Nov. 6, 1962 M. W. GRELA ET AL 3,062,380

TEST TUBE HOLDER

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Fig. 1.

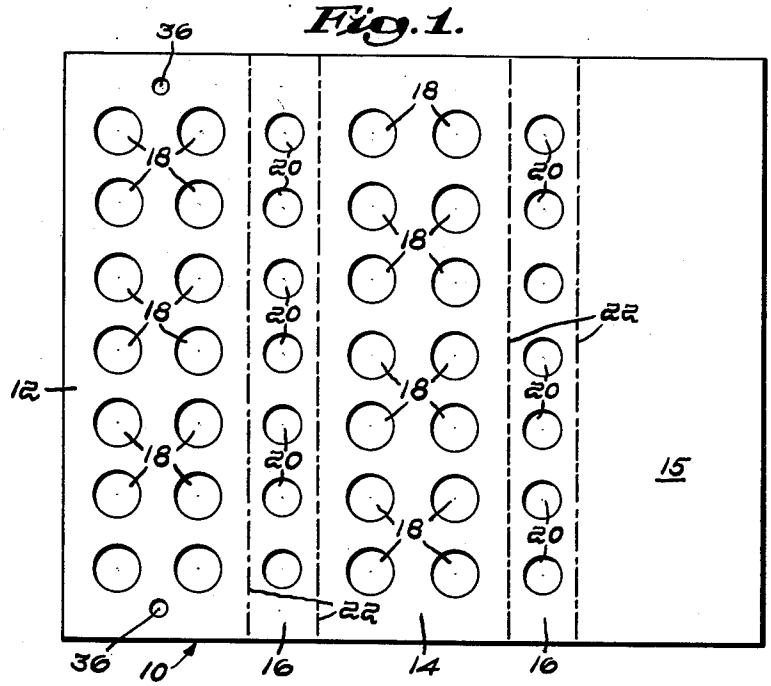


Fig. 2.

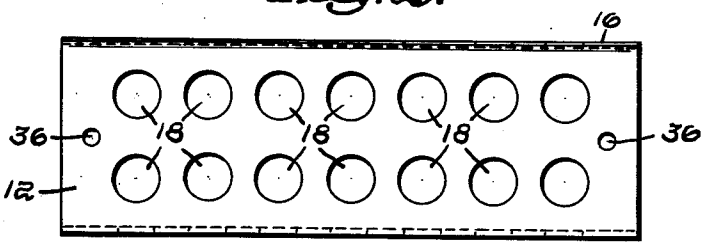
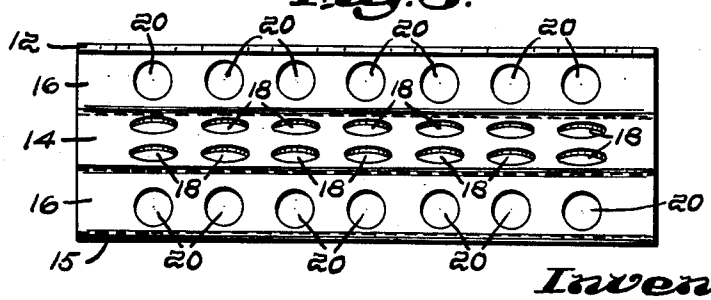


Fig. 3.



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Fig. 4.

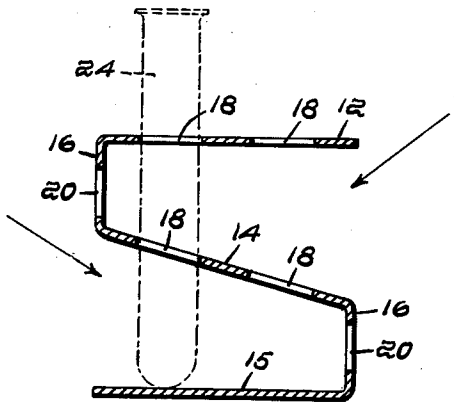


Fig. 5.

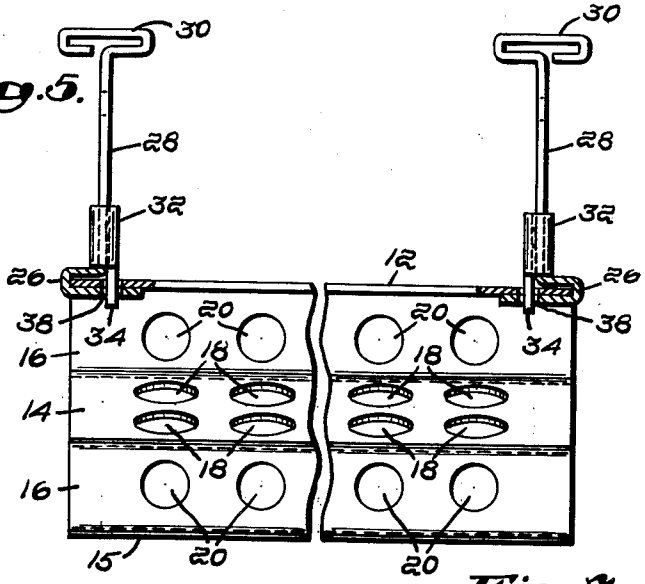


Fig. 6.

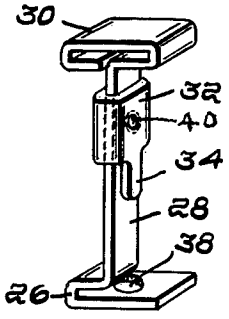
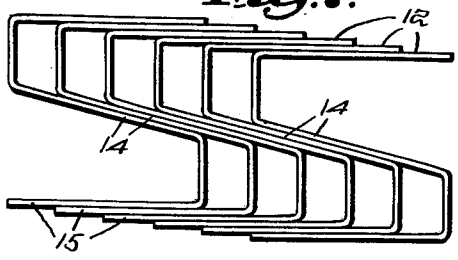


Fig. 7.



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TEST TUBE HOLDER

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5 Claims. (Cl. 211—73)

This invention relates to racks or holders for supporting test tubes in upright position and providing an improved receptacle for such use in laboratories. The primary object of the invention is to provide a simple and superior holder for this purpose at relatively small cost and embodying a novel and substantially Z-shaped construction having numerous advantages hereinafter described and including a diagonal intermediate connecting portion providing outwardly flaring openings at opposite sides of the holder permitting a plurality of the holders to readily nest into compact relation for storing and shipping purposes. A further feature of the invention relates to a novel lifting handle cooperating with the holder and adapted to serve conveniently as a carrying handle for supporting the holder and its contained tubes in stable and upright position during transportation from one position to another.

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 drawings in which:

FIG. 1 is a plan view of a metal plate adapted to be folded to form our improved test tube holder,

FIG. 2 is a plan view of the holder,

FIG. 3 is a side elevation thereof,

FIG. 4 is an enlarged sectional view transversely through the holder,

FIG. 5 is a fragmentary side elevation of the holder together with lifting handles therefor,

FIG. 6 is a perspective view of one of the lifting handles, and

FIG. 7 is an end view of a plurality of the holders in compact nested relation.

Our novel test tube holder is simply and economically made from sheet metal of relatively heavy gauge to provide stabilizing weight, preferably stainless steel. In this construction a sheet **10** of such metal of the required dimensions is divided into three relatively wide panels **12**, **14** and **15** preferably connected by two narrower panels **16**. The panels **12** and **14** are then drilled at predetermined locations to provide a series of pre-arranged test tube receiving holes **18**. The panels **16** are also preferably drilled at **20** to provide viewing and ventilation openings in the holder. The sheet is thereafter bent on the median lines **22** to the general Z-shape shown in FIG. 4 wherein the holes **18** in the panels **12** and **14** are brought into the test tube receiving alignment illustrated. In the holder thus formed the panel **15** becomes the base of the holder and is adapted to rest flatly on a supporting surface and the panels **12** and **14** thereabove are adapted to receive and support test tubes **24** extending through the aligned holes and resting on the base panel **15**. The panel **14** connecting the panels **12** and **15** is disposed diagonally and thus provides outwardly flaring openings at opposite sides of the holder permitting free, compact and unlimited nesting of the holders as illustrated in FIG. 7. The broad base together with the weight factor provides a very stable support for the test tubes, and the holes **20** provide for visibility of the tube contents and for circulation of air or liquids around the test tubes in the rack or holder. While we have herein

illustrated the preferred form of our invention and its construction it will be understood that the holder can be otherwise constructed, as by molding from suitable plastic composition and including suitable base weighing material if desired.

Particular attention is directed to the general Z-shape of the holder wherein the diagonal character of the intermediate connecting panel **14** provides outwardly diverging walls between the panels at opposite sides of the holder and permits free and substantially greater compact nesting of the holders. As illustrated in FIG. 7, applicants' holders freely nest to an extent approximating seventy-five percent of full and complete nesting without distorting the top and base portions **12** and **15** from their normally parallel relation, thus permitting compact and convenient stacking of the holders and providing maximum efficiency for storing and shipping purposes.

The novel Z-construction also provides other very substantial advantages over the usual and well known S-type of holder. These advantages include (1) substantially greater visibility of the test tubes and contents as indicated by arrows in FIG. 4, (2) provides more scrubbing room for easier and more thorough cleaning of the racks, (3) permits the use of stronger and heavier fabricating tools facilitating the bending operations and at sharper angles which is of particular advantage with extra wide racks, (4) requires less sheet stock which lightens the weight of the rack and provides a substantial saving in the cost of stainless steel required, and (5) the connecting of the panels **12**, **14** and **15** along their longitudinal margins provides a substantially more rigid construction than when connected along the relatively short lateral ends of the panels.

Another feature of the invention relates to a lifting handle for the holder as illustrated in FIG. 5. This handle comprises a metal strap bent to form a U-shaped base portion **26** for engaging over the top panel **12** and a stem **28** extending upwardly from the portion **26** and having its top end bent into a hand gripping unit **30**. Slidably mounted on the stem **28** is a locking key **32** having a downwardly extending projection **34** adapted to extend through a hole **36** in the top panel and into a hole **38** in the base portion **26**, thereby locking the handle onto the panel **12**. The U-shaped base portion is of a dimension snugly to receive the panel **12** thereinto and support the panel and holder in horizontal position when lifted by the handle. Handles can be employed at both ends of the holder as illustrated in FIG. 5 if desired. The locking key is provided with a detent **40** for holding the key in locking position.

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

1. A test tube holder comprising a rectangular sheet of metal bent zig-zag along spaced straight lines between and parallel with two opposite margins of the sheet and providing a substantially Z-shaped member including a base portion adapted to rest flatly on a supporting surface, a top portion parallel to and spaced above said base portion and an intermediate portion connecting the base and top portions and including a panel inclined at an angle to said base and top portions and providing therewith outwardly flaring openings at opposite sides of the holder permitting at least twenty-five percent complete nesting of the holders without distorting said top and base portions from their normally parallel relation, the top and intermediate portions having a series of aligned holes therethrough disposed along and substantially parallel to said straight lines for receiving and supporting test tubes resting at their closed ends on the base portion.

2. A test tube holder comprising a substantially Z-shaped member embodying a plane base portion

adapted to rest flatly on a supporting surface, a plane top portion parallel to and in spaced relation above said base portion, and means connecting the base and top portions and including an intermediate plane portion inclined at an angle to said base and top portions and providing therewith outwardly flaring openings into the holder at opposite sides of said intermediate plane portion permitting at least twenty-five percent complete nesting of the holders without distorting said top and base portions from their normally parallel relation, the top and intermediate portions having a series of aligned holes therethrough disposed along the junction of said top and intermediate portions for receiving and supporting test tubes resting at their closed ends on the base portion.

3. The test tube holder defined in claim 2 in which said top and base portions and said intermediate portions are rectangularly oblong and the top and base portions are integrally connected with the intermediate portion along their adjacent longitudinal margins.

4. The test tube holder defined in claim 2 in which said intermediate portion is spaced from and integrally connected at opposite margins to the top and base portions by other portions disposed right-angularly to the top and base portions.

5. The test tube holder defined in claim 2 in which

said means including an intermediate plane portion is integrally connected along opposite margins of the intermediate portion to said top and base portions and said top portion has a plurality of series of said holes therethrough in spaced and substantially parallel relation and said intermediate portion has test tube receiving holes therethrough respectively in alignment with the holes in the top portion and disposed along and between said opposite margins.

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