United States Patent

Serrell

[15] **3,659,706**

[45] **May 2, 1972**

[54] PHARMACAL PACKAGE CONSTRUCTION

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[73] Assignee: **Parke, Davis & Company,** Detroit, Mich.

[22] Filed: **Apr. 24, 1970**

[21] Appl. No.: **31,534**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 831,557, June 9, 1969, Pat. No. 3,603,453, Continuation-in-part of Ser. No. 877,075, Nov. 17, 1969.

[52] **U.S. Cl.**.....**206/56 AB,** 206/42, 206/65 R, 220/23.4

[51] **Int. Cl.**.....**B65d 21/02,** B65d 75/36, B65d 83/04, B65d 85/56

[58] **Field of Search**.....206/56 AB, 65 R, 42; 220/23.4, 220/60 R; 215/10

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Primary Examiner—William T. Dixson, Jr.
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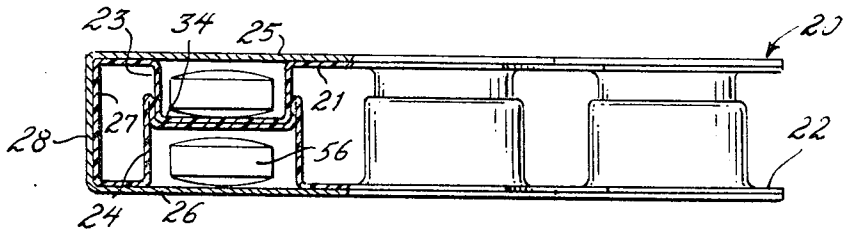
[57] **ABSTRACT**

A pharmacal package construction wherein a pair of blister sheets are closed by respective backing sheets and arranged with the blisters in proximate relation so that the backing sheets are outermost, the blister sheets being provided with detachably interfitting formations, to releasably retain the blister sheets and their backing sheets in position defining a package effectively protected by the backing sheets.

6 Claims, 19 Drawing Figures



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SHEET 1 OF 3

Fig. 1.

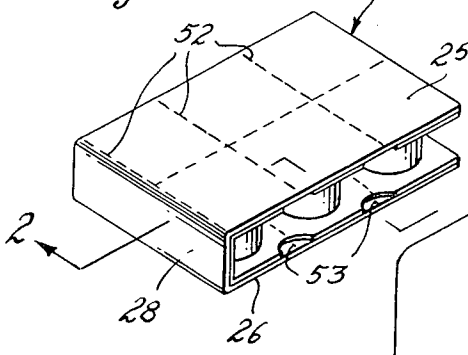


Fig. 3.

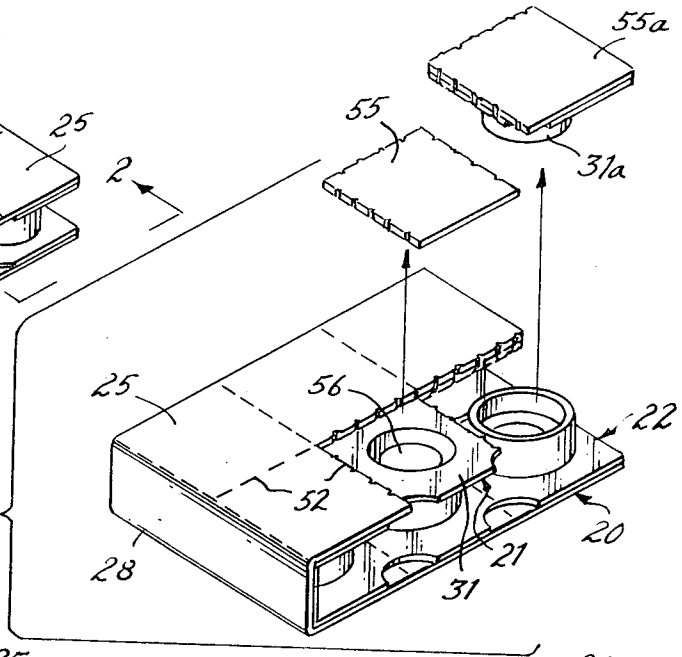


Fig. 2.

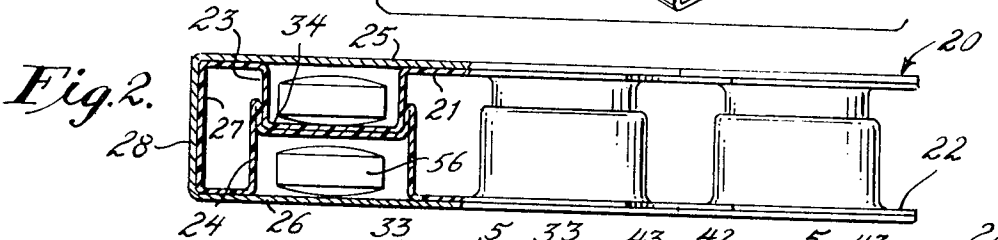


Fig. 4.

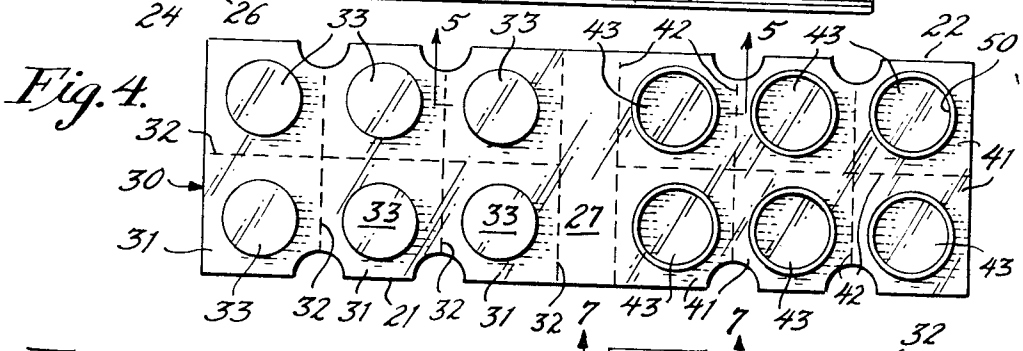


Fig. 5.

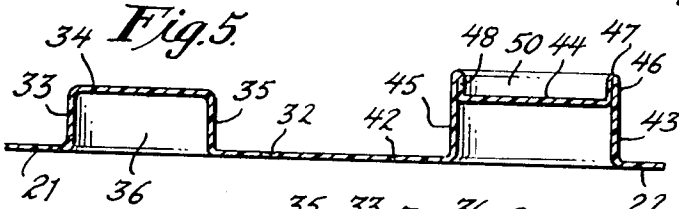


Fig. 7.

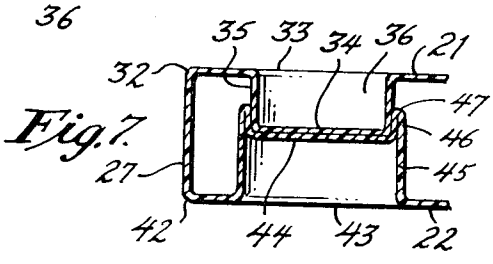
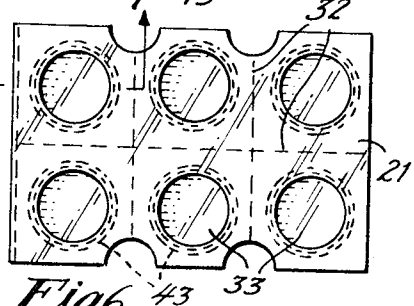


Fig. 6.



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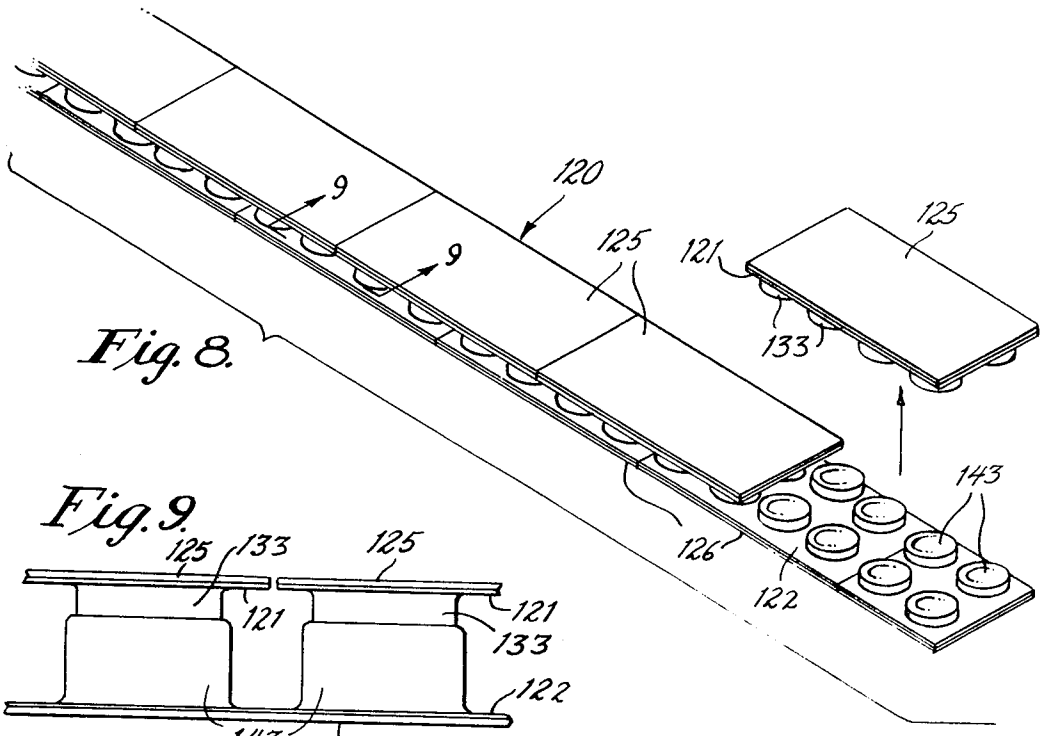
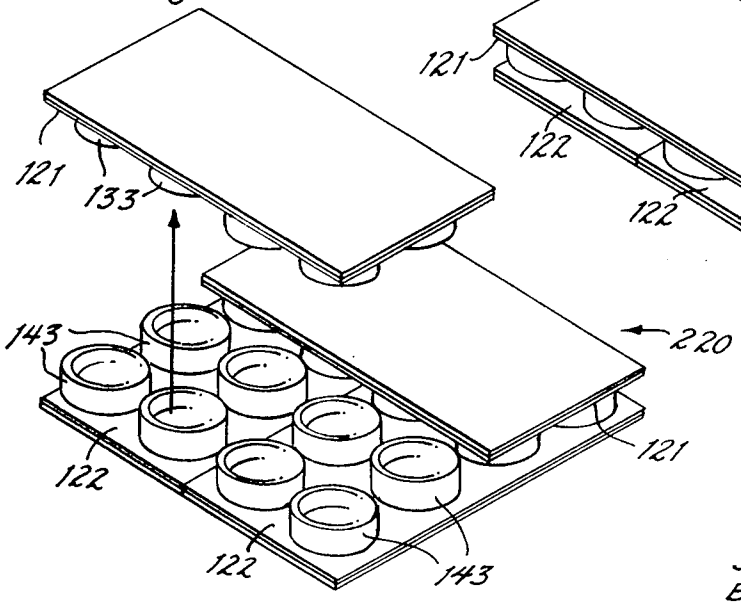


Fig. 8.

Fig. 9.

Fig. 11.



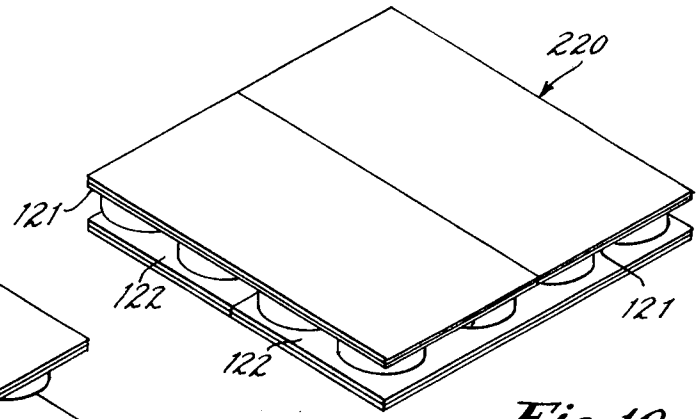


Fig. 10.

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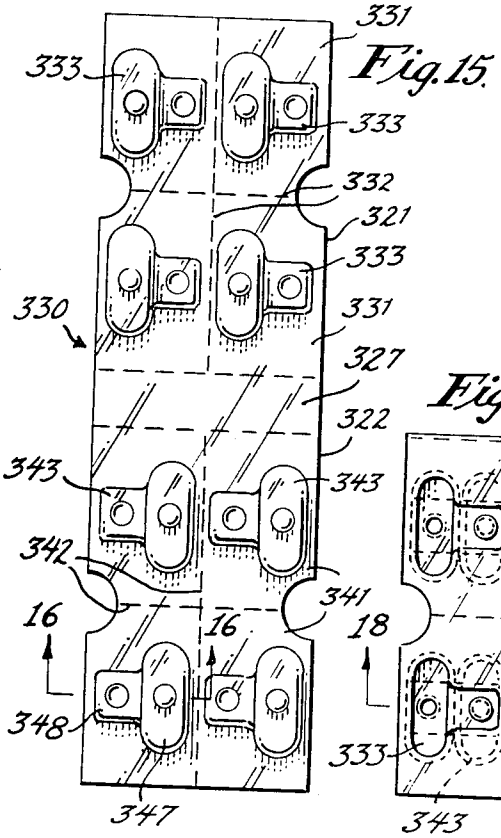


Fig. 15.

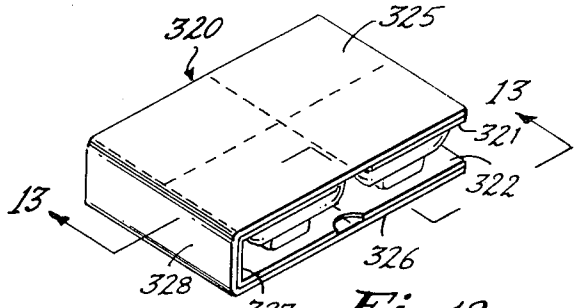
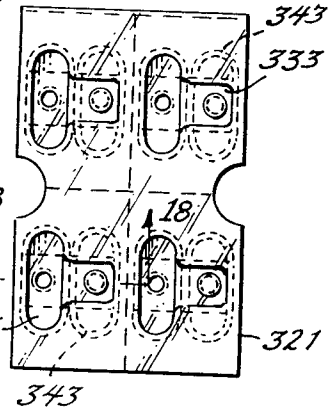


Fig. 12.

Fig. 17.



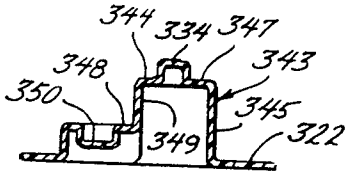


Fig. 16.

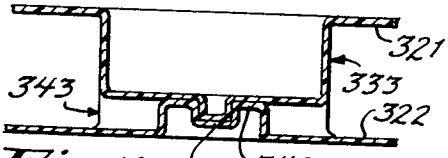


Fig. 19.

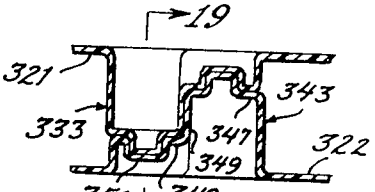


Fig. 18.

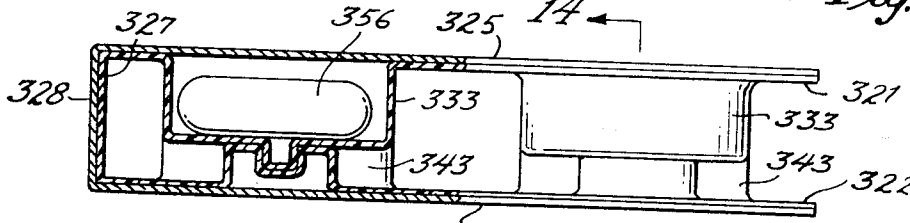


Fig. 13.

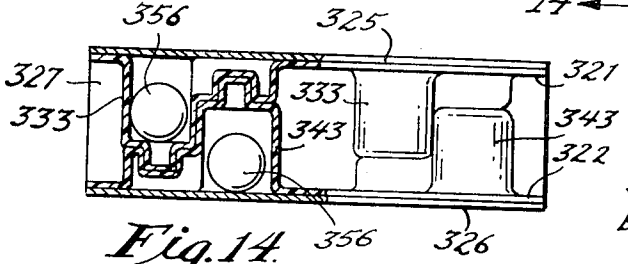


Fig. 14.

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PHARMACAL PACKAGE CONSTRUCTION

CROSS-REFERENCES TO RELATED APPLICATIONS

This patent application is a continuation-in-part of the copending patent applications Ser. No. 831,557 filed June 9, 1969, now U.S. Pat. No. 3,603,453 and Ser. No. 877,075 filed Nov. 17, 1969, both assigned to a common assignee.

BACKGROUND OF THE INVENTION

While the package construction of the instant invention has been primarily developed and employed in the pharmaceutical field, and particularly for in-hospital dispensing of drugs, it is appreciated that the novel features disclosed herein are capable of many varied applications, all of which are intended to be comprehended.

As is well known to those versed in the hospital administration field, the dispensation of drugs, accurately and efficiently, presents many problems both economic in nature and pertinent to health, safety and law enforcement.

The conventional compounding of prescriptions in the hospital pharmacy, many of which prescriptions are transported more or less loosely on a tray to the various patients' rooms leaves innumerable possibilities for inadvertent error, as in loss, transposition of prescriptions, as well as pilferage, and the like.

Consonant with advanced thinking in the field, it is desirable to employ prepackaged drugs, thereby minimizing or eliminating the possibility of contamination through handling and exposure, and to automatically inventory, store and dispense the required drugs in a manner including the maintenance of completely accurate and current records of drugs ordered, prescribed, dispensed and consumed.

SUMMARY OF THE INVENTION

In accordance with the teachings of the instant invention, there is provided a highly improved pharmacal package construction which permits of economical fabrication and filling by the drug manufacturer, being capable of carrying all required indicia in ready visually accessible location, being shipped and stored in its original package to insure sterility, adapted for convenient automatic handling and dispensing, say from conventional dispensing machines, and which provides a continuing record of the actual drug and dosage administered to the patient, the quantity remaining to be administered, and further insures that the drug reaches the patient in its original sterile condition.

It is another object of the present invention to provide a pharmacal package construction having the advantageous characteristics mentioned in the previous paragraph, which is extremely simple in structure, durable throughout storage, handling and use, and which can be economically manufactured and effect substantial economies in costs of handling.

It is still another object of the present invention to provide a pharmacal package of the type described wherein the patient's prescription may be conveniently incorporated and retained for future reference, from which individual doses are conveniently removed without defacement of the package as a whole, so that even the last remaining dose does not inadvertently go lost, but remains a part of the entire package until consumed.

It is among additional objects of the present invention to provide packaged constructions having the advantageous features described hereinbefore, wherein the blister sheets may be selectively held in adjacent relation, as determined in manufacture, by interfitting, detachable holding formations, both with and without hinges interconnecting the blister sheets, and wherein the interfitting holding formations are highly effective to retain the blister sheets in their held condition, preventing inadvertent or accidental separation thereof, while permitting of quick and easy deliberate manual separation or detachment of the formations.

It is still a further object of the present invention to provide a pharmacal package construction of the type described

wherein individual doses may be removed from the package without defacement of the package as a whole, and further wherein the package may be separated into individual doses without opening of the package to expose or otherwise contaminate the contents.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view illustrating a finished package constructed in accordance with the teachings of the present invention.

FIG. 2 is a side elevational view, partly in section, taken generally along the line 2—2 of FIG. 1.

FIG. 3 is an exploded perspective view illustrating different operational aspects of the instant invention.

FIG. 4 is a plan view showing a blank of the present invention adapted to be formed into a pair of blister sheets.

FIG. 5 is a partial sectional view, somewhat enlarged, taken generally along the line 5—5 of FIG. 4.

FIG. 6 is a plan view showing the blank of FIG. 4 folded into a pair of blister sheets in back-to-back relation with each other.

FIG. 7 is a partial sectional view, somewhat enlarged, taken generally along the line 7—7 of FIG. 6.

FIG. 8 is a perspective view illustrating a further embodiment of the present invention.

FIG. 9 is a partial side elevational view taken generally along the line 9—9 of FIG. 8.

FIG. 10 is a perspective view illustrating still another embodiment of the instant invention.

FIG. 11 is a perspective view similar to FIG. 10, showing the embodiment thereof in exploded condition.

FIG. 12 is a perspective view showing a further embodiment of the instant invention.

FIG. 13 is a side view, partly in section, taken generally along the line 13—13 of FIG. 12.

FIG. 14 is an elevational view, partly in section, taken generally along the line 14—14 of FIG. 13.

FIG. 15 is a plan view showing a blank adapted to be formed into a pair of blister sheets in the embodiment of FIG. 12.

FIG. 16 is a partial transverse sectional view taken generally along the line 16—16 of FIG. 15, somewhat enlarged for clarity.

FIG. 17 is a plan view showing the blank of FIG. 15 folded upon itself to define a pair of blister sheets.

FIG. 18 is a partial sectional view taken generally along the line 18—18 illustrating the interfitting formations of the blister sheets of FIG. 17.

FIG. 19 is a sectional view taken generally along the line 19—19 further illustrating the interfitting formations of the blister sheets.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to the drawings, and specifically to FIGS. 1–7 thereof, a package construction is generally designated 20 in FIGS. 1, 2 and 3. The package construction 20 may include a pair of blister sheets 21 and 22 disposed in generally parallel, facing spaced relation, respectively formed with a plurality of blisters 23 and 24. The blisters 23 and 24 of the respective sheets 21 and 22 extend inward toward each other and are disposed in proximate relation, while the internal hollows of the blisters face outwardly and are closed by backing or cover sheets 25 and 26 secured to respective blister sheets 21 and 22. One pair of adjacent edges

of the blister sheets 21 and 22 may be swingably connected by a hinge member or extension 27, while the backing or cover sheets 25 and 26 may be hingedly connected together by an extension or hinge member 28 overlying the hinge member 27.

In FIG. 4 is illustrated a blank, generally designated 30, from which are formed the blister sheets 21 and 22, and the interconnecting member or hinge part 27. In particular, the blank 30 is of elongate generally rectangular outline configuration, one generally rectangular end portion defining the blister sheet 21, the opposite generally rectangular end portion defining the blister sheet 22, and the intermediate, generally rectangular portion defining the hinge part 27. In the illustrated embodiment, the blister sheet 21 is subdivided into a plurality of rectangular portions or sections, such as the rectangular sections 31, each being bounded by the sheet edges and lines of perforation or weakening, as at 32, such that the intersecting lines of weakening 32 combine with the sheet edges to define a plurality of rectangular sections 31. Formed centrally in each section 31 of the blister sheet 21 is a blister, as at 33. The blisters 33 in the illustrated embodiment of FIGS. 1–7 are generally circular or cylindrical, but may be of other desired configuration. Further, each blister 33 includes a generally circular back wall or bottom 34 depressed out of the plane of the blister sheet 21, and a peripheral or side wall 35 extending about the periphery of the back wall or bottom 34 and toward the sheet 21. As seen in FIG. 4 and the enlarged sectional view of FIG. 5, the blisters 33 are raised or protrude upwardly, having their interior hollow 36 opening or facing downwardly.

The opposite end portion of blank 30 defines the blister sheet 22, being generally rectangular in outline configuration and subdivided into a plurality of rectangular blister sheet portions or sections 41 by a gridwork of lines of perforation or weakening, as at 42, corresponding to the gridwork of perforate lines 32. In the illustrated embodiment, the blister sheet 22, together with its lines of perforation 42 is congruent with the blister sheet 21 and its lines of perforation 32. Further, centrally of each generally rectangular section or portion 41 of blister sheet 22, there is formed therein a blister 43. The blisters 43 are formed from the material of the blister sheet 22, being generally circular and raised from the blister sheet in the illustrated embodiment, best seen in FIG. 5. It will there be apparent that the blister 43 is raised to form a bottom or back wall 44, spaced from the plane of the blister sheet 22. The bottom or back wall 44 may be of circular configuration, as in the illustrated embodiment, or otherwise, and a peripheral or side wall 45 extends about the periphery of the blister bottom or back wall 44 and extends therefrom to the blister sheet 22. The blisters 43 may be formed from the material of the sheet 22, and the blister back wall or bottom 44 may be slightly depressed or recessed to a level below the outer end of the side wall 43, the latter including an outwardly extending end portion 46 which curves or bends upon itself at its outer end 47, and extends thence inwardly, as at 48 to the bottom or back wall 44. By this recessed configuration of bottom or back wall 44 within the peripheral wall portion 48, there is defined therein a recessed or female formation 50, for a purpose appearing presently.

In practice, see FIGS. 6 and 7, the blank 30 is foldable along the adjacent pair of perforate lines 32 and 42, to swing the blister sheets 21 and 22 into congruent overlying, parallel spaced relation. The blisters 33 of sheet 21 are configured for snug conformable interfitting projection into the respective female formations 50 of the blisters 43, see FIG. 7. Thus, the blisters 33 each define a male formation extending normal to the plane of blister sheet 21, while the hollow or recess 50 of each blister 43 defines a female formation extending inwardly toward and normal to its associated blister sheet 22.

In practice, before swinging of the blister sheets 21 and 22 into their parallel facing spaced relationship, it is preferred to fill the blisters 33 and 43 with contents, such as pharmaceutical pills or tablets. After filling, a suitable blank is secured in congruent relation with the filled blister sheets 21 and 22 to define the outer blister closure or backing sheets 25 and 26 and hinge part 28. In practice, the blank 30 may be suitably formed, say by thermoforming, of plastic material, and the backing sheets 25 and 26, and their connection member 28 may be a laminate of foil, plastic and cardboard, or other suitable sheet material.

The outer closure or backing sheets 25 and 26 may preferably be of rectangular configuration congruent to their respective blister sheets 21 and 22, and the backing sheets may each be formed with lines of perforation or weakening, weakening lines being shown in backing sheet 25 at 52 in FIG. 1, configured to substantially conformably overlie respective weakening lines 32 of adjacent blister sheet 21. The perforate lines may be formed simultaneously after assembly, if desired. Similarly, backing or closure sheet 26 may be formed with lines of weakening or perforation at 53, respectively overlying the lines of weakening or perforation 42 of the adjacent blister sheet 22.

Following the filling of blisters 33 and 43 with contents, the backing or closure sheets 25 and 26 may be secured in their closing relation, as by heat-sealing or other suitable adhesive means, a lamination of metal foil providing an effective moisture and vapor barrier to protect the contents. A lamination or layer of cardboard in the backing sheets 25 and 26 permitting of convenient printability for conveying essential information as to the contents, its dispensation, and other copy material.

In the completed package condition of FIGS. 1 and 2, the blister sheets 21 and 22, and their associated backing sheets 25 and 26, have been swung relative to each other about the hinge 27, 28 into parallel spaced facing relationship. Further, the male formations defined by blisters 33 have been conformably engaged into respective female formations 50 of blisters 43. This interfitting engagement and disengagement requires movement of the blister sheets 21 and 22 generally normal to their planes, which movement is prevented by the hinge part 27, 28, in the absence of deliberate manipulation by a user. By this structure, the package 20 remains in its folded condition with the blister sheets 21 and 22 swung into parallel spaced facing relation against accidental or inadvertent action.

When it is intended to remove a single article of contents, see FIG. 3, a single section of the closure or backing sheet 25, as at 55, is separated from the remainder of the backing sheet along the severance lines 52, being simultaneously peeled from the associated section 31 of the blister sheet 21. This exposes a single article or dose 56 for removal from the package.

If it is desired to remove a single article of contents or dose from the package without exposing the article of contents, see FIG. 3, a blister sheet section 31*a*, together with its closing backing sheet section 55*a*, may be detached along the severance or perforate lines 32 of the blister sheet at 52 of the backing sheet. In this manner, any copy or directions for use, or the like, may remain with the article of contents until its administration.

As set forth in detail in said copending patent applications, the instant package construction 20 also permits of convenient automatic handling, say in article dispensing machines, and otherwise.

While the package 20 of FIGS. 1–7 is illustrated as including a hinge part 27–28, it is appreciated that the hinge part may be omitted, if desired under certain conditions.

In the embodiment of FIGS. 8 and 9, a package is there generally designated 120, and may include a plurality of generally rectangular blister sheets 121 formed with blisters 133 and provided with closure or backing sheets 125, similar to the first described blister sheets 21, blisters 33 and backing sheets 25. Additionally, there are provided a plurality of blister sheets 122, formed with blisters 143 and provided with closure or backing sheets 126, all similar to the blister sheets 22, blisters 43 and backing sheets 26. The blister sheets 122, in the embodiment of FIGS. 8 and 9, are arranged in end-to-

end relation with their female formation blisters **143** extending upwardly, and the blister sheets **121** are arranged in end-to-end relation with their male formation blisters **133** extending downwardly. Further, the upper blister sheets **121** are located in overlapping or staggered relation with respect to the lower blister sheets **121**, the depending male formation blisters **133** engaging into the nether upwardly facing female formation blisters **143**. In this manner, a continuous package **120** of any desired length may be formed, as for automatic handling, printing, or the like. If desired, the lower layer may include both male and female formation blisters, say in alternate groups, as may the upper layer. This interfitting assembly provides a staunch and rigid structure.

A package is generally designated **220** in FIG. **10**, and may include the elements of the package **120** in FIGS. **8** and **9**, but in a different combined relationship with each other. More specifically, a pair or other number of blister sheets **122** may be disposed in side-by-side relation with their female formation blisters **143** extending upwardly, and a pair or other number of blister sheets **121** may be disposed in side-by-side relation with respect to each other, over and extending across a plurality of the blister sheets **122**, with the male formation blisters **133** projecting downwardly. In such assembly, the male formation blisters **133** may conformably engage in the upwardly facing female formation blisters **143**, so that a plurality of the blister sheets may be detachably secured together to define the package **220** of convenient handling size and configuration.

Referring now to the embodiment of FIGS. **12–19**, a slightly modified package constructed in accordance with the teachings of the present invention is shown in FIG. **12** and there generally designated **320**. The package **320** is essentially similar to the package **20**, including a pair of generally rectangular, parallel spaced, facing blister sheets **321** and **322** having their blisters extending toward and in proximate relation with each other. A hinge part **327** extends between one adjacent pair of edges of the blister sheets **321** and **322**. Secured on the outer faces or surfaces of the facing blister sheets **321** and **322** are respective closure or backing sheets **325** and **326**, which are respectively congruent to the adjacent blister sheet, and an additional hinge part **328** may extend between an adjacent pair of edges of the backing sheets **325** and **326**, closely along the hinge part **327**. The blister sheets **321** and **322**, and connecting hinge part **327** may all be integrally formed, as by thermoforming, or otherwise, of a single blank **330**, best seen in FIG. **15**. The blank **330** is subdivided by suitable lines of weakening into a pair of generally congruent, rectangular end portions defining blister sheets **321** and **322**, respectively, and an intermediate portion defining a hinge part **327**. Further, each of the blister sheets is subdivided by lines of weakening or perforation, the blister sheet **321** being subdivided into a plurality of generally rectangular sections **331** by crossing lines of perforation or weakening, as at **332**. The blister sheet **322** is similarly subdivided into generally rectangular sheet portions or sections **341** by a plurality of crossing lines of weakening or perforation **342**.

Each of the sections **331** of blister sheet **321** is formed, say from the material thereof, with a raised portion or blister, as at **333**, while each of the sections **341** of the blister sheet **322** is formed with a raised blister **343**.

The blisters **333** and **343** may all be substantially identical, with the blisters **343** being rotated approximately one hundred and eighty degrees with respect to the blisters **333**. That is, the blister sheet **321** is substantially identical to the blister sheet **322**, but in the blank **330**, the blister sheets are rotated one hundred and eighty degrees with respect to each other. As all of the blister formations **333** and **343** are substantially identical, a single such blister is shown in FIG. **16**, and description thereof will suffice.

It will there be seen that the blister **343** is raised out of the plane of the blister sheet **322** including a raised outer or back wall **344** having an upper portion **347** and a lower portion **348** connected together by an intermediate, generally vertical connecting wall portion **349**. As best seen in FIG. **15**, the outer back wall portion **347** is of an elongate configuration, while the lower or inner back wall portion **348** is of a shorter, generally rectangular configuration. A peripheral or side wall **345** extends circumferentially about the back wall **344**, extending therefrom to the blister sheet **322**. Thus, the peripheral or side wall **344** is of greater vertical extent along the outer back wall portion **347** than along the lower back wall portion **348**.

Additionally, the outer back wall portion **347** is formed from the material thereof with a outwardly or upwardly upset, male formation or projection **334**, while the lower back wall portion **348** is formed from the material thereof with an inwardly or downwardly depressed female formation or recess **350**. The female formation **350** may depend toward and terminate short of the plane of the blister sheet **322**.

In FIG. **7** it will be observed that the blister sheet **321** has been swung about the hinge part **327** into congruent, parallel spaced overlying relation with respect to the blister sheet **322**. In this condition, by reason of the 180°reversal of the blisters **333** and **343**, the blisters of respective sheets are configured for complementary interfitting relation. This condition is best seen in FIG. **18** wherein the raised or upper back wall portion of each blister **343** and **333** engages the lower or inner back wall portion of the adjacent blister of the other sheet. Further, the male formation or projection on the outer back wall portion of each blister conformably engages in the female formation or recess on the inner or lower back wall portion of the adjacent blister of the other blister sheet.

This condition is also shown in FIG. **19**.

Additionally, it will be appreciated that the raised or upper back wall portion of each blister **333** and **343** is interiorly unobstructed, and so may readily receive an article of contents, such as a capsule **356**, shown in FIGS. **13** and **14**.

By the extension of the male formations **343** and female formations **350** generally normal to their associated blister sheets **321** and **322**, and the backing sheets **325** and **326**, it will be understood that disengagement or separation of the interfitting male and female formations requires movement normal to the planes of the blister and backing sheets. As this movement is restrained by the hinge **327**, **328**, disengagement of the male and female formations can only be effected by deliberate manual operation, rather than accident or inadvertence.

However, access to the contents of the blisters may be achieved in the same manner as in the previously described embodiments. The embodiment of FIGS. **12–19** utilizing a hermaphrodite type of male and female formation, wherein each blister and its detachable formations being substantially identical to each other, for simplicity in manufacture and double the number of interfitting connections, when such construction may be desired.

From the foregoing, it is seen that the present invention provides a pharmacal package construction which fully accomplishes its intended objects and is well adapted to meet practical conditions of manufacture, filling, distribution and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention.

What is claimed is:

1. A pharmacal package construction comprising a pair of backing sheets, a pair of unitary blister sheets each having hollow blisters and secured to one of the backing sheets with the blister hollows facing the respective backing sheet, said backing sheets serving to close said blisters, contents in said blisters and detachable interfitting male and female formations on the backs of said blister sheets releasably holding the latter together with the blisters in back-to-back proximate relation and said backing sheets outermost, to define a package externally protected by said backing sheets, and hinge means swingably connecting together an adjacent pair of edges of said backing sheets, for relative swinging movement of said backing sheets and their associated blister sheets,

said interfitting formations extending generally normal to the planes of said backing sheets, to resist inadvertent detachment of said formations upon relative swinging movement of said backing sheets.

2. A pharmacal package construction according to claim 1, said blisters each comprising a back wall spaced from said backing sheet, and a peripheral wall extending about the periphery of said back wall and toward said backing sheet, said female formations each comprising at least a portion of a blister back wall depressed into the blister toward the associated backing sheet.

3. A pharmacal package construction according to claim 2, said male formations each comprising at least a portion of the blister back wall protruding away from the associated backing sheet.

4. A pharmacal package construction according to claim 3, said blister back walls each being configured to define a male and female formation.

5. A pharmacal package construction according to claim 4, said blister sheets being identical.

6. A pharmacal package construction according to claim 3, said male and female formations each comprising the entire back wall and adjacent peripheral wall portion of a respective blister.

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