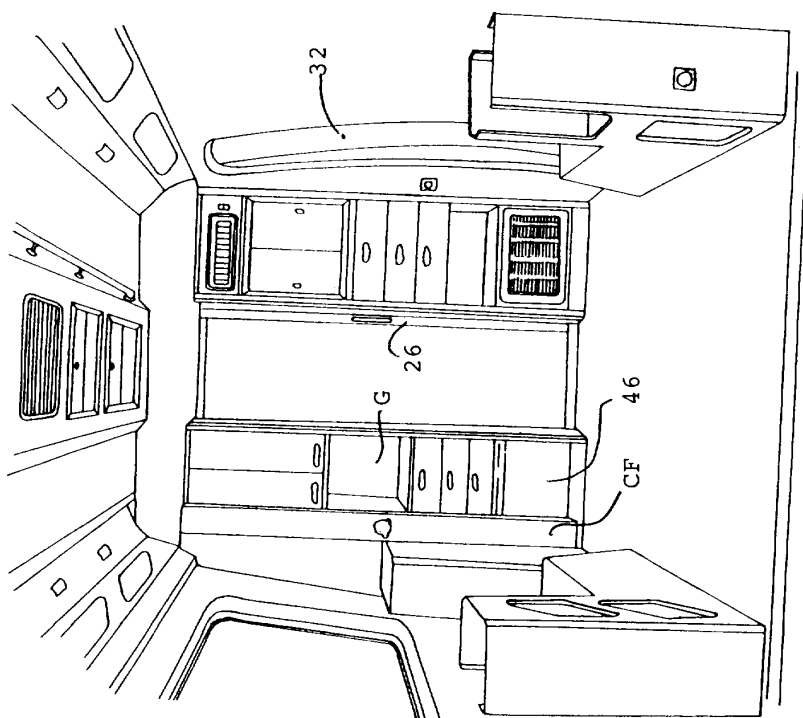


FIG. 11

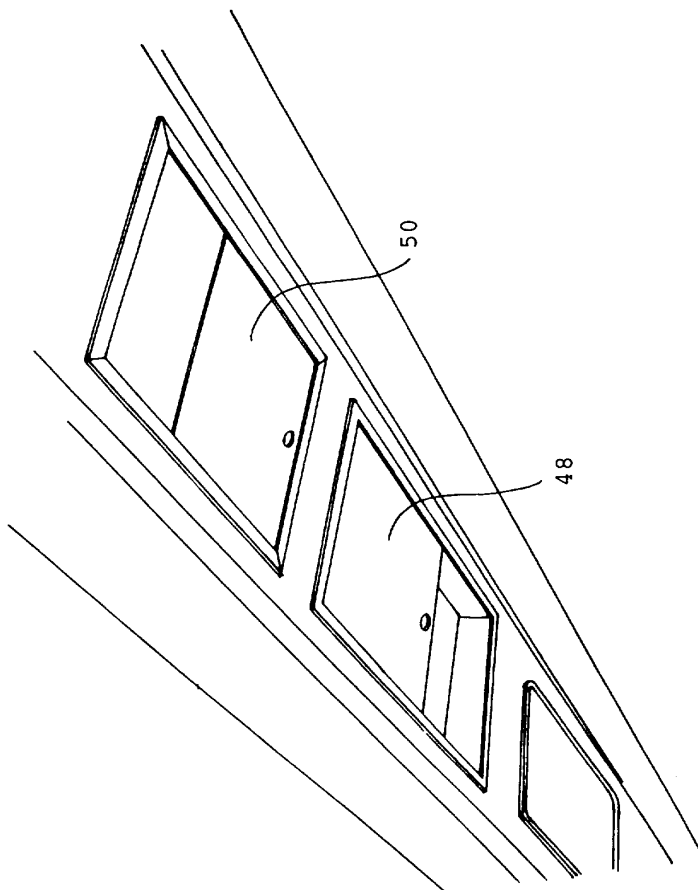


FIG. 12

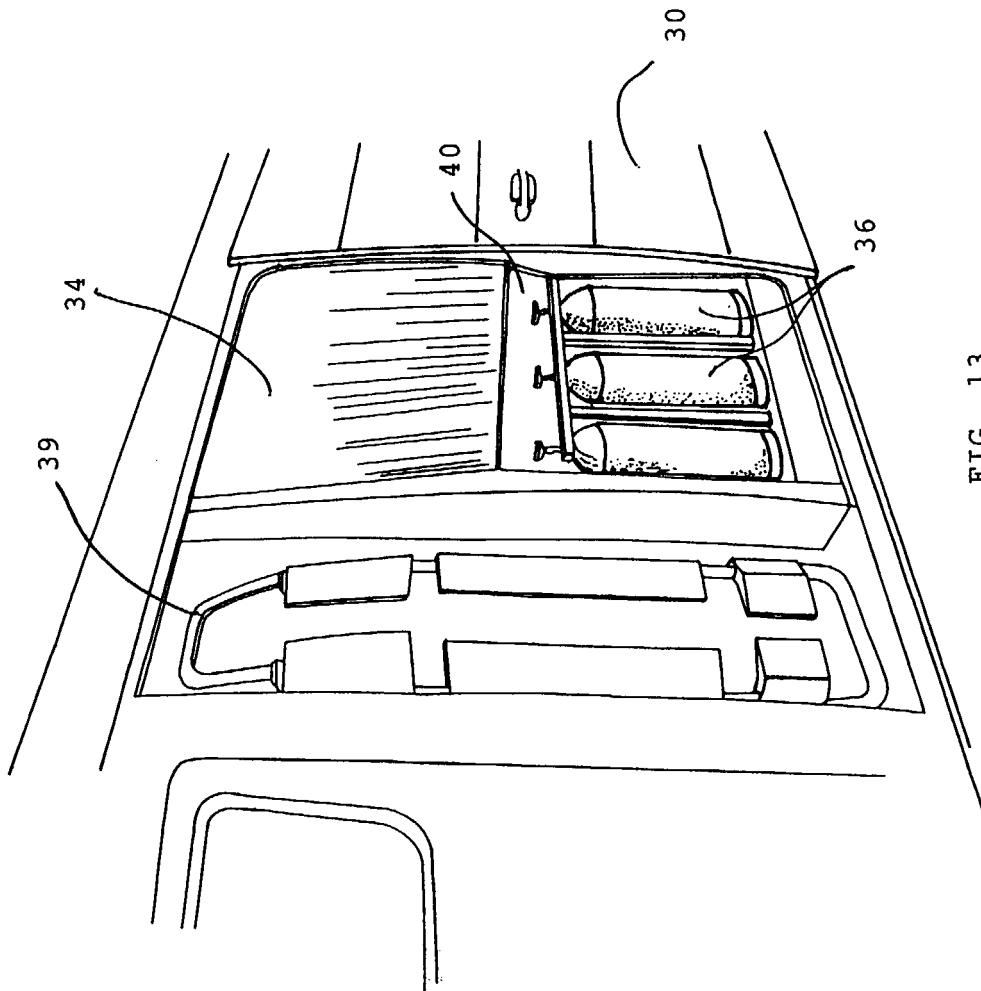


FIG. 13



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 83 0474

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		7 January 2000	Baert, F
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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