United States Patent [19]

Swensson

[11] **3,834,777**

[45] **Sept. 10, 1974**

[54] **ARTICLE STORING AND DISPENSING MODULE**

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[73] Assignee: **The University of Mississippi,** University, Miss.

[22] Filed: **Dec. 6, 1971**

[21] Appl. No.: **205,192**

[52] **U.S. Cl.** **312/209,** 52/36

[51] **Int. Cl.**.... **A47b 81/00,** A61b 19/02, A47b 5/00

[58] **Field of Search** 312/209, 45; 52/27, 34, 52/35, 37, 64, 173

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Primary Examiner—Paul R. Gilliam

Attorney, Agent, or Firm—William D. Stokes

[57] **ABSTRACT**

An article storing and dispensing module having an arcuate body portion and including a plurality of adjustable, vertically spaced, inwardly and downwardly inclined shelves with the upper shelves progressively extending further inwardly than the intermediate shelves to facilitate access thereto. A plurality of arcuate sections combined together form a generally circular body portion defining an interior central work area and having shelving, counters, and at least one dispensing window. Doors opening on the outside of the body portion permit the shelves to be easily filled. A canopy extends out from the top of the body portion above the dispensing window and has wall means extending downwardly therefrom to form a dispensing booth in front of the window.

4 Claims, 22 Drawing Figures

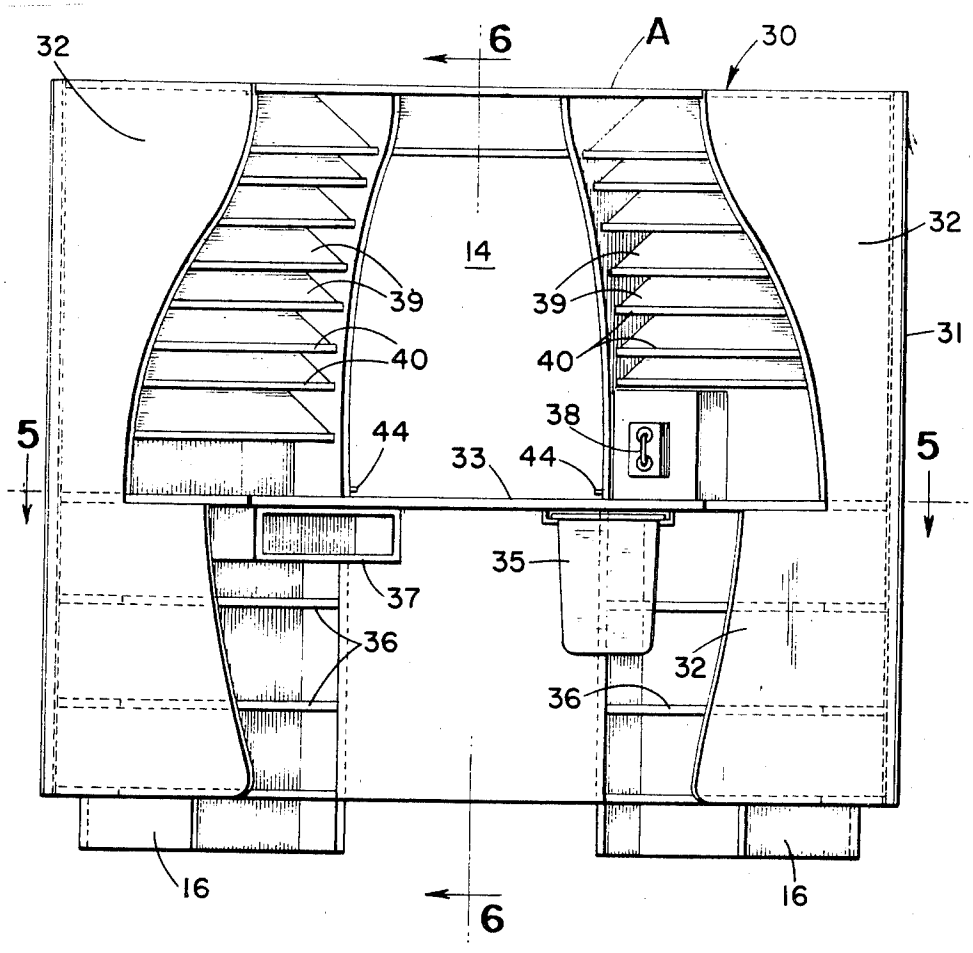
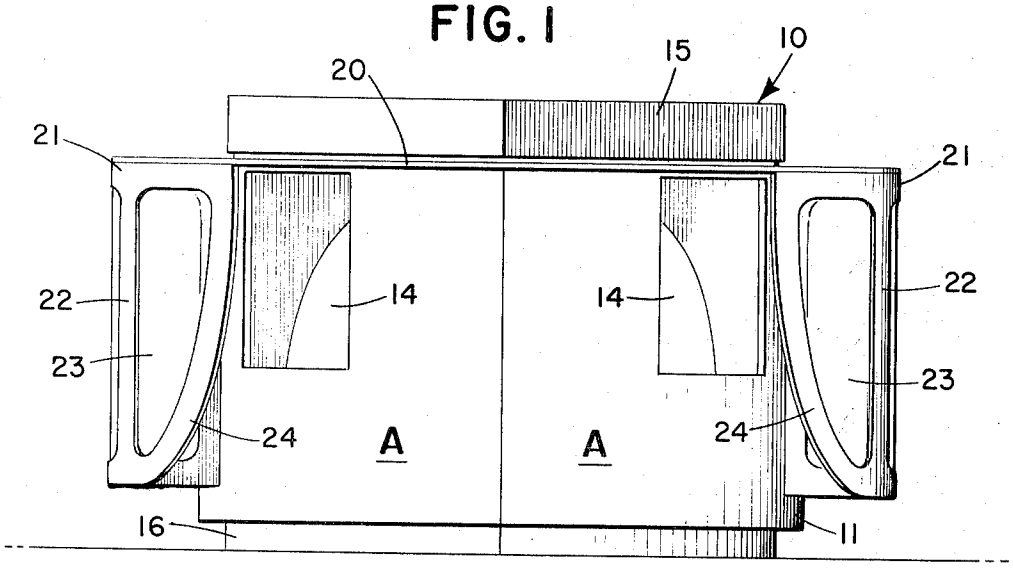


FIG. 1


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21
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A
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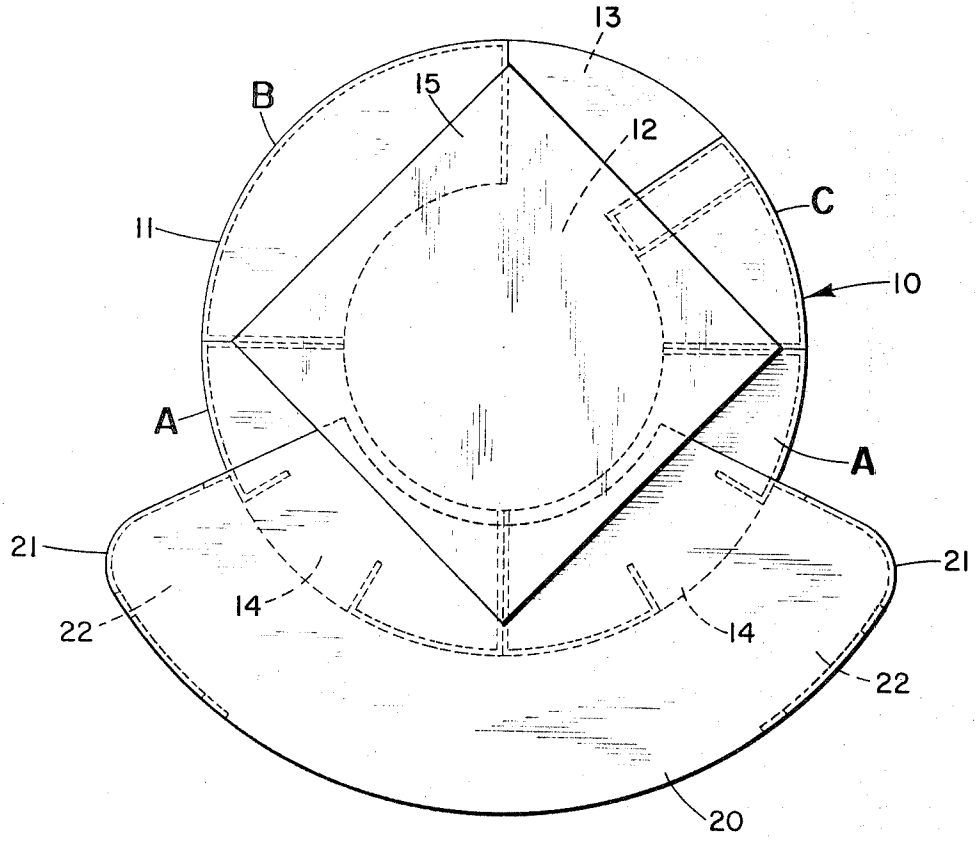

13
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15
12
C
11
10
A
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FIG. 2

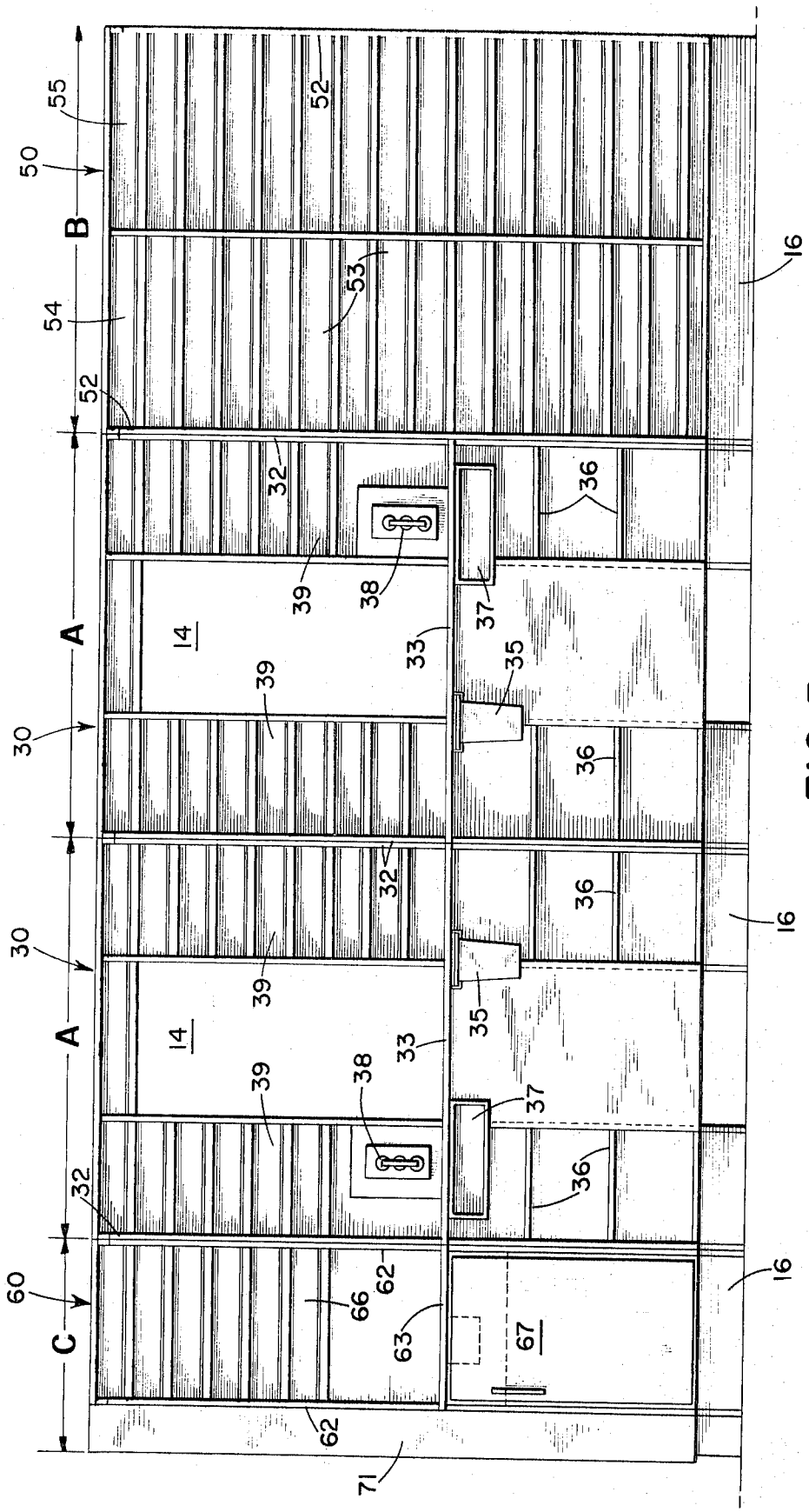
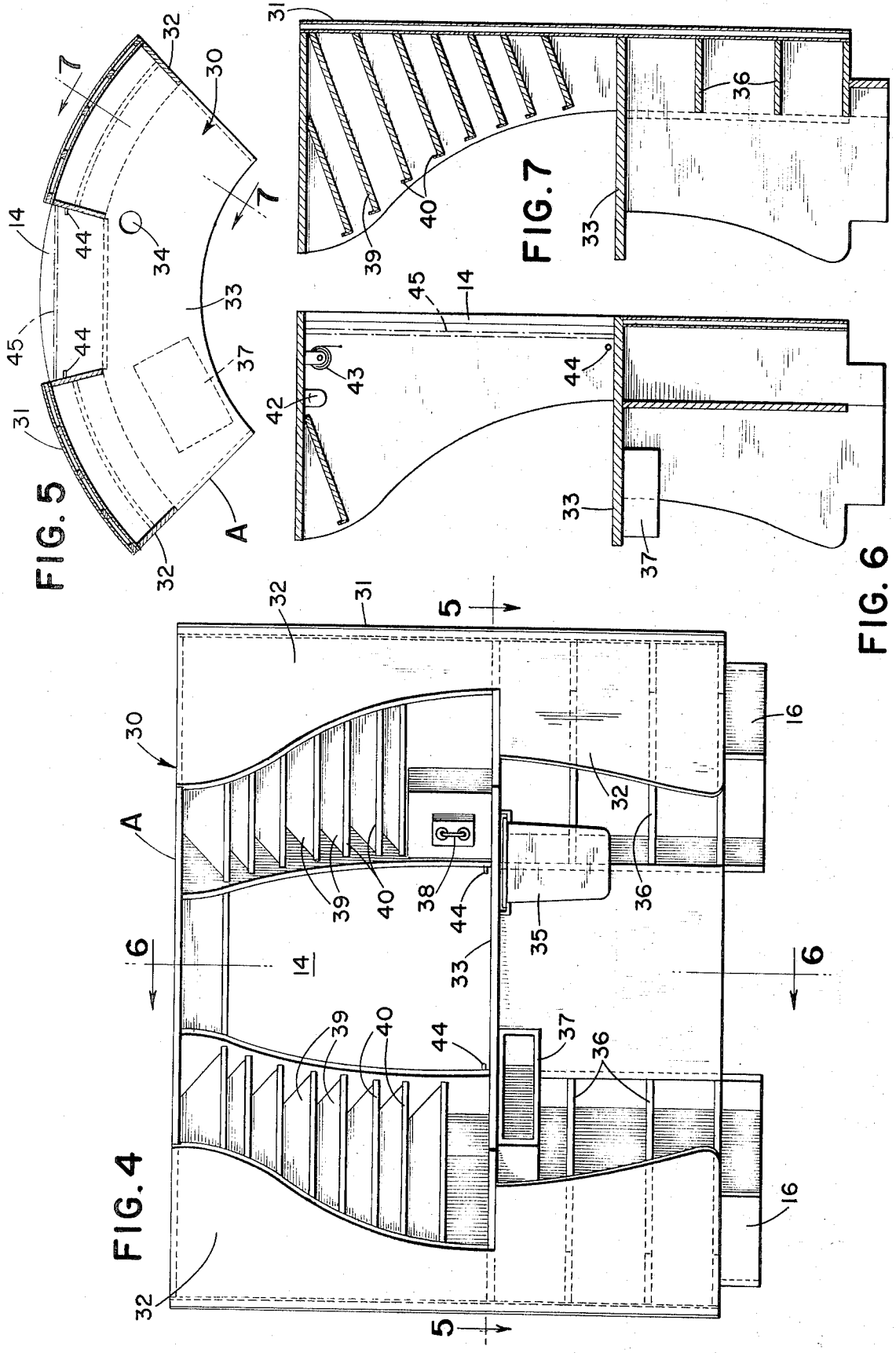

55
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B
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14
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16
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39
35
14
33
A
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38
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67
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71

FIG. 3


FIG. 4
FIG. 5
FIG. 6
FIG. 7

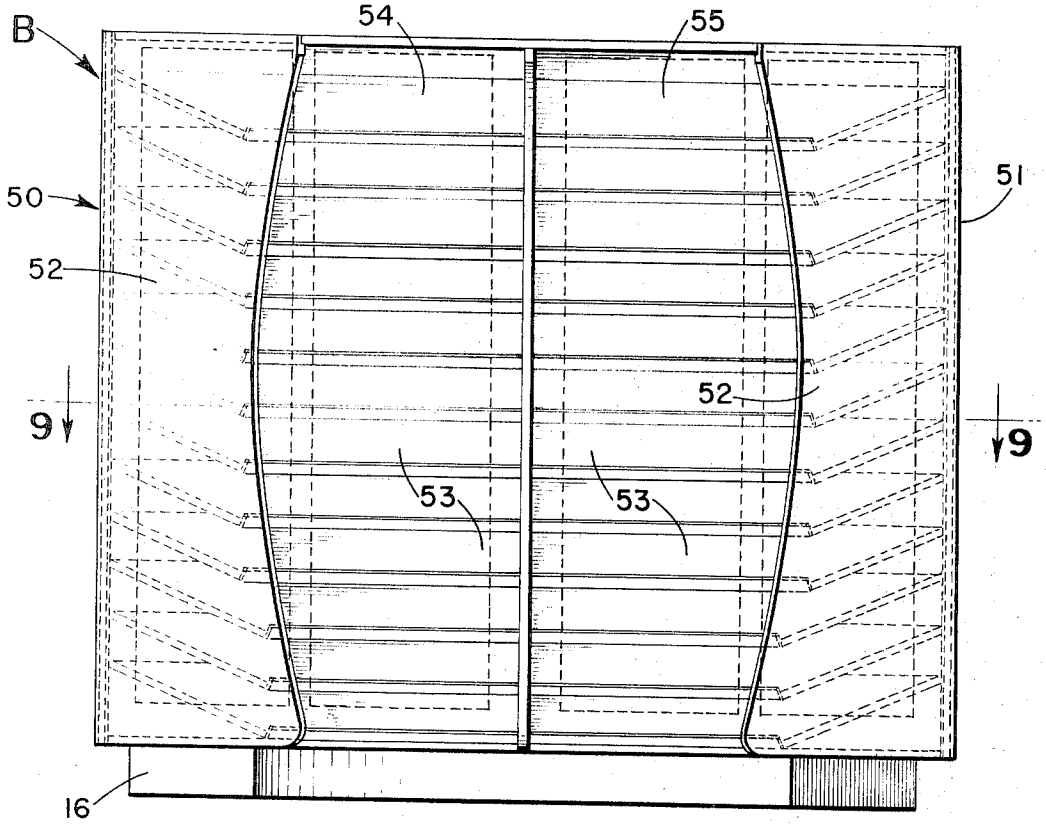


FIG. 8

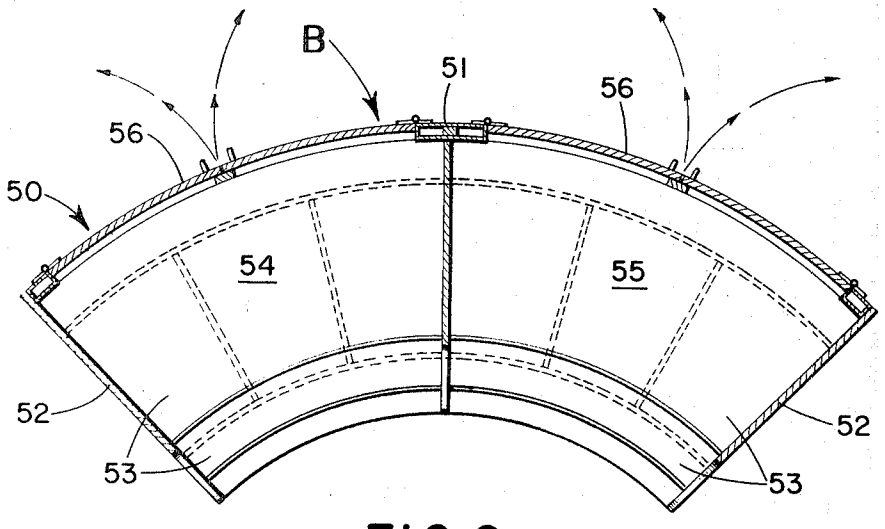


FIG. 9

FIG. 10

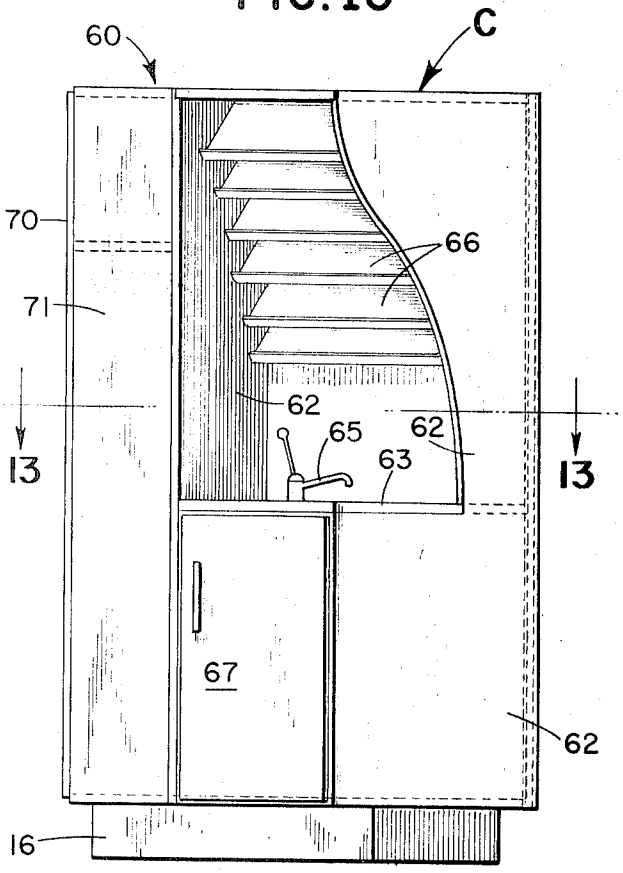


FIG. 11

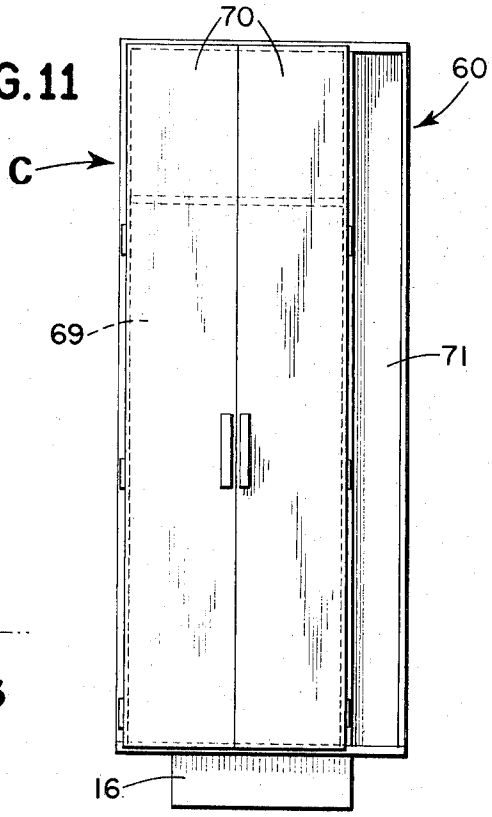


FIG. 12

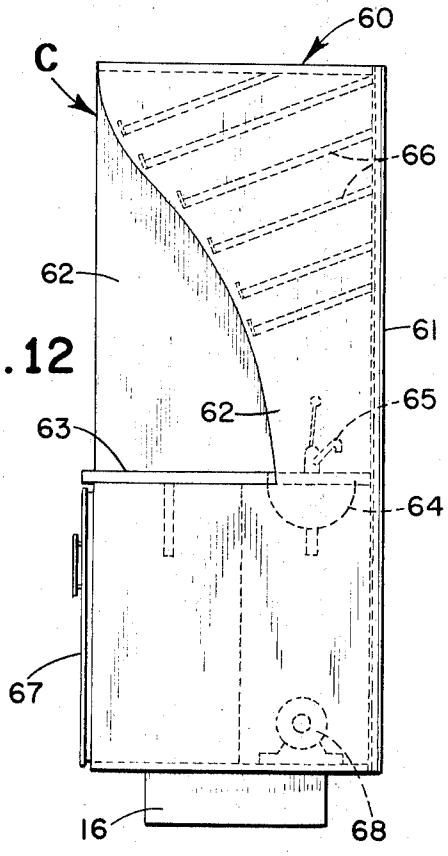


FIG. 13

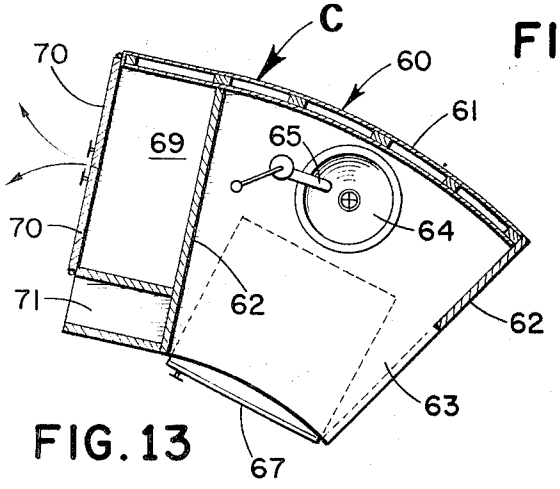


FIG. 14

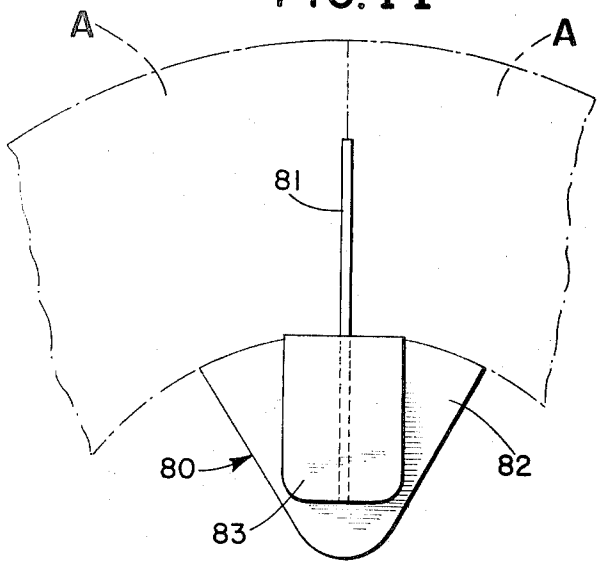


FIG. 17

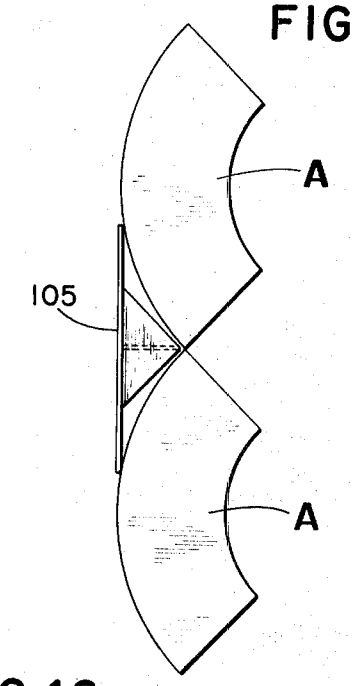


FIG. 15

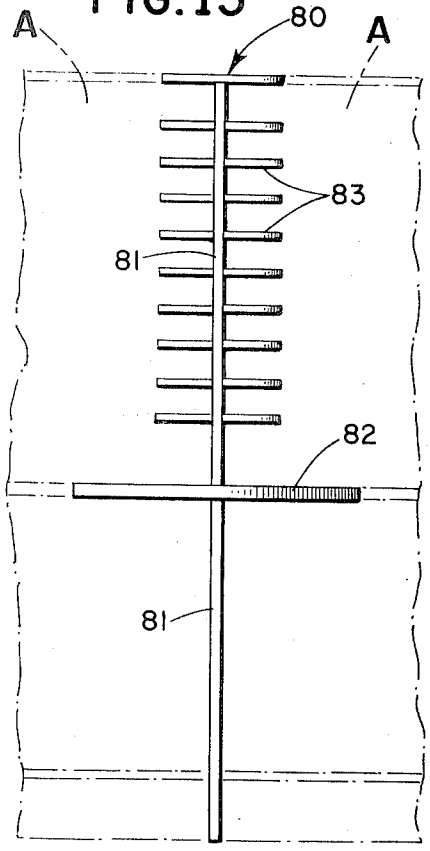


FIG. 16

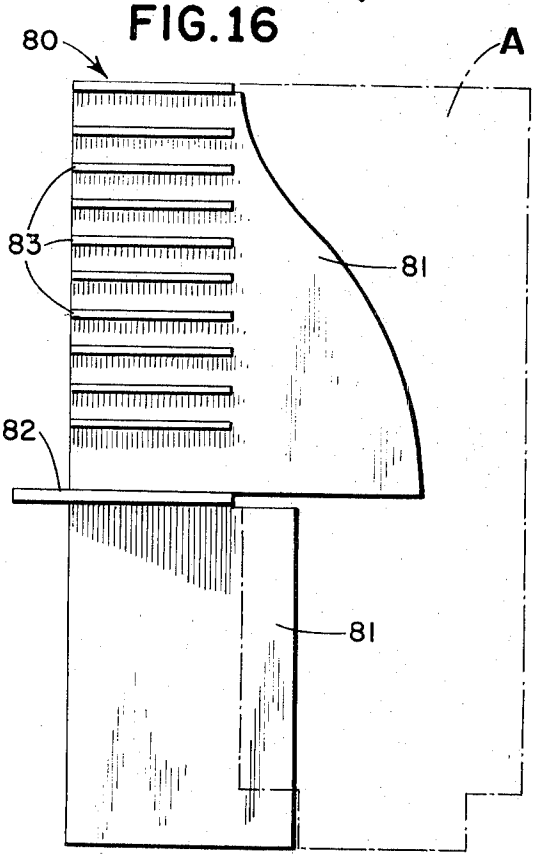


FIG. 18

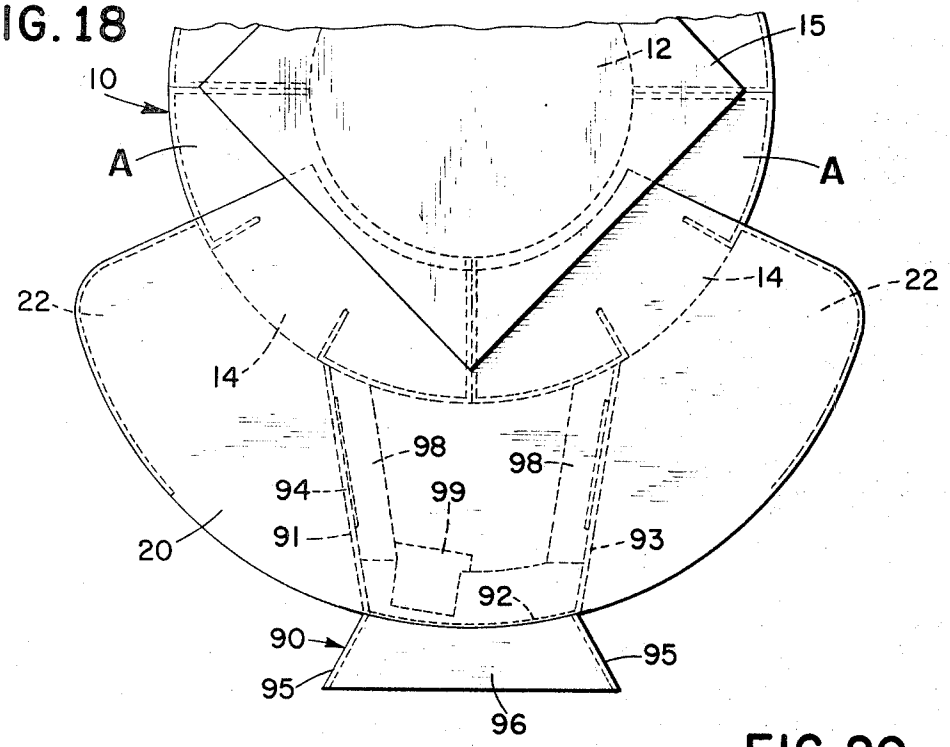


FIG. 19

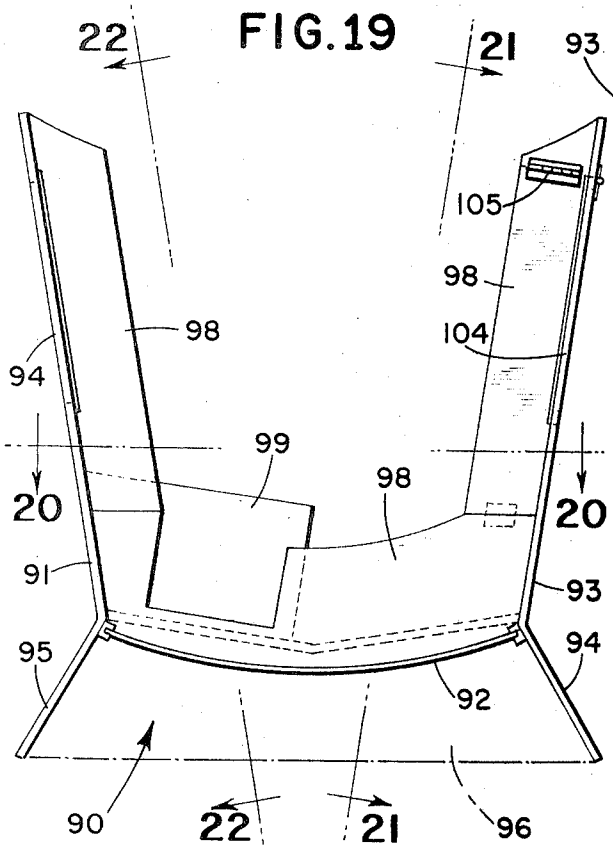


FIG. 20

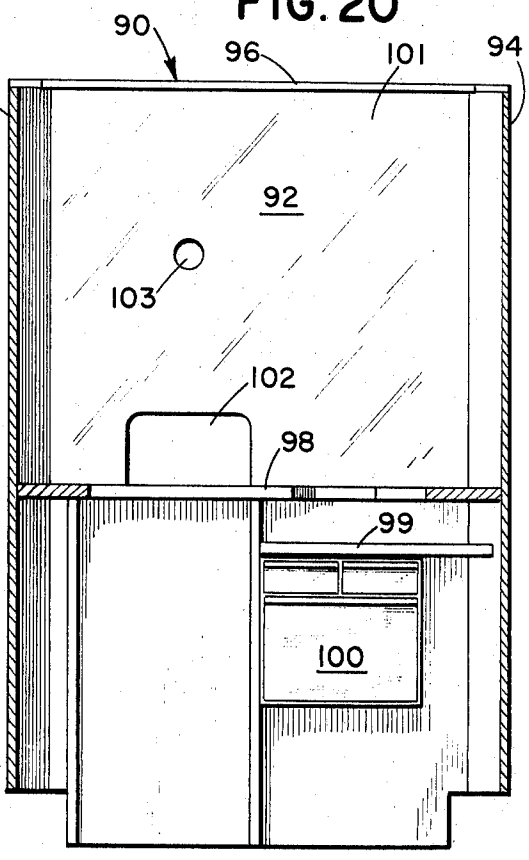


FIG. 21

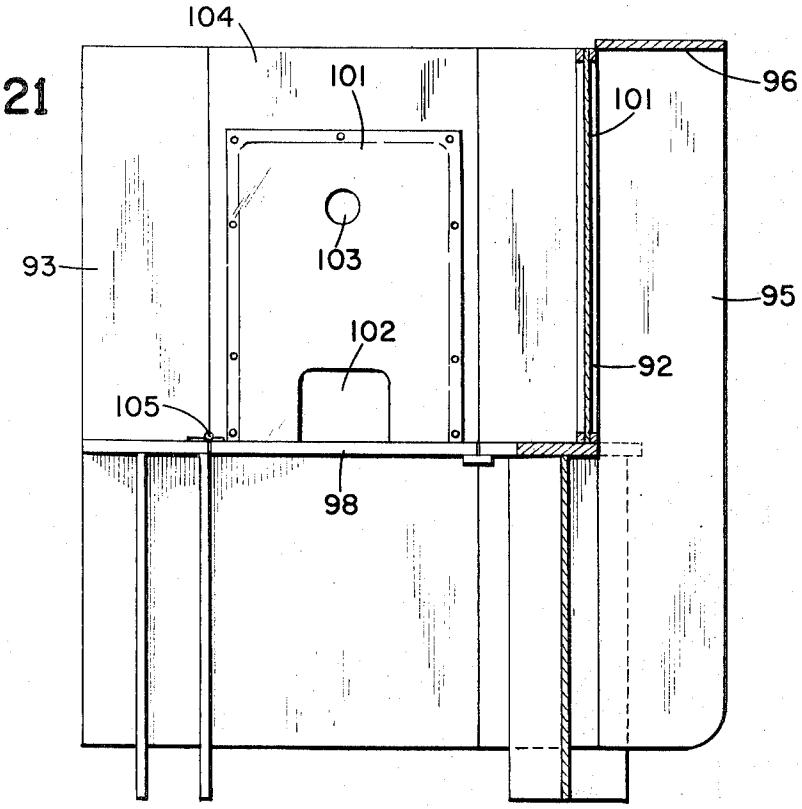
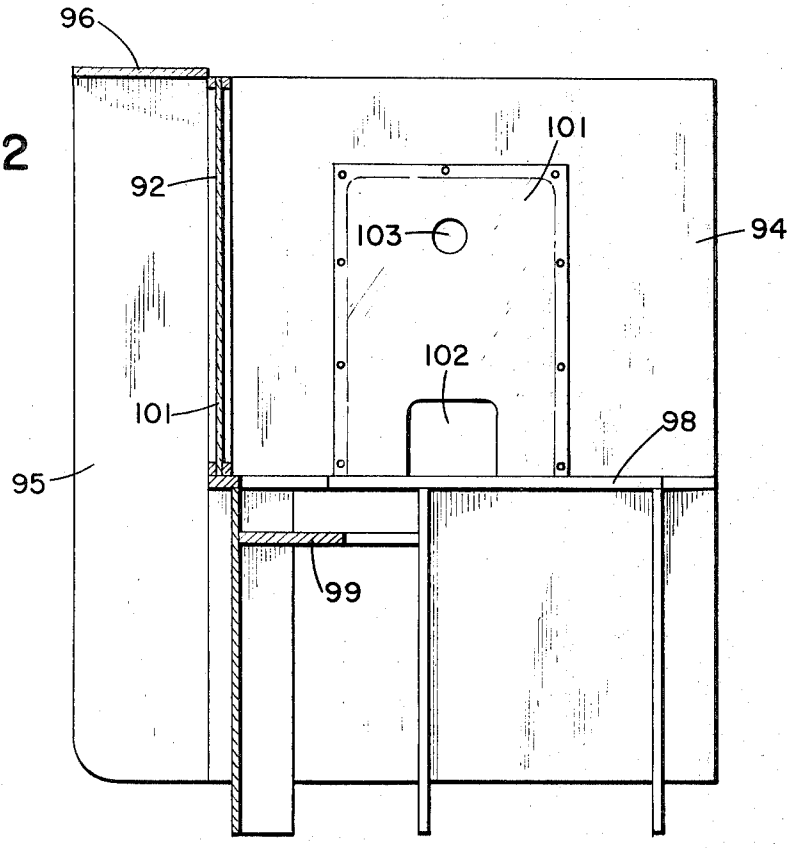

104
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96
101
93
103
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102
92
105
98

FIG. 22


96
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103
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98
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99

ARTICLE STORING AND DISPENSING MODULE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to an article storing and dispensing module or unit and more particularly to such a unit which is generally circular or arcuate in configuration and suitable for use in dispensing pharmaceuticals within a medical facility such as a hospital.

2. Description of the Prior Art

Numerous types of cabinet and storage units have been available in the past for dispensing and/or storing articles. Many such prior art devices, however, have been unsatisfactory in that they have not been specifically designed to form a separate module from which such articles can be efficiently stored and dispensed with a minimum of effort by an operator while still providing a pleasant working environment for the operator. Other such prior art dispensing and/or storing devices have been relatively complicated and cumbersome in construction, thus requiring an extensive amount of operating space.

Specifically, many prior art pharmaceutical dispensing facilities have not provided a satisfactory dispensing and storing unit for distributing drugs while emphasizing quality of service and providing a pleasant atmosphere for both the pharmacist or other operator and the patient or person receiving the drugs. Other such prior art pharmaceutical dispensing facilities further have often lacked sufficient capability for accommodating the necessary equipment such as sinks, refrigerators, narcotic cabinets, telephones, files, and the like.

SUMMARY OF THE INVENTION

Among the objects of the present invention is to avoid the disadvantages of prior art article storing and dispensing modules enumerated above. Another object of the present invention is to provide an article storing and dispensing module which is generally circular or arcuate in configuration, thus providing an extremely compact, relatively inexpensive and efficient module for dispensing such articles. Still another object is to provide an article storing and dispensing module provided with shelves which slant downwardly and inwardly whereby articles to be dispensed are continually gravity fed into an easily accessible position. A further object of the invention is to provide such a module wherein the shelves at the top of the module extend progressively farther inwardly than the shelves intermediate thereof, to facilitate access thereto. An additional object of the invention is to provide an article storing and dispensing unit having conveniently located dispensing windows with consultation booths positioned in front of the windows. Still another object of the invention is to provide an article storing and dispensing module which may be constructed within an existing building and which may be fully secured to safeguard the contents within the module.

According to the present invention, there is provided an article storing and dispensing module having a generally arcuate body portion provided with a plurality of adjustable vertically spaced shelves. These shelves are mounted to slant inwardly and downwardly to gravity feed articles to be dispensed towards the inside for access by an operator. The shelves adjacent the top of the body portion extend progressively farther inwardly than the shelves intermediate the body portion to facilitate access thereto.

In one embodiment of the invention, a plurality of arcuate sections are combined to form a generally circular body portion defining an interior central work area. Inwardly and downwardly slanted shelves in the sections are readily accessible from the interior. These sections further include work counters and space for installing necessary equipment such as a refrigerator, files, a narcotics cabinet, a typewriter, waste disposal unit and a sink unit. The central work area is covered by a top panel which includes connections for utilities such as lighting, heating, ventilating and other electrical connections. One or more dispensing openings or windows are provided in the body portion. A canopy extends out from the top of the body portion above the dispensing windows and includes wall connections extending downwardly therefrom to form a dispensing or consultation booth in front of each window. A control or cashier's booth may be positioned in front of the body portion under the canopy between two dispensing windows. A shelved partition also may be installed in the interior work area between two dispensing windows to define separate work areas adjacent each window.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the invention will become apparent by reference to the more detailed description of the invention and the accompanying drawings which follow, wherein

FIG. **1** is a front elevational view of a module according to the present invention;

FIG. **2** is a top plan view of the module shown in FIG. **1**;

FIG. **3** is an interior panoramic view illustrating the various arcuate sections of the module shown in FIG. **1**;

FIG. **4** is an enlarged interior elevational view of an arcuate module or unit according to the present invention;

FIG. **5** is a sectional view taken along line **5—5** of FIG. **4**;

FIG. **6** is a sectional view taken along line **6—6** of FIG. **4**;

FIG. **7** is a sectional view taken along line **7—7** of FIG. **5**;

FIG. **8** is an interior elevational view of another dispensing unit according to the present invention;

FIG. **9** is a sectional view taken along line **9—9** of FIG. **8**;

FIG. **10** is an interior elevational view of another dispensing unit according to the present invention;

FIG. **11** is a left side elevational view of the unit of FIG. **10**;

FIG. **12** is a right side elevational view of the unit of FIG. **10**;

FIG. **13** is a sectional view along line **13—13** of FIG. **10**;

FIG. **14** is a top plan view showing a partition positioned between two arcuate sections of a dispensing module;

FIG. **15** is a front elevational view of the partition structure shown in FIG. **14**;

FIG. **16** is a side elevational view of the partition structure shown in FIG. **14**;

FIG. 17 is a top plan view of two arcuate units according to the present invention positioned in line immediately adjacent each other and having a panel in between to form a continuous front wall;

FIG. 18 is a partial top plan view of a module according to the present invention illustrating a control or cashier's booth positioned between two dispensing windows;

FIG. 19 is an enlarged top plan view of the control booth shown in FIG. 18;

FIG. 20 is a sectional view taken along line 20—20 of FIG. 19;

FIG. 21 is a sectional view taken along line 21—21 of FIG. 19;

FIG. 22 is a sectional view taken along line 22—22 of FIG. 19.

DESCRIPTION OF THE INVENTION

Referring to FIGS. 1–3 of the drawings, there is shown an article storing and dispensing module or unit, generally indicated by the numeral **10**, comprised of a generally circular body portion **11** constructed of a plurality of generally curved or arcuate-shaped Sections A, B and C. Circular body portion **11** defines an interior central work area **12** having an entrance **13** on one side and a pair of dispensing windows **14** for dispensing articles from the central work area. As shown in FIGS. **1–3**, the dispensing windows **14** are located in each Section A of the circular body portion.

The top of the circular body portion **11** is covered by a ceiling panel **15** which contains utility connections therein such as lighting and other electrical connections, heating, ventilating, and exhaust fans. The circular body portion **11** is supported by a suitable base portion **16**, also preferably of circular configuration.

Extending out from the top of the body portion **11** is a canopy **20** of generally arcuate configuration, as best shown in FIG. **2**. Canopy **20** extends outwardly over the dispensing windows **14** and includes wall means **21** extending downwardly and dependent therefrom on either end. As shown in FIG. **1**, the wall means **21** preferably extend down along the outer side and in front of each dispensing window **14** to form a dispensing or consultation booth **22** in front of each of the windows. Each wall means **21** further may be provided with windows **23** to permit visual observation into and out of the booth **22**. As shown in FIG. **1**, the wall means **21** preferably are spaced at the bottom from the surface upon which the module rests. The outer edge **24** of each consultation booth **22** preferably is of a generally curved configuration, as shown in FIG. **1**, to provide a pleasing and aesthetic appearing design.

It is to be noted that the dispensing or consultation booths **22** in front of each dispensing window **14** of adjacent Sections A of the module provide an area for private consultation between an operator such as a pharmacist working in the central work area **12** and a patient or customer standing in front of the dispensing window. It is further apparent that the module **10** is self-sustaining in construction such that it is adapted for use within a previously existing structure such as a hospital or other medical facility. Once the module has been set up, the utilities only need to be connected to render the module operable. During construction, of course, each of the Sections A, B and C may be secured together by any suitable means such as clamps or nut and bolt connections. The circular interior central work area further provides a compact, efficient, and convenient work space for dispensing of articles from interior shelves to be described more fully hereinafter. Moreover, if desired, the entrance **13** to the central work area **12** may be locked against unauthorized entry by means of any suitable sliding or folding enclosure which may extend down from the ceiling panel **15** or fold out from the walls of the units on either side of the entrance.

Each of the Sections A, B and C shown in the interior panoramic view of FIG. **3** and in FIGS. **4–13** contain various of the elements such as telephones, waste disposal, shelving, counters, refrigerator, sink and locked storage areas necessary in an article storing and dispensing unit. Each of these sections will be described in detail hereinafter.

Referring to FIGS. **4–7**, each Section A of the module **10** of the present invention is comprised of a generally arcuate or curved body portion **30** having a generally arcuate outer front wall **31** and a pair of spaced upstanding end walls **32**. Each Section A is provided with an arcuate counter **33** at a point intermediate of the height of the section. The counter **33** is constructed to extend through and form the bottom of dispensing window **14**. Dispensing window **14** preferably is located in approximately the center of the section so that a pharmacist or other operator standing in front of the window dealing with a patient or customer has ready access to all other parts of the section.

The counter **33** is provided on one side of dispensing window **14** with an opening **34** which leads to a waste receptacle **35** secured under the counter as shown in FIGS. **4** and **5**. The portion of Section A underneath the counter **33** on each side of dispensing opening **14** is filled with suitable vertically adjustable horizontal shelves **36**. A drawer or receptacle **37** capable of being securely locked also may be provided under the counter on one side of the dispensing window for safe keeping of items such as narcotics. In addition, a telephone **38** is provided just above counter **33** on one side of dispensing unit **14** as shown in FIG. **14** for convenient access by an operator within the module.

As best illustrated in FIGS. **4** and **7**, the space at the counter **33** on each side of dispensing window **14** is filled with shelves **39** which are inclined downwardly and inwardly from the outer wall **31** of the section. Each shelf is provided with a lip **40** on its inner end to prohibit articles from sliding off the shelf. By inclining each shelf **39**, articles may be gravity fed to the innermost end of each shelf for easy access by an operator working within the section. It is further to be noted that the upper shelves **39** extend progressively farther inwardly than the lower or intermediate shelves such that the ends of the shelf form an arcuate profile as illustrated in FIG. **7**. This particular design is extremely advantageous in that it permits an operator standing in front of the shelves to have ready accessibility to the upper shelves as well as to the lower or intermediate shelves. The arcuate profile of the ends of the shelving conform to the arcuate path of the arm of an individual as it is moved upwardly.

Each of these shelves **39** is mounted in Section A by suitable means such that the shelves are adjustable to vary the vertical spacing between the shelves as well as the angle of inclination thereof. If desired, the front wall **31** in front of each group of shelves **39** may be provided with an outward opening door in the manner il-

lustrated by the arrows of Section C in FIG. **9** to permit the shelves **39** to be easily stocked with articles as well as to permit the easy insertion and adjustment of the shelves in originally constructing the unit.

As shown in FIG. **6**, a light fixture **42** may be mounted in Section A just above dispensing opening **14**. A suitable closing means such as roll-up door **43** may be provided for closing and locking the dispensing window **14** against access from the outside. For this purpose, suitable locking means **44** are provided at the bottom on both sides of dispensing window **14**. If desired, dispensing window **14** also may be partially enclosed by a transparent member such as a plexiglass window **45** shown in dotted lines in FIG. **6**.

Section B of the module of the present invention is illustrated in greater detail in FIGS. **8** and **9**. As shown therein, each Section B is comprised of a body portion **50** of generally arcuate configuration having a generally arcuate outer front wall **51** and a pair of spaced upstanding end walls **52**. Preferably, the entire interior of Section B is filled with inclined shelves **53** which are adjustably supported by suitable mounting means so that the vertical spacing between the shelves as well as the angle of inclination of each shelf may be adjusted. The shelves **53**, as shown in FIG. **8**, are inclined downwardly and inwardly to facilitate gravitational movement of articles on the shelves towards the interior for ready accessibility by an operator. Moreover, both the upper and lower shelves of Section B extend progressively farther inwardly than the middle or intermediate shelves to provide easier accessibility to the upper and lower shelves, since the arcuate profile thus created conforms with the arcuate path followed by the arm of an operator on the inside of the section. The shelves **53** preferably are divided into at least two halves **54** and **55**, as shown in FIG. **8**. If desired, outwardly opening doors **56** may be provided in the outer front wall **51** of Section B. The doors open in the direction of the arrows shown in FIG. **9** to permit the shelves to be easily stocked from the outside as well as to facilitate ease of construction and adjustment of the shelves. While it is preferred that the shelves be slanted downwardly and inwardly, it will be understood that some or all of the shelves in any of the sections may be made horizontal.

Illustrated in FIGS. **10–13** is Section C of the module according to the present invention. This section is comprised of a generally arcuate outer front wall **61** and a pair of spaced upstanding end walls **62**. Body portion **60** is provided with a horizontal counter **63** intermediate its height and at the same level as counter **33** of Section A. A sink **64** and water supply faucet **65** are mounted in the counter toward outer wall **61**, as shown in FIG. **13**.

Mounted above counter **63** and sink **64** are a plurality of vertically spaced shelves **66** inclined downwardly and inwardly as best shown in FIG. **12**. These shelves are adjustably mounted by suitable supporting means in order that the vertical spacing, as well as the angle of inclination, may be varied. The upper shelves extend progressively farther inwardly than the intermediate shelves to permit easy access thereto. Situated below counter **63** is a refrigeration unit **67** having suitable compressor means **68** associated therewith.

One end of the Section C additionally may be provided with a full length closet **69**, closed by outwardly opening doors **70**. Also a full length open compartment **71** may be provided on the same end of Section C located adjacent to the closet **70**, as shown in FIGS. **11** and **13**. If Section C is incorporated in a module in the position shown in FIG. **2**, the open compartment **71** can be utilized to store a folding door which, when unfolded, would close and lock entrance **13** to the interior of module **10**.

As previously stated, the above-described Sections A, B and C may be incorporated into a single module **10**, as shown in FIG. **2**, whereby two A sections are positioned adjacent each other with one of the A sections having a C section on its other end and the other of the A sections having a B section at its other end. Thus these sections, when combined with ceiling panel **12**, base section **16** and canopy **20**, form an easily constructed selfcontained module which may be installed within another building. The unit thus described forms a very compact and self-sufficient dispensing module which may be constructed with a minimum of effort. Such a module not only provides a space sufficient to accommodate two or more people working on the inside with a considerable degree of comfort and convenience, but also provides a private consultation booth on the outside of the module for the convenience of customers or patients while an order is being filled.

Moreover, the counters **33** and **63** in Section A provide sufficient space for holding one or more typewriters, as well as appropriate files and records. This is particularly important when the module is used to dispense pharmaceuticals since it is desirable to have ready access to patient profile records as well as to information on specific drugs and other pharmaceutical supplies.

While the module **10** just described in Sections A, B and C forms a complete unit, certain optional features are also contemplated within the scope of the present invention. FIG. **14** discloses a partition **80** adapted to fit inside the module **10** and positioned between two A sections. As shown in FIGS. **14–16**, partition **80** is provided with a back extension or fin **81** adapted to fit between the end of the two A sections to secure the partition in place. The partition **80** further includes a counter **82** intermediate its height and at the same elevation as the counter **33** of each A section. Mounted on partition **81** above the counter **82** are a plurality of spaced horizontal shelves **83** on each side of the partition. The partition forms a convenient and easy method of sub-dividing the work area **12** within the module **10** to provide a greater degree of privacy for an operator or pharmacist working in front of each dispensing window **14**.

FIGS. **18–22** disclose still another optional feature of the present invention. Illustrated in these figures is a control or cashier's booth **90** adapted to be positioned under canopy **20** between the two dispensing windows **14** of adjacent A sections. Control booth **90** is comprised of a body portion **91** having a front wall **92** and two opposite side walls **93** and **94**. The front of the body portion **91** is further provided with a pair of side wall extensions **95** which flare outwardly and are covered on top by a panel **96** to form a small consultation enclosure **97** in front of the control booth **90**. The control booth **90** is provided intermediate its height with a counter **98** which extends generally all around the inside of the booth. Suitable additional shelves **99** may be provided under counter **98**, as shown in FIG. **20**. A compartment **100**, capable of being locked and suitable for storing cash or other valuables, is provided at the

front of booth **90** underneath counter **98** and shelf **99,** as shown in FIG. **20.**

Front wall **92** and side walls **93** and **94** of the booth **90** are each provided with a window **101.** As shown in FIGS. **20, 21** and **22,** each window **101** is provided with a lower opening **102.** Small circular openings **103** may be provided above each opening **102** to permit communication between a cashier or other operator inside the booth and a customer on the outside.

Referring particularly to FIGS. **19** and **21,** it will be seen that side wall **93** is provided with a door **104** extending from the top to the bottom of the side wall to permit access to the booth **90.** Counter **98** is hinged at **105** in front of door **104** to permit a portion of the counter to be raised to permit entering or leaving of the booth **90.**

It will be observed that by providing windows on the sides as well as in the front of booth **90,** convenient means are available for collecting money from the people who are serviced at dispensing windows **14** or for communicating with people who come directly to the front of the booth.

While it is desirable to form a module of generally circular configuration as shown in FIGS. **1** and **2,** it is also possible to position two arcuate sections, as as two Sections A shown in FIG. **17,** immediately adjacent and in line with each other so that the outer walls form a generally V-shaped pocket or indentation at the meeting corners. With such a configuration of two arcuate sections, it is also within the scope of the invention to fill that V-shaped space with a flat panel **105** to form a continuous front wall.

Although the present invention has been illustrated and described with reference to specific embodiments, it will be understood that various modifications may be made by persons skilled in the art without departing from the spirit of the invention which is defined solely by the appended claims.

I claim:

1. An article storing and dispensing module having a plurality of interchangeably arranged storing and dispensing sections in a generally arcuate configuration wherein said module comprises

a body portion of generally arcuate configuration having a generally arcuate outer front-wall and a pair of spaced end walls, said body portion being composed of a plurality of said sections wherein said outer front-wall of at least one of said sections defines an opening for dispensing articles therefrom and having means for closing said opening, and

a plurality of vertically spaced shelves in at least one of said sections having adjustable means for mounting said shelves at an incline in said section whereby each of said shelves slants from the outside of said section toward the inside thereof, the shelves adjacent the top of said section extending progressively father inwardly than the shelves intermediate said body portion to facilitate access thereto, wherein said outer wall of at least one of said sections includes at least one normally closed door therein for easy access to the outer ends of said shelves where said door is opened to permit said shelves to be filled with articles.

2. An article storing and dispensing module as defined in claim **1** which includes a ceiling panel covering the top of the area defined by said body portion, said ceiling panel containing electrical, heating and cooling connections.

3. An article storing and dispensing module as defined in claim **2** which includes a refrigerator unit and a sink unit mounted in one of said sections.

4. An article storing and dispensing module as defined in claim **3** wherein at least one of said sections has vertically spaced shelves having adjustable means for mounting said shelves in the horizontal plane.

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