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METHOD OF FABRICATING PERCOLATOR VESSEL AND PUMP CONSTRUCTIONS

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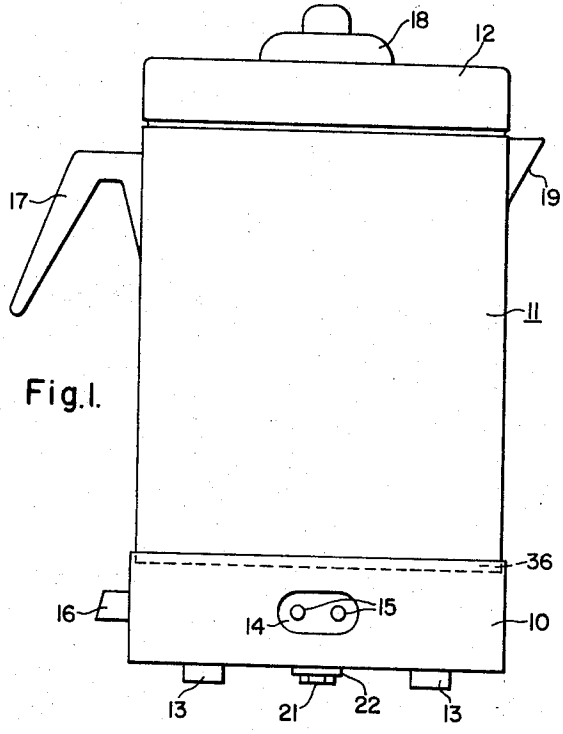


Fig.1.

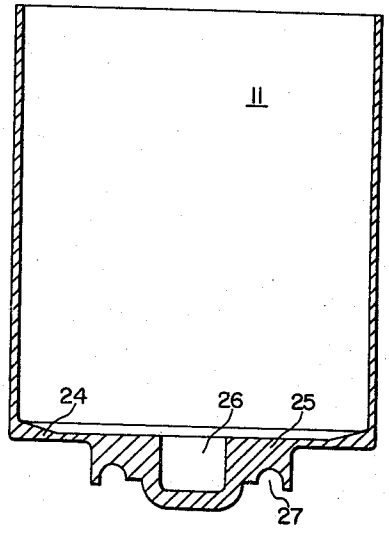


Fig.2.

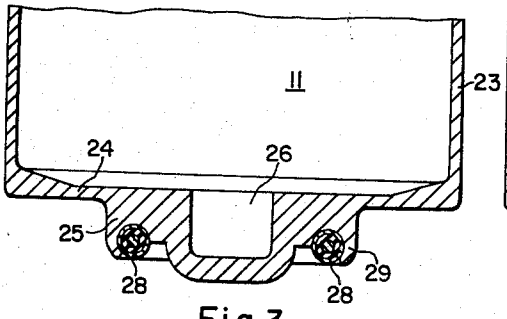


Fig.3.

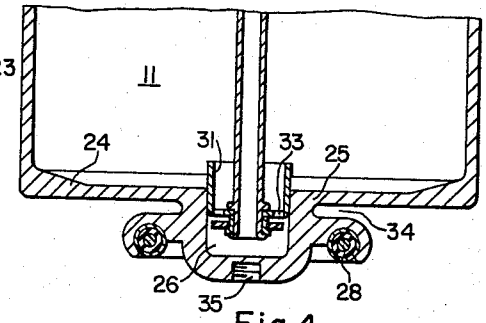


Fig.4.

WITNESSES

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METHOD OF FABRICATING PERCOLATOR VESSEL AND PUMP CONSTRUCTIONS

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3 Claims. (Cl. 29—611)

This application is a continuation-in-part of copending application, Ser. No. 326,832, filed Nov. 29, 1963 now abandoned.

This invention relates, generally, to beverage makers and, more particularly, to beverage makers of the type generally known as coffee percolators.

The cost of manufacturing coffee percolators can be reduced by fabricating the vessels by a process known as impact extrusion or impact process which enables each percolator vessel to be produced in a single operation with tooling consisting of a moving punch and a stationary die. Heretofore, it has been necessary to provide a separate pump well assembly comprising a heater casting attached to the vessel by some means, such as a threaded ring or nut, thereby preventing all of the advantages of the impact process from being realized.

The primary object of this invention is to provide a new and improved method of manufacturing an integral percolator vessel and pump well.

Another object of this invention is to provide a new and improved method of manufacturing an integral percolator vessel and pump well which results in a substantial cost reduction.

A further object of the invention is to provide a new and improved method of fabricating integral percolator vessel and pump assemblies which increases the effectiveness of the heating element in raising the temperature of the liquid in the pump well.

Other objects of the invention will be explained fully hereinafter or will be apparent to those skilled in the art.

In accordance with one embodiment of the invention, a generally cylindrical percolator vessel having a closed bottom end is provided with a pump well chamber which is formed integrally in the closed end of the vessel. An annular groove is provided around the pump well for a heating element which is forged into place. Part of the metal in the bottom end of the vessel is removed to provide a groove above the heating element to force the heat to flow inwardly toward the pump well, thereby raising the temperature of the well surface high enough to cause pumping of the liquid from the well.

For a better understanding of the nature and objects of the invention, reference may be had to the following detailed description, taken in conjunction with the accompanying drawing, in which:

FIGURE 1 is a view, in elevation, of a coffee percolator embodying features of the invention;

FIG. 2 is a view, in section, of the vessel of the percolator manufactured by the method herein disclosed;

FIG. 3 is an enlarged view, in section, of the lower portion of the vessel, and

FIG. 4 is a view, similar to FIG. 3, showing the finished pump well chamber with the percolator tube and pump cup in position.

Referring now to the drawing, particularly to FIG. 1, the coffee percolator shown therein comprises a base **10**, a vessel **11** and a cover **12**. The base **10** has feet **13** thereon for supporting the percolator and an opening **14** therein through which a plug (not shown) may be inserted to engage contact prongs **15** to connect the percolator to an electric circuit. A control handle **16** extends through

an opening in the base for controlling the operation of the percolator in the usual manner. A handle **17**, which may be composed of wood or a plastic material, is attached to the vessel **11** for lifting the percolator. A glass dome **18** is inserted in the cover **12** in the usual manner for the liquid spray to impinge against during operation of the percolator. A spout **19** is provided on the vessel **11** to enable liquid to be poured from the vessel. The vessel **11** may be attached to the base **10** by means of a bolt **12** and an insulating washer **22** as will be described more fully hereinafter.

As shown in FIG. 2, the vessel **11**, which is generally cylindrical in shape with a side wall **23** and a closed bottom end **24**, is provided with a pump well chamber **26** having a wall **25** formed integrally with the bottom end **24**. The vessel **11** is preferably composed of aluminum and it is shaped by a method known as impact extrusion or impact process by utilizing a moving punch and a stationary die. In the process a controlled volume of aluminum in a predetermined shape, called a slug, is placed or otherwise introduced into the die. Impact pressure is exerted on the slug by the rapidly moving punch which enters the die cavity and partly closes the die opening. An orifice is thus formed corresponding in shape to the cross section of the vessel. As pressure continues, the metal flows through the orifice and forms the side wall **23** of the vessel by extrusion. At this point the wall **25** (without the pump well chamber **26**), and an annular groove **27** in the wall **25** are being simultaneously formed with the side wall **23**, the metal which has not moved out of the die at the end of the pressure stroke forming the closed bottom end **24** including the wall **25**. Continuing pressure produced by further movement of the punch serves to produce the pump well chamber **26** in the wall **25**. The punch and the formed impact or vessel are then removed from the die after which the spout **19** may be formed on the vessel by a secondary operation.

As shown in FIG. 3, a heating element **28** is disposed in the annular groove **27**. The element **28** is retained in the groove by forging or bending inwardly a rim **29** of the metal around the groove **27**, thereby engaging the element **28**.

As shown in FIG. 4, a cup **31** is attached to the lower end of a percolator tube **32**. The cup **31** is disposed in the top of the pump well chamber **26** and it supports the tube **32** and a basket (not shown) mounted on the upper end of the tube for containing ground coffee. Drain holes **33** are provided in the bottom of the cup **31** to permit liquid to flow into the pump well.

Referring to FIG. 3, it will be seen that there is a relatively large amount of metal in the wall **25** directly above the heating element **28**. This metal would normally act like a heat sink to bleed heat from the heating element into the vessell **11** and prevent the temperature of the pump well surface from becoming high enough to establish pumping of the liquid in the pump well.

In order to increase the effectiveness of the heating element in raising the temperature of the liquid in the pump well, a horizontally extending groove **34** is provided in the wall **25** between the element **28** and the bottom end **24** of the vessel as shown in FIG. 4. The groove **34** forces the heat to flow inwardly toward the pump well, thereby raising the temperature of the liquid sufficiently to cause pumping of the liquid through the tube **32**.

The groove **34** may be machined or cut into the extrusion after it is removed from the die. Also, a hole **35** may be drilled and threaded in the bottom wall of the pump well chamber **26** to receive the bolt **21** for attaching the base **10** to the vessel **11**. The insulating washer **22** prevents heat from being conducted from the pump well to the base through the bolt **21**. As shown in FIG. 1, the vessel **11** rests on a flange **36** provided around the

top of the base **10** and the bottom of the pump well does not touch the bottom of the base.

As explained hereinbefore, the vessel **11** and the integral wall **25** for the pump well chamber **26** are preferably formed by impact extrusion or process. However, the vessel and integral wall could be formed by casting in the usual manner in a suitable mold. In this case, the annular groove **34** could be formed during the casting operation. It will be understood that the pump well chamber **26**, or groove **34** could be cut into or otherwise produced in the wall **25** if it were desired to cast the wall **25** as a solid piece.

From the foregoing description, it is apparent that the invention makes it possible to reduce the overall cost of a percolator vessel-pump well assembly by providing a one-piece or integral unit instead of two units which are made separately and then assembled together. Furthermore, a smooth, easy-to-clean vessel interior is provided which is free of hardware and joints that are conventional with prior percolators. The present percolator is efficient in operation as heat from the heating element is effectively utilized to produce the desired pumping action.

Since numerous changes may be made in the above-described construction, and different embodiments of the invention may be made without departing from the spirit and scope thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Method of fabricating percolator vessel and pump constructions comprising the step of: simultaneously forming a cylindrical vessel having a closed bottom end, a wall in said bottom end, an annular groove in one end of said wall and a pump well chamber in the end of said wall opposite the end having said groove cutting away wall material between the annular groove and the bottom of said vessel to form a channel whereby the heat will necessarily be directed to the pump chamber and placing a heating element in said annular groove and bending one of the walls forming said groove over said heating element.

2. Method of fabricating percolator vessel and pump constructions comprising the steps of: simultaneously forming a cylindrical vessel having a closed bottom end, a wall in said bottom end, and an annular groove in one end of said wall; providing a pump well chamber in said wall; and cutting away wall material between the annular groove and the bottom end of said vessel and placing a heating element in said annular groove and bending one of the walls forming said groove over said heating element.

3. Method of fabricating integral percolator vessel and pump constructions comprising the steps of: impact extruding a cylindrical vessel having a closed bottom end, a wall in said bottom end, an annular groove in one end of said wall, and a pump well chamber in said wall; and removing wall material between the annular groove and the bottom end of said vessel and placing a heating element in said annular groove and bending one of the walls forming said groove over said heating element.

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