US 20060292536A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2006/0292536 A1**

Hoster, JR. (43) **Pub. Date: Dec. 28, 2006**

(54) **MASS CASUALTY, DISASTER TRAINING INFLATABLE MANIKIN AND METHOD**

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(21) Appl. No.: **11/514,570**

(22) Filed: **Aug. 31, 2006**

Related U.S. Application Data

(62) Division of application No. 10/889,300, filed on Jul. 12, 2004.

(60) Provisional application No. 60/518,195, filed on Nov. 7, 2003.

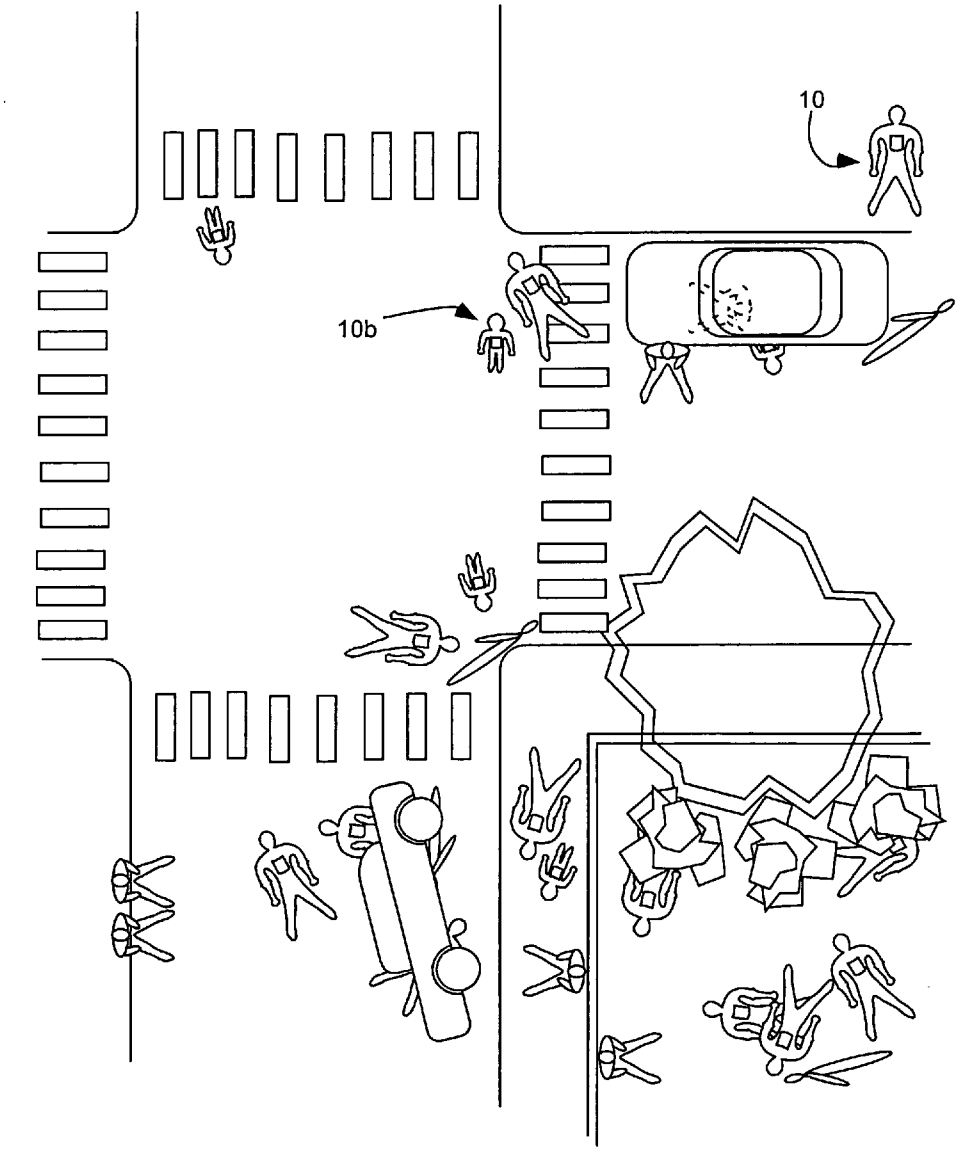
Publication Classification

(51) **Int. Cl.**
G09B 23/28 (2006.01)

(52) **U.S. Cl.** **434/262**

(57) **ABSTRACT**

A mass casualty disaster training method includes arranging a plurality of manikins to simulate a plurality of victims of a mass casualty disaster scenario; and simulating triage and treatment of the plurality of manikins.



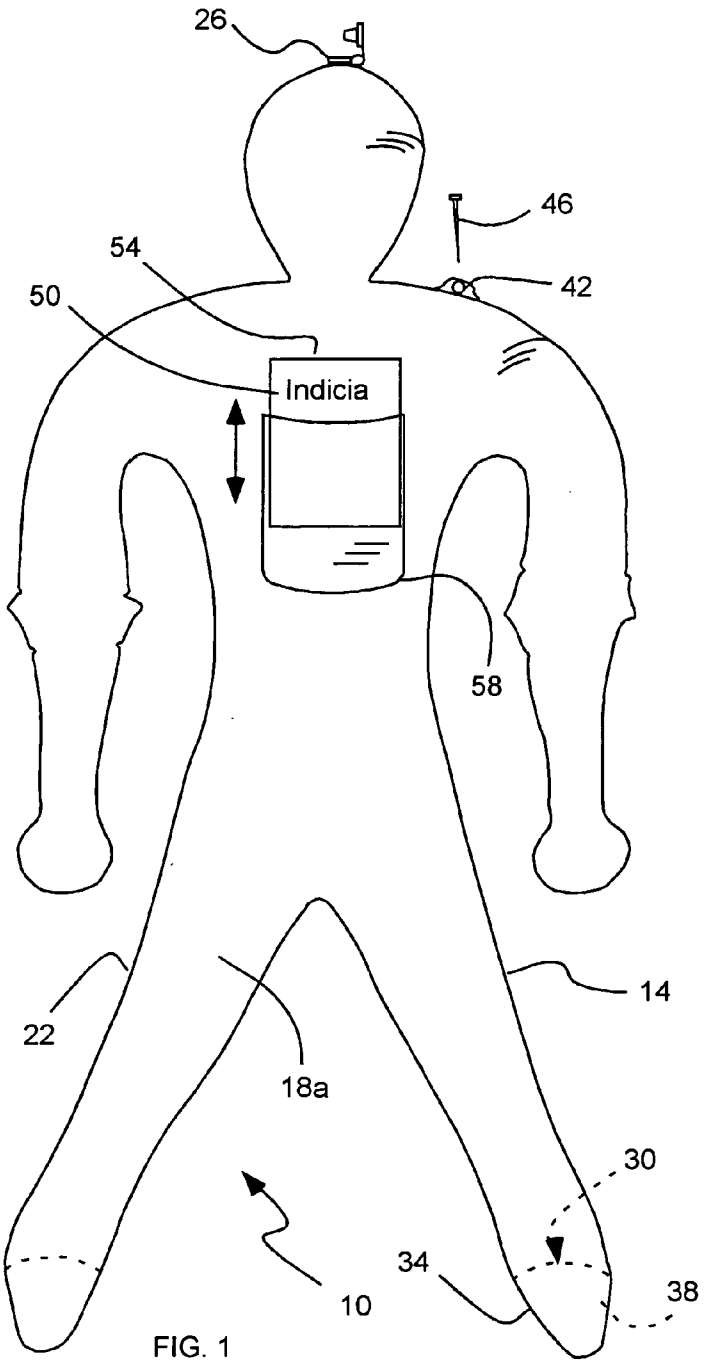

26
46
54
42
50
Indicia
58
22
18a
14
30
34
38
10

FIG. 1

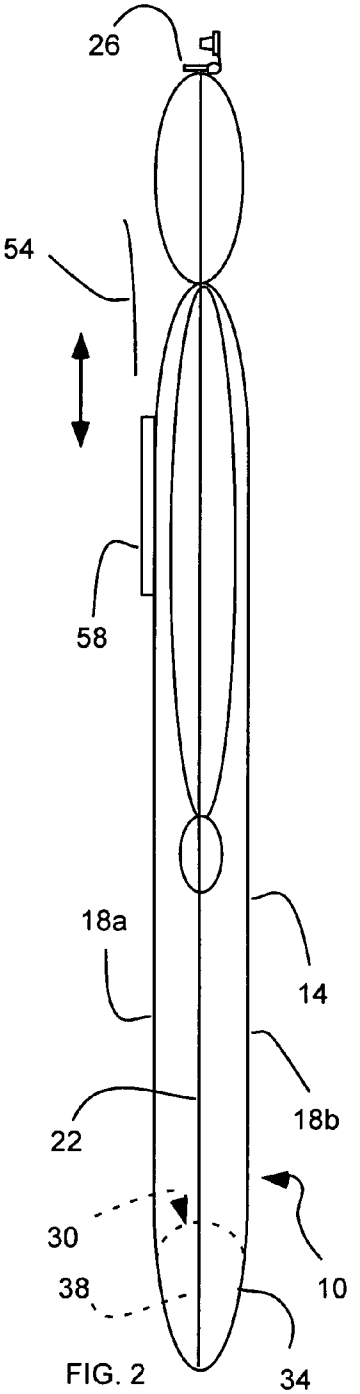

26
54
58
18a
14
18b
22
30
38
10
34

FIG. 2

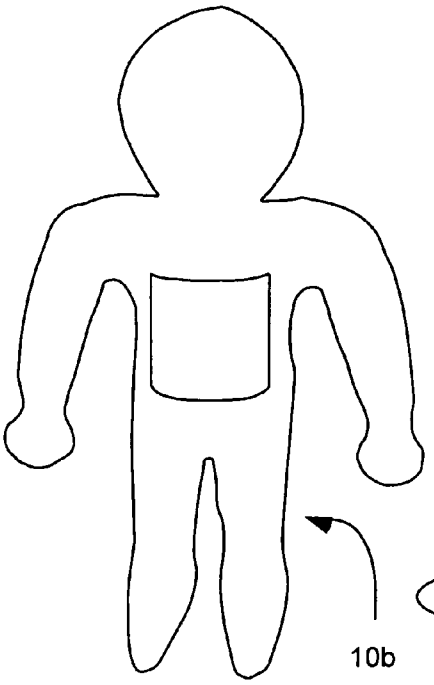


FIG. 5

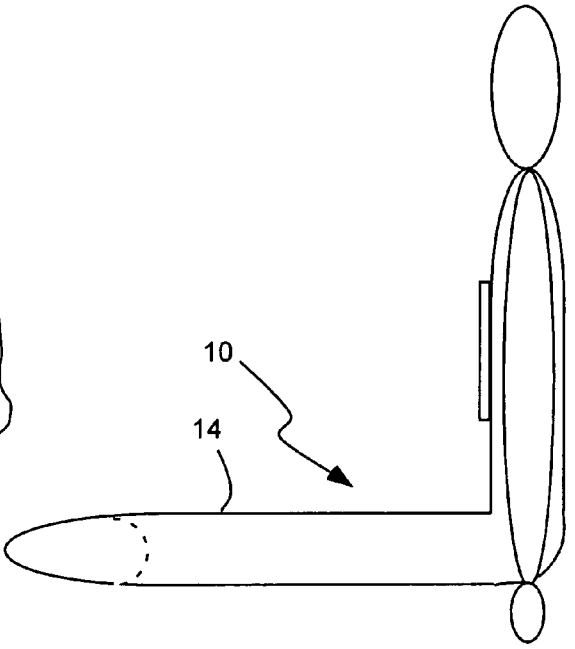


FIG. 3

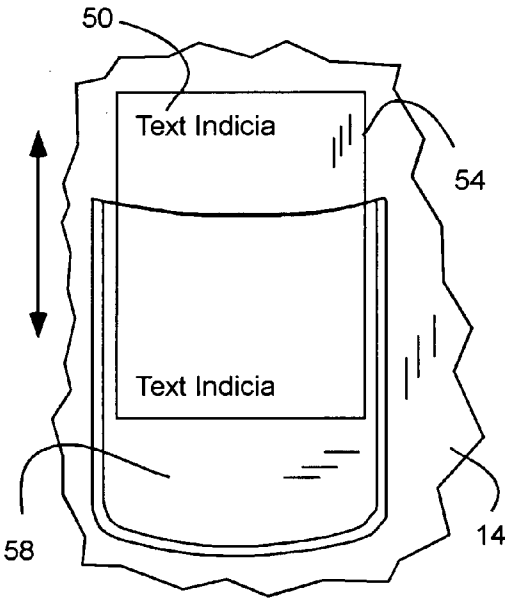


FIG. 4

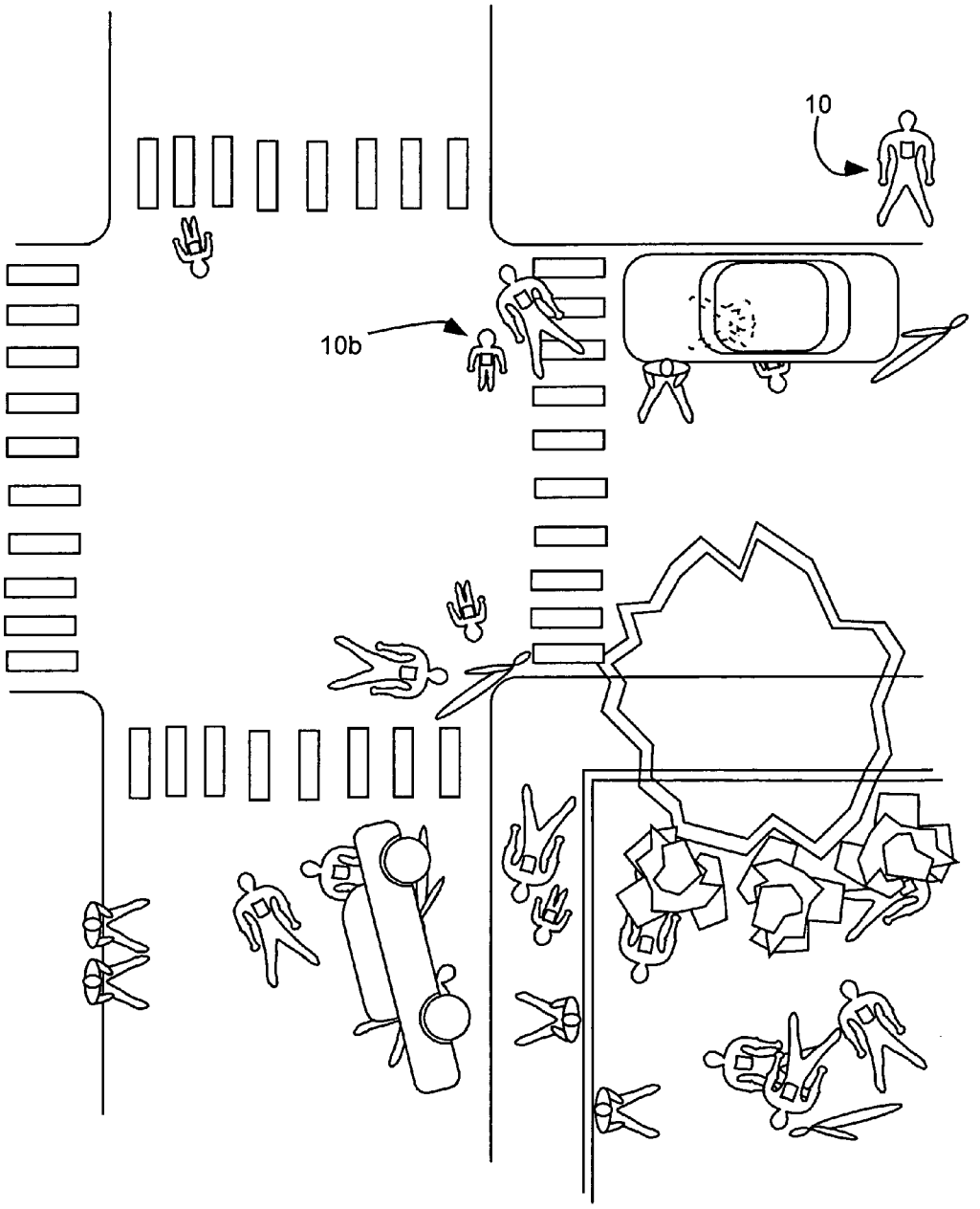


FIG. 6

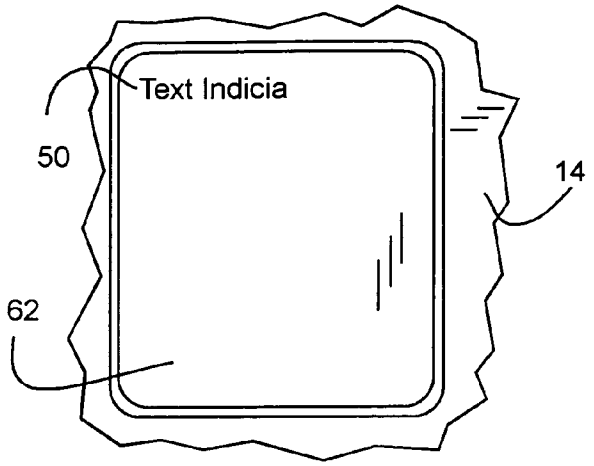

Text Indicia
50
14
62

FIG. 7

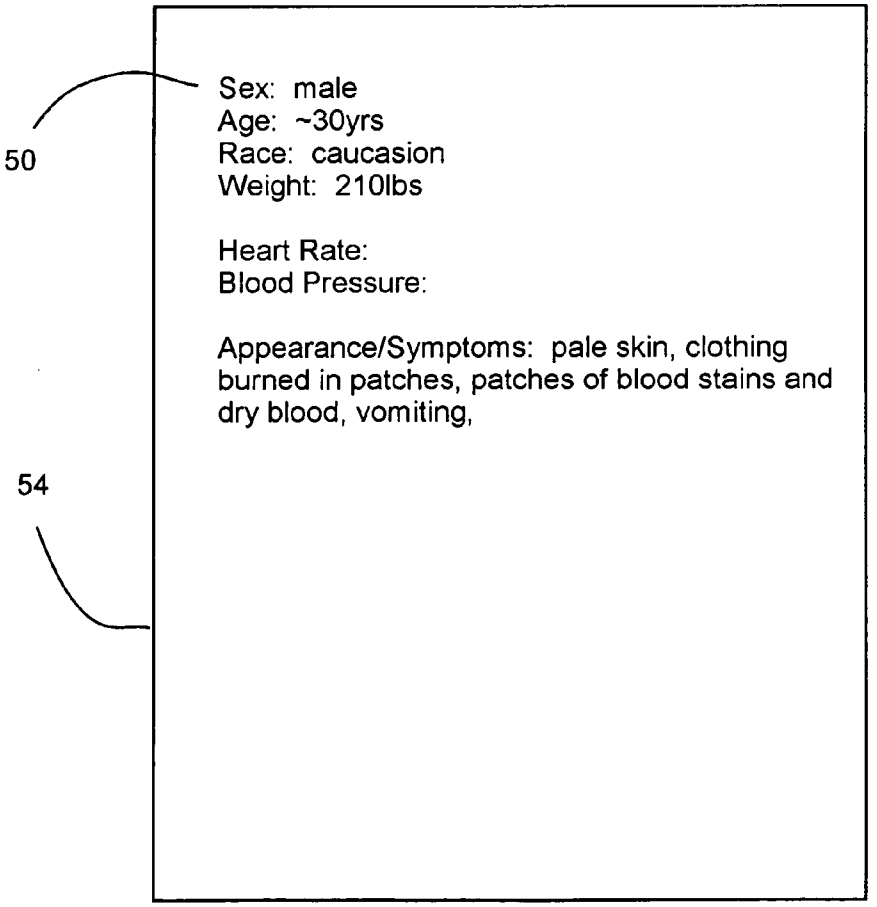

50
Sex: male
Age: ~30yrs
Race: caucasion
Weight: 210lbs
Heart Rate:
Blood Pressure:
Appearance/Symptoms: pale skin, clothing burned in patches, patches of blood stains and dry blood, vomiting,
54

FIG. 8

MASS CASUALTY, DISASTER TRAINING INFLATABLE MANIKIN AND METHOD

[0001] This is a divisional of U.S. patent application Ser. No. 10/889,300, filed Jul. 12, 2004; which claims priority to U.S. Provisional Patent Application No. 60/518,195, filed Nov. 7, 2003; which are herein incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to mass casualty disaster training and inflatable manikins (mannequins). More particularly, the present invention relates to a system and method for using inflatable manikins for training for mass casualty disaster scenarios.

[0004] 2. Related Art

[0005] Training for mass casualty disasters has become a standard for emergency agencies around the world. Such mass casualty disasters include various different scenarios, including for example, terrorist attack, transportation disaster (e.g. vehicle crash), natural disaster (e.g. earthquake), and the like.

[0006] Training for such mass casualty disasters typically involves numerous participants or actors who act as victims of the disaster. The participants or actors may act in accordance with an assigned condition or event, and may have make-up applied, to provide realism. It will be appreciated that the very nature of training for mass casualties requires numerous participants or actors. Organizing such disaster training can be costly, and can require enormous coordination efforts. For example, numerous participants or actors must be arranged for, organized, instructed, prepared, etc., in addition to the emergency agencies that will actually be training. The needs of the participants or actors must be considered, such as restroom facilities, food, water, etc.

SUMMARY OF THE INVENTION

[0007] It has been recognized that it would be advantageous to develop a system and method for mass casualty disaster training that requires fewer participants or actors. In addition, it has been recognized that it would be advantageous to develop a system and method for such training that is less costly and less complicated to implement and coordinate.

[0008] The invention provides a method for training for mass casualty disasters. A plurality of manikins is arranged to simulate a plurality of victims of a mass casualty disaster. Triage and treatment of the plurality of manikins are simulated.

[0009] In accordance with a more detailed aspect of the present invention, a plurality of inflatable manikins can be inflated. Inflating the manikins can include inflating an inflatable bladder with a human form. The plurality of inflatable manikins can be deflated and stored after simulating triage and treatment.

[0010] In accordance with a more detailed aspect of the present invention, an insert with indicia can be inserted into a pocket formed on the manikin so that the indicia is visible from the pocket. The indicia can be indicative of predetermined physical or medical conditions associated with the mass casualty disaster scenario.

[0011] Additional features and advantages of the invention will be apparent from the detailed description which follows, taken in conjunction with the accompanying drawings, which together illustrate, by way of example, features of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] **FIG. 1** is a front view of a mass casualty disaster training manikin in accordance with an embodiment of the present invention;

[0013] **FIG. 2** is side view of the manikin of **FIG. 1**;

[0014] **FIG. 3** is a side view of the manikin of **FIG. 1**;

[0015] **FIG. 4** is a partial front view of the manikin of **FIG. 1**;

[0016] **FIG. 5** is a front view of another mass casualty disaster training manikin in accordance with an embodiment of the present invention;

[0017] **FIG. 6** is a top view of a mass casualty disaster training system and scenario in accordance with an embodiment of the present invention;

[0018] **FIG. 7** is a partial front view of another mass casualty disaster manikin in accordance with an embodiment of the present invention; and

[0019] **FIG. 8** is a front view of an insert with text indicia of the manikin of **FIG. 1**.

DETAILED DESCRIPTION

[0020] Reference will now be made to the exemplary embodiments illustrated in the drawings, and specific language will be used herein to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended. Alterations and further modifications of the inventive features illustrated herein, and additional applications of the principles of the inventions as illustrated herein, which would occur to one skilled in the relevant art and having possession of this disclosure, are to be considered within the scope of the invention.

[0021] As illustrated in **FIGS. 1-4**, a mass casualty disaster training manikin (mannequin), indicated generally at **10**, in accordance with the present invention is shown for use in training for mass casualty disasters. A plurality of such manikins **10** can be used, as described in greater detail below. The manikins **10** can be utilized to simulate a mass casualty disaster or scenario, including for example: terrorist attack; riot; transportation disaster, such as an airline, train, boat or car crash; natural disaster, such as earthquake, tornado, hurricane, flood, fire, avalanche or landslide; war or battle; etc. The manikins **10** can be arranged to simulate a plurality of victims of the mass casualty disaster scenario. The manikins can be used to train various different personnel and agencies, including for example, emergency medical technicians (EMTs), hospital staff, police, firefighters, transit employees, etc.

[0022] The manikins **10** can have a human form, or can be shaped and sized substantially as a human, to provide a degree of realism. Thus, the manikins can include a head,

torso, legs and arms. The manikins can have different shapes or configurations. For example, some manikins can be provided without one or more appendages to be consistent with the predetermined medical conditions, such as amputation. In addition, the manikins can be configured with other human characteristics, such as clothing, facial features, etc. Such characteristics can be painted or printed on the manikins. Furthermore, the manikins can be flexible or posable to provide realistic simulated configurations.

[0023] The manikins **10** can be collapsible and expandable so that they may be expanded for use and collapsed for storage, thus saving storage and transportation costs. It will be appreciated that a significant number of manikins can be utilized in a scenario with mass casualties, and that shipping and storage of numerous manikins can be costly. For example, the manikins **10** can be inflatable for use, and deflatable to reduce the storage volume of the manikins. The manikins **10** can include an inflatable bladder **14** that has a human form. The bladder **14** can be formed by opposing plies or sheets of material **18***a* and **18***b* joined together around a perimeter 22. For example, a pair of plies or sheets can be cut or stamped to have a desired human shape, and the perimeters can be welded or adhered together. The material can include vinyl or PVC that is sonic welded around the perimeter. An air inlet/outlet with a cap and/or valve **26** can extend through the bladder to allow the bladder to be filled with air. The valve **26** can be positioned at any appropriate location, and can include a plug received within an aperture, and a flexible flap pivotally disposed over the aperture as a check valve.

[0024] The inflatable bladder **14** also allows the manikin to be flexible or posable. The bladder **14** can be partially, or not quite fully inflated, to allow the bladder to be bent at certain locations, such as at the waist (**FIG. 3**), arms or legs. The bladder **14** can be configured or shaped to create bending points, such as at the waist, shoulders, elbows, knees and/or neck. The shape of the bladder can include lateral or perimeter projections and/or indentations in the sheets to create wrinkles in the sheets when inflated, and thus bending points.

[0025] The manikin or bladder can further include a ballast **30** to provide weight or anchoring to the manikin, and resist undesired displacement of the manikin, such as by wind. The ballast **30** can include one or more ballast compartments **34** formed with the inflatable bladder. The compartment **34** can be formed of another sheet of material, similar to the material of the bladder, coupled to the bladder to form the compartment. The ballast compartment **34** can be formed on or in the bladder. For example, the ballast compartments **34** can be formed at the foot location of the manikin or bladder. The compartment, however, can be disposed or located at any appropriate position. A ballast material **38** can be disposed in the compartments **34**, and can have a weight greater than a weight of the inflatable bladder.

[0026] The ballast is an example of one means for maintaining a physical location of the manikin, or for resisting unintentional displacement of the manikin. Other means can also be used, including for example, staking the manikin to the ground or tying the manikin to another object. An aperture **42** can be formed on the manikin or bladder, such as in a tab of the sheet of material. A peg or a line **46** can be received through the aperture to stake or tie the manikin.

[0027] The manikins **10** also include indicia **50** indicative of predetermined physical or medical conditions associated with the mass casualty disaster. The indicia **50** can include text, or a readable text version of the physical or medical condition attributed to the respective manikin. The indicia **50** or text can include general background information of the victim, such as the victim's: age, weight, race, gender, etc. The indicia or text can include current medical conditions of the victim, such as the victim's: heart rate, blood pressure, body temperature, pain, consciousness, fractures, lacerations, burns, trauma, etc. The indicia or text can include information that might otherwise be observable in an actual disaster, such as exposure to nerve agent, exposure to biological agents, exposure to radiological material, condition of clothing, appearance of skin, etc. The indicia or text can also include information relating to the incident, such as: elapse time or time since incident, etc. Furthermore, the indicia can include graphics or pictures, such as of a particular wound or burn.

[0028] In accordance with one aspect of the invention, the indicia **50** or text can be provided on inserts **54**. For example, the inserts **54** can be paper or cardstock with the indicia printed thereon. In addition, the inserts **54** can be laminated or otherwise protected. Thus, different disaster scenarios can be quickly and easily scripted or prepared, and the inserts printed for use. A plurality of inserts can be provided, and the inserts can be different, or can include several different medical conditions. The inserts can be provided in sets representing a particular scenario. In addition, the inserts or indicia can have different levels of severity. Thus, during training, the medical personnel will be presented with multiple different symptoms.

[0029] A pocket **58** can be formed on the inflatable bladder **14** or manikin **10** to receive the insert **54**. Thus, the insets **54** can be removably disposed in the pockets **58**. Removable inserts **54** allow the conditions or scenarios to be quickly and easily changed. In addition, it allows the manikins to be disposed in a scenario, and the inserts to be inserted afterwards so that specific manikins do not need to be positioned in specific locations. The pocket **58** can be a clear plastic sheet adhered or welded to one of the sheets of the bladder. For example, a clear plastic sheet can be sonic welded around three sides (bottom and sides) to a top sheet **18***a* of the bladder **14** to form the pocket. Thus, the indicia or text can be visible through the pocket. The pocket can be located on the chest or torso of the manikin, as shown. It is of course understood that several different pockets can be provided on a single manikin, and that the pocket(s) can be located at different locations, thus causing the medical personnel to inspect the manikins as they would a real victim.

[0030] In another aspect, the pocket can include a frame with an opening therein through which the insert can be viewed. In another aspect, a panel **62** (**FIG. 7**) can be formed on a torso region of the manikin, with the indicia disposed on the panel. The text or indicia can be permanently formed on the panel, such as by printing. In another aspect, the panel can provide an erasable surface, such as a dry-erase surface, and the indicia or text can be eraseably written on the panel. In another aspect, the panels can be removably secured to the bladder or manikin, such as with snaps or hook-and-loop type fasteners.

[0031] The manikins **10** can be provided in different sizes. For example, many manikins **10** can have a size correspond-

ing to an adult, or approximately 5.5-6.5 feet in length or height. Other manikins **10***b* (**FIG. 5**) can have a size corresponding to a child, or approximately 2-3 feet in length or height. The different sizes help define a more realistic scenario.

[**0032**] A plurality of the mass casualty disaster training manikins **10** described above can be provided as a mass casualty disaster training system. As described above, a plurality of manikins can be provided with a plurality of different inserts, or sets of inserts.

[**0033**] The manikins **10** can be used to instruct emergency personnel on various aspects of emergency response, particularly in a mass casualty disaster situation. The instruction can include for example, proper procedures, panic control, crowd control, triage, resisting self-contamination, inter-department communication, etc. In addition, the instruction can include practicing emergency procedures using the manikins, such as transport, triage, etc.

[**0034**] A method for training for mass casualty disasters includes arranging a plurality of manikins **10** to simulate a plurality of victims of a mass casualty disaster, such as shown in **FIG. 4**. The type and scope of the disaster scenario can be determined beforehand, and the manikins **10** arranged and posed consistent with a predetermined scenario. Emergency personnel can then simulate triage and treatment of the plurality of manikins. In addition, the simulation can include instruction, such as how to triage mass casualties, how to communicate between various different agencies, etc. The simulation can include transporting the manikins, as victims.

[**0035**] Prior to the simulation, the plurality of inflatable manikins can be inflated. An air compressor or blower can be used to facilitate inflation. It will be appreciated that inflating a plurality of manikins can be easier than arranging for, and coordinating, a plurality of actual human actors. After the simulation, the manikins can be deflated and stored. Deflating the manikins reduces the storage volume and handling of the manikins.

[**0036**] In addition, the physical location of the plurality of manikins can be maintained due to the ballast, and/or being staked or tied.

[**0037**] In addition, prior to the simulation, a disaster scenario can be prepared or scripted. The number and type of victims, as well as the type and severity of injuries, can be determined. This information can be prearranged as the indicia on the manikins. For example, a plurality of different inserts can be printed. The inserts can then be inserted into the pockets. The manikins can be positioned first, and the inserts inserted second. Thus, all the manikins can be distributed generically, and the inserts can be inserted in appropriate locations.

[**0038**] Emergency personnel can be instructed on aspects of responding to the disaster scenario, before, after, and/or during the simulation.

[**0039**] It is to be understood that the above-referenced arrangements are illustrative of the application for the principles of the present invention. It will be apparent to those of ordinary skill in the art that numerous modifications can be made without departing from the principles and concepts of the invention as set forth in the claims.

What is claimed is:

1. A method for training for mass casualty disasters, including the steps of:

arranging a plurality of manikins to simulate a plurality of victims of a mass casualty disaster scenario; and

simulating triage and treatment of the plurality of manikins.

2. A method in accordance with claim 1, further comprising the steps of:

expanding the plurality of manikins prior to arranging the plurality of manikins; and

collapsing the plurality of manikins after simulating triage and treatment.

3. A method in accordance with claim 2, further comprising the step of:

inflating a plurality of inflatable manikins, each inflatable manikin including an inflatable bladder with a human form.

4. A method in accordance with claim 3, further comprising the steps of:

deflating the plurality of inflatable manikins after simulating triage and treatment; and

storing the deflated manikins.

5. A method in accordance with claim 1, further comprising the step of:

scripting the disaster scenario.

6. A method in accordance with claim 1, further comprising the step of:

instructing emergency personnel on aspects of responding to the disaster scenario.

7. A method in accordance with claim 1, further comprising the step of:

practicing emergency procedures using the plurality of manikins.

8. A method in accordance with claim 1, further comprising the step of:

providing indicia associated with the plurality of manikins that is indicative of predetermined physical or medical conditions associated with the mass casualty disaster scenario.

9. A method in accordance with claim 8, wherein the indicia includes text.

10. A method in accordance with claim 9, wherein the text is selected from the group consisting of: age, weight, race, gender, heart rate, blood pressure, body temperature, elapse time or time since incident, pain, consciousness, fractures, lacerations, burns, trauma, exposure to nerve agent, exposure to biological agents, and exposure to radiological material.

11. A method in accordance with claim 8, further comprising the step of:

inserting an insert with the indicia disposed thereon into a pocket formed on the manikin so that the indicia is visible from the pocket.

12. A method in accordance with claim 1, further comprising the step of:

maintaining a physical location of the plurality of manikins.

13. A method in accordance with claim 12, wherein each of the plurality of manikins further comprises:

an inflatable bladder; and

a ballast, attached to an inflatable bladder, having a weight greater than a weight of the inflatable bladder.

14. A method in accordance with claim 12, wherein each of the plurality of manikins further comprises:

an aperture, associated with the inflatable bladder; and

a peg or a line, receivable through the aperture.

15. A method for training for mass casualty disasters, including the steps of:

inflating a plurality of inflatable manikins, each inflatable manikin including an inflatable bladder with a human form;

arranging the plurality of manikins to simulate a plurality of victims of a mass casualty disaster;

simulating triage and treatment of the plurality of manikins;

deflating the plurality of inflatable manikins after simulating triage and treatment; and

storing the deflated manikins.

16. A method in accordance with claim 15, further comprising the step of:

providing indicia associated with the plurality of manikins that is indicative of predetermined physical or medical conditions associated with the mass casualty disaster scenario.

17. A method in accordance with claim 16, wherein the indicia includes text.

18. A method in accordance with claim 17, wherein the text is selected from the group consisting of: age, weight, race, gender, heart rate, blood pressure, body temperature, elapse time or time since incident, pain, consciousness, fractures, lacerations, burns, trauma, exposure to nerve agent, exposure to biological agents, and exposure to radiological material.

19. A method in accordance with claim 16, further comprising the step of:

inserting an insert with the indicia disposed thereon into a pocket formed on the manikin so that the indicia is visible from the pocket.

20. A method for training for mass casualty disasters, including the steps of:

inflating a plurality of inflatable manikins, each inflatable manikin including an inflatable bladder with a human form;

arranging the plurality of manikins to simulate a plurality of victims of a mass casualty disaster;

inserting an insert with indicia disposed thereon that is indicative of predetermined physical or medical conditions associated with the mass casualty disaster scenario into a pocket formed on the manikin so that the indicia is visible from the pocket; and

simulating triage and treatment of the plurality of manikins.

21. A method in accordance with claim 20, wherein the pocket includes a clear sheet directly attached to the inflatable bladder.

* * * * *