

- [54] **TUBE STORAGE RACK**
- [72] Inventors: **Robert J. Mander, Mays Landing; Duane E. Ramm; Robert J. Simms, both of Vine-land, all of N.J.**
- [73] Assignee: **Owens-Illinois, Inc.**
- [22] Filed: **June 12, 1970**
- [21] Appl. No.: **45,725**

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Primary Examiner—Edward C. Allen
Assistant Examiner—Abraham Frankel
Attorney—E. J. Holler and Richard B. Dence

- [52] U.S. Cl.211/74, 206/65, 220/21, 220/97
- [51] Int. Cl.A47b 73/00
- [58] Field of Search211/72, 74, 73; 248/152; 220/97 F, 21; 206/65 A, 72; 217/26.5

[57] **ABSTRACT**

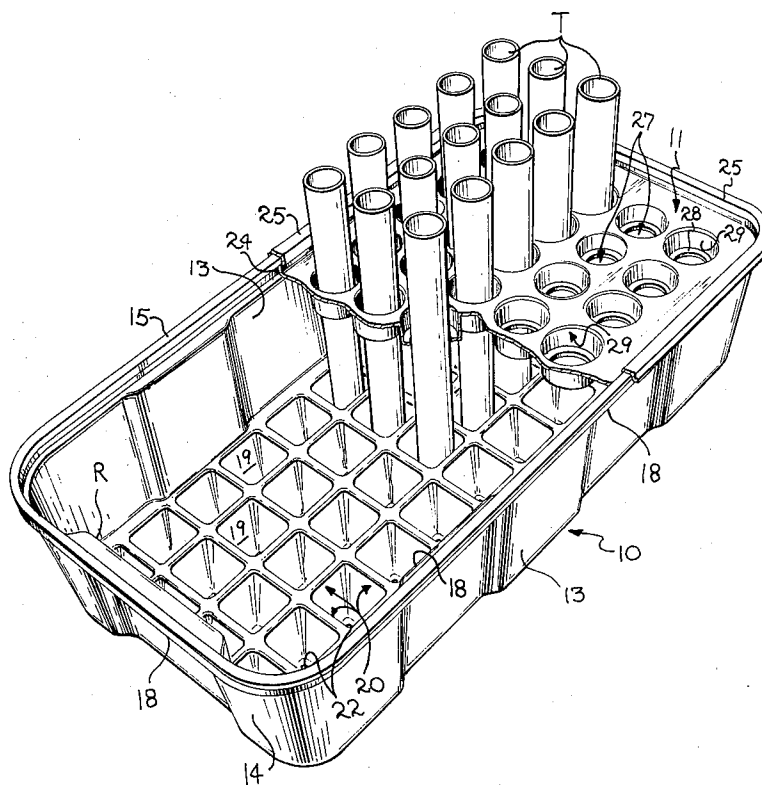
A storage rack for culture tubes or similar tubular articles is vacuum-formed from a plastic material, such as polypropylene and comprises two separably connected elements, one being a boxlike member with upstanding peripheral walls and a floor having a plurality of wells in which to receive the lower end of culture tubes or such articles and restrain them against lateral displacement and which also are provided with bottom drain openings for discharge of condensation. The other separably connected element which is in the form of a cover, or top-piece, separably attachable to the upper margin of the upstanding peripheral walls, has vertical, tube-receiving apertures with depending guide sleeves which are coaxial with the wells and which aid in initial placement of such tubes or articles in the rack.

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2 Claims, 3 Drawing Figures



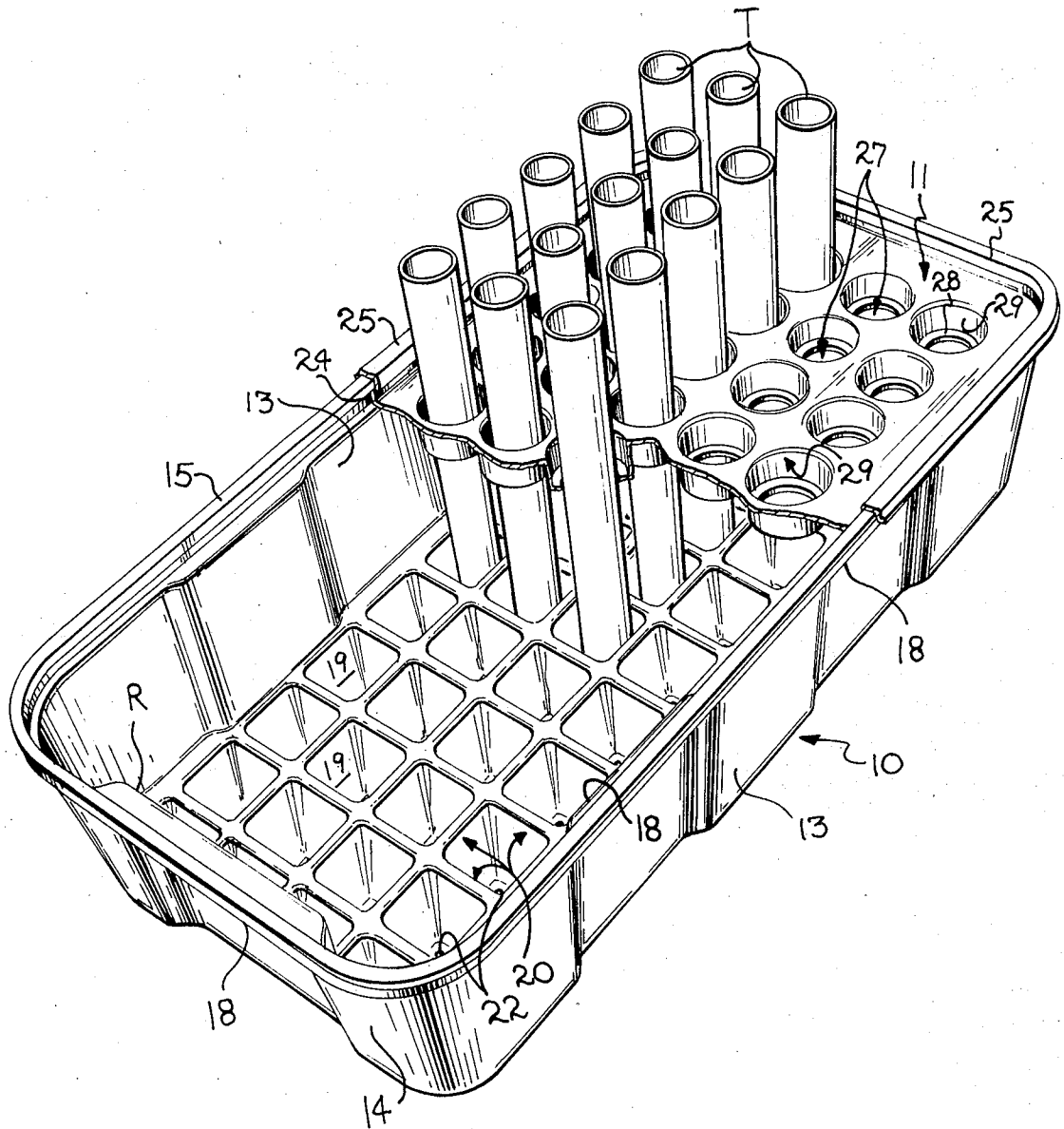


FIG. 1

INVENTORS
ROBERT J. MAUNDER
BY DUANE E. RAMM
ROBERT J. SIMMS
Richard B. Vance &
E. J. Holley
ATTORNEYS

FIG. 3

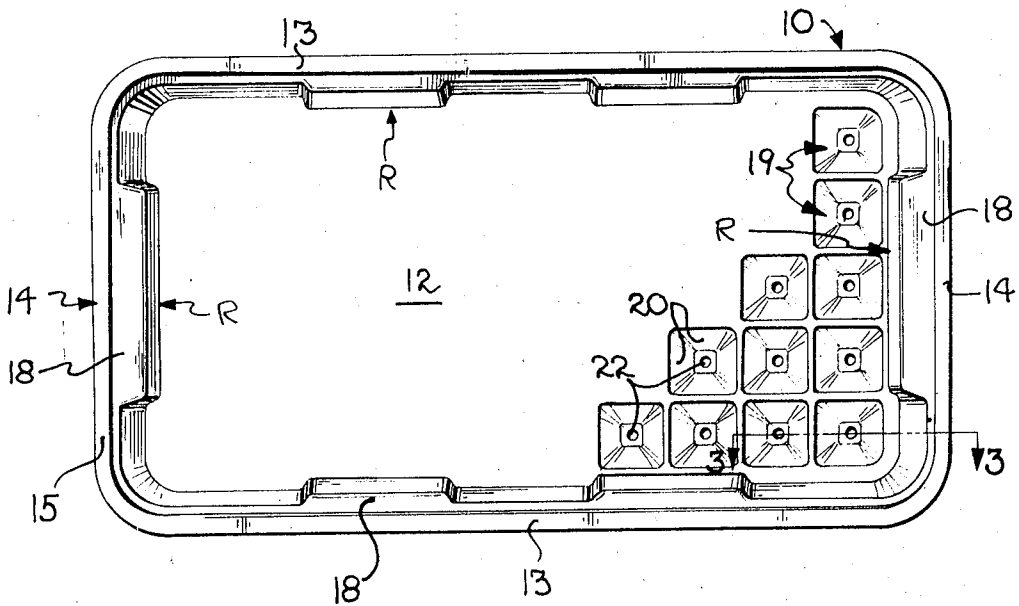
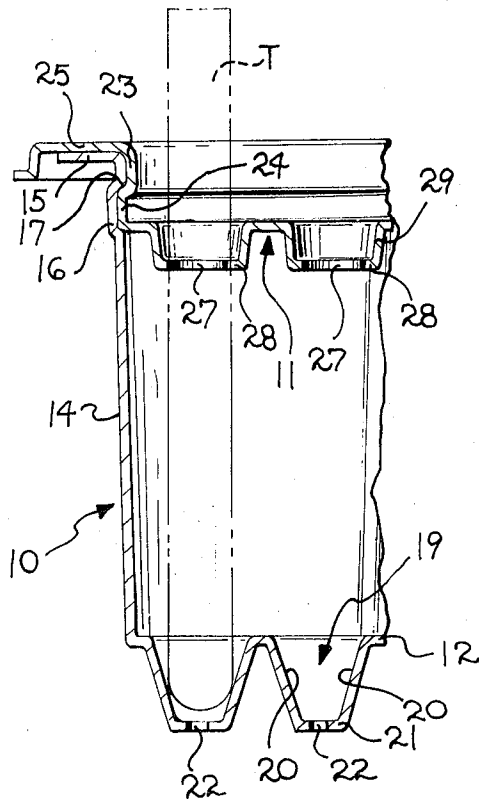


FIG. 2

INVENTORS
ROBERT J. MANDER
DUANE E. FARM
BY ROBERT J. SIMMS
*Richard Blance &
E. J. Holler*
ATTORNEYS

TUBE STORAGE RACK

An important objective of the present invention is the provision of tube storage racks which are constructed and formed in such manner that they may economically be discarded or disposed of after only a single use.

Another objective of the invention is the provision of tube storage racks formed from an inexpensive plastic material, which, along with tubes supported therein, may be safely autoclaved or sterilized, if required, without damaging affect or deformation of the racks.

It is also an object of this invention to provide a disposable tube storage rack of the foregoing type which is capable of accommodating a relatively wide range of tube sizes, both as to diameter and length.

A no less important objective of the present invention is to provide a plastic tube storage rack which is capable of supporting an array of tubes, such as culture tubes, in upright position therein and, by means of having a floor portion formed with a multiplicity of wells designed to accommodate the bottom end of the tubes, to restrain the tubes against undesirable lateral bodily displacement.

The specific nature of the present invention, as well as other objects, advantages and features thereof, will become readily apparent to those skilled in the art from the following detailed description taken in conjunction with the annexed sheets of drawings on which, by way of example only, the preferred embodiments of the invention are illustrated, and wherein:

FIG. 1 is a perspective view of the tube rack with a substantial portion of the cover element fragmentarily removed to more clearly depict the cooperative arrangement of the bottom wells and the tube-accommodating apertures in the cover element, or toppiece; and

FIG. 2 is a partial top plan view of the rack with the cover element or top piece removed and showing only a few of the tube accommodating wells; and

FIG. 3 is an enlarged fragmentary, sectionalized elevational view particularly showing the cooperative coaxial alignment of the bottom wells and apertures in the cover element, as well as in which the cover element and boxlike member are firmly yet separably interconnected in snug snap-fit relationship.

As best illustrated in FIG. 1, the present invention generally comprises two elements, viz: a generally rectangular boxlike member 10 and an apertured cover, or toppiece 11, which is dimensioned to substantially enclose the top of member 10 and to be separably, yet firmly secured to same.

The boxlike member 10 comprises a floor 12 and upstanding, integral, side and end walls 13 and 14 respectively, the latter, preferably tapering outwardly and upwardly (FIG. 3) and terminating in a continuous external horizontal flange 15. Spaced slightly below the flange 15 there is a hollow rib 16 projecting laterally outward from walls 13 and 14 and running substantially parallel with the flange 15, thus providing a continuous downwardly and inwardly facing shoulder 17, or abutment, intended for separable holding engagement with a portion of the cover element 11, as will be explained presently. At intervals along the side and end walls 13 and 14, respectively, external recesses R, or indentations, are provided which create convenient handles 18 which facilitate manual transport of the rack. The floor 12 of the boxlike member 10 is provided with a multiplicity of symmetrically arranged wells 19 which are individually designed to accommodate the closed bottom end of a tube T, such as a culture tube or other like article. Each such well 19 defines a noncircular peripheral configuration in top plan and preferably, though not necessarily defines a square configuration at the merger thereof with the floor 12. The sidewalls 20 of each well taper downwardly and inwardly and converge into a bottom 21 of relatively small area wherein a drain opening 22 is formed to provide a means for draining or discharging condensate formed, during autoclave cooling, on the interior rack surfaces. Since, as contrasted with the circular periphery of the tubes T, the walls 20 are noncircular in contour, it is evident that the tubes T cannot form a continuous band of peripheral contact with the walls 20 and thus cannot act as a valve and seal the wells, but

rather leave adequate clearance for passage and drainage of the condensate.

The interchangeable cover element, or toppiece 11, is a generally flat rectangular sheet of plastic material formed with an upstanding, continuous, peripheral wall 23 of such external dimensions that it fits snugly within the upper region of the walls of the boxlike bottom 10. A hollow external rib 24 situated substantially at the juncture of the cover 11 and the wall 23 is shaped to nest in snap-fit engagement with the hollow rib 16 and shoulder 17 portions of walls 13 and 14 of the boxlike member 10 and thus securely, yet separably interconnect the top-piece 11 and boxlike member in assembled relationship. At the upper end of the wall 23 is a continuous outwardly extending horizontal flange 25 which seats upon the flange 15 extending continuously along the upper margin of the side and end walls 13 and 14 respectively. The extreme outer margin of the flange 25 is turned downwardly and thence outwardly to present a generally rounded surface for hand contact. This cover element 11, or toppiece, is provided with a plurality of vertical apertures 27, or openings, which correspond in number to and are coaxially oriented with the aforementioned wells 19. Each such aperture 27, or opening, is formed in a floor 28 at the bottom of a depending tube guide-sleeve 29 which is formed integrally with the cover element. It is evident that glass culture tubes T, or other like articles positioned in the aligned apertures 27 and well 19, will be positively supported in an axially upright position facilitating transportation or movement of the rack and tubes as a unit from place to place quite safely and without tube dislocation. Moreover, both the apertures 27 and wells 19 are, within reasonable limits, dimensioned to accommodate tubes of varying diameter.

Preferably, the rack is vacuum-formed from polypropylene so that it will withstand steam and heat during autoclaving without damaging formation. Obviously, other materials may be employed, particularly if autoclaving is not necessary.

We claim:

1. A rack for storage of an array of axially elongated articles in upstanding relationship comprising:
 - a horizontally disposed wall,
 - a sidewall extending vertically from and continuously marginally encompassing said horizontally disposed wall and defining a boxlike storage compartment therewithin for said articles, said sidewall being provided with a rim portion in outwardly spaced relationship with said horizontally disposed wall and extending around said storage compartment,
 - said horizontally disposed wall forming the floor of said storage compartment and defining an array of mutually interspaced pockets recessed within and extending beneath said floor,
 - each of said pockets being noncircular in top contour and having sidewalls tapering downwardly and inwardly and converging with a bottom end portion defining a centrally located transverse drain opening, said sidewall also providing a discontinuous peripheral seat upon which to gravitationally rest a lower end portion of each of said articles in elevated relationship above each said drain opening and across which to accommodate continuous drainage flow between said storage compartment and each said drain opening,
 - a cover spanning said storage compartment having a marginal edge portion extending around and engaging said rim portion if said sidewall in snap-fit removable relationship, said cover being provided with an array of mutually interspaced transverse circular openings vertically oriented in axial alignment with said pockets and in which to accommodate and support said articles in upright position within said pockets.
2. A rack as defined in claim 1, wherein each of said pockets is provided with a generally rectangular top contour and wherein sidewalls of each of said pockets define a generally rectangular seat upon which to gravitationally rest a lower end portion of each of said articles.