

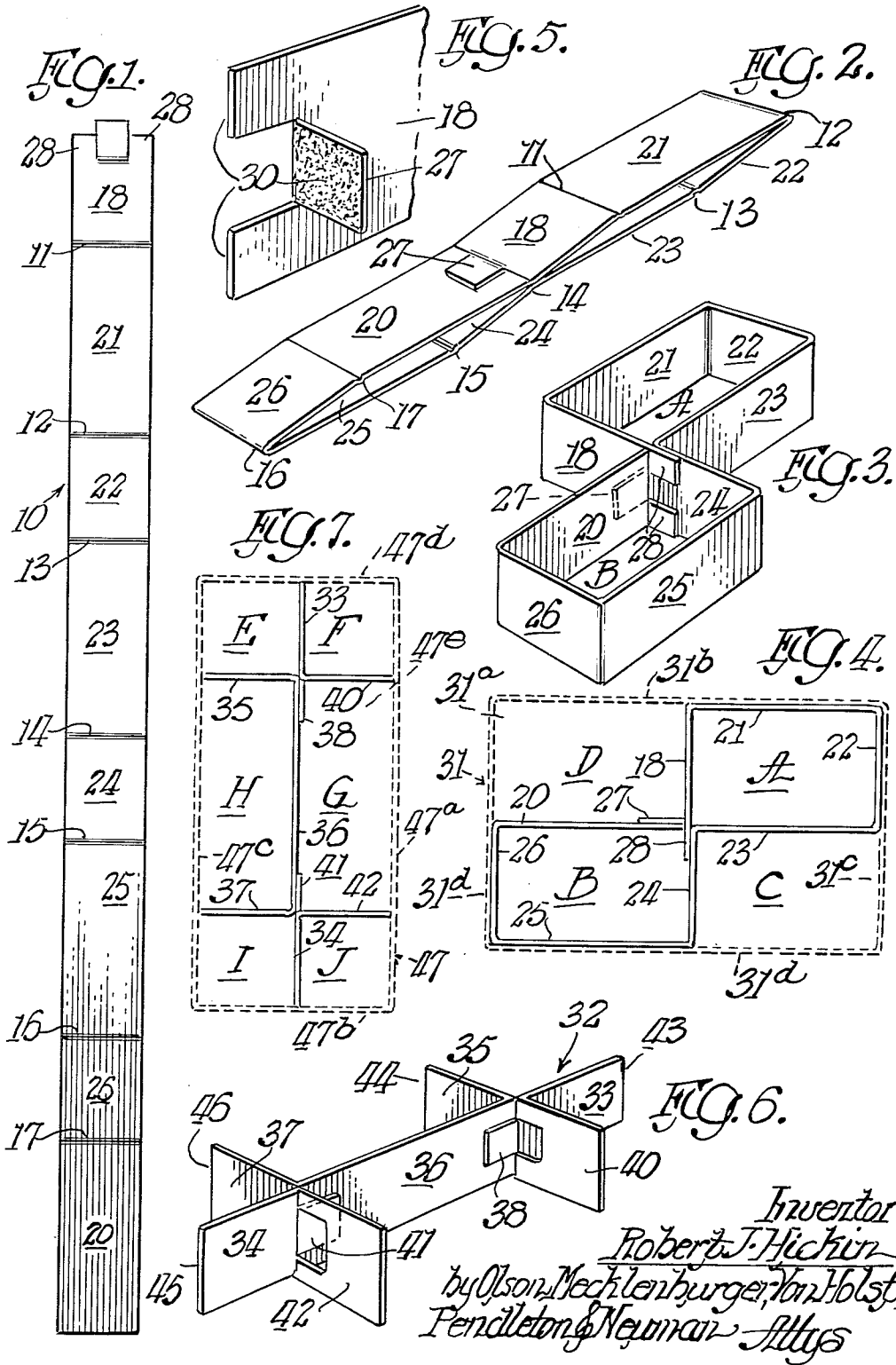
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FOLDABLE DEVICE

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FOLDABLE DEVICE

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3 Claims. (Cl. 229-15)

This invention relates to a device having a plurality of intersecting planes and a method of forming same. The device has particular application for use as a partition in compartmenting the interior of a receptacle.

Heretofore the formation of a device of this type required a plurality of individual pieces which were manually joined so as to cause such pieces to lie in a plurality of intersecting plane. By reason of these facts the formation of such device by automatic machinery was exceedingly difficult and complex and thus required the utilization of specially designed, one-purpose type equipment.

It is one of the objects of this invention to provide a device of this type which may be expeditiously and inexpensively formed from a single piece of elongated stiff foldable material.

It is a further object of this invention to provide a method of forming a device of this type which is suitable to being practiced by automatically operated machinery which is also capable of performing many other functions.

It is a still further object of this invention to provide a device formed from a single piece of elongated stiff foldable material, the ultimate configuration of such device being readily varied over a wide range, if desired.

It is a still further object of this invention to provide a device of this type wherein there results no waste of material.

It is a still further object of this invention to provide a device which will effectively compartment the interior of a receptacle and in addition provides added support against crushing for the receptacle within which such device is disposed when such receptacle has a plurality of similar receptacles stacked thereabove.

It is a further object of this invention to provide a device which may be collapsed, when not in use, to form a flat compact body and will not occupy a large space when being stored.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of this invention a device is provided having a plurality of interconnected planar sections forming a plurality of intersecting planes. One of said sections has a pair of tabs formed in one end thereof and one of said tabs is secured to a second section whereby said first and second sections are disposed in substantially coplanar relation. A third section is provided which is foldably connected to and is integral with the second section in the vicinity of the connection of said one tab to said second section. The third section lies in a plane intersecting the plane of said interconnected first and second sections. The second tab of the first section is folded relative to the first tab and lies in a plane intersecting the plane of said interconnected first and second sections. The lines of fold between the second and third sections and between the first section and the second tab are disposed substantially parallel to one another. All of said sections are initially foldably interconnected to form a blank having an elongated configuration.

For a more complete understanding of this invention reference should be made to the drawing wherein:

FIGURE 1 is a plan view of a blank from which one form of the device is made.

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FIG. 2 is a perspective view of the blank of FIG. 1 in a flat folded condition.

FIG. 3 is a perspective view of the blank of FIG. 1 in a set-up condition.

FIG. 4 is a top plan view of FIG. 3 showing the device thereof disposed within a receptacle, the latter being indicated by broken lines.

FIG. 5 is an enlarged fragmentary perspective view of the end section of the blank shown in FIG. 1 in which tabs are formed therein.

FIG. 6 is a perspective view of a modified form of device shown in a set-up condition.

FIG. 7 is a top plan view of FIG. 6 showing the device thereof disposed within a receptacle, the latter being indicated by broken lines.

Referring now to the drawings and more particularly to FIG. 1, a blank 10 is shown which, in this instance, is of an elongated rectangular configuration and is formed preferably of stiff paperboard. Several blanks of the type shown, may be simultaneously formed from a large sheet of paperboard material or from a web of such material and such blanks separated from one another by perforated lines whereupon such blanks may be readily severed from one another after folding thereof as will be hereinafter described.

Each blank 10 is provided with a plurality of parallel foldlines 11, 12, 13, 14, 15, 16 and 17 which are arranged in longitudinally spaced relation and are disposed transversely with respect to the longitudinal axis of said blank. The foldlines cooperate to form end sections 18 and 20 and intermediate sections 21, 22, 23, 24, 25 and 26. End section 18 has formed in the free end thereof a pair of tabs 27 and 28. Tab 27, if desired, may be slightly longer than tab 28 as shown. Furthermore, tab 28 may, if desired, constitute one or more segments which may be separated by tab 27, see FIG. 1 or 5.

In forming the illustrated device which, in this instance, is utilized for compartmenting the interior of a receptacle or tray 31, the end section 18 and intermediate section 21, the latter being foldably connected thereto by foldline 11, are folded about foldline 12. This operation may occur while several blanks are attached to one another. End section 20 and intermediate section 26 connected thereto by foldline 17 are similarly folded about foldline 16 so that tab 27 will overlie the free end of end section 20 and be affixed to a surface thereof. The segments of tab 28 are disposed beneath the free end of end section 20 and are affixed to a surface of intermediate section 24, adjacent foldline 14, see FIG. 2. In the illustrated embodiment the means for affixing the tabs to the end and intermediate sections is by an adhesive coating or stripe 30 which is applied to the corresponding surface of both tabs 27 and 28. Such adhesive material may be applied by a suitable gluing apparatus such as a roller, subsequent to the tabs being die-cut and the folding scores applied to the opposite surfaces of the blank and before the individual blanks are separated from one another. After the blank has been flat-folded to the shape shown in FIG. 2, it may be stored or transported for later use. At the time the flat folded blank is ready for use, it is further folded to the condition shown in FIG. 3 whereupon it may be directly disposed within the interior of the receptacle 31 which is to be compartmented. When the device shown in FIG. 2 is fully set up, the end section 18 and intermediate sections 21 through 23 delimit an area A, and end section 20 and intermediate sections 24 through 26 delimit an area B. These areas A and B, in this instance, are of like configuration and are diagonally arranged, or in staggered relation with respect to one another.

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In FIG. 4 the set-up device when disposed within the interior of the receptacle or box 31, cooperates with the receptacle side walls so as to define areas C and D of similar configuration. The device, if desired, may be retained in its set-up condition by the articles accommodated in the compartments themselves or the device may be mechanically or manually folded so as to remain in its set-up condition. The receptacle 31 is, in this instance, of rectangular configuration having a bottom panel 31a and upstanding foldably connected side walls 31b-e which delimit such bottom panel.

Generally, the height of the end and intermediate sections is of substantially the same height as the side walls of the receptacle. Thus, when the device is disposed within the receptacle, it will rest upon the bottom panel 31a and will engage the undersurface of a cover, not shown, for the receptacle and thereby provide effective support against crushing when the receptacle is subjected to normal loads which occur during stacking of such receptacles.

A modified form of device 32 is shown in FIG. 6 which is provided with a pair of end sections 33 and 34 and intermediate sections 35, 36 and 37. Initially the device is formed from a blank having an elongated substantially rectangular configuration. In this instance each end section 33 and 34 is provided with a pair of tabs 38 and 40 and 41 and 42. The tabs 40 and 42, in this instance, are of substantially inverted U-configuration and form a compartmenting wall within the interior of a receptacle 47 such as shown in FIG. 7. The edges 43 and 44, respectively, of end section 33 and intermediate section 35 were initially integral with one another and formed a transverse foldline of the blank. Likewise, edges 45 and 46, respectively, of end section 34 and intermediate section 37 were initially integral and formed a transverse foldline of the blank. These edges of the end and intermediate sections were formed by severing the blank at these foldlines subsequent to partial folding of the blank and securing of tabs 38 and 41 to portions of intermediate section 36.

As shown in FIG. 7 the modified device 32 is disposed within the interior of receptacle 47 and cooperates with the side walls 47a-d and bottom panel 47e thereof so as to form compartments E, F, G, H, I, and J. These compartments, as well as compartments A through C previously described, are adapted to accommodate various types of articles and prevent intermixing of such articles during handling of the receptacle.

It is obvious that the number and shape of the intermediate sections of the blank may be readily varied from that shown in the drawings and will depend in large measure upon the shape of the receptacle in which the device is disposed and/or the shape or configuration of the article to be accommodated by the compartments formed by the device. Furthermore, the means of affixing the tabs to the various sections of the blank may be accomplished by staples, clips, or the like in addition to adhesive materials previously mentioned.

While the invention in this instance has been described in relation to a device for use in compartmenting the interior of a receptacle, it is to be understood, of course, that the invention is not limited thereto but may be utilized in numerous other ways wholly different from that as illustrated.

By reason of the fact that one of the tabs formed in the end section remains substantially in the same plane as the end section on which it is formed subsequent to such tab being affixed to another section of the blank and the device being flat-folded or in set-up condition, there is provided a strong interconnection between said end section and another section of the blank.

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Thus, the device described may be readily produced by automatically operated machinery because of its simple configuration and due to the fact that it is formed from a single piece of material. In addition the improved device may be readily varied in size and shape to meet certain conditions.

While several embodiments of this invention have been shown above, it will be understood of course that the invention is not to be limited thereto, since many further modifications may be made by those skilled in this art in light of the disclosure herein. It is contemplated, therefore, by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. A device of the class described formed from an elongated piece of stiff foldable material, said piece including end sections and intermediate sections foldably connected to one another, one of said end sections having the free end thereof provided with a pair of tabs, said one end section being folded relative to said intermediate sections and said other end section and having one of said tabs secured to the free end of said other end section whereby said end sections are substantially contiguous and lie in intersecting planes, the other tab being secured to one of said intermediate sections whereby said one intermediate section and said one end section are disposed in substantially coplanar relation; said end sections and said intermediate sections cooperating with one another to delimit adjacent areas.

2. A device of the class described formed from an elongated piece of stiff foldable material, said piece including end sections and an intermediate section, the latter being initially foldably interconnected to both of said end sections, one of said end sections having the free end thereof provided with a pair of tabs, one of said tabs being secured to the other end section at a foldline between said one end section and the adjacent intermediate section whereby said one tab and said other end section lie in substantially coplanar relation and said intermediate section lies in an intersecting plane, the other tab being angularly disposed relative to said one tab and lying in a plane intersecting the plane of said other end section.

3. A method of forming a plurality of sections lying in a plurality of planes from an elongated piece of stiff foldable material provided with a plurality of transversely extending substantially parallel spaced foldlines forming a pair of end sections and at least three intermediate sections, forming a pair of tabs in the free end of one of said end sections, folding said one end section relative to said intermediate sections, affixing one of said tabs to an intermediate section separated from said one end section by at least one intermediate section whereby an area is delimited by said end section and said intermediate sections, folding said other end section relative to said one end section, and affixing the second of said pair of tabs to said other end section.

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