Jan. 24, 1967 J. H. ROHR 3,300,055

RACK

Filed Dec. 14, 1964

Fig. 1.

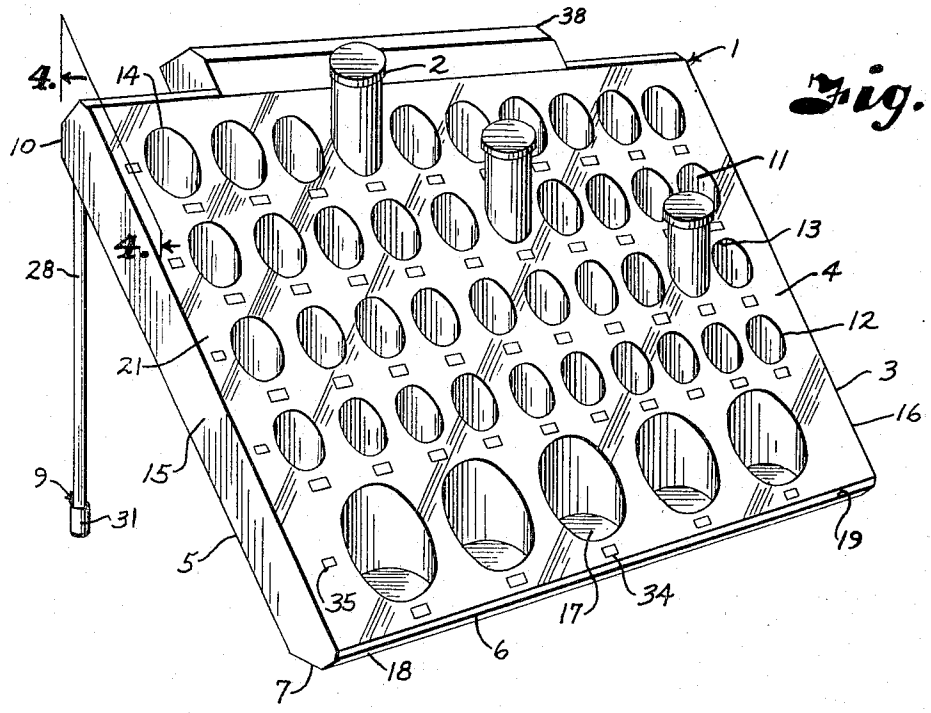


Fig. 3.

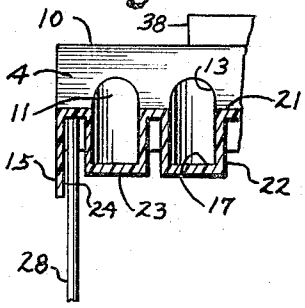


Fig. 2.

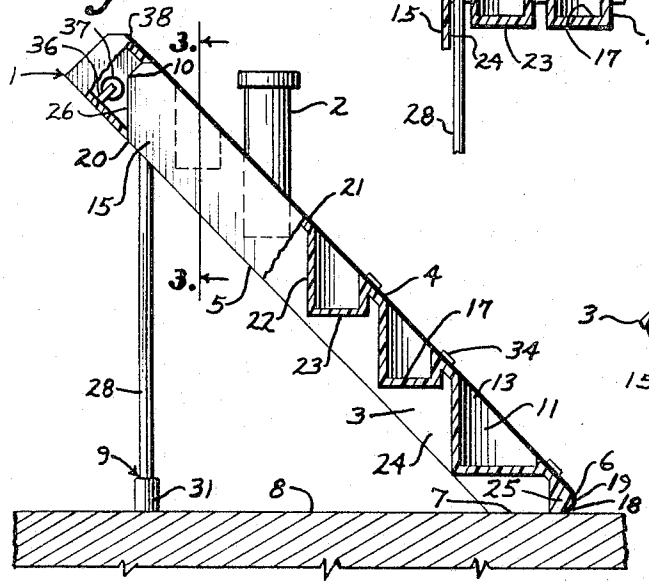
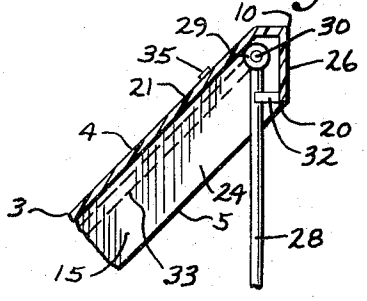


Fig. 4.



INVENTOR.
JOSEPH H. ROHR

BY
Fishburn and Gold
ATTORNEYS

United States Patent Office 3,300,055 Patented Jan. 24, 1967

3,300,055
RACK

Joseph H. Rohr, 6115 Martway, Mission, Kans. 66202

Filed Dec. 14, 1964, Ser. No. 418,221
2 Claims. (Cl. 211—74)

This invention relates to racks for holding bottles, vials and the like and has for its principal object to provide such a rack particularly adapted for holding vials of materials for facile use by doctors, laboratory technicians and the like, as for example, antigen dilutions for allergists.

Other objects of the present invention are to provide a rack structure with suitable supports wherein the rack plate when erected is inclined and has a plurality of spaced vial receiving recesses in rows with the rows at different elevations whereby the vials positioned therein are readily visible and accessible; to provide such a structure wherein the supports are in the forms of legs that are foldable to a collapsed position under the plate whereby the rack requires a minimum of space during storage; to provide such a rack plate of a substantially transparent plastic that is substantially unbreakable and that will withstand temperatures of an autoclave for sterilization; to provide such a rack of a plastic material capable of transmitting light with a light source at an edge directing light therein for transmission to the cavities and the vials and contents thereof positioned in the cavities to illuminate same; to provide such a rack with indicia or labels for each of the cavities to indicate the material in the vials contained therein, said indicia being fluorescent or illuminated to be readily legible in darkened surroundings; to provide such a rack of a material treated with anti-infectives to enhance the maintenance of sterility; and to provide a storage rack structure that forms clean sterilizable storage facilities for bottles, vials and the like with ready accessibility and visibility thereof particularly adapted to hold containers of diagnostic and/or treatment medical materials.

Other objects and advantages of this invention will become apparent from the following description taken in connection with the accompanying drawings wherein are set forth by way of illustration and example certain embodiments of this invention.

FIG. 1 is a perspective view of a rack embodying the features of the present invention.

FIG. 2 is a side elevational view of the rack with portions broken away to illustrate the arrangement of the light source and the cavities.

FIG. 3 is a vertical sectional view through the rack taken on the line 3—3, FIG. 2.

FIG. 4 is a vertical sectional view taken through the rack on the line 4—4, FIG. 1.

Referring more in detail to the drawings:

The reference numeral **1** generally designates a support rack for holding bottles or vials **2** and particularly such vials having contents for use by doctors, laboratory technicians and the like as, for example, antigen dilutions for allergists. The rack **1** includes a plate or platform member **3** having a flat upper or front surface **4** and rear or bottom surfaces **5** on which the platform may be positioned in storage or when not in use. The platform portion of the rack is adapted to be arranged in inclined relationship and, in the structure illustrated, the inclination is approximately 45 degrees with the horizontal. The forward edge portion **6** has its lower portion cut away in angled relation to the face **4** to present faces or edges **7** adapted to rest flat on a support surface **8** when the platform is in inclined relation, as illustrated in FIGS. 1 and 2. Support members **9** are preferably arranged adjacent the rearward portion **10** of the platform and adapted to engage the support surface **8** in cooperation with the faces or edges **7** in forming a firm support for the platform **3** in inclined position.

A plurality of open top cavities **11** extend into the platform member **3** from the upper surface **4** and are of a size to receive lower portions of vials **2** to support same. It is preferred that the cavities be of suitable size and cross-sectional shape to substantially conform to the cross-sectional shape of the lower portion of the vials **2** adapted to be received therein. Various sized cavities for respective sized vials may be used. It is also preferred that the cavities be arranged in rows **12** that extend across the face **4** substantially parallel to the forward edge **6**. There are a plurality of cavities spaced apart in each of the rows **12** and the rows **12** are also spaced apart so that when the platform is arranged in inclined relation, as shown in FIG. 1, each of the rows **12** have their upper openings **13** of the cavities at different elevations, the rearmost rows being at a higher elevation than the next adjacent forward row. It is also preferred that where the cavities **11** in adjacent rows are of the same or substantially the same size that they be arranged whereby the cavities of one row are aligned with the cavities of the next row and form tiers or lines **14** of cavities that are in a line substantially parallel with the side edges **15** and **16** of the platform. Each of the cavities regardless of size extends into the platform at an angle to the plane of the surface **4**, the angle substantially corresponding to the angle of inclination of the surface **4** when the platform is in use, so that when the rack platform is supported as illustrated in FIGS. 1 and 2 the cavities **11** are substantially vertical. Also, the cavities extend into the platform and terminate in bottoms **17** that are preferably substantially horizontal when the platform is in inclined relation so as to aid in supporting the vials **2** in upright or vertical position. It is preferred that the platform member have substantially the same contour at the forward end portion **6** and rearward portion **10** for uniformity and apperance and, in the illustrated structure, the edge between the surface **4** and an end face **18** is beveled as at **19**. The end face **18** extends toward the bottom and terminates in the cut-away portion forming the faces on edges **7** at the forward end and the cut-away portion **20** at the rearward portion **10**.

The platform **3** may be of a solid member with the cavities **11** extending therein; however, for economy of manufacture, reduction of material and lightness in weight, it is preferred that the platform **3** be molded of a suitable synthetic resin or plastic wherein the surface **4** is on a front wall **21** and the cavities are defined by walls **22** depending from the front wall **21** and terminating in a bottom wall **23**, as illustrated in FIGS. 2 and 3 of the drawings. With this structure, the side edges **15** and **16** are on the side walls **24** that depend from the front wall **21**. In the molding operation, the forward portion is shaped as at **25** but the rearward portion **20** is formed by a wall **26** so that the structure may be re-

moved from a mold. It is also preferred that all of the surfaces of the platform be polished and smooth to facilitate cleaning.

The platform or plate **3** is of a material that can be sterilized or, in other words, able to withstand temperatures such as would be used in an autoclave for sterilizing purposes. It is also preferred that the material be a resin that is substantially transparent and may be made with a very small quantity of a colored dye so as to only give a slight tint with different colors providing a color coding for indicating different types of materials in the vials to be used in the rack. Resins that have good heat stability may be utilized as, for example, polycarbonate resin, polypropylene or the like that has a high heat distortion point and preferably transparent. For example, polycarbonate resin has a heat distortion point of approximately 290° F., polypropylene can withstand high temperatures and can be subjected to repeated sterilization with steam as it will withstand temperatures up to 300° F.

It is preferred that the platform **3** be molded of such a resin that is treated or includes an anti-infective that will resist contamination of the surfaces by organisms, bacteria or the like. It is found that when the platform is molded and a silicone release agent is applied to the mold surfaces and then the molding resin applied to the mold cavity, when the resin is hardened and the platform article removed from the mold cavity, there is a retention of some of the silicone at the surface areas of the platform and this silicone retained in the platform acts as an inhibitor of organisms or contaminants that might otherwise infect the surfaces of the platform. This facilitates maintaining a greater degree of continuing sterility.

With the molded platform, the support **9** is in the form of legs **28** having their upper ends pivotally mounted as at **29** by pivot pins **30** connected to the side walls **24**. The lower ends of the legs preferably have resilient tips **31** for engaging the supporting surface **88** and providing some non-skid characteristics. When the leg is pivoted to the erected position, it is engaged by a resilient clip member **32** that holds it in place. When it is desired to store the platform, the leg may be hinged to the position shown in the broken lines as at **33**, FIG. 4. When the contents of the vials in the various cavities differ, as for example each may have a different antigen and, therefore, a label **34** is preferably applied to the surface **4** adjacent the respective cavity **11**. Also, the rows may be of certain characteristics so that a label **35** is arranged to identify the respective rows, the label **35** being between the wall surface **15** and the first adjacent cavity of the respective row **12**. It is preferred that the identifying label be of fluorescent material or suitably illuminated so as to be readily legible in darkened surroundings.

To provide some illumination for facilitating selection of the particular vials in darkened surroundings, a light structure **36** is arranged adjacent one of the edges of the platform. In the structure illustrated, a light bulb **37** is suitably supported in a housing **38** arranged at the upper or rear edge portion **10** and connected to the platform so that when the bulb is energized light will be directed into the platform for transmission through the transparent plastic illuminating the vial cavities **11** and also the contents of the vials **2** in the respective cavities, this illumination aiding in the distinction between the vials. The lamp may be energized by conventional electrical sources; however, it is preferred that they be energized by suitable batteries (not shown) as, for example, solar cells so that the platforms and the vials thereon will be illuminated in the event of failure of the usual sources of power in the area.

With a rack structure constructed as described, the legs **28** may be folded and the platform laid with the surfaces **5** engaging the supporting surface **8** so that the structure requires little space in storage and with bottles or vials suitably sealed, they may be placed in the cavities while the structure is stored for later use. When it is desired to use the vials, the legs **28** are pivoted to the position for holding the platform in inclined relation with the support, said legs being engaged by the spring clips **32**. Then the platform is placed on a supporting surface **8** so that the platform is supported by the cushion ends **31** and the lower surfaces **7**. The light bulb **36** is energized so as to facilitate identifying the various vial contents. Due to the arrangement of the rows and tiers of cavities, each vial in the rack may be visible at all times and easily accessible so as to facilitate the doctor or technician being able to readily obtain the vial desired. It is believed that the rack structure provides a support for bottles or vials and the like wherein each are readily visible and accessible and also a structure that is easily maintained, that has a degree of continuing sterility and that may also be sterilized in autoclaves and the like.

It is to be understood that while I have illustrated and described one form of my invention, it is not to be limited to the specific form or arrangement of parts herein described and shown except insofar as such limitations are included in the claims.

What I claim and desire to secure by Letters Patent is:

1. A support rack for vials positioning same for ready visibility and accessibility comprising,

(a) a platform having a substantially flat upper surface and a plurality of open top vial receiving cavities extending into said platform at an angle to said upper surface, said cavities terminating in a bottom surface spaced below said platform upper surface,

(b) said platform being generally rectangular with opposed ends and opposed sides with said cavities being arranged in rows with a plurality in each row and a plurality of rows extending across said platform generally parallel with the sides thereof,

(c) said platform having elongate recesses extending substantially from side to side and spaced between the platform end and adjacent cavities,

(d) leg members in said recesses with one end of each pivotally connected to the platform adjacent one side with the other end of the legs adapted to swing downwardly and engage a supporting surface to hold said platform with the upper surface inclined and the legs extend from the platform generally at the angle of the cavities relative to the upper surface whereby the inclination of the platform positions the bottom of the cavities in horizontal planes and the cavities arranged to hold the vials positioned therein substantially vertically, the inclined arrangement of the upper surface of the platform positioning the rows of cavities at different elevations whereby the next adjacent rearward row of vials is at a higher elevation than the next forward row for visibility and accessibility of the vials,

(e) and resilient clip members in each recess adjacent said one side of the platform for engaging the respective leg when in a downwardly swung position to retain the leg in its platform supporting position.

2. A support rack for vials positioning same for ready visibility and accessibility comprising,

(a) a platform having a substantially rectangular top wall with a flat upper surface and integral downwardly extending side and end wall portions, said platform having a plurality of spaced open top vial receiving cavities with each defined by respective cavity side walls and a bottom wall integral with said top wall, said cavities extending downwardly at an angle to said upper surface with the bottom wall spaced below said upper surface, said platform side walls terminating in lower edges substantially parallel to said upper surface and below the bottom walls of the cavities whereby said lower edges are adapted to engage a supporting surface to support the platform in a generally horizontal position,

(b) said cavities being arranged in rows with a plurality

in each row and a plurality of rows extending across said platform,

(c) a leg positioned at each end of said platform between the platform end walls and the adjacent cavity walls,

(d) means pivotally mounting one end of the legs to the platform whereby the other end of said legs are swingable downwardly to engage a supporting surface to hold said platform with one side up and the other side portion engaging said supporting surface whereby the upper surface of the platform is inclined and the bottom of the cavities are in horizontal planes and the cavities arranged to hold the vials positioned therein substantially vertically,

(e) a resilient clip member for each leg fixed to the platform and engaged by the respective leg to retain the leg in platform supporting position.

References Cited by the Examiner

UNITED STATES PATENTS

1,604,509	10/1926	Caldwell	211—128
1,610,834	12/1926	Webster	211—74
2,012,983	9/1935	Bales	211—74
2,639,213	5/1953	Barth	18—47
2,653,893	9/1953	Romans	206—63.2 X
2,969,795	8/1959	Dean	131—144
3,138,253	6/1964	Harautuneian	206—63.2

OTHER REFERENCES

Silicones in Medicine and Surgery, Dow Corning Corp., 1957, page 5.

CLAUDE A. LE ROY, *Primary Examiner.*

R. P. SEITTER, *Assistant Examiner.*