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METHOD OF REENFORCING THIN WALLED METAL ARTICLES

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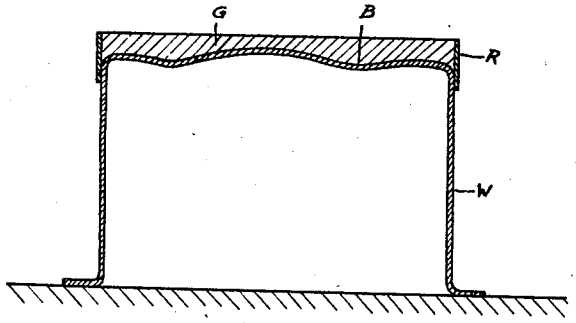


Fig. 1

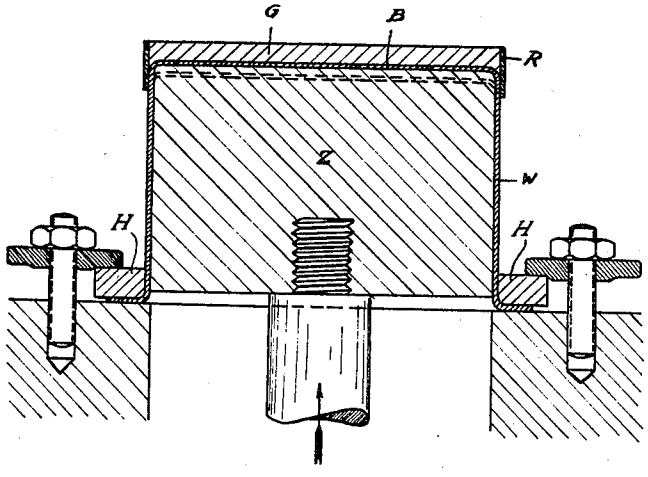


Fig. 2

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METHOD OF REENFORCING THIN-WALLED METAL ARTICLES

Original application filed December 16, 1929, Serial No. 414,543, and in Germany June 15, 1929. Divided and this application filed May 15, 1931. Serial No. 537,727.

This invention relates to a method of reenforcing thin-walled metal articles, for example the bottoms of cooking utensils, by casting metal thereon.

The present invention is a division of my application for Letters Patent Serial Number 414,543 filed 16th of December, 1929.

In this procedure there has previously been the objection that the part of the metal utensils reenforced by the cast on metal becomes bent or waved. This phenomenon is the more pronounced the smaller the thickness of the part of the utensil to be reenforced by the cast on metal. The reason for this may be assumed to be that when the molten casting metal is poured onto the part of the article to be reenforced the said part becomes strongly heated and consequently expands, whilst the parts which do not come into contact with the molten metal offer considerable resistance to the expansion of the heated part which latter is therefore compelled to bend or become waved. Return to the flat condition after cooling is not possible because the cast on layer applied to the part in question, and now fused thereto, has solidified and does not permit this.

By means of the method according to the present invention the above-described objection is avoided. According to the invention the part to be reenforced by the cast on layer is drawn or pressed out during the casting operation or immediately thereafter, and the said drawing or pressing out is continued until the cast on metal layer has solidified, whereby the said part is stretched out flat and the expansion thereof due to the heating cannot result in bending or the formation of waves in the reenforced part.

A practical example of the application of the method according to the invention will now be described with reference to the accompanying drawing wherein:

Fig. 1 shows a cooking utensil the bottom of which has been reenforced by a metal casting in the usual way and which has in consequence become waved, whilst

Fig. 2 shows an application of the method according to the present invention, also as applied to reenforcing the bottom of a cooking utensil.

Referring to the drawing, W indicates the cooking utensil, shown in inverted position. B is the bottom thereof which is reenforced by the cast layer G, whilst R represents an applied confining ring which can consist of the same metal as the body of the utensil or of some other metal and which may be fused to the cast layer or comprise a removable casting mould.

In order to avoid the formation of waves in the cooking utensil bottom B as shown in Fig. 1, the said bottom is on one side submitted during the casting operation to the pressure of a pressing or stamping head Z acting in the direction of the arrow (Fig. 2), the cross-section of the said stamping head being adapted exactly to conform with the internal cross-section of the cooking utensil. The expansion which the bottom B undergoes as a result of the heating when the molten reenforcing layer G is poured on, results in the stamping head Z pressing up the bottom B from the position shown in broken lines, which is its position prior to pouring on the molten reenforcing layer, into the position shown in full lines. The expansion of the bottom is thus caused by the stamping head to be taken up by the walls of the cooking utensil, the bottom itself remaining perfectly flat. The extent of movement of the stamping head Z is advantageously so limited as to prevent the bottom of the utensil from being pressed through by the stamping head when the bottom is in the hot state. The stamping head is allowed to act until the cast on metal is no longer in the liquid state. After the casting has solidified the utensil bottom will remain in the pressed out position shown in Fig. 2.

A holding ring H is used for holding down the utensil W during the operation of casting on the reenforcing layer and when the stamping head Z is being actuated.

I claim:

1. A method of preventing the formation of waves or bends in thin walled metal articles when reeinforcing the same by casting a metal layer thereon, which consists in press-

ing or drawing that part to be reenforced by the cast on layer immediately after the casting operation and until the cast on layer has solidified.

2. A method of preventing the formation of waves or bends in the bottom of a thin walled metal utensil when reenforcing that part of the utensil by casting a metal layer thereon, which consists in pressing or drawing the bottom of the utensil outward after the cast on layer has been applied and until the same has solidified.

3. A method of reenforcing the bottom of a thin walled metal utensil which consists in casting a layer of metal on the outside of the bottom, and then pressing or drawing the bottom of the utensil outward until the cast on layer has solidified, thereby preventing the formation of waves or bends in said bottom.

4. A method of reenforcing the bottom of a thin walled metal utensil which consists in casting a layer of metal on the outside of the bottom, and in drawing the bottom of the utensil outward during the casting operation and until the cast-on layer has solidified, thereby preventing the formation of waves or bends in said bottom.

In testimony whereof I affix my signature.

ADOLF HAINLEN.