

July 17, 1956

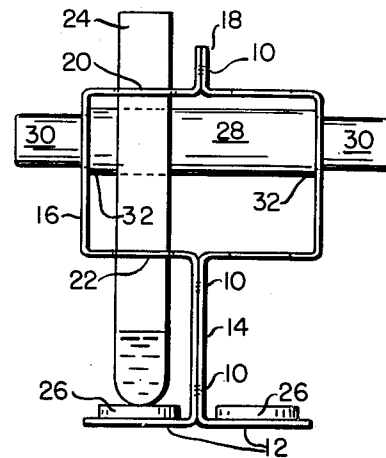
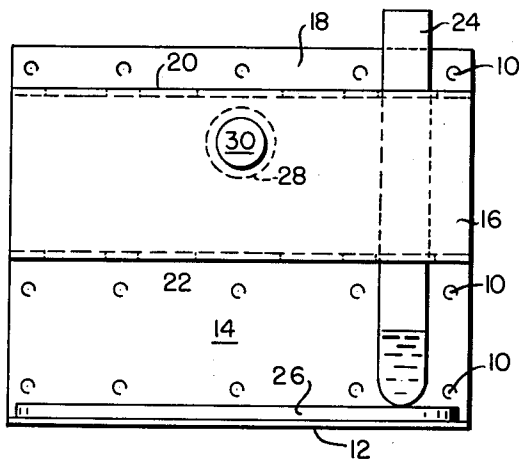
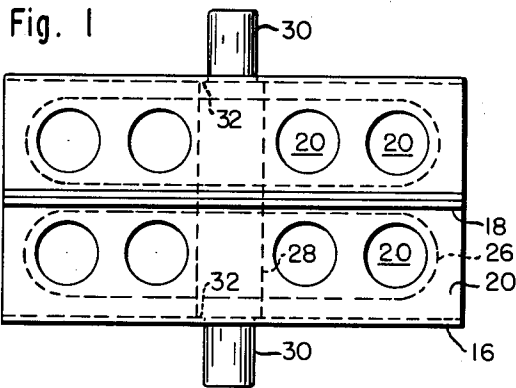
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2,755,018

TEST TUBE RACK FOR CENTRIFUGES

Filed Jan. 6, 1955

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4

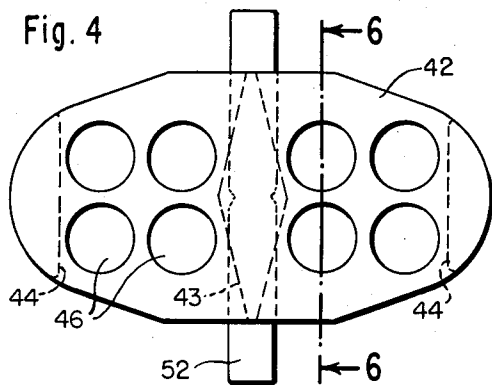


Fig. 7

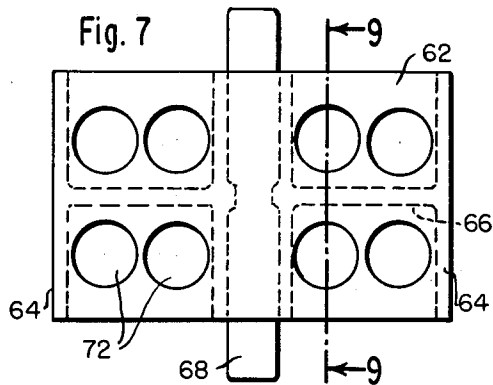


Fig. 5

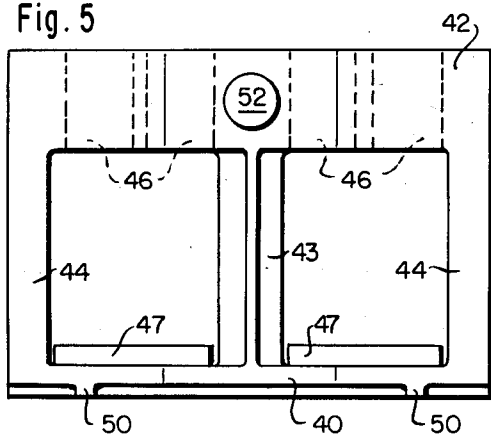


Fig. 8

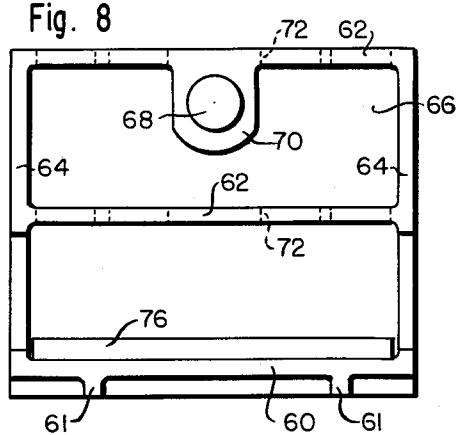


Fig. 6

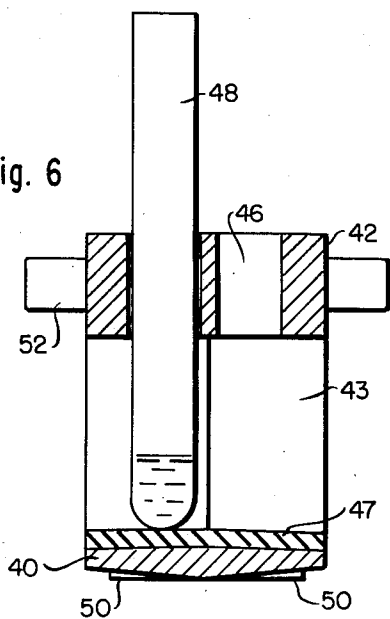
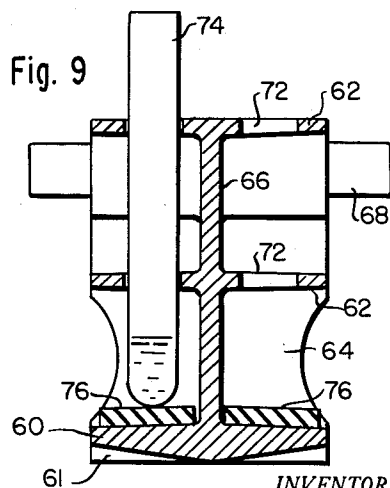


Fig. 9



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TEST TUBE RACK FOR CENTRIFUGES

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13 Claims. (Cl. 233—26)

This invention relates to test tube racks for use with centrifuges and the primary object of the invention resides in the production of an improved, relatively simple and economical rack for this purpose which has numerous advantages including an open construction permitting the shaking and inspecting of the tubes and contents without removing the tubes from the racks, permitting direct contact of treating bath liquids with the tubes in the racks and permitting easy and thorough cleaning of the racks.

Our improved rack can be economically constructed in integral form as a metal casting or molded plastic unit or from sheet metal. In each case the rack will be shaped to receive and support a plurality of tubes in open and exposed position and includes a base for supporting the rack in upright position on a table surface and trunnions for operatively mounting the rack in a centrifuge. When constructed from sheet metal each rack will preferably comprise two pieces of sheet metal shaped to provide two complementary half sections bonded in face to face contact and providing the novel tube supporting features above described. The production of an improved rack of this nature as hereinafter more specifically described comprises a further object of the invention.

These and other features of the invention will be best understood and appreciated from the following description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawing in which—

Fig. 1 is a plan view of a test tube rack made from sheet metal and embodying the invention,

Fig. 2 is a side elevation thereof,

Fig. 3 is an end elevation,

Fig. 4 is a plan view of a modified construction,

Fig. 5 is a side elevation thereof,

Fig. 6 is a vertical sectional view on line 6—6 of Fig. 4,

Fig. 7 is a plan view of a further modified construction,

Fig. 8 is a side elevation thereof, and

Fig. 9 is a vertical sectional view taken on line 9—9 of Fig. 7.

In Figs. 1-3 of the drawings we have illustrated our improved test tube rack as constructed from sheet metal sufficiently rigid to retain its shape. In this form of the invention as illustrated the rack comprises two complementary half sections brought together in face to face contact along a medial line and spot welded at 10 into a unit. Each half section comprises a single sheet of metal shaped to the configuration illustrated and the two combined halves produce a rack having a horizontal supporting base 12, a vertical portion 14 extending upwardly and centrally from the base and a box like portion 16 supported on the vertical portion in spaced relation from and above the base. Other portions 18 extending upwardly from the portion 16 in vertical alignment with the portion 14 are spot welded in face to face contact.

The upper and lower horizontal walls of the box like

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portion 16 are perforated to provide vertically aligned holes 20 and 22 for receiving and holding test tubes 24. The holes at the two sides of the vertical portion 14 are also in alignment with the base portion 12 and cushioning material 26 is affixed to these portions 12 to receive and support the tubes.

When assembling the two half sections together, a rod 28 is disposed centrally within the box like sections 16 and is provided with end portions 30 projecting outwardly therefrom. The end portions 30 provide trunnions for mounting the rack on the hooks of a centrifuge head and the shoulders 32 at the junctions of the trunnions with the rod serve to grip the rod tightly within the box.

The materials from which the rack is constructed will depend upon the corrosion and other requirements of the user. The rack above described and illustrated in Figs. 1-3 can be made from stainless steel which satisfies the requirements for numerous uses.

Our improved rack can also be conveniently and economically made by casting or molding. The casting would be from suitable metals, as aluminum or magnesium, and the molding would be from suitable plastics.

The cast or molded rack illustrated in Figs. 4-6 comprises a horizontal supporting base 40 together with a relatively deep horizontal portion 42 supported in spaced relation thereon and thereabove by a central vertical section 43 and vertical end portions 44. The casting is open between the section 43 and each section 44 and the portion 42 above each opening is perforated to provide four test tube receiving and supporting holes 46. A mat 47 of rubber or like cushioning material is secured to the base beneath each four holes to receive and support test tubes 48, and the base is provided with ribs 50 for supporting the rack in upright position on a horizontal surface. The ends of a rod 52 extending centrally through and fixed to the portion 42 above the vertical section 43 provide trunnions for mounting the rack on the hooks of a centrifuge head.

The cast or molded rack illustrated in Figs. 7-9 is of box-like shape and comprises a horizontal base 60 with supporting ribs 61. Disposed in spaced relation above the base are two spaced horizontal portions 62 integral with the base through vertical side wall ribs 64 and a centrally disposed rib 66. A trunnion providing rod 68 is mounted within a centrally disposed portion 70 of the top horizontal portion 62. Each quarter section of the horizontal portions 62 of the rack, Fig. 7, is perforated with two vertically aligned holes 72 for receiving and supporting test tubes 74 and two cushion pads 76 are provided on the base therebeneath for receiving and supporting the test tubes.

It will now be apparent that our improved rack is simple and economically constructed and is adapted to support a plurality of test tubes in fully exposed position. The tubes can be shaken and the contents observed without removing the tubes from the rack, also the tubes can be inserted in liquid treating baths without removing them from the rack. The open construction of the rack also permits direct contact of treating liquids with the tubes and provides maximum heat exchange thereto.

The construction also permits use of relatively large cushions 26, 47 and 76 each serving several tubes and being easier to maintain in place and condition than are small individual cushions for the device, especially when breakage of a glass tube occurs. White cushions are preferably employed for blood tests to make it easier for the user to ascertain that red blood cells are resuspended in saline prior to each successive washing operation.

The open construction makes our rack easy to clean and therefore more sanitary. In various test operations it is necessary to dump excess material from the tubes

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and this can be done without removing the tubes by holding the tubes with the fingers at the openings in the bottom of the rack and then dumping all the tubes in one easy movement.

Racks heretofore commonly employed in centrifuge work have utilized a single drill hole for each tube and these racks are hard to clean and blood and other material collecting in these holes cause them to become unsanitary and foul smelling. These objections are quite eliminated in our open and improved rack.

Having thus disclosed our invention what we claim as new and desire to secure by Letters Patent is:

1. A test tube rack for centrifuges, comprising a horizontal supporting base, a cooperating horizontal portion above and spaced from the base, a vertical portion rigid with and extending upwardly and centrally from the base and rigidly connected to and supporting the horizontal portion in spaced relation thereabove, cushions fixed to the top surfaces of the base at opposite sides of the vertical portion, the horizontal portion having a plurality of test tube receiving and supporting holes therethrough each disposed in vertically aligned relation above a cushion, and two trunnions extending outwardly and centrally at opposite sides of the horizontal portion for mounting the rack in a centrifuge, the space between the base and horizontal portion being open to expose test tubes extending downwardly through said holes and resting on the cushions.

2. The test tube rack defined in claim 1 in which said base and vertical and horizontal portions comprise an integral unit.

3. The test tube rack defined in claim 1 in which said horizontal portion embodies two vertically spaced units having test tube receiving and supporting holes therethrough in vertically aligned relation above the cushions.

4. The test tube rack defined in claim 1 plus vertical portions rigid with and extending upwardly from the base at opposite ends of the rack and rigidly connected to and supporting the horizontal portion in spaced relation thereabove.

5. The test tube rack defined in claim 1, in which the two trunnions comprise the two ends of a rod extending through and fixed to the rack, the rod extending outwardly at both ends from the rack.

6. The test tube rack defined in claim 1 in which the base is of oblong configuration, the vertical portion is disposed medially thereof and the cushions are mounted on the base along and at opposite sides of the vertical portion.

7. A test tube rack for centrifuges, comprising substantially rigid sheet material shaped to provide a horizontal supporting base, a vertical portion rigid with and extending upwardly and centrally from the base, and

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horizontal portions rigid with and supported on the vertical portion in spaced relation from and above the base, cushions fixed to the top surfaces of the base at opposite sides of the vertical portion, the horizontal portions having a plurality of test tube receiving and supporting holes therethrough each disposed in vertically aligned relation above a cushion, and two trunnions extending outwardly and centrally at opposite sides of the horizontal portion for mounting the rack in a centrifuge.

8. The test tube rack defined in claim 7 plus vertical portions connecting the horizontal portions and shaped therewith to rectangular box form having vertically aligned tube receiving holes through opposite walls thereof.

9. The test tube rack defined in claim 8 in which the trunnions comprise the two end portions of a rod extending through and outwardly at opposite sides of the rectangular box form.

10. The test tube rack defined in claim 7 in which said vertical and horizontal portions embody two sheets shaped to like and cooperating configuration and including portions thereof rigidly affixed together in face to face contact in a plane disposed at and along said vertical portion.

11. The test tube rack defined in claim 10 in which said base comprises two portions respectively integral with said sheets.

12. The test tube rack defined in claim 7 and vertical portions connecting the horizontal portions and shaped therewith to rectangular box form having vertically aligned tube receiving holes through opposite walls thereof, and in which said vertical and horizontal portions embody two sheets shaped to like and cooperating configuration and include portions thereof rigidly affixed together in face to face contact in a plane disposed at and along the first named vertical portion at one side of said rectangular box form and other like portions affixed together in like manner at the other side of the rectangular box form.

13. The test tube rack defined in claim 7 comprising two like and complementary half sections each embodying a sheet of metal joined rigidly together in a plane disposed in and along said vertical portion and shaped to provide said base and said vertical and horizontal portions.

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