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(54) **Structure assembly**

(57) The invention relates to a structure which can be moved between storage and erected in use forms via the user of one or more connecting members. The connecting member (2) can be provided with at least two angularly disposed arms (4,6), at least one of the arms (4,6) provided to receive an edge of a panel (14,16) of the structure in the erected form. The other of the arms (4,6) may receive an edge of another panel (4,6) or may be formed integrally with said further panel (4,6). The structure in accordance with the invention can be moved between forms without the need for tools.

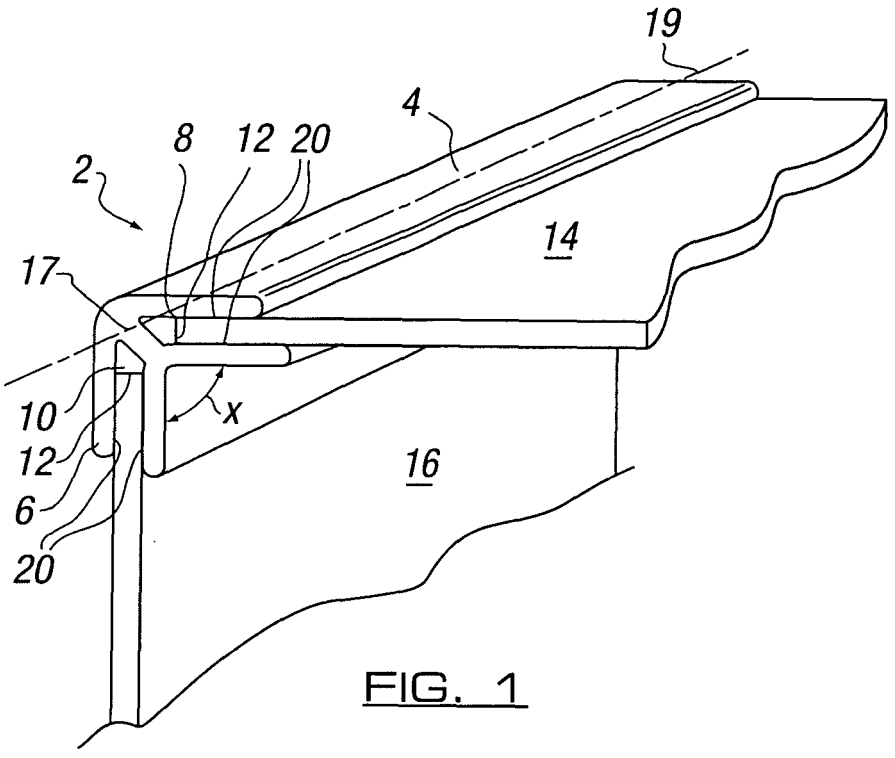

FIG. 1

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Description

[0001] The invention to which this application relates is to an improvement in structure assemblies, such as for example, toys, pet housing, storage means, and the like, which can be constructed from a "flat pack" form to an in-use, erected form so as to allow the structure to thereafter be used. Typically the structure can thereafter be moved between the two forms in a manner which can be performed by adults or children in a relatively simple manner and preferably, without the need for any, or any special, tooling to be used.

[0002] Conventionally, in structures of this type, the same are typically initially purchased in one of two forms. In the first form, the structure has already been assembled under factory conditions and is therefore provided in a permanent, in-use form. This has the advantage in that the structures are typically more robust, but, for many uses, or environments robustness is not the only concern and other concerns, such as the price of the structure, which tends to be high when preassembled, and/or subsequent storage of the structure when not in use, are other features which have equal or greater importance to the purchaser. With regard to these features, preassembled structures are often not as attractive to the purchaser. The alternative to pre-assembled structures is to purchase the same in pieces in a flat pack form, and then to assemble the structure into the erected position after purchase and at the location of use. It is to this type of structure that the present invention is directed.

[0003] It is known to provide flat pack structures for assembly at a location for use. The assembly typically involves the use of a series of screws or other fastening means which are required to be inserted in pre-formed apertures in the panels of the structure in accordance with a set of instructions which accompany the structure when purchased. The use of these fastening means typically requires the use of one or more tools, which are often required to be provided as part of the package when purchased. This can provide additional expense to the manufacturer and/or customer and in some instances, if the tool is lost, the item cannot thereafter be constructed. Furthermore, if the structure is required to be disassembled for storage purposes, the repeated use of the fastening means, can lead to the same becoming damaged and/or lost thereby preventing the reassembly of the structure.

[0004] A further problem which is often experienced with this type of flat pack furniture is that the appearance of the structure, when formed, is affected by the use of the conventional fastening systems. It can be difficult in many cases, for the fastening means to be hidden from view in all instances. Furthermore, the panels of sheet material which are used to form the items are often, at best, provided with a continuously and/or repeated patterned surface which therefore limits the type of decorative patterns which can be applied to the structure panel. This can often restrict the attractiveness and use of the structure for both purchase and in subsequent use and therefore can limit sales of the same.

[0005] A first aim of the invention is therefore to provide a structure which can be moved between a storage and in use erected form relatively easily and to allow the same to be performed without the need for special tools to be used by the person assembling the same and to also allow the structure if required to be repeatedly moved between storage and in-use forms as required.

[0006] A further aim is to provide a structure which is formed of panels, with at least one of the panels being provided in a form which has greater visual attractiveness than is typically conventionally achieved thereby providing an improved visual appearance of the structure, once formed.

[0007] In a first aspect of the invention, there is provided a structure, said structure formed of a plurality of panels, said structure movable between a storage form in which at least some of the panels are disconnected, and a second erected form for use in which edges of adjacent panels can be connected together to form the structure, wherein at least some of the said adjacent edges of the panels are connected using a connecting member, said connecting member having a first arm with a channel formed therein to receive an edge of a first panel therein and at least a second arm including a channel to receive an edge of a second panel therein and thereby retain the said first and second panels in an in-use position.

[0008] Typically, the first and second arms have an angular displacement which defines the angular orientation of the said panels when located with the connecting member.

[0009] Typically, the connecting member has a longitudinal axis and the longitudinal axis of the channels in the first and second arms are parallel therewith. Typically, the first and second channels are separated by a rib which passes along the length of the connecting member, which rib defines a corner of the connecting member.

[0010] Typically a plurality of connecting members are provided as part of the structure at spaced locations, each of the connecting members connecting at least two panels together.

[0011] In one embodiment, the connecting member is provided in permanent attachment to one of said panels, typically by the provision of mechanical or adhesive means such that, only one panel edge needs to be placed into or removed from the connecting member to assemble or disassemble the structure respectively.

[0012] In one embodiment the connecting member has three or more, angularly oriented arms, each having a channel for reception of panel edge therein or attached to or found as part of a panel.

[0013] Typically, the connecting member is of a length which matches the length of at least one of the panel edges to be connected thereby and thereby provides a supported joint along the length of the panels.

[0014] In one embodiment, the connecting member is formed from an extruded plastics material.

[0015] In one embodiment, at least one of the panels of the structure, may be provided with one or more fold lines to allow the panel itself to be folded in the storage position, and unfolded and then connected to at least one further panel using the connecting member, in the in-use position.

[0016] In a further aspect of the invention, there is provided a structure which can be moved between storage and erected in-use forms, said structure formed from a plurality of panels which can be interconnected in the erected form, and disconnected in the storage form and wherein at least one of the panels includes along at least one edge thereof a connecting member, said connecting member having an arm with a channel provided to receive an edge of one or more further panels retain the panels in position while the structure is in the erected form.

[0017] In one embodiment, the connecting member is provided as an integral formation of one of the panels, typically said panel being formed of moulded plastics material with a connecting member formed as part thereof. Alternatively, the connecting member can be attached mechanically or by adhesive to said panel and hence thereafter allow the edge of the further panel to be selectively placed into the channel in the arm of the connecting member.

[0018] In one embodiment, the structure which is formed is a toy model of a type which can be used, for example, in a child's playhouse. In an alternative embodiment, the structure is used as pet housing, such as for example a kennel. In a yet further embodiment, the structure can be used as an item of furniture and/or to provide storage facilities. In each case it will be appreciated that the structure can be moved between storage and erected in-use conditions easily and efficiently without the need for special tools or indeed, any tools, to be used. It is also found that the location of the edges of the respective panels in the connecting member, and the provision of the connecting member along the length thereof, provides sufficient rigidity so as to allow the structure, when in the in-use condition, to be used safely and successfully.

[0019] In many uses, it is important for the structure's intended use, for example, where the structure is for use as a toy model, that the visual appearance of the structure when in-use, gives a desired effect as otherwise the toy model would be unattractive to a child.

[0020] In accordance with a further aspect of the invention, there is provided a structure, said structure formed from a plurality of panels, at least one of said panels formed of a sheet material and to at least one side of which is applied a coating and onto which a decorative pattern is printed.

[0021] In one embodiment, the sheet material used for the panels is medium density fibre board (MDF) or could be any other suitable sheet material. The coating can be a plastics material applied to a planer surface thereof to seal the same and allow the application of printing inks to preferably be applied using a 4 colour printing process. This allows detailed decorative printing to be achieved which therefore makes the overall appearance of that panel and the structure as a whole to be more closely related to the item depicted. For example, if the structure is a toy model, the item which the same is intended to depict such as for example a sink, washing machine, cooker or the like can be shown on the printed surface which forms the external surfaces of the structure when in the in-use form.

[0022] In one embodiment, a range of the structures can be used in conjunction to form a particular toy model or toy environment such as, for example, a kitchen, bedroom, or the like.

[0023] In a further aspect of the invention, there is provided a toy model structure, said structure comprising a top, and one or more side walls depending downwardly from the top to support the top at a distance from a support surface, at least said side walls formed by panels, said panels selectively movable between a storage form in which at least some of the same are disconnected, and an erected in-use form and wherein in the in-use form the panels are retained in the required configuration by connecting members, said connecting members including at least one arm having a channel for the reception of an edge of a panel therein, to thereby retain said panel in position and locate said panel in an angular orientation with respect to a second panel with which the connecting member is connected or formed.

[0024] In one embodiment, the connecting member is formed as an integral part of said second panel or alternatively, an edge of the said second panel can be selectively placed into a further arm provided in the connecting member at the required angular orientation to the first arm. In one embodiment the said further panel can be permanently maintained with said further arm.

[0025] Thus, the structure can be moved between the erected and storage conditions without the need for tools to be used.

[0026] In one embodiment, at least one of the panels is formed from a sheet material having at least one laminated surface, to which an ink pattern is applied using a 4 colour printing process.

[0027] In one embodiment, at least one of the panels is formed from a moulded plastics material and in this case, may include connecting members formed as integral parts at the edges thereof.

[0028] In a further aspect of the invention there is provided a connecting member, said connecting member elongate in form and having a first arm running along the length thereof, with a channel provided therein for the reception of an edge of a first panel to retain the same in position and said connecting member provided with a second arm formed as part of or connectable to a further panel so as to retain the respective panels in a angular orientation defined by the orientation of said arms.

[0029] In one embodiment, the channel includes therein, one or more protrusions, to exert an increased retention force on one or more faces of the panel adjacent the

edge thereof.

[0030] Typically, at least one of the panels can be selectively detached from said connecting member without the need for tools.

[0031] Specific embodiments of the invention are now described with reference to the accompanying drawings, wherein:-

Figure 1 illustrates a first embodiment of a connecting member in accordance with the invention;

Figure 2 illustrates a second embodiment of a connecting member in accordance with the invention;

Figures 3a and b illustrate a first embodiment of use of a connecting member in accordance with the invention; and

Figures 4a and b illustrate further embodiments of a structure formed in accordance with the invention.

[0032] Referring now to Figure 1, there is illustrated a connecting member 2 in accordance with one embodiment of the invention. As will be seen, the connecting member is elongate and, in this embodiment, includes first and second arms, 4, 6 which are angularly offset by an angle X, as illustrated. In this case, each of the arms includes a channel, 8, 10 respectively, which runs along the length of the same. The channel 8 of the first arm 4, is shown receiving an edge 12 of the first panel 14 which is partially shown and the channel 10 of the second arm 6 receives the edge 12 of a second panel 16 which is partially shown. The channels can be provided with retention means, which may be in the form of protrusions 20, which improve the retention on one or more faces of the panel at the panel edge so as to improve the retention of the panel within the channel. It will therefore be seen that by retaining the respective panel edges in the connecting member, so the panels can be held in position, and in position at the required angular orientation, angle X. The longitudinal axes of the respective channels run parallel to the longitudinal axes 19 of the rib 17 and member, said rib separates the channel 8, 10.

[0033] Figure 2 illustrates an alternative embodiment of a connecting member 2 in which the same is again provided with a first arm 22 with the channel 24 which operates to receive the edge 12 of a first panel 14 as shown. However rather the second arm 15 is formed as an integral part of the second panel 16 which may, for example, be formed of a plastics material.

[0034] In whichever embodiment, it is preferred that only one panel needs to be inserted or attached to allow the movement of the structure between storage and erected positions and in the second embodiment of Figure 2, this is achieved. In the first embodiment, where both arms receive a panel, this can be achieved by providing one of the panels to be permanently attached within a channel either by, for example, a mechanical connection or the use of adhesive, or simply by leaving one of the panel edges engaged in the channel of one of the arms.

[0035] Figures 3a and b illustrate one embodiment of use of the connecting members 2 in accordance with the invention and it will be seen how each of the connecting members 2 provides support along the length of the edge of the respective panels 26/28, 28/30, 30/32 and 32/28 respectively. In this case, the structure which is formed, is a play structure in the form of a toy model and it will be seen that the connecting members form the four corners of the side walls of the structure and therefore provide a rigid and secure structure for play when in the erected position. Equally, the invention allows the structure to be easily moved to the storage position, by disconnection of the panels from the connecting members 2 and therefore allow the panels to be stored in a flat pack form one on top of the others. The panels can also be provided with apertures 34 if this assists the decorative effect which is required to be created. This therefore means that the child can gain pleasure from playing with the item but without the potential problem of storage when not in use.

[0036] Figures 4a and b, illustrate further possible embodiments of the invention and in this case, the connecting members 2 are provided as integral parts of moulded panel 36 which forms the top face of the structure and are also provided at the base of the structure. If desired connecting members can also be used to connect the panels along the vertical edges although not shown in the diagrams. In the case when used on the top panel 36 therefore the connecting members are provided with only one arm 37 with a channel into which the top edges of the side wall panels of the structure are retained. The other arm is provided integrally with the top panel 36. In this case, a base 38 is also provided which has a further connecting member 2 formed as part thereof or the connecting members may be of the type shown in Figure 1.

[0037] It is a further aspect of the invention that the current invention allows the use of panels which have relatively decorative appearances as shown in Figures 4a and b. This allows a particularly attractive and effective visual appearance to be created. In a further embodiment, the panels are formed of MDF which provide the rigidity and strength and at least the external surface of the same is coated, typically with a plastic laminate onto which the decorative pattern can be printed, typically using a 4 colour printing process to provide a detailed and attractive visual effect. Furthermore, the panels may be provided with apertures or other patterns to further improve the appearance.

[0038] It is therefore clear from the present invention as defined that structures can be provided in an in-use condition which is sufficiently strong and rigid so as to allow the same to be used yet also easily moved to a storage position, without the need for tooling or fastening elements and thereby allows the structures to be used, for example, by children and constructed into an in-use

position by them without the need for adult intervention which provides greater independence and education to them.

Claims

1. A structure, said structure formed of a plurality of panels, said structure movable between a storage form in which at least some of the panels are disconnected, and a second erected form for use in which edges of adjacent panels can be connected together to form the structure, wherein at least some of the said adjacent edges of the panels are interconnected using a connecting member, said connecting member having a first arm with a channel formed therein to receive an edge of a first panel therein and a second arm including a channel to receive an edge of a second panel and retain the same therein and thereby retain the said first and second panels in an in-use position.

2. A structure according to claim 1 wherein the angular orientation of the first and second arms about the longitudinal axis of the connecting member define the angular orientation of the said panels when located with the connecting member.

3. A structure according to claim 1 wherein the first and second channels are separated by a rib.

4. A structure according to claim 3 wherein the rib passes along the length of the connecting member.

5. A structure according to claim 4 wherein the rib defines a corner of the connecting member.

6. A structure according to claim 1 wherein a plurality of connecting members are provided as part of the structure at spaced locations.

7. A structure according to claim 1 wherein the connecting member is provided in permanent attachment to one of said panels.

8. A structure according to claim 1 wherein the connecting member is of a length which matches the length of at least one panel edge to be connected thereby.

9. A structure according to claim 1 wherein at least one of the panels of the structure is provided with one or more fold lines to allow the panel to be folded in a storage position.

10. A structure which can be moved between the storage and in-use forms, said structure formed from a plurality of panels which can be interconnected in the erected, the in-use form and disconnected in the storage form and wherein at least one of the panels includes along at least one edge thereof a connecting member, said connecting member having an arm with a channel provided to receive an edge of one or more further panels and retain the panels in position while the structure is in the erected form.

11. A structure according to claim 10 wherein the connecting member is provided as an integral formation of one of the panels.

12. A structure according to claim 10, said structure formed from a plurality of panels, at least one of said panels formed of a sheet material to at least one side of which is applied a coating and onto which a decorative pattern is printed.

13. A structure according to claim 12 wherein the coating is a plastic material applied to at least one planer surface of the panel.

14. A structure according to claim 12 wherein the decorative patter is printed using a 4-colour printing process.

15. A toy model structure, said structure comprising a top and one or more side walls depending downwardly from the top to support the top at a distance from a support surface, at least said side walls formed by panels, said panels selectively movable between a storage form at which at least some of the same are disconnected, and an erected in use form and wherein in the in-use form, the panels are retained in the required configuration by connecting members, said connecting members including at least one are having a channel for the reception of an edge of a panel therein, to thereby retain said panel in position and locate said panel in an angular orientation with respect to the second panel with which the connecting member is connected or formed.

16. A structure according to claim 15 wherein the connecting member is formed as an integral part of said further panel.

17. A connecting member, said connecting member elongate in form and having a first arm running along the length thereof with a channel provided therein for the reception of an edge of a first panel to retain the same in position therewith and said connecting member formed as part of or connected to a second panel so as to retain the respective panels in a required angular orientation.

18. A connecting member according to claim 17 wherein the channel includes therein one or more protrusions

to exert an increased retention portion on one or more faces of the panel adjacent the edge thereof.

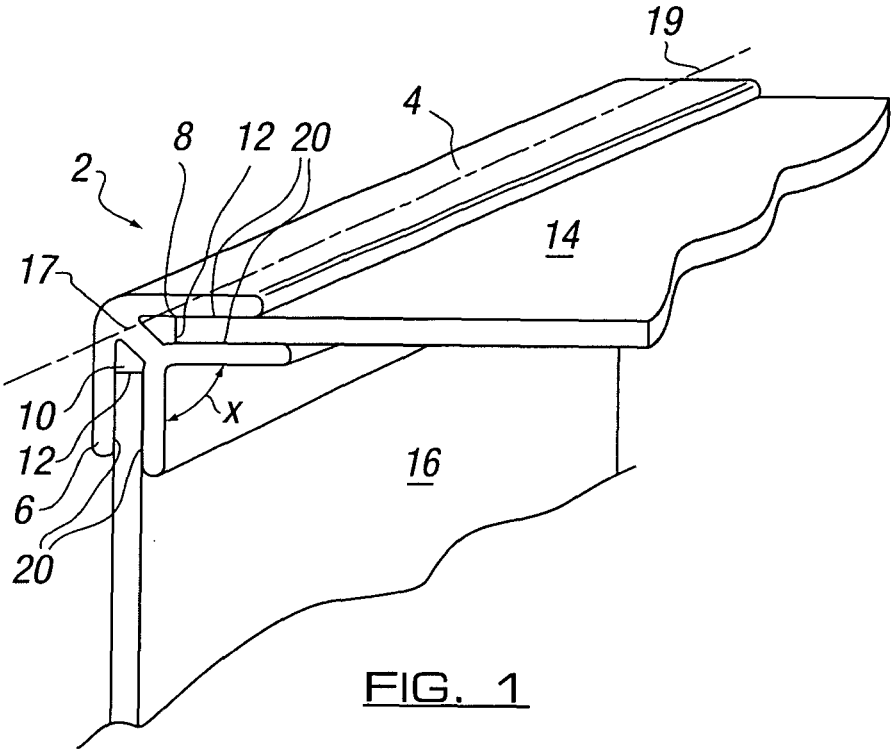

FIG. 1

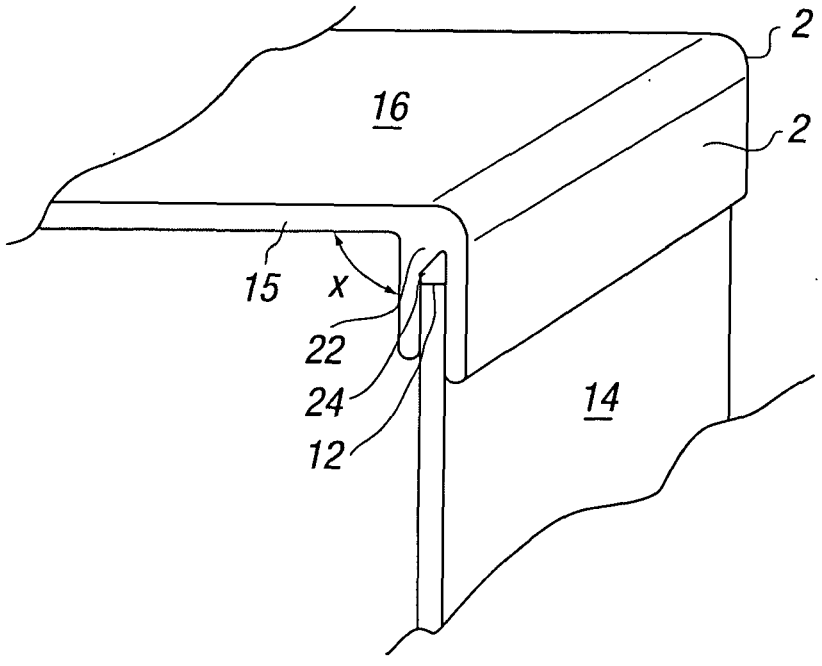

FIG. 2

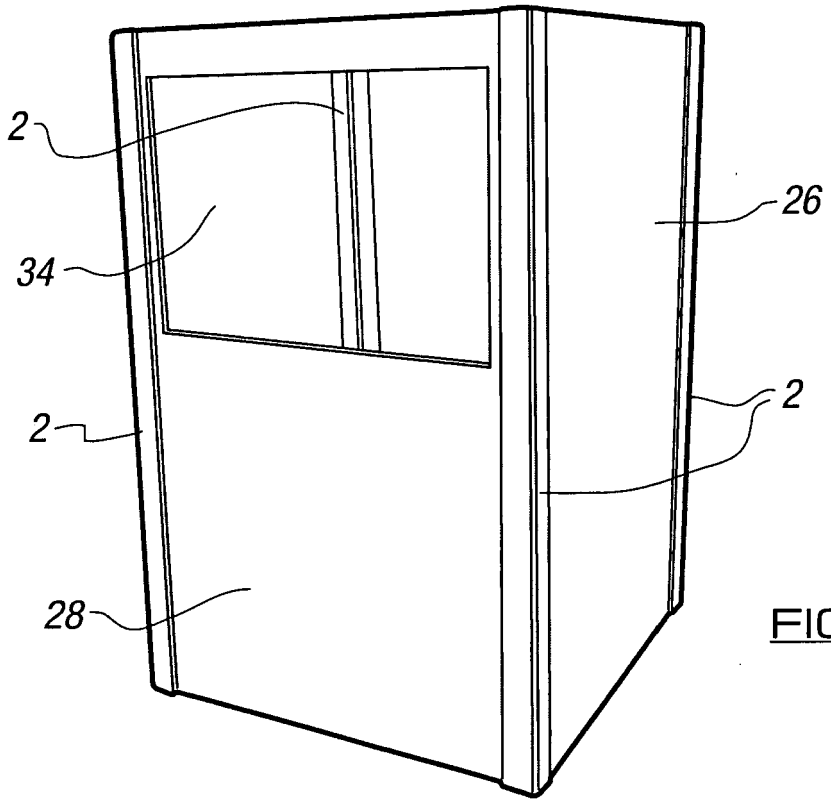

FIG. 3a

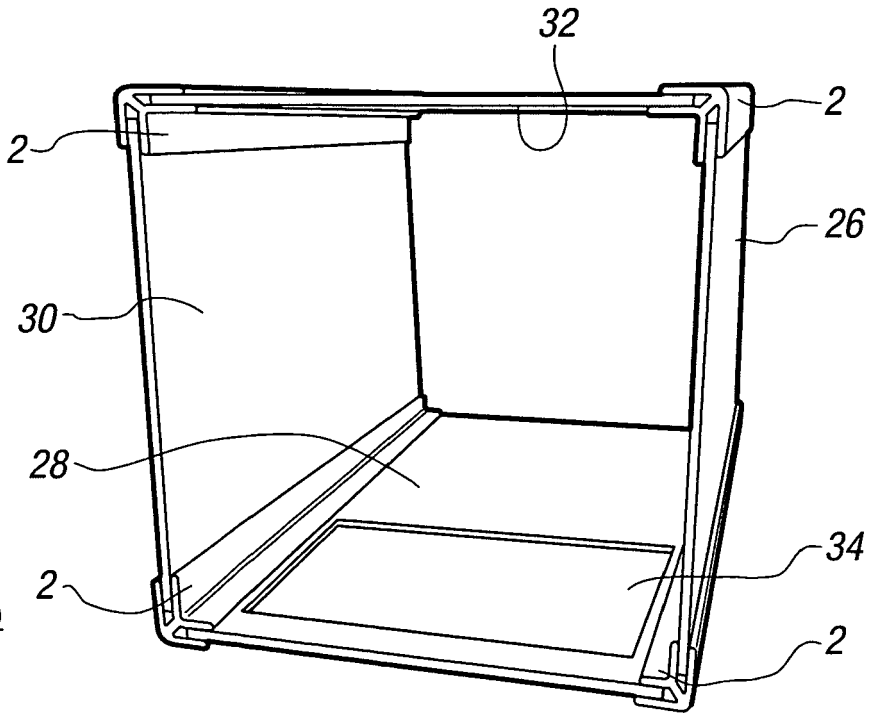

FIG. 3b

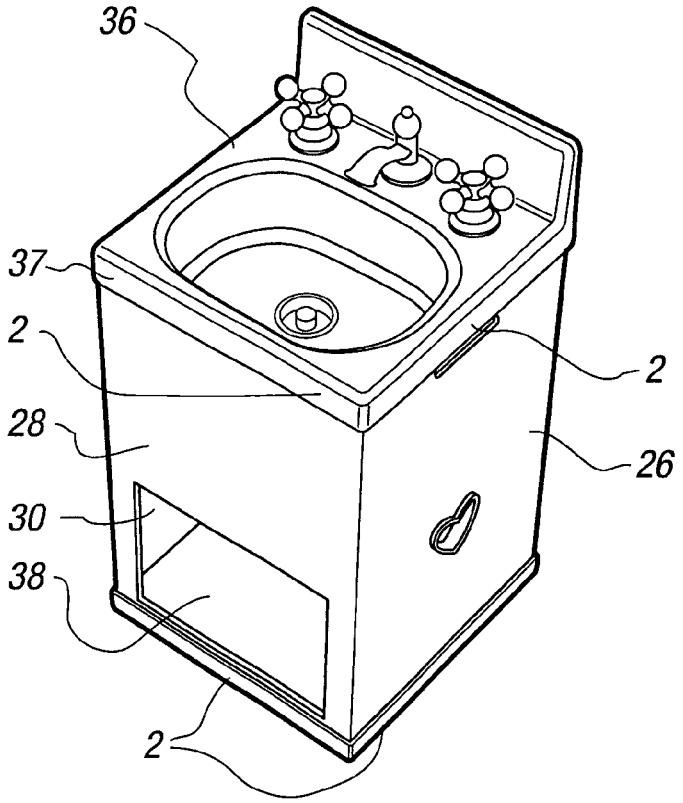

FIG. 4a

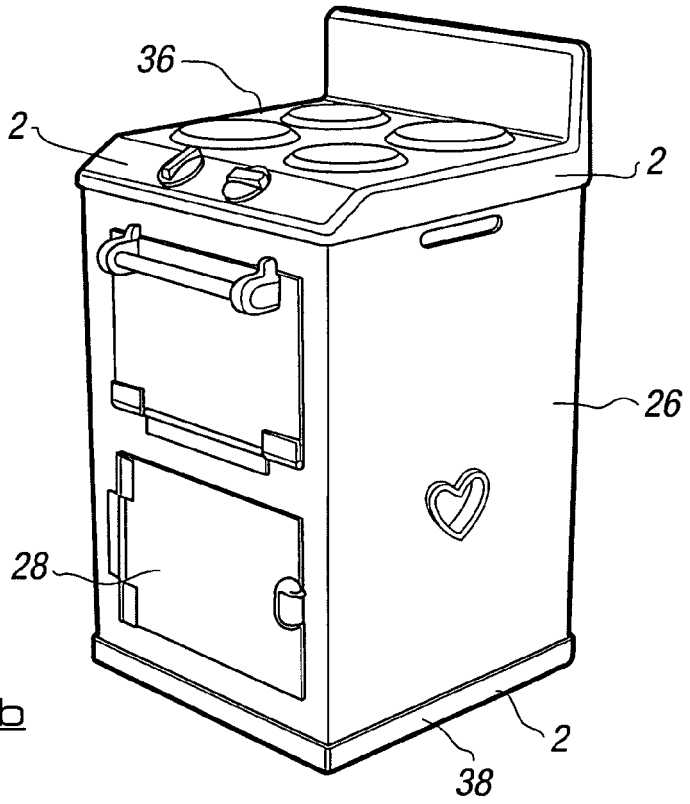

FIG. 4b