May 23, 1961 H. W. MARANO 2,985,496

COLLAPSIBLE STORAGE FILE

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FIG. 1

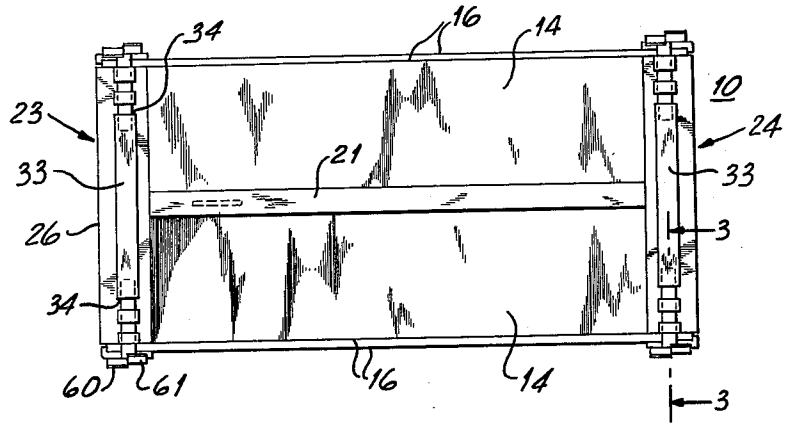


FIG. 2

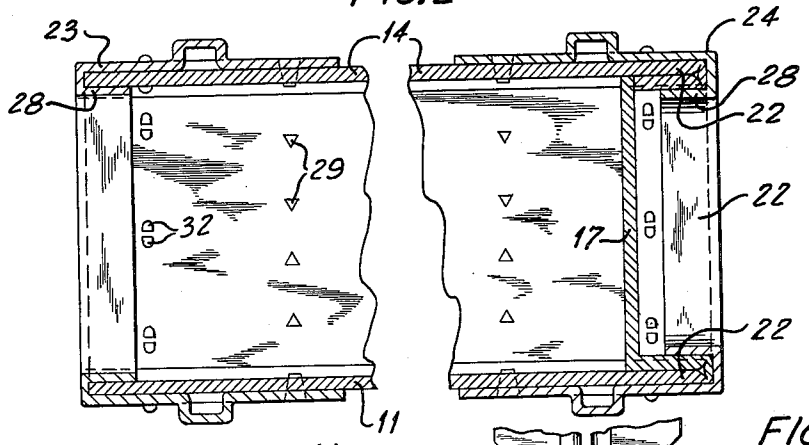
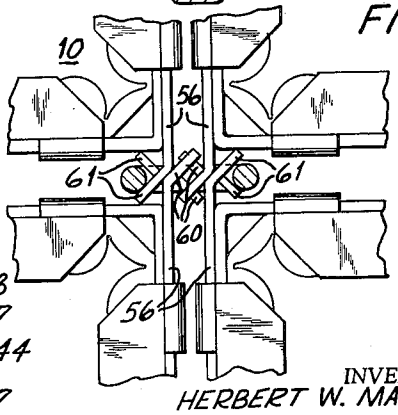


FIG. 4



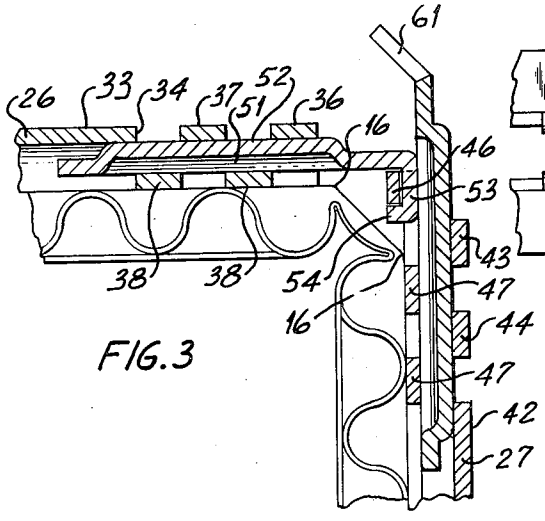


FIG. 3

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FIG. 5

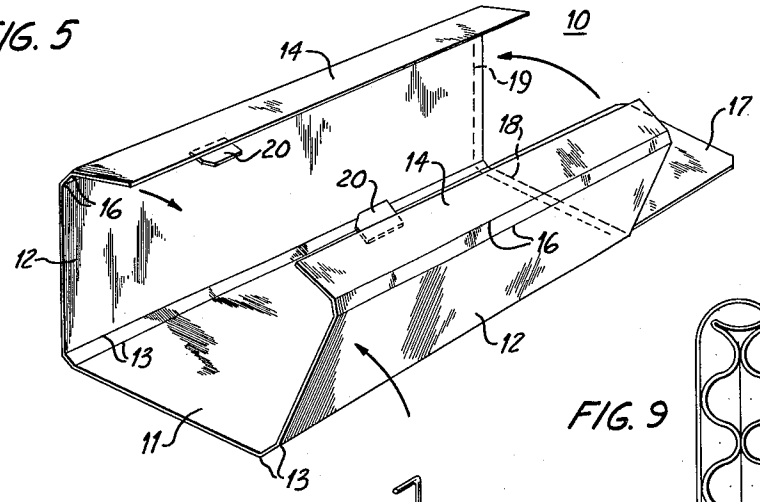
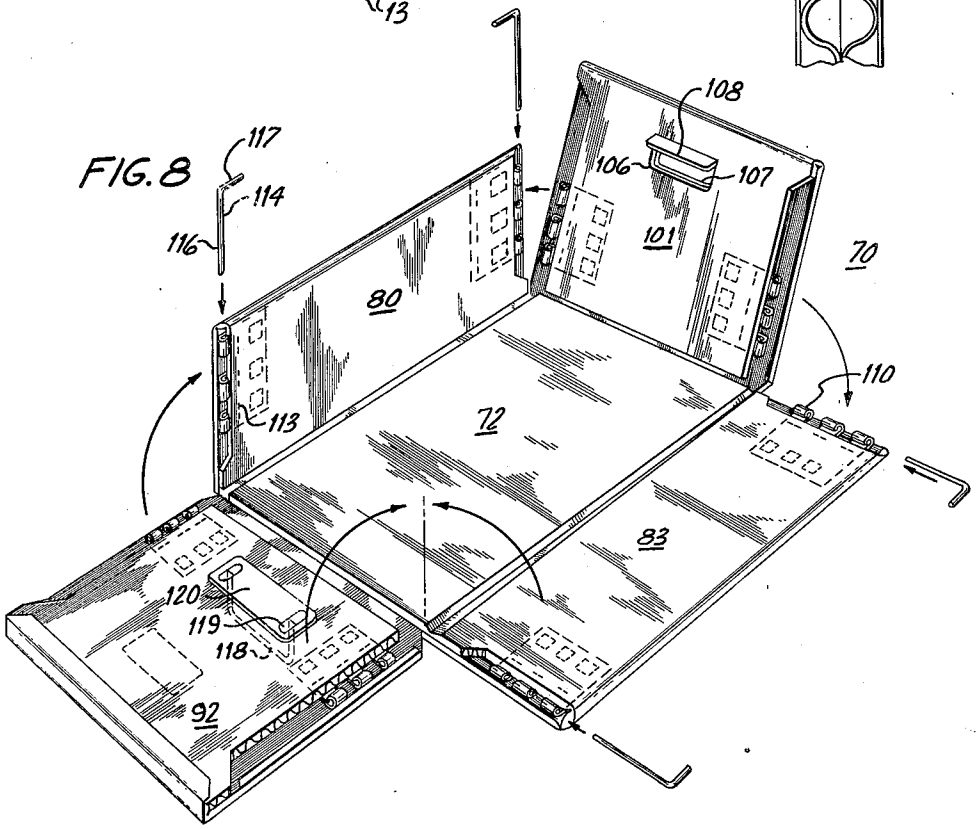


FIG. 9

FIG. 8



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FIG. 6

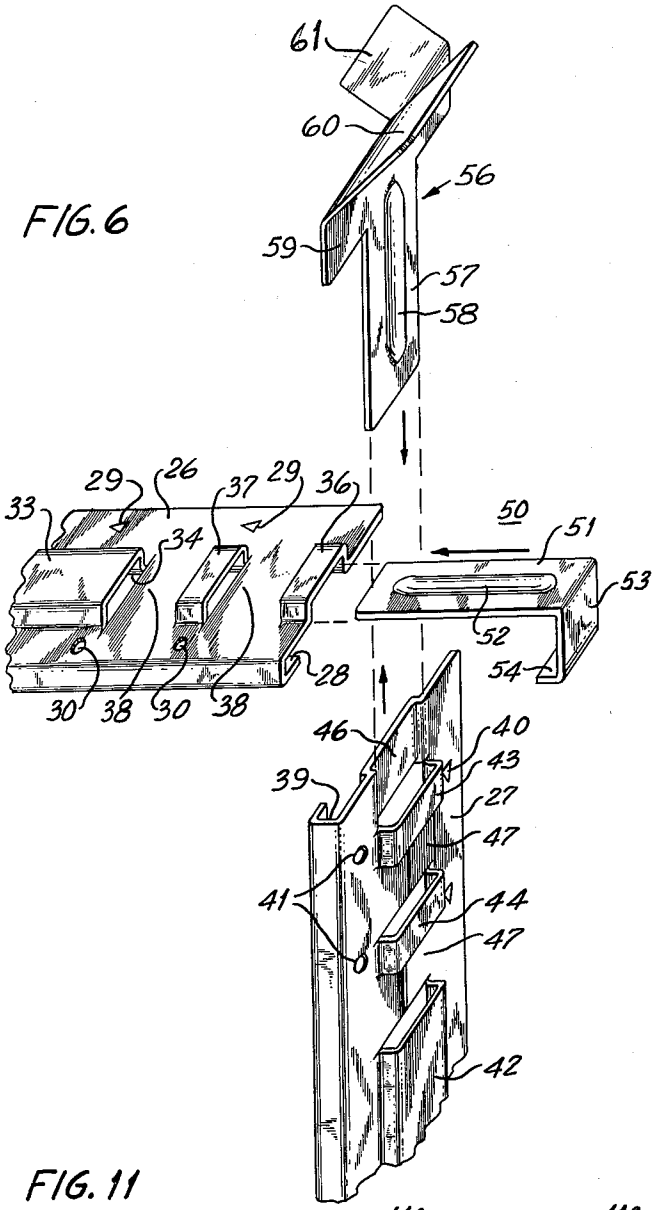


FIG. 12

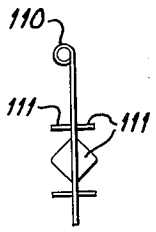


FIG. 10

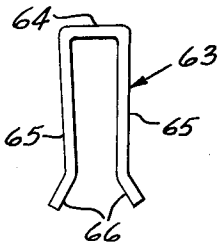
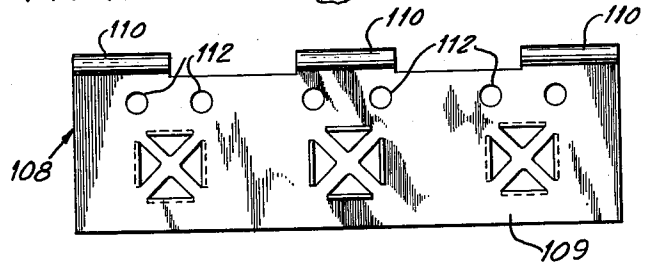


FIG. 11



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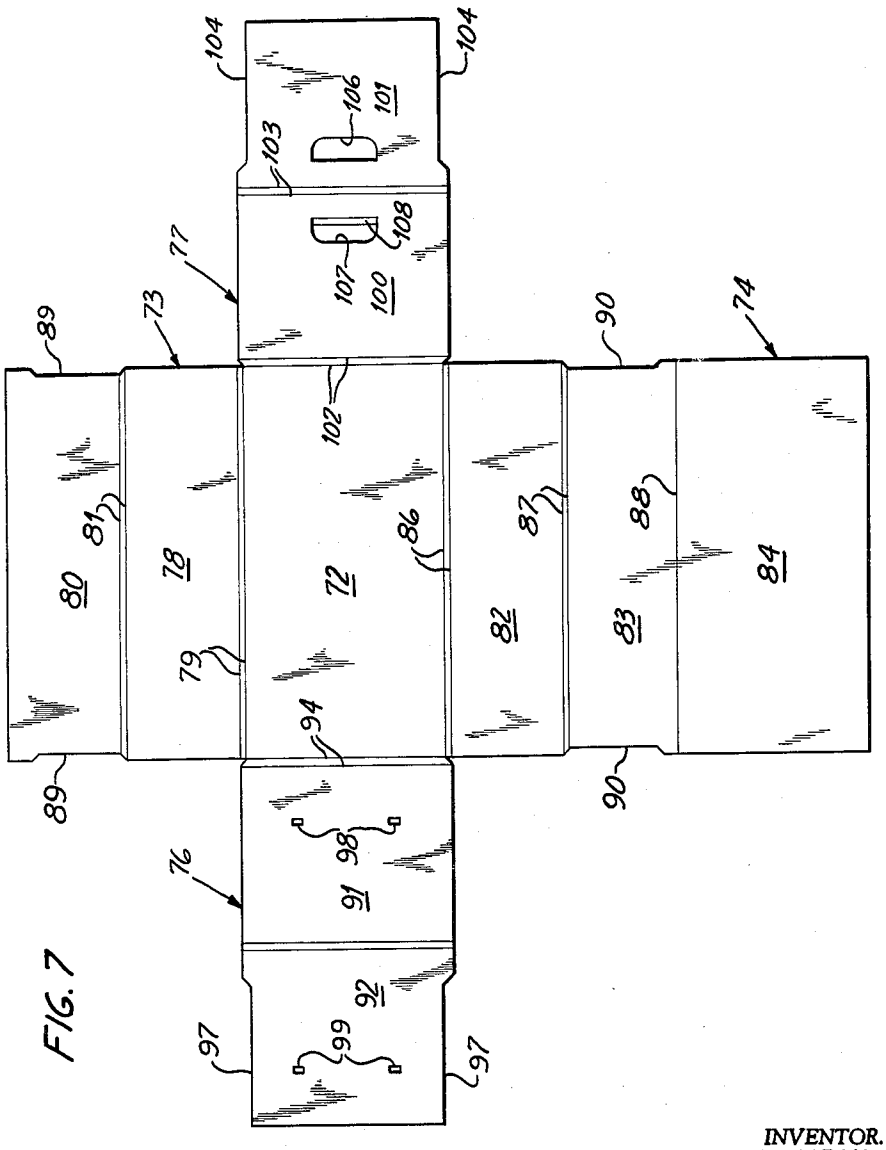


FIG. 7

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United States Patent Office

2,985,496

Patented May 23, 1961

2,985,496

COLLAPSIBLE STORAGE FILE

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Filed Apr. 16, 1958, Ser. No. 730,042

7 Claims. (Cl. 312—259)

The present invention relates generally to improvements in storage structures, and in particular it relates to improvements in collapsible storage and filing cabinets.

The conventional collapsible storage or temporary filing cabinet consists usually of a tubular shell member of rectangular cross-section and a registering drawer, each fabricated of corrugated cardboard or fiberboard. The shell and drawer are separable and of a collapsible construction, and when assembled may be arranged in vertical stacks. The collapsible filing cabinets generally available possess numerous disadvantages and drawbacks. They are usually weak and easily deformed and will not sustain any substantial weight. They cannot be stacked safely in high columns without danger of collapse. Furthermore, when so stacked it is difficult and often impossible to slide a filled drawer out of and back into the shell, particularly the lowermost portions of the stack, to obtain access to the contents. The conventional collapsible filing cabinets are also expensive, difficult to assemble and highly inflexible.

It is thus a principal object of the present invention to provide an improved storage or temporary filing cabinet.

Another object of the present invention is to provide an improved collapsible storage or temporary file cabinet.

Still another object of the present invention is to provide an improved collapsible storage or filing cabinet of rugged and inexpensive construction.

A further object of the present invention is to provide an improved collapsible storage or filing cabinet which may be rapidly and simply assembled and disassembled.

Still a further object of the present invention is to provide an improved cabinet unit which may be stacked and arranged side-by-side with other units in simple interlocked arrangement.

Other and further objects of the present invention will become apparent from a reading of the following description, taken in conjunction with the accompanying drawings, wherein—

Figure 1 is a top plan view of the shell or casing portion of a filing cabinet embodying the present invention;

Figure 2 is a longitudinal vertical sectional view of the casing illustrated, shown partially broken away for convenience of illustration;

Figure 3 is an enlarged detail sectional view taken along line 3—3 in Figure 1;

Figure 4 is a front elevational view of the junction point of four casings arranged in side-by-side relationship showing the interlocking brackets;

Figure 5 is a perspective view of the partially assembled blank forming the casing member;

Figure 6 is an enlarged detail exploded perspective view of a pair of reinforcing frame members and the associated coupling and locking members;

Figure 7 is a plan view of the blank employed in fabricating the drawer member;

Figure 8 is a perspective view of the partially assembled drawer illustrating the locking elements in position prior to interengagement;

Figure 9 is an end view of a folded corrugated board forming a multiple wall of the drawer member;

Figure 10 is a plan view of a bracket clip member;

Figure 11 is a top plan view of a drawer wall connecting member; and

Figure 12 is an end elevational view thereof.

In a sense, the present invention contemplates the provision of a storage device comprising a casing including a pair of angularly arranged longitudinally extending panels; transversely extending reinforcing members secured to said panels and having adjacent free ends; an angular coupling element separably engaging the free ends of said reinforcing member to connect rigidly said elements in angular relationship; and a locking element engaging one of said reinforcing members and removably registering with said coupling element to maintain said element in a coupling position.

Another feature of the present invention is the provision of bracket members which facilitate the vertical stacking of the cabinet shelves as well as the side-by-side arrangement thereof. Each bracket includes a pair of laterally spaced diverging wings. In the upper brackets the wings extend downwardly and in the lower brackets they project upwardly so that when the shelves are stacked the diverging wings interlock, the inner portions of the upper wings resting upon and abutting the inner portions of the lower wings. There is also interengagement of the wings of the adjacent side-by-side brackets. A clip member is provided which releasably engages the outer arms so as to maintain releasably the brackets in assembled condition.

A further feature of the storage or filing cabinet of the present invention is in the structure of the drawer member which is formed of side, front and rear panels hinged to a panel base, each of the panels being provided with relatively staggered tubular members which interlock upon erection of the walls, and a latching pin is inserted through correspondingly aligned tubular members so as to maintain the assembly of the drawer.

Still a further feature of the article of the present invention resides in the manner of folding corrugated cardboard or fiberboard so as to maintain its maximum strength. This is principally accomplished by forming a pair of parallel score lines in the area of folding separated a predetermined distance in accordance with the degree of folding to be achieved.

Referring now to the drawings which illustrate a preferred embodiment of the cabinet of the present invention, and Figure 5 in particular, reference numeral 10 generally designates a hollow shell or casing member which is of rectangular transverse cross-section. Shell 10 is formed of a single blank of double-faced corrugated cardboard or the like which includes a bottom rectangular panel 11 and laterally extending rectangular side panels 12 which are demarked from the longitudinal edges of the bottom panel 11 by a pair of parallel spaced score lines 13 formed in the inner face of the blank, said lines 13 being spaced apart a distance approximately equal to 1.2 times the thickness of the corrugated cardboard material forming the shell. A pair of rectangular panels 14 extend from the opposite longitudinal edges of panels 12 to define the top wal of shell 10, the width of each of top panels 14 being half the width of bottom panel 11, and being separated from side panels 12 by parallel spaced score line 16 the same characteristics as the score line 13. Extending rearwardly from the trailing edge of bottom panel 11 is a rear panel 17 which is separated from bottom panel 11 by a score line 18 formed in the underface of panels 11 and 17. A score

line 19 is formed in the inner face of the blank forming shell 10 parallel to and spaced inwardly from the trailing edges of panels 11, 12 and 14. A pair of opposing stop tabs 20 are secured to the underface of panels 14 projecting inwardly from the inner edges thereof and being located rearward of the leading edges of panels 14.

In assembling shell 10, panels 17 and the rear marginal borders of panels 11, 12 and 14 are folded inwardly along score lines 19 until the borders and panel 17 are disposed against the inner faces of the blank. Panel 17 is then swung back about score line 18 to a vertical position, and panels 12 and 14 are swung up about score lines 13 and 16 and the inner edges of panels 14 are brought into abutment to complete the shell, with its rear end closed by panel 17 and its forward end open. Prior to assembly, tabs 20 are folded at right angles perpendicular to panels 14 and are then brought into abutment with each other. A suitable adhesive tape 21 or other fastening means is applied to the line of juncture of the abutting edges of the top panels 14. The trailing edge of shell 10 is provided with an upper border 22 formed of a double layer of corrugated cardboard, and rear wall 17 is spaced slightly inwardly from the trailing end of the shell, with its upper edge abutting the inner edge of the confronting border underply, as seen in Figure 2.

In order to impart rigidity to shell 10, the trailing and leading ends thereof are reinforced by rectangular metallic frame members 23 and 24 respectively. Frame members 23 and 24 are formed of upper and lower frame elements or ribs 26 and vertical frame elements or ribs 27. Ribs 26 are formed of longitudinal strips extending transversely across the top and bottom walls of shell 10 along the leading and trailing edges thereof. Each of strips 26 is provided with a channel-shaped border 28 which, in the case of frame member 23, engages and embraces the leading borders of the top and bottom walls of shell 10, and in the case of frame member 24 engages and embraces the trailing edge of shell 10. Formed along the trailing edge of each frame element 26 are depending pointed tongues 29 which penetrate into and through the shell walls, and the ends of which are offset to effect a securement of the frame elements to the shell walls. Also formed in frame elements 26 along the leading edges just rearward of the trailing edge of channel 28 are regularly spaced pairs of openings 30 through which pass the legs of suitable staples, the leg ends of which are upset, as at 32.

Extending along the length of each frame element 26 and shaped from the strip forming the body of said frame element is an elongated channel-shaped rib 33 which terminates at and is spaced from the free ends of the frame elements 26, provided with outwardly directed openings 34 at each end thereof. An inverted U-shaped rib 36 of the same cross-section as rib 33 is formed at each end of the frame element 26 in longitudinal alignment with rib 33. Between each rib 36 and 33 there is formed a rib 37, also of inverted U-shaped configuration similar to that of rib 33 and in alignment with rib 33 and end rib 36. Strap or bridge portions 38 between ribs 36, 37 and 33 define, with said ribs, coupling member receiving sockets.

Vertical frame supporting elements 27 are of somewhat similar construction to horizontal frame elements 26, and are disposed along the leading borders of the outer faces of the vertical shell walls 12, each element 27 being formed of a metal strip having a leading channel-shaped portion 39 which engages and embraces the leading edges of the vertical walls 12. Frame element 27 is also provided with inwardly directed fastening tongues 40 which engage the vertical walls 12 and have formed therein along the leading edge regularly spaced pairs of openings 41 which engage the legs of the fastening staples as aforesaid.

A raised rib 42, similar to rib 33 of element 26, extends along the length of frame element 27 terminating short of the free ends thereof. Longitudinally spaced forward and intermediate inverted U-shaped ribs 43 and 44 respectively are formed adjacent each end of frame element 27 and are of the same configuration as rib 42 and in alignment therewith, the forward ribs 43 being spaced inwardly from the ends of frame elements 27. A depressed strap 46 is formed in the free end of the frame element 27 between the edge of rib 43 and the corresponding edge of frame element 27. The width of the strap 46 is substantially equal to the width of ribs 43 and 44. Ribs 43, 44 and 42 with strap and bridge portions 46 and 47 define end sockets. As illustrated in Figure 3, the ends of frame elements 27 extend substantially to the outer faces of the shell upper and lower walls, whereas the ends of the horizontal frame elements 26 extend to points slightly short of the outer faces of shell side walls 12.

The adjacent ends of the frame elements 26 and 27 are rigidly separably interconnected by means of mating coupling members 50, preferably formed of sheet metal. Each coupling member 50 includes a longitudinally extending leg 51 having a longitudinally extending upwardly directed arcuate reinforcing rib 52 formed therein. Projecting perpendicularly from an end of leg 51 is an arm 53 which terminates in an inwardly directed flange or lip 54. In connecting the ends of frame elements 26 and 27 coupling member 51 is inserted into the socket of a frame element 26 defined by ribs 36, 37 and 33 and by bridges 38 until lip 54 engages the inner edge of strap 46, cross arm 53 snugly resting in the depressed portion of strap 46, its free face being coplanar with the outer face of the corresponding frame element.

In order to releasably lock coupling members 50 in inserted position there are provided locking pins 56. Pins 56 serve a dual function, that of locking coupling members 50 in inserted position, and of facilitating the stacking of a plurality of cabinets in properly supported arrangement and permitting the interlocking of adjacent side-by-side disposed cabinets. Each pin 56, as illustrated in Figure 6, includes a longitudinally extending leg 57 provided with an arcuate longitudinal reinforcing rib 58 and having located at one end thereof a coplanar cross arm 59. Projecting from the outer longitudinal edge of cross arm 59 are a pair of laterally spaced diverging legs or wings 60 and 61, which are substantially rectangular and of identical configuration, their adjacent edges meeting at a point along the upper edge of cross arm 59 and on the medial axis of leg 57. Wings 60 and 61 preferably form a dihedral angle of 90° with each other and of 135° with the plane of cross arm 59.

Pins 56 are brought into locking position by inserting the vertical legs 57 into the sockets of the corresponding frame elements 27 which are defined by ribs 43, 44 and 42 and by strap 46 and the intermediate bridge portions 47, 47. The upper edge of rib 43 provides an abutment for the under edge of locking member cross arm 59. Eight coupling members 50 having been inserted in the corners of the forward and rear frame members 23 and 24, and the eight pins 56 having been inserted, shell 10 is in completely assembled condition, supported on all four sides and braced against deformation.

As illustrated in Figure 4 of the drawing the cabinets according to the present invention may be arranged in vertically stacked as well as in side-by-side interlocked arrangement. The lower pins 56 of the upper shell 10 are in vertical alignment with the upper pins 56 of the lower shell 10, the offset wings of the V-shaped crotches between the wing portions interfitting. The inner portions of the wings 60 and 61 of the upper pins 56 abut and rest upon the inner portions of the wings 60 and 61 of the lower pins 56.

Two stacks of shells 10 may be brought also into side-by-side relationship, the terminal portions of the wings 60 of the four adjacent pins 56 interdigitating, also as illustrated in Figure 4. Coupling pins 56 are releasably

interlocked by means of a U-shaped spring clip 63, as illustrated in Figure 10 of the drawing, clip 63 being formed of resilient wire comprising a bridge 64, a pair of depending arms 65 terminating in outwardly inclined fingers 66. Clip 63 is slipped about the assembled bracket wings 60 and 61, arms 65 registering in the saddles defined by the outwardly directed adjacent bracket wings 61. The outwardly directed arms 65 facilitate the application of clip 63.

In collapsing shell 10 for storage or transportation purposes, clips 63 are removed and the shells unstacked. Thereafter, the locking pins 56 are extracted and the coupling members 50 removed, thus permitting the collapsing of the frame members 23 and 24 and the shell 10. The shells 10 may be erected by reversing this procedure.

Referring now to Figures 7 to 9 and 11 and 12 of the drawing, which relate to the drawer component of the improved collapsible file of the present invention, reference numeral 70 generally designates the drawer which is formed, like shell section 10, of a single blank 71 of double-faced corrugated cardboard. Blank 71 includes a rectangular-shaped base panel 72 having laterally extending wings 73 and 74 and forwardly and rearwardly directed wings 76 and 77 respectively.

Wing 73 includes an inner rectangular panel 78 separated from base panel 72 by a pair of longitudinally extending spaced parallel score lines 79 having a spacing approximately equal to 1.2 times the thickness of the corrugated cardboard. Panel 78 terminates in an end panel 80, and is separated therefrom by a pair of spaced parallel score lines 81 spaced from each other approximately 1.5 times the corrugated cardboard thickness.

The opposite wing 74 is formed of three side-by-side panels; inner panel 82, intermediate panel 83 and end panel 84. Inner panel 82 is separated from base panel 72 by parallel score lines 86 spaced apart 1.2 times the panel thickness; panel 83 is separated from panel 82 by parallel score lines 87 spaced apart 1.5 times the panel thickness, and panel 84 separated from panel 83 by a single score line 88 formed in the underface of the corrugated cardboard. The dimensions of end panel 84 are slightly less than the dimensions of base panel 72, the heights of the panels 80, 78 and 82 being approximately equal and that of panel 83 being slightly less than that of panel 82 in height. Narrow recesses 89 are formed in opposite side edges of panel 80 from the inner border to a point short of the free edge thereof, and narrow recesses 90 are formed in the side edges of panel 83 from the inner edge thereof to a point short of the outer edge thereof. It is important to note that the provision of parallel score lines spaced approximately 1.2 and 1.5 times the blank thickness for folding 90° and 180° respectively is highly advantageous since a stronger corner or edge is achieved than is realized with a single scored line.

Front wing 76 includes an inner rectangular panel 91 and an outer rectangular panel 92, inner rectangular panel 91 being separated from base panel 72 by parallel score lines 94 spaced apart approximately 1.2 times the blank thickness, and panel 92 is separated from panel 91 by a pair of parallel score lines 96 spaced apart approximately 1.5 times the blank thickness. Formed in the side edges of outer panel 92 are recesses 97 which extend from the free edge of panel 92 to a point short of score lines 96. Also formed in the panels 91 and 92 are laterally spaced apertures 98 and 99 respectively, the apertures being equidistant from the opposite edges of the panels 91 and 92.

Rear wing 77 includes an inner panel 100 and an end panel 101, inner panel 100 being separated from base panel 72 by parallel score lines 102 spaced apart 1.2 times the blank thickness and panel 101 being separated from panel 100 by parallel score lines 103 spaced apart 1.5 times the blank thickness. Recesses 104 are formed in the opposite side edges of panel 101 extending from the free edge thereof to a point short of score lines 103. Equally spaced on opposite sides of score lines 103 are hand openings 106 and 107 respectively, hand opening 107 being located in panel 100 and being provided with an upwardly directed wing 108 along the edge thereof adjacent score line 103.

In order to permit the collapsible assembly of the drawer 70 there is provided a plurality of connecting members 108 which are located along the edges of the drawer walls, as will be hereinafter set forth. Each connecting member 108 includes a rectangular plate 109, along the longitudinal edge of which is formed a plurality of regularly spaced tubular knuckles or hinge ears 110. Knuckles 110 extend longitudinally and the distance between the confronting ends of the respective knuckles 110 is slightly greater than the length of each knuckle.

A plurality of upstanding triangular fastening ears 111 are located on plate 109 and formed integrally therewith, ears 111 being oppositely directed and of a depth slightly less than the thickness of the corrugated cardboard forming the drawer 70. Also formed in plate 109 between ears 111 and the knuckle-carrying edge of plate 109 are a plurality of longitudinally spaced pairs of staple-receiving apertures 112.

In assembling blank 71 and connecting members 108 to form drawer 70, a connecting member is positioned along the opposite side edges of each of the panels 80, 83, 92 and 101, the knuckles 110 registering with side recesses 89, 90, 97 and 104, the inner edges thereof confronting the longitudinal edges of the respective recesses. It should be noted that connecting members 108 are so-disposed along panels 80, 82, 92 and 101 that upon final assembly of the blank 71 adjacent connecting members 108 are vertically staggered or offset relative to each other a distance slightly greater than the distance of a knuckle 110 so as to permit the interdigitating of the knuckles of adjacent connecting members 108. Triangular ears 111 of connecting members 108 pierce the walls of the panels and are embedded therein and plates 109 are further secured to the wall panels by means of staples 113, the legs of which pass through plate openings 112 and are clinched to the underside of the respective panels.

Panels 101 and 92 are then folded inwardly about score lines 96 and 103 respectively until they are superimposed upon panels 91 and 100, the outwardly directed ears 111 piercing and extending into panels 91 and 100. Opening flap 108 passes through hand opening 106, and openings 98 are brought into registry with openings 99. Similarly, panel 80 is folded inwardly about score lines 81 into superposition upon panel 78, ears 111 piercing panel 78. Panels 83 and 84 are folded inwardly so that panel 83 is brought into superposition upon panel 82 and panel 84 into overlying position upon base panel 72. Thereafter, the end walls defined by the superimposed panels 100 and 101 and 91 and 92 are bent to an upstanding position perpendicular to base panel 72 and the side walls defined by superimposed panels 78 and 80 and 82 and 83 are likewise erected, knuckles 110 of adjacent connecting members 108 being brought into interdigitating registry. Lock pins 114, having depending shanks 116 and upper laterally extending finger pieces 117, are inserted into engagement with the aligned knuckles 110 releasably to lock the drawer in assembled condition. A wire handle 118 of conventional shape is secured to the front face of the front wall of the drawer in the usual manner by means of a pair of support elements 119 passing through a backing plate 120 and aligned openings 98 and 99. Drawer 70 may be simply collapsed by removing locking pins 116 and flattening the drawer, thus permitting its simple storage and facilititating its transportation.

While there has been described and illustrated a preferred embodiment of the present invention, it is apparent

that numerous alterations and omissions may be made without departing from the spirit thereof.

I claim:

1. A storage device comprising a shell including a pair of angularly arranged longitudinally extending panels, transversely extending reinforcing elements secured to said panels and having adjacent free ends, an angular coupling element separably engaging the free ends of said reinforcing elements to connect rigidly said reinforcing elements in said angular relationship, and a locking element engaging one of said reinforcing elements and removably registering with said coupling element to releasably latch said coupling element.

2. An improved storage structure comprising a shell including upper and lower longitudinally extending horizontal rectangular walls and longitudinally extending vertical rectangular side walls, reinforcing frame members disposed adjacent the leading and trailing ends of said shell, each of said frame members including a plurality of elongated frame elements secured to and extending transversely of said shell walls and having outwardly directed sockets formed adjacent their ends, a plurality of coupling members each including a first leg slidably registering with one of said sockets and a second leg substantially perpendicular to said first leg and confronting the wall of the frame element adjacent to said latter socket, and a plurality of locking elements each including a leg slidably registering with a frame element socket and substantially abutting the outwardly directed face of said coupling member second leg.

3. An improved structure in accordance with claim 2, wherein said frame elements are formed of metal strips having longitudinally spaced transversely extending ridges disposed adjacent the ends thereof, said ridges including bridge portions spaced inwardly from the face of said strips to define said sockets.

4. An improved structure in accordance with claim 2, wherein said coupling member second leg terminates in an inwardly directed ear registering with an aperture formed in the adjacent frame element.

5. An improved structure in accordance with claim 2, wherein said frame elements having said locking element engaging sockets having grooves formed in the outer faces thereof forward of said corresponding sockets, said coupling member second legs registering with said grooves.

6. An improved structure in accordance with claim 2, wherein each of said frame elements is provided with an inwardly directed channel-shaped longitudinal edge engaging an adjacent edge of said shell wall.

7. An improved structure in accordance with claim 2, wherein each of said coupling element first legs are horizontally disposed and said locking element legs are vertically disposed.

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