Jan. 10, 1967 A. C. BRADER 3,297,372

STORING AND DISPENSING APPARATUS

Filed Feb. 19, 1965 4 Sheets-Sheet 1

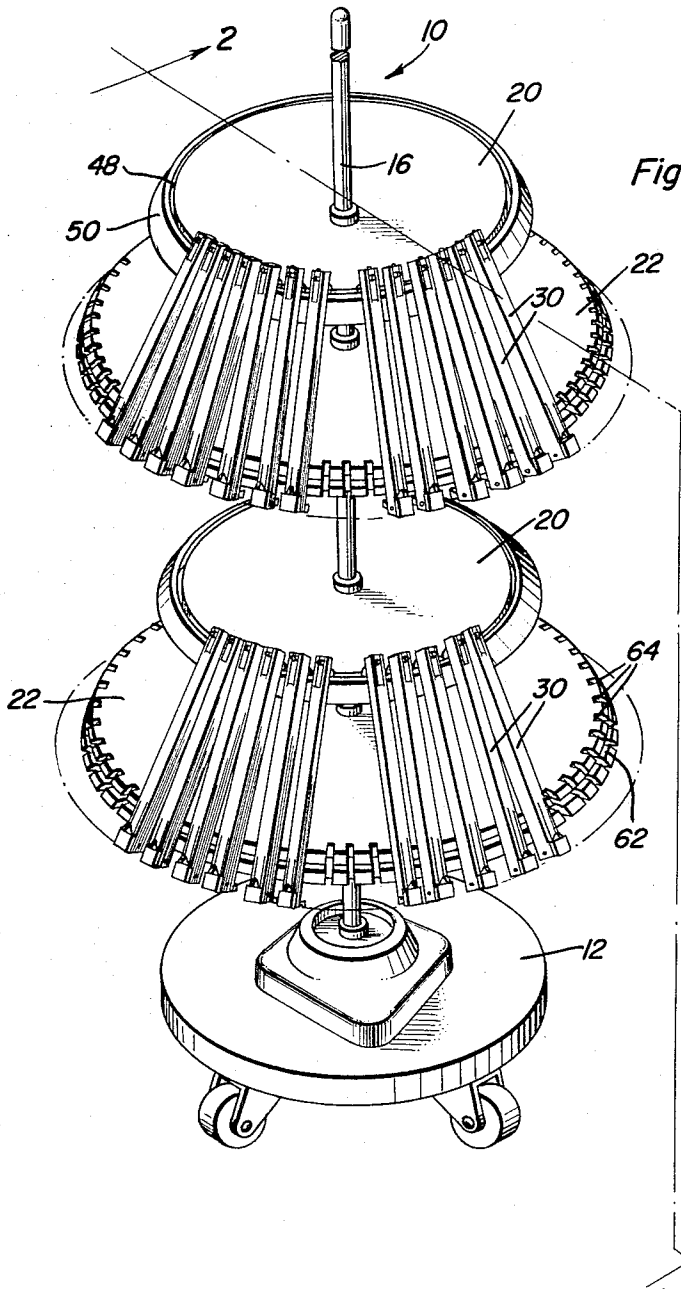


Fig. 1

Allen C. Brader
INVENTOR.

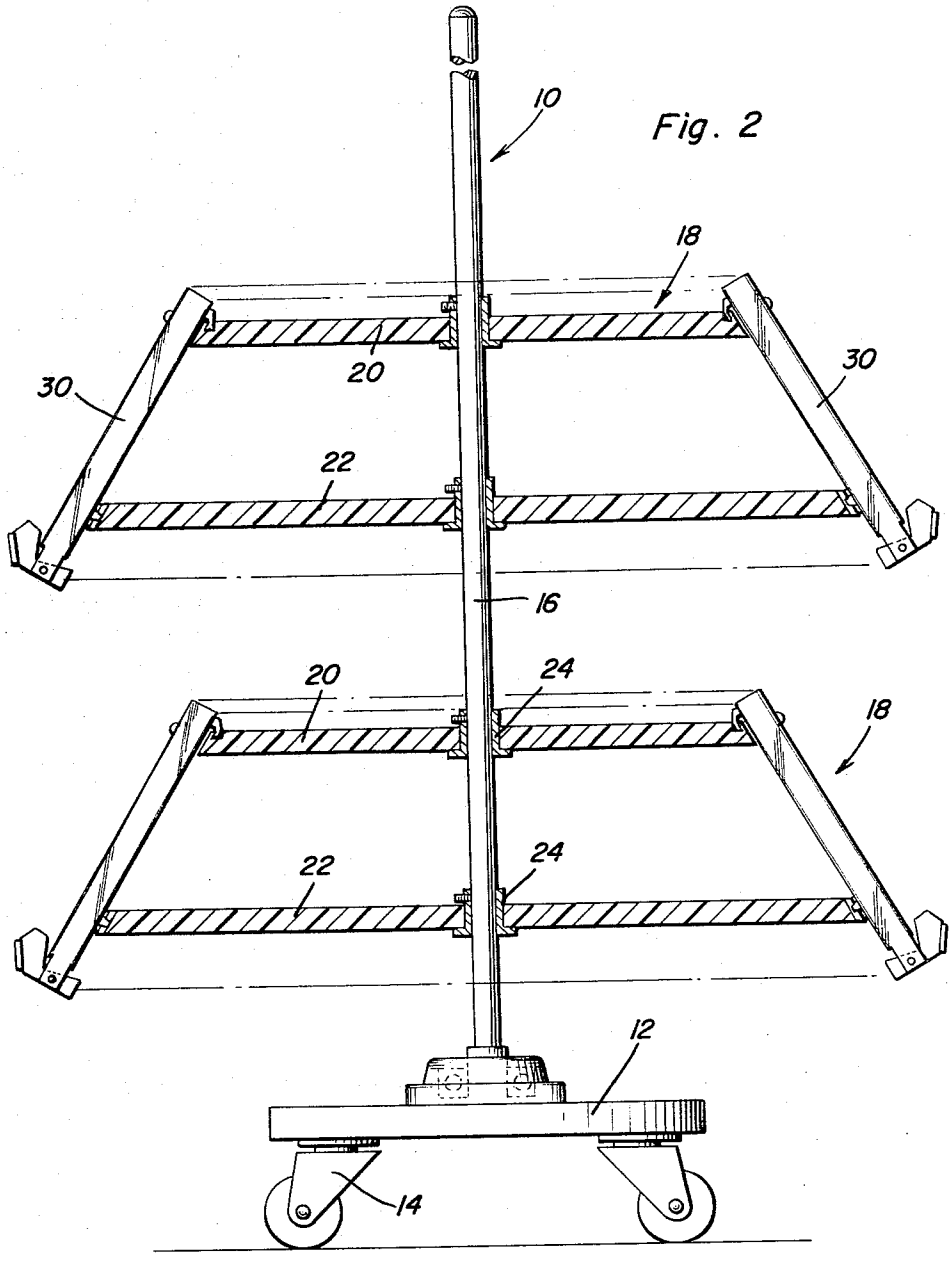
BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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STORING AND DISPENSING APPARATUS

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Fig. 2



Allen C. Brader
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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STORING AND DISPENSING APPARATUS

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Fig. 3

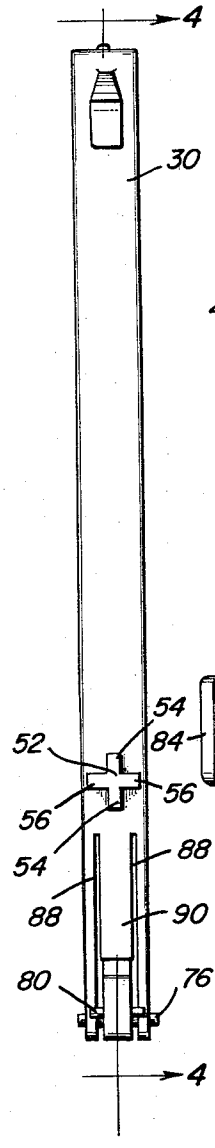


Fig. 4

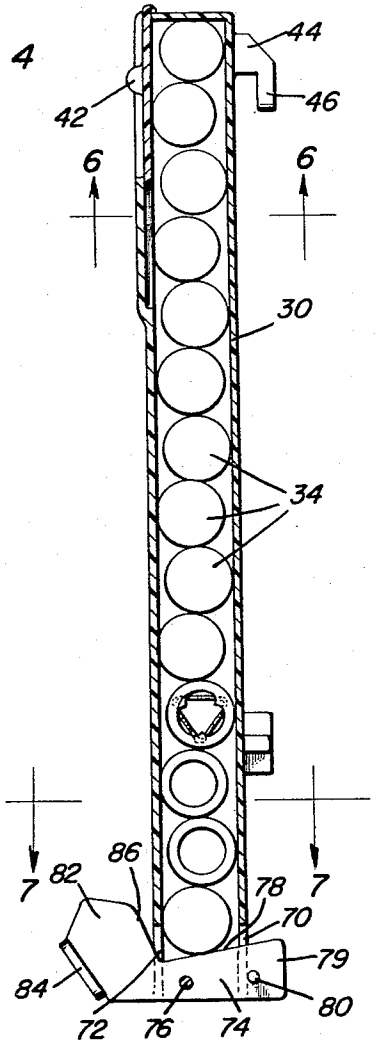


Fig. 5

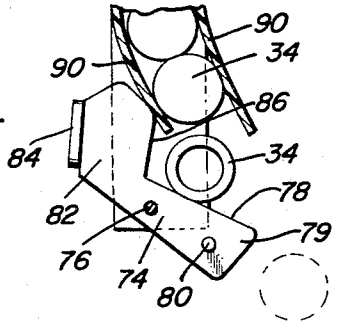
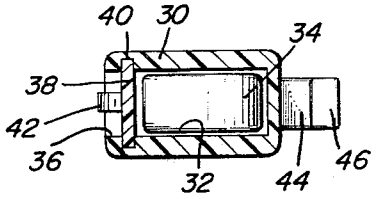


Fig. 6



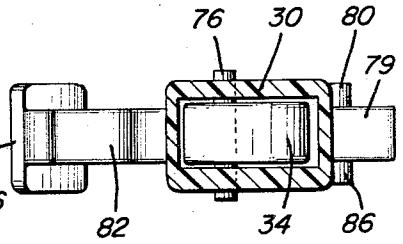


Fig. 7

Allen C. Brader
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson
Attorneys

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STORING AND DISPENSING APPARATUS

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Fig. 8

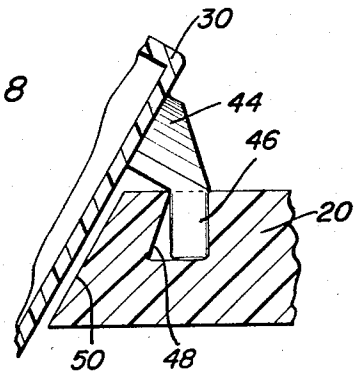


Fig. 11

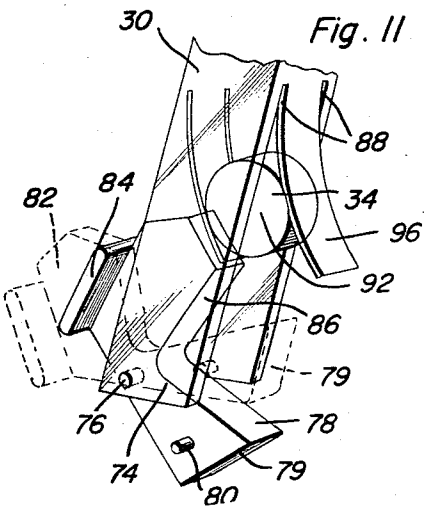


Fig. 9

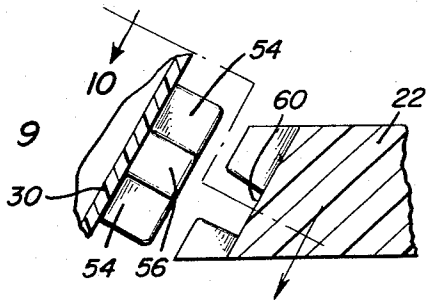
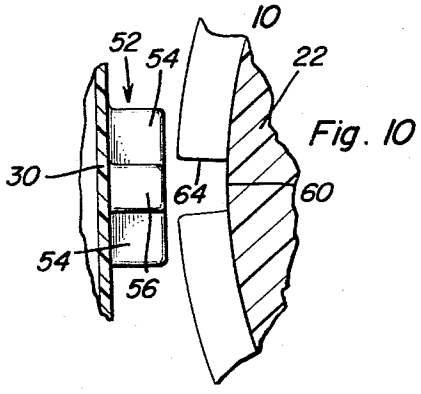


Fig. 10



Allen C. Brader

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

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3,297,372

STORING AND DISPENSING APPARATUS

Allen C. Brader, 1350 Hamilton St.,
Allentown, Pa. 18102

Filed Feb. 19, 1965, Ser. No. 434,031
2 Claims. (Cl. 312—45)

This invention comprises a novel and useful storing and dispensing apparatus for dental parts and more particularly pertains to a display stand and storage device for rendering readily visible and conveniently accessible any one of a large number of different sizes and types of relatively small articles such as dental parts.

Although the principles of the invention have been shown as applied to a device particularly adapted for use by dental surgeons and others for rendering accessible and readily visible a very large number of minutely different parts which the dental surgeon must maintain in stock, is also generally applicable to the storage, display and rendering conveniently accessible of a large number of different sizes, shapes and classifications of articles.

Dentists and dental surgeons in the performance of their work necessarily stock and use a large number of relatively small dental parts. For example, it is necessary to maintain in stock the following groups of items:

(1) Incisor bands (3 types)
(2) Cuspid bands
(3) Bicuspid bands
(4) Upper molar bands
(5) Lower molar bands
(6) Various attachments and auxiliaries

Further, in each of the six groups above, there may exist up to thirty-five different sizes.

The present system now necessarily employed by dentists and dental surgeons for the storage of the necessary dental parts is inadequate, inefficient, involves a wasteage of time and space all of which is objectionable.

It is therefore the basic purpose of this invention to provide a system for the storing and dispensing of dental parts which will reduce to a minimum the inefficiency and disadvantages of the present haphazard system for the storage and dispensing of parts.

Basically, it is the primary object of this invention to provide a system which will enable the entire inventory of dental parts, commonly employed by the dentist or dental surgeon to be instantly available, clearly visible and conveniently at his finger tips during his dental operations. By way of example, this invention comprehends the provision of a display stand and storage cabinet in which may be stored in a space of approximately 15″ x 15″ x 15″ up to 2500 items in the above groups in a manner which will permit complete visibility of all of the items, ready accessibility of any selected item and wherein all of the items will be disposed within inches of their intended place of use.

It is a further and more specific object of the invention to provide a combined storage and display stand having a plurality of separately removable receptacles each of which contains a group of a selected article and whereby the receptacle itself may be so mounted as to be readily accessible and to permit easy manual release of articles singly therefrom.

A further object of the invention is to provide a receptacle in accordance with the foregoing object which will enable the articles stored in the receptacle to be gravity fed therefrom and readily recharged into the receptacle if necessary, and yet whereby the receptacle is of such an inexpensive construction that it may be readily disposable and may conveniently serve as the package by which the articles are supplied by the manufacturer to the dentist or dental surgeon.

A further object of the invention is to provide a display stand in accordance with the preceding objects in which a plurality of article containing receptacles may be individually readily attached to the display stand in such a manner that they are all readily visible and whereby the receptacles may be readily rotatable to accessibly position any individual receptacle for the use of the operator.

A still further object of the invention is to provide a system for the storage and accessibility of dental articles which will provide the dentist with a visual inventory of his entire stock and also wherein the entire stock of articles may be individually readily accessible for immediate use with a minimum requirement of time and labor for selecting the desired article for use.

Still another object of the invention is to provide a device in accordance with the preceding object which shall include a receptacle for small articles of a disk-like configuration and which receptacle shall include a simple but effective means for manually singly releasing articles by gravity from the lower end of the receptacle.

An additional object of the invention is to provide a system for the storage and handling of small dental articles and the like in which a plurality of holders of a disk-like configuration are stored in a receptacle for the dispensing therefrom singly by gravity where each holder shall contain in properly oriented position therein a dental article, appliance or attachment in a manner facilitating its placement and further manipulation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construtcion and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of an exemplary embodiment of a display stand and dispenser in accordance with this invention, a number of the detachable receptacles being omitted therefrom in the interest of clarity;

FIGURE 2 is a view taken in vertical central longitudinal section upon an enlarged scale substantially upon the plane indicated by section line 2—2 of FIGURE 1 and showing more particularly the structure and mounting of the support racks and of the disposition of the article receptacles thereon;

FIGURE 3 is an elevational view of one of the removable receptacles taken from the back side thereof;

FIGURE 4 is a view in vertical central longitudinal section through the receptacle of FIGURE 3 taken substantially upon the plane indicated by the section line 4—4 of FIGURE 3 and showing the provision of a plurality of articles within the receptacle;

FIGURE 5 is a view of the lower portion of FIGURE 4 but with the dispensing valve or lever being shown in dispensing position;

FIGURES 6 and 7 are horizontal sectional detail views taken upon an enlarged scale substantially upon the planes indicated by section lines 6—6 and 7—7 respectively of FIGURE 4;

FIGURE 8 is a detail view taken upon an enlarged scale and in vertical section and showing the releasable attachment of the upper portion of a receptacle to the upper member of a support rack;

FIGURE 9 is a detail view taken upon an enlarged scale and in vertical section of the cooperating portions of the lower portion of a receptacle and the lower member of a support rack;

FIGURE 10 is a further detail view taken in section upon the plane indicated by broken section line 10—10 of FIGURE 9; and

FIGURE 11 is a perspective view of a lower portion of a receptacle and of the manual article dispensing mechanism therefor showing in full lines the position of the parts during dispensing and with the dispensing lever being indicated in dotted lines in its rest position.

In FIGURE 1, there is shown a display stand indicated generally by the numeral **10** and which is of the well-known Lazy Susan type. As shown in FIGURES 1 and 2, the display stand is of a readily mobile character including a base member **12** having supporting casters **14** by which the device may be readily shifted about the floor into convenient proximity to the chair of a patient undergoing dental treatment. Conveniently, the stand may be disposed between a number of chairs so that the dental specialist may move from patient to patient during various stages of the treatment of each with a minimum loss of time and with a maximum convenience of the dental articles carried by the display stand.

Mounted upon the base **12** and arising therefrom is an upstanding standard **16** in the form of a rod or the like upon which is rotatably mounted one or more vertically spaced support racks each indicated generally by the numeral **18**. In some instance, the support racks may be rigidly attached to the standard **16** which in turn will be revolubly supported upon the base **12**. Alternatively, however, and preferably, the support racks are journalled upon the standard for rotation individually thereabout.

By way of example, each support rack may comprise a pair of upper and lower members **20** and **22** of any suitable material and preferably of a disk-like configuration. The upper member is of lesser diameter than the lower member and the outer periphery of each is beveled as shown best in FIGURE 2 so as to define by the two peripheries of the upper and lower member a conical surface. Each member may be secured as by bushings **24** in any suitable manner upon the standard **16** either for fixed engagement therewith or for rotation thereabout as previously stated. Inasmuch as the details of the Lazy Susan construction in itself form no part of the present invention, and are well understood by those skilled in the art, a further description thereof is deemed to be unnecessary.

Supported upon the periphery of each of the support racks **18** is a plurality of individually detachable receptacles each indicated by the numeral **30** and preferably of a particular construction to be set forth hereinafter. It will thus be seen from FIGURE 1 that the plurality of receptacles are disposed upon the upper and lower members of their associated support rack about the surface of a cone so that the receptacles are each inclined to the vertical in a manner which will render more compact the mounting of a plurality of receptacles upon the device and also render readily visible each receptacle and inasmuch as the latter is preferably of transparent plastic material, subject the contents of the receptacles to easy visual inspection.

It is contemplated that each receptacle shall contain one size of a plurality of articles of a given group or classification.

The receptacle itself thus may constitute the original container in which the articles are packaged by the manufacturer and delivered to the dentist and are then directly mounted upon a support rack in readiness for use. With this type of receptacle and storage and display means, it is thus evident that the dentist will immediately be aware of the size of his stock of that particular part thereby facilitating his inventory and re-ordering of parts as necessary.

Attention is now directed specifically to FIGURES 3, 4, 6 and 7 for an understanding of the preferred construction of the receptacle **30**. Each of these receptacles is preferably of a transparent plastic material which may be economically fabricated as by injection extrusion or the like and is of a sufficient low cost to be readily disposable after use. The receptacle is a tubular body open at its lower end and preferably having a closed top wall or an open top with a removable closure. The receptacle is of rectangular cross section as will be apparent from FIGURES 6 and 7 and provides a vertical, hollow chamber **32** therein of sufficient size to loosely receive a plurality of cylindrical or disk-like articles **34** disposed in a vertical stack and in a manner to be fed by gravity to the open lower discharge end of the receptacle. A wide variety of shapes and types of articles may be stored in the receptacles. Thus, cylindrical objects such as bands and the like may themselves constitute the article so stored. On the other hand, articles of a disk-like or spherical configuration may be stored and dispensed and the articles may be mounted in holders of a disk-like configuration to facilitate their storage and dispensing from the receptacle and the subsequent handling and utilization as set forth hereinafter.

At its upper end, the receptacle is shown provided with a charging or access opening **36** in its side wall through which articles may be fed into the receptacle for charging the latter.

A slidable closure plate **38**, received in keyways or channels **40** in the adjacent faces of the two side walls of the receptacle and provided with a finger-grip projection **42** is also provided to facilitate uncovering the charging opening and closing the latter.

A pair of fastening means are provided by which each receptacle may be readily detachably mounted upon the upper and lower members **20** and **22** of its associated support rack. The upper fastening means, see also FIGURE 8, comprises a laterally projecting bracket or lug **44** having a downwardly extending hook **46** which is adapted to be loosely engaged in a seat consisting of an annular groove or channel **48** formed in the top surface of the support rack member **20**. It will be observed that the peripheral surface **50** of the upper support member is beveled or is inclined at an angle to the vertical so that the side of the receptacle will rest thereagainst when the hook **46** of the fastener is disposed in the seat or channel **48**.

Adjacent its lower end, the receptacle is provided with a second fastener of a somewhat more complex construction. A second fastener, see also FIGURES 9 and 10, consists of a projection **52** disposed on the same side of the receptacle **30** and underlying the upper fastener **44**, and which is preferably of a cruciform shape as will be best seen from FIGURE 3. For this purpose, the second or lower fastener projection includes a pair of ribs or wings **54** and a pair of laterally projecting wings **56**.

Cooperating with the cruciform shaped lower fastener **52** are complementary seats upon the lower member **22** of its associated support rack. Thus, the beveled peripheral surface **60** of the lower support rack member **22** is provided with an annular channel or recess **62** extending medially about this bevel surface as shown in FIGURE 1 and a series of vertically extending recesses or grooves **64** intersecting across the channel **62** to thus provide a plurality of circumferentially spaced cruciform-shaped recesses or sockets each of which receives one of the lower fasteners **52**. As will be appreciated, the adjacent cooperating surfaces of the lower fastener **52** and of the corresponding seat in the support rack lower member **22** have vertical and horizontally extending surfaces which are engaged with each other and thus firmly secure the lower portion of the receptacle against circumferential lateral displacement, with the weight of the receptacle being carried by the upper fastener **42** and lying against the two bevel surfaces **50** and **60** of the upper and lower members of their associated support rack.

As will be apparent, the lower end of the receptacle may be moved inwardly or outwardly to facilitate applying of the receptacle to the support rack or removing the latter therefrom.

As more clearly shown in FIGURE 2, the lower portion of each receptacle projects downwardly below the lower support bracket member **22**. Further, the upper portion

of the receptacle underlies the immediately superposed support rack and receptacles carried thereby, by virtue of the conical disposition of the receptacles, effecting a much more compact and accessible nested arrangement of the receptacles upon the display stand.

Attention is now directed more specifically to FIGURES 3–5, 7 and 11 for an understanding of the manually operated dispensing means for each of the receptacles.

As previously mentioned, the lower end of each receptacle is open and constitutes its discharge end. The bottom portion of the two end walls of the receptacle at the open lower end are vertically notched or slotted as at **70** and **72** to receive movably therethrough a horizontally projecting member **74** in the form of a lever and manually operated release valve. This member is pivoted by a transverse pivot pin **76** to the side walls of the receptacle and has an inwardly downwardly inclined top surface **78** against which the lowermost of the articles **34** within the receptacle rest. The slope of the surface **78** tends to retain the articles towards what may be termed the back wall of the receptacle which is actually the outer face of the receptacle as viewed in FIGURE 2. The member **74** projects at both ends outwardly of the receptacle having a dispensing end **79** with transversely extending stop pins **80** which are engageable against the associated end wall of the receptacle on opposite sides of the slot **70** to limit upward pivoting of the member **74** about its support pivot **76**. The opposite end of the member **74** is provided with an enlarged finger-grip member **82** provided with a transversely extending plate or wing **84** constituting a push member. The member **82** has an inner surface **86** which is substantially perpendicular to the surface **78** and which constitutes a thrust surface, when the valve member **74** is depressed inwardly as shown in FIGURE 5, to force the lowermost article **34** outwardly from the receptacle.

During this operation it will be apparent that the portion **82** will move into and out of the receptacle through the slot **72**, its inward movement being limited by arrangement of the plates **84** with the associated side of the receptacle on opposite sides of the slot **72**, while movement of the valve member **74** in the reverse direction is limited by engagement of the stop pin **80** with the sides of the receptacle on opposite sides of the slot **70** as previously mentioned.

Referring now especially to FIGURE 11, it will be noted that the end walls of the receptacle **30** above the valve receiving slots **70** and **72** are each provided with a pair of vertically extending slits **88** which thus define therebetween flexible strips **90**. The lower end of each strip is thus free to flex laterally of the receptacle due to its inherent resiliency, the strips normally being straight and one of them closing a dispensing opening **92** which is defined by the two slits **88** above the slot **70**.

The inherent resiliency of the slit strips **90** is such that they will normally retain the articles within the receptacles in the position shown in FIGURE 4. It is contemplated that the material of the receptacle and walls in which the slits are formed will be of a predetermined thickness sufficient to afford the desired degree of resiliency and stiffness to the strip. However, if desired to dispense an article, the operator merely engages that portion of the two wings **84** of the manually operated valve **74**, pushes inwardly to move the valve member in the position shown in FIGURE 5. This inward movement presses inwardly the slit strip **90** on the outer side of the receptacle, presses the adjacent article **34** against the strip **90** on the inner side of the receptacle and thus moves the article itself through the receptacle. During this function, the thrust surface **86** on the valve member **74** pushes the lowermost article **34** so that it passes below the outwardly flared strip **90** and is discharged to the exterior of the receptacle by the hand of the user.

At the same time, that the lowermost article is being dispensed, the flexing of the two strips **90** tends to close off the receptacle and confine the article immediately thereabove, as will be readily apparent from FIGURE 5 so that only one article can be dispensed at a time. When the dispensing valve is released, the inherent flexibility of the strips **90** will tend to move towards the left as viewed in FIGURE 5, restoring the dispensing lever to its original position in FIGURE 4, then releasing the now lowermost article so that it may drop into its dispensing position upon the surface **78** of the dispensing lever in readiness for next operation.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A dispensing receptacle comprising a body having a vertically extending storage chamber therein for receiving a vertical stack of articles of a disk-like configuration, said body having a vertically elongated dispensing opening in the lower portion of a side wall opening into said chamber, through which articles may be dispensed, a pair of vertically elongated slits in each of a pair of opposed side walls of said body extending upwardly from the bottom of said dispensing opening and one pair of slits defining said dispensing opening, a pair of resilient strips each disposed between a pair of said slits and each strip having its upper end mounted on said side wall and having its lower end freely movable laterally of said chamber and adjacent and above the lower end of said dispensing opening and confining articles in said chamber, a dispensing lever pivotally mounted in said chamber and including a support surface supporting the lowermost article of a stack in said chamber adjacent said dispensing opening, said lever having a vertically extending thrust surface upon the exterior of said receptacle positioned for engagement with the adjacent strip upon pivoting of said lever, whereby said adjacent strip will be flexed toward the other strip and will frictionally and resiliently grip the next lowermost article while the lowermost article is discharged through said dispensing opening.

2. The combination of claim **1** wherein the lower end of said body is open, opposite walls of said body lower end having vertical slots in which said lever is movably received, said lever extending across said chamber and blocking passage of articles through said open lower end.

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CLAUDE A. LE ROY, *Primary Examiner.*

JOHN PETO, *Examiner.*