March 23, 1937. A. O. ROSS 2,074,860

PROCESS FOR MANUFACTURING CLOSED RECEPTACLES

Filed Aug. 25, 1933

Fig. 1

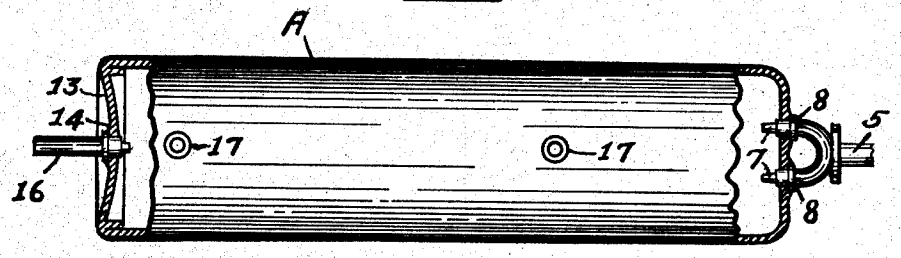


Fig. 2

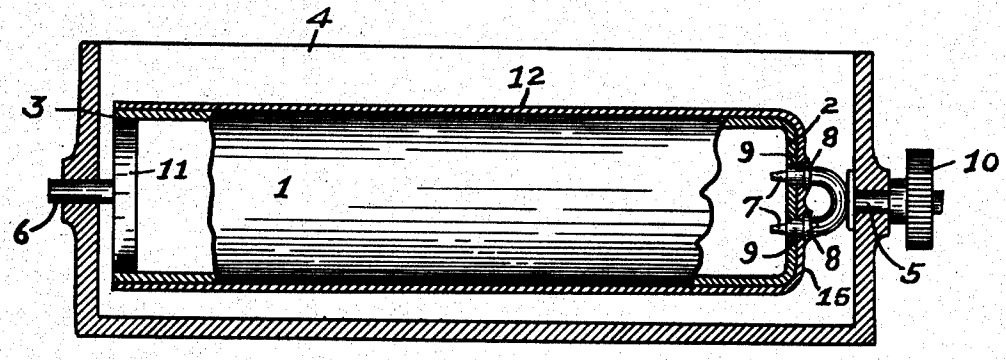


Fig. 3

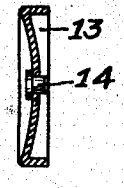
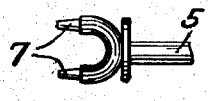


Fig. 4



INVENTOR
Aylmer O. Ross
By Jas R. Snyder
Attorney

Patented Mar. 23, 1937 2,074,860

UNITED STATES PATENT OFFICE

2,074,860

PROCESS FOR MANUFACTURING CLOSED RECEPTACLES

Aylmer O. Ross, Wilkinsburg, Pa., assignor to Maro Corporation, New York, N. Y., a corporation of New Jersey

Application August 25, 1933, Serial No. 686,742

2 Claims. (Cl. 204—6)

This invention relates to an improved process for making closed receptacles, and while primarily intended for use in the manufacture of copper range boilers or hot water tanks, it will be obvious that the same may be successfully employed in the production of other types of closed receptacles wherein it is found to be applicable.

Important objects of the invention are to provide an improved process of the character described, for producing a hot water tank of the usual conformation by electro-deposition, whereby the product will be an integral structure free from seams and any securing elements, and whereby a finished product, of superior appearance, quality and strength, at a relatively low cost, is produced.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the novel process hereinafter set forth, but it is to be understood that variations in the procedure may be resorted to that come within the scope of the claims hereunto appended.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views:

Figure 1 is a side view, partly in section, of a hot water tank constructed in accordance with the invention.

Figure 2 is a cross sectional view, of the tank shell, illustrating its suspension, with associated parts, in the electrolytic solution tub.

Figure 3 is a sectional view of the tank shell bottom.

Figure 4 is a side view of the coupling shaft employed in carrying out the present invention.

Referring in detail to the drawing, 1 represents a hollow cylindrical form member having a superficial configuration identical to, except slightly smaller than that of the hot water tank A, to be produced.

The form member 1 may be constructed from any suitable material, preferably stainless steel or analogous steel material, and is highly polished throughout its entire surface area. The form member has a closed end 2 and an open end 3, and is provided with an imperceptible taper gradually increasing its diameter from the closed to the open end thereof.

The form member 1 is suspended horizontally in a tub 4, which is the container for the copper electrolytic solution employed for effecting the metal depositing process in the manner well known in the art to which the invention appertains. The form member is supported by a coupling shaft 5 and a bearing shaft 6. The shafts 5 and 6 are horizontally aligned, relatively to each other, and are suitably journaled for rotation in the walls of the solution tub 4.

The coupling shaft 5 has a forked inner end terminating in a pair of tapered connecting pins 7, which engage in respective conduit fittings 8. The latter are made from copper and extend into spaced apertures 9 provided therefor in the closed end 2 of the form member 1. The outer end of the coupling shaft 5 carries a fixed gear 10 adapted for connection with a source of power imparting slow rotation to the form member during the metal depositing operation.

The bearing shaft 6 is fixed in a disk 11, which is secured in the open end 3 of the form member 1. The shafts 5 and 6, together with the disk 11, are constructed from any suitable material calculated to prevent the accumulation of electro-deposits thereon. At least, the portions of these elements exposed to the electrolytic action are suitably insulated to prevent the accumulation of metal deposits thereon.

In constructing a hot water tank A, in accordance with the present invention, the form member 1 is entirely submerged in the electrolytic solution within the tub 4 and subjected to the copper depositing action until a shell 12, capable of sustaining itself, has been produced. The form member, with its deposited shell 12, is removed from the tub 4 and then withdrawn from said shell. A copper bottom 13, constructed in any suitable manner and provided with a conduit fitting 14, is sweated or otherwise secured in the open end of the shell 12.

The removal of the form member 1 from the shell 12 is readily effected owing to the taper of the former and the consequent taper of the latter. The removal of the shell is further facilitated by subjecting the latter to a rolling operation to slightly expand same prior to its removal.

During the formation of the shell 12, the conduit fittings 8, will have become fixedly embedded in the closed end 15 of the shell. A bearing shaft 16 is provided to engage in the bottom conduit fitting 14. The shell 12 with its bottom 13 is now submerged in the electrolytic solution in the tub 4, and supported in the latter by the bearing shaft 16 and the coupling shaft 5. The shell with its bottom is subjected to the electrolytic copper depositing action until the required thickness of the wall structure of the shell is attained to provide a completely finished tank A.

It will here be noted that, my improved process

involves two distinct stages of electrolytic action, the first stage forming the shell 12 only, and the second stage completing the metal depositing operation and producing the finished product in the form of a hot water boiler or tank A. During both stages of the electrolytic copper depositing operation, the shell is slowly rotated to assure uniform wall thickness and a smooth uninterrupted finished surface.

Laterally disposed conduit fittings 17, provided with suitable insulation plugs, may be embedded in desired positions in the side wall of the shell 12 during the second stage of the metal depositing operation. In mounting the fittings 17 the shell is provided with apertures to receive same and to establish communication with the interior of the shell.

During the second stage of the electrolytic metal depositing operation, the juncture of the bottom 13 with the shell 12 is completely effaced and the latter are united in an integral structure. In like manner, the conduit fittings 8, 14 and 17 become an integral part of the tank structure with reenforced and perfectly finished surrounding portions, whereby the possibility of leakage at their points of connection with the shell is entirely eliminated.

The present invention provides a most efficient and economical process for producing a perfectly finished closed receptacle of high quality, durability and appearance.

What I claim is:

1. The herein described process for the electrolytic formation of a hot water tank, which consists in utilizing a tapered form member having a polished cylindrical surface and supported at one end by a fork-shaped coupling element carrying conduit fittings, in electrolytically depositing copper upon the polished surface of said form member and on said conduit fittings to produce a self-sustaining shell having an open end and a closed end with said conduit fittings fixed in the latter, in removing said shell from said form member and in securing a copper closure member in the open end of said shell, and finally in electrolytically depositing copper on said shell and closure member to provide the wall thickness desired.

2. The herein described process for the electrolytic formation of a closed receptacle; which consists in utilizing a tapered form member having a polished cylindrical surface, and supported at one end by a coupling element carrying a conduit fitting, in electrolytically depositing copper upon the polished surface of said form member and upon said conduit fitting, to produce a self-sustaining shell, having an open end and a closed end with said conduit fitting fixed in the latter; in removing said shell from said form member and securing a copper closure member in the open end of said shell; and finally in electrolytically depositing copper on said shell and closure member to provide the wall thickness desired.

AYLMER O. ROSS.