United States Patent [19]

Relyea

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[54] **PHARMACEUTICAL CABINET**

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[52] **U.S. Cl.** **312/209,** 312/351

[51] **Int. Cl.** **A47b 81/00,** A47b 91/00

[58] **Field of Search** ..... 312/209; 206/72, 65 R; 220/97 R; 217/26, 26.5; 211/126

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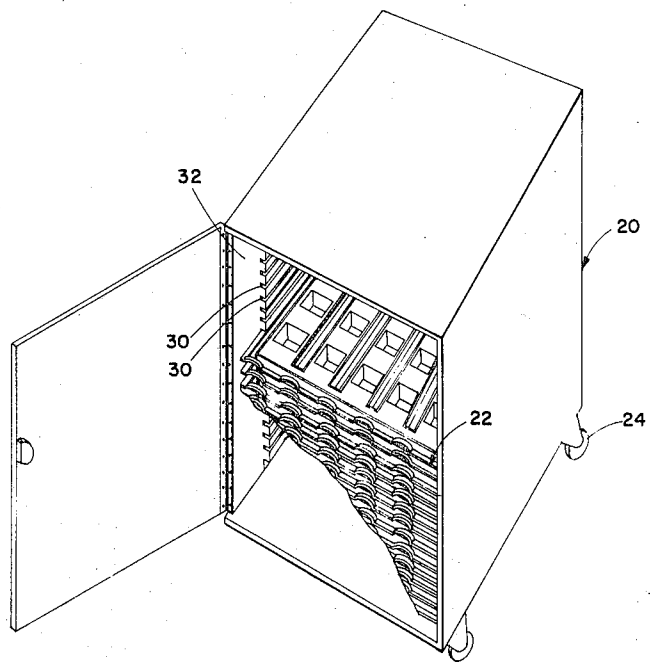
Primary Examiner—Paul R. Gilliam

Attorney, Agent, or Firm—Cennamo, Kremblas & Foster

[57] **ABSTRACT**

An apparatus for the preparation and distribution of individual dosage units of pharmaceutical material including a portable housing means provided with a plurality of distribution trays removably mounted therein. Each of the trays include aligned rows of container-receiving recesses adapted to receive unit dose containers of pharmaceutical materials. Further, the trays include slot means disposed adjacent the container-receiving recesses for removably receiving identifying cards for each patient to whom the pharmaceuticals will be delivered. The trays are constructed such that the forward and rearward ends as well as the bottom of the container-receiving recesses and the slot means cooperate to effect a locking action to prevent upsetting of individual containers from the recesses and yet provide clearance for the identity cards so as not to interfere with removal of any selected tray from the housing.

3 Claims, 7 Drawing Figures



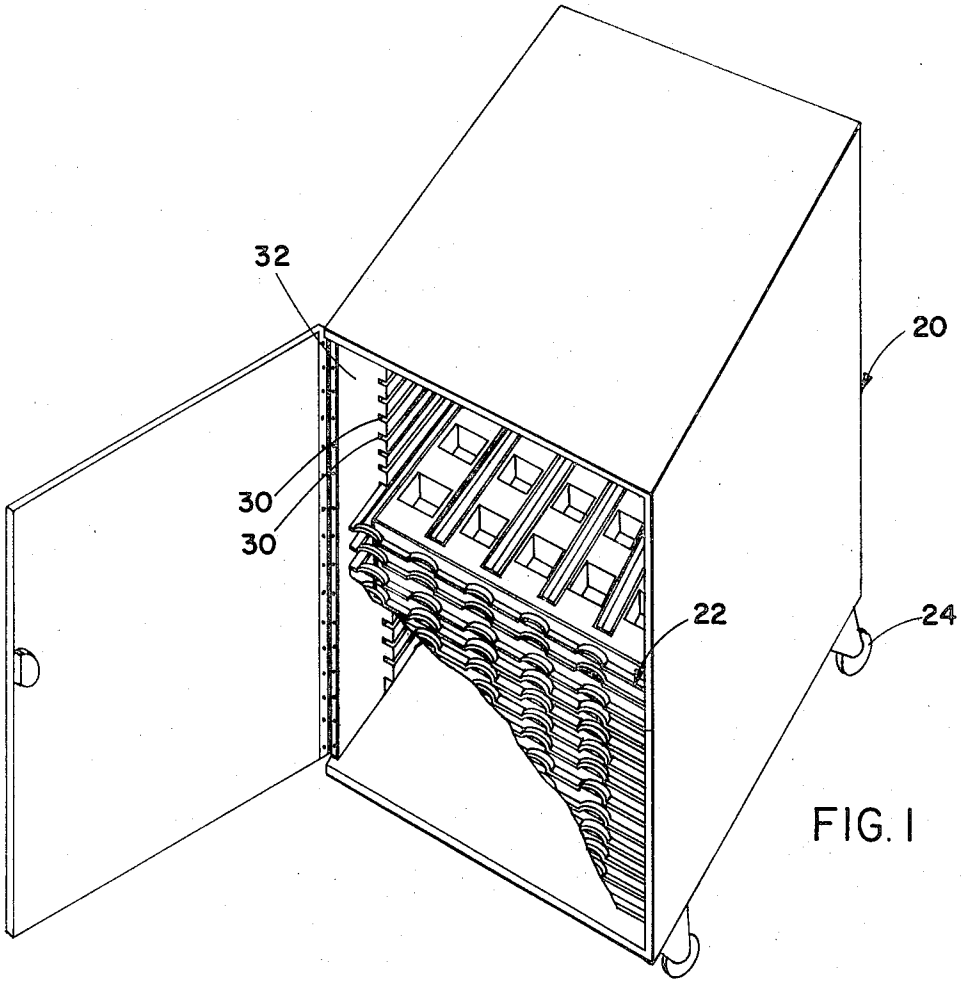


FIG. 1

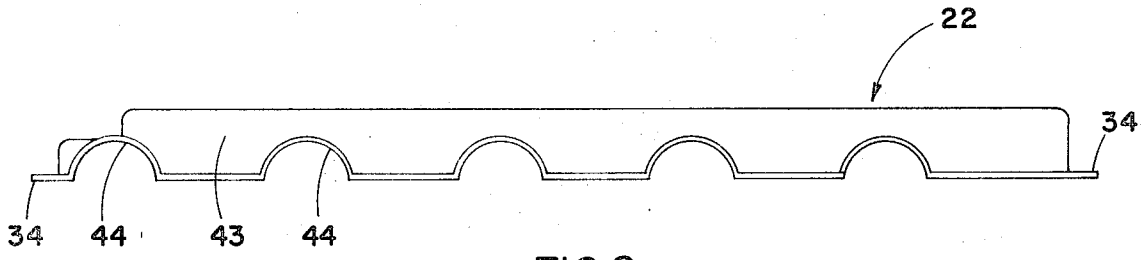


FIG. 2

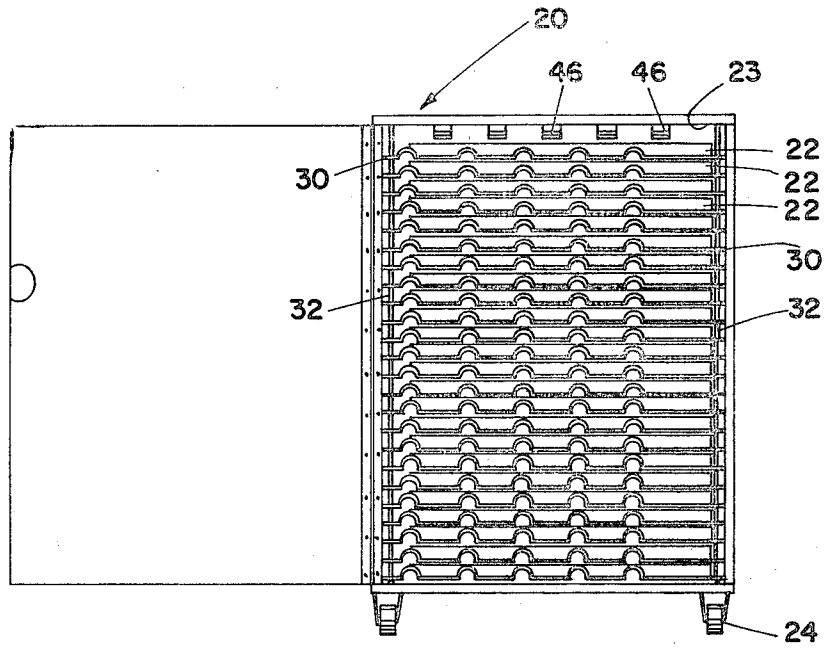


FIG. 3

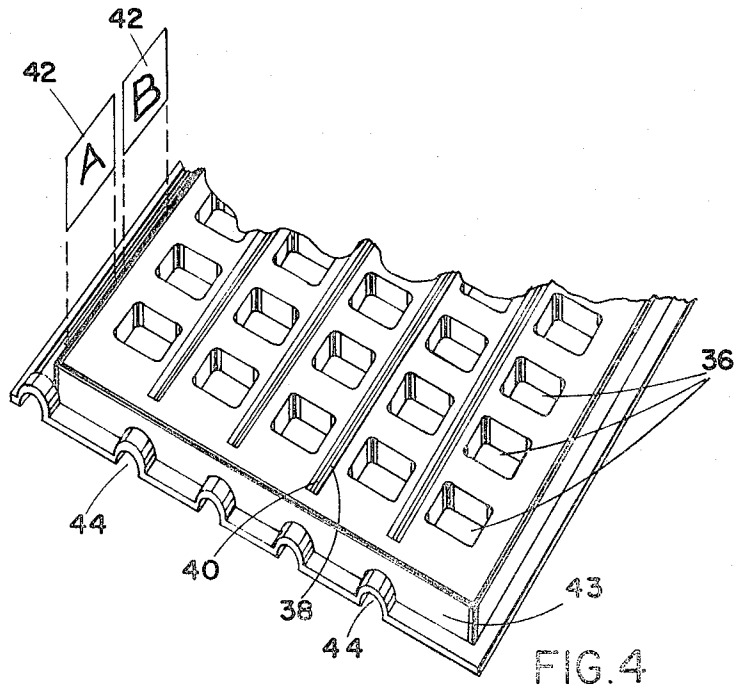


FIG. 4

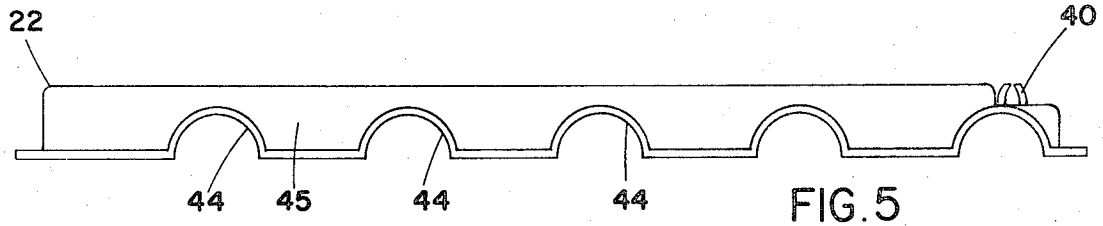


FIG. 5

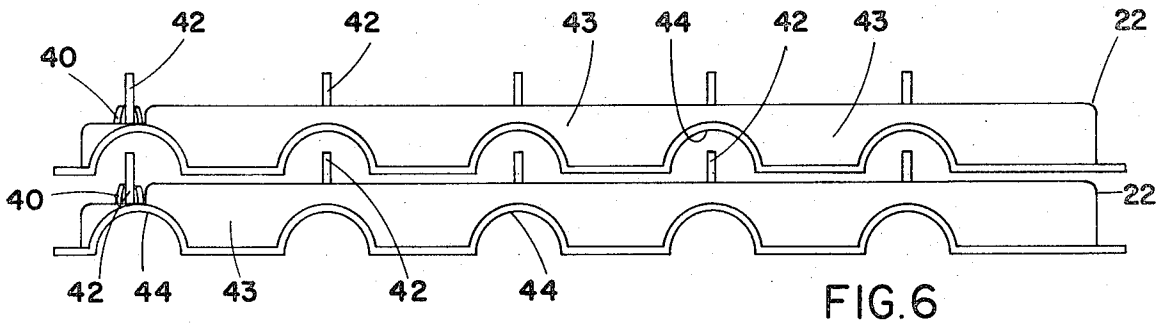


FIG. 6

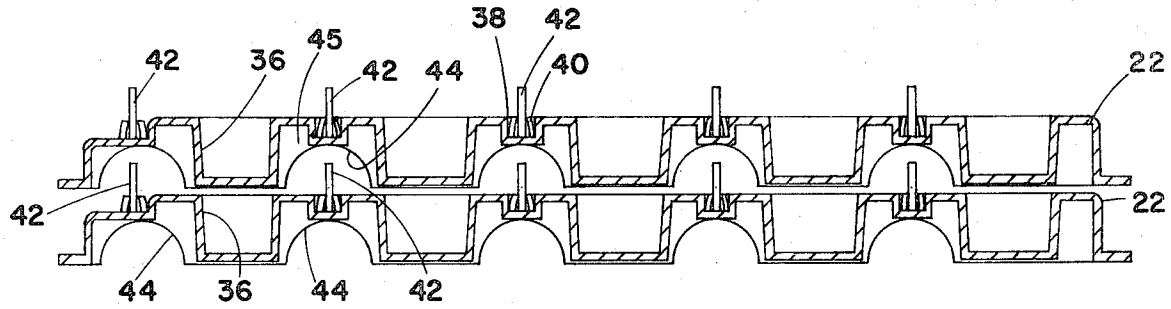


FIG. 7

PHARMACEUTICAL CABINET

BACKGROUND

Prior to the introduction of the unit-dose concept of serving nursing homes and similar institutions, these institutions obtained prescriptions from a pharmacy in much the same manner as the individual who seeks filling of an occassional prescription. However, the large number of patients in a nursing home and the normal frequency of receiving medication required by such patients created problems unique to both the pharmacist and to the personnel of the institution.

For example, the nurses must keep separate facilities for each patient to store the various types of pharmaceutical materials that each patient may be receiving. Then according to each prescription, the nurse must remove an individual dosage unit for distribution to each patient at each prescribed time during each day. This may occur three or four times a day for some prescriptions. A typical insitution of this type, having 50 to 100 patients, makes such a procedure a very time consuming task.

As each prescription order runs out or a new one is obtained, the pharmacist would receive a relatively large volume of orders which were difficult to fill in the time required to supply the patients needs.

With the aid of delivery apparatus such as described in U.S. Pat. No. 3,512,858, the unit dose delivery concept has become a viable reality to the benefit of pharmacist, nursing personnel and patient alike. However, certain problems remained unsolved and total safety and reliability has been enhanced by the present invention which represents an improvement of the former apparatus.

SUMMARY OF INVENTION

In general, the apparatus of the present invention comprises a portable housing means provided with an opening for access to a plurality of tracks mounted in the housing. A plurality of distribution trays are removably mounted on the tracks in the housing. Each distribution tray includes a plurality of rows of openings or recesses, each adapted to receive a container carrying a predetermined individual dosage unit of a particular pharmaceutical material. The containers are arranged in the tray in a predetermined order preferably relating to the order of the arrangement of the patients who are to receive the particular dosage unit. Each distribution tray includes a slot means between each row of recesses adapted to receive means for the identification of the patients being served.

The housing and trays of the present invention have been significantly improved in that the container-receiving recesses and the depression which forms the slot means have been constructed to cooperate with the adjacent trays as mounted in the housing to assure against accidental upsetting of the containers therein and yet maintain clearance for the patient-identity cards so no inferences exists in removing trays from the housing or in replacing them. This construction also lends to an economy of space which provides a substantially greater number of unit dose containers per housing unit volume as compared to prior constructions.

OBJECTS

It therefore is an object of the present invention to

provide apparatus of the type described which facilitates the handling of large volumes of prescription orders of pharmaceutical materials to nursing homes and the like, and also reduces the liklihood of serious errors relating to the preparation or the delivery of the improper medication to the patient.

It is another object of the present invention to provide apparatus of the type described which facilitates the distribution of the individual dosage units to the patients by the personnel responsible for the ultimate delivery of the pharmaceutical material to the patient.

It is another object of the present invention to provide apparatus of the type described which improves the reliability of the delivery of the proper medication to the patient and eliminates costly and time consuming confusion caused by potential spilling of containers from their proper positions in the trays during transit of the housing from the pharmacist to the institution.

It is a further object of the present invention to provide apparatus of the type described which includes improved constructional features which provide for economy of space by permitting an increase in the carrying capacity of the housing with a decrease in overall size.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of embodiment of the invention is clearly shown.

IN THE DRAWINGS

FIG. 1 is a perspective view of a container apparatus for delivering unit doses of pharmaceuticals constructed in accordance with the present invention, the apparatus being shown with several of the uppermost trays removed from the housing;

FIG. 2 is a front elevational view of one of the removably mounted trays which form a portion of the apparatus shown in FIG. 1;

FIG. 3 is a front elevational view of the apparatus shown in FIG. 1 illustrating the relationship of several trays to one another and to the top wall of the housing;

FIG. 4 is a partial perspective view of the tray shown in FIG. 2;

FIG. 5 is a rear elevational view of the tray shown in FIG. 2;

FIG. 6 is a front elevational view, similar to the view shown in FIG. 2, illustrating two trays in a partially nested configuration;

FIG. 7 is a front elevational view in section of the nested trays shown in FIG. 6, the section taken along the midline of the trays.

DETAILED DESCRIPTION

Referring in detail to the drawings, a container apparatus for delivering predetermined unit doses of pharmaceuticals constructed in accordance with the present invention is illustrated in FIG. 1 and includes a portable housing, indicated generally at **20**, provided with a plurality of distribution trays, indicated generally at **22**.

Housing **20** is provided with two pair of wheels **24** for mobility to facilitate delivery of its contents to the institution and the final distribution within the institution.

A door **26** provided with a suitable lock **28** is included for security reasons as substantially all of the contents are prescription pharmaceuticals.

Each tray **22** is removably mounted in housing **20** via a slot or track **30** disposed in opposing side walls **32** which form track means adapted to receive the outer side edges **34** of each tray **22.**

Each tray **22** also includes a plurality of recesses **36** arranged in parallel rows with each recess **36** adapted to receive an individual unit dose container.

A longitudinal depression **38** which includes a slot means **40** adapted to receive a patient identity card **42** is disposed adjacent to each row of container-receiving recesses **36.**

The number of longitudinal and horizontal rows of recesses **36** in a given tray is preferably determined relative to the number of patients and rooms on a given floor or in a given section of the nursing institution being served. In this manner, each tray **22** represents a particular area of the insitution and the cards **42** may be arranged in a predetermined order to facilitate the administration of the medication to the patient by a nurse carrying tray **22** removed from housing **20.**

Recesses **36** extend downwardly from the bottom of tray **22** as do depressions **38.** However, the depth of recesses **36** is greater than depressions **38** such that when trays **22** are mounted in housing **20** in the vertically stacked relationship shown, only a very small clearance exists above each unit dose container in the lower adjacent tray. As an upper limit this vertical clearance must be substantially less than the depth of the recesses **36** as well as less than the depth of a unit dose container adapted to be received in recesses **36.**

This construction provides, in effect, a locking action which prevents the possibility of containers of unit doses from accidentally becoming dislodged during transit of the housing to the insitution or during use in the institution. Should the housing become overturned or jarred seriously, the locking relationship between the trays **22** relative to the unit dose containers disposed in the recesses **36** prevents dislodgment of containers. Without such a precaution, the inadvertent dislodging of unit dose containers from the trays would cause much time-consuming confusion in replacing the containers, and of even greater importance, provides an opportunity for misplacement of containers in recesses which may result in the wrong medication being delivered to a patient.

The depressions **38** which form the recessed slot means **40** are of less depth than the recesses **36.** This construction permits the patient identity cards **42** to extend above the tray sufficiently for convenient observation by the nursing personnel and yet conserves vertical spacing to avoid interference between adjacent trays when they are being removed or replaced.

In effect, the trays **22** when loaded in the housing with the identity cards **42** in position are partially nested in that a portion of the identity cards extends upwards between the lower portions of the recesses **36** in the upper adjacent tray **22.**

Therefore, in addition to the safety and reliability of eliminating a possible error or at least a great deal of time-consuming labor in the event of an inadvertent upset of the housing, this construction further leads to a very compact arrangement of the trays **22** in the housing. This leads to a major advantage in lessening the overall size of the housing and a substantial gain in usuable volume.

The smaller, compact housing costs less to manufacture, is more convenient to transport, takes up less storage space when not in use, and permits delivery of a greater number of unit doses per unit volume.

The front and rear edge portions of each tray **22** include downturned flanges **43** and **45** respectively, which are provided with semi-circular openings **44** which are aligned with slot means **40** so as to accomodate the upraised portion of identity cards **42** in the next lower tray **22.**

The top wall **23** of housing **22** is provided with a plurality of downwardly extending ribs **46** which function, in the same manner as the aforementioned lower portion of recesses **36,** to "lock" the individual containers disposed in recesses **36** in position during transit for the uppermost tray **22** in housing **20.** The depth of ribs **46** is sufficient to accomodate the upraised cards **42** which are disposed in the uppermost tray **22** to permit that tray to be slideably mounted or removed without interferences with cards **42.**

The unit dose containers which are to be disposed in recesses **36** are preferably similar to those described in my co-pending patent application Ser. No. 239,278, filed Mar. 29, 1972. This type of construction greatly facilitates the preparation and distribution of the materials to the patient and are well suited for use with the present invention.

Each distribution tray **22** is prepared first by placing a patient identity card **42** in one of slots **40** adjacent to a respective recess **36.** The identity cards are preferably arranged in a predetermined order coinciding with the arrangement of the patients in the institution being served, therefore greatly aiding in the convenient and efficient distribution of each dosage unit.

Then according to the prescription orders for each patient, the appropriate container is placed in the recess **36** adjacent to the appropriate patient identity card **42** by the pharmacist.

It is desirable to label each distribution tray to correspond to a given time period and a given section of the institution corresponding to the location of the patients whose identity cards are in slots **40** of that tray. This provides ready indentification to the nurses who are to distribute the dosage units.

When the required number of distribution trays are prepared, for example, a one day supply, they are arranged in the order of the time and section of the institution on a respective one of tracks **30** in housing means **20.**

Assuming each housing means **20** has at least a capacity capable of holding a one day supply of materials, it may be delivered to the nursing home the day before or early the same morning the materials are scheduled for distribution to the patients.

Upon arrival at the institution, housing means **20** is delivered to the nursing personnel. All that is then required of the nursing personnel, is the distribution of the individual dosage units to the patients at each prescribed time period.

As a matter of control, the nurses should check their own patient files against the label portion of each unit dose container in a respective recess **36** to make certain that the proper medication for each patient is disposed therein.

Since housing means **20** is portable and relatively compact, it may be rolled quite easily through the halls of the institution to locations where each distribution tray **22** may be removed and carried into the patient's room.

As each tray **22** is emptied, it is placed back in housing **20** via tracks **30.** When all the trays **22** are emptied and replaced in the housing means **20,** the housing means may be returned to the pharmacy and the procedure repeated.

With at least two housing means **20** and the appropriate number of trays **22,** it can be readily understood that this type of daily delivery of individual dosage units can be accomplished in a reliable, continuous manner to provide more convenient and efficient service to the institutions and to the patients without undue interruption of the pharmacist's regular customer service to individuals.

Since it is not unusual for a prescription order to be changed by the attending physician before the total order is used by the patient, the patient was required to pay for the total prescription order which was delivered in bulk when the materials were prepared using prior methods and means. However, using the apparatus and method of the present invention, the patient need only pay for the individual dosage units delivered. Therefore, if a prescription order is halted before the total number of individual doses are given the patient, the patient realizes considerable savings compared to the prior method of servicing such institutions.

Further, it should be pointed out that if an error does occur in the preparation of an individual dosage unit even in view of all of the precautions outlined, the error is more likely to be discovered sooner in the preparation of the daily dosage units as compared to the discovery of the same error occurring in the delivery of the total prescription in bulk. In the latter case, it is likely that the error may not be discovered until the material is reordered and the patient has taken the total prescription order. However, using the apparatus of the present invention and the described procedure, it is likely that such an error would be discovered the following day since each dosage unit is individually checked each day by both the pharmacist and the nursing personnel.

From the above description, it should be readily apparent that the apparatus and method of the present invention permits a pharmacist to offer more efficient and reliable service in delivering individual dosage units of pharmaceutical materials to such institutions in a relatively convenient manner without substantial interference with the normal flow of his business and with greater benefit to the patient in such institutions.

It is also important to point out that since a substantial number of prescription orders delivered to the aforementioned institutions call for narcotic materials, theft is a constant threat. However, this threat is substantially reduced by the delivery of small quantities such as individual dosage units which are not very attractive to potential thieves.

In addition to the above advantages, the novel construction herein clearly represents a substantial improvement of reliability in delivery which eliminates the possible upsetting of the predetermined arrangement of dosage units in the trays **22.** In view of human nature, this leads to another reduction of the possiblity of an occurrence of the serious error in delivering the improper medication to a patient if the personnel involved is less conscientious than desired in replacing the unit doses in proper order. And to the same degree, it eliminates the potential of this type of accident which at the very least causes considerable confusion and costly delay.

This construction is particularly desirable when at the same time it reduces the overall manufacturing cost and results in a more compact, efficient unit which may be transported with substantially greater ease and consumes less space for storage purposes.

What is claimed is:

1. An apparatus for the storage and distribution of individual unit dose containers of pharmaceuticals comprising, in combination a portable housing means including at least one side wall opening having a closure means and a plurality of parallel, vertically spaced tracks on opposite sides of said opening and (b) a plurality of unitary trays for receipt of said containers removably and slidably mounted to said tracks in vertically spaced relationship each of said trays including a plurality of container-receiving recesses spaced from one another in substantially parallel rows and provided with slot means recessed below the top surface of said tray and disposed adjacent and parallel to each of said rows of recesses, each of said slot means arranged parallel to said tracks and adapted to removably receive a plurality of card-like strips extending upwardly above the top surface of said tray and provided with predetermined indicia, said trays being vertically spaced from one another and retained in said housing in a spaced relationship which defines a vertical clearance between the top surface of a tray and the bottom surface of the tray recesses in the upper adjacent tray which is substantially less than the depth of a unit dose container adapted to be received in said tray recesses, each of said trays having a downwardly opening corridor formed beneath its slot means and above the slot means of the next lower adjacent tray to permit said trays having said strips mounted therein to be partially nested but allowing individual trays to be slideably withdrawn without interference.

2. The apparatus defined in claim **1** wherein the top wall of said housing includes a plurality of downwardly extending ribs, each of said ribs aligned with a row of recesses in the uppermost tray of said housing and defining a clearance between the bottom surface of said ribs and the upper surface of said uppermost tray which is substantially less than the depth of the unit dose containers adapted to be disposed in said recesses.

3. The apparatus defined in claim **1** wherein each of said trays include forward and rearward flanges provided with a plurality of arcuate openings, each of said openings being aligned with a respective one of said slot means.

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