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(54) **SUPPORT STRUCTURE FOR HANGING FILE FOLDERS**

(52) **U.S. Cl.**
CPC *B42F 15/0094* (2013.01); *Y10T 403/7164* (2015.01)

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(57) **ABSTRACT**

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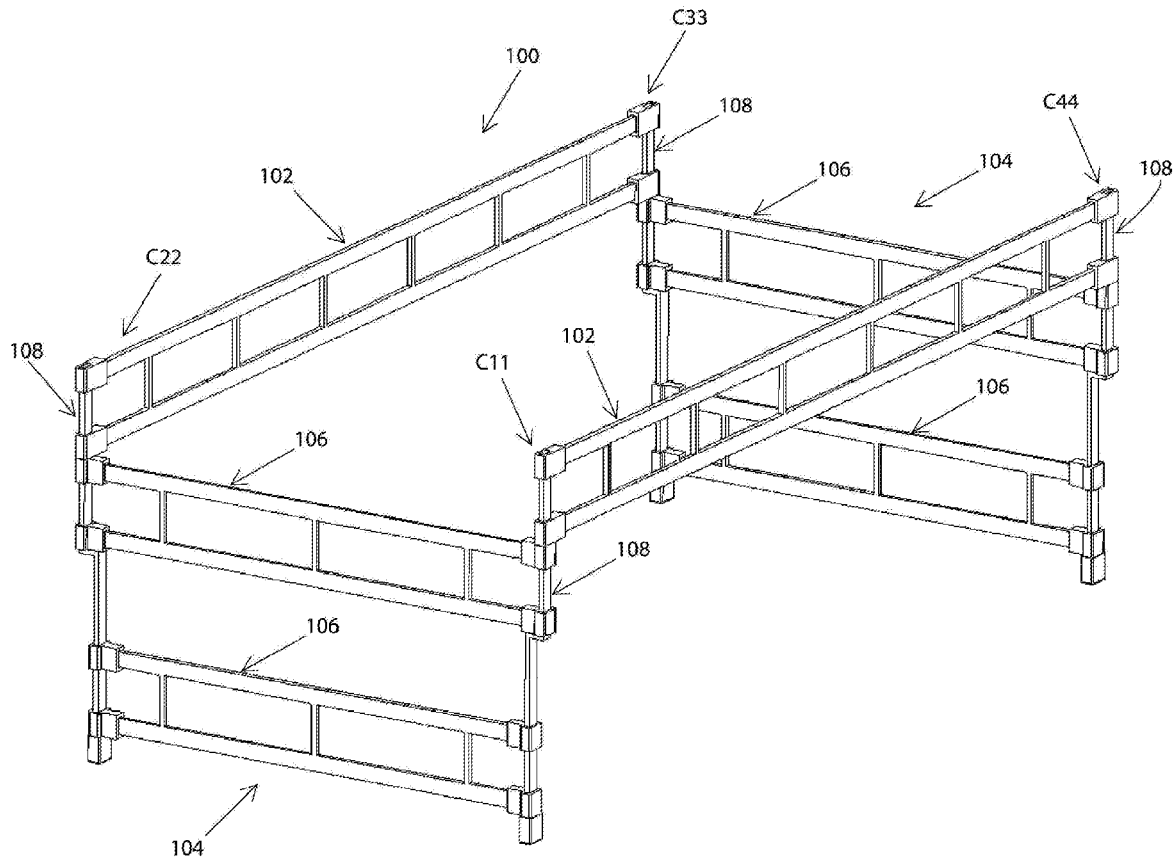
Related U.S. Application Data

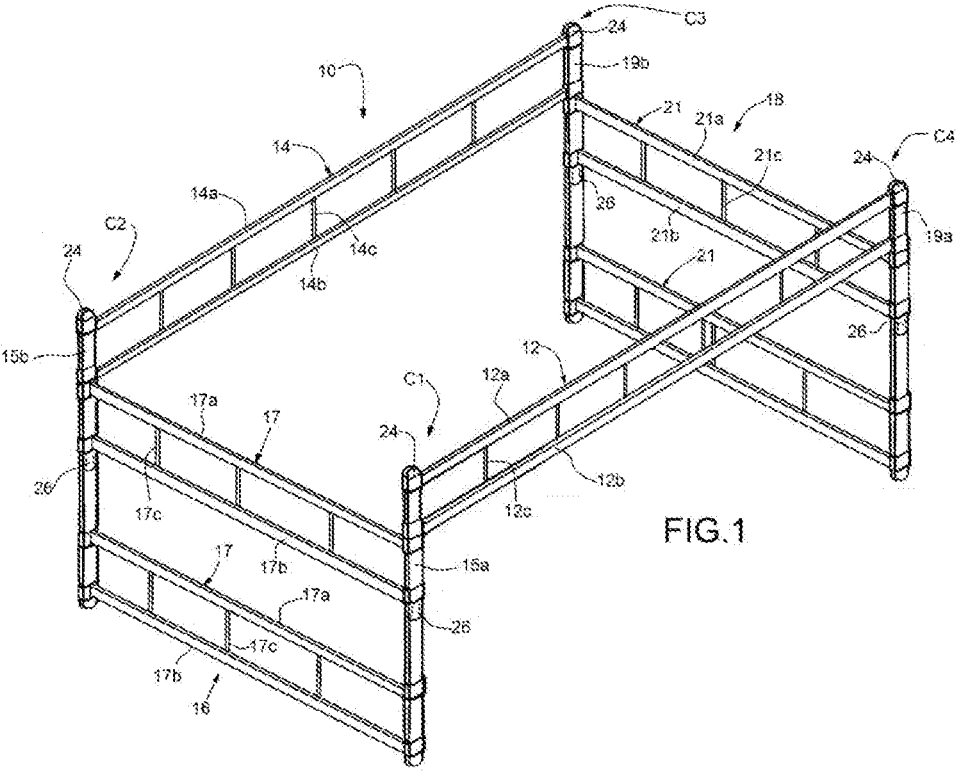
(63) Continuation-in-part of application No. 15/055,540, filed on Feb. 27, 2016, now Pat. No. 9,764,587, which is a continuation of application No. 13/896,477, filed on May 17, 2013, now Pat. No. 9,272,566.

A support structure has two side panels and two support frame assemblies maintaining the side panels in a mutually spaced relationship and at an elevation to enable suspension of hanging file folders from upper surfaces of the side panels. Each side panel has a top member having the upper surface and a bottom member spaced apart from the top member. Terminal ends of each of the top and bottom members are provided with vertical slots. Each support frame assembly has two support legs that extend into the vertical slots of the respective terminal ends of the side panels and has a transverse support member having opposite terminal ends releasably mounted to respective ones of the support legs. Each support leg has first and second leg portions spaced apart from one another by a bend serving as a seat that positions and holds the transverse support member.

Publication Classification

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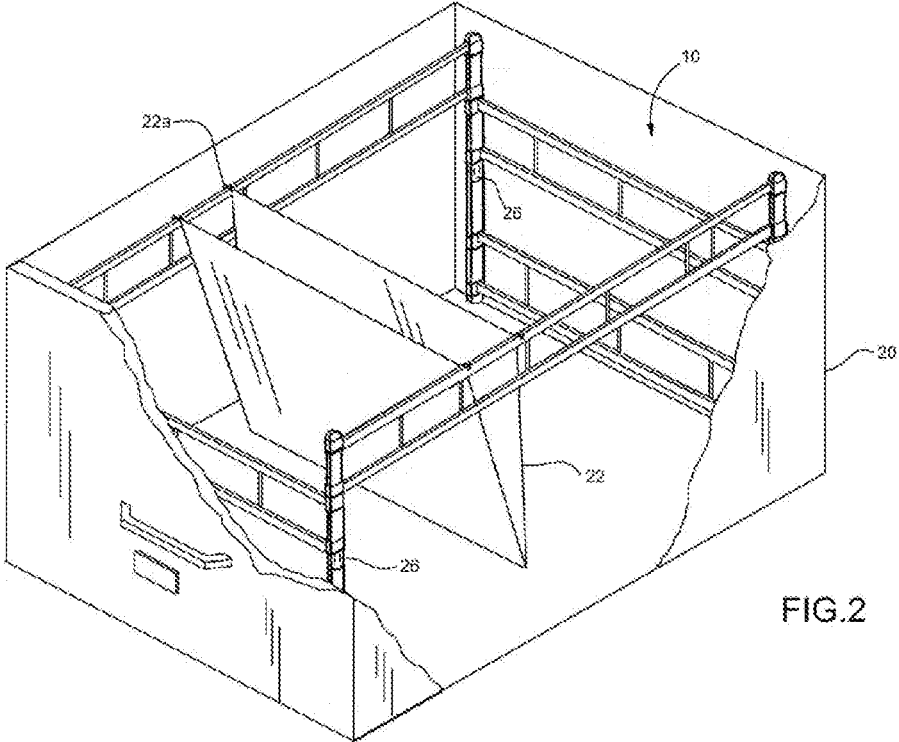
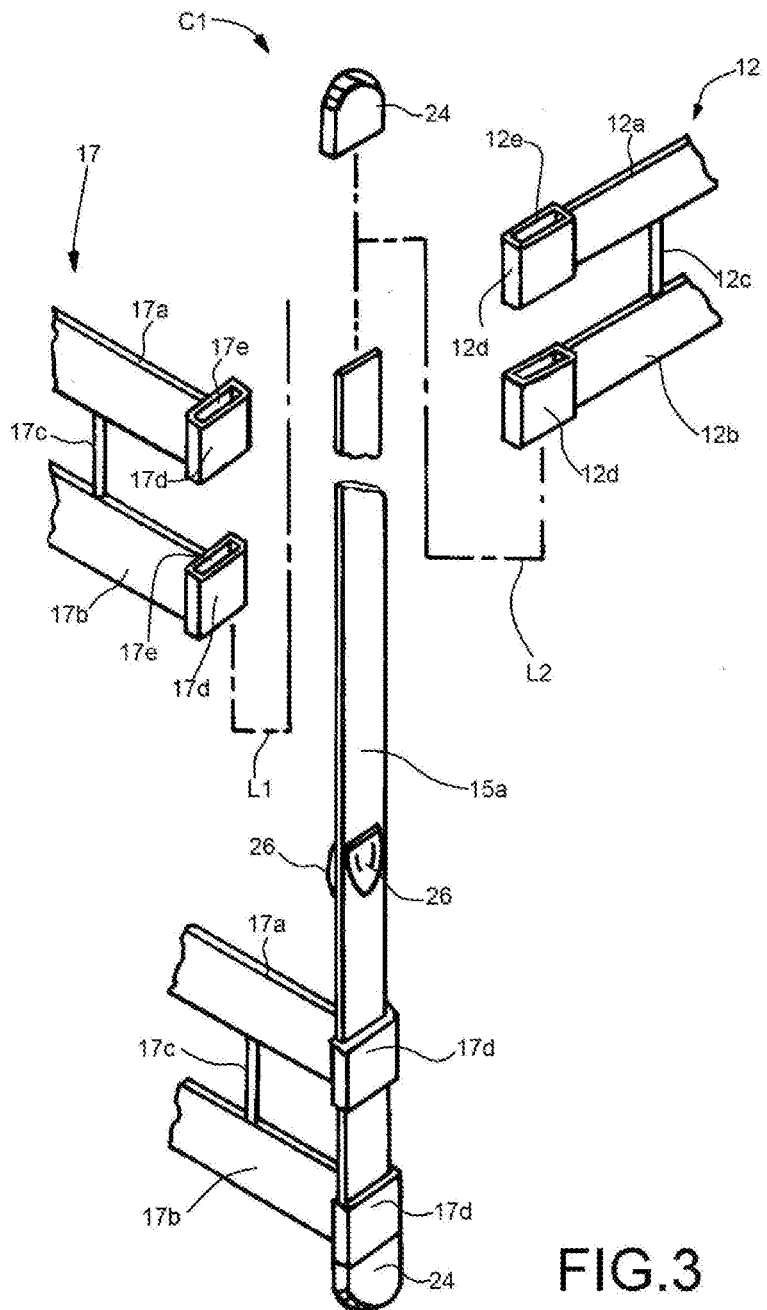
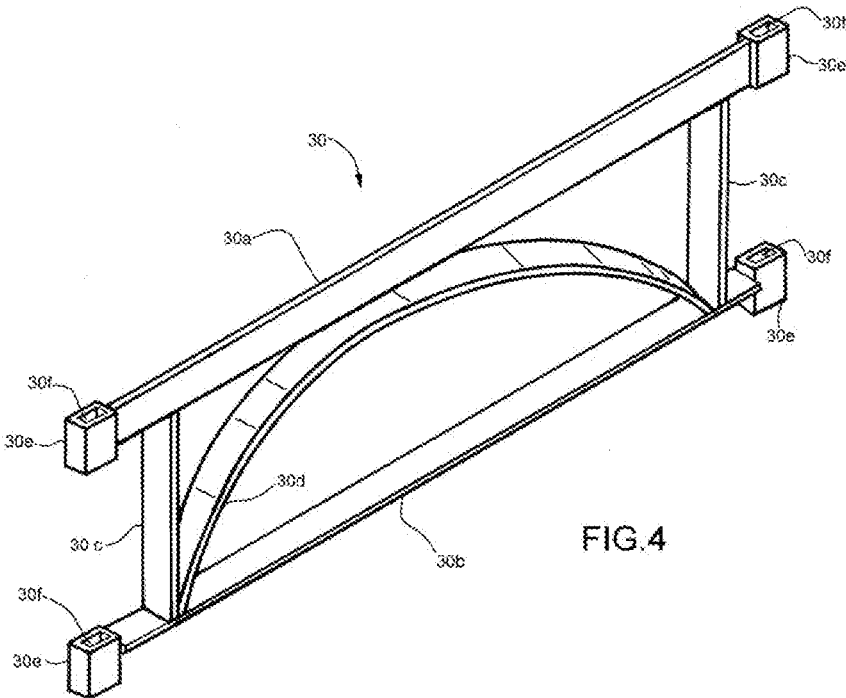
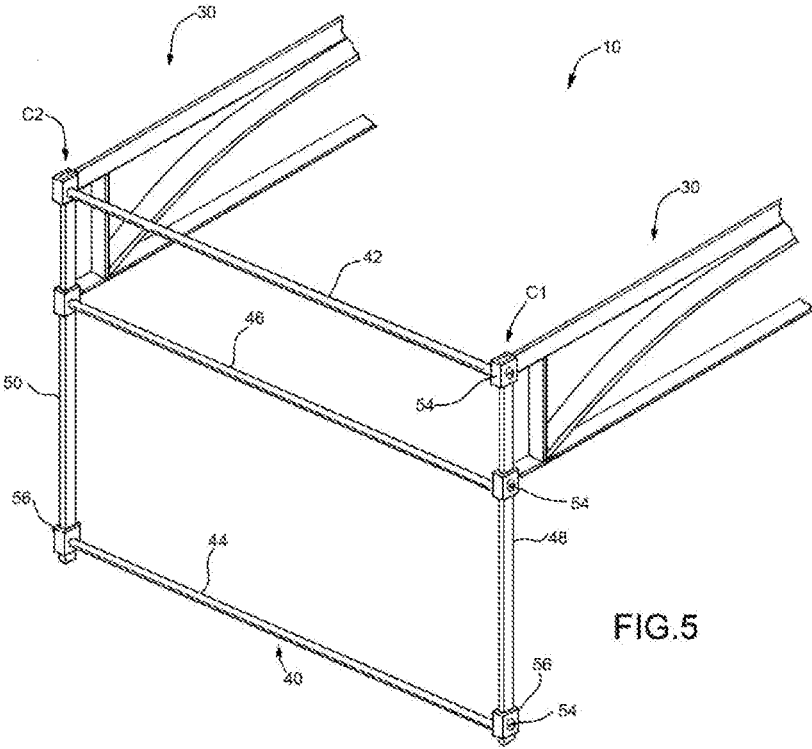
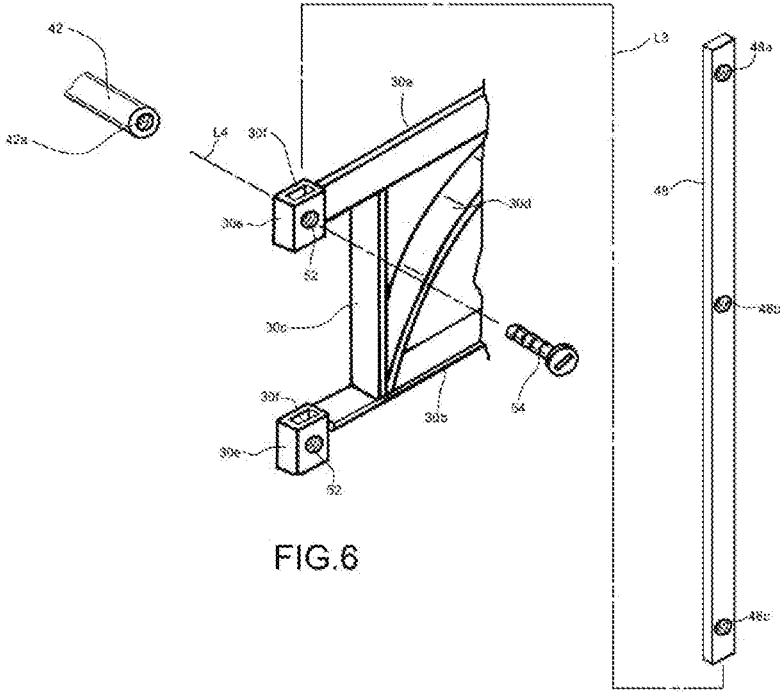


FIG.2









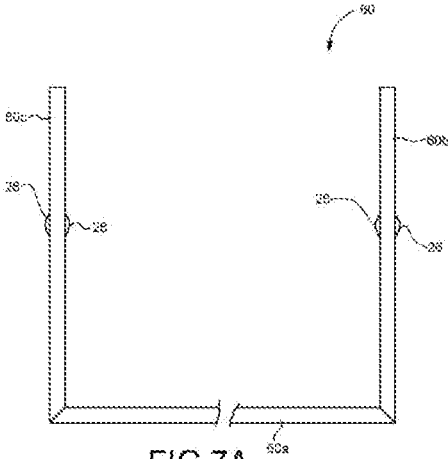


FIG. 7A

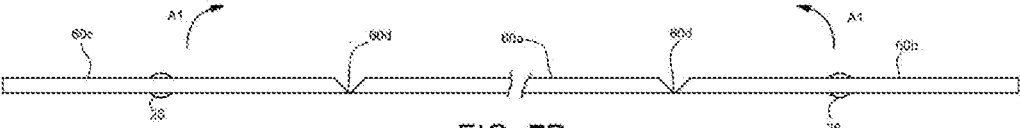


FIG. 7B

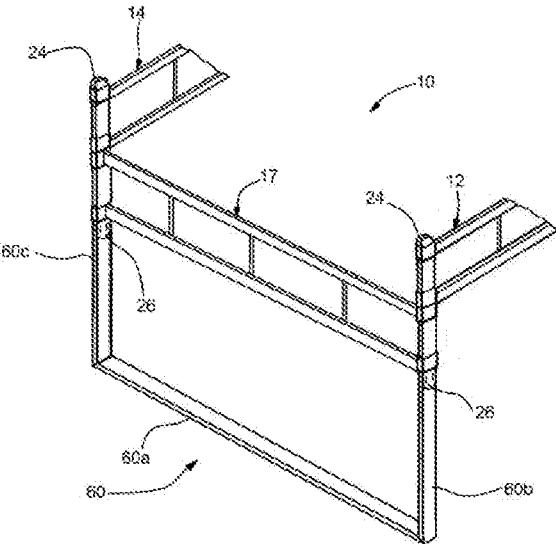


FIG. 8

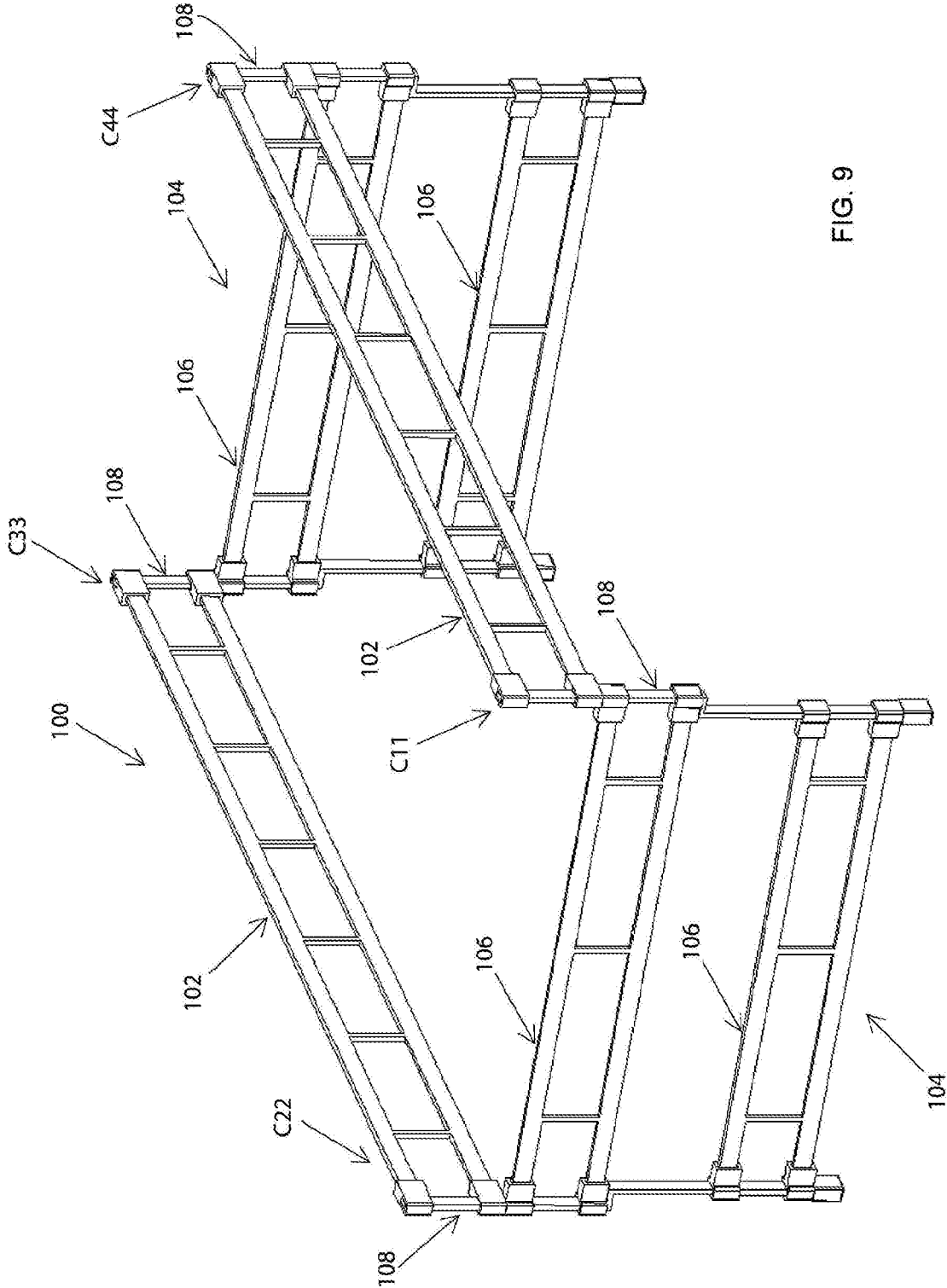


FIG. 9

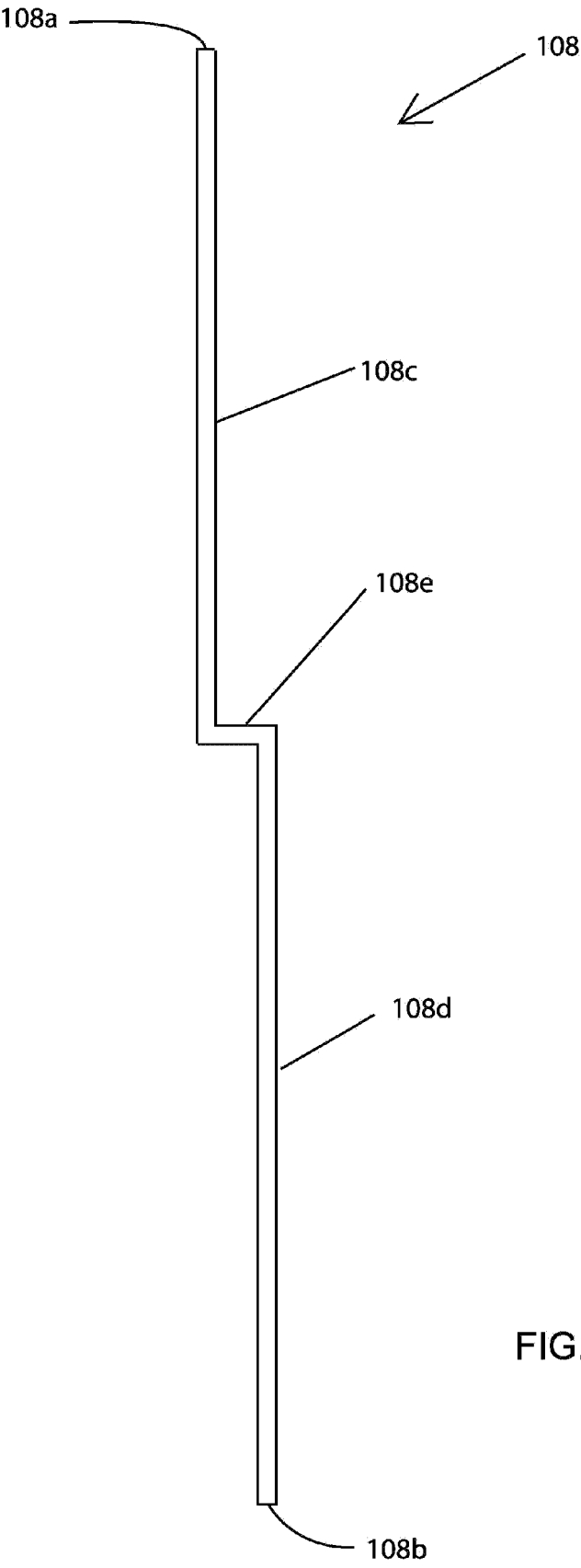


FIG. 10

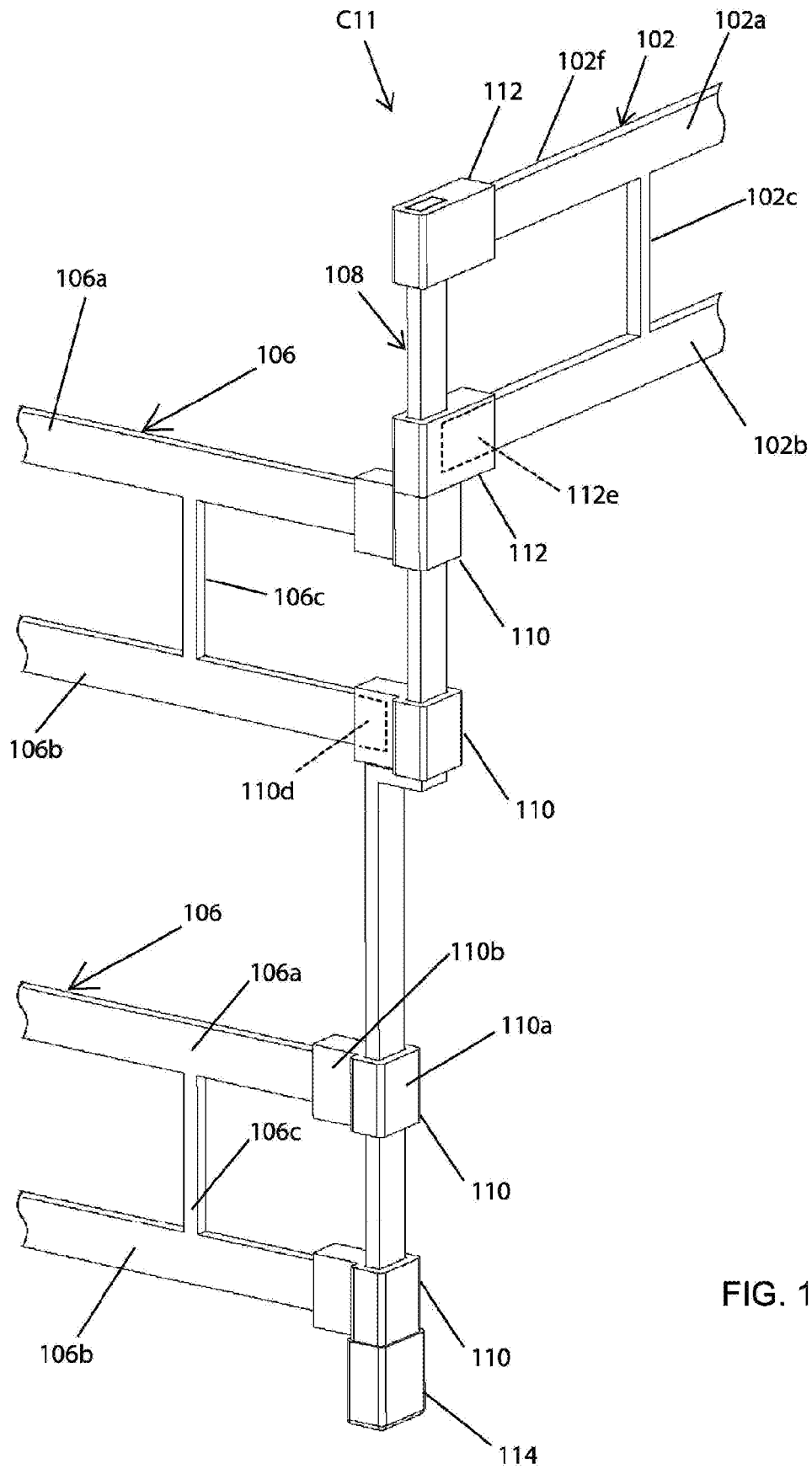


FIG. 11

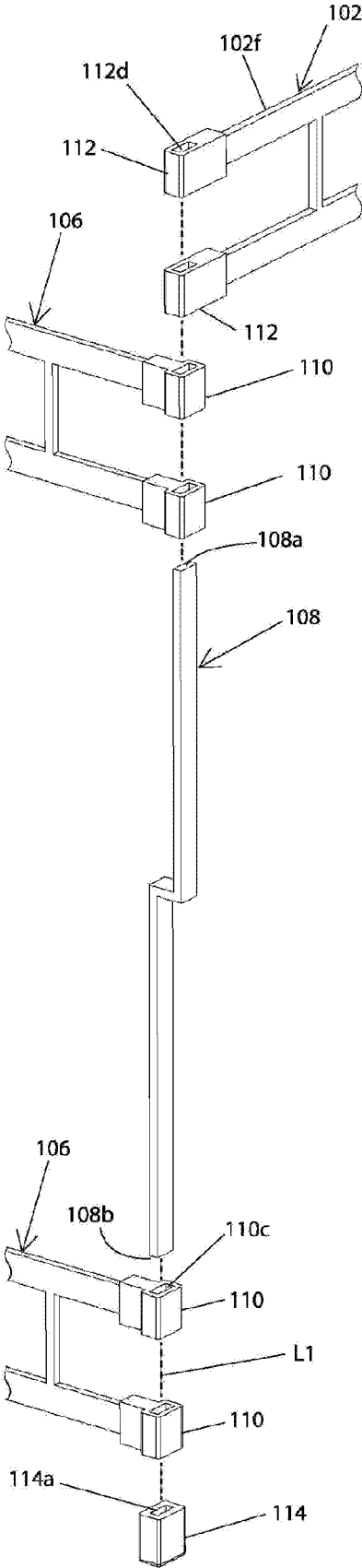


FIG. 12

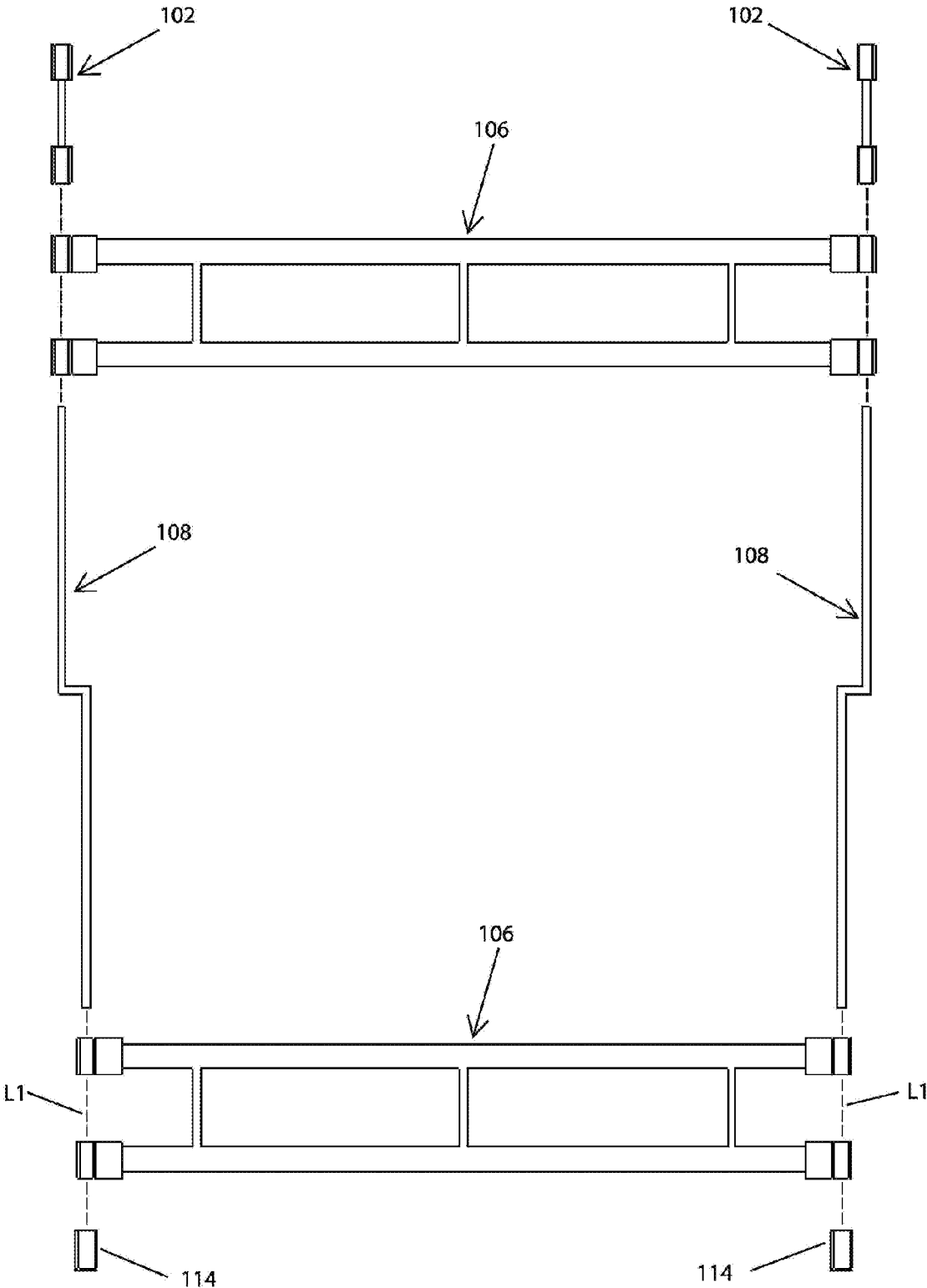


FIG. 13

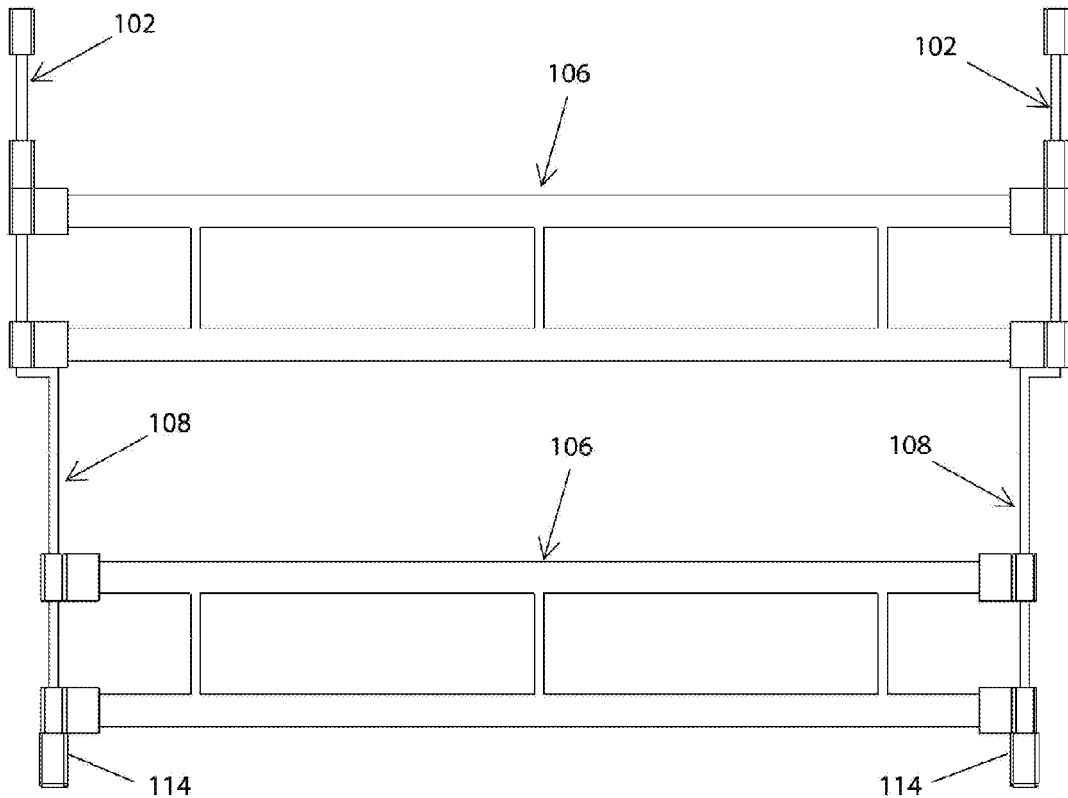


FIG. 14

SUPPORT STRUCTURE FOR HANGING FILE FOLDERS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of application Ser. No. 15/055,540, filed Feb. 27, 2016, which is a continuation of application Ser. No. 13/896,477, filed May 17, 2013, now U.S. Pat. No. 9,272,566.

BACKGROUND OF THE INVENTION

Field of the Invention

[0002] The present invention relates generally to support structures arranged to support or suspend other articles, and specifically, to a support structure for mounting within a file drawer to support hanging file folders therein.

Background Information

[0003] Hanging or suspension type folder systems employ some type of support structure having a pair of spaced rails from which file folders are hung by cross members adapted for resting upon, and slide along, the rails. This type of support structure is designed to be placed in a conventional file drawer or cabinet.

[0004] Various types of hanging file folder support structures have been proposed, including in those of U.S. Pat. No. 4,526,277, U.S. Pat. No. 4,049,127, U.S. Pat. No. 4,030,610, U.S. Pat. No. 3,999,663, U.S. Pat. No. 3,860,119, U.S. Pat. No. 3,788,718, and U.S. Pat. No. 3,734,300. However, these proposed structures are rather complex, costly to manufacture, and/or cumbersome to utilize. In particular, the foregoing support structures do not appear to be suitable, in terms of strength and rigidity, for supporting heavy loads of hanging file folders.

[0005] Thus, despite the number and variety of disclosures relating to hanging file folder support structures, such as those noted above, none are believed to provide satisfactory solutions to problems relating to ease and economy of construction and assembly, and to strength and rigidity of the components forming the support structures.

[0006] The present invention addresses the foregoing problems and disadvantages of conventional hanging file folder support structures.

SUMMARY OF THE INVENTION

[0007] It is an object of the present invention to provide a support structure for hanging file folders which may be readily assembled into a strong, rigid structure which is self-supporting and self-retaining in use so as to be extremely efficient and sturdy for the supporting of hanging file folders.

[0008] It is another object of the present invention to provide a support structure for hanging file folders which may be easily and readily assembled and disassembled by a user without requiring special tools.

[0009] It is a further object of the present invention to provide a support structure for hanging file folders which can be manufactured economically from a small number of separate components.

[0010] It is yet another object of the present invention to provide a support structure for hanging file folders that can

be shipped and stored in compact, knock-down form and is capable of easy and rapid assembly into a rigid structure for use.

[0011] The foregoing and other objects of the present invention are carried out by a support structure comprising a pair of elongate side panels configured for suspending hanging file folders from upper surfaces thereof, and a pair of end support frame assemblies for maintaining the pair of side panels in a mutually spaced relationship and at an elevation to enable suspension of the hanging file folders therefrom. Each of the side panels includes a top member having the upper surface, a bottom member spaced apart from the top member, and at least one reinforcing member interconnecting the top and bottom members, each of the top and bottom members having opposite terminal ends each formed as a connecting member having a vertical slot. Each of the end support frame assemblies includes a pair of support legs configured to removably extend through the vertical slots of the respective side panel connecting members and at least one transverse support member having opposite terminal ends configured to be releasably mounted to respective ones of the pair of support legs.

[0012] According to a feature of the present invention, each of the support legs of each of the end support frame assemblies has upper and lower portions. The support structure further comprises, for each of the end support frame assemblies, means for positioning the at least one transverse support member relative to the support legs and for preventing the at least one transverse support member from displacing in a direction toward the lower portions of the support legs.

[0013] In one exemplary embodiment, the side panels are identical in dimension and construction to one another, and the at least one transverse support member of each of the end support frame assemblies are identical in dimension and construction to one another. Each of the interconnecting panels is configured to be releasably mounted to the respective pair of support legs so that the support legs extend through the vertical slots of respective connecting members of the interconnecting panels.

[0014] In another exemplary embodiment, the at least one transverse support member of each of the end support frame assemblies comprises at least one rod-shaped member.

[0015] In yet another exemplary embodiment, the at least one reinforcing member of each of the first and second side panels comprise a plurality of vertical reinforcing members connected between the top and bottom members.

[0016] In a further exemplary embodiment, the at least one reinforcing member of each of the first and second side panels comprises an arc-shaped reinforcing member connected between the top and bottom members.

[0017] In yet another exemplary embodiment, for each of the support legs, the means for positioning the at least one transverse support member relative to the support legs and for preventing the at least one transverse support member from displacing in a direction toward the lower portions of the support legs comprises a seat or rest portion of the support leg disposed between the upper and lower portions thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The foregoing summary, as well as the following detailed description of the preferred embodiments of the

invention, will be better understood when read in conjunction with the accompanying drawings.

[0019] FIG. 1 is a perspective view showing an arrangement of the support structure for hanging file folders according to one embodiment of the present invention as assembled for use;

[0020] FIG. 2 is a perspective view of a file drawer, partially cut away, showing the support structure for hanging file folders in FIG. 1 during use;

[0021] FIG. 3 is an expanded view of a portion of the arrangement in FIG. 1 shown disassembled and partially cut away for further detail;

[0022] FIG. 4 is a perspective view of a modified form of the side panels for the support member shown in FIG. 1;

[0023] FIG. 5 is a perspective view of another embodiment of the support structure for hanging file folders, partially cut away, according to the present invention;

[0024] FIG. 6 is an expanded view of a portion of the arrangement in FIG. 5 shown disassembled and partially cut away for further detail;

[0025] FIG. 7A is a front view of a modified form of the end support frame assembly, partially cut away, for the support structure for hanging file folders according to the present invention;

[0026] FIG. 7B is a front view of the end support frame assembly, partially cut away, shown in FIG. 7A depicted in a mode prior to being assembled into the configuration shown in FIG. 7A;

[0027] FIG. 8 is a perspective view of a support structure for hanging file folders, partially cut away, employing the end support frame assembly shown in FIG. 7A;

[0028] FIG. 9 is a perspective view showing an arrangement of the support structure for hanging file folders according to another embodiment of the present invention as assembled for use;

[0029] FIG. 10 is a front elevational view of a support leg for the support structure shown in FIG. 9;

[0030] FIG. 11 shows a portion of the arrangement of the support structure shown in FIG. 9;

[0031] FIG. 12 is an exploded view of the portion of the arrangement of the support structure shown in FIG. 11;

[0032] FIG. 13 is an exploded, front elevational view of the end support frame assembly of the support structure shown in FIG. 9;

[0033] and

[0034] FIG. 14 is a front elevational view of the end support frame assembly in FIG. 13 shown in an assembled state.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0035] While this invention is susceptible of embodiments in many different forms, this specification and the accompanying drawings disclose only presently preferred embodiments of the invention. The invention is not intended to be limited to the embodiments so described, and the scope of the invention will be pointed out in the appended claims.

[0036] Certain terminology is used in the following description for convenience only and is not intended to be limiting. The words right, left, front, rear, back, top, bottom, upper, lower, inner, outer, rearwardly and forwardly designate directions in the drawing to which reference is made. Such terminology includes the words above specifically mentioned and words of similar import.

[0037] Referring now to the drawings in detail, wherein like numerals are used to indicate like elements throughout, there is shown in FIGS. 1-3 an exemplary embodiment of a support structure for hanging file folders, generally designated at **10**, according to the present invention. The support structure **10** is formed of interlocking components including a pair (first and second) of elongate side panels **12**, **14** and a pair (first and second) of end support frame assemblies **16**, **18** removably connected together to form an open box-type structure having four corner sections C1-C4 and configured to be placed in a conventional file drawer, such as the unit **20** of FIG. 2, and provided with hanging file folders (file pockets) **22** for the storage of files therein. The hanging file folders **22** are provided with support elements **22a** for slidably engaging the side panels **12**, **14** so that the hanging file folders **22** may be moved to various positions on the support structure **10** and may be inserted and removed as desired. For clarity, the unit **20** is shown partially cut away to illustrate the positioning of the support structure **10** inside of the unit **20**. According to the embodiment of the present invention shown in FIGS. 1-3, the first and second end support frame assemblies **16**, **18** are identical in construction and dimension to one another, and the first and second side panels **12**, **14** are identical in construction and dimension to one another, as set forth in more detail below.

[0038] The first end support frame assembly **16** includes a pair of first support legs **15a**, **15b** and upper and lower first transverse support members **17** releasably mounted to respective ones of the first support legs **15a**, **15b**. The second end support frame assembly **18** is disposed in spaced-apart relationship to the first end support frame assembly **16** and includes a pair of second support legs **19a**, **19b** and upper and lower second transverse support members **21** releasably mounted to respective ones of the second support legs **19a**, **19b**. The support legs **15a**, **15b**, **19a**, **19b** are identical in dimension and construction to one another.

[0039] Each of the first transverse members **17** has a top member **17a**, a bottom member **17b** spaced apart from the top member **17a**, and reinforcing members **17c** interconnecting the top and bottom members **17a**, **17b**. Each of the top and bottom members **17a**, **17b** has opposite (first and second) terminal ends. Similarly, each of the second transverse support members **21** has a top member **21a**, a bottom member **21b** spaced apart from the top member **21a**, and reinforcing members **21c** interconnecting the top and bottom members **21a**, **21b**. Each of the top and bottom members **21a**, **21b** has opposite (first and second) terminal ends.

[0040] The first and second side panels **12**, **14** are adapted to span the distance between the first and second end support frame assemblies **16**, **18**. The first side panel **12** has a top member **12a** for releasably supporting one of two ends of the support element **22a** of the hanging file folder **22**, a bottom member **12b** spaced apart from the top member **12a**, and reinforcing members **12c** interconnecting the top and bottom members **12a**, **12b**. Each of the top and bottom members **12a**, **12b** has opposite (first and second) terminal ends. Similarly, the second side panel **14** has a top member **14a** for releasably supporting the other of the two ends of the support element **22a** of the hanging file folder, a bottom member **14b** spaced apart from the top member **14a**, and reinforcing members **14c** interconnecting the top and bottom members **14a**, **14b**. Each of the top and bottom members **14a**, **14b** has opposite (first and second) terminal ends.

[0041] The specific construction of the first terminal ends of the side panel 12 and the transverse members 17 will be described below with reference to FIG. 3 in connection with the construction of the corner section C1 of the support structure 10. It will be understood, however, that the construction of the components for each of the corner sections C2-C4 of the support structure 10, including the second terminal ends of the first side panel 12 and the transverse members 17, the first and second terminal ends of the second side panel 14 and the transverse members 21, and the support legs 15a, 15b, 19a, 19b, are identical to those as described below for the corner section C1.

[0042] FIG. 3 is an expanded, exploded view of the corner section C1 of the support structure 10 shown in FIG. 1. The corner section C1 is assembled by mounting the first terminal ends of the top and bottom members 12a, 12b of the first side panel 12 and first terminal ends of the top and bottom members 17a, 17b of each of the upper and lower first transverse support members 17 on the first support leg 15a. For clarity of illustration, the first side panel 12 and first transverse support members 17 are shown partially cut away to illustrate details of the first terminal ends of these components that are removably mounted and secured on the first support leg 15a.

[0043] The first terminal end of each of the top and bottom members 12a, 12b of the first side panel 12 is formed as a connecting member 12d having a vertical slot 12e releasably receiving therethrough the first support leg 15a. Likewise, the first terminal end of each of the top and bottom members 17a, 17b of the first transverse support members 17 is formed as a connecting member 17d having a vertical slot 17e for releasably receiving therethrough the first support leg 15a. Each of upper and lower ends of the first support leg 15a is covered with a cover or shoe member 24. The cover members 24 are configured to be removably secured to the respective upper and lower ends of the first support leg 15a with a friction fit.

[0044] Each of the connecting members 12d, 12e and 17d, 17e is generally rectangular-shaped in cross-section. The top and bottom members 12a, 12b of the first side panel 12 are attached to generally central portions of short sides of the rectangle shapes of the respective connecting members 12d, 12e (i.e., the long sides of the rectangle shapes of the connecting members 12d, 12e extend along longitudinal directions of the respective top and bottom members 12a, 12b). The top and bottom members 17a, 17b of the first transverse support member 17 are attached to generally central portions of long sides of the rectangle shapes of the respective connecting members 17d, 17e (i.e., the short sides of the rectangle shapes of the connecting members 17d, 17e extend along longitudinal directions of the respective top and bottom members 17a, 17b). Stated otherwise, in the present embodiment each of the top member 17a and corresponding connecting members 17d and the bottom member 17b and corresponding connecting members 17d is configured as a structure having a generally I-shape in longitudinal cross-section.

[0045] In addition to providing structural integrity, a primary reason for the difference in orientation between the connecting members 12d relative to the top and bottom members 12a, 12b of the first side panels 1 and the connecting members 17d relative to the top and bottom members 17a, 17b of the first transverse support members 17, a set forth above, is to permit the assembly of the first side

panel 12 and transverse support members 17 on the support leg 15a to form the corner section C1 as shown in FIG. 1.

[0046] It will be appreciated that the orientations of the connecting members relative to the side panel 12 and transverse support members 17 as described above may be reversed, provided that the orientation of the support leg 15a is adjusted by 90 degrees from the position shown in FIGS. 1 and 3. More specifically, in the embodiment of FIGS. 1 and 3, the support leg 15a is formed of a flat strip of material having opposite main surfaces. The support leg 15a is positioned such that each of the top and bottom members 17a, 17b of the transverse support members 17 extend generally perpendicular to the main surfaces of the support leg 15a. Thus, reversal of the orientation of the connecting members relative to the side panel 12 and transverse support members 17 would result in each of the top and bottom members 12a, 12b of the side panel 12 being generally perpendicular to the main surfaces of the support leg 15a.

[0047] The first support leg 15a is provided with indentations 26 formed on opposite surfaces and disposed approximately at a central portion of the first support leg 15a in the longitudinal direction thereof. The indentations 26 serve to position and retain the upper first transverse support member 17 relative to the first support leg 15a so as to prevent the upper first transverse support member 17 from displacing in a direction toward the lower end of the first support leg 15a.

[0048] An example of the manner of assembling the corner section C1 of the support structure 10 is described with reference to FIGS. 1 and 3.

[0049] The lower first transverse support member 17 is mounted on the first support leg 15a by passing the first support leg 15a, from the lower end thereof, through the vertical slot 17e of each of the connecting members 17d at the first terminal end of the lower first transverse support member 17. One of the cover members 24 is then secured to the lower end of the first support leg 15a to position and retain the lower first transverse support member 17 on the first support leg 15a. The upper first transverse support member 17 is then mounted on the first support leg 15a bypassing the first support leg 15a, from the upper end thereof, through the vertical slot 17e of each of the connecting members 17d at the first terminal end of the upper first transverse support member 17, as denoted by chain link line L1 in FIG. 3. In this state, the upper first transverse support member 17 is displaced along the first support leg 15a until the connecting member 17d of the bottom member 17b firmly engages and rests on the indentations 26 of the first support leg 15a. Thereafter, the first side panel 12 is mounted on the first support leg 15a by passing the first support leg 15a, from the upper end thereof, through the vertical slot 12e of each of the connecting members 12d at the first terminal end of the first side panel 12, as denoted by chain link line L2 in FIG. 3. In this state, the first side panel 12 is displaced along the first support leg 15a until the connecting member 12d of the bottom member 12b firmly engages and rests on against the connecting member 17d of the top member 17a of the upper first transverse support member 17. Lastly, another of the cover members 24 is then releasably secured to the upper end of the first support leg 15a with friction fit to securely anchor the first side panel 12 between the cover member 24 and the upper first transverse support member 17. This assembly operation is both simple and quick. The completely assembled corner section C1 of

the support structure **10**, including the first side panel **12** and the upper and lower first transverse support members **17** mounted on the first leg **15a**, is shown in FIG. 1.

[0050] It will be appreciated that in the assembled configuration of the corner section C1 shown in FIG. 1, the indentations **26** formed on the first support leg **15a** serve to position and retain the first terminal ends (i.e., connecting members **17d**) of the top and bottom members **17a**, **17b** of the upper first transverse support member **17** on the first support leg **15** so as to prevent displacement thereof toward the lower end of the first support leg **15a**. Furthermore, the first terminal end (i.e., connecting member **12d**) of the bottom member **12b** of the first side panel **12** rests on the first terminal end (i.e., connecting member **17d**) of the top member **17a** of the upper first transverse member **17** and is retained in place by the cover member **24** covering and engaging the upper end of the first support leg **15a** with friction fit. Thus, the first terminal ends of the top and bottom members of each of the first side panel **12** and the upper first transverse member **17** are firmly retained in place and prevented from undergoing upward and downward movement along the first support leg **15a**. It will also be appreciated that the cover member **24** covers and engages the lower end of the first support leg **15a** with sufficient frictional fit so as to prevent the first terminal ends of the top and bottom members **17a**, **17b** of the lower first transverse member **17** from displacing in the direction toward the lower end of, and thereby be disengaged from, the first support leg **15a**.

[0051] It will be understood by those skilled in the art that assembly of each of the corner sections C2-C4 of the support structure **10** can be accomplished using the same procedure described above for the assembly of the corner section C1. In this regard: the corner section C2 is assembled by mounting the first terminal ends of the top and bottom members **14a**, **14b** of the second side panel **14** and the second terminal ends of the top and bottom members **17a**, **17b** of each of the upper and lower first transverse support members **17** on the second support leg **15b**; the corner section C3 is assembled by mounting the second terminal ends of the top and bottom members **14a**, **14b** of the second side panel **14** and the second terminal ends of the top and bottom members **21a**, **21b** of each of the upper and lower first transverse support members **21** on the second support leg **19b**; and the corner section C4 is assembled by mounting the first terminal ends of the top and bottom members **12a**, **12b** of the second side panel **12** and the first terminal ends of the top and bottom members **21a**, **21b** of each of the upper and lower first transverse support members **21** on the first support leg **19a**.

[0052] From the foregoing description with reference to FIGS. 1-3, it will be appreciated that each of the first upper and lower transverse support members **17** are identical in construction and dimensions to each of the second upper and lower first transverse support members **21**, and that the side panels **12**, **14** are identical in construction to one another. Furthermore, each of the first and second upper and lower transverse support members **17**, **21** are identical in construction to each of the side panels **12**, **14**, with the exception of the respective lengths thereof and the orientation of the respective connecting members as set forth above. More specifically, in this embodiment each of the side panels **12**, **14** have a length greater than that of each of the first and second transverse support members **17**, **21**, thereby forming

an open rectangular frame. It will be understood, however, that the relative dimensions between the side panels and transverse support members can be varied depending on the particular configuration of the support structure **10** desired, without departing from the spirit and scope of the invention. Likewise, the orientation between the connecting members between the side panels **12**, **14** and the connecting members of the transverse support members **17**, **21** may be reversed as set forth above.

[0053] Moreover, the configuration of the side panels **12**, **14** and the transverse support members **17**, **21**, including the top and bottom members separated by the reinforcing members and including terminal ends formed with the connecting members having slots configured for receiving the respective support legs, advantageously serve to add rigidity to the support structure **10** by substantially reducing lateral stress on the corner sections C1-C4 of the support structure. Furthermore, any torsional stress that the support structure **10** is likely to encounter is resisted by virtue of the configuration of the side panels and the transverse support members and by these components being mounted on the respective support legs by passing the support legs through the respective slots of these components.

[0054] It will also be appreciated that assembly of the support structure **10** according to the embodiment of the invention shown in FIGS. 1-3 can be readily accomplished in a quick and detachable manner without the use of tools and without the need for screws or other extraneous fasteners. Furthermore, by the above construction, the side panels **12**, **14** and the end support frame assemblies **16**, **18** can be readily assembled to form the support structure either in the filing cabinet drawer **20** or out of the drawer for placement therein.

[0055] By providing each of the first and second terminal ends of the top and bottom members of each of the side panels and transverse support members with the connecting member having the vertical slot, and by providing the support legs with the indentations, these parts can be readily and securely mounted to the support legs to construct the corner sections of the support structure **10** so that the parts cannot be disassembled when handling the support structure during insertion into the file cabinet drawer **20** or when loaded with hanging folders **22**. However, the construction of the support structure **10** according to the present invention allows it to be readily disassembled by hand for storage and to be reassembled for use in another file cabinet drawer.

[0056] Moreover, the support structure **10** can be constructed with a minimum number of parts as compared to conventional support structures for hanging file folders. This is made possible by the fact that each of the side panels **12**, **14**, transverse support members **17**, **21**, support legs **15a-15b**, **19a-19b** and cover members **24** has a unitary construction. In the particular embodiment shown in FIG. 1, the support structure **10** can be assembled into a stable, open frame configuration using just two side panels, four transverse support members, four support legs and eight cover members. Accordingly, it will be appreciated that the support structure **10** for hanging file folders may be readily and economically manufactured and later assembled by the user without the need for fasteners or specialized tools, as set forth above. The various parts of the support structure **10** according to the present invention is particularly adapted for packaging as a kit.

[0057] Preferably, the side panels 12, 14, transverse support members 17, 21 and support legs 15a-15b and 19a-19b of the support structure 10 are constructed from a metal, such as aluminum or steel, which may be in stamped, cast, machined or extruded form. For example, these parts may be fabricated from flat strip metal of uniform section with smooth edges throughout. Alternatively, these parts may be constructed of comparatively strong rigid plastic or other material. The cover or shoe members 24 are preferably made of rubber or similar material to protect the file drawer 20 from damage and/or the user from injury.

[0058] FIG. 4 illustrates another embodiment of the present invention showing a modified form of the side panels, generally designated at 30, for the support structure 10 according to the present invention.

[0059] The modified side panel 30 has a top member 30a for releasably supporting one of two ends of the support element 22a of the hanging file folder 22, a bottom member 30b spaced apart from the top member 12a, and reinforcing members 30c, 30d interconnecting the top and bottom members 30a, 30b. Each of the terminal ends of each of the top and bottom members 30a, 30b of the side panel 30 is formed as a connecting member 30e having a vertical slot 30f for releasably receiving therethrough one of the support legs 15a, 15b, 19a and 19b as described above for the embodiment of FIGS. 1-3. The top and bottom members 30a, 30b (other than the connecting members 30e) and the reinforcing members 30c, 30d are formed of generally flat strips of material. Any material as described above for the side panels 12, 14 of FIGS. 1-3 may be used for the side panel 30.

[0060] The reinforcing members 30c extend vertically between the top and bottom members 30a, 30b. The reinforcing member 30d is curved into a generally semi-circular shape and extends from a junction between one of the reinforcing members 30c and the bottom member 30b to a junction between the other of the reinforcing members 30c and the bottom member 30b. A generally central portion of the reinforcing member 30d is disposed in contact with a generally central portion of the top member 30a.

[0061] As can be seen in FIG. 4, the top and bottom members 30a, 30b of the side panel 30 are oriented at 90 degrees relative one another. The orientation of the top member 30a is such that it allows one of two ends of the support element 22a of the hanging file folder 22 to be supported thereon for sliding movement along the top member 30a to various positions on the support structure 10 and to be inserted and removed therefrom as desired.

[0062] FIGS. 5-6 illustrate another embodiment of the present invention showing a modified form of the end support frame assemblies, generally designated at 40, of a support structure 10 according to the present invention. For clarity of illustration, in FIGS. 5-6 various components of the support structure 10 are shown partially cut away. The support structure 10 has an open rectangular frame similar to the support structure 10 shown in FIG. 1, including two side panels and two end support frame assemblies (each including two support legs). The two end support frame assemblies 40 in the embodiment of FIGS. 5-6 are identical in dimensions and construction, and thus only one of the end support frame assemblies 40 is described below in connection with this embodiment. Furthermore, the support structure 10 in this embodiment employs two of the side panels 30 as described above for the embodiment of FIG. 4, with the

exception of a modification to the connecting members 30e as further described below. It is understood, however, that the side panels 12, 14 as described above with reference to FIGS. 1-3, including the modification to the corresponding connecting members, can also be used in place of the side panels 30.

[0063] The end support frame assembly 40 includes three transverse support members 42, 44, 46 and two support legs 48, 50. More specifically, the transverse support members include a top (first) rod-shaped member 42, a bottom (second) rod-shaped member 44, and an intermediate (third) rod-shaped member 46 disposed between the top and bottom rod-shaped members 42, 44, each interconnected to the support legs 48, 50 and the side panels 30 as shown in FIG. 4. Each of the top and intermediate rod-shaped members 42, 46 has opposite ends connecting with the respective support legs 48, 50 and the connecting members of the respective top and bottom members of the side panels 30. The opposite ends of the top rod-shaped member 42 connect to upper ends of the respective support legs 48, 50. The opposite ends of the bottom rod-shaped member 44 connect to proximate lower ends of the respective support legs 48, 50. As further described below, each of the opposite ends of each of the top, bottom and intermediate rod-shaped members 42, 44, 46 has a threaded bore.

[0064] FIG. 6 is an expanded, partial exploded view of the corner section C1 of the support structure 10 shown in FIG. 5. For clarity of illustration, the rod-shaped member 42 and the side panel 30 are shown partially cut away. Each of the opposite ends of the rod-shaped member 42 is provided with a threaded-bore 42a. The support leg 48 is provided with three threaded holes 48a, 48b, 48c. The connecting member 30e at the terminal end of each of the top and bottom members 30a, 30b of the side panel 30 is provided with a threaded hole 52.

[0065] With reference to FIGS. 5 and 6, assembly of the corner section C1 is accomplished by inserting the support leg 48 through the vertical slots 30f in each of the connecting members 30e of the side panel 30, as denoted by chain link line L3, until the threaded holes 48a, 48b are aligned with the respective threaded holes 52 of the connecting members 30e. The threaded bore 42a of the top rod-shaped member 42 is then aligned with the aligned threaded holes 48a and 52 (corresponding to the connecting member 30e of the top member 30a of the side panel 30), and a threaded fastener 54 is threaded into the aligned threaded holes 48a, 52 and threaded bore 42a, as denoted by chain link line L4, to thereby secure the end of the top rod-shaped member 42 and the connecting member 30e of the top member 30a to the support leg 48 and to one another. Similarly, the threaded hole 48b, the threaded hole 52 in the connecting member 30e of the bottom member 30b of the side panel 30, and the threaded bore (not shown) at one of the ends of the intermediate rod-shaped member 46 are aligned relative one another, and another threaded fastener (not shown) similar to the threaded fastener 54 is threaded into the aligned threaded holes and threaded bore to thereby secure the end of the intermediate rod-shaped member 46 and the connecting member 30e of the bottom member 30b to the support leg 48 and to one another. The other end of each of the top and intermediate rod-shaped members 42, 46 is secured to the support leg 50 and corresponding connecting members of the other side panel 30 in a manner similar as described above.

[0066] The opposite ends of the bottom rod-shaped member 44 are secured to the respective support legs 48, 50 via connecting members 56 and similar threaded fasteners 54. The connecting members 56 are identical in construction to the connecting members 30e of the side panel 30 shown in FIG. 6, including vertical slot and threaded hole. However, the connecting members 56 do not form part of any side panel, but are rather separate and independent connecting elements. The end of the bottom rod-shaped member 44 is secured to the support leg 48 proximate the lower end portion thereof. The lower end portion of the support leg 48 is passed through the vertical slot of one of the connecting members 56 until the threaded hole 48c is aligned with the threaded hole of the connecting member 56. The threaded bore at the end of the bottom rod-shaped member 44 is then aligned with the aligned threaded hole 48c and threaded hole of the connecting member 56, and another threaded fastener 54 is threaded into the aligned threaded holes of the threaded bore to thereby secure the end of the bottom rod-shaped member 44 and the connecting member 56 to the support leg 48 and to one another. The other end of the bottom rod-shaped member 44 is secured to the support leg 50 and the other of the connecting members 56 in a manner similar as described above.

[0067] The embodiment of the support structure 10 shown in FIGS. 5-6 does not employ cover members for the upper and lower ends of the support legs as described above for the embodiment of FIGS. 1-3. However, it is understood that the upper and lower ends of the support legs in FIGS. 5-6 may also be covered with such cover members to achieve the benefits previously described. In this case, the length of the support legs and/or the position of the threaded hole at the upper end of each of the support legs may be varied accordingly so that the upper end of the support leg protrudes from the connecting member 30e, and the protruding upper end is covered with one of the cover members.

[0068] It will be appreciated that, in the assembled state, the support structure 10 according to the embodiment shown in FIGS. 5-6 provides a stable, open frame configuration that is sufficiently strong to support and hang therefrom a number of hanging file folders when the support structure 10 is mounted within the file drawer 20 (FIG. 2). The components of the support structure 10 described above with reference to the embodiment of FIGS. 5-6 may be formed of materials similar to those described above with reference to embodiments of FIGS. 1-3 and 4.

[0069] FIGS. 7A-7B and 8 illustrate another embodiment of the present invention showing another modified form of the end support frame assemblies, generally designated at 60, of a support structure 10 according to the present invention. For clarity of illustration, in FIGS. 7A-7B and 8 various components of the support structure 10 are shown partially cut away. The support structure 10 has an open, rectangular frame construction similar to the support structure 10 shown in FIG. 1, including two side panels and two end support frame assemblies. The two end support frame assemblies 60 are identical in construction to one another, and thus only one of the end support frame assemblies 60 is described below in connection with this embodiment. Furthermore, the support structure 10 in this embodiment employs the side panels 12, 14 and one of the transverse support members 17 as described above for the embodiment of FIGS. 1-3. It is understood, however, that in this embodi-

ment side panels having the structure of the side panel 30 shown in FIG. 4 may be substituted for the side panels 12, 14.

[0070] Referring to FIGS. 7A-7B, the end support frame assembly 60 differs from the end support frame assemblies 16, 18 (FIGS. 1-3) and 40 (FIGS. 5-6) described above in that the end support frame assembly 60 is of a unitary construction. More specifically, in the assembled state shown in FIG. 7A, the end support frame assembly 60 has a generally U-shaped configuration and is formed of a transverse support member (e.g., a horizontally extending bar) 60a and two spaced apart corner posts 60b, 60c interconnected by the transverse support member 60a. The transverse support member 60a is configured to rest on the surface of the file drawer 20 (FIG. 2). The corner posts 60b, 60c function as the support legs described above for the end support frame assemblies of the embodiments of FIGS. 1-3 and 5-6.

[0071] Each of the support legs 60b, 60c is provided with indentations 26 formed on opposite surfaces and disposed approximately at a central portion thereof. As described above for the embodiment of FIGS. 1-3, the indentations 26 serve to position and retain the transverse support member 17 relative to the support legs 60b, 60c so as to prevent the transverse support member 17 from displacing in a direction toward lower ends of the support legs 60b, 60c.

[0072] Referring to FIG. 7B, the end support frame assembly 60 is preferably formed of a flat strip of material and includes a pair of notched portions 62d (bending points) separating the transverse support member 60a from the support legs 60b, 60c. The support legs 60b, 60c are configured to be bent at the notched portions 60d in the direction denoted by arrows A1 to form the end support frame assembly 60 into the U-shaped configuration shown in FIG. 7A.

[0073] Assembly of the support structure 10 shown in FIG. 8 is accomplished in a manner similar to the support structure 10 described above with reference to FIGS. 1-3, except as described below. The transverse support member 17 is first mounted on the end support frame assembly 60 by passing the support legs 60b, 60c, via the upper end thereof, through the respective vertical slots of the connecting members of the transverse support member 17 until the connecting members at the respective terminal ends of the bottom member of the transverse support member 17 firmly engage and rest on the respective indentations 26 provided on the support legs 60b, 60c. Each of the side panels 12, 14 is then mounted on the end support frame assembly 60 by passing the support legs 60b, 60c, via the upper ends thereof, through the respective vertical slots of the connecting members of the side panels 12, 14 until the connecting members at the respective terminal ends of the bottom members of the side panels 12, 14 firmly engage and rest on the respective connecting members at the respective terminal ends of the top member of the transverse support member 17. The exposed upper end of each of the support legs 60b, 60c is then covered with a cover member 24, as described above for the embodiment of FIGS. 1-3. A similar procedure is followed to assemble the other end support frame assembly (not shown), which is identical to the end support frame assembly 60 described above, relative to the side panels 12, 14 and to another transverse support member 17.

[0074] The support structure 10 according to the embodiment shown in FIGS. 7A-7B and 8 can be assembled with

a reduced number of parts. This is accomplished by forming each of the end support frame assemblies **60** with a unitary construction as described above. Furthermore, by forming the end support frame assembly **60** with the transverse support member **60a** which is unitary with the support legs **60b**, **60c**, only one transverse support member **17** (as compared to two for the embodiment of FIGS. 1-3) is required to interconnect the support legs **60b**, **60c** and provide overall stability and support to the support structure **10**. The components of the support structure **10** according to the embodiment of FIGS. 7A-7B and **8** may be formed of materials similar to those described above with reference to the embodiments of FIGS. 1-3, **4** and **5-6**.

[0075] FIGS. 9-14 illustrate another embodiment of a support structure for hanging file folders, generally designated at **100**, according to the present invention. FIG. 9 shows the support structure **100** in the assembled state. Support structure **100** is formed of interlocking components including a pair (first and second) of elongate side panels **102** and a pair (first and second) of end support frame assemblies **104** removably connected together to form an open box-type structure having four corner sections **C11**, **C22**, **C33** and **C44**. Support structure **100** is configured to be placed in a conventional file drawer for supporting hanging file folders (file pockets). As described above for the exemplary embodiment of FIG. 2, the hanging file folders are provided with support elements for slidably engaging the side panels **102** so that the hanging file folders may be moved to various positions on the support structure **100** and may be inserted and removed as desired. In this exemplary embodiment, elongate side panels **102** are identical in construction and dimension to one another and end support frame assemblies **104** are identical in construction and dimension to one another.

[0076] Referring to FIGS. 9-12, each end support frame assembly **104** includes a pair of support legs or posts **108** and upper and lower transverse support members **106** releasably mounted to respective ones of the support legs **108**. Each transverse support member **106** includes a top member **106a**, a bottom member **106b** and multiple (e.g., three in this exemplary embodiment) reinforcing members **106c** interconnecting the top and bottom members. Top and bottom members **106a**, **106b** have opposite (first and second) terminal ends each formed as a connecting member **110** for removably connecting transverse support members **106** to respective support legs **108**. In this embodiment, each connecting member **110** is formed unitarily (i.e., in one piece) of two generally rectangular-shaped portions **110a**, **110b** in orthogonal relation to one another. Portion **110a** has a vertical slot **110c** for receiving therethrough support leg **108**, and portion **110b** has a blind hole **110d** for receiving therein an end of corresponding top **106a**/bottom member **106b** of transverse support member **106**. In an alternative embodiment, connecting members **110** may be unitary (i.e., formed in one piece) with corresponding top **106a**/bottom **106b** members of transverse support member **106**, thereby reducing the number of parts of support structure **100**.

[0077] Side panels **102** are adapted to span the distance between support end assemblies **104**. Each side panel **102** includes a top member **102a**, a bottom member **102b** and multiple (e.g., six in this exemplary embodiment) reinforcing members **102c** interconnecting the top and bottom members. Top members **102a** are configured to releasably and slidably support elements of hanging file folders as

described above for the exemplary embodiment shown in FIG. 2. Top and bottom members **102a**, **102b** have opposite (first and second) terminal ends each formed as a connecting member **112** for removably connecting the top and bottom members to respective support legs **108**. Each connecting member **112** has a vertical slot **112d** for receiving therethrough support leg **108** and a blind hole **112e** for receiving therein an end of corresponding top **102a**/bottom member **102b** of side panel **102**. In an alternative embodiment, connecting members **112** may be unitary (i.e., formed in one piece) with corresponding top **102a**/bottom **102b** members of side panel **102**, thereby further reducing the number of parts of support structure **100**.

[0078] FIG. 10 is a front elevational view of support leg **108** for each corner section **C11**, **C22**, **C33**, **C44**. Support leg **108** has opposite terminal ends **108a**, **108b** and two leg portions **108c**, **108d** extending between the terminal ends. In the configuration of support **100** according to this exemplary embodiment, terminal ends **108a**, **108b** correspond to upper and lower ends, respectively, of support leg **108**, with leg portion **108c** having upper end **108a** and leg portion **108d** having lower end **108b**. Lower end **108b** of each support leg **108** is covered with a cover or shoe member **114**. Specifically, cover member **114** has a vertical slot **114a** for receiving therein lower end **108b** of support leg **108**. In this embodiment, cover member **114** is removably secured to lower end **108b** of support leg **108** with a friction fit.

[0079] Leg portions **108c**, **108d** are spaced apart from one another by a bend **108e** provided between terminal ends **108a**, **108b** such that leg portions **108c**, **108d** extend generally parallel to one another. As further described below, bend **108e** serves as a seat for positioning and holding the corresponding upper transverse support member **106** relative to support leg **108** so as to prevent the upper transverse support member from displacing in a direction toward terminal end **108b** of support leg **108**.

[0080] An example of the manner of assembling corner section **C11** of support structure **100** is described with reference to FIGS. 10-14.

[0081] Initially, connecting members **110** and **112** are mounted to corresponding ends of top **106a** and bottom **106b** members and corresponding ends of top **102a** and bottom **102b** members of transverse support members **106** and side panel **102**, respectively. Lower transverse support member **106** is then mounted on support leg **108** by passing leg portion **108d** of support leg **108**, from lower end **108b** thereof, through vertical slots **110c** of connecting members **110** provided to top **106a** and bottom **106b** members of lower transverse support member **106**, as denoted by chain link line **L1** in FIG. 12. The lower end **108b** is positioned so as to extend through vertical slot **110c** of connecting member **110** provided to bottom member **106b**, and cover member **114** is thereafter removably secured to lower end **108b** (FIG. 11). Upper transverse support member **106** is then mounted on support leg **108** by passing leg portion **108c** of support leg **108**, from upper end **108a** thereof, through vertical slots **110c** of connecting members **110** provided to top **106a** and bottom **106b** members of upper transverse support member **106**, as denoted by chain link line **L1** in FIG. 12. In this state, upper transverse support member **106** is displaced along leg portion **108c** of support leg **108** until connecting member **110** provided to bottom portion **106b** of upper transverse support member **106** firmly engages and rests on seat **108e** of support leg **108**. Thereafter, side panel

102 is mounted on support leg **108** by passing leg portion **108c** of support leg **108**, from upper end **108a** thereof, through vertical slots **112d** of connecting members **112** provided to top **102a** and bottom **102b** of side panel **102** until connecting member **112** provided to bottom member **102b** of side panel **102** rests on connecting member **110** provided to upper member **106a** of upper transverse support member **106**, and upper end **108a** of support leg **108** is generally flush with a side surface of connecting member **112** provided to top member **102a**. In this configuration, the terminal ends of upper **106a** and lower **106b** members of upper transverse support member **106** are interposed between seat **108e** of support leg **108** and connecting member **112** provided to the terminal end of lower member **102b** of side panel **102**.

[0082] It will be appreciated that the foregoing assembly operation is both simple and quick. The completely assembled corner section **C11** of support structure **100** described above is shown in FIG. **11**. The same procedure is followed to assemble corner sections **C22**, **C33** and **C44** to complete assembly of support structure **100** shown in FIG. **9**.

[0083] It will be appreciated that in the assembled configuration of corner sections **C11**, **C22**, **C33** and **C44** shown in FIGS. **9**, **11** and **14**, seat **108a** provided in each support leg **108** serves to position and retain the terminal end of bottom member **106b** of upper transverse support member **106** so as to prevent displacement thereof toward lower end **108b** of support leg **108**. Furthermore, connecting members **110** of upper and lower transverse support members **106**, connecting members **112** of side panel **102**, and cover member **114** are configured to engage leg portions **108c**, **108d** of support leg **108** with a friction fit. By this arrangement, secure corner sections **C11**, **C22**, **C33** and **C44** providing overall structural integrity to support structure **100** are achieved. It will be understood by those skilled in the art that assembly of each corner section **C22**, **C33** and **C44** of support structure **100** can be accomplished using the same procedure described above for the assembly of corner section **C11**.

[0084] It will be appreciated from the foregoing description with reference to FIGS. **9-14** that side panels **102** are identical in construction and dimensions, upper and lower transverse support members **106** of support frame assemblies **104** are identical in construction and dimensions, support legs **108** are identical in construction and dimensions, connecting members **110** are identical in construction and dimensions, connecting members **112** are identical in construction and dimensions, and cover members **114** are identical in construction and dimensions. By this construction, mass production of the various parts for support structure **100** is facilitated.

[0085] Moreover, the configuration of side panels **102** and transverse support members **106**, including the top and bottom members separated by the reinforcing members and including terminal ends formed with the connecting members having slots configured for receiving the respective support legs, advantageously serve to add rigidity to support structure **100** by substantially reducing lateral stress on corner sections **C11**, **C22**, **C33** and **C44** of support structure **100**. Furthermore, any torsional stress that support structure **100** is likely to encounter is resisted by virtue of the configuration of side panels **102** and transverse support members **106** and by these components being mounted on support legs **108**

passing through respective slots of the connecting members provided to terminal ends of these components.

[0086] It will also be appreciated that assembly of support structure **100** according to the embodiment shown in FIGS. **9-14** can be readily accomplished in a quick and detachable manner without the use of tools and without the need for screws or other extraneous fasteners. Furthermore, by the above construction, side panels **102** and end support frame assemblies **104** can be readily assembled to form support structure **100** either in a filing cabinet drawer within which it is used or out of the drawer for placement therein. By providing the terminal ends of the top and bottom members of the side panels and transverse support members with connecting members having vertical slots and providing the support legs with seats, as described above, these parts can be readily and securely assembled to construct the corner sections of the support structure **100** so that the parts cannot be disassembled when handling the support structure during insertion into a file cabinet drawer or when loaded with hanging folders. However, the construction of support structure **100** according to this embodiment allows it to be readily disassembled by hand for storage and to be reassembled for use in another file cabinet drawer. Moreover, support structure **100** can be constructed with a minimum number of parts as compared to conventional support structures for hanging file folders. In this regard, the total number of parts for support structure **100** can be reduced even further by forming connecting members **110** and **112** unitarily (i.e., in one piece) with transverse support members **106** and side panels **102**, respectively, as set forth above. The various parts of support structure **100** according to the present embodiment is therefore particularly adapted for packaging as a kit.

[0087] Preferably, side panels **102**, transverse support members **106**, support legs **108** and connecting members **110**, **112** of support structure **100** are constructed from a metal, such as aluminum or steel, which may be in stamped, cast, machined or extruded form. For example, these parts may be fabricated from flat strip metal of uniform section with smooth edges throughout. Alternatively, these parts may be constructed of comparatively strong rigid plastic or other material. The cover or shoe members **114** are preferably made of rubber or similar material to protect the file drawer within which support structure **100** is installed from damage and/or the user from injury.

[0088] It will be appreciated by those skilled in the art that the support structure for hanging file folders according to the foregoing embodiments of the present invention may be readily assembled into a strong, rigid structure which is self-supporting and self-retaining in use so as to be extremely efficient and sturdy for the supporting of hanging file folders. The support structure may be easily and readily assembled and disassembled by a user without requiring special tools. The support structure may also be manufactured economically from a small number of separate components, can be shipped and stored in compact, knock-down form, and is capable of easy and rapid assembly into a rigid structure for use.

[0089] While the present invention has been described in terms of specific embodiments of support structures for hanging file folders, it is to be understood that the invention is not limited to these disclosed embodiments. This invention may be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided by way of

illustration only and so that this disclosure will be thorough, complete and will fully convey the full scope of the invention to those skilled in the art. Indeed, many modifications and other embodiments of the invention will come to mind of those skilled in the art to which this invention pertains, and which are intended to be and are covered by both this disclosure, the drawings and the claims.

I claim:

1. A support structure for hanging file folders, the support structure comprising:

- a pair of support frame assemblies each comprised of a pair of support legs and at least one transverse support member having opposite terminal ends releasably mounted to respective ones of the pair of support legs, each of the support legs having a first leg portion and a second leg portion spaced apart from the first leg portion by a bend serving as a seat for positioning and holding the at least one transverse support member; and
- a pair of side panels interconnecting the pair of support frame assemblies in spaced apart relationship along a length direction of the support structure, the side panels having terminal ends releasably mounted to respective ones of the first leg portions of the respective support legs, each of the side panels having a top member for releasably supporting one of two ends of a support element of one or more hanging file folders.

2. The support structure of claim 1, wherein for each of the support frame assemblies, the opposite terminal ends of the at least one transverse support member are releasably mounted to the first leg portion of the corresponding support leg.

3. The support structure of claim 2, wherein the at least one transverse support member is interposed between the corresponding side panel and the seat of the corresponding support leg.

4. The support structure of claim 1, wherein the first and second leg portions of each support leg are generally parallel to one another.

5. The support structure of claim 1, wherein for each of the support frame assemblies, the at least one transverse support member comprises a first transverse support member, and further comprising a second transverse support member having opposite terminal ends releasably mounted to the second leg portions of the support legs.

6. The support member of claim 1, wherein the support frame assemblies are identical in construction to one another.

7. The support member according to claim 1, wherein the side panels are identical in construction to one another.

8. The support structure of claim 1, wherein for each of the support frame assemblies, the at least one transverse support member comprises a top member, a bottom member spaced apart from the top member, and at least one reinforcing member interconnecting the top and bottom members.

9. The support structure of claim 8, wherein each of the terminal ends of the transverse support member is formed as a connecting member having a slot for releasably receiving therethrough the first leg portion of the support leg.

10. The structure of claim 1, wherein each of the side panels has a bottom member spaced apart from the top member and at least one reinforcing member interconnecting the top and bottom members.

11. A support structure for hanging file folders, the support structure comprising:

- a pair of support frame assemblies each including a pair of support legs and a transverse support member having opposite terminal ends releasably mounted to respective ones of the first support legs, each of the support legs having a first leg portion and a second leg portion spaced apart from the first leg portion by a bend serving as a seat for positioning and holding the transverse support member, the transverse support member having a top member, a bottom member spaced apart from the top member and at least one reinforcing member interconnecting the top and bottom members in spaced-apart relation to one another, each of the terminal ends of the transverse support member having a slot releasably receiving therethrough the first leg portion of the corresponding support leg so that the terminal end is disposed on the seat of the corresponding support leg; and

- a pair of side panels interconnecting the pair of support frame assemblies in spaced apart relationship along a length direction of the support structure, each of the side panels having a top member for releasably supporting one of two ends of a support element of one or more hanging file folders, a bottom member spaced apart from the top member, and at least one reinforcing member interconnecting the top and bottom members, each of the top and bottom members having first terminal ends each formed as a connecting member having a slot for releasably receiving the first leg portion of the corresponding support leg of the corresponding support frame assembly.

12. A support structure for hanging file folders, the support structure comprising: a pair of elongate side panels and a pair of end support frame assemblies for maintaining the side panels in a mutually spaced relationship and at an elevation to enable suspension of hanging file folders from upper surfaces of the side panels, each of the side panels includes a top member having the upper surface, a bottom member spaced apart from the top member, and at least one reinforcing member interconnecting the top and bottom members, each of the top and bottom members having opposite terminal ends each formed as a connecting member having a vertical slot, each of the end support frame assemblies includes a pair of support legs configured to extend into the vertical slots of the respective connecting members of the side panels and including a transverse support member having opposite terminal ends configured to be releasably mounted to respective ones of the support legs, each of the support legs having a first leg portion and a second leg portion spaced apart from the first leg portion by a bend serving as a seat for positioning and holding the transverse support member.

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