Aug. 10, 1965 E. H. STRAUS ETAL 3,199,669

COMBINATION CONTAINER AND RACK

Filed Aug. 22, 1963 2 Sheets-Sheet 1

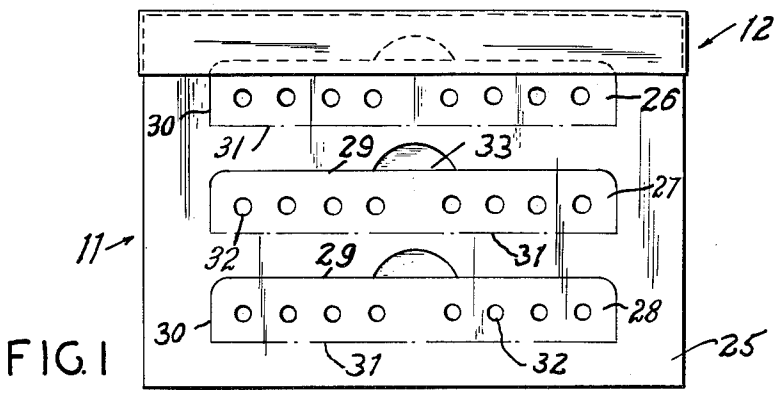


FIG. 1

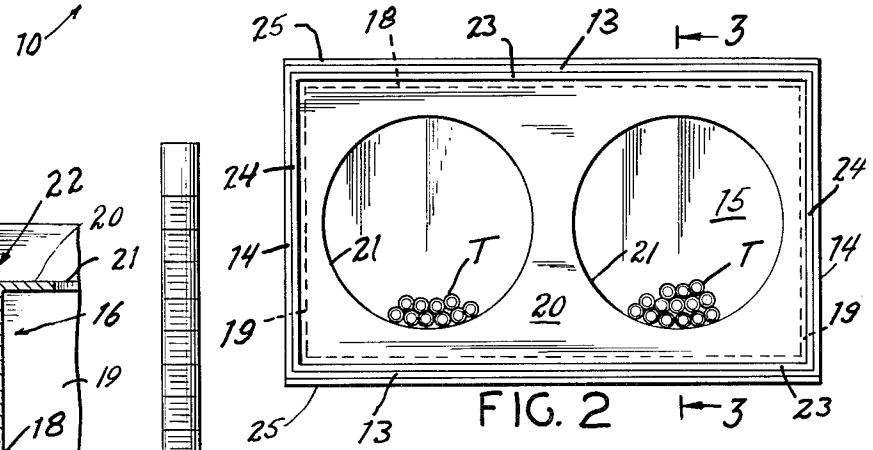


FIG. 2

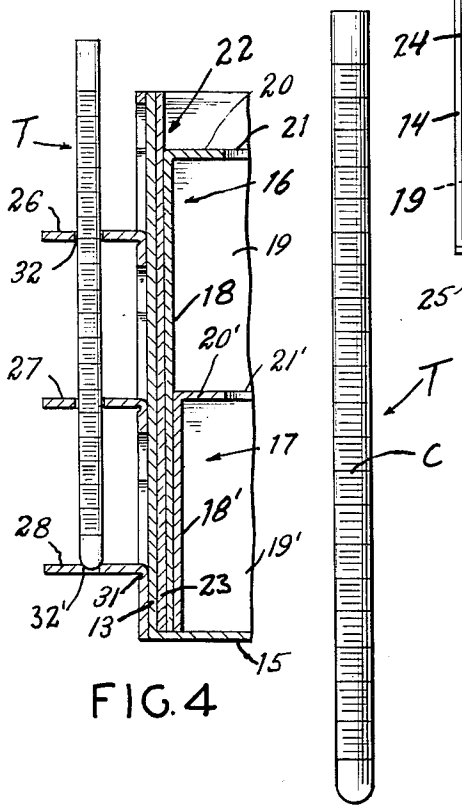


FIG. 4

FIG. 5

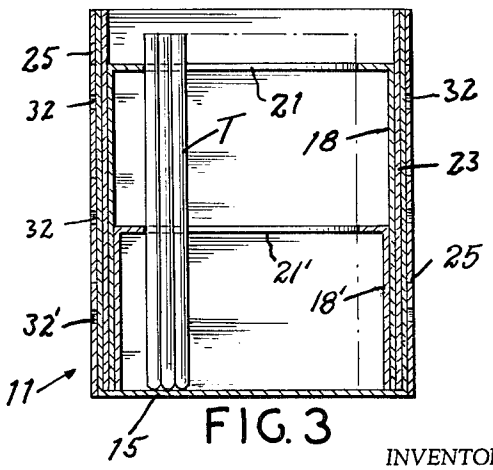


FIG. 3

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COMBINATION CONTAINER AND RACK

Filed Aug. 22, 1963 2 Sheets-Sheet 2

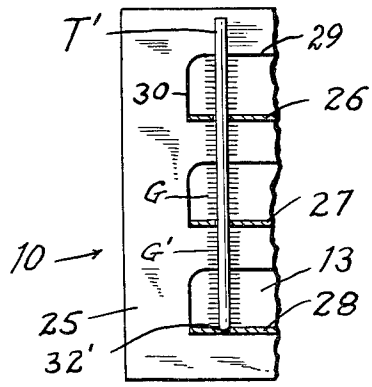


FIG. 6

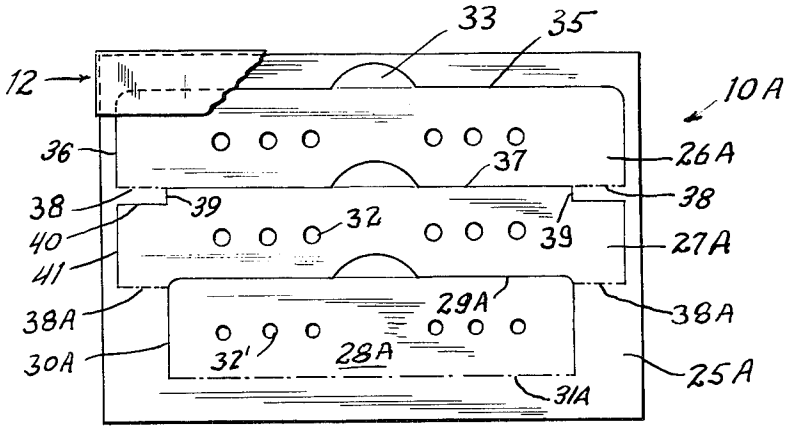
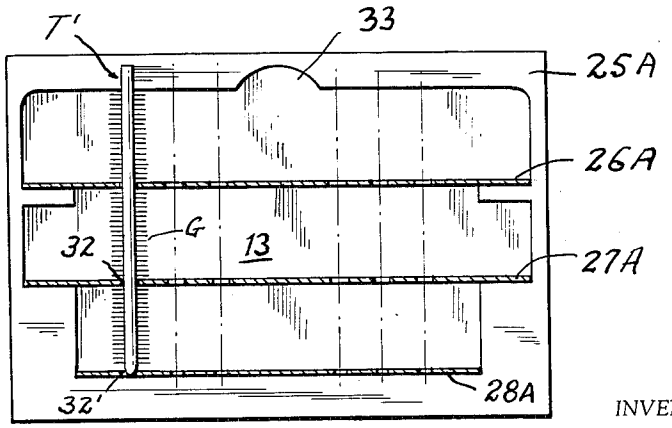


FIG. 7



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FIG. 8

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United States Patent Office 3,199,669 Patented Aug. 10, 1965

3,199,669

COMBINATION CONTAINER AND RACK

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Filed Aug. 22, 1963, Ser. No. 303,858
3 Claims. (Cl. 206—44.11)

This invention relates to a combination container and rack, and more particularly concerns a container for packaging graduated, liquid measuring tubes which can be converted into a rack for holding a selected number of such tubes.

Tubular containers of relatively small bore and carrying volumetric graduations are used in blood sedimentation tests. Such containers in the form of glass tubes, after treatment in accordance with conventional practice, are disposed in racks of special construction. The tubes are normally packaged in cardboard containers which are discarded when the tubes are removed.

Accordingly, an object of this invention is to provide an improved container structure for packaging liquid measuring tubes, such as the hematocrit tubes used in blood sedimentation tests; such container structure having wall portions which are convertible into a rack structure for supporting a selected number of tubes as the same are being used for test purposes.

Another object of this invention is to provide a combination container and rack of the character described, which includes wall means adapted to facilitate the reading of liquid levels in the graduated tubes when such tubes are supported in the rack means derived from the container.

Still another object of this invention is to provide an improved container for packaging liquid containing tubes; such container having a simplified structure which permits the same to be easily and quickly converted into a rack structure for supporting graduated tubular liquid containers; such container being economical to manufacture and which is readily manipulated by the user to convert the original container into rack means.

A further object of this invention is to provide an improved container and rack for use with ungraduated tubes wherein the container includes graduation markings for correlation with the tubes in their racked positions.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

In the drawing, FIG. 1 is a side elevational view of a container embodying the invention;

FIG. 2 is a top plan view thereof with the cover removed;

FIG. 3 is a sectional view taken on the line 3—3 of FIG. 2;

FIG. 4 is a partial elevational view in section, showing the container converted into a tube holding rack;

FIG. 5 is a side view of a graduated tube;

FIG. 6 is a partial front elevational view showing the container modified for racking unmarked tubes;

FIG. 7 is a view similar to that of FIG. 1, showing another embodiment of the invention; and

FIG. 8 is a view similar to that of FIG. 7 showing the container in its rack forming condition.

Essentially, the instant invention relates to a container for packaging glass tube containers with a modified wall structure, which may be manipulated to provide rack means integral with the container; the rack means being adapted to support the liquid containing tubes to allow liquid levels to be easily read and ascertained.

Thus, as shown in the drawing, **10** designates a container embodying the invention, which is convertible, as desired, into a rack structure for supporting a selected number of small bore tubular liquid containers T, which

are graduated and calibrated, and may be in the form of hematocrit tubes used in blood sedimentation tests or other tubes used in clinical or chemical volumetric determinations.

Container **10**, which is formed of cardboard or other suitable material, of a selected gauge, comprises a rectangular container body **11** and a telescoping cover **12**. Container body **11** comprises parallel side walls **13** and parallel end walls **14** which are interconnected by a bottom wall **15**.

Means are provided interiorly of container body **11** for holding therein, safe from breakage during transportation, packages of tubes T which are of relatively small bore, elongated and are formed with calibrated volumetric markings C. To this end, a pair of rectangular shaped, walled support members **16**, **17** in nested relation, are disposed within container body **11**. The outer support member **16** comprises parallel side walls **18** and parallel end walls **19** interconnected by a top wall **20**; the side and end walls being of a length to locate top wall **20** adjacent the top edges of container body **11**.

The top wall **20** of support member **16** is formed with a pair of spaced, circular openings **21**. The inner support member **17** is similar to member **16**; having comparable walls **18'**, **19'** and **20'**, wall **20'** being located intermediate the container bottom wall **15** and the top edges of container body **11**. The openings **21'** in wall **20'** of support member **17** are aligned with openings **21** so that packages of tubes T may be inserted in the aligned openings **21**, **21'** and filling such openings (see FIG. 3).

A tubular reinforcing sleeve **22** of rectangular section may be disposed interiorly of container body **11** with the side walls **23** thereof in contact with the inner surface of container side walls **13** and the outer surface of support member side walls **18**; and walls **24** thereof in contact with the inner surface of container end walls **14** and the outer surface of support member end walls **19**.

Rack means is provided in integral relation with container **10**; such rack means comprising panels **25**, of cardboard or other suitable material and which are rectangular in shape. Panels **25** are substantially coextensive with side walls **13** of container body **11** and are firmly secured to the outer surfaces thereof, as by adhesive or the like.

The panels **25** are initially formed by die cutting and creasing to provide rectangular shelf forming portions **26**, **27** and **28** disposed in horizontal, parallel relation. Such shelf forming portions are defined by top cut lines **29**, end cut lines **30** and bottom crease lines **31**. Also, the shelf forming portions **26**, **27** and **28** are prepunched to form spaced openings **32** which are in vertically aligned relation. The openings **32'** on the lowermost shelf forming portion **28** have a diameter slightly smaller than that of openings **32**, which diameter is substantially equal to the O.D. of tubes T.

The panels **25** are also provided with semicircular cutouts **33** located centrally and communicating with the top cut lines **29**. Such cutouts **33** provide means for engaging top edge portions of the shelf forming portions **26**, **27** and **28**, as by a finger nail, to deflect such panel portions outwardly of the plane of the panels into horizontal, parallel rack forming relation, as shown in FIG. 4. The crease lines **31** facilitate the folding of the portions **26–28** to form the rack means wherein the openings **32**, **32'** are now in overlying, vertical registry.

It will be apparent, that when container **10** is opened to allow removal therefrom of the packages of tubes T; the panels **25** thereof are easily and quickly manipulated to provide at least temporary rack means for supporting tubes T which have liquid contents such as centrifuged blood specimens or the like. Such tubes T are inserted in the aligned openings **32**, **32'**; the openings **32'** providing bottom locating means for the inserted tubes T.

The container walls 13 as well as panels 25 are of an opaque white color on their outer surfaces; thus facilitate reading the calibration markings C on the supported tubes T. Accordingly, the container 10 now serves a dual purpose and is not discarded after the tubes T are removed therefrom; since the container is readily and quickly convertible to a rack structure.

It is understood that panels 25 are secured to the walls 13 in a manner to leave the shelf forming portions 26, 27, 28 in unadhered relation to said walls, thus allowing the portions 26, 27, 28 to be readily displaced into their rack forming positions.

In some cases, the tubes to be packaged in container 10 are unmarked and devoid of graduation markings. In such case, the container walls 13 and the panels 25 are preprinted with graduation markings, as shown in FIG. 6. Thus, vertically aligned portions of said walls 13 and portions of the panel 25 intermediate shelf forming portions 26–28 are preprinted with columns of graduation markings G, G′ respectively. Such columns of markings are located so that tubes T′ racked in the openings 32, 32′ of the bent shelf forming portions 26–28 may have their liquid levels read from such markings.

Also, the unmarked tubes T′ may be packaged in a container 10A similar to container 10 hereinbefore described, except that the rack forming panels 25A are modified somewhat, as shown in FIGS. 7 and 8. Here the shelf forming panels 26A, 27A and 28A are immediately adjacent each other without any uncut portions of the panel 25A intervening therebetween.

Thus, shelf forming portion 26A is defined by a top horizontal cut line 35, end cut lines 36, together with a bottom horizontal cut line 37 which terminates at its opposite ends short of end cut lines 36. A pair of horizontal crease lines 38 of short extent connect cut line 37 with said end cut lines 36; the crease lines 38 providing hinge means for shelf forming portion 26A when the same is bent out of the plane of panel 25A.

Shelf forming portion 27A is defined by cut line 37, short vertical cut lines 39 extending downwardly from the ends of cut line 37, short horizontal cut lines 40 extending outwardly from the ends of cut lines 39, end cut lines 41, a bottom cut line 37A which terminates at its opposite ends short of end cut lines 41, and a pair of short horizontal crease lines 38A which extend from the ends of cut line 37A to the lower ends of end cut lines 41. Again, crease lines 38A provide hinge means for shelf forming portion 27A when the same is bent out of the plane of panel 25A.

The shelf forming portion 28A is defined by cut line 29A, end cut lines 30A and continuous, bottom crease line 31A. It will be apparent from a consideration of FIGS. 7, 8, that when the shelf forming portions 26A, 27A and 28A are bent out of the plane of panel 25A to register openings 32, 32′; the outer surface of container wall 13 is fully exposed, except for slight portions corresponding to the thickness of the shelf forming portions. Thus, ungraduated tubes T′ may be racked

therein and with wall 13 preprinted with graduation markings G, in columns located adjacent the tubes, the liquid levels may be read therefrom.

As various changes might be made in the embodiment of the invention herein disclosed without departing from the spirit thereof, it is understood that all matter herein shown or described shall be deemed illustrative and not by way of limitation except as set forth in the appended claims.

What is claimed is:

1. A container for packaging small bore tubular liquid containers, said container comprising a plurality of upstanding walls, rack forming means comprising a panel coextensive with one of said walls and adhesively secured to the outer surface thereof, said panel being precut and precreased along predetermined lines providing therein a plurality of horizontally extending shelf forming portions, said shelf forming portions being adapted to be bent out of the plane of said panel and hinged thereto along said crease lines, said shelf forming portions being formed with longitudinally spaced openings providing a plurality of sets of vertically aligned openings to respectively receive said tubular containers, the openings in the bottommost of said shelf forming portions being of a diameter slightly smaller than that of the other shelf forming portions to receive and locate the bottom ends of said liquid containers, the outer surface of said one upstanding wall being exposed when said shelf forming portions are bent out of the plane of said panel.

2. A container as in claim 1 wherein the exposed surface portion of said one upstanding wall is premarked with graduations in laterally spaced vertical columns for correlation with the said tubular containers in the openings in said bent shelf forming portions.

3. A container as in claim 1 wherein the bottom most shelf forming portion is hinged to said panel along a continuously extending horizontal crease line and each of the top most and intermediate shelf forming portions is hinged to said panel along short, horizontal crease line portions at the opposite ends thereof, the free bottom edge portion of the top most shelf forming portion abutting the free top edge of the intermediate shelf forming portion and the bottom free edge of the intermediate shelf forming portion abutting the free top edge of the bottom most shelf forming portion.

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