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RACK FOR HEMATOCRIT TUBES

Filed May 21, 1962

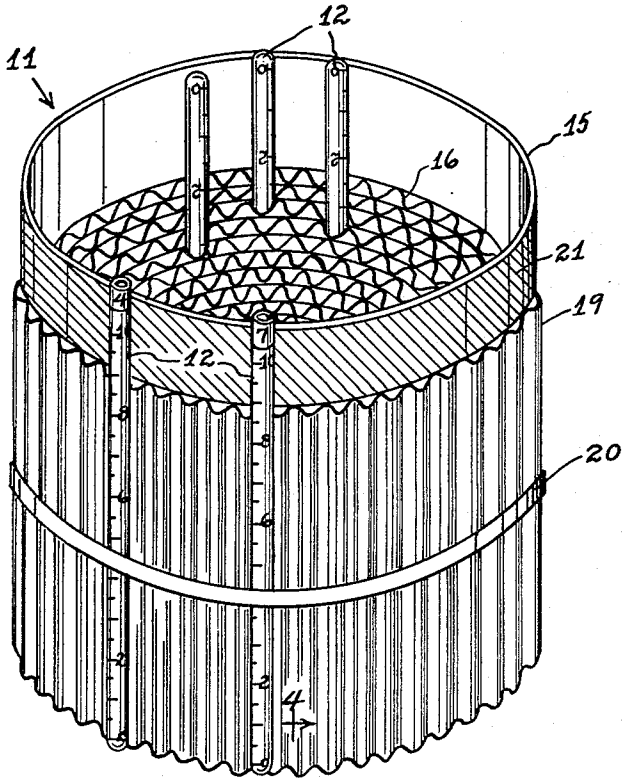


FIG. 1

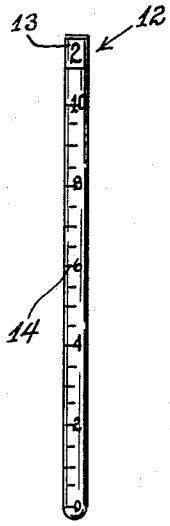


FIG. 2

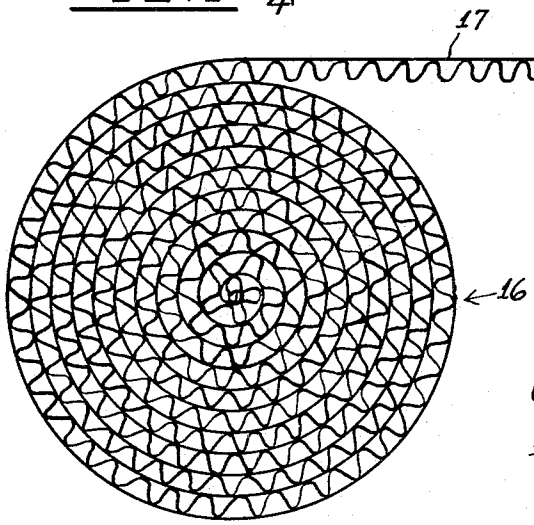


FIG 3

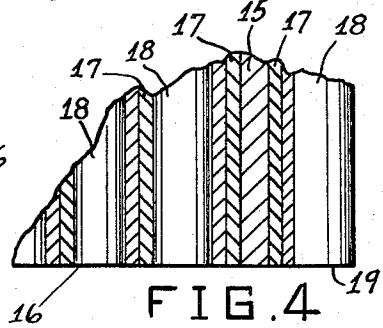


FIG. 4

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RACK FOR HEMATOCRIT TUBES

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This invention relates to racks for slender elongated containers, and more particularly to an improved supporting rack for hematocrit tubes used for testing blood specimens.

A main object of the invention is to provide a novel and improved disposable supporting rack for hematocrit tubes, for supporting blood specimens for sedimentation testing thereof, said rack being very simple in construction, being relatively compact in size, and being arranged to support a relatively large number of hematocrit tubes in vertical, stable, and highly visible positions.

A further object of the invention is to provide an improved disposable supporting rack for hematocrit tubes which is very inexpensive to fabricate, which is adapted to safely and reliably support a relatively large quantity of hematocrit tubes in easily visible stable vertical positions with easy access to said tubes, and which supports the tubes in spaced positions and with minimum risk of breakage or other damage to said tubes.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

FIGURE 1 is a perspective view of an improved disposable supporting rack for hematocrit tubes constructed in accordance with the present invention.

FIGURE 2 is an enlarged elevational view of a typical hematocrit tube adapted to be supported in the rack of FIGURE 1.

FIGURE 3 is a top plan view of the inner corrugated paper tube supporting core employed in the rack of FIGURE 1, shown in a partly unrolled condition.

FIGURE 4 is an enlarged fragmentary vertical cross-sectional view taken substantially on the line 4—4 of FIGURE 1.

Referring to the drawings, **11** generally designates an improved disposable rack device according to the present invention, said device being adapted to removably support a plurality of calibrated glass sedimentation tubes **12** in vertical positions, namely, in positions to support blood samples or the like for specified periods of time to allow sedimentary material in the samples to settle, the calibration markings **14** on the tubes providing sedimentation data relative to the particular samples. The tubes may be suitably labelled or otherwise distinctively marked so that they can be readily identified, for example, they may be provided with numbered labels **13** at their top portions.

The rack **11** comprises a generally cylindrical main shell **15** of stiff cardboard, or the like, open at its top and bottom ends and of a height generally corresponding to that of the sedimentation tubes **12**. Disposed within the main shell and fitting relatively tightly therein is a rolled-up strip **16** of corrugated paper material, said strip comprising a smooth paper backing sheet **17** to which is glued the corrugated paper strip **18**, the resultant composite corrugated paper body **16** being quite flexible in a direction transverse to the corrugations of the strip **18** but being relatively stiff in a direction parallel to said corrugations. Thus, the body **16** may be easily rolled up in the manner illustrated in FIGURE 3 and may be readily inserted in the main shell **15**, the rolled-up body being normally slightly larger in diameter than the inside of shell **15** but being sufficiently compressible to slide into said shell, after which it is frictionally retained therein by its tendency to expand ot its normal diameter. As shown in FIGURE 1, the height of the rolled-up body **16** is somewhat

less than the height of the shell **15**, so that the upper portions of sedimentation tubes **12** engaged vertically between the convolutions of the body will be exposed.

The corrugations in the respective convolutions of body **16** define vertical grooves adapted to receive the relatively slender tubes **12**, the convolutions being sufficiently yieldable to allow the tubes to be inserted in said grooves or channels, whereby the tubes will be clampingly engaged and will be supported vertically therein. Due to the yieldability of the rolled-up body **16**, the tubes may be easily inserted between the convolutions, and may be readily removed therefrom.

A band **19** of corrugated paper material is glued or otherwise suitably secured to the outer surface of the main shell **15**, the band **19** being substantially the same in height as the inner body **16**. The corrugations of the band **19** face outwardly and define vertical grooves or channels adapted to receive sedimentation tubes **12**, as shown in FIGURE 1, the tubes being retained in the vertical grooves or channels of band **19** by an elastic band **20** of rubber or similar resilient material engaged around the rack. The elastic band **20** normally surrounds the intermediate portion of the outer corrugated paper member **19**, allowing tubes **12** to be readily inserted in the vertical grooves of member **19** within the elastic band **20** and allowing said tubes to be easily removed when desired.

In using the device simply as a rack, it may be placed on a flat horizontal surface and the tubes **12** may be inserted vertically between the vertically corrugated convolutions of the inner body **16** and between the elastic band **20** and the grooves of the outer vertically corrugated member **19**, with the closed bottom ends of the tubes adjacent the horizontal bottom supporting surface. The tubes will thus be supported vertically with their labelled top ends clearly visible for easy identification. As will be readily apparent, due to the relatively large number of available supporting grooves or channels provided by the members **16** and **19**, a relatively large number of sedimentation tubes may be supported in a single rack **11**.

The device may also be employed as a storage container for empty tubes, from which empty tubes may be taken, as required, may be filled with blood samples, and may then be engaged between the outer corrugated member **19** and the elastic band **20** for sedimentation and display. Thus, the empty tubes **12** may be packed within the shell member **15** between the convolutions of the body **16** in inverted positions, namely, with their closed ends up, as shown in FIGURE 1. In this manner no dust can settle into the tubes, nor can any spray or spilled liquids enter the tubes. The tubes **12** may then be removed from the body **16** as needed, inverted, filled with oxalated blood to the uppermost scale numeral, for example, the "10" mark, inserted between the outer corrugated band **19** and the elastic band **20**, and left for the time needed to observe sedimentation, usually, one hour.

It is important that the tubes be undisturbed to read the sedimentation rate; this is another reason why it is desirable to support them outside the shell member **19**, where the length of the clear column of plasma may be read often, if required, without removing the tubes from the rack. The shell **15** has a brightly colored upper outer surface **21**, for example, bright green, visible as a band above the outer corrugated member **19**. This bright band displays the top portions of the filled sedimentation tubes **12** to best advantage. Most of the normal bloods will have one hour sedimentation rates within this band. Zero to 7 mm. is normal for men and zero to 15 mm. is normal for women, at the one hour rate.

Since the components of the rack are made of very in-

expensive material, namely, paper or the like, it is of very low cost and can be discarded after use. The tubes 12 are similarly of very simple and inexpensive construction and may likewise be discarded after use.

While a specific embodiment of an improved disposable supporting rack for hematocrit tubes has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A rack for slender glass tubes comprising a generally cylindrical shell member of relatively stiff cardboard material open at its top end and adapted to stand in an upright position on a horizontal supporting surface, a relatively yieldable vertical rolled-up supporting core of vertically corrugated relatively flexible paper material snugly and tightly enclosed in said shell member, said core being normally slightly larger in diameter than the inside of the shell member, said core being adapted to clampingly receive the tubes between adjacent convolutions thereof in the vertical grooves defined by the corrugations and to clampingly support the tubes in inverted readily accessible positions, a corrugated paper band surrounding the outer surface of the shell member and having outwardly facing vertical corrugations, and an elastic band surrounding said paper band and being adapted to clampingly engage tubes disposed in the vertical grooves defined by the corrugations of the paper band and to support said last-named tubes in upright positions, said corrugated paper band being substantially lower in height than the shell member, whereby the upper portion of the shell member will provide a visual background for the upper portions of the tubes.

2. A rack for slender glass tubes comprising a generally cylindrical shell member of relatively stiff cardboard material open at its top end and adapted to stand in an upright position on a horizontal supporting surface, a relatively yieldable vertical rolled-up supporting core of vertically corrugated relatively flexible paper material snugly and tightly enclosed in said shell member, said core being normally slightly larger in diameter than the inside of the shell member, said core being adapted to clampingly receive the tubes between adjacent convolutions thereof in the vertical grooves defined by the corrugations and to clampingly support the tubes in inverted readily accessible positions, a corrugated paper band surrounding the outer surface of the shell member and having outwardly facing vertical corrugations, and an elastic band surrounding said paper band and being adapted to clampingly engage tubes disposed in the vertical grooves defined by the corrugations of the paper band and to support said last-named tubes in upright positions, said vertical supporting core and said corrugated paper band being substantially lower in height than the shell member, whereby to allow the upper portions of the tubes engaged therewith to be exposed and whereby the upper portion of the shell member above the paper band will provide a visual background for the upper portions of the tubes, the said upper portion of the shell member having a height corresponding to the one hour sedimentation rate of normal blood.

3. The structure of claim 2, and wherein said upper portion of the shell member has a brightly colored outer surface, whereby to display the top portions of the tubes to best advantage.

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