United States Patent [19]

Klatskin

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[54] **INTRAVENOUS INJECTION BOARD**

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[73] Assignee: **Inventors Marketing & Mfg. Inc.**, Encino, Calif.

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[52] **U.S. Cl.** **128/133**; 128/DIG. 6

[51] **Int. Cl.** **A61m 05/00**

[58] **Field of Search**.... 128/133, 214 R, 215, DIG. 6

[56] **References Cited**

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[57] **ABSTRACT**

A board to facilitate intravenous feedings which is to support the user's hand, arm and fingers. The board includes a raised rounded portion (on mound) adjacent the front end of the board adapted to cooperate with the underside of the user's hand and fingers. A ledge is formed on each side of raised rounded portion which are to support the user's thumb and little finger. The back end of the board is of a sufficient length to extend into the forearm area. The bottom surface includes a cavity and a plurality of ventilation holes which extend through the board and connect with the cavity. Formed within the bottom surface are a first pair of spaced apart aligned recesses and a second pair of spaced apart aligned recesses. These recesses are to function to facilitate the application of adhesive tape to bind the user's hand and arm to the board and also the recesses function to ventilate the cavity to the ambient. Included as part of the ventilating apertures is an enlarged ventilating aperture formed adjacent the aft end of the raised rounded portion to ventilate specifically the palm area of the user. The board may also be turned over and used as an arterial board. The board includes means to make the board electrically conductive.

2 Claims, 7 Drawing Figures

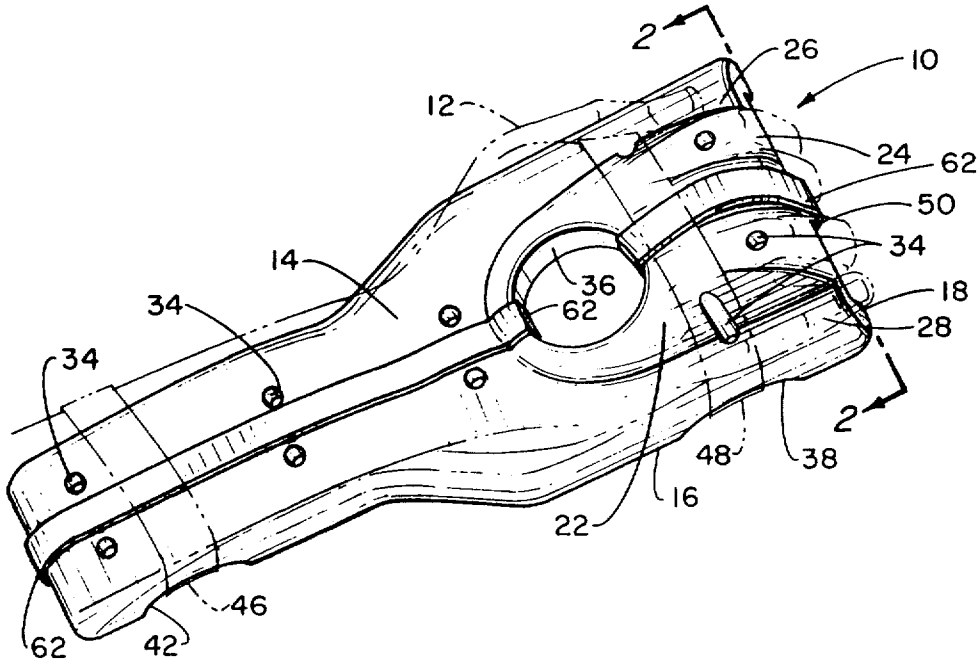

Fig. 1.

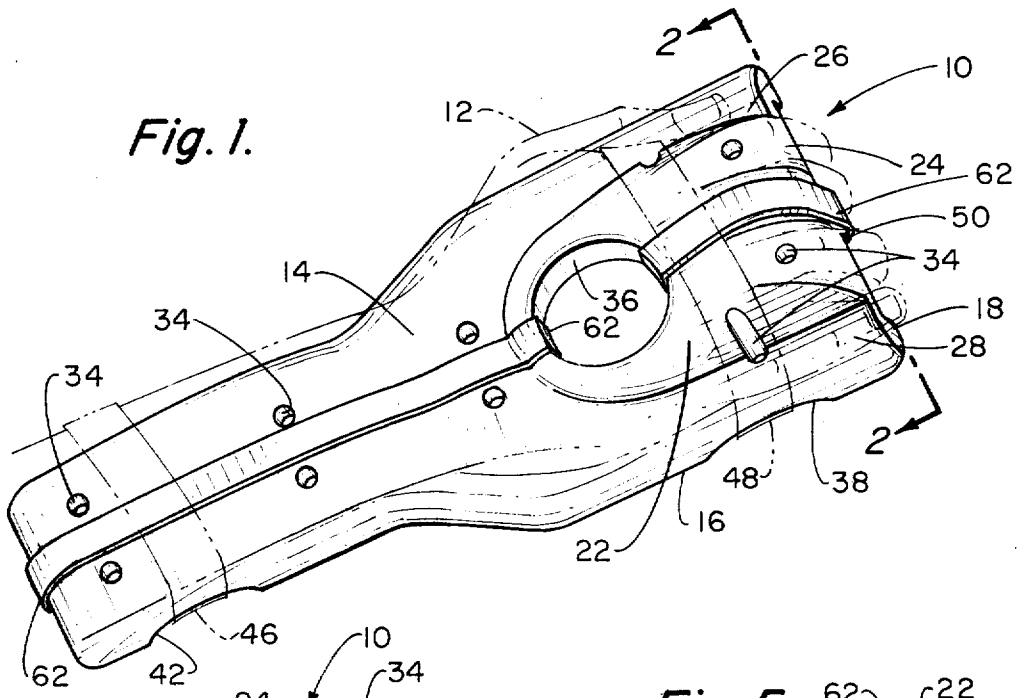

Fig. 2.

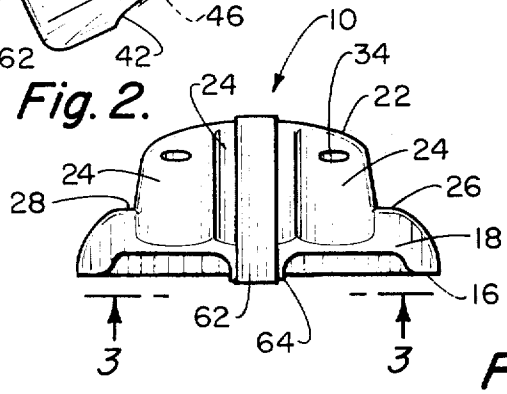

Fig. 5.

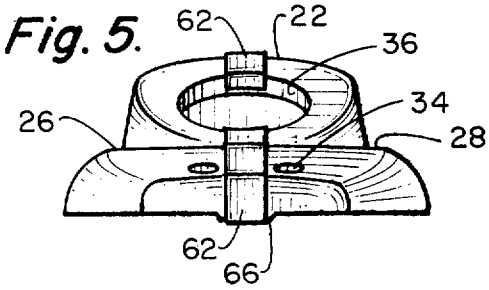

Fig. 3.

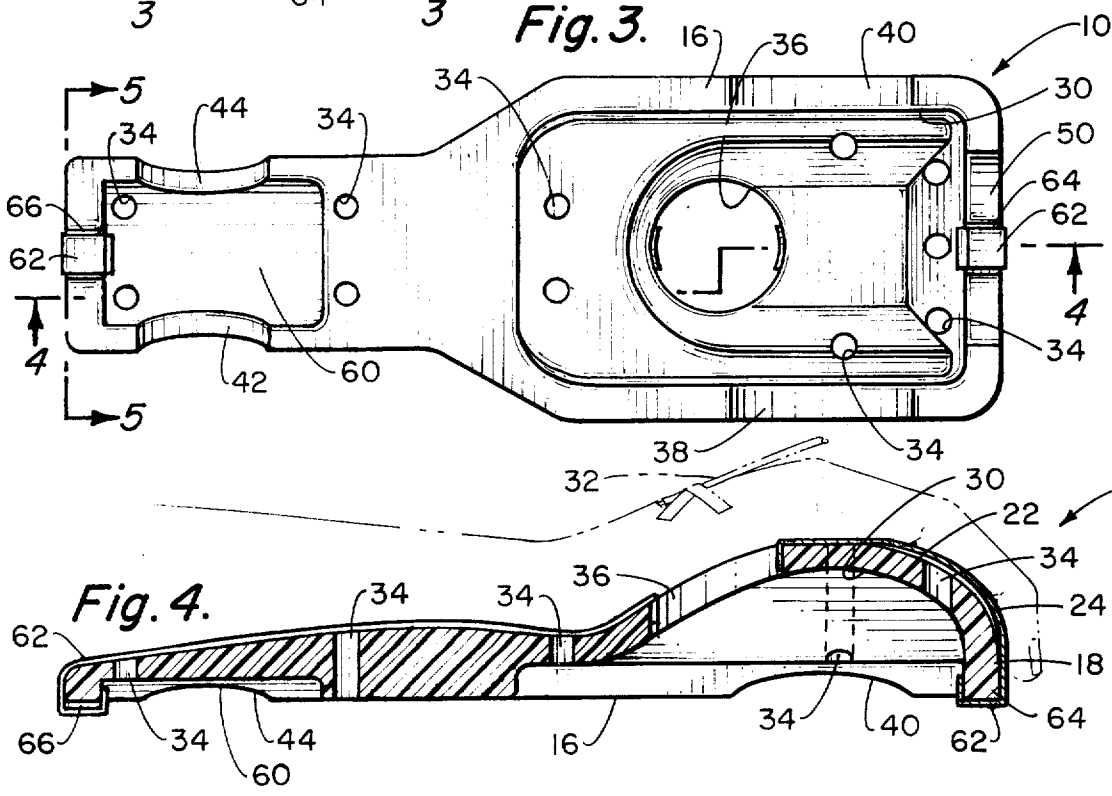

Fig. 6.

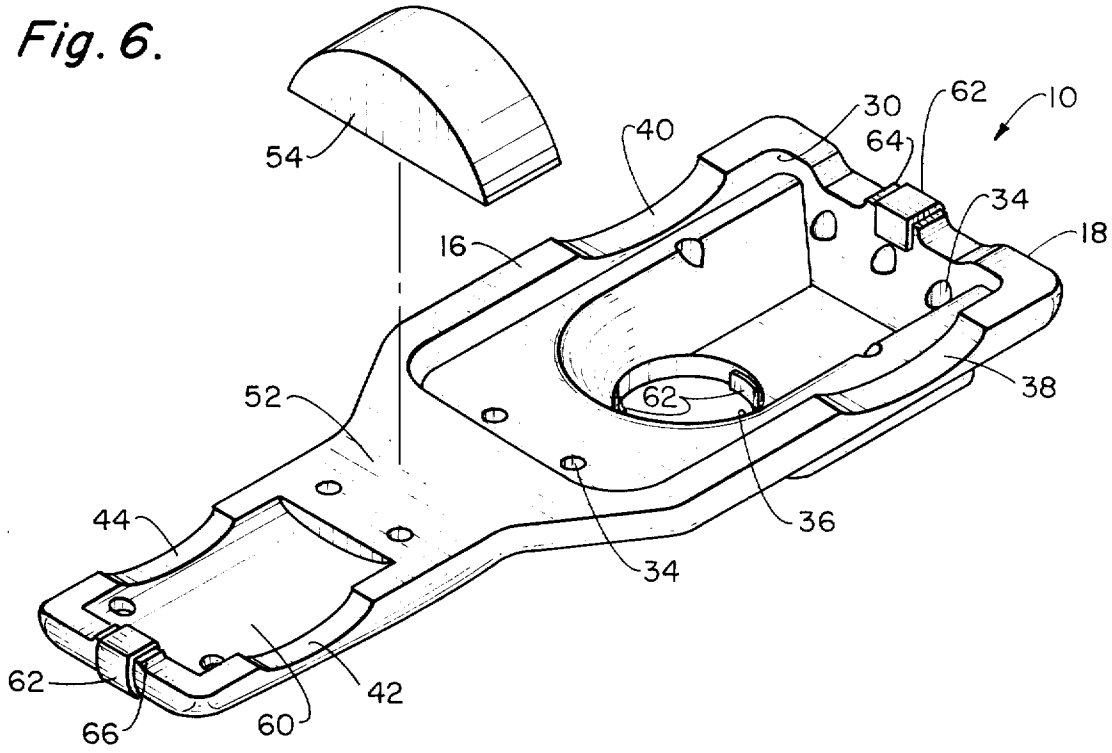
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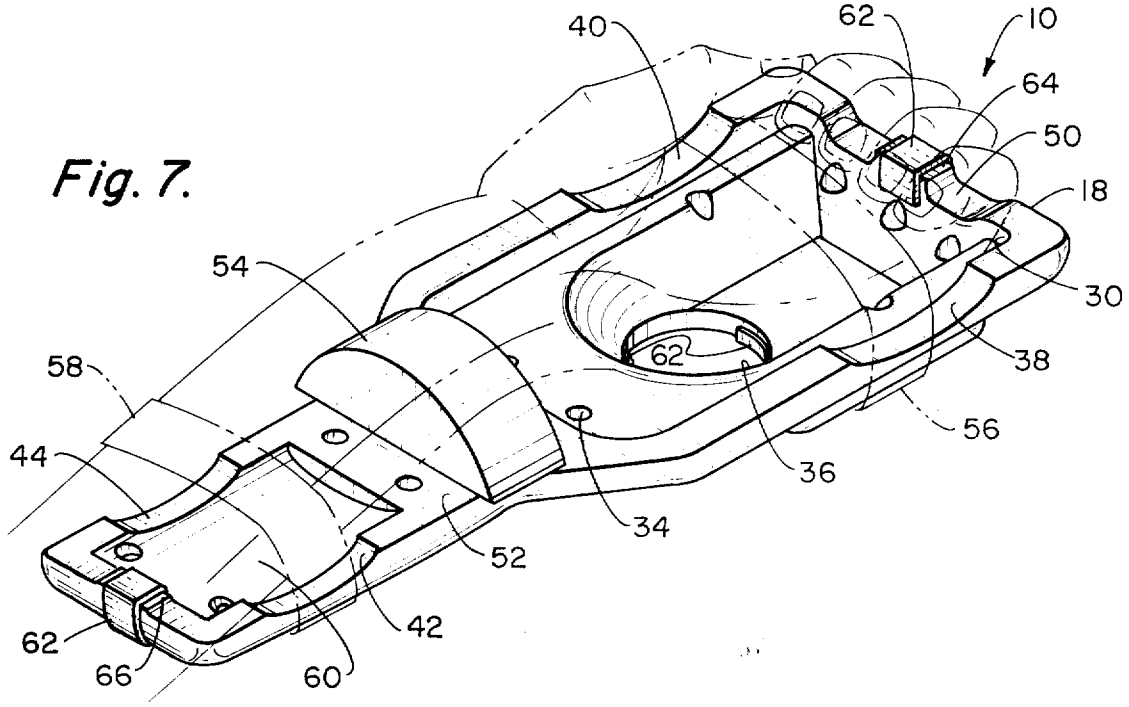
Fig. 7.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INTRAVENOUS INJECTION BOARD

RELATED DISCLOSURE

The invention of this application was broadly defined within disclosure document No. **017520** filed within the Patent Office on March **12, 1973,** under the disclosure document program.

BACKGROUND OF THE INVENTION

The field of this invention relates to a board to facilitate the positioning and maintaining of medical patient's hand and arm in a particular position to facilitate the insertion and maintaining of a needle into the veins in the back of the patient's hand. Also, the board may optionally be used to facilitate the insertion and maintaining of a needle into the arterial artery through the underside of the patient's wrist.

Intravenous injections is a most common procedure of seriously injured or ill patients within hospitals. It has been found to be preferable to feed intravenously through the veins located in the back of the patient's hand which can be referred to as the dorsal metacarpal surface. To facilitate the insertion of the needle into the vein, it is desirable that the hand be located in a particular position so that the needle can be inserted straight into the vein. After the needle is inserted, it is preferred that the needle be located in a substantially parallel relationship to the vein. This parallel relationship is essential in order that the fluid injected into the vein will be injected properly. The point of the needle is cut sharply at an angle in order to facilitate insertion into the vein. The sharp point of the needle is capable of puncturing the other side of the vein wall if the needle should be inserted improperly or should it be moved after it has been inserted.

Intravenous feedings occurs over a substantial period of time and it is not uncommon for a single patient to be intravenously fed for several days. Immediately after most surgical operations the patient is fed intravenously. Frequently the patient will become restless and will make quick movements with his hands and arms after an operation. Such quick movements can frequently cause the intravenous feeding needle to be broken or to cause injury to the vein or to be removed. Also, when the needle is maintained in the patient's arm for several hours or several days, the normal movements of the patient may cause the same problems to occur. Therefore, it has been found to be desirable to fix the patient's arm to a board so that the patient's wrist cannot be bent. It is in the bending of the wrist that normally the problems occur with respect to the needle.

Previously, there have been available some intravenous feeding boards to overcome the above noted problems of the intravenous feeding needle. A few of such boards have been designed quite complex in construction and therefore are quite costly. Others of such boards are not designed for the patient's comfort and make no attempt at ventilating the board. It has been found that after a period of time that perspiration will collect between the board and the patient's arm and hand. This collection of perspiration can become quite uncomfortable to the patient and also encourages unsanitary conditions.

The majority of the intraveous feeding boards in the prior art have not been designed to be disposable and therefore require periodic cleaning and sterilization. It would be desirable to design an intravenous feeding board which could readily be disposed of.

During surgical operations, an electrostatic charge can be quite hazardous. In anesthesiology, extremely explosive gases are used which are capable of igniting such gases causing injury or death to the patient. It is required that any item used in the operating room be capable of dissipating electrostatic charges. In the prior art, no known intravenous feeding board included means to make the board electrically conductive.

SUMMARY OF THE INVENTION

The intravenous feeding board of this invention is essentially a flat board with a portion of the upper surface of the board being mounded to bring the dorsal metacarpal surface to the preferred angle to facilitate insertion of a hypodermic needle. The board of this invention includes a substantial number of ventilating apertures which connect with an enlarged ventilation cavity located within the underside of the board. The internal cavity is ventilated to the ambient so that accumulated humidity can escape. Included within the board is an enlarged ventilating hole positioned adjacent the palm of the hand of the user. It is in the area of the palm that the greatest amount of perspiration occurs. A strip of electrically conductive tape is placed across the board to electrically ground the board to the surface upon which it is placed.

The primary objective of the intravenous feeding board of this invention is to construct the board in a simple manner of a styrofoam plastic material so that the board is quite inexpensive to manufacture and is readily disposable. A further objective of the board of this invention is to construct the board so that it is comfortable to the wearer during even prolonged periods of use. To aid in obtaining this comfort feature, the board is to include ventilation means to eliminate accumulated perspiration.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of the intravenous feeding board of this invention showing how such would be normally used;

FIG. **2** is a front view of the board of this invention taken along line **2—2** of FIG. **1**;

FIG. **3** is a bottom view of the board of this invention taken along line **3—3** of FIG. **2**;

FIG. **4** is a cross-sectional view of the board of this invention taken along line **4—4** of FIG. **3**;

FIG. **5** is a back view of the board of this invention taken along line **5—5** of FIG. **3**;

FIG. **6** is an exploded isometric view of the board of this invention relating to an arterial board; and

FIG. **7** is an isometric view of the board of this invention showing how it would be used as an arterial board.

DETAILED DESCRIPTION OF THE SHOWN EMBODIMENT

Referring particularly to FIG. **1** of the drawings, there is shown the intravenous feeding board **10** of this invention. In phantom there is shown a human hand **12** positioned as it would be upon the board **10.** The board **10** includes a top **14,** a bottom **16,** a front end **18** and a back end. The entire board **10** is constructed of styrofoam plastic material and is to be molded in a single operation. Although styrofoam plastic is found to be pref-

erable, it is to be understood that other types of material could be selected.

Formed upon the upper surface of the board **14** adjacent the front end **18** is a mound or raised rounded portion **22.** At the front portion of the mound **22** are a plurality of grooves **24** to allow the fingers of the user to lie comfortably upon the board **10.** The purpose of the mound **22** is to position the back of the hand so that the veins within the back of the human hand are pushed upwardly and straightened to some extent in order to facilitate the insertion of a needle **32.** Such hollow sharp pointed needles are used to feed patients intravenously, to insert catheters within the blood stream, or to inject drugs or antibiotics.

Positioned on each side of the mound **22** are ledges **26** and **28.** If the board **10** is applied to the patient's right hand, the thumb of the patient will rest on ledge **26** with the little finger resting on ledge **28.** If the board is used on the left hand, the opposite would be true. The lateral edges of the board **10** adjacent ledges **26** and **28** are rounded so that if in chance the board becomes lodged beneath the patient's body, there will not be any sharp edge which would cut off blood circulation. This is particularly desirable since frequently patients that use such boards are either unconscious or heavily drugged.

Formed within the bottom **16** of the board **10** is an internal cavity **30.** In the event that a patient proceeds to use the board as a leaning support such as when trying to sit up in bed, the board will be strong enough to support the patient's weight.

Formed through the board **10** and connecting with the cavity **30** are a plurality of ventilation apertures **34.** There is a ventilation aperture **34** which connects with each of the finger grooves **24.** There is also a pair of ventilation apertures located on either side of the mound **22.** There are further ventilation apertures formed through the forearm and wrist section of the board. The crux of the ventilating apertures **34** is to provide an escape means for accumulated perspiration. Also, by permitting air to be conducted between the board and the hand, the amount of perspiration should be decreased.

Located within the aft end of the mound **22** is an enlarged ventilating aperture **36.** The aperture **36** has for its primary purpose to expose the palm area of the hand. The most likely place for perspiration to occur is within the palm area. Therefore, if the palm area can be kept dry and the amount of perspiration substantially decreased, the patient will be made significantly more comfortable. The size of the ventilating aperture **36** is such that most of the entire palm area is ventilated.

Formed within the edge of the bottom **16** are a first set and a second set of aligned recesses. The first set of aligned recesses is located adjacent the front **18** and includes recesses **38** and **40.** The second set of aligned recesses is located adjacent the back end **20** and includes recesses **42** and **44.** One function of the recesses **38** and **40** is to connect the cavity **30** to the ambient. The humidity due to the accumulated perspiration is to be permitted to be expelled from the cavity **30** through the recesses. Also, the recesses function to provide air circulation into each of the ventilation apertures **34** and **36.**

An additional function of the recesses **38–44** is to facilitate the securing of the patient's arm to the board **10.** Adhesive tape is to be conducted through the aligned recesses **42** and **44** and then about the patient's forearm to secure the board **10** to the patient's arm. The adhesive tape **46** is shown in phantom in FIG. **1.** Similarly, adhesive tape **48** is to be conducted through the recesses **38** and **40** and about the patient's hand in the area of the finger joints to also secure the front portion of the board **10** to the patient's hand. Because the adhesive tape is positioned within the recesses, the board **10** will lie flat on any flat surface.

When it is desired that the patient have a needle injected into the patient's bloodstream and held for a period of time, one of the patient's hands and forearm is placed upon the board and bound thereto by the use of adhesive tape strips **46** and **48.** Because of the mound **22,** the veins in the back of the person's hands are positioned straight and accentuated out of the skin. This makes the insertion of the needle easier and less likely to cause unwanted injury. Also, with the needle inserted it tends to be retained parallel to the vein which is the preferred position of the needle.

Because both the forearm section and the upper hand section is bound to the board, it is impossible for the wrist to bend. The patient can move his hand and his arm and the board, but cannot bend his wrist. It is in the bending of the wrist that the needle **32** is likely to be moved and puncture the inner side of the vein.

When it is desired to take the patient off intravenous feeding, the needle is removed and the board is then discarded. Because of the inexpensiveness of the board **10,** it can be changed on a daily basis with the old board being discarded and a new one employed. The board of this invention can be constructed to include a bacteria static substance which is to kill bacteria on the surface of the board. This is to keep the surface free of living organisms thereby keeping the board sanitary. An example of such a substance would be benzylconium chloride or various alcohol compounds.

The board of this invention can also be used as an arterial board. At times it is desirable to place a needle within an artery and a desirable place to make contact with an artery is through the underside of the wrist into the arterial artery. The normal procedure to facilitate inserting of the needle in the artery is to bend the wrist which tends to push the artery toward the skin surface and thereby facilitate insertion of the needle. When the needle is inserted, the wrist is then relaxed and the hand is permitted to be located in the normally straight extended position.

In order to use the board **10** of this invention as a arterial board, reference is to be had in particular to FIGS. **6** and **7** of the drawings. Board **10** is to be turned over so that the mound **22** will be positioned against the supporting surface. The upper portion of the mound **22** just forward of the enlarged ventilating aperture **36** is to be slightly flattened to facilitate positioning of the board **10** on the supporting surface. The patient is to place the backside of his hand within the cavity **30** as shown in FIG. **7.** A cut-out section **50** is formed within the front end **18** of the board so that the patient's fingers are positioned within the cut-out section **50** to make the patient's hand as comfortable as possible.

Intermediate the front end and the back end of the board **10** is a flattened area **52.** A wedge **54,** which has a smooth upper contoured surface and a lower flat surface, is to be positioned upon the flat surface **52.** The wedge **54** functions to push upwardly the wrist of the

patient to facilitate the insertion of the needle into the arterial artery. Once the needle is inserted, the wedge **54** is removed and the patient's hand and arm are permitted to relax upon the underside of the board **10**. Adjacent the back end of the board on the under surface of board **10** is a shallow longitudinal recess **60**. The function of the recess **60** is to provide comfort for the patient's forearm when located in contact with the board **10**.

The normal procedure for the using of the arterial board would be to initially locate the patient's hand within the cavity **30** and a strip of adhesive tape **56** would be wound about the patient's hand and in cooperation with the aligned recesses **38** and **40**. The wedge **54** would then be located under the patient's wrist with the forearm section of the patient still being in contact with the aft end of the board **10**. The needle would then be inserted within the arterial artery. The wedge **54** would then be removed and discarded. The patient's hand is then relaxed against the board and a strip of adhesive tape **58** is positioned about the arm in the area of the aligned recesses **42** and **44**.

It is desirable for the board **10** to be electrically conductive so any static charge will be dissipated. For this purpose, a metallic electrically conductive tape **62** is attached to upper surface of the board **10**. The patient's hand will always be in contact with some part of the tape **62** to dissipate any accumulated static charge from the patient's body. One end of tape **62** extends over protuberance **64** formed on the bottom side of board. The height of protuberance **64** is so that the tape **62** will contact the supporting surface (such as the operating table) and therefore provide a continuous electrical ground. The height of protuberance **64** is slightly greater than the edges of the board **10**.

The other end of tape **62** is attached in a similar manner to a protuberance **66**. Protuberance **66** is also slightly raised in respect to the edges of board **10**. Due to the electrical contact points fore and aft provided by protuberances **64** and **66**, if the board is tilted, a continuous electrical ground is still maintained because at least one of the protuberances will be in contact with the supporting surface.

Instead of the tape strip **62**, it may be preferable to employ a strip of electrically conductive paint. Also, a coating of material may prove to be satisfactory such as the benzylconium chloride previously mentioned.

When the board **10** is used as an arterial board, the patient's body will be in continuous contact with at least one of the protuberances **64** and **66**. The tape **62** located upon the top surface of board **10** will then be in contact with the supporting surface completing the electrical ground.

What is claimed is:

1. An injection board for use as a support for an arm, hand and fingers having a front end, a back end, a top surface and a bottom surface, said board comprising:

a raised rounded portion formed within said board adjacent said front end and convex with said top surface, the fingers being adapted to rest upon the forward end of said raised rounded portion with the palm of the hand to be positioned against the aft end of said raised rounded portion;

said top surface including a ledge on each side of said raised rounded portion, said ledges being adapted to provide a thumb rest area and a little finger rest area, the lateral outer edge of each said ledge being smoothly contoured;

said back end being of sufficient length to extend past the wrist of the user and into the forearm area;

said bottom surface including a cavity, a plurality of ventilation holes formed through said board connecting with said cavity, a first pair of spaced apart aligned recesses formed within said bottom surface adjacent said front end, a second pair of spaced apart aligned recesses formed within said bottom surface adjacent said back end, said first and said second pair of aligned recesses to facilitate the placing of adhesive tape about the user's hand and arm binding such to said board, said first and said second pair of aligned recesses also functioning to ventilate said cavity to the ambient; and

means for making said board electrically conductive.

2. The injection board as defined in claim **1** wherein:

said means comprises a narrow strip of electrically conductive material extending between said bottom surface and said top surface.

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