

EUROPEAN PATENT APPLICATION

Application number: 87306314.3

Int. Cl. 4: **A61J 1/00**

Date of filing: 16.07.87

Priority: 21.07.86 US 887489

Date of publication of application:
27.01.88 Bulletin 88/04

Designated Contracting States:
BE CH DE ES FR LI NL

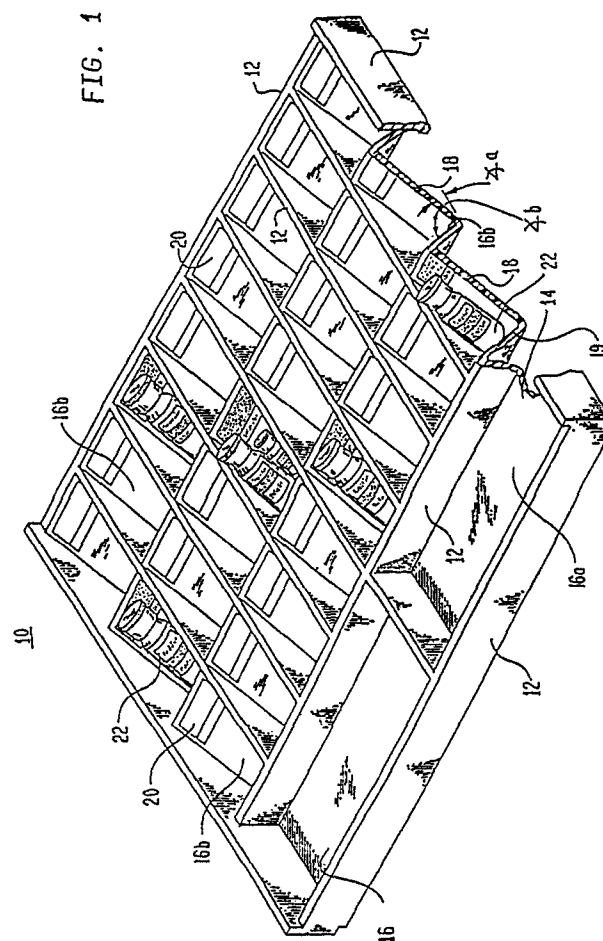
Applicant: **BOC, Inc.**
85 Chestnut Ridge Road
Montvale New Jersey 07645(US)

Inventor: **Lind, Michael J.**
5415 Dennis Drive
McFarland Wisconsin 53558(US)

Representative: **Gough, Peter et al**
c/o THE BOC GROUP PLC Patent Department
Chertsey Road
Windsor Surrey GU20 6HJ(GB)

Medication holder and display apparatus.

A medication holder and display tray(10) holds colour coded bottles(22) of medications in a plurality of separate compartments(16b) which each have an inclined plane(18) to which is attached a colour coded label(20). The inclined plane(18) of each compartment positions the bottles(20) of medication resting thereon such that each can be easily and quickly recognized and removed. Colour coding on each bottle corresponds to the colour coding on a top portion of the inclined plane(18) of a compartment-(16b). This speeds up identification of a medication and helps prevent mistakes. Colour coding is not meant as a substitute for reading a label on a container of medication.



MEDICATION HOLDER AND DISPLAY APPARATUS

This invention relates to a tray system which is adapted to hold, organize and display medications-(drugs) and instruments for professional use in a medical treatment environment.

It is estimated, that in the order of one percent of all drugs are incorrectly administered in the operating room (OR). Although these errors occur infrequently and sporadically, there is an awareness that such errors are a very significant problem in view of the potential seriousness of a mix-up between diverse drugs. The disorganization of drug holders in the operating room is believed to play a contributing role in drug administration errors. Such disorganization may result in the grabbing of a wrong vial or ampule during an operation.

It commonly occurs that holders for drugs used in the operating room are organized in a gerry rigged fashion. For example, one hospital is known to utilize a sheet of plastic with holes drilled into it for ampule storage. Another hospital is known to use a nuts and bolts work bench organizer of the kind sold in hardware stores, which contains small pull out drawers. Typically, the organization of drugs in such holders for use in the operating room is not formal, but may consist of a system where most frequently used drugs are placed in the front of the holder and less frequently used drugs are placed in the rear of the holder.

Drugs may be regularly and systematically supplied to an operating room (OR) of a hospital by the hospital pharmacy. One method of supplying drugs is based on orders from those in charge of the OR. Normally, orders originate from the anaesthesiologist and the supplies are either delivered by the pharmacy or a technician from the OR is sent to pick them up. Another method of supplying drugs is to have a cabinet in the OR with labelled compartments. The pharmacy replenishes supplies as they are needed. An alternate method of dispensing drugs from the pharmacy involves using individual drug trays which are set up for each case and returned once the case has been completed.

The method of transport of drugs from the hospital pharmacy to the OR is usually not formalized. Any available container is typically used to hold drugs on the top of a hospital vehicle during transport to the OR. A widely used vehicle for both storing drugs in the OR as well as transporting drugs to the OR is the Sears CRAFTSMAN cart. Another commercially available hospital cart is the Herman Miller L cart. These carts have shelves and drawers in the cart wall for stacking peripheral

items such as masks, tables, scopes, syringes, electrodes, suction catheters and the like. Trays in the top portion of the cart may be used to house the drugs used during surgery.

It is believed that none of the currently available holders for medications carried in hospitals carts are fully satisfactory for organizing drugs in an efficient manner for use by a hospital pharmacist, a certified registered nurse or an anaesthetist.

Various systems for holding and displaying drugs for an individual patient are described in the art. U.S. Patent No. 2,953,242 (M. A. Shaw) describes a circular container having a plurality of separate compartments which each have at least one aperture therethrough. Each compartment has four vertical walls which intersect a flat horizontal base portion. The base portion of each compartment has time, and/or date indicators attached thereto which are indicative of when a patient is supposed to take tablets or capsules placed in a particular compartment of the container.

The contents of a particular compartment can be removed by aligning the aperture of one of the rotatable covers with the compartment. One problem with this container is that anyone seeking to load or unload medication into or out of the container must bend his or her head markedly downward so as to be able to read the date and/or time indicators or must hold the container vertical. In some cases this takes more time than is desirable and may be inconvenient, awkward and stressful. Another problem is the container of medication may partly or fully cover the written information and thus make the same difficult to read. Another problem is that rotating the cover(s) to the right location takes time and then reaching into the same takes more time. This loss of time may be critical to saving a patient's life. Another problem is that the wrong medication may be placed in a compartment. Shaw does not teach or even suggest how to solve the problem of the wrong medication being in a compartment.

U.S. Patent Nos. 4,039,080 (J.A. Cappuccilli), 4,318,477 (S.Z. Kerpa) and 4,473,156 (D.C. Martin) all describe rectangular tablet and capsules containers which carry indicia of the day of the week and the time of the day on a top horizontal surface. The containers have rectangular, cylindrical or spherical bottoms. The cylindrical and spherical bottoms facilitate timely removal of the contents. Each of these containers has a cover which must be removed or lifted before the medication can be removed. In the D.C. Martin patent the compartments which are to contain medication to be taken

at the same time each day, for example in the morning, have an identity unique colour such as red. A patient must still bend his head over or turn the container vertical to determine which compartment contains the proper medication. He must then open the cover and remove the contents of one or more compartments. These observations and mechanical acts take time which may adversely affect the health of the patient. For example, a patient with a heart condition may collapse before being able to reach nitroglycerin medication.

U.S. Patent No. 1,306,591 (W.B. Grant) is directed to a tray designed "for use by a nurse in a hospital in his or her attendance upon a number of different patients to whom medicines or the like or different characters can be administered in a safe, rapid, and sanitary manner". The tray disclosed is rectangular and has a plurality of guiding/supporting arms which each hold a separate tumbler that is adapted to hold medication. A separate spring loaded cover is rotated over the top of each tumbler to keep the contents and inside surfaces of each tumbler "as free as possible from contamination". Both sides of each cover are adapted to receive indicia such as to the prescription, when to administer the same, and the name of the patient. The nurse must bend his or her head down to see the top of the cover and then lift up the cover and then read the reverse side of same. He or she can then remove the tumbler from the tray and administer the medication contained therein to a patient. This process is time consuming and therefore might even cost the life of the patient. In addition, no colour coding is taught, suggested or implied. Thus confusion may arise and a patient may receive the wrong medication.

U.S. Patent No. 1,650,980 (K. Campbell) describes a case adapted to hold vertically a plurality of glass vials of medications. Each medication is removed from its vial using a hypodermic needle. The horizontal areas around the openings through which the vials are placed in the case contain written information describing the contents of the vials. Vials containing one type of drug are typically grouped together. To use a particular drug one must first open a cover of the case and then significantly bend his or her head over to read the name of the drug. This is time consuming and can cost the life of a patient. In addition, no colour coding is described or suggested and it is possible the wrong vial can be removed and administered to a patient.

It is desirable to provide a medication holder which is adapted to hold a plurality of medications and medical instruments and which is designed to permit an operating room physician to locate relatively quickly, identify, and remove a medication from the holder.

An aim of the present invention is to provide a tray for organizing drugs for use in transporting drugs from a hospital or satellite pharmacy to an operating room.

5 Another aim of the present invention is to provide a tray for organizing drugs for use by an anesthesiologist during surgery.

10 Another aim of the present invention is to provide a tray which organizes drugs so as to prevent mishandling or mix-up of drugs in the operating room.

15 Another aim of the present invention is to provide a tray which is flexible with respect to the arrangement of compartments for holding vials or ampules.

20 Another aim of the present invention is to provide a tray which is adaptable either for use for an individual patient or for use for multiple patients on a shared basis.

25 According to the present invention medical apparatus is characterised by a plurality of compartments at least one of the compartments comprising a first inclined plane member having a surface which forms an acute angle with the horizontal; and the surface of the first inclined plane member being adapted to support and display one or more containers of medication placed in the compartment so that each container of medication is displayed at an angle such that an observer can identify the medication without having to bend his or her head significantly.

30 The present invention is directed to medical apparatus which is adapted to hold, organize and display a number of medications (drugs) in a manner which makes same easily visible, recognizable and removable. The medical apparatus comprises a plurality of compartments with at least one of the compartments having a inclined plane member having a surface which forms an acute angle with the horizontal. The surface of the inclined plane is adapted to support and to display containers of medication in a manner which makes same easily visible to an observer without the observer having to significantly bend his head over to identify the contents of the container of medication and such that the containers of medication can be easily and quickly removed.

35 In a preferred embodiment the apparatus comprises a tray which is adapted to hold a plurality of removable sections which each comprise one or more compartments that are adapted to hold one or more colour coded containers of medication. Colour coded indicia means(labels) are provided which can be attached to top portions of the surface of the inclined plane of each compartment. The colour coding on the labels corresponds to corresponding colour coding on labels on containers of medication which are to be placed in the

compartments. The use of colour coded labels on containers(bottles) of medication and corresponding colour coded labels on compartments is designed to reduce the number of medication errors. Colour coding is not intended as a substitute for reading the name of the drug on the label of the container housing the drug.

The colour coding scheme separates and thus organizes drugs(medication) into therapeutic categories by using a different colour for each therapeutic category. Thus if an error does occur in the operating room it will likely be made with a drug from the same therapeutic category as the intended drug.

This will tend to result in less serious consequences to the patient than if some other drug is mistakenly given. Letters, symbols, and/or numbers on labels on the bottles are made larger and bolder than letters, symbols, and/or numbers, respectively, on many conventional medication bottles in order to facilitate easy and quick identification. Bar coding can be placed on the labels attached to the compartments and/or to those on the containers of medication.

The apparatus of the present invention is useful in the operating room and can be used to transport drugs from a hospital pharmacy to the operating room. It allows sections of various numbers and sizes of compartments to be custom organized. The apparatus is adaptable either to be used on one patient or for use with multiple patients on a shared basis.

Embodiments of the invention will now be described, by way of example, reference being made to the Figures of the accompanying diagrammatic drawings in which:-

FIG. 1 is an isometric view of one embodiment in accordance with the present invention;

FIG. 2 is an isometric view of another embodiment in accordance with the present invention;

FIG. 3 illustrates a removable portion of the embodiment of FIG. 2;

FIG. 4 is an isometric view of an other embodiment in accordance with the present invention; and

FIG. 5 illustrates cut away views of removable portions of the embodiment of FIG. 4.

Referring to FIG. 1, there is illustrated an isometric view with a cut away section of medication holder and display apparatus 10 in accordance with the present invention. Apparatus 10, which may be referred to as tray 10, comprises a plurality of compartments 16a and 16b. Compartments 16a, which in a typical embodiment are each a rectangular parallelepiped, each have an essentially horizontal floor member 14 which intersects wall members 12 and are adapted to store hypodermic needles, syringes, scissors, and/or other medical

equipment. Each of compartments 16b comprises a first inclined plane member 18 which forms an angle "a" with respect to the horizontal and which intersects with a second inclined plane member 19 to form an angle "b". Compartments 16b are designed to hold and display bottles(containers) 22 of medication which are shown in some of compartments 16b. Colour coded labels 20 are supplied with tray 10 and are typically placed by an end user of tray 10 on an upper portion of inclined plane 18 of compartment 16b. The colours on labels 20 correspond to colours on labels and/or tops of bottles 22 of medication.

Ampules, jars or vials and/or any combination of the three and/or bottles of medication can be held in tray 10. Bottles 22 rest against inclined plane members 18 and 19 and walls 12 such that the tops and labels on the same are easily visible without a person having to significantly bend his or her head over to see the labels. Angle a is typically approximately 30 degrees but can be varied in the range of approximately 10 and 80 degrees. A preferred range for angle "a" is 15 to 45 degrees. Angle "b" is typically 90 degrees but can be varied in the range of 60 to 170 degrees. A preferred range for angle "b" is 70 to 110 degrees.

Colour coded bottles 22 of medication and corresponding colour coded labels 20 attached to compartments 16b are used to reduce the number of medication errors.

A preferred colour scheme separates drugs-(medication) into therapeutic categories by using a different colour for each therapeutic category. For example, an entire row of compartments 16b may be colour coded a certain colour to signify that the drugs stored in that row are analgesics. Thus if an error does occur in drug selection it will likely be made with a drug from the same therapeutic category as the intended drug. This is believed to result in potentially less serious consequences to the patient than if some other drug is mistakenly given. Colour coding is not intended as a substitute for reading the label on a container of medication.

Lettering, symbols, and/or numbers on labels of bottles 22 are made larger and bolder than lettering, symbols, and/or numbers on many conventional medication bottles in order to facilitate easy and quick identification. Bar coding can be placed on labels 20 and/or on bottles 22.

Tray 10 has a rectangular foot print and has outer perimeter side walls which have staggered heights so as to facilitate the stacking of a plurality of trays 10 with each tray 10 interlocking with the one above and the one below in the stack.

Tray 10 may be fabricated from plastics using a pressure forming or vacuum forming process.

Apparatus 10 is designed to make it easy to determine quickly and accurately which medication is which and to allow one to remove easily and quickly the desired medication. This is extremely important in operating and emergency rooms where lost time can result in the loss of a patient's life.

Referring now to FIG. 2, there is illustrated an isometric view of a medication holder and display apparatus 50 which comprises wall members 52 intersecting a floor member 54 to define two fixed compartments 56. Apparatus 50 is illustrated partly filled with a plurality of removable compartments 60. FIG. 3 illustrates one of the removable compartments 60. Compartments 56 are adapted to hold and display medical equipment and compartments 60 are adapted to hold and display containers of medication. Apparatus 50 provides the same function and is similar to apparatus 10 of Fig. 1.

Compartment 60 comprises side walls 62, a first inclined plane member 64, and a second inclined member 66 which define a compartment 68 in which ampules, bottles, jars, and/or vials of medication can be placed and displayed. Inclined plane member 64 forms an angle "c" with respect to the horizontal and intersects with inclined member 66 to form an angle "d". Angle "c" is typically 30 degrees but can be varied from 10 to 80 degrees. A preferred range for angle "c" is 15 to 45 degrees. Angle "d" is typically 90 degrees but can be varied from 60 to 170 degrees. A preferred range for angle "d" is 70 to 110 degrees. A colour coded label 70 is typically attached by an end user to a top portion of each inclined plane member 64. Optionally, colour coded labels 70 could also be attached to each inclined plane member 64 by a manufacturer of tray 50.

One advantage of apparatus 50 is that the size of compartments in which bottles of medication are held and displayed can be varied and that medications can be prepackaged in individual compartments 60 that are then placed into apparatus 50 in any desired organization.

Apparatus 50 is designed to make it easy to determine quickly and accurately which medication is which and to allow one to remove easily and quickly the desired medication.

This is extremely important in operating and emergency rooms where lost time can result in the loss of a patient's life.

Tray 50 may be fabricated from plastics using a pressure forming or vacuum forming process.

Referring now to FIG. 4, there is illustrated an isometric view of a preferred embodiment of a medication holder and display apparatus 100 in accordance with the present invention. Apparatus 100, which may be referred to as tray 100, comprises a rectangular box member (housing means)

102 and a plurality of removable sections 104, 106, 108, 110, and 112. Sections 104 are adapted to hold and display medical equipment. Sections 106, 108, 110, and 112 are adapted to hold containers of medication (drugs). Sections 104, 106 and 110 are each illustrated in a cut away isometric view in FIG. 5. Sections 108, 110, and 112 have essentially the same cross-section as section 106. One of each of sections 104 and 112 are illustrated removed from 102 with an arrow indicating where same fit into 102. Tray 100 is similar to trays 10 and 50 of FIG's 1 and 2, respectively, and performs the same basic function.

Each of the compartments of sections 104, 106, 108, 110, and 112 has end side walls which are essentially vertical and slope upward toward the rear of each compartment. These end side walls help prevent containers (not illustrated) of medication placed in the compartments from moving from one compartment to another or from falling out of apparatus 100.

Rectangular box member 102 has essentially vertical side walls 102a which intersect with a horizontal base member 102b. As is illustrated in FIG. 5, each of removable sections 104 defines a single compartment which has a relatively flat floor member, four side walls which are essentially vertical, two interior slightly sloped inside side walls, and a relatively flat floor portion.

Section 106 has five essentially vertical side walls which define two separate compartments 106(1) and 106(2). Each of compartments 106(1) and 106(2) has a first inclined plane member which forms an angle "e" with respect to the horizontal and which intersects with a second inclined member forming an angle "f". Each of sections 108 has six essentially vertical side walls which define three separate compartments 108(1), 108(2), and 108(3). Section 110 has seven essentially vertical side walls which define four separate compartments 110(1), 110(2), 110(3), and 110(4). Each of compartments 110(1), 110(2), 110(3), and 110(4) has a first inclined member which forms an angle "g" with respect to the horizontal and which intersects with another inclined member to form an angle "h". Each of sections 112 has eight essentially vertical side walls which define five separate compartments 112(1), 112(2), 112(3), 112(4), and 112(5). All angles "e" and "g" are both typically 30 degrees but may be independently in the range of 10 to 80 degrees. The preferred range for all angles "e" and "g" is 15 to 45 degrees. All angles "f" and "h" are both typically 90 degrees but may be independently in the range of 60 to 170 degrees. The preferred range for all angles "f" and "h" is 70 to 110 degrees.

A colour coded label 114 is illustrated in FIG. 5. The arrow indicates that label 114 is to be placed on an area 106a of compartment 106(1) of section 106. Each of the compartments of sections 108, 110, and 112 has a similar area 108a, 110a, and 112a, respectively, in which a colour coded label can be placed. Colour coding is not intended as a substitute for reading the label on a container of medication. The colour coded label can also contain a bar code. The colour on the label corresponds to the colour on a bottle of medication that is to be placed in a compartment.

Colour coding is preferably used to separate drugs into therapeutic categories. For example, separate therapeutic categories may comprise the following: analgesics, anticholinergics, anti-nauseant/gastric motility, IV anesthetics, muscle relaxants, narcotic reversal, neuromuscular reversal, tranquilizers/sedatives, respiratory stimulant, vasopressors, vasopressors, vasodilators, and antiarrhythmics. Each category may have one or more drugs. For example, the category of analgesics may contain fentanyl, meperidine, morphine, nalbuphine, and buprenorphine and the category of muscle relaxants may contain metocurine, pancuronium, and succinylcholine.

The width of each compartment can be preselected to fit one or an integral number of bottles, ampules, jars, and/or bottles of medication.

Tray 100 is useful in the operating room to hold and display the drugs used by an anaesthesiologist or other doctor during surgery. It allows drugs to be organized in an efficient manner, displays same such that they are easy to see and recognize without having to unduly bend ones head over, and allows the medications to be easily and quickly removed. This results in an efficient and quick handling of drugs during surgery which saves critical time. It may be used on an individual case basis or for use for multiple patients on a shared basis. Tray 100 may also be used to transport drugs from a hospital or satellite pharmacy to an operating room.

Tray 100 is typically fabricated from plastics using a pressure forming or vacuum forming process.

Apparatus 100 is designed to make it easy to determine quickly and accurately which medication is which and to allow one to remove easily and quickly the desired medication.

This is extremely important in operating and emergency rooms where lost time can result in the loss of a patient's life.

It is to be understood that the embodiments described herein are merely illustrative of the general principles of the invention. Various modifications are possible, for example, the size of the compartments can be varied to accommodate dif-

ferent needs. Still further, some of the vertical straight walls of the trays can be sections of cylinders. Furthermore, the bottoms of the compartments can be rounded to make them easier to clean. Still further, the inclined planes can be cylindrical sections. Furthermore, a cover could be added to the trays to limit dust and other contaminants from getting into the trays while same are not in use. Still further, the number of compartments used to hold and display medications can be varied from one to any desired number. Furthermore, the number of compartments used for medical equipment can be varied from zero to any desired number. Still further, the floor members can be designed to define apertures therethrough which facilitate contaminants not being retained in the trays and the cleaning of same. Furthermore, the compartments of each tray can be colour coded in accordance with individual preference or can be standardized throughout a hospital.

Claims

1. Medical apparatus (10) characterised by a plurality of compartments (16a, 16b) at least one of the compartments (16b) comprising a first inclined plane member (18) having a surface which forms an acute angle ("a") with the horizontal; and the surface of the first inclined plane member (18) being adapted to support and display one or more containers (22) of medication placed in the compartment so that each container (22) of medication is displayed at an angle such that an observer can identify the medication without having to bend his or her head significantly.

2. Medical apparatus as claimed in claim 1, characterised by vertical wall members (12) and a floor member (14) which intersect to form a plurality of separate compartments (16a, 16b).

3. Medical apparatus as claimed in claim 1 or 2, characterised in that the or each said one compartment (16b) has a width which is preselected to fit an integral number of standard size containers (22) of medication.

4. Medical apparatus as claimed in claim 1, 2 or 3, characterised in that the or each said one compartment (16b) includes a second inclined plane member (19) which has a surface which intersects the surface of the first inclined plane member (18).

5. Medical apparatus as claimed in anyone of claims 1 to 4, characterised in that the compartments (110(1), 110(2), 110(3), 110(4)) are arranged in sections (110), each section (104, 106, 108, 110, 112) being removable from the apparatus (100).

6. Medical apparatus as claimed in any one of the claims 1 to 5, characterised by indicia means (20) adapted to be attached to the surface of

the first inclined plane member 18, said indicia means 20 corresponding to indicia means on a container 22 of medication to be placed in a particular compartment (16b):

7. Medical apparatus as claimed in any one of claims 1 to 6, characterised in that the acute angle ("a") is in the range of approximately ten and eighty degrees. 5

8. Medical apparatus as claimed in any one of claims 4 to 7, characterised in that said surface of the second inclined plane member (19) intersects said surface of the first inclined plane member (18) at an angle ("b") in the range of sixty to one hundred and seventy degrees. 10

9. Medical apparatus as claimed in any one of claims 1 to 8, characterised in that bottom areas of each compartment are rounded to facilitate cleaning. 15

10. Medical apparatus as claimed in any one of claims 1 to 9, characterised in that the base of each compartment defines apertures therethrough which facilitates contaminants not being retained in the apparatus and the cleaning of the same. 20

11. Medical apparatus as claimed in any one of the claims 1 to 10, characterised in that the apparatus (10) is adapted to be stacked with a plurality of like apparatus and each apparatus 10 is adapted to interlock with the apparatus immediately above and below it in the stack. 25

12. Medical apparatus as claimed in any one of claims 6 to 11, characterised in that the indicia means (20) comprises colour coding which corresponds to colour coding on a container (22) of medication to be placed in the compartment. 30

35

40

45

50

55

FIG. 1

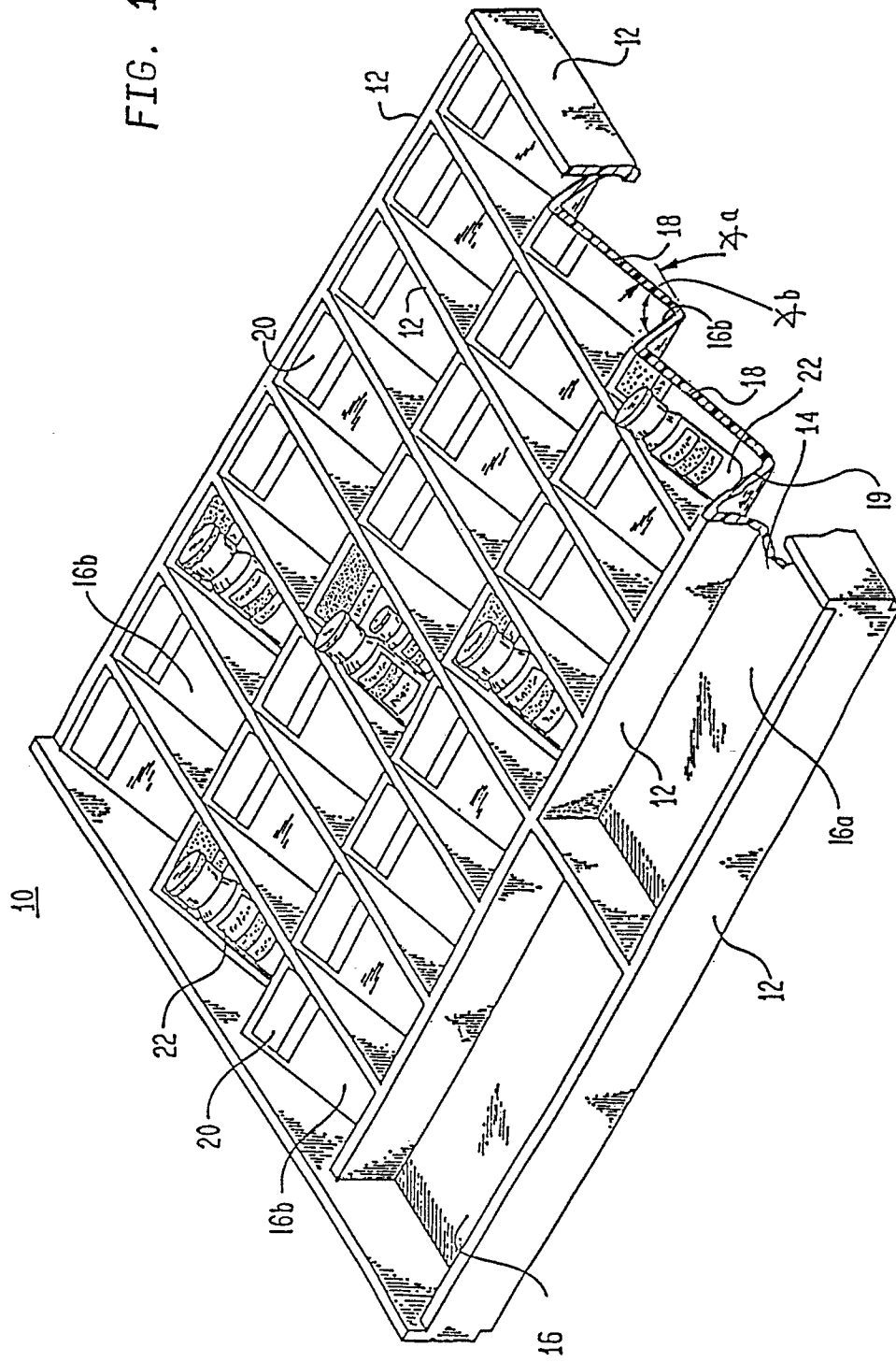


FIG. 2

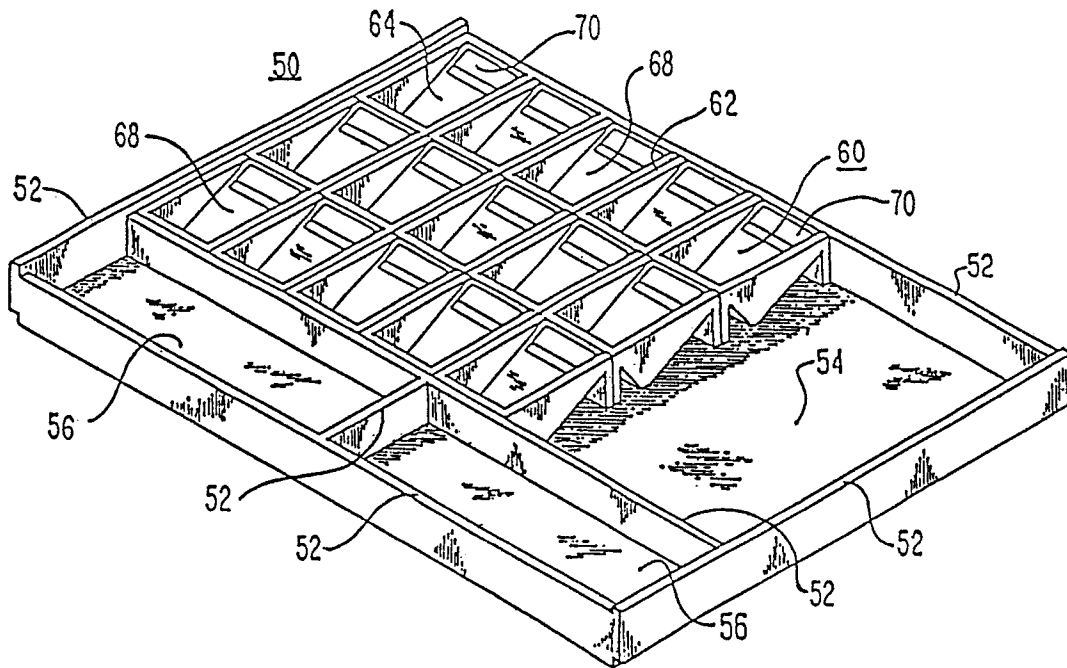
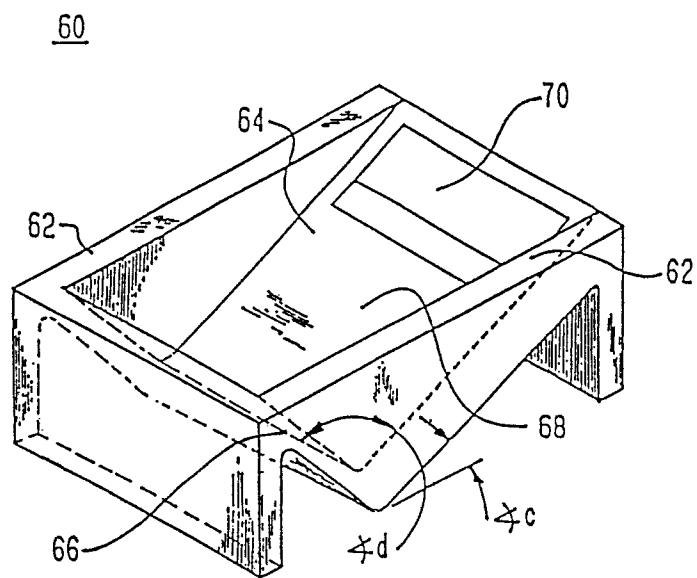


FIG. 3



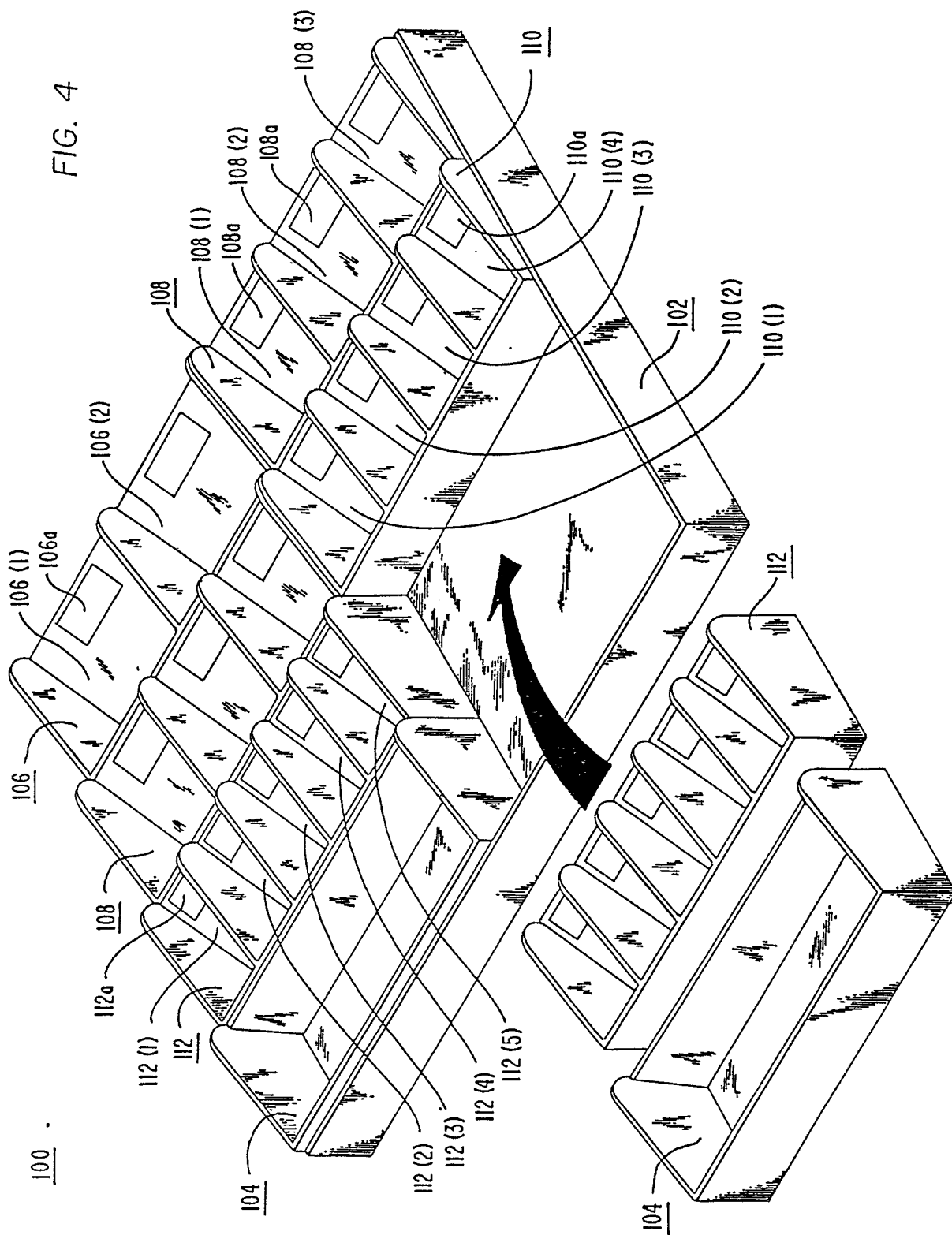


FIG. 5

