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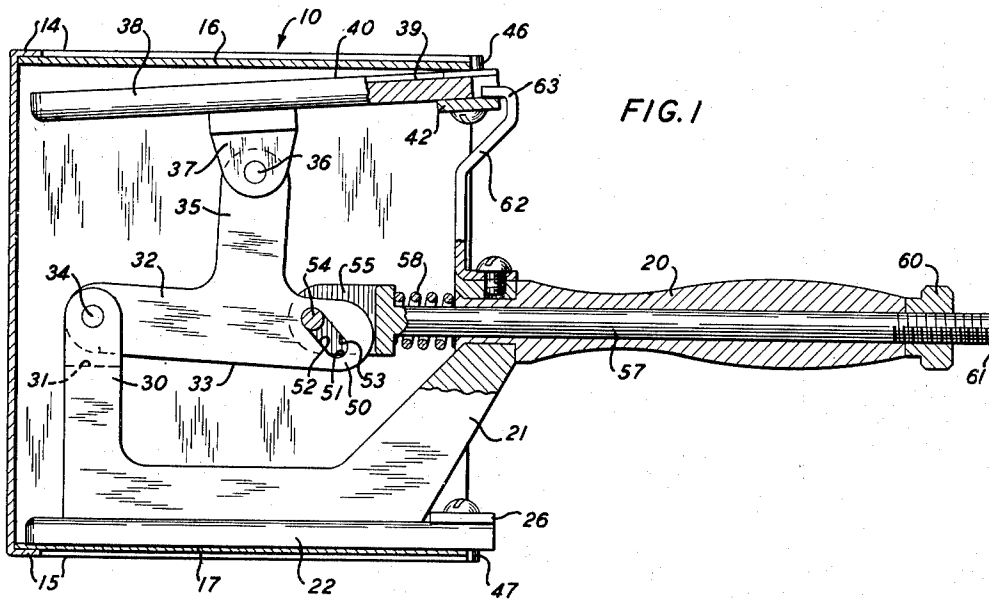
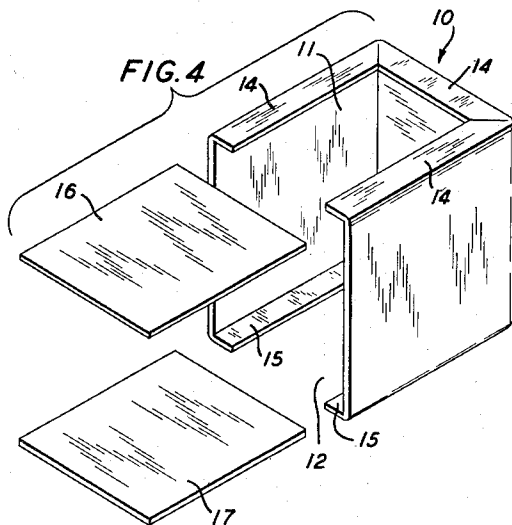
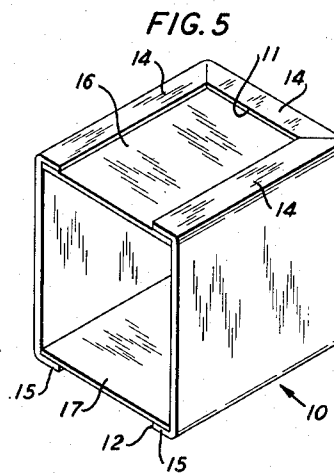
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APPARATUS FOR HOLDING CONTAINER PARTS FOR ASSEMBLY

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2 SHEETS—SHEET 1



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APPARATUS FOR HOLDING CONTAINER
PARTS FOR ASSEMBLY

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This invention relates to apparatus for holding container parts for assembly and has for its objects the provision of an apparatus for readily locating container parts accurately with respect to each other and firmly holding them in their respective positions for assembly.

In the communication arts, numerous electrical units are housed in metal containers varying in size and contour depending upon the size and contour of the units they are to house. In certain instances, the containers are blanked from sheet metal and include a main part substantially U-shaped in general contour with opposing open ends provided with integral flanges against which end parts or panels may be positioned to close the open ends when secured to the flanges thereof by suitable means, such as solder. The main part of containers of this type, although accurately formed by the blanking and forming machines are of a flexible nature and may be bent slightly during handling, causing their sides to be moved out of parallel relation with each other and/or out of right angular relation with respect to the connecting portion. Furthermore, it is a difficult problem to accurately position the main part, as well as the end parts and hold them firmly against the flanges at the open ends of the main part during the soldering operations to secure the parts in assembly.

In accordance with the aforementioned object, the invention comprises an apparatus for holding container parts for assembly including a main part substantially U-shaped in general contour with opposing ends thereof open excepting integral flanges and end parts or panels to close the open ends of the main part by engaging the flanges thereof. The apparatus comprises a handle having fixed thereto a lower element receivable in the main part to engage the lower end part, and an upper element receivable in the main part to engage the upper end part and mounted on the handle for movement between a loading position and a holding position. Means is normally active to hold the movable upper element in the loading position closest to the fixed lower element whereby the parts may be assembled on the apparatus with the elements within the main part engaging their respective end parts or closure panels. Other means is actuable to move the movable upper element into its holding position away from the fixed lower element whereby its end part will be moved into intimate engagement with the flange at the adjacent open upper end of the main part and move the main part

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until the flange at the open lower end thereof engages the other end part held against the fixed element.

The mechanism for actuating the upper element includes a lever having one arm pivotally supported by a bracket fixed to the handle, and another arm pivotally supporting the upper element. The lever also has a connecting means including a cam in the form of a diagonally positioned elongate opening through which a pin extends, the pin being supported by a yoke on an actuating rod extending longitudinally through the handle, whereby a spring concentric with the rod moves the pin on the cam to normally move the movable upper element into its loading position. The outer end of the actuating rod is threaded to receive a hand wheel or nut rotatable relative to the handle on the rod to move the rod longitudinally against the force of the spring to cause the cam to function to move the movable upper element into its holding position substantially parallel with the fixed lower element. Locating members are carried by the fixed lower and movable upper elements to receive the leading edges of the sides of the main part to accurately locate the main part on the elements and additional locating members in the form of pins are positioned on the elements to accurately locate the end parts or closure panels for assembly in the main part.

Other objects and advantages will be apparent from the following detailed description when considered in conjunction with the accompanying drawings, wherein

Fig. 1 is a side elevational view of the apparatus, portions thereof being shown in section, the apparatus being illustrated in its loading position;

Fig. 2 is an isometric view of the apparatus in its holding position, portions of the apparatus being broken away;

Fig. 3 is a top plan view of the apparatus, portions of the container parts being broken away;

Fig. 4 is an isometric view of the container parts ready for assembly; and

Fig. 5 is an isometric view of the container parts in assembled position.

Referring now to the drawings, attention is first directed to Figs. 4 and 5 which illustrate the container parts ready for assembly, and in assembled positions. The container is to be formed of a main part indicated generally at 10 which is substantially U-shaped in general contour with opposing open ends 11 and 12 having inwardly bent flanges 14 and 15 integral with the sides

and bottom of the main part. Upper and lower end parts or panels 16 and 17 are to complete the container when disposed in position against the inner surfaces of the flanges 14 and 15, as illustrated in Fig. 5 and held in this position while being soldered to the flanges.

The apparatus includes a handle 20, supporting a main frame or lower intermediate means 21, of the contour shown, which, if desired, could be an integral part of the handle. A lower element 22 is fixedly mounted on the frame or intermediate means 21 thereof, the element being similar in contour to the end part 17 it is to engage. The central portion of the under surface of the element 22 is recessed as at 23 to provide a flange or raised portion 24 extending around the major portion of the lower element. An aligning member 26, mounted on the inner surface of the element 22 adjacent the handle 20, has notches 27 disposed at like positions adjacent its outer ends, the outer portions of the notches tapering outwardly as at 28 to guide the leading edges of the sides of the main part 10 into the notches when positioned on the apparatus. The bracket or lower intermediate means 21, which is considered a portion of the handle 20, has a vertical leg 29 notched at 31 to receive a horizontal arm 32 of a lever or upper intermediate means 33. A pivot pin 34 connects the lever arm 32 to the leg 30 of the bracket 21. A vertical arm 35 of the lever 33 is pivotally connected at 36 to a bracket 37 upon which an upper movable element 38 is mounted. The movable element 38 is substantially identical in structure to the fixed lower element 22 in that the central portion 39 thereof is recessed providing a raised or flanged portion 40 extending substantially around the element. An aligning member 42 identical with the aligning member 26 is mounted on the inner surface of the movable element 38 and provided with notches 43 identical with the notches 27. The notches 27 and 43 are positioned in vertical alignment and cooperate in receiving and positioning the leading edges of the sides of the main part 10. Tapered surfaces 44 are provided to assist in guiding the leading edges of the sides of the main part 10 into the notches 43. Locating pins 46 are mounted at spaced positions on the movable element 38 to engage the adjacent edge of the part 16 to locate it accurately within the main part 10 during assembly. Pins 47 identical with the pins 46 and mounted at like positions on the under or outer surface of the fixed element 22 are positioned to engage the adjacent edge of the end part 17 to locate it accurately within the main part 10.

The lever 33 has another arm 50 which may be described as a cam portion in that it has an elongate, diagonally positioned aperture 51 therein providing cam surfaces 52 and 53 functioning to cause movement of the upper element 38 into loading or holding positions. A pin 54 carried by a yoke 55 extends through the aperture 51 for movement therein to engage either cam surface 52 or 53. The yoke 55 is supported by the inner end of an actuating rod 57 which extends longitudinally through the handle as illustrated in Fig. 1. Said arm 50 with its cam slot 51, pin 54 and yoke 55 constitute a connecting means between said rod 57 and the upper intermediate means 33. A spring or resilient means 53 disposed concentric with the actuating rod 57, is positioned between the handle 20 and the yoke 55, to normally urge the actuating rod 57 to the left to cause the pin 57 to move in a straight

path against the cam surface 52 to actuate the lever from the holding position shown in Fig. 2 to the loading position shown in Fig. 1. A hand wheel or nut 60 mounted on a threaded outer end 61 of the actuating rod 57, is positioned to engage the outer end of the handle 20, and when rotated in a given direction, will cause movement of the actuating rod 57 (Fig. 1) to the right against the force of the spring 58, causing the pin 57 to act against the cam surface 53 to move the element 38 upwardly into its holding position. A retaining element 62, mounted on the handle 20, or the bracket portion 21 thereof, has a hooked upper end 63 to extend around the locating member 42 to cause tilting of the element 38 when moved into its loading position (Fig. 1) and positioning of the element 38 substantially parallel with the element 22 when moved into the holding position (Fig. 2).

Considering now the operation of the apparatus, let it be assumed that the apparatus is in the loading position shown in Fig. 1. The end part or upper closure panel 16 is first placed upon the upper movable element 38 adjacent the pins 46. The end part or lower closure panel 17 is then placed within the main part 10 to rest upon its flanges 15. The main container part 10 with its end part 17 is then moved toward the apparatus or the apparatus may be moved into the main part, the operator gripping the handle 20 with one hand, and controlling positioning of the main part with the end part 17, with the other hand. While the main part is being moved relative to the elements 38 and 22, the leading edges of the sides are guided into the notches 27 and 43. At the same time, movement of the end parts 16 and 17 will be controlled by the pins 46 and 47, whereby the end parts or closure panels will be accurately positioned within the main container part. Furthermore, any irregularities in the main part 10 will be corrected when the main part is positioned around the elements 22 and 38 and with its leading side edges within the notches 27 and 43.

At this time, the operator rotates the hand wheel 60, moving the actuating rod 57 to the right, compressing the spring 58 and rocking the lever or upper intermediate means 33 counterclockwise until the upper element 38 is in the holding position firmly forcing the end part or panel 16 against its flanges 14 and at the same time, causing movement of the main part to force its lower flanges 15 against the end part 17.

This requires little effort on the part of the operator and the parts of the container are accurately positioned and firmly held until the operator solders or otherwise secures the end part or panel 16 to its flanges 14, after which the apparatus may be turned over so that the operator may solder the end part or panel 17 to its flanges 15. When this has been accomplished, all that the operator has to do is loosen the hand wheel 60 and the force of the spring will move the rod 57 to the left and through the cam action on the lever 33, move it clockwise to the position shown in Fig. 1 where the completed container may be removed from the apparatus and other parts for another container readily assembled thereon.

It is to be understood that the above described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope of the claims.

What is claimed is:

1. An apparatus for holding for assembly a main U-shaped container part having opposed flanged lower and upper open ends and lower and upper closure panels to be secured to the said flanged open ends, comprising a hollow handle, a lower intermediate means connected to the handle, a lower element secured to said lower intermediate means and receivable in the main part of the container to engage said lower panel in position relative to said flanged lower open end, an upper element receivable in said main container part to hold the upper panel in said flanged upper open end, and actuating rod extending through the handle and having an inner end positioned between said elements and an outer end extending beyond the end of the handle, an upper intermediate means movably connecting the upper element to said rod, means connecting the inner end of the rod to the upper intermediate means operable by longitudinal movement of the actuating rod in one direction to cause said upper intermediate means to move the upper element from a loading position to a holding position where said closure panels will be firmly held against the flanges at said open ends of the main part of the container, said connecting means being operable by longitudinal movement of the actuating rod in the opposite direction to cause the upper intermediate means to move the upper element from the holding position into the loading position, resilient means interposed between the said connecting means and the handle to normally urge the actuating rod in one direction, and means operatively connected to the outer end of the actuating rod to move it in the other direction.

2. An apparatus according to claim 1 including locating members carried by the upper and lower elements to locate the main container part and said closure panels in assembled position, and a retaining means carried by the handle to engage

the upper element to cause tilting thereof when moved into its loading position and causing it to be substantially parallel with said lower fixed element when the upper element is moved into holding position.

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