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TEST TUBE RACK

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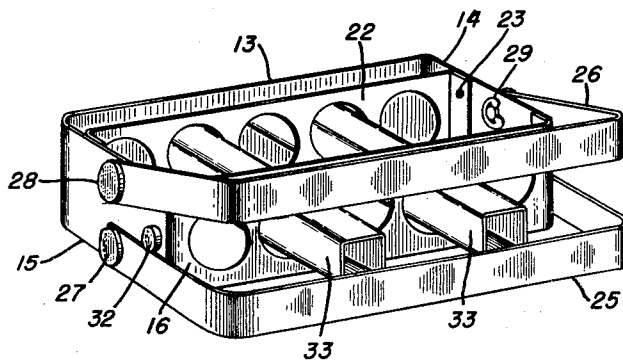


Fig-1

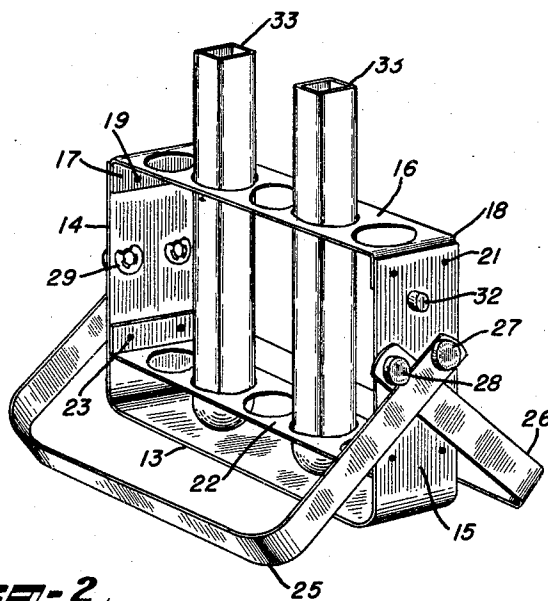


Fig-2

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TEST TUBE RACK

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3 Claims. (Cl. 211—72)

This invention relates to a rack for supporting test tubes and the like particularly, to a rack of novel construction adapting the device to a plurality of useful purposes.

It is frequently desirable to have a rack for holding test tubes which not only functions as a stable receptacle for such when in use in a laboratory, but which allows for a sort of closure to hold the tubes when shaken for rinsing, and which may also function as a shipping container for protecting the tubes prior to their placement in a shipping box. The rack of the present invention serves these purposes.

An object of this invention is the provision of a rack which will function as a stable receptacle for test tubes when in use in a laboratory and which may be adjusted to form a closure allowing a group of contained test tubes to be shaken for rinsing.

An object of this invention is the provision of a test tube rack which will also function as a shipping container, protecting the test tubes prior to placement in a shipping box.

More specifically, an object of this invention is the provision of a test tube rack comprising a substantially-rectangular, metal frame having a plurality of holes formed in one side, a partition member spanning sides of the frame and provided with holes aligned with those in the frame, a pair of U-shaped legs having ends pivotally secured to opposed sides of the frame at spaced points, one of said legs being larger than the other so as to be swingable thereover to diagonally-crossed position, and means limiting the pivotal rotation of each leg.

These and other objects and advantages will become apparent from the following detailed description when taken with the accompanying drawings. It will be understood that the drawings are for purposes of illustration and do not define the scope or limits of the invention, reference being had for the latter purpose to the appended claims.

In the drawings, wherein like reference characters denote like parts in the several views:

Figure 1 is a view in perspective of one embodiment of my rack, in which one of the combination U-shaped closure and rack members has been moved to closed position over a set of contained test tubes, while the other member has been moved almost but not quite to closed position; and

Figure 2 is a view in perspective of my rack set up to function as a stable receptacle for test tubes, a set of such test tubes being shown in position.

Referring to the drawings in detail, there is shown one embodiment of my test tube rack comprising a generally rectangular frame made of a band of metal bent to U-shape form, that is, with a base or intermediate portion 13 and sides 14 and 15. The free ends of the sides 14 and 15 are connected by a top metal member 16 formed with offset ends 17 and 18, which are desirably respectively spot welded to the inner surfaces of the side members 14 and 15, as indicated at 19 and 21.

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As an alternative, the top member 16 may be formed integral at one end with one of the sides 14 and 15. Intermediate portions of sides 14 and 15 are connected by a metal partition 22 which may be, and desirably is, formed identical with the top member 16 except that the off-set ends 23 thereof preferably are reversed in position, that is, they point toward the flanges 17 and 18 of the top member 16. These flanges 23 are likewise desirably spot welded to the sides at an elevation suitable to position the partition 22 nearer the bottom than the top, as viewed most clearly in Figure 2.

The sides 14 and 15 of the rack body just described have pivoted thereto combination U-shaped closure arm and leg members 25 and 26. These members are connected to said sides by means of headed pivot pins 27 and 28. All of these pins pass through the sides and have interior projections grooved to receive resilient locking devices 29 which hold them in position and tend to frictionally press the combination members against the sides of the rack. The pivot members 27 carry the combination member 25 which is slightly larger than the member 26, that is, its arms are somewhat longer and spaced somewhat more widely than the arms of the other member 26, so that the member 25 may swing over the member 26 from the position shown in Figure 1 to that shown in Figure 2. However, because of the adequate spacing between the pivot members 27 and 28, in the illustrated embodiment the arms may be uniform in length so that when moved to parallel one another, as approximately illustrated in Figure 1, the longer elements, or those between the pivoted sides of the members 25 and 26, are coplanar. For that reason these pivot members 27 carry suitable spacing washers between the outer surfaces of sides 14 and 15 and the inner surfaces of the arms of the member 25.

When the arms 25 and 26 are pivotally moved to the position shown in Figure 1, actual contact between the arms is prevented by desirably cylindrical stop members 32 having shanks of reduced diameter passing through holes formed in the sides of the rack body and secured thereto as by riveting over on the inner body surfaces. By using such stops, a space is always left between the then parallel members 25 and 26, so that upon inversion of the rack 11, the test tubes 33 held therein may be drained or rinsed. The clearance between these members and such test tubes, as well as the clearance between the test tubes and the receiving apertures, allows for relative motion therebetween facilitating rinsing.

The rack of the present invention has been particularly designed for holding absorption cells which are square in section. These absorption cells are desirably 1 square centimeter in interior cross section, so that each centimeter in length represents a cubic centimeter in capacity. Such absorption cells are known as "cuvettes."

Although I have shown the top member 16 and the partition 22 each provided with a set of five holes, the holes in one member being axially aligned with those of the other, it will be understood that any suitable number of holes may be provided in a single row or a plurality of rows. It will also be understood that although the rack is preferably made in its entirety of stainless steel, most of it in sheet or plate form, to permit sterilization at high temperatures, yet I do not wish to be limited in this respect as other suitable material may be substituted.

From the foregoing, it will be seen that I have devised a rack particularly adaptable for holding test tubes but which is so flexible that it serves numerous other purposes. Specifically, the rack may be adjusted to the position shown in Figure 1 wherein it forms an enclosure for the test tubes, allowing them to be shaken for rinsing, or to the position shown in Figure 2 in which the mem-

bers 25 and 26 are crossed and support the body of the rack on a table or other supporting surface. It is here pointed out that in the latter position the side arms of the member 25 engage the pivot members 28 and the side arms of the member 26 engage the pivot members 27 thereby limiting the angular spread of the arms and forming a stable support by allowing said arms to function as steady legs for the rack. Further, it is apparent that in the Figure 1 position the rack forms a protective container for shipment of the absorption cells, such container being placed in a suitable shipping box.

Having now described my invention in detail in accordance with the requirements of the patent statutes, those skilled in this art will have no difficulty in making changes and modifications in the individual parts or their relative assembly in order to meet specific requirements or conditions. Such changes and modifications may be made without departing from the scope and spirit of the invention, as set forth in the following claims.

I claim:

1. A test tube rack comprising a band of metal forming a four-sided frame, one side of which serves as the bottom and the opposite side as the extreme top of said rack, a metal partition secured internally of the frame and spaced from the frame bottom, said partition and top of the frame being provided with aligned holes for receiving test tubes, a first U-shaped member having arms spanning the distance between the other sides of the frame, means pivotally securing the arms of the first U-shaped member to the sides of the frame, a second U-shaped member spanning the sides of the frame, said second member having arms spaced more widely than the arms of the first U-shaped member, means pivotally securing the arms of the second U-shaped member to the sides of the frame at points spaced laterally from the securing means of the first U-shaped member, and fixed stop pins secured to the sides of the frame above and between the pivot means and extending outwardly therefrom into the path of travel of the arms of both said U-shaped members to space them in parallel relationship when swung up into engagement therewith to complete the enclosure of the test tubes and allow them to be shaken for rinsing, or allow them to be swung

down to diagonal crossed positions where their pivots limit the angular spread of said members, allowing them to function as steady legs for the rack.

2. A test tube rack comprising a band of metal, bent and connected at its ends to form a four-sided frame, a metal partition connecting intermediate portions of opposite sides of said frame, said partition and a parallel side of the frame each having a series of apertures to receive a number of test tubes, a first U-shaped member having arms spanning the distance between the other sides of the frame, means pivotally securing the arms of said first U-shaped member to the spanned sides of the frame, a second U-shaped member spanning the sides of the frame, said second member being larger than the first U-shaped member so as to be swingable thereover, means pivotally securing the arms of the second U-shaped member to the spanned sides of the frame at points spaced laterally from the securing means of the first U-shaped member, and fixed stop pins secured to the sides of the frame above and between the pivot means and extending outwardly therefrom into the path of travel of the arms of both said U-shaped members to space them in parallel relationship when swung up into engagement therewith to complete the enclosure of the test tubes and allow them to be shaken for rinsing, or allow them to be swung down to diagonal crossed positions where their pivots limit the angular spread of said members, allowing them to function as steady legs for the rack.

3. The invention as recited in claim 1, wherein the means pivotally securing the arms of the first U-shaped member to the sides of the frame comprise headed studs the heads of which extend into the path of travel of the arms of the second U-shaped member.

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