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Hirano et al.

[11] **3,923,160**

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[54] **TEST TUBE SUPPORT**

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[52] **U.S. Cl.** **211/73;** 211/74; 206/45.14

[51] **Int. Cl.²** **A47G 29/00**

[58] **Field of Search** ..... 211/72, 73, 74, 60 A; 248/459; 206/538, 485, 486, 45.19, 45.14, 45.24; 229/28 R

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Assistant Examiner—Robert A. Hafer
Attorney, Agent, or Firm—Kemon, Palmer & Estabrook

[57] **ABSTRACT**

A test tube support is formed by folding a sheet-like material bearing a certain pattern.

2 Claims, 4 Drawing Figures

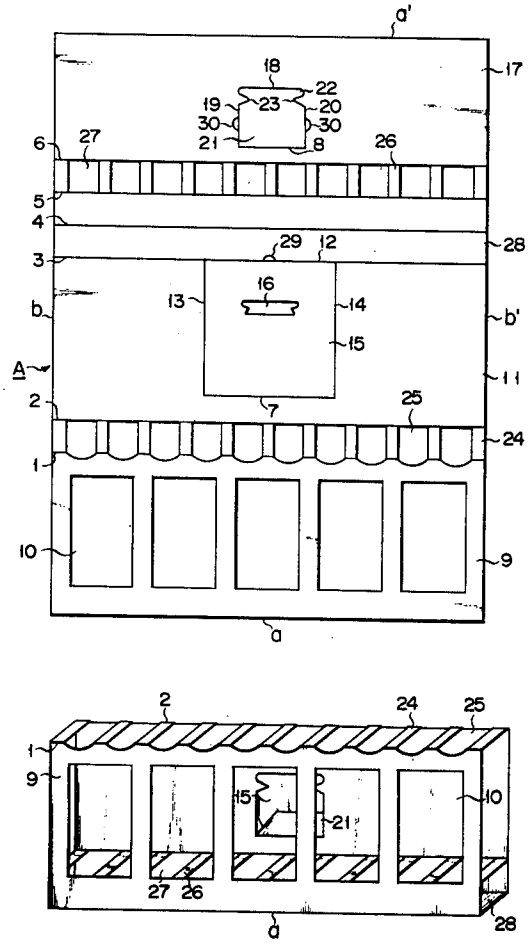


FIG. 1

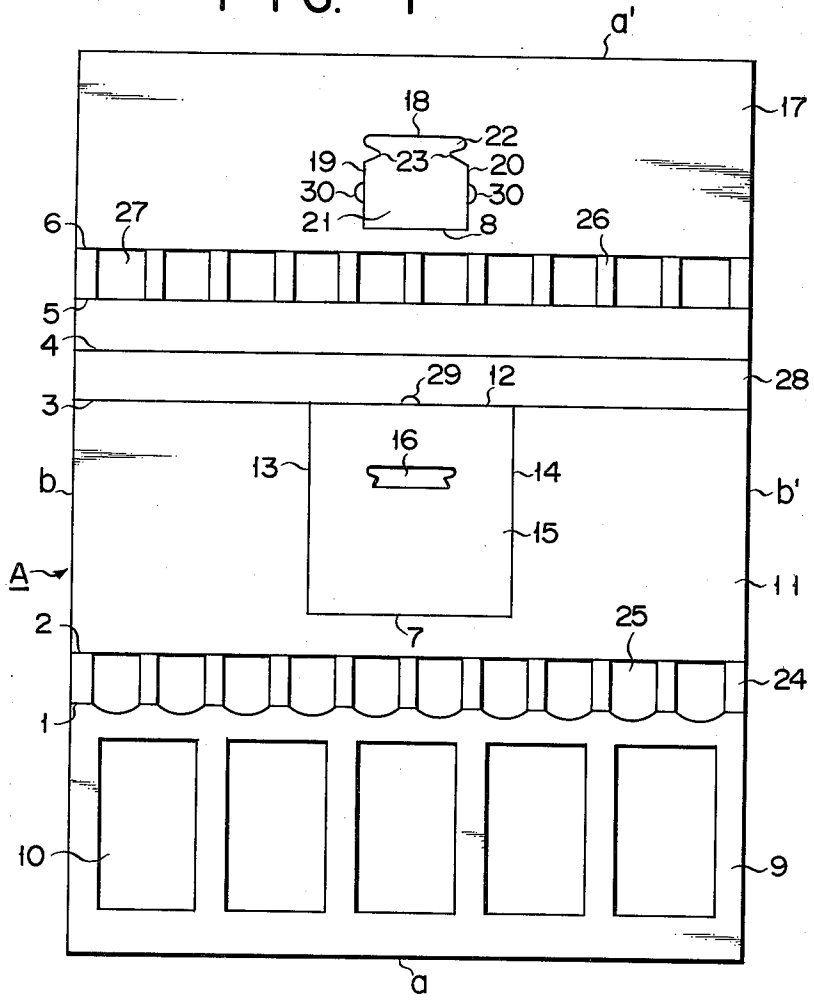

a'
17
18
22
19
23
20
30
30
21
8
6
27
26
5
4
29
12
28
3
16
13
14
b
b'
15
A
11
2
7
25
24
1
10
9
a

FIG. 2

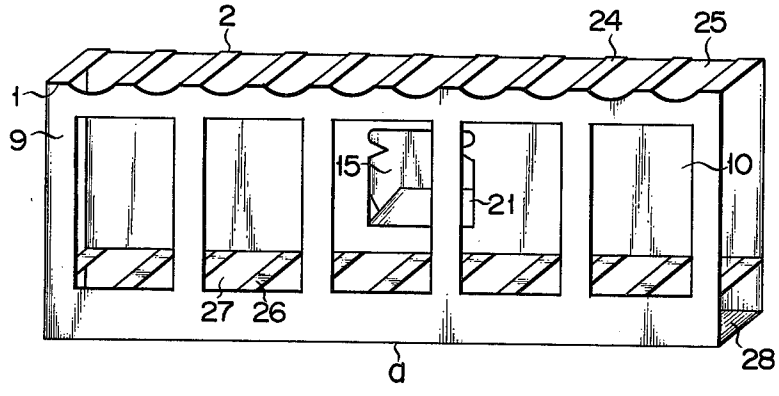

2
24
25
1
9
15
21
10
27
26
28
a

FIG. 3

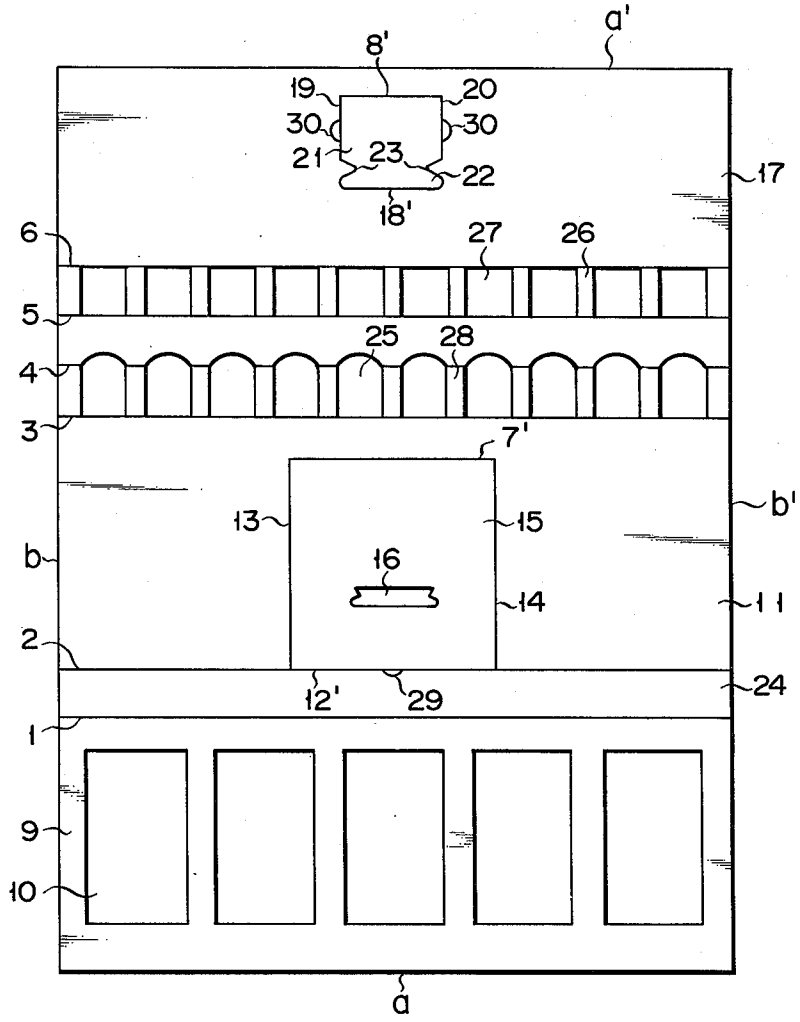
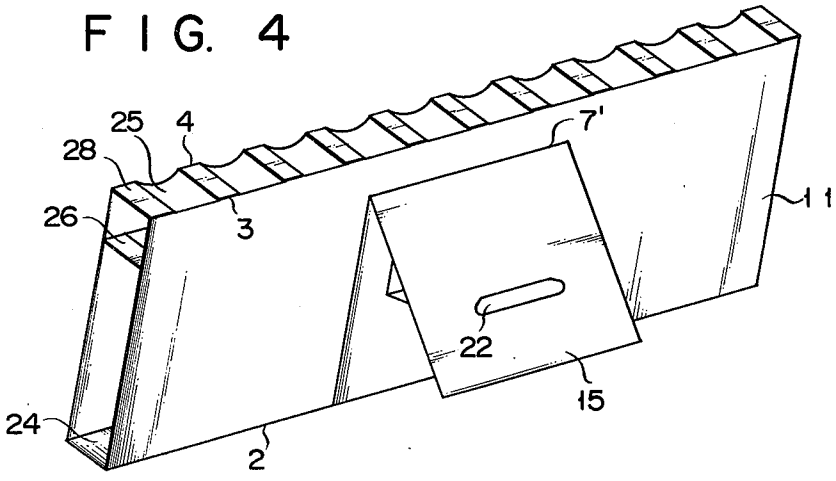

a'
8'
19
20
30
30
21
23
22
18'
17
6
27
26
5
25
28
4
3
7'
13
15
b'
b
16
14
11
2
12'
29
24
1
9
10
a

FIG. 4


25
4
28
7'
26
3
11
22
15
24
2

TEST TUBE SUPPORT

This invention relates to a test tube support for use in storing or transporting glass tubes such as test tubes etc.

Conventionally, a test tube support has been manufactured from wood. Such test tube support is rigid in construction and durable. However, it is expensive and difficult to manufacture. Moreover, it is very inconvenient for storage or transportation.

It is accordingly an object of this invention to provide a test tube support formed by folding a sheet-like material such as a cardboard etc.

Another object of this invention is to provide a simple and inexpensive test tube support which is easy to manufacture and very convenient for storage or transportation.

The above-mentioned objects, as well as other objects, can be attained by a test tube support formed by folding a sheet-like material, such as a cardboard, bearing a particular pattern.

The sheet-like material has a first section having a plurality of windows and constituting a relatively wide front wall; a second section having a plurality of openings and constituting a narrow upper compartmentalized wall, a third section having a corresponding number of openings aligned with said plurality of openings of said second section and constituting a lower compartmentalized wall; a fourth section having a first support wall with a slit and constituting the outer wall of a relatively wide rear panel; a fifth section having a second support wall with a projection and constituting the inner wall of the relatively wide rear panel; a sixth section constituting a narrow bottom; and a seventh section constituting a narrow wall. The first, second, third, fourth, fifth, sixth and seventh sections are defined by, and being foldable along, folding lines. The test tube support is formed by folding the sheet-like material along these folding lines, bonding said fifth section and said seventh section to said fourth section and the rear surface of said first section, respectively, and lockingly fitting the projection of said second support of said fifth section into the slit of said first support wall of said fourth section.

This invention will be further described by reference to the accompanying drawings, in which:

FIG. 1 is a plan view showing a sheet-like material from which a test tube support according to this invention is formed;

FIG. 2 shows a front perspective view of the test tube support formed from the sheet-like material of FIG. 1;

FIG. 3 is a plan view showing a sheet-like material from which another test tube support according to this invention is formed; and

FIG. 4 is a rear perspective view of the test tube support formed from the sheet-like material of FIG. 3.

FIG. 1 shows a sheet-like material, for example, a cardboard A, having a predetermined pattern from which a test tube support or stand is formed. The sheet-like material is rectangular in configuration. In the Figure, the opposite sides *b*, *b'* of the rectangle are longer than the opposite sides *a*, *a'* thereof. For example, the opposite sides a, a' and *b*,*b'* are **230** mm and **308** mm, respectively.

A first folding line **1** is provided at a relatively wide interval of, for example, **86** mm from, and parallel to, the side a of the rectangle. A second folding line **2** is

provided at a narrow interval of, for example, **17** mm from, and parallel to, the first folding line **1.** A third folding line **3** is provided parallel to the second folding line and spaced a distance —for example, **86** mm— substantially equal to that of the first folding line. Fourth, fifth and sixth folding lines **4, 5** and **6** are provided parallel to the third line **3** and spaced a distance —for example, **17** mm— substantially equal to the distance between the first and second folding lines **1** and **2,** from the third, fourth and fifth folding lines, respectively. Between the sixth folding line **6** and the side *a'* is defined a relatively wide space **17** of, for example, **68** mm.

Between the side a and the first folding line **1,** a plurality of rectangular apertures or windows **10,** for example, five in number, are provided, for example, at equal intervals and each have opposite long side parallel to the sides *b*, *b'* of the rectangle. The window **10** has opposite long sides of, for example **59** mm and opposite short sides of, for example, **34** mm. The distance between the long sides of the adjacent windows **10** is, for example, **10** mm and the distance between the side a and that short side of the window **10** which is closer to the side a is, for example, **17** mm. A section **9** defined between the side a and the folding line **9** constitutes the front wall of the test tube support. The number of windows **10,** as well as the shape and size of the window **10,** may be suitably selected. In this case, it will be necessary that, when the test tube support has been formed, test tubes etc. be clearly observed through the window **10.**

At the middle portion of a wide section **11** between the second and third folding lines **2** and **3** is formed a first rectangular shaped support wall **15** defined by a seventh folding line **7** parallel to the third folding line **3,** a corresponding line **12** cut on the third folding line **3** and opposite side lines **13** and **14** cut in a direction perpendicular to the third folding line **3.** A slit **16** parallel to the side cut line **12** is formed in the support wall. The wide section **11** constitutes the outer wall of a rear panel of the test tube support. At the middle portion of a relatively wide section **17** defined between the sixth folding line **6** and the side *a'* is formed a second support wall **21** defined by an eighth folding line **8** parallel to the side *a'*, a corresponding line cut in a direction parallel to the eighth folding line **8** and opposite side lines **19** and **20** cut in a direction perpendicular to the eighth folding line **8.** The second support wall **21** has an ear-like projection **22** adapted to be lockingly fitted into the slit **16** of the first support wall **15.** The first and second support walls are both raised up in the same direction. In the Figure, the ear-like projection **22** of the second support wall **21** has a pair of recesses **23, 23** which facilitates a locking engagement with the slit **16** of the first support wall **15.** The section **17** constitutes the inner wall of the rear panel of the test tube support.

Cut ends **29** and **30** may be provided adjacent to the cut lines **12** and **19, 20,** respectively, so that the first and second support walls can be easily raised up from the plane of the cardboard when the test tube support is formed.

At a section defined between the two folding lines (in the FIGS. **1** and **2**) which are located in the neighborhood of the seventh folding line **7** and on a side opposite to a side on which the cut line **12** is provided with the seventh folding line **7** as a reference, a plurality of openings **25,** for example, **10** in number, equal in shape

and size to each other are provided parallel to the side *b* of the rectangle. In the Figure, the opening **25** is rectangular in configuration. The rectangular shaped opening **25** has opposite long sides of, for example, **17** mm and opposite short sides of, for example, **16** mm. The long sides of the adjacent openings **25** are spaced, for example, **6** mm apart from each other. One side of the opposite short sides of the opening **10** is arcuate shaped. The shape of the opening **25** may be suitably selected. However, it is necessary that the opening **10** have such a size as to permit the test tube to be freely inserted and removed. At the section **26** defined between the folding lines **5** and **6** are provided a plurality of openings **27** (in the Figure, **10** in number) equal in size and shape to each other which are aligned with the plurality of openings **25**, respectively. In the Figure, the opening **27** has a rectangular configuration having opposite long sides of, for example, **17** mm and opposite short sides of, for example, **16** mm. The size of the opening **27** may be suitably selected. However, it is necessary that the opening **27** have such a size as to permit the test tube to be freely inserted and removed. The sections **24** and **26** constitute the upper and lower compartmentalized walls, respectively, of the test tube support.

The test tube support is formed as follows.

The cardboard is folded in a direction along the first, second, third, fourth and fifth folding lines. Then, it is folded along the sixth folding line in a direction opposite to the direction in which it is folded along the above-mentioned folding lines. The section defined between the sixth folding line **6** and the side *a'* is bonded to the section defined between the second and third folding lines **2** and **3**, while the section defined between the side *a* and the first folding line **1** is bonded to the section defined between the fourth and fifth lines **4** and **5**. The first and second support walls are respectively raised up and the ear-like portion of the second support wall is lockingly fitted into the associated slit of the first support wall. The test tube support is so formed.

FIG. **2** is a perspective view showing the front of the test tube support so formed. As will be understood from the Figure the section **28** defined between the folding lines **3** and **4** constitutes the bottom of the test tube support.

FIG. **3** shows a second sheet-like material from which another test tube support according to this invention is formed. In the Figure, similar reference numerals are employed to designate lines or sections corresponding to those shown in FIG. **1**. As will be evident from the Figure, the relative position of a folding line **7'** and cut line **12'** is reversed with respect to the relative position of the folding line **7** and cut line **12** shown in FIG. **1**, while the relative position of a folding line **8'** and cut line **18'** is reversed with respect to the folding line **8** and cut line **18** shown in FIG. **1**. FIG. **4** shows a perspective view showing the rear of a test tube support formed from the second sheet-like material. As will be easily understood from the Figure, a section **24** defined between first and second folding lines **1** and **2** constitutes the bottom of the test tube support; a section **28** defined between third and fourth folding lines, the upper compartmentalized wall of the test tube; and a section **26** defined between fifth and sixth folding lines **5, 6**, the lower compartmentalized wall of the test tube.

As the sheet-like material, plastics may also be used in addition to a cardboard. In this case, each folding line may be formed by grooving.

Though the above-mentioned embodiments have been formed from the rectangular sheet-like material, this invention is not restricted thereto. For example, the rectangle may be modified by making one side positively or negatively arcuate or angular in configuration or making opposite sides selectively indented or notched.

As described above, the test tube support is easily formed from, for example, a cardboard stamped out to form a predetermined pattern. The test tube support according to this invention is inexpensive, light in weight and convenient for transportation. It is also convenient for storage since it is foldable.

Since the test tubes are supported by the upper and lower compartmentalized walls, there is no fear that any injury to the test tube will be caused during transportation. Furthermore, the kind, amount etc. of the content of the test tubes can be readily observed through the windows without the necessity of removing the test tube from the test tube stand.

The test tube support can be used as a package for test tubes or evacuated containers for blood collection by bringing the first and second support walls **15** and **21** into the initial position. In this case, the test tubes etc. can be safely transported without any injury. When the test tube support is used as a test tube stand, the support walls **15** and **21** need only to be raised up from the fourth and fifth sections for support. If the test tube support is soiled, it can be thrown away in view of its inexpensiveness.

What we claim is:

1. A foldable test tube support formed from rectangular sheet material, said test tube support having a compartmentalized top, a bottom, a front wall, a doubled rear wall and a compartmentalized intermediate wall interposed between the top and the bottom, said sheet material having in series:

a large front wall section adapted to form said front wall and having a plurality of windows:

a narrow top section adapted to form said top and having a plurality of openings, the top section being separated from the front wall section by a first fold line;

an outer rear wall section having the same size as the front wall section, the outer rear wall section being separated from the top section by a second fold line;

a bottom section adapted to form said bottom and having the same size as the top section, the bottom section being separated from the outer rear wall section by a third fold line;

a first wall section adapted to be bonded to said front wall section to secure the same, said first wall section being so narrow that said intermediate wall is located near but spaced from said bottom when the test tube support is formed, said first wall section being separated from the bottom section by a fourth fold line;

an intermediate wall section adapted to form said intermediate wall, and having a plurality of openings corresponding in number and location to the openings of said top and the same size as the top section, the intermediate wall section being separated from the first wall section by a fifth fold line; and

an inner rear wall section adapted to be bonded to said outer rear wall section, forming therewith said doubled rear wall when the test tube support is formed, the total size of the inner rear wall section and the first narrow wall section having substantially the same size as the front wall section, the inner rear wall section being separated from the intermediate wall section by a sixth fold line;

said outer rear wall section has substantially at a center area thereof a rectangular first support wall section having a slit therein defined by a seventh fold line parallel to and adjacent to said second fold line, a first cut line provided in said third fold line and opposed second and third cut lines, and

said inner rear wall section has substantially at a center area thereof a rectangular second support wall section defined by eighth fold line parallel to and adjacent to said sixth fold line, a fourth cut line opposite said eighth fold line and opposed fifth and sixth cut lines, said second support wall section being adapted to be lockingly fitted into said slit in said first support wall section to support the test tube support when it is constructed.

2. A foldable test tube support formed from a rectangular sheet material, said support having a compartmentalized top, a bottom, a front wall, a doubled rear wall and a compartmentalized intermediate wall interposed between the top and the bottom, said sheet material having in series:

a large front wall section adapted to form said front wall and having a plurality of windows;

a narrow bottom section adapted to form said bottom, the bottom section being separated from the front wall section by a first fold line;

an outer rear wall section having the same size as the front wall section, the outer rear wall section being separated from the bottom section by a second fold line;

a top section adapted to form said top and having a plurality of openings and the same size as the bottom section, the top section being separated from the outer rear wall section by a third fold line;

a first wall section adapted to be bonded to said front wall section to secure the same, said first wall section being so narrow that said intermediate wall is located near but spaced from said top when the test tube support is formed, said first wall section being separated from the top section by a fourth fold line;

an intermediate wall section adapted to form said intermediate wall, and having a plurality of openings corresponding in number and location to the openings of said top section and the same size as the top section, the intermediate wall section being separated from the first wall section by a fifth fold line; and

an inner rear wall section adapted to be bonded to said outer rear wall section, forming therewith said doubled rear wall when the test tube support is formed, the total size of the inner rear wall section and the first wall section having substantially the same size as the front wall section, the inner rear wall section being separated from the intermediate wall section by a sixth fold line;

said outer rear wall section has substantially at a center area thereof a rectangular first support wall section having a slit therein defined by a seventh fold line parallel to and adjacent to said third fold line, a first cut line provided in said second fold line and opposed second and third cut lines, and

said inner rear wall section has substantially at a center area thereof a rectangular second support wall section defined by an eighth fold line parallel to and spaced from said sixth fold line, a fourth cut line opposite said eighth fold line and near said sixth fold line, and opposed fifth and sixth cut lines, said second support wall section being adapted to be lockingly fitted into said slit in said first support wall section to support the test tube support when it is constructed.

* * * * *