

Container for Evacuating Casualties

Field of the Invention

5 The invention relates to a container for evacuation of casualties, and to a method of evacuating casualties.

Background

Conventionally, an ambulance is used for transporting casualties needing immediate medical attention. Ambulances are convenient only for carrying a single casualty person
10 from an area that is accessible by road. However, when disasters, such as earth quake, tsunami, flood, major accident, bomb explosion, etc. occur, a larger number of casualties need to be transported for immediate medical attention. Ambulances and other existing modes of transport are impractical for transporting a plurality of casualties at the same time. The situation may become worse when the area where the disaster
15 has occurred is inaccessible by land and/or a nearest hospital is located miles away from the disaster area.

There is a need for an alternative way of transporting a plurality of casualties from a disaster area that is inaccessible by road that may be faster and more effective.

20

Summary of the Invention

In accordance with a first aspect of the present invention there is provided a container for evacuating a plurality of casualties, said container comprising a support structure for receiving and securing against movement a plurality of stretchers in two or
25 more horizontal, vertically spaced apart layers, each layer comprising two or more stretchers.

The support structure may comprise a pair of elongate tracks for supporting each layer of stretchers, the respective tracks of each pair being mounted opposite to each
30 other in the container.

Each of said tracks may be removable from the container.

Each of said tracks may be arranged for receiving handles of the stretchers.

35

The track may be a C-Channel loading track.

Each track may comprise conveying means for facilitating displacement of the handles of the stretchers along the length of the track.

Said conveying means may comprise a series of rollers.

5

Each track may further comprise a plurality of fastening means for fastening the handles of the stretchers at predetermined positions along the track.

The fastening means may comprise one or more of a group consisting of a self-locking buckle, a lock, a strap, a rope, and a cable tie.

10

The container may further comprise lugs on a top face of the container, each of said lugs having an opening for enabling the container to be carried under-slung a helicopter or for loading the container on a truck or a ship.

15

The container may further comprise lugs on a bottom face of the container, each of said lugs having an opening for securing the container while being transported on a truck or a ship.

20

The container may further comprise wheels on a bottom portion of the container to enable the container to be loaded on to a land mover or an evacuation aircraft.

The container may further comprise a ventilation means for providing air ventilation between an interior and exterior of the container.

25

The ventilation means may comprise one or more air vents.

The container may further comprise the stretchers.

30

In accordance with a second aspect of the present invention there is provided a method of evacuating a plurality of casualties, the method comprising the step of laying casualties on a plurality of stretchers, and loading the stretchers into a container in two or more horizontal, vertically spaced apart layers, each layers comprising two or more stretchers, and securing the stretchers against movement.

35

The method may further comprise connecting one or more of the casualties to a medial supply mounted inside the container.

5 The method may further comprise air-lifting the container or transporting the container by land or sea.

Brief Description of the Drawings

The present invention is further described by way of non-limiting embodiments, with reference to the accompanying drawings, in which:-

10 Figure 1 is an external perspective view of a container for evacuating casualties according to an example embodiment;

Figure 2 is an internal perspective view of the container of Figure 1;

Figure 3 A and B are detailed partial views of a loading track used in the container for evacuating casualties according to an example embodiment;

15 Figure 4 is a schematic drawing illustrating the layout of a layer of stretchers in a container for evacuating casualties according to an example embodiment;

Figure 5 is a schematic drawing illustrating the loading sequence of stretchers in a container for evacuating casualties according to an example embodiment;

20 Figures 6A, and 6B are perspective views of a medical accessories bag suitable for mounting on to the interior of a container for evacuating casualties according to an example embodiment; and

Figure 7 is a partial view of the interior of a container mounted with a medical accessories bag of Figures 6A and 6B according to an example embodiment.

25 Detailed Description

Figure 1 shows an external perspective view of a container 100 for evacuating casualties according to an example embodiment. The dimensions of the container 100 for evacuating casualties used in the example embodiment may be based on industry standards such as e.g. International Organisation for Standardisation (ISO) containers, although non-standard containers may also be used. The container 100 consists of a
30 container housing 130 having four side walls, a top wall, and a bottom wall. The container 100 has a length 108, a width 112 and a height 110. Along the sides corresponding to the width 112 of the container 100, one or more loading doors 118 are provided for accessing the interior of the container 100.

Unlike conventional containers, the container 100 for evacuating casualties of an embodiment of the present invention has a ventilation system comprising a plurality of air vents 106, 114, 116 along the four side walls of the container 100 for providing ventilation between exterior and the interior portions of the container 100. In an example
5 embodiment, air vents 106 are located laterally along the sides corresponding to the length 108 of the container 100, whilst air vents 114, 116 are located laterally along the sides corresponding to the width 112 of the container 100. In an example embodiment, the air vents 114, 116 are laterally located on the side loading doors 118.

10 Each of the four top corners of the container 100 for evacuating casualties in an example embodiment, has a lug 102. Each lug has an opening 120, through which the container 100 could be carried underslung by a helicopter, or to be loaded on a truck or a ship. The ventilation system is designed to provide adequate air-supply to the interior of the container 100 when the container 100 is transported underslung from a
15 helicopter, or a truck or a ship.

Figure 2 illustrates an internal perspective view of the container 200 for evacuating casualties in accordance with an example embodiment. Internally, the housing of container 200 comprises one or more pairs of opposing pillars 204 mounted vertically
20 along the length of the container 200, the axis of the pillars 204 being parallel to each other. The pillars are removably mounted to the wall of the container 200 using bolts and nuts or any other securing mechanisms. One or more pairs of elongate loading tracks 202a, 202b are horizontally mounted to the pillars 204, each pair of loading racks defining one layer. The loading tracks 202a, 202b are removably mounted to the pillars
25 204 using bolts and nuts or any other securing mechanisms. The axes of the elongate loading tracks are parallel to each other and extend along the length of the container 200. The loading tracks 202a, 202b are mounted transverse to the pillars 204. It will be appreciated that in embodiments where the loading tracks 202a, 202b and the pillars 204 are removable from the container 200, the container 200 may be used as a
30 "conventional" cargo container, if desired. In the example embodiment, four layers of loading tracks are used. A first layer consists of a first pair of elongate loading tracks 202a, 202b; a second layer consisting of a second pair of elongate loading tracks 216a, 216b; a third layer consisting of a third pair of elongate loading tracks 218a, 218b; and a fourth layer consisting of a fourth pair of elongate loading tracks 220a, 220b.

A plurality of stretchers 206 can be loaded by way of respective pairs of loading tracks 202, 216, 218, 220 from the sides of the container 200 in a direction indicated by 208 and 210. The number of stretchers 206 that can be loaded in a container 200 is dependent on factors such as the size of the container 200, the number of layers of loading tracks 202, 216, 218, 220, and the layout of the stretchers 206. The stretchers may e.g. be stretchers of a type commonly referred to as military 4-folded stretcher/litter.

In addition to providing adequate ventilation while transporting casualties, the container 200 for evacuating casualties is designed to provide personal medical accessories, such as oxygen supply, drip pump etc. (refer Figures 6A, 6B, 7) while the casualties are transported during evacuation

The stretchers 206 are usually carried by two persons, each using two main-handles 212 extending along the length of the stretcher 206 (Figure 2). Along the two main handles 212, two pairs of opposing sub-handles 214 are provided. The sub-handles 214 extend downwardly from the main-handles 212 and are used for pulling or pushing the stretchers 206 by persons loading the stretchers 206. In addition, the sub-handles 214 can be used as legs for resting the stretcher on a surface before being carried. After a stretcher 206 is loaded on a designated position on a pair of the loading tracks 202, 216, 218, 220 the four respective main-handles 212 of each stretcher are fixed to the respective loading tracks 202, 216, 218, 220 (refer to Figure 3) to keep the stretcher 206 secured against movement during flight.

Figures 3A and 3B are partial views of a loading track 306 that is used in the container for evacuating casualties according to an example embodiment. The loading tracks 306 are removably mounted on the pillars 204 (Figure 2) which, in turn, are mounted to the inner walls of the container.

The loading tracks 306 are mounted in pairs and horizontally extending, one each on opposing inner side walls of the container. Each loading track 306 consists of a C-channel designed to receive the handles 308 of a stretcher (refer Figure 3). The lower portion of the horizontally positioned C-Channel track has a plurality of momentum-based free rollers 316 suitable for receiving the stretchers for facilitating displacement of the stretchers along the tracks. The distance between the opposing C-channel loading tracks 306 is so designed to receive a horizontally positioned stretcher 206 (refer Figure 2) (either loaded or unloaded).

A stretcher is initially positioned on one end of the elongate loading tracks 306 by persons carrying the stretchers. The stretchers 206 are then pushed horizontally to a designated position on the loading track with the help of the main handle 308 or the sub-handle of the stretcher 206. In the designated position, the handles 308 rest centrally on top of two rollers 316.

Below the C-Channel tracks 306, a plurality of spring loaded strap dispensers 312 are provided at predetermined positions. At suitable positions, a locking means 314 is placed adjacent to each strap dispenser 312. Each strap dispenser 312 can dispense a strap 310 or a string which is used for securing the handles 308 that rest on the corresponding rollers 316. The locking means 314 may be a buckle, such as a self-locking buckle.

After a stretcher is pushed horizontally to a designated position on the loading tracks 306, a person loading the stretcher dispenses a length of a strap 310 from the strap dispenser 312. The strap 310 is wound around the corresponding rollers 316 positioned below a handle 308 of a stretcher and the free end of the dispensed strap 310 is inserted in to the buckle 314. The strap 310 is pulled manually to tighten and lock the handle 308. Once the handles 308 are securely fastened, the stretcher remains secured when the container is transported by air, land or sea. During unloading of stretchers, the fastened strap 310 is released from the buckle 314 and the strap 310 is rewound in to the strap dispenser 312.

Figure 4 shows a possible layout of a layer of stretchers in a 20 feet container 400 for evacuating casualties according to an example embodiment. In this configuration, nine stretchers 402 are laid side by side on respective loading tracks (not shown) along the length of the container 400. Typically, a 20 ft container 400 employing this layout may be designed to have four layers of loading tracks and can carry up to thirty six standard stretchers 402. In the embodiment, a pair of loading doors 420, 430 are respectively provided at the ends 401, 403 corresponding to the width of the container 400.

It is preferred that the loading of the stretchers 402 follow a pattern that enable persons loading the stretchers 402 to move freely within the container 400 and fix the handles of each of the stretchers 402.

For example, in case of a container 400 for evacuating casualties having a loading door 420 at one end 401 of the container 400 and a layout of Figure 4, a column of stretchers 402 at the other end 403 (opposite to the end 401 having the loading door) of the container 400 may be stacked from bottom layer to top layer, before proceeding to the adjacent columns, towards the end 401. In case a loading door is at the end 403, a column of stretchers 402 at one end 401 of the container 400 may be stacked from bottom layer to top layer, before proceeding to the adjacent columns, towards the other end 403. In case the container 400 has loading door 420, 430 respectively at both ends 401, 403, the stacking of stretchers 402 may start with a column at the center of the container 400 using any of the loading doors 420, 430 before proceeding to the adjacent columns, towards the ends 401, 403, simultaneously.

The layout of the stretchers may be altered and for each layout, the position of the loading tracks may be altered to suit the orientation of the stretchers, which can be understood from the explanation on Figure 2.

Figure 5 illustrates a schematic diagram to show the loading sequence of stretchers 508 in a container 500 for evacuating casualties according to an example embodiment. In the embodiment, the stretchers 508 are shown to be loaded from a side corresponding to a width of the container 500. Loading doors 514 of the container 500 are in open position to enable loading of stretchers 508 inside the container 500.

At position 502 two persons 512 are shown to carry a casualty 510 on a stretcher 508 towards a container 500. At position 504, the persons carrying the stretcher 508 loaded with the casualty 510 positions the stretcher 508 on a pair of loading tracks 516 from a plurality of rows of loading tracks inside the container 500. Then, the stretcher 508 is horizontally pushed over the rollers of the loading tracks 516 by the person 512 loading the stretcher 508. At position 506, upon reaching a designated position, the handles of the stretchers 508 are securely fastened (by a fastening means as shown in Figure 3) to the rolling tracks 516 by the person loading the stretchers 508.

Figure 6A is an illustrative perspective view of a medical accessories bag 600 in an open position as per an example embodiment. The bag is suitable for mounting on to the interior wall of the above-described container for evacuating casualties. The bag 600 consists of a hollow body 602 and a flat cover 604. The hollow body 602 is divided into two compartments 622, 624 by a divider 608. A first compartment 622 is suitable for

holding a drip pump 606, whilst the second compartment 624 is suitable for holding an oxygen cylinder 626. A drip pump 606 is used for supplying a drip to a casualty while being transported in the container of the invention. The drip pump 606 comprises a flexible drip tube 612 which is inserted into an opening 628 on the front portion of the bag 600 before terminating with a needle 610 used for inserting into a patient's arms. The oxygen cylinder 626 is connected with a flexible oxygen drip tube 616 and is terminated with an oxygen mask 614. The oxygen mask 614 is used for supplying oxygen to a patient while being transported in the container of the invention. The rear portion of the bag has a pair of horizontally positioned holders 634. The holders 634 are suitably mounted on the inner walls of the container at predefined positions using nuts and bolts 630 or any other fastening means. In order to fasten the top cover 604 of the bag to the lower portion 602, a pair of Velcro tapes 618, 620 are respectively provided on the inside of the flexible top cover 604 and the outside of the lower portion 602.

Figure 6B is perspective view of the above-described medical accessories bag 650 showing the top cover 604 closed and fastened to the lower portion 602.

Figure 7 is a partial view of the interior of a container mounted with a medical accessories bag of Figures 6A and 6B according to an example embodiment. Partial view of two stretchers 720, 740 are shown to be mounted on the lower row of a pair of loading tracks (not shown), whilst another stretcher 730 is mounted on the upper row of another pair of loading tracks (not shown). A medical accessory bag 750 in a closed position is mounted to the wall of container, near a casualty 704 for supplying the casualty with a drip and oxygen supply. The casualty 704 is supplied with a drip from flexible drip tubes 708. For safety, the distal end of the drip tube is fastened to an ankle of a casualty 704 using an arm band 706. The casualty 704 is also supplied with oxygen through a drip tube 710 and oxygen mask 712

The invention is not limited to the above embodiments. However, those skilled in the art will recognise that the invention can be practised, with modification, in the light of the information contained herein without departing from the scope of the invention.

For example, the container for evacuating casualties may be adapted to have wheels below the container housing to enable it to be used on land or to be towed and loaded on to a transport aircraft.

Instead of a strap dispenser and buckle, other fastening means, such as a lock, rope, cable tie etc may also be used. The loading track may e.g. be in the form of a conveyor belt.

- 5 In alternative embodiments, the container may further comprise lugs on a bottom face of the container, each of the lugs having an opening for securing the container while being transported on a truck or a ship.

- 10 Instead of a C-channel, the loading track may have other cross-section. The pillars and loading tracks may be permanently fixed to the container.

The pillars could be embedded or integrally formed in the container.

- 15 The dimension of the container, the number of layers of stretchers, the number of stretchers, the number/position/orientation of the loading doors, the location of the loading tracks, the pattern of loading the stretchers, the number/orientation of side doors may be altered to suit the requirements.

Claims

1. A container for evacuating a plurality of casualties, said container comprising a support structure for receiving and securing against movement a plurality
5 of stretchers in two or more horizontal, vertically spaced apart layers, each layer comprising two or more stretchers.

2. The container of claim 1, wherein the support structure comprises a pair of elongate tracks for supporting each layer of stretchers, the respective tracks of each
10 pair being mounted opposite to each other in the container.

3. The container of claim 2, wherein each of said tracks is removable from the container.

4. The container of claims 2 or 3, wherein each of said tracks is arranged
15 for receiving handles of the stretchers.

5. The container of claim 4, wherein the track is a C-Channel loading track.

6. The container of claims 4 or 5, wherein each track comprises conveying
20 means for facilitating displacement of the handles of the stretchers along the length of the track.

7. The container of claim 6, wherein said conveying means comprises a
25 series of rollers.

8. The container of any one of claims 2 to 7, wherein each track further comprises a plurality of fastening means for fastening the handles of the stretchers at
predetermined positions along the track.

9. The container of claim 8, wherein the fastening means comprises one or
30 more of a group consisting of a self locking buckle, a lock, a strap, a rope, and a cable tie.

10. The container of any one of the preceding claims, further comprising lugs
35 on a top face of the container, each of said lugs having an opening for enabling the

container to be carried under-slung a helicopter or for loading the container on a truck or a ship.

11. The container of any one of the preceding claims, further comprising lugs on a bottom face of the container, each of said lugs having an opening for securing the container while being transported on a truck or a ship.

12. The container of any one of the preceding claims, further comprising wheels on a bottom portion of the container to enable the container to be loaded on to a land mover or an evacuation aircraft.

13. The container of any one of the preceding claims, further comprising ventilation means for providing air ventilation between an interior and exterior of the container.

14. The container of claim 13, wherein the ventilation means comprises one or more air vents.

15. The container of any one of the preceding claims, further comprising the stretchers.

16. A method of evacuating a plurality of casualties, the method comprising the step of laying casualties on a plurality of stretchers, and loading the stretchers into a container in two or more horizontal, vertically spaced apart layers, each layers comprising two or more stretchers, and securing the stretchers against movement.

17. The method as claimed in claim 16, further comprising connecting one or more of the casualties to a medial supply mounted inside the container.

18. The method as claimed in claim 17, further comprising air-lifting the container.