March 1, 1938. L. B. GENEBACH 2,109,724

METHOD OF MAKING METAL SHELVES FOR REFRIGERATORS, OVENS, AND THE LIKE

Filed Oct. 1, 1936

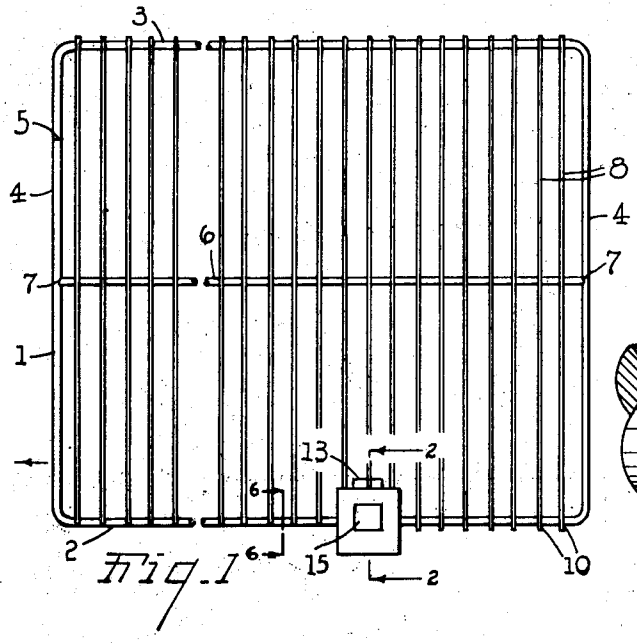


Fig. 1

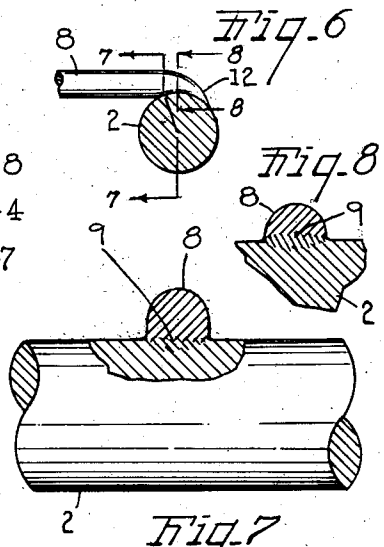


Fig. 6

Fig. 8

Fig. 7

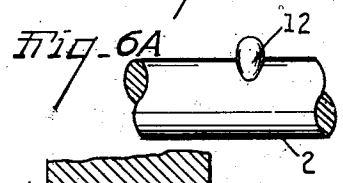


Fig. 6A

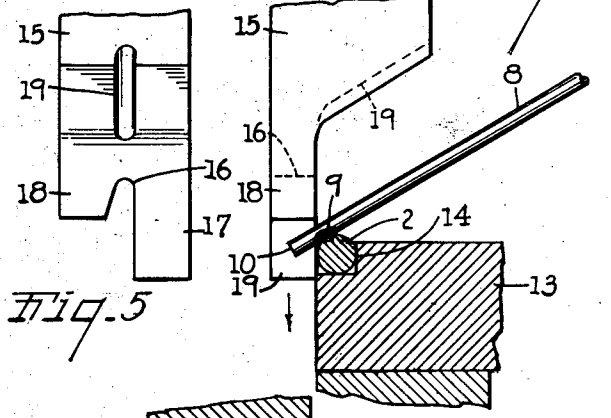


Fig. 5

Fig. 2

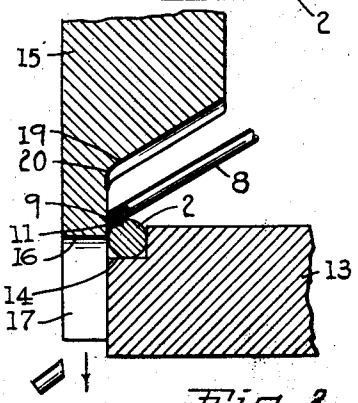


Fig. 3

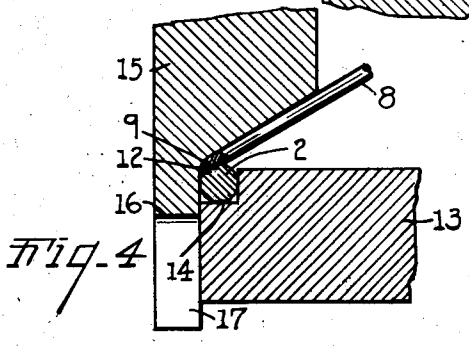


Fig. 4

INVENTOR.
Lowell B. Genebach
BY Chappell, Earl & Chappell
ATTORNEYS

Patented Mar. 1, 1938 2,109,724

UNITED STATES PATENT OFFICE

2,109,724

METHOD OF MAKING METAL SHELVES FOR REFRIGERATORS, OVENS, AND THE LIKE

Lowell B. Genebach, Battle Creek, Mich., assignor to United Steel & Wire Company, Battle Creek, Mich.

Application October 1, 1936, Serial No. 103,499

7 Claims. (Cl. 29—160)

This invention relates to improvements in method of making metal shelves for refrigerators, ovens, and the like.

The main objects of this invention are:

First, to provide a metal or so-called wire shelf for refrigerators, ovens and like purposes which presents rounded surfaces at its front ends so that objects may be slid or placed upon the shelf without catching and without injury to the hands or to objects placed upon the shelves.

Second, to provide a structure embodying these features which is finished and attractive in appearance and at the same time may be economically produced.

Third, to provide a method of manufacturing shelves which results in a product superior in appearance and one which presents only rounded surfaces at the front of the rack, and at the same time is economical in practice.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure which embodies the features of my invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a fragmentary plan view of my improved shelf or rack partially completed, a cutting and forming die being shown conventionally in operative relation.

Fig. 2 is a fragmentary view partially in section on line 2—2 of Fig. 1 illustrating certain of the steps of the method.

Fig. 3 is a fragmentary view similar to that of Fig. 2 showing the die parts in partly actuated position.

Fig. 4 is a fragmentary section corresponding to that of Fig. 3 with the parts in fully actuated position.

Fig. 5 is a fragmentary side view of a cutting and forming die.

Fig. 6 is an enlarged detail section on a line corresponding to line 6—6 of Fig. 1.

Fig. 6—A is a fragmentary view looking from the right of Fig. 6.

Fig. 7 is an enlarged detail view partially in section on line 7—7 of Fig. 6.

Fig. 8 is an enlarged detail view in section on line 8—8 of Fig. 6.

The embodiment of my invention illustrated in the accompanying drawing is especially designed for use as a refrigerator or oven shelf or rack. My improved shelf or rack comprises a border frame 1 formed of rod material or stock of cylindrical cross section as illustrated consisting of a front member 2, rear member 3 and end members 4. These members are preferably formed of a single piece of stock bent into proper shape and butt welded as indicated at 5. An intermediate bar 6 also formed of cylindrical stock extends between the end members and is butt welded thereto as indicated at 7. The wire slats 8 are arranged upon this frame and are electrically welded to the front and rear frame members and to the intermediate member. These welds are indicated at 9 in the drawing. The slats are welded to the frame members with their ends 10 projecting as shown in Figs. 1 and 2.

The steps of manufacture are to form the border frame, then secure the cross member 6, and then weld the slats to the border frame and cross member. I have not illustrated this welding step as it is known in the art and will be readily understood by those skilled in the art. It has been the practice to shear the projecting ends leaving them beveled or inclined as shown at 11, Fig. 3. This leaves the slats with relatively sharp edges and slightly projecting beyond the face of the border members so that the hands of the person placing articles on the shelves may be scratched or abraded and articles placed upon the shelves may be torn or abraded, and it is very difficult to slide objects on to the shelves. In my improved shelves, at least the front ends of the slats are conformed at 12 into longitudinally and transversely curved contour and are swaged around the curved surface of the border member with the edges of the curved surfaces of the slats meeting the curved surface of the border member so that only rounded surfaces are presented and no surfaces that would be likely to scratch or abrade the hands or tear a package or carton as it is being placed upon the shelf. The construction also permits any object being placed upon the shelf with a sliding motion.

In Figs. 2, 3, and 4, I illustrate a support 13 having a rabbet-like seat 14 for the front border member 2. After the welding operation is completed, the rack is placed upon this support in an inclined position as shown in Figs. 2, 3, and 4, which presents the projecting ends 10 for the cutting and swaging operation. The cutting and swaging die 15 is provided with a V-shaped cutter 16 one arm 17 of which projects beyond the other arm 18 so that the work may be fed along or advanced step by step. The long arm 17 coacts with the projecting portions of the work to stop and position the work relative to the cutter. The means for actuating the cutting and swaging dies are not illustrated. Means such as those

employed in operating punch presses, for example may be used.

The combined cutter and swaging die is provided with a swaging and forming portion 19 which has a surface 20 curved longitudinally and transversely. This swaging die is so proportioned relative to the gauge of the slat stock that when the die is fully actuated the ends of the slats are formed to a transversely curved contour and are partially swaged around the curved surface of the border member with the edges of the curved surfaces of the slats meeting the curved surface of the border member, see Figs. 6, 6—A, 7 and 8. It will be observed that the slats are cut off at a rearwardly inclined angle and in a plane substantially tangential to the plane of the cylindrical border member.

After the swaging operation the entire end of the slat is rounded both longitudinally and transversely and it is swaged partially around the border member, filling in the recess between the border member and the end of the slat as shown in Fig. 3 and providing a smooth rounded surface. This cutting and swaging operation is performed at one stroke of the cutting and forming die so there is practically no additional time element involved in the manufacture and the structure has the several advantages which I have pointed out.

I have illustrated and described my improved rack and the method of making the same in very practical embodiments thereof. I have not attempted to illustrate or describe certain modifications or adaptations which I contemplate as it is believed this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. The steps in the method of manufacture of metal racks comprising electrically welding slats upon a border frame member of cylindrical section with the ends of the slats projecting beyond the border frame member, shearing each projecting end by a shearing stroke at a rearwardly inclined angle and in a plane approximately tangent to the border member and swaging the sheared end during the shearing stroke and following the actual shearing operation into longitudinally and transversely curved contour partially around the curved surface of the border member with the edges of such swaged curved surfaces of the slats meeting the curved surface of the border member.

2. The steps in the method of manufacture of metal racks comprising electrically welding slats upon a border frame member of cylindrical section with the ends of the slats projecting beyond the border frame member, shearing each projecting end by a shearing stroke at a rearwardly inclined angle and in a plane approximately tangent to the border member and swaging the sheared end during the shearing stroke into longitudinally and transversely curved contour upon the curved surface of the border member.

3. The steps in the method of manufacture of metal racks comprising electrically welding a slat upon a border frame member of cylindrical section with the ends of the slat projecting beyond the border frame member, and in a single stroke shearing a projecting end and swaging the sheared end into longitudinally and transversely curved contour partially around the curved surface of the border member with the edges of such swaged curved surface of the slat meeting the curved surface of the border member.

4. The steps in the method of manufacture of metal racks comprising electrically welding a slat upon a border frame member of cylindrical section with an end of the slat projecting beyond the border frame member, and in a single stroke shearing the projecting end and swaging the end into longitudinally and transversely curved contour upon the curved surface of the border member.

5. The steps in the method of manufacture of metal racks, comprising electrically welding slats upon a border frame of cylindrical section with the ends of the slats projecting beyond the border frame member, and sequentially but as a single operative stroke shearing a projecting end of one of the slats and swaging said end into longitudinally and transversely curved contour upon the curved surface of the border member.

6. The steps in the method of manufacture of metal racks, comprising disposing slats upon a border frame member with the ends of the slats projecting beyond the border frame member, and sequentially but as a single operative stroke shearing a projecting end of one of the slats and swaging said end into contact with the border member.

7. The steps in the method of manufacture of metal racks, comprising disposing slats upon a border frame member of cylindrical section with an end of each slat projecting beyond the border frame member, and sequentially but as a single operative stroke shearing the projecting end of a slat and swaging said end into longitudinally and transversely curved contour upon the curved surface of the border member.

LOWELL B. GENEBACH.