June 28, 1960 H. W. ROSENBERG 2,942,749

SECTIONALIZED METAL CHASSIS FOR ELECTRONIC EQUIPMENT

Filed March 22, 1956 2 Sheets-Sheet 1

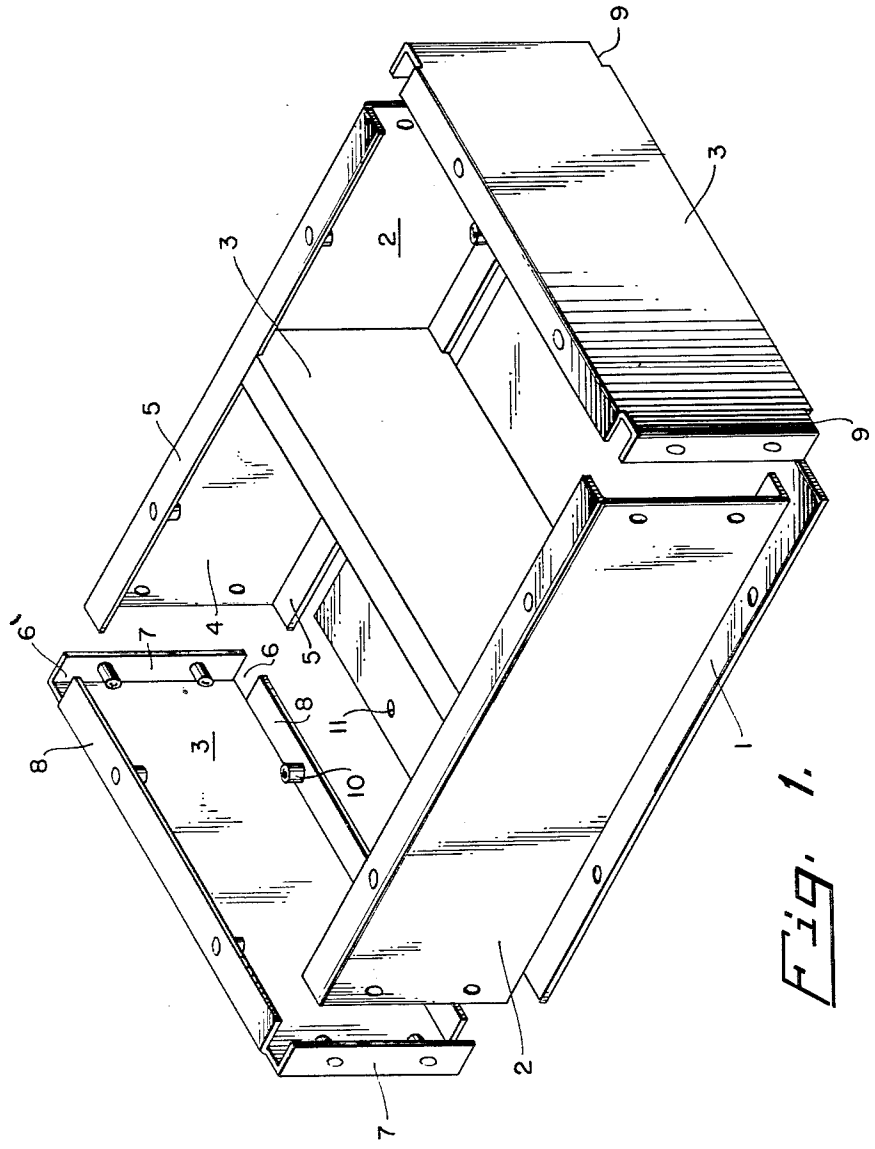


Fig. 1.

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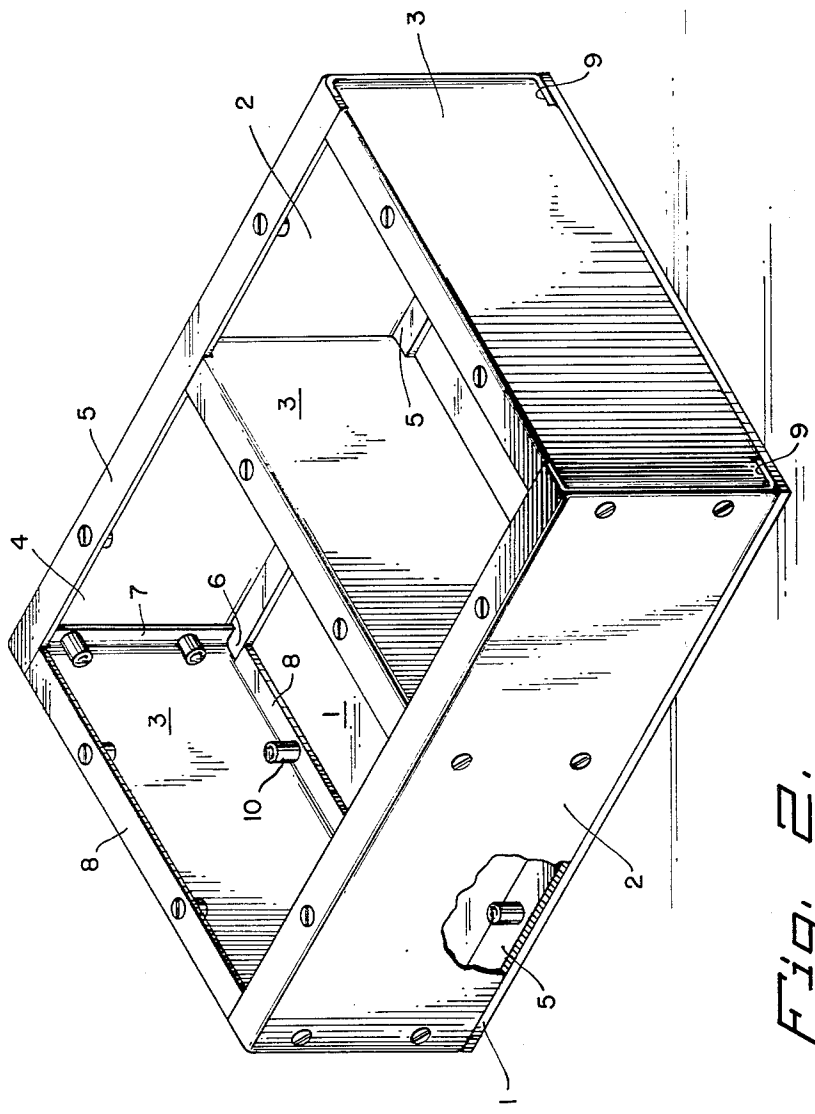


Fig. 2.

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SECTIONALIZED METAL CHASSIS FOR ELECTRONIC EQUIPMENT

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(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefor.

This invention relates to knock-down sectionalized receptacle constructions and more particularly to such constructions as are utilized in sectionalized metal chassis for electronic equipment.

It has been common, in the past, to provide receptacles of the knock-down type, for many purposes, in order to provide economy of space in storage and shipment, or to provide the user a choice as to the size or nature of the receptacle he may construct. Similarly, it has been common to provide sectionalized receptacles whereby a plurality of compartments could be arranged within the receptacle, as desired. Receptacles embodying these features have been variously employed for many uses as for example desk drawers, storage and shipping receptacles, etc., and have been made of a wide variety of materials. Similarly, the present invention, while disclosed as made of metal and in conjunction with the specific application to electronics equipment chassis utility, is obviously of general applicability in the receptacle arts and may be made of any suitable material.

Receptacles are often provided with an inwardly directed flange at the open top thereof for purposes of rigidity, for facilitation of securement of internal pieces, for providing sliding or stacking surfaces, or or other purposes. Such receptacles, when formed of knock-down or prefabricated parts, have had the disadvantage that the top surfaces or flanges thereof have not presented smooth level surfaces, by virtue of the double thicknesses of material formed by the joints between the walls. Where sectionalization of such receptacles was attempted, further disadvantages generally existed in the necessity for the design of special configuration for the inner partitions in order that proper fit or support could be obtained, and in the fact that the top surfaces of such partitions were not at the level of the remainder of the receptacles.

The present invention provides means whereby prefabricated pieces which are easily stored and shipped in knock-down form, may be utilized to form receptacles of desirable sizes and in which sectionalization may be achieved by utilization of internal wall pieces which are identical with the end wall pieces whereby the variety of pieces is minimized, the entire arrangement being such that the finished receptacle has a top flange which is level and smooth. A particular illustrative use of the invention is in the use of sheet metal pieces, preformed to the desired shapes, as by bending and cutting, and assembled to form a metallic sectionalized box which may serve as the metal chassis for electronic equipment. In such a usage, the sectionalization is particularly important since it is often necessary in mounting electronic components for special applications, electrostatic shielding of elements where necessary and in the provision of additional structural supports for large chassis assemblies. Moreover, the use of a knock-down arrangement

for electronic component support and housing provides the further advantages that the components, as tube sockets, supports for wiring, etc., may be attached and the wiring connections made on the flat top plate (which would be the bottom surface of a general utility receptacle) and on the various side walls and compartment walls prior to their assembly, so that such operations may be conducted on flat, open surfaces rather than in the cramped confinement generally present when working in an already assembled chassis receptacle.

It is, therefore, an object of the present invention to provide knock-down sectionalized receptacles in which the assembled receptacles may be formed of a small variety of types of pieces.

A further object of the invention is to provide knock-down sectionalized receptacles in which the assembled receptacles have inwardly directed flanges at the tops of the side walls thereof, said flanges being level at the tops thereof to facilitate stacking or sliding of such receptacles on one another.

A still further object of the invention is to provide knock-down, metallic chassis for electronic equipment, such chassis being characterized in that internal compartment walls are identical with the end walls whereby sectionalization may be achieved with a minimum of types of components and whereby chassis may be selectively built up to a size and compartmentation desired from such components.

Another object of this invention is to provide knock-down metallic elements for forming chassis for electronic equipment, whereby the attachment of electronic components and the majority of the electrical connections may be effected on substantially flat pieces prior to assembly of the chassis.

Still another object of the invention is to provide a knock-down compartmented receptacle wherein the inner walls are identical with the outer walls so that a minimum of types of parts need be used, in which the side and inner walls of the assembled receptacle are inwardly flanged at the upper edge, and in which said flanges have a common, flat upper surface.

These and other objects, and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawing wherein:

Fig. 1 is an exploded perspective view of a receptacle according to the present invention, showing the component parts in the general arrangement in which they are to be assembled.

Fig. 2 is an assembled view of a metallic chassis of the present invention.

Referring now to the drawing, it may be seen that the receptacle of the present invention may be constructed of three types of pieces, each of which may be stacked separately for economy of space in storage or shipment. Thus, the specific illustrative embodiment depicted in the drawings is a metallic chassis for electronic equipment and includes a phantom showing of the manner of achieving compartmentation if electrostatic shielding or additional structural support should be desired. The chassis comprises a flat rectangular sheet metal piece 1, comprising the top plate of the chassis (which for other general uses would comprise the bottom plate of a receptacle), a pair of side walls 2, each of a length equal to a dimension of the wall 1, and formed of sheet metal formed in a U-configuration to provide longitudinal flanges 5, 5 extending the full length thereof; and a pair of lateral pieces 3 forming the end walls of the receptacle. The end walls 3 are formed of rectangular

pieces of sheet metal having inturned flanges at all four edges thereof. Thus, the longitudinal edges are turned down to form flanges **8**, **8** as shown, the side edges being bent to form the flanges **7**, **7**. The dimensions of the end walls **3** are so chosen that the flanges **7** will closely engage the inner walls of side walls **2** and the flanges **8** will be in planar alignment with the flanges **5** when the side walls are properly attached to the edges of the flat plate **1**.

It should be noted that if each of the flanges **7** and **8** described in the preceding paragraph were to extend the entire length of end walls **3**, said end walls could not be inserted between the side walls **2** without distortion thereof, which would result in lack of flatness of the resulting top and bottom flanges **5**, **5**; **8**, **8** and in lateral distortion of the ends of side wall **2**. The gist of the present invention as previously stated, resides in the provision of a particular notch **6** in each of the corners of the end walls **3**, whereby such walls can be fitted to the ends of the side walls, between said walls in a manner to form level top and bottom flanges and straight side walls in the resulting receptacle. The notch **6** is formed by removal of the ends of the longitudinal flanges **8** to a distance equal to the thickness of the flanges **5** of the side walls **2**, and by the removal of a thin strip of material longitudinally of the end wall **3** at right angles to the edge of the resulting shortened flange **8** to form a depressed support surface **9** to receive the flanges **5** of the side wall **2**. The depth of the surface **9** is determined by the thickness of the material and the nature of the bending used in forming the flange **8**. A space is thus formed at each of the corners of the end walls **3** into which the matching ends of the flanges **5** may be fitted without distortion of either the side walls or the end walls. Thus, when the pieces are assembled as described, a receptacle is formed, such receptacle having a level, inwardly turned top flange and sides free from bulging or bowing.

The various pieces or walls may be secured to one another in any suitable manner. Thus, matching connecting openings, **11**, may be formed in the mating surfaces of the pieces and metal screws, nuts and bolts or other detachable fastening means may be utilized. One specific form of fastening is illustrated in the drawing wherein the inner walls of flanges intended to be disposed internally of the receptacle (as the flanges **5**, **7** and **8**) are provided with inwardly threaded bushings **10** suitably supported, as by riveting, internally of the associated opening, as shown. When the pieces are assembled, with the openings **11** of mating flanges properly, machine screws are inserted through the openings **11**, and by engagement with bushings **10**, maintain the pieces in rigid assembly.

The method of fabricating the pieces is not the subject matter of this invention and any suitable known metal-working technique can be utilized. For example, appropriate flat shapes, with appropriate notches and connecting holes can be punched from thin gage flat stock which may then be bent to form the flanges. When desired, fastening media such as the bushings **10** may be appropriately attached, as by riveting.

By reference to the drawing, it may be seen that the knock-down receptacle arrangement described in the preceding paragraphs has the further important advantage that the end walls **3**, are of such configuration that they may also be used as internal compartmentation walls. Thus, as shown in the drawings, a panel **3** may be positioned internally of the receptacle to be formed, and by virtue of the notches **6**, it will be positioned between the flanges **5** and the side walls of opposed side panels **2** when the receptacle is assembled. For a given compartmentation arrangement appropriate holes (not shown) are drilled in the side walls and/or top plates, through which screw means can be inserted to effect a connection with the bushings **10** of the compartment wall. It should be noted that such internal compartmentation does not require a differently fabricated piece and results in a structure which does not cause or require deformation of any of the other walls and in which the compartment wall itself provides an upper flange level with that of the other walls.

From the above it way be seen that the present invention provides a novel knock-down receptable which is sturdy and which has a top flange surface to adapt it for stacking or sliding arrangements and which is constructed of a minimum number of types of pieces and in which compartmentation may be effected by use of a piece of exactly the type used for an outer wall. It should further be obvious that such receptacles when made of metallic pieces, are particularly adapted for use as chassis for electronic equipment. The pieces may be made in varieties of sizes to give a wide selection of sizes and configurations of receptacles and such pieces may be easily stacked for storage or transportation.

Obviously, many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that the scope of the invention is to be restricted only by the scope and limitations of the appended claim and not by the details of the single illustrative example specifically described hereinabove.

What is claimed is:

A knock-down metallic chassis for electronic equipment which permits attachment of electronic components and the majority of electrical connections to be made on substantially flat sections prior to assembly of said chassis, comprising two side wall sections, two end wall sections, a flat top plate and a flat bottom plate, said wall sections and plates forming a rectangular chassis, said side wall sections have longitudinal edge flanges forming U-shaped channel sections of equal width for the entire length of said side wall sections, said end wall sections also having longitudinal edge flanges forming U-shaped channel sections of the same width as said side wall sections, the longitudinal edge flanges of said end wall sections terminating short of the ends of said end wall sections a distance equivalent to the width of the longitudinal flanges of said side wall sections, the ends of said end wall sections having inwardly directed flanges, the shortened edge flanges of said end wall sections accommodating the longitudinal flanges of said side wall sections and the inwardly directed flanges at the ends of said end wall sections being removably attachable to the internal surfaces anywhere along said side wall sections, the shape of said end wall sections allowing them to be positioned parallel to the ends of said chassis anywhere along the internal surfaces of said side walls and fastened thereto such that additional end wall sections can be used to form parallel compartments along the length of said chassis without the necessity of changing the structural shape of any wall section, at least one inner compartment wall parallel to said end wall sections and of identical construction and size as said end wall sections, said top and bottom plates being substantially as wide as the length of said end sections and substantially as long as the length of said side sections and being removably attached to the longitudinal edge flanges of said side and end sections to form a rigid chassis construction.

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