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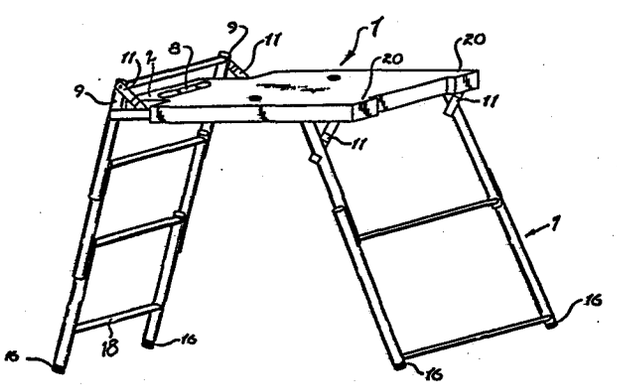
(54) Work top and work bench.

(57) This invention relates to a detachable work top (1) to be used with foldup ladders (7), which can be converted into structures such as a work bench, table or step ladder. The top (1) comprises a rectangular main portion (3) and a narrower extending section (2). The main portion (3) fits over and around the rails of the ladder (7) (after conversion to a work bench) and the narrower extending section (2) fits inside the rails (9) but on substantially the same plane as the main portion (3).



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WORK TOP AND WORK BENCH

This application relates to a work top for use in forming a work bench table and to such a work bench table.

In U.S. Patent No. 4 429 766 and European Applications 84 105 445.5 and 84 105 444.8 convertible ladders are disclosed and claimed. The content of these earlier documents is hereby incorporated herein by this reference. Each of these ladders made up of U-shaped modules that are connected to each other by hinges that permit each module when not in use to fold or slide within an adjacent wider module. Each of these ladders has locking mechanisms that permit the modules to lock securely to each other when the ladder is in the extended or raised position.

In the above-noted European Patent Applications, the U-shaped hinged modules are adapted to fold into their next wider modules when compacted for storage or to be transported. Since each hinged module will rotate 360° on its hinged axis, many variations can be accomplished such as step ladders, work benches, etc. In EPA 84 105 445.5 a ladder conversion to a work bench is disclosed and ill trated in Figure 6. This work bench is formed from the folding ladder merely by folding down the second (from bottom) and fifth (from bottom) modules. These modules are then locked in place and supported by brackets in at least two corners. These brackets generally take the form of metal or plastic bars that have

a projection on one end and an aperture on the opposite end. When this structure is to be used as a work bench it is highly desirable to have a working surface on which to work.

It is therefore an object of this invention to provide a removable workbench top adapted for use with the above-described ladders.

It is another object of this invention to provide a detachable top that can also be used with the ladder structure as a table.

Another object of this invention is to provide a convenient case or container for the ladder when the ladder is compacted for storage.

Still another object of this invention is to provide a solid top for the above-noted ladders that can be used to stand on when painting, papering, or otherwise working when a flat raised surface is required.

Another still further object of this invention is to provide a secondary container into which the ladder can be fitted and packed before shipping or storage.

A further object of this invention is to provide a work bench top that can accommodate bracket storage for the ladder when the ladder is not in use.

According to one aspect of the invention, there is provided a work top adapted for use with a supporting structure characterized by a substantially rectangular main portion

having an extending section protruding therefrom said extending section having a width less than that of said main rectangular portion and being adjacent to and integral with one side of said main portion; a side wall extending downward from substantially the entire periphery of the combination of said main rectangular portion and said extending section; and a cutout located at the interface between said main portion and said extending section.

According to another aspect of the invention, there is provided a work top adpated for use with a supporting structure, characterized by a substantially rectangular main portion having an extending section at one side thereof; a recessed portion of said main portion adjacent said extending section; a cutout located on each side of said extending section thereby defining two openings to accommodate brackets used with said supporting structure; and a side wall extending downward from substantially the entire periphery of said top.

According to a further aspect of the invention, there is provided a work bench table comprising in combination a supporting structure and a detachable top, said supporting structure comprising a series of U-shaped modules in a sequence of progressively decreasing size towards one end of said supporing structure, each module being movably connected to another by a hinge positioned in the upper portion of a wider module and in the lower portion of the next adjacent narrower module, said supporting structure being folded in such manner as to define a support surface, said detachable top comprising a substantially rectangular main portion having an extending section on one side thereof,

said extending section having a width less than that of said main portion and being integral with one side of said main portion, and a cutout located between said main portion and said extending section, and resting on a portion of said structure to secure said top to said structure.

The foregoing objects and others are accomplished by this invention generally speaking by providing a detachable work bench top having dimensions slightly exceeding the outer periphery of the supporting structure. The above-mentioned ladders comprise modules of vertical side rails and horizontal rungs. The work bench top of this invention has dimensions that slightly exceed the widest or bottom module. When the ladder is folded or compacted the ladder will fit snugly within the lower interior portion of this work bench top.

The work bench top is of a rectangular structure of configuration having integral therewith a rectangular (or other shaped) extending section. Positioned between the main rectangular structure and the rectangular (or other shaped) extending section are cutout portions to accommodate the side rails or rungs of the supporting structure (ladder). The main rectangular structure fits around and encloses the outer periphery of the rails of supporting structure while the extending section fits inside the rails. The extending section preferably contains a pocket portion for holding nails, screws, tools or other objects used while working. This pocket portion is structured so that the longitudinal side is spaced from the outer edge of the extending section just slightly more than the width of the brackets. Thus, when stored, the ladder and brackets both can be housed within the

framework of the detachable top. The brackets will fit tightly just above the recessed pocket along its upper longitudinal side and the ladder will abut and fit tightly against the lower longitudinal side of the pocket.

The detachable top of this invention can be made from metal such as aluminium, steel, alloys, or wood, or plastics such as nylon, Teflon, P.V.C., polystyrene materials, polyurethanes, polycarbonates, or fiberglass or any other suitable material. It is important that the materials be of high impact strength and be durable enough to permit the user to stand on it or exert pressure on it without any structural failure.

For a better understanding of the invention, and to show how the same may be carried into effect, reference will now be made, by way of example, to the accompanying drawings, in which;

Figure 1 is an upper perspective view of a detachable top according to one embodiment of this invention;

Figure 2 is a lower perspective view of the detachable top of Figure 1;

Figure 3 is a side perspective view of a work bench (converted ladder) before the work bench top of Figures 1 and 2 is mounted;

Figure 4 is a side perspective view of the work bench (converted ladder) after the work bench top is attached onto its upper surface; and

Figure 5 is a view in bottom perspective view of the ladder (or work bench) when it is folded and fitted within the bottom portion of the work bench top of Figures 1 and 2.

In Figure 1, table top or work bench top 1 is shown in top perspective view. The top is substantially rectangular and has at one edge an extended section 2 that is not as wide as the width of main rectangular structure 3. The top 1 has a top surface 4, and side walls or lips 5 which are approximately the same height around the complete periphery of top 1. These side walls 5 are dimensioned to fit tightly around and encompass rails 6 of a supporting structure of work bench 8 shown in Figure 3. The dimensions of the main rectangular portion of detachable top 1 are just slightly greater than the dimensions of the upper peripheral portion of work bench 7. In the extended section 2 of the top 1 is provided a depressed pocket 8 which can be used for screws, nails, bolts, tools or other items needed when working with the work bench 7. Extended section 2 may be of any configuration or shape but preferably it is rectangular so that it fits snugly between rails 9 as shown in Figure 4.

In Figure 2 table top 1 is turned over so that the bottom surface is shown in bottom perspective. The walls 5 are arranged to completely encircle the periphery of table top 1 and to provide tight fit on all four sides, whereby table top 1 is held firmly in position. Cutout portions 10 permit the table top 1 to fit tightly around the rails 9 and brackets 11 as shown in Figure 3. Cutout portions 10 are located immediately adjacent the extending section 2 terminal portions and the recessed portions 12 of the

table top 1. The bottom surface 13 of pocket 8 performs a dual function. First, it holds items in pocket 8 and secondly it forms a side of bracket compartment 14. Brackets 11, when not in use, are stored in compartment 14 (as shown in Figure 5). The inner surfaces 15 of walls 5 fit tightly against the leg portions 16 of ladder or work bench 7. It is preferred that this inside surface 15 be fluted or grooved in order more securely to hold the leg portions 16 in position. Also, it is preferred to provide projections or nipples 17 on the bottom surface of table top 1 in order to better support the ladder when in a storage mode as shown in Figure 5.

Projections 17 abut and hold rail or rung 18 when the ladder or work bench 7 is contained within top 1. A fluted portion 20 is located at the bottom side of top 1 to accommodate the legs of the ladder or supporting structure when it is in a folded or stored mode and is contained therein for shipping or storage.

In Figure 3 the ladder 7 is shown as it is converted into a work bench or table 7. Brackets 11 are best placed at diagonal corners for good support. They may of course be used in all four corners if desired. Side rails 6 around which the table top 1 of this invention fits provide the outer longitudinal skeleton structure for the work bench top surface. The table top 1 therefore fits over and around the top portion of side rails 6 and rung 19 which forms the periphery of the top structure of work bench 7.

Figure 4 illustrates the work bench 7 with the table top 1 attached thereto. Side walls 5 completely tightly encircle the rungs 19 and side rails 6 which define the

upper surface of work bench 7. Because of the snug fit, table top 1 is firmly held in position and will not slip. Additional security is provided by cutout sections 10 which fit around brackets 11 and/or side rails to lock the top 1 in position. Pocket 8 is shown located in extending section 2 as it fits between narrower side rails 9. Brackets 11 are clearly illustrated in position on diagonal corners of the work bench 7.

Figure 5 shows the ladder or work bench 8 when its rails and rungs (which make up the modules 21 of the ladder or structure) are folded and positioned within table top 1 for storage, shipping, or protection. Brackets 11 are stored in the upper compartment 14 and contact pocket upper side walls. The ladder 7 contacts pocket lower side walls and is held firmly in position both here and in other locations around its periphery. Legs 16 are firmly in contact with the inner walls 15 of table top 1 and because of the somewhat resilient nature of the material (polystyrene materials preferred) from which top 1 is constructed, a spring-like locking action is exerted. Thus, when folded, ladder 7 is tightly fitted within top 1, and the resilient nature of the top 1 will firmly grip and hold the ladder in position. If metal is used to make the table top, a somewhat less resilient locking action is exerted. However, there will be a certain resilience because of the end rubber portions of legs 16. Rail or rung 18 fits across projections 17 to provide an extra holding action to prevent sliding of the ladder when in shipping or tranist. It is desirable to have at least one projection 17 or any shape structure that is in the bottom surface of the top 1 and extends downward therefrom. This could be in the form of a bar extending across

a portion of or the entire width of the bottom of detachable top 1. It could be integral with top 1 or detachable therefrom. Thus, it can be snapped into bottom of top 1 when required for shipping and the like and removed when top 1 is in use.

Additionally, a work top similar to that described above can be used when the ladder or support is used as shown in Figure 3b of co-pending application 84 105 444.8. That is one module of the ladder is folded down to provide a work surface for the lean-to ladder. Brackets 11 are used to support this work surface formed by the folded down module. The work top then merely rests upon the folded down module and provides a surface on which a paint can, tools or other objects can rest. This work top can have a depressed pocket into which paint can be poured to be used with a paint roller, brush or pad. The pocket can have vertical walls or slanted or inclined walls to accommodate the use of rollers or pads. This work top can merely fit into the depression of the module or can fit over the side rails of the module for additional strength.

The preferred and optimum embodiment of the present invention have been described herein and shown in the accompanying drawings to illustrate the underlying principles of the invention, but it is to be understood that numerous modifications may be made without departing from the scope of this invention.

Claims:

1. A work top (1) adapted for use with a supporting structure (7) characterized by: a substantially rectangular main portion (3) having an extending section (2) protruding therefrom, said extending section (2) having a width less than that of said main rectangular portion (3) and being adjacent to and integral with one side of said main portion (3); a side wall (5) extending downward from substantially the entire periphery of the combination of said main rectangular portion (3) and said extending section (2); and a cutout (10) located at the interface between said main portion (3) and said extending section (2).

2. A work top (1) adapted for use with a supporting structure (7) characterized by: a substantially rectangular main portion (3) having an extending section (2) at one side thereof; a recessed portion (12) of said main portion (3) adjacent said extending section (2); a cutout (10) located on each side of said extending section (2) thereby defining two openings to accommodate brackets (11) used with said supporting structure (7), and a side wall (5) extending downward from substantially the entire periphery of said top.

3. A top according to claim 1 or 2, characterized in that said cutout (10) is located in said side wall (5).

4. A work top according to claim 1, 2 or 3, characterized in that said main portion (3) has a recessed portion (12) on each side of said extending section (2), and in that said cutout area is located in said recessed portion (12).

5. A top according to any one of claims 1 to 4, characterized in that said extending section (2) contains a pocket (8) which is extended downwardly from the upper surface (4) of said top.

6. A top according to any one of claims 1 to 5, characterized in that a part of said side walls (5) on said main portion (3) is adapted to fit over the outer periphery of said supporting structure (7) and in that a part of said side wall (5) on said extending section (2) is adapted to fit between two members (9) of said supporting structure (7).

7. A top according to any one of claims 1 to 6, characterized in that said main portion (3) has at least one projection (17) extending downwardly from the lower surface thereof.

8. A top according to any one of claims 1 to 7, characterized in that said main portion (3) contains two fluted sections (20) to accommodate leg portions (16) of said supporting structure (7) when said structure (7) is folded within said top.

9. A top according to any one of claims 1 to 8, characterized by being made from high impact polystyrene material.

10. A top according to any one of claims 1 to 8, characterized by being made from plastics material.

11. A top according to any one of claims 1 to 8, characterized by being made from fiberglass.

12. A top according to any one of claims 1 to 8, characterized by being made from a metal.

13. A top according to claim 12, characterized by being made from aluminium.

14. A top according to any one of claims 1 to 8, characterized by being made from a wood product.

15. A work bench table comprising in combination a supporting structure (7) and a detachable top (1), said supporting structure (7) comprising a series of U-shaped modules (21) in a sequence of progressively decreasing size towards one end of said supporting structure (7), each module (21) being movably connected to another by a hinge positioned in the upper portion of a wider module (21) and in the lower portion (21) of the next adjacent narrower module (21), said supporting structure being folded in such manner as to define a support surface, said detachable top (1) comprising a substantially rectangular main portion (3) having an extending section (2) on one side thereof, said extending section (2) having a width less than that of said main portion (3) and being integral with one side of said main portion (3), and a cutout (10) located between said main portion (3) and said extending section (2), and resting on a portion of said structure (7) to secure said top (1) to said structure (7).

16. For use in assembling the work bench table of claim 15, a top (1) according to any one of claims 1 to 14 and a supporting structure (7) adapted to define a support surface to accept and engage with said top (1).

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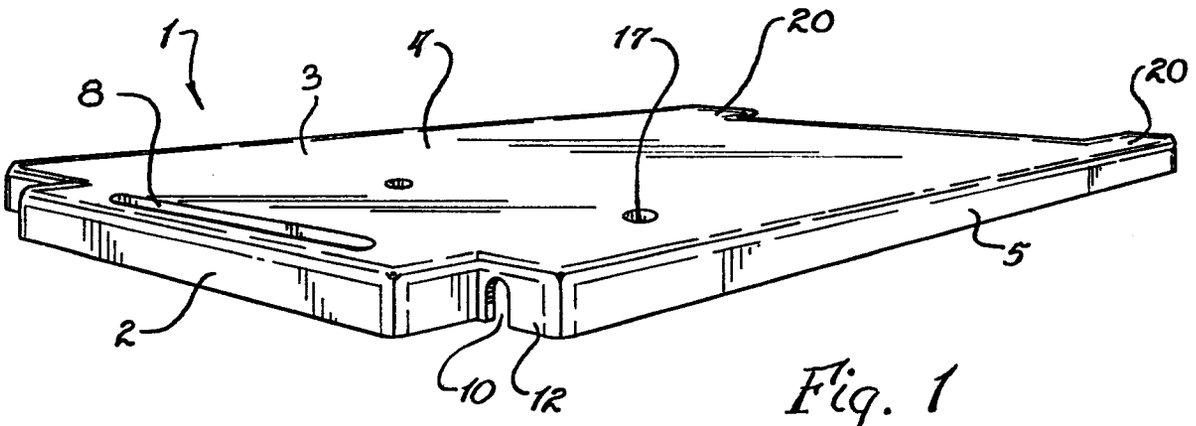

Fig. 1

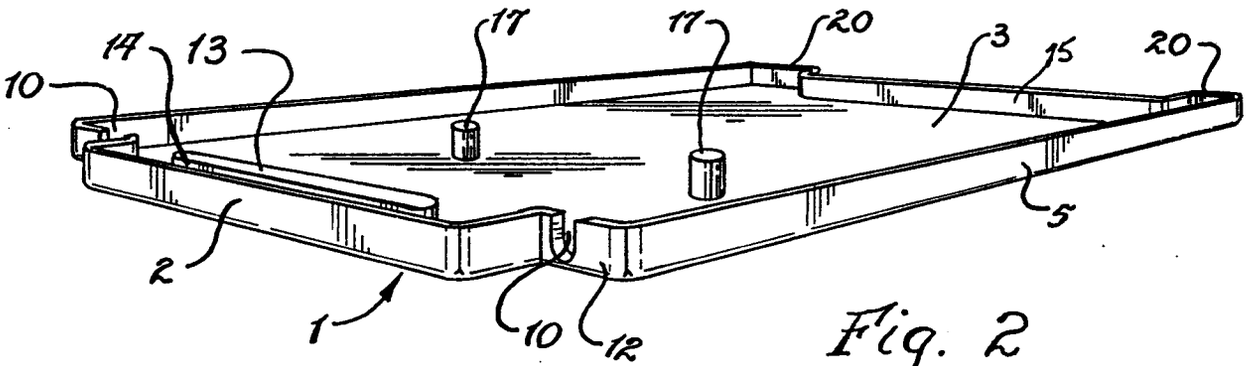

Fig. 2

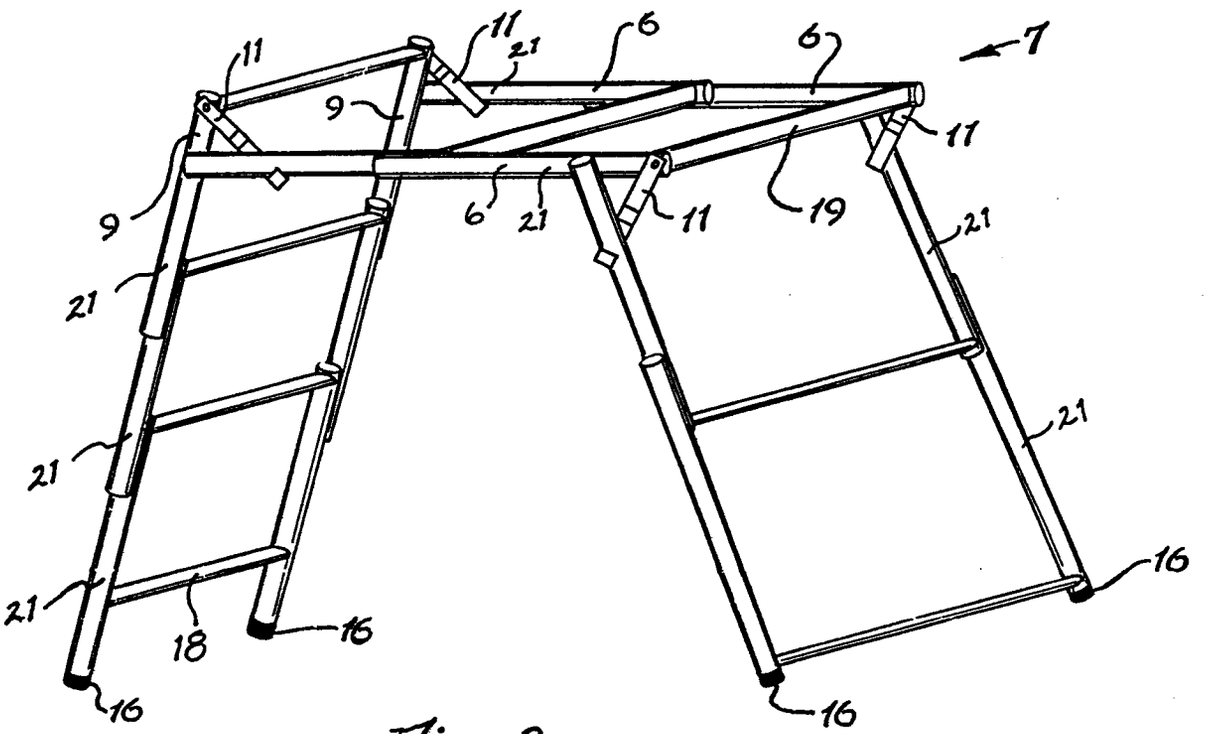

Fig. 3

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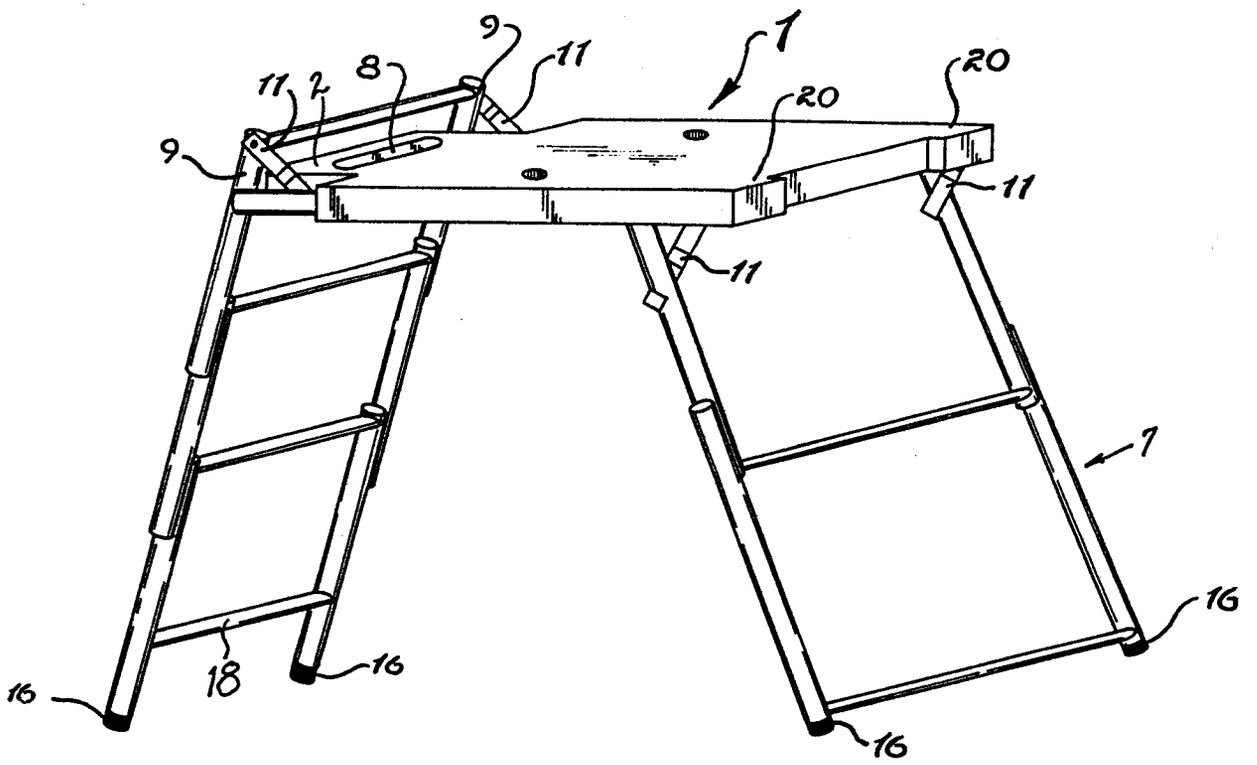

Fig. 4

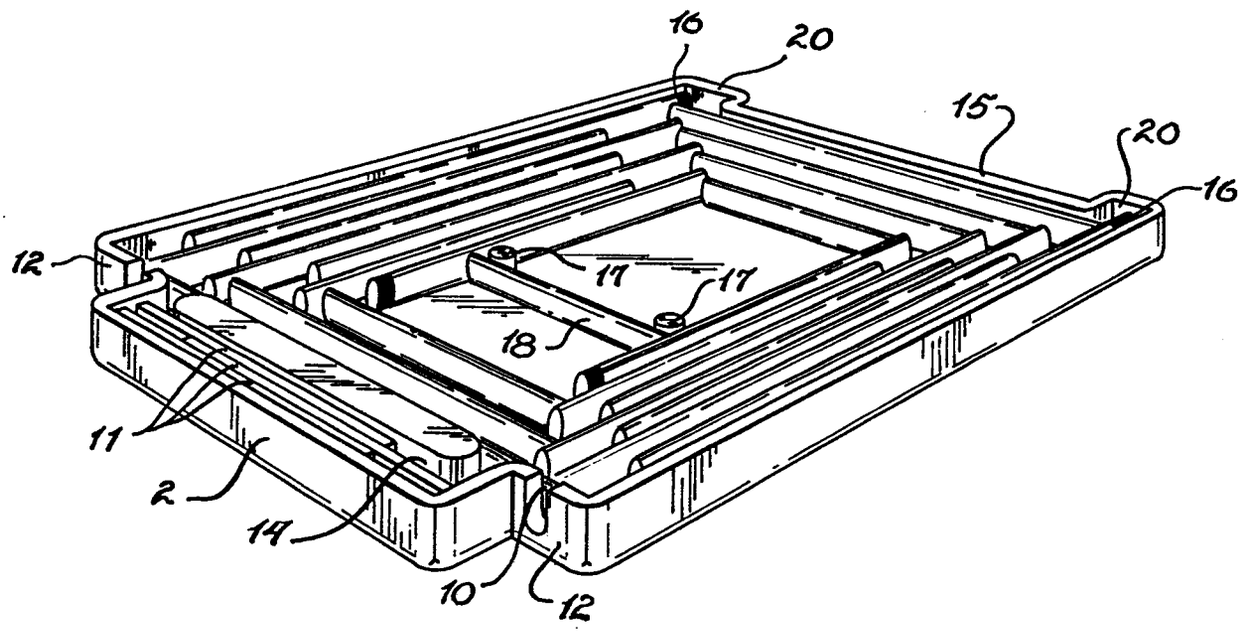

Fig. 5