Jan. 10, 1967 E. RAWSON 3,296,991

CORNER CONSTRUCTION FOR METAL CABINETS

Filed May 13, 1964

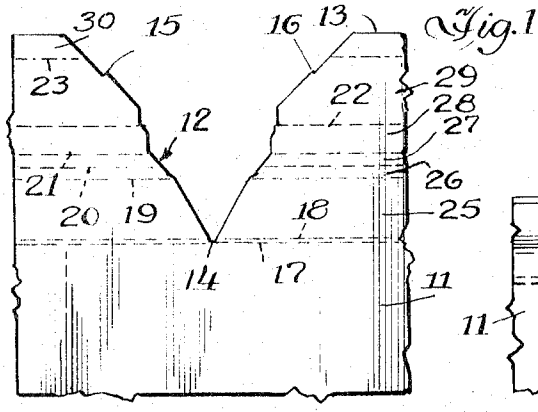


Fig. 1

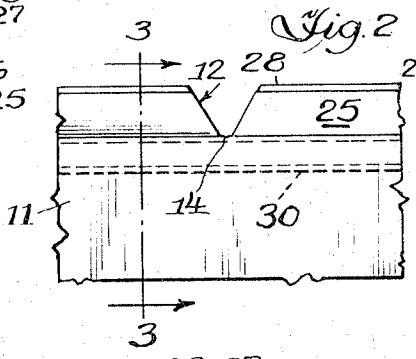


Fig. 2

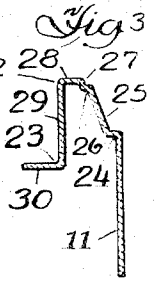


Fig. 3

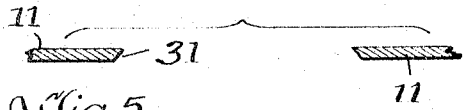


Fig. 5

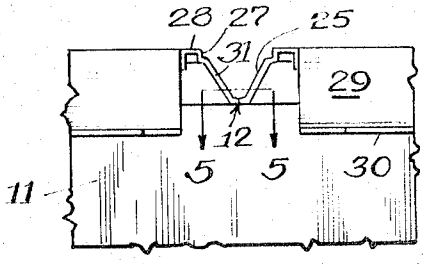


Fig. 4

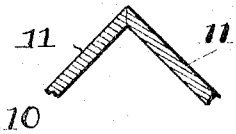


Fig. 10

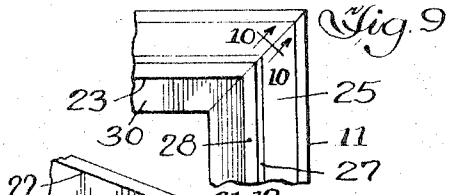


Fig. 9

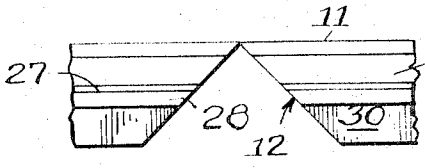


Fig. 6

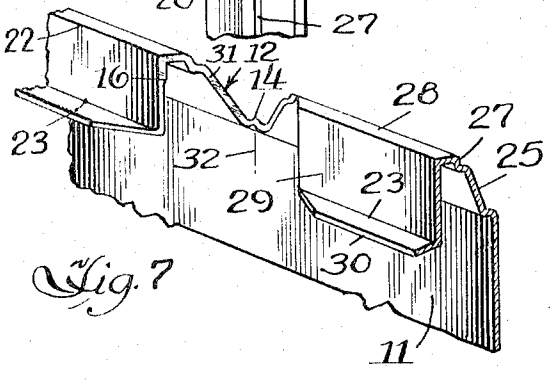


Fig. 7

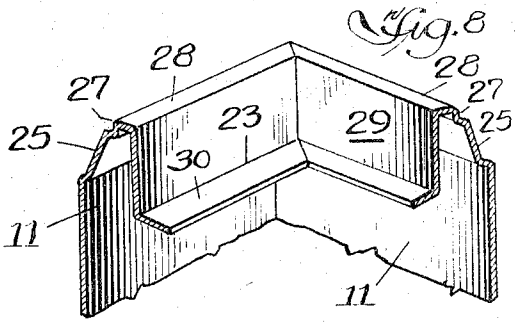


Fig. 8

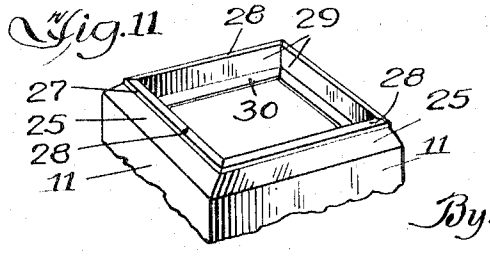


Fig. 11

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United States Patent Office

3,296,991

Patented Jan. 10, 1967

3,296,991

CORNER CONSTRUCTION FOR METAL CABINETS

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Filed May 13, 1964, Ser. No. 367,006
4 Claims. (Cl. 113—116)

This invention relates to a corner construction for metal cabinets, and is particularly concerned with a method of forming a miter corner for a cabinet from a sheet metal blank without any gaps between the meeting edges of the blank forming any portion of the corner joint that is exposed in the completed cabinet structure.

Although the invention will hereinafter be described with reference to a television cabinet, it will be understood that the advantages of the invention may be utilized in connection with many different types of metal cabinets in which the front of the cabinet has a plurality of curved or angularly disposed surfaces. In cabinets made of wood it is easy to rout or groove the wood around the edges of the front panel to obtain a desirable curved or angular appearance. Sheet metal having its front surface provided with a grained finish to give it the appearance of wood is used in the fabrication of metal cabinets made to simulate wood cabinets in many fields. Prior to the present invention, there has been no satisfactory method of providing a metal cabinet with an integral front panel having a plurality of curved or angular surfaces to provide the same appearance as wood cabinets that have been routed or grooved around the edges of the front panel.

One previously known method of providing a metal cabinet with a curved or angular trim around its front edges is to form a front panel separately by molding or casting. It is also known to form a separate front panel of wood. In either case the front panel may be provided with any desired trim. However, regardless of how the separate front panel is made, the manufacturer still has the problem of attaching it to the cabinet. The use of a separate front panel has not been considered satisfactory because of the extra expense involved in securing the panel to the cabinet.

It has also been known that the desired surface appearance for the front of metal cabinets may be obtained by notching a sheet metal blank, then bending the blank along a plurality of parallel bend lines, and finally bending the blank at right angles to the parallel bends, but heretofore it has been commercially impossible to form miter corners for such cabinets without gaps between the meeting edges. When the notched blank is bent along the parallel bend lines, the edges along both sides of the notch form irregular curves or angles regardless of how accurately the notches are shaped. These irregular curves and angles are not complementary, and do not meet in smooth lines when the blank is bent perpendicularly to the parallel bend lines. The finish on the outer surface of the metal blank makes it impractical to hammer the miter corner portions to force the meeting edges together or to weld the adjoining edges to form a smooth miter joint.

It has been customary to bend the blank along a line perpendicular to the parallel bend lines to bring the meeting edges together as close as possible, then to fill the gaps between the meeting edges with putty or with some suitable plastic material, and finally to color the filler to match the finish of the cabinet. This method of eliminating or concealing the gaps between the meeting edges of the miter corner joints has not been satisfactory, because of the added expense of the skilled hand labor required.

In accordance with the present invention, one edge of a sheet of metal is provided with one or more notches of rough triangular shape, with the apex of each notch coinciding with one of the corners to be fabricated. The portion of each of the notches that is later to form the joint of that part of the miter corner that will be normally visible in the completed cabinet construction is slightly smaller than the size required for the desired miter corner construction. The sheet is then bent along a plurality of parallel lines to form sections of any desired curvilinear or angular configuration. The portions of the notch that were originally cut too small are then cut accurately to the required size at oppositely disposed angles of 45° to the outer and inner surfaces of the blank.

When the metal sheet is bent at right angles along a line perpendicular to the parallel bend lines and in alignment with the apex of the notch, the 45° surfaces on opposite sides of the notch meet in an accurate butting joint. If desired, the inner surface of the flat sheet of metal may be scored along the line aligned with the apex of the notch to facilitate bending the sheet of metal along said line. The portions of the miter corner that are exposed in the complete structure meet accurately without any gap. The other portions of the miter corner joint that are not normally visible in the completed cabinet structure do not meet accurately, and may have a bracket riveted thereto to provide added strength for the miter corner joint.

The method of forming the miter corner structure is described in considerable detail in the following specification, taken in conjunction with the accompanying drawing, showing the sheet metal blank at various stages of fabrication of the corner structure. In the drawings,

FIG. 1 is a fragmentary plan view of the blank in which a notch has been roughly cut;

FIG. 2 is a fragmentary elevational view of the outer side of the roughly notched blank after it has been bent along a plurality of parallel bend lines;

FIG. 3 is a cross sectional view, taken along the line 3—3 of FIG. 2;

FIG. 4 is a fragmentary elevational view of the inner side of the blank after portions of the notch have been cut accurately at angles of 45° to the outer and inner surfaces of the blank, with the angles on opposite sides of the notch oppositely disposed;

FIG. 5 is a fragmentary cross sectional view taken along the line 5—5 of FIG. 4;

FIG. 6 is a fragmentary front elevational view of the structure of FIG. 4 turned forwardly through 90°;

FIG. 7 is a fragmentary perspective view of the structure shown in FIG. 4 with a partial score line on the inner surface of the blank to facilitate bending of the blank after it has been bent along the parallel bend lines;

FIG. 8 is a fragmentary perspective view showing the structure of FIG. 7 after it has been bent along a line perpendicular to the parallel bend lines to form a miter corner;

FIG. 9 is a fragmentary plan view of the miter corner structure of FIG. 8 turned forwardly through 90°;

FIG. 10 is a cross sectional view, taken along the line 10—10 of FIG. 9; and

FIG. 11 is a fragmentary perspective view of the front of a cabinet.

In the drawings, a blank 11 of sheet metal having a decorative finish on its outer surface is cut out to form a notch 12 having the rough outline of a triangle. The notch extends inwardly from one longitudinal edge 13 of the blank. Both sides of the notch are symmetrical, and each edge of the notch from the apex 14 to the point 15 on one side of the notch, and to the point 16 on the other side of the notch is slightly undersized for a purpose hereinafter described. A notch 12 that is roughly of triangular shape is cut or punched from the longitudinal edge 13 of the blank in every location where the blank is to be fabricated into a corner, with the apex 14 of each notch accurately positioned to coincide with the center line of the corner.

The blank 11 is then bent along a plurality of parallel bend lines indicated in FIG. 1 by the dotted lines 17, 18, 19, 20, 21, 22 and 23. The bend line 17, which is most remote from the longitudinal edge 13 of the blank, runs through the apex 14 of the notch. Each bend on any one line is uniform along the entire length of the blank, but the bends along the various parallel lines are inclined at different angles, as shown in FIG. 3. In the illustrated construction, the parallel bends form sections 24, 25, 26, 27, 28, 29 and 30, but it will be understood that the structure shown is merely examplary. If desired, one or more of the surfaces between adjacent parallel bend lines may be curved instead of plane surfaces. Any desired number of parallel bends may be formed in the blank, with each section having any desired configuration, either angular or curvilinear depending upon the desired appearance of the completed structure.

After the blank is bent into the desired configuration, the portions of the edges of the notch in the area where the notch is undersized are machined to the precise dimensions required for a tight fitting miter corner joint. The edges may be milled, broached or ground to a smooth surface 31, and the machined surfaces, which are oppositely disposed on opposite sides of the notch, are inclined outwardly from the outer surface to the inner surface of the blank at an angle of 45°. Although it is preferred to have the surfaces 31 inclined at 45° to the outer and inner surfaces of the blank, it will be understood that they may be inclined at any desired angularity, just so the meeting surfaces may be brought in flat surface contact throughout the meeting area. For example, the effect is the same if the surface on one edge of the notch is inclined 60° and the surface on the other edge of the notch is inclined 30°. At the time the surfaces 31 are machined, the inner surface of the blank may be scored along the line 32 which is perpendicular to the parallel bend lines. The score line extends through only a portion of the thickness of the metal blank and may be of any desired length.

The blank is then bent at 90° along the line 32. The score line 32 facilitates bending the sheet metal of the blank at a sharp angle, but is not essential to the bending operation. The 90° bend brings the two oppositely inclined surfaces 31 together in an accurately fitting joint to form a sharp miter corner. If the corners of the cabinet are not right angled corners, the blank may be bent at any desired angle. In such case the total of the angles on the meeting surfaces 31 must equal the angle of the corner to provide flat surface contact between the meeting surfaces 31 when the blank is bent to form the corner. There are no gaps between the meeting edges of the blank forming the joint in any portion of the miter corner construction that is visible in the complete cabinet. The joint between the edges of the blank extending from the point 15 to the edge 13 and from the point 16 to the edge 13 is not visible in the complete cabinet. These two edge portions are cut back to provide clearance so as to facilitate the bending operation along the line 32. After the corner has been formed by bending the blank along the line 32, which may or may not be scored, the adjacent edges of the notch in the area between the points 15, 16 and the edge 13 may have a bracket riveted thereto to provide additional strength for the corner without marring the finish on the visible portion of the cabinet.

Although I have described a preferred embodiment of the invention in considerable detail, it will be understood that the description thereof is intended to be illustrative, rather than restrictive, as many details of construction may be modified or changed without departing from the spirit or scope of the invention. Accordingly, I do not desire to be restricted to the exact construction described.

I claim:

1. A method of forming a miter corner for a cabinet which comprises the steps of cutting a triangular notch in one edge of a blank of sheet metal, bending said blank along a plurality of lines parallel to said edge to provide a plurality of angularly disposed sections with angles of different magnitudes between adjacent bend lines, the bend line most remote from said notched edge of said blank passing through the apex of said triangular notch, cutting each side of said notch at an angle of 45° to the front and back surfaces of the blank through the thickness of said blank, the angle of 45° on one side of said notch being oppositely directed to the angle of 45° on the opposite side of said notch, and bending said blank along a line extending through the apex of said triangular notch at right angles to said parallel bend lines, thereby bringing the edges of said angularly disposed sections together to form a miter corner free of any gap between meeting edges in the area exposed in the completed cabinet structure.

2. A method of forming a miter corner for a cabinet which comprises the steps of cutting a triangular notch in one edge of a blank of sheet metal, bending said blank along a plurality of lines parallel to said edge to provide a plurality of angularly disposed sections with surfaces extending at angles of different magnitudes between adjacent bend lines, the bend line most remote from said notched edge of said blank passing through the apex of said triangular notch, cutting each side of said notch at an angle of 45° to the front and back surfaces of the blank through the thickness of said blank, the angle of 45° on one side of said notch being oppositely directed to the angle of 45° on the opposite side of said notch, scoring the inner surface of said blank along a line perpendicular to said parallel bend lines extending from the apex of said triangular notch toward the unnotched edge of said blank, and bending said blank along said score line, thereby bringing the edges of said angularly disposed sections together to form a miter corner free of any gap between meeting edges in the area exposed in the completed cabinet structure.

3. A method of forming a miter corner for a cabinet which comprises the steps of cutting a roughly dimensioned triangular notch in one edge of a blank of sheet metal, bending said blank along a plurality of lines parallel to said edge to provide a plurality of angularly disposed sections, machining the edges of said blank forming the sides of said notch to form smooth surfaces on each side of said notch extending through the thickness of said blank at diverging angles of 45° to one surface of said blank, and bending said blank transversely along a line extending through the apex of said triangular notch, thereby bringing the machined edges of said angularly disposed sections together to form a miter corner free of any gap between meeting edges in the area exposed in the completed cabinet structure.

4. A method of forming a miter corner for a cabinet which comprises the steps of cutting a blank of sheet metal inwardly from one edge along two converging lines to form a notch of approximately triangular shape, the edges of said notch diverging at an acute angle from the apex of said notch for a distance approximately equal to

the length of the portion of the corner joint normally visible in a completed cabinet, and at an obtuse angle in an area more remote from the apex of said notch, bending said blank along a plurality of lines parallel to said one edge of said blank, machining the edges of said blank forming the sides of said notch adjacent the apex at complementary angles to the front and back surfaces of said blank to increase the angularity between said portions of the sides of said notch to 90°, and bending said blank transversely of said first mentioned bends along a line extending through the apex of said notch, thereby bringing said machined surfaces together to form a miter joint

free of any gap between the machined surfaces and having a clearance gap between the edge of said notch in the portion of said joint not normally visible in a completed cabinet.

References Cited by the Examiner

UNITED STATES PATENTS

319,305	6/1885	Paige	113—116
1,695,091	12/1928	Everhard	113—116

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