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**SYNTHETIC CASUALTY**

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3 Claims. (Cl. 35-17)

This invention relates to training manikins or dummies for first aid and other medical work and relates more particularly to a manikin simulating a seriously injured man whose various wounds may be treated by standard techniques of first aid and as such is intended to serve as a practice victim in first aid training classes.

An important object of the invention is to provide a portable manikin for first aid training and containing a variety of simulated wounds, some of grievous character, the manikin being independent of any base or supporting structure so that it can be operated in any body position and can be placed in a simulated accident scene. The manikin of the present invention is thus distinguished from all prior devices of this character which have been immovably mounted in one position only on a base. Also, in these earlier dummies the several injuries received their "blood" supply from a single pump, and if several injuries were being operated the blood would flow from each at the same rate, or if they were successively operated a new setting of the valve was required in order to simulate the actual flow from a particular type of injury. An open sump was used and hence the simulated blood had to be drained before it could be transported. The whole assembly was notably lacking in realistic operation and appearance and could obviously be used only for classroom work. It could not be used for field work where the students could unexpectedly discover a "casualty."

Another object of the invention is to provide a manikin which has the appearance of a living man so that it will evoke shock reactions which have been found essential for fully effective first aid training, particularly for the treatment of wounds expected in this atomic age.

A further object of the invention is to provide a dummy whose injury complement can be expanded readily by the use of injury moulages which are synthetic skin sections duplicating various injuries and which have blood lines to provide a flow of simulated blood.

The manikin of the present invention has a number of other particularly realistic features, including (1) blood flow-control means wherein a flow to a second injury may be commenced without reducing the flow to the first injury; (2) an "umbilical cord" connecting the manikin's various bleeding injuries to a flow-control unit, and a "service cord" connecting the flow-control unit to the pumping mechanisms; (3) a mechanical unit containing pumps and electrical controls; (4) a reservoir and associated tubing for storage and transmission of simulated blood to the pumping unit; (5) a presentation table and drain system; and (6) a by-pass system consisting of means for diverting a portion of the blood taken up by the pump directly back to the reservoir, as a result of which, if the pump is operating with all injuries off, the by-pass tube is circulating an appreciable volume of blood and additional increments of blood flow, due to the use of each injury, affect total pump flow to a much lesser degree than would otherwise be the case.

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Other objects and advantages will presently appear or will become apparent as the specification proceeds.

In the drawings:

FIG. 1 is a perspective of a synthetic casualty embodying the present invention.

FIG. 2 is a schematic diagram showing the elements of control.

FIG. 3 is a side elevation of the synthetic casualty without clothing and resting upon a table.

FIG. 4 is a front elevational view of the manikin with a portion of the skin removed to show the frame structure.

FIG. 5 is a view along line 5-5 of FIG. 4.

FIG. 6 is a top view of the manikin in FIG. 4 with head removed.

FIG. 7 is a sectional view showing the head construction.

FIG. 8 is a perspective of the shoulder construction.

FIG. 9 is an elevational view of a typical elbow or knee joint.

FIG. 10 is a view along line 10-10 of FIG. 9.

FIG. 11 is an elevational view partly in section of a connector.

FIG. 12 is an elevational view of a pair of the tubes used in the connector of FIG. 11.

FIG. 13 is a typical moulage blood line.

FIG. 14 is a typical moulage assembly.

FIG. 15 is a view along line 15-15 of FIG. 14.

FIG. 16 is an elevational view of a blood storage tank.

FIG. 17 is a plan view of the tank of FIG. 16.

FIG. 18 is a perspective view of the flow control unit.

FIG. 19 is a top view of the control unit of FIG. 18 partly broken away to show the inside components.

FIG. 20 is a view along line 20-20 of FIG. 19.

FIG. 21 is a plan view of the inside of the mechanical unit.

FIG. 22 is a sectional view along line 22-22 of FIG. 21.

FIG. 23 is a view along line 23-23 of FIG. 22.

Referring now to FIG. 1 a synthetic casualty generally indicated 10 comprises a manikin 12 having suitable clothing 14 including shoes 15. The clothing is torn away at a point 16 on the leg and at a point 18 on the arm, exposing a leg injury 20 and an arm injury 22. The casualty 10 is resting in a reclining position upon a suitable table top 24. The head and shoulders are supported in an inclined position by a prop 26 which is adjustable for angle of incline. A schematic or condensed overall picture of the synthetic casualty is shown by FIG. 2. In order to further enhance the realistic simulation of a casualty the wounded portions are constructed so as to secrete a simulated blood. The manikin 12 receives a supply of synthetic blood through tubes contained in a flexible cable 27 which will hereafter be known as the umbilical cord.

A flow control unit 28 controls the quantity and location of blood distribution within the manikin. The blood is pumped to the control unit 28 through another arrangement of tubes 30 which will hereafter be known as the service cord. This service cord is attached to a delivery end of several pumps and driven by electric motors which will be described later, all of which are housed in a unit 31 which will hereafter be known as the mechanical unit. This unit draws blood from a reservoir 32 through suitable tubing 33. A by-pass tube 34 is