April 28, 1936. W. F. NEWSON 2,038,668

EDGE WELDING

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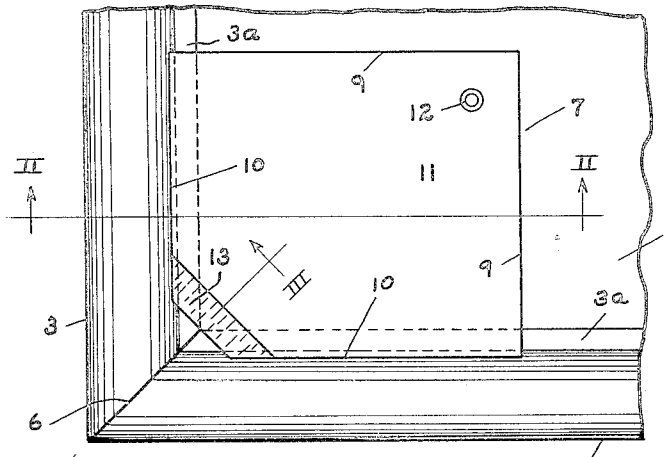

Fig. I

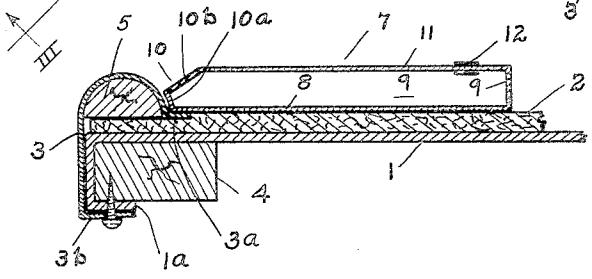

Fig. II

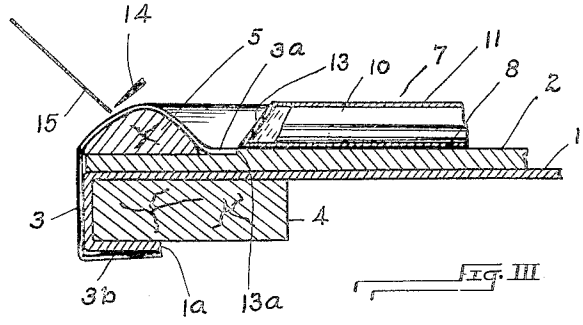

Fig. III

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EDGE WELDING

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4 Claims. (Cl. 113—112)

This invention relates to edge welding, and specifically to the welding of metallic edging, or stripping used to bind the edges of a non-metallic covering material.

The object of the invention is to provide a method of, and apparatus for, protecting the corner regions of a covering of non-metallic material from destructive heating, during the formation of a welded joint at the ends of strips of metallic edging material which are in abutment at a corner of the non-metallic covering material.

Attractive articles of furniture, such as sinks, desks, and kitchen tables, may be made by covering a flat body of sheet metal, constituting a splash board, or drain board, of a sink, or the top of a desk or table, with a covering sheet of suitable non-metallic material. Examples of non-metallic material suitably used as coverings of this type, are linoleum, composition cork, rubber fiberboard, and micarta.

When such a covering of non-metallic material is applied to an underlying base, as by being cemented thereto, it is highly desirable that the edges of the composite structure of metallic and non-metallic materials, so made up, be bound by edging strips embracing the edges of the material of both sorts. Such binding prevents edge curling of the non-metallic covering and produces a pleasing finished appearance of the sink, or other article of furniture.

Since a prime requisite of the structure is that it present a pleasing appearance, it is very desirable that the meeting edges of the metallic binding strip used be welded in their regions of abutment at the corners of the sink top, or the like, which is bound. The difficulty encountered in so doing is that, in order to present the desired pleasing appearance, the edging must be welded along lines which lie over, or adjacent the covering layer of non-metallic material.

The covering materials which are preferred for their appearance, smoothness, and commercial availability, are subject to deterioration under the influence of relatively intense heat. It is difficult, therefore, to make suitable weld between the edges of the metallic stripping, without fusing, igniting, or scorching the surface of the non-metallic covering material at the corner regions in which the metallic edging is welded.

In the accompanying drawing Fig. I is a fragmentary plan view, showing a corner of a composite plane element, such as a sink top, with edge binding applied thereto in strips abutting at their ends, and showing a shield of my special form in position to protect the non-metallic covering of the composite structure during a welding operation at the ends of the metallic binding strips.

Fig. II is a vertical sectional view through the composite structure, edge binding, and shield, taken on the plane of section line II—II in Fig. I.

Fig. III is a similar vertical sectional view, taken on the plane of section line III—III in Fig. I.

In the drawing, reference numeral 1 designates the metallic base to which a covering 2 of non-metallic material is attached. The covering material is shown as rabbeted along its edge, and with a binding strip 3, of light springy metal lying with its upper flange 3*a* in the rabbetted edge region of the covering. A foot 1*a* of the metallic base is shown as embracing a wooden form member 4; and the lower flange 3*b* of the edging strip embraces this foot of the metallic base, resiliently to engage the edging strip in position. As shown, upper flange 3*a* of the edging strip 3 is bowed upwardly, and houses in the concavity of this bowed region a filler strip 5, having a flat under face which bears upon the rabbeted edge region of the non-metallic covering element 2. This filler strip 5 may be made of wood or other inflammable material, as charring of the strip is of no moment, and it is so confined that it cannot burst into flame during the operation of welding.

It is to be understood that the showing of the drawing is exemplary only, insofar as concerns a specific contour of edging strip, as generally similar forms of edging may be welded by practising my method. Also the specific edging shown constitutes no part of my invention, but is a form of edging disclosed to me by one Eugene E. Brey.

Fig. I of the drawing shows two edging strips 3 meeting at a corner of the structure, and having their adjacent ends mitered to form a diagonal line of meeting 6, which is to be the weld line between them. In preparation for welding, I place over the corner surface of the non-metallic covering 2, a thin-walled vessel 7, which is made of some suitable metal, but which desirably is of copper because of the high heat conductivity of that metal. Copper is also suitable as a metal for the shielding vessel 7 for the reason that it does not tend to oxidize under the temperature resulting from the welding operation, and does not, therefore, tend to stain the linoleum, or other non-metallic covering on which it is placed.

This metallic vessel 7, which I term a "jig",

is of substantially closed structure, comprising a bottom **8**, upstanding walls **9** and **10**, and an upper wall, or cover, **11**. For its use as a shield, the jig **7** has in its upper wall **11** an opening for the reception of a cooling medium. As shown, the upper wall **11** of the jig has therein a relatively restricted opening **12**, which serves as a port for the introduction of water and as a vent for the escape of vapor. If it be desired to use a solid, such as "dry ice", congealed carbon dioxide, as the cooling medium, the port in the upper wall of the jig is desirably of an area greater than that shown.

The two walls **9** of the jig which lie away from the edges of the structure, in the working position of the jig shown in Fig. I, may be perpendicular to the bottom **8** of the jig. The walls **10**, which lie adjacent the edging strips **3**, are, however, desirably contoured to conform to the inwardly presented face contour of the edging strips in the lower region of the strips adjacent the covering material **2**.

As shown in Fig. II of the drawing, the lower regions **10***a* of the walls **10** incline upwardly and outwardly from the jig bottom **8**, so that they may closely approach the convex lower longitudinally extending regions of the strips. Desirably, the lower regions **10***a* of the walls **10** are slightly concave in outer-face presentation, so that they may actually embrace some proportion of the edging strip face. The upper regions **10***b* of the walls **10** each inclines outwardly and downwardly to meet the lower wall region **10***a* of each of the sides **10**.

It will be observed from Fig. II of the drawing, that the jig **7** thus overlies that inner belt of each upper edging strip flange **3***a* which lies directly upon the surface of covering material **2** in the edge region of the covering. This belt, or band, of covering material is, therefore, fully protected by the jig.

It is of course, impossible that a weld be made along the weld line **6**, without fully exposing this line for the welding action. To this end the contoured walls **10** of the jig are terminated short of a line of normal meeting, and a forward wall **13** intervenes to interconnect their edges. As shown in Fig. III of the drawing this bridge wall **13** slopes downwardly and outwardly, so that its lower edge **13***a* meets the inner edge of flange **3***a* at the extreme inner end of the weld line **6**. It does, however, expose a minimized area of the bands or flanges, **3***a* which lies directly upon the covering material **2**.

It is to be understood that the contour of jig walls **10** is exemplary generally of the contouring of the jig wall to conform to the inner face contour of the edging strips. If an edging strip of contour different from that shown be used, the walls **10** of the jig will naturally be appropriately contoured in conformity with the shape of that different edging strip.

To perform an edge welding operation in accordance with my method, the jig **7**, filled with water or other suitable cooling medium, is positioned as shown in the drawing. With the jig in position, the act of welding is performed on the two adjacent strips **3** along the diagonal corner line **6**. During welding, the jig protects the face of the covering **2** which otherwise would be exposed, and also protects from heat the inner edge of flanges **3***a* by which heat otherwise would be transmitted to the covering in the region of this contact. The cooling medium prevents heat absorbed by the upper region of the jig from so raising the temperature of the jig bottom as to injure the covering.

Even with the protection afforded by jig **7**, it is important that the welding operation be properly conducted. In making the weld, I may employ an oxy-acetylene torch, and draw the flame from it to a very fine tip. I employ a welding wire of small diameter, and have found wire having a diameter of one-sixteenth inch suitable in conducting my method.

Referring to Fig. III of the drawing, in which the actual welding operation is illustrated, the weld is begun at the inner extremity of weld line **6**, with the flame tip **14**, and the tip **15** of the welding wire directed angularly outward from the horizontal plane of their suspension. The weld is run rapidly, and the metal must be so rapidly fused that the flame does not pause at any point in line **6**, as it is moved outwardly therealong.

By performing my method with the use of a closely fitting jig of heat conducting material, and comprising a cooling medium, I have been able to weld the mitered corners of metallic binding strips without causing charring of, or other deterioration in, a non-metallic covering element which is susceptible to the effect of high temperature.

While the operation of welding two adjacent edging strips has been shown as performed at a corner, as such specific welding operating is the one most difficult to perform, it is to be understood that an operation may be performed at any region along a length of edging. This may be done by bringing the skew wall **13** up to the weld line in a length of welding. If desirable, the equivalent of the bridging, or skew, wall **13** may be made in one of the side walls of the jig by indenting the wall in a region adequate to expose the line of weld.

I claim as my invention:

1. The herein described method of making welded inter-connection between two adjacent strips of metallic edging which contact at least one edge zone of a relatively flat sheet of non-metallic material susceptible of deterioration under elevated temperature which comprises shielding an area of the non-metallic material in the region of the junction line between the edging strips by positioning thereon a heat-conducting vessel with a substantially plane bottom wall thereof overlying the said area of the non-metallic material and extending to the line of contact of the non-metallic material with the metallic edging to both sides of the junction line between the edging strips while exposing the said junction line, rapidly running a welding flame over the junction line between the edging strips, and in welding protecting the non-metallic material from the heat of welding by means of a cooling medium lying in the vessel and in interposition between the welding flame and the bottom wall of the vessel.

2. The herein described method of making welded inter-connection between two adjacent strips of metallic edging which embrace at least one edge zone of a relatively flat sheet of non-metallic material susceptible of deterioration under elevated temperature which comprises shielding an area of the non-metallic material in the region of the junction line between the edging strips by positioning thereon a vessel with a substantially plane bottom wall thereof overlying the said area of the non-metallic material and overlying the meeting margins of the non-metallic material and the edging strips to both sides of

the junction line between the edging strips while exposing the said junction line, rapidly running a welding flame over the junction line between the edging strips, and in welding protecting the non-metallic material from the heat of welding by means of a cooling medium lying in the vessel and in interposition between the welding flame and the bottom wall of the vessel.

3. The herein described method of making welded inter-connection between two adjacent strips of metallic edging which contact at least one edge zone of a relatively flat sheet of non-metallic material susceptible of deterioration under elevated temperature which comprises shielding an area of the non-metallic material in the region of the junction line between the edging strips by positioning thereon a heat-conducting vessel with a substantially plane bottom wall overlying the said area of the non-metallic material and extending to the line of contact of the non-metallic material with the metallic edging to both sides of the junction line between the edging strips, effecting a weld at the junction line between the edging strips, and in welding protecting the non-metallic material from the heat of welding by means of a static body of cooling medium overlying substantially the entire bottom wall of the heat-conducting vessel and the area of non-metallic material shielded thereby.

4. The herein described method of making welded inter-connection between two adjacent strips of metallic edging which embrace at least one edge zone of a relatively flat sheet of non-metallic material susceptible of deterioration under elevated temperature which comprises shielding an area of the non-metallic material in the region of the junction line between the edging strips by positioning thereon a vessel with a substantially plane bottom wall thereof overlying the said area of the non-metallic material and overlying the meeting margins of the non-metallic material and the edging strips to both sides of the junction line between the edging strips while exposing the said junction line, effecting a weld at the junction line between the edging strips, and in welding protecting the non-metallic material from the heat of welding by means of a static body of cooling medium overlying substantially the entire bottom wall of the heat-conducting vessel and the area of non-metallic material shielded thereby.

WILFERD F. NEWSON.