

[54] **HEATED DISPENSING APPARATUS**
 [76] Inventor: **Fred Morgan**, 1 Forest Rd., Glen Burnie, Md. 21061

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Primary Examiner—Robert B. Reeves
Assistant Examiner—Frederick R. Handren
Attorney, Agent, or Firm—Imirie, Smiley & Linn

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[57] ABSTRACT

Dispensing apparatus for maintaining a liquid, such as shampoo, at a warm temperature and for facilitating dispensing thereof, which includes a generally flat base or support having a plurality of upward protrusions each including a heating element and cooperating with a resilient cylindrical container having a recessed base conforming to the surface configuration of the protrusion for direct heat transfer contact therewith.

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14 Claims, 5 Drawing Figures

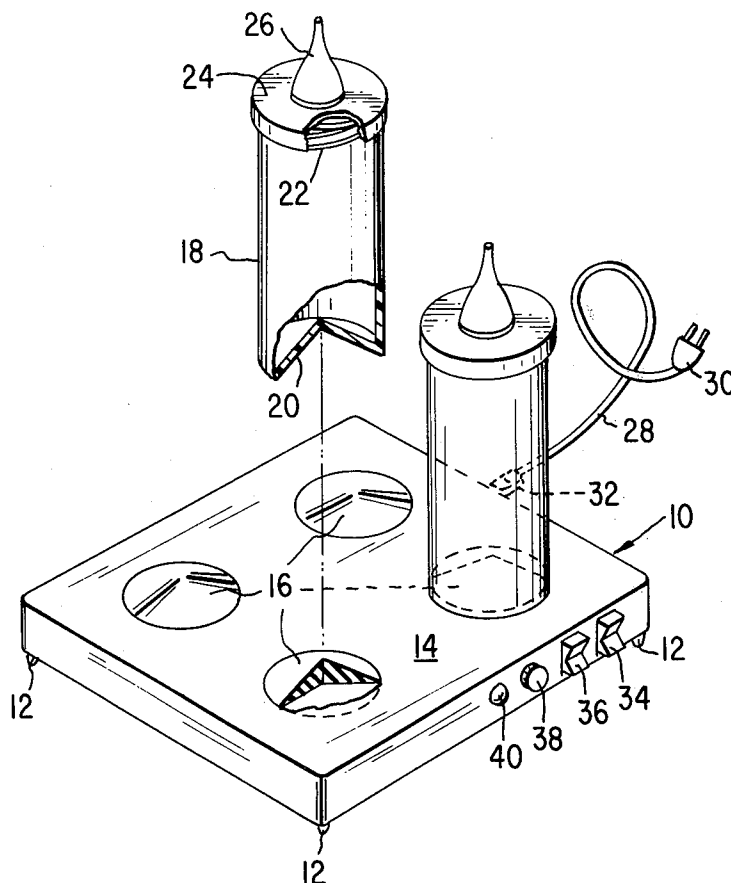


FIG. 1

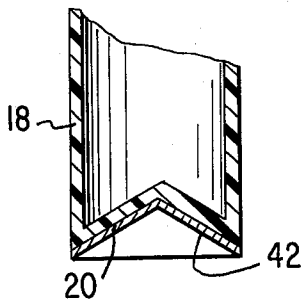
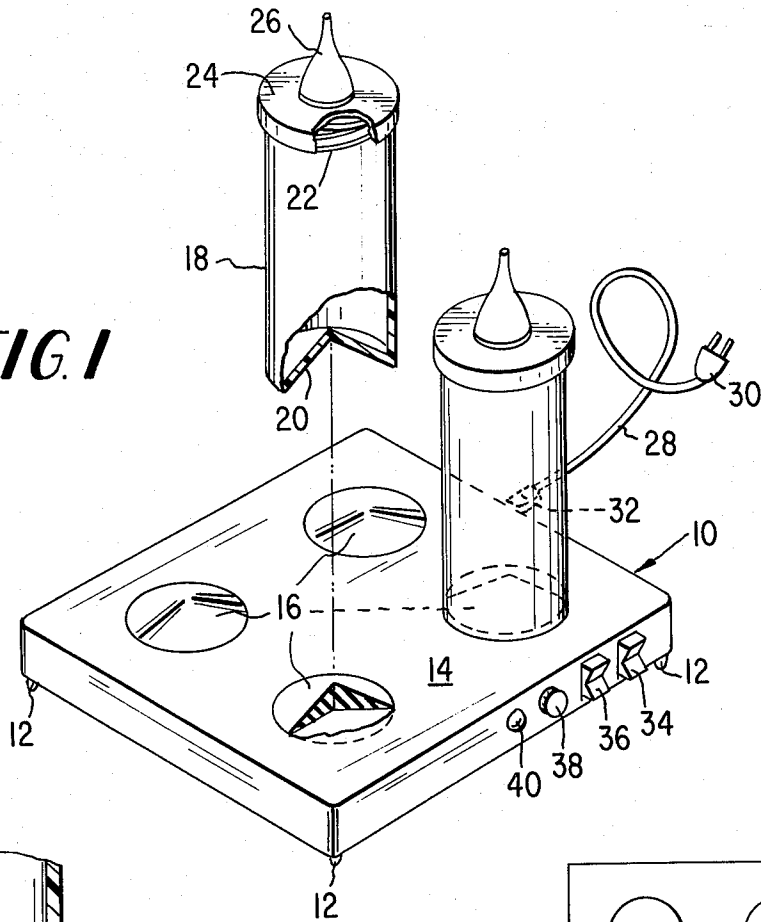


FIG. 2

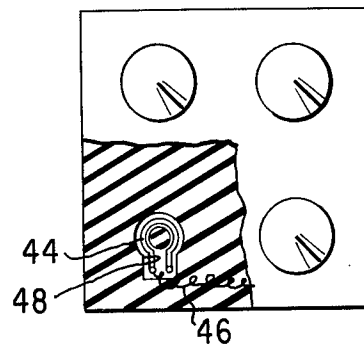


FIG. 4

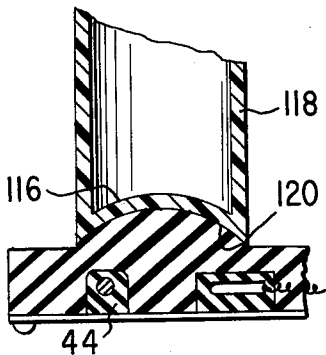


FIG. 3

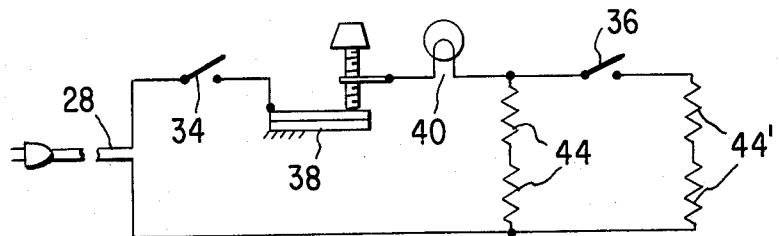


FIG. 5

HEATED DISPENSING APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to heated dispensing systems, and more particularly, to a heated liquid dispensing assembly providing for the improved heating of a plurality of resilient, thermoplastic synthetic containers.

2. Description of the Prior Art

Many diverse situations exist where it is desired to maintain a supply of fluid in a warm or heated condition for subsequent dispensing. One such application is in connection with commercially operated hair salons, beauty parlors, barbershops and the like. In those situations, it is often desirable to maintain a supply of various different types of shampoos and hair treatment lotions at a temperature substantially equal to body temperature. In this manner, the initial application of such fluid to the scalp creates not an uncomfortable sensation, but rather one which is soothing and somewhat relaxing.

In the attainment of systems of the above general type, many approaches have been taken, but have proven to be of only limited success. For example, electrically heated plates or stands are well-known; however, when used to heat shampoo or like fluids contained in flexible, resilient thermoplastic containers, there is the danger of the plastic melting or at least becoming deformable if it is maintained on the heated plate for any substantial length of time. If the temperature of the plate is decreased to avoid this problem, typically the fluid contained within the resilient container is not heated sufficiently to justify use of such apparatus.

Another approach has been to form a depression or recessed area in the hot plate itself which accommodates a major lower portion of the container for improving the heating of the contents thereof. However, this approach has again exhibited numerous disadvantages in that the heat transfer relationship between the hot plate and the container is very poor due to the air space existing between the vertical walls in the recessed portion. Also, construction of the hot plate assembly itself is extremely complex, which necessarily increases the costs of manufacture and the likelihood of future maintenance being required.

Thus, while a long standing need has been established for maintaining any number of different fluids in resilient dispensing containers at elevated temperatures, a convenient, reliable, safe and economical solution has heretofore been unavailable.

SUMMARY OF THE INVENTION

Accordingly, it is an object of the present invention to effectively heat a fluid contained in a flexible resilient container and to maintain the same at an elevated temperature without damage to the container itself.

The present invention may be summarized in that a heated dispensing apparatus includes a base member having a substantially planar upper surface; a plurality of protrusions formed on the surface and extending above the plane thereof, each of the protrusions defining a generally horizontal aplanar support surface having a circular periphery; a heating element disposed interiorly of at least one of the protrusions for exclusively heating the same over substantially the entire exposed

surface area thereof; and at least one resilient, cylindrical container removably disposed atop the base member for heating fluid within the container, the container having a diameter substantially equal to the diameter of the protrusion and having a recessed bottom conforming to the aplanar support surface for direct heat transfer contact therewith over the entire bottom surface of the container.

Another object of this invention is to construct a heated stand having a plurality of protrusions conforming to recesses in resilient containers for use therewith so as to facilitate the proper positioning of the containers atop the plate and to provide maximum heat transfer therebetween.

The present invention exhibits numerous advantages over the prior art in that the same is simple in design, requires minimal steps in construction and maintenance, conveniently provides for the proper positioning of the resilient containers atop the base plate, and assures that a maximum heat transfer relationship is established so as to bring the contents of the container to a desired temperature by means of a reduced temperature heating element allowing the use of thermoplastic materials otherwise subject to heat damage.

Other objects and advantages of the present invention will become apparent from the following description of the preferred embodiments when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a prospective view, with parts broken away, of a preferred embodiment of a heated dispensing apparatus in accordance with the present invention;

FIG. 2 is a partial sectional view of a modification of the container of FIG. 1;

FIG. 3 is a partial prospective view, with parts broken away, of an alternative embodiment according to the present invention;

FIG. 4 is a top plan view of the base member of FIG. 1 with parts in section; and

FIG. 5 is a schematic diagram of the heating circuit of the apparatus of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1, the present invention includes a base member 10 of a generally rectangular configuration having feet 12 at the corners thereof to facilitate placement of the base member upon a countertop or other convenient location. The base member may be made of any suitable material and may either be molded as an integral structure, or bent, stamped or assembled from individual pieces. Preferably, the base member 10 is constructed of a material capable of conducting heat but not electricity and having an exterior finish decorator coordinated for consumer acceptance. The top surface 14 of the base member 10 is substantially flat or planar and has formed therein a plurality of protrusions 16.

Each of the protrusions 16 defines a generally horizontal, aplanar support surface having a circular periphery for cooperation with a flexible, resilient container 18. As shown in FIG. 1, the flexible, resilient container 18 is generally cylindrical and has a diameter substantially equal to the diameter of the periphery of the protrusions 16. The base or bottom surface of the container 18 is concave so as to define a recess 20 hav-

ing conforming surface configurations with respect to the surface of protrusion 16.

In the embodiment illustrated in FIG. 1, the protrusions 16 are generally conical such that the recesses 20 formed in the bottom of containers 18 are similarly conical. Container 18 is open at its upper end and defines an upper peripheral boundary with fastening means such as screw threads 22 for cooperation with like fastening elements interiorly formed on a downward flange of a cover 24. Cover 24 supports centrally thereon an upwardly extending nozzle 26 such that the contents of the container may be dispensed by inverting the same and squeezing the side walls in a well-known manner.

Base member 10 houses electrical circuitry for heating each of the protrusions 16 to the exclusion of the remaining planar surface 14. In this manner, the overall surface 14 remains at ambient temperature to obviate the possibility of injury to a person using the apparatus. Operating potential is supplied preferably from a source of alternating current over a line cord 28 which terminates at one end in a conventional AC plug and at its opposite end in an appropriate female receptacle 32. Receptacle 32 cooperates with a corresponding plug (not shown) which is preferably rigidly attached to a side wall of the base member 10. Mounted in a convenient location either on a front wall or on the top surface 14 of base member 10 are a plurality of controls for the electrical circuit of the system. Such controls include an off-on switch 34, an individual heating element control switch 36, to be described more fully below, a thermostat control 38, and an appropriate indicator lamp 40.

A modification according to the present invention is illustrated in FIG. 2 and includes a shaped thermal conductor element 42 constructed of any suitable material, such as metal. Element 42 is stamped or otherwise made to precisely conform to the shape of the recessed area 20 in the bottom of container 18 and is permanently attached thereto by a suitable adhesive. Alternatively, element 42 may be constructed with plural layers, the bottom or outermost of which is a thermal conductor, with the inner layer formed of a ceramic, glass or other material capable of storing heat energy and slowly releasing the same interiorly of the container 18.

Protrusion 16 may take any number of forms dictated, for example, by desired aesthetics or manufacturing convenience. One such alternative configuration is shown in FIG. 3 in the form of a spherical section 116. As in the embodiment of FIG. 1, the peripheral dimensions of protrusion 116 conform substantially identically with the diameter of a container 118, and the recess 120 conforms to the shape of the protrusion for direct heat transfer contact over the entire bottom surface area of the container. While two preferred embodiments of the protrusions and conforming recesses have been illustrated and described, the same are by no means exhaustive of the particular configurations encompassed by the present invention. Others, for example, may include more complicated frusto-conical, trapezoidal, stepped cylindrical, and the like shapes depending upon the particular characteristics and configuration most appropriate to the ultimate use of the system and the particular fluid being heated and dispensed.

The various heating elements designed for use in accordance with the present invention are preferably in-

dividual elements of the resistive type which are disposed within base member 10 for heating the protrusions and preferably the protrusions alone. As shown in FIG. 4, one such heating element 44 is in the form of an annular single loop connected by leads 46 to the remaining circuitry. Loop 44 is positioned within a conforming recess or channel 48 defined in base member 10 directly beneath its associated protrusion 16.

To facilitate mounting of the various heating elements, base member 10 may be constructed with a removable bottom plate exposing the various channels 48 for initial installation or subsequent replacement of the various heating elements 44. Furthermore, the various heating elements 44 may be disposed within the channels and held therein by attachment of the cover plate (not shown) or by any other suitable method. One alternative method, for example, is the installation of a heating element, followed by the application of an appropriate potting compound for support of the element and promotion of more effective heat transfer to the top surface of the protrusion 16.

The electrical circuit for the present invention is illustrated in FIG. 5. One of the two leads of the electrical cord 28 is connected for supplying operating potential to on-off switch 34, thermostat 38 and lamp 40, in series. The lamp 40 in turn is connected through two of the heating elements 44 back to the other lead of the cord 28. Two additional heating elements 44' are connected in parallel with the heating elements 44 through selector switch 36 to complete the circuit.

In operation, when switch 34 is closed, operating potential will be fed through the thermostat and the indicator lamp 40 to elements 44 causing the same to be heated to their desired temperature. Thermostatic element 38 is mounted within the base member 10 in a manner well-known to those skilled in the art such that the bimetallic or other heat sensing element thereof is within heat proximity of the elements 44. Thus, when the elements have reached their desired temperature, thermostatic switch 38 will open causing the extinguishment of lamp 40 and the termination of further heating of elements 44. As the elements 44 begin to cool, the same is detected by the thermostat 38 which thereafter again closes and completes the circuit to apply operating potential again to the heaters.

In the embodiment illustrated in FIG. 1, four protrusions 16 are shown, and likewise, four heating elements 44 and 44' are provided within the interior of base member 10. Since it may often be desired to have only two of the four protrusions 16 maintained at an elevated temperature at any one time, an additional switch 36 is provided on the front panel of base 10 to selectively connect the additional heating elements 44', corresponding to the two rear protrusions 16. Since thermostat 38 controls the application of operating potential to all four of the heating elements, the temperature of all of the activated elements may be easily regulated, whether switch 36 is open or closed.

From the foregoing, it can be appreciated that all that is necessary to use the system according to the present invention, is that the base plate 10 be located in a convenient position and the line cord 28 connected to an appropriate source of AC potential. Thereafter, on-off switch 34 can be closed and the desired temperature selected by the control knob of thermostat 38. The various containers 18 may be filled with the desired solu-

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tions and merely placed atop the protrusion 16 for heating and maintaining at a warm temperature.

At this point it is noted that each of the protrusions 16 provides a number of very important functions. One such function is the facilitation of the proper positioning of the containers 18 atop the plate so as to assure that the same will be accurately located above the various heating elements 44. In addition, by constructing the various protrusions 16 in an aplanar manner above the surface of the base member 10 while maintaining their generally horizontal or low-profile configuration, a substantially greater surface area is provided for improving the amount of heat energy which may be transferred to the contents of the container. This is further enhanced by shaping the protrusion and the conforming recess in the container 18 such that the same extends over substantially the entire bottom surface of the container. The heat transfer relationship is therefore maximized such that the temperature of the protrusions may be maintained at a much lower level. This of course adds additional safety and protects against accidental burns, and at the same time, assures that the containers 18 will not be damaged by excessive heat; the latter being a particular advantage where it is desired to use inexpensive, resilient containers constructed of thermoplastic synthetic resinous materials.

While the present invention has particular utility in the dispensing of heated shampoos and hair care lotions, it is by no means limited to such use. For instance, the various containers may be used for heating and dispensing different syrups, sauces or condiments in restaurants, or for the heating and dispensing of adhesives or other chemicals in a manufacturing facility, to cite but two examples.

Inasmuch as the present invention is subject to many variations, modifications and changes in detail, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

What is claimed is:

1. Heated dispensing apparatus comprising
 - a base member having a substantially planar upper surface;
 - a plurality of protrusions formed as an integral part of said surface and extending above the plane thereof, each of said protrusions defining a generally horizontal, unbroken, aplanar support surface having a circular periphery;
 - means inbedded in said base member and disposed directly below said protrusions for exclusively heating the same over substantially the entire exposed surface area thereof; and
 - at least one unitary, resilient, cylindrical container removably disposed directly atop said base member for heating fluid within said container, said container having a diameter substantially equal to the diameter of said at least one protrusion and having ar recessed bottom conforming to said aplanar

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nar support surface for direct heat transfer contact therewith over the entire bottom surface of said container.

2. The invention as recited in claim 1 wherein said protrusions are conical.

3. The invention as recited in claim 1 wherein said protrusions are curvilinear.

4. The invention as recited in claim 1 wherein said resilient container has a dispensing nozzle at an upper end thereof.

5. The invention as recited in claim 1 wherein said heating means comprise a plurality of heating elements each associated with one of said protrusions.

6. The invention as recited in claim 5 further including thermostatic control means operatively connected with said heating elements for regulating the temperature thereof.

7. The invention as recited in claim 6 wherein said thermostatic control means is adjustable to vary the regulated temperature of said heating elements.

8. The invention as recited in claim 4 further including circuit means interconnecting said plurality of heating elements for selectively causing the actuation of preselected ones of said heating elements independently of the others.

9. The invention as recited in claim 1 further including a heat transfer member attached to the recessed bottom of said container in permanent heat transfer relationship therewith and constructed of a thermal conductor.

10. The invention as recited in claim 1, said container consisting essentially of thermoplastic synthetic resinous material.

11. Heated dispensing apparatus comprising a base member;

a plurality of protrusions formed as an integral part of said base member, each of said protrusions defining a generally horizontal, unbroken, aplanar support surface having a circular periphery;

means embedded in said base member directly under said protrusions for exclusively heating said protrusions over substantially the entire exposed surface area thereof; and

at least one unitary, resilient container removably disposed directly atop said base member for heating fluid within said container, said container having a recessed bottom of the same diameter as and conforming to said aplanar support surface for direct heat transfer contact therewith over the entire bottom surface of said container.

12. The invention as recited in claim 11 wherein said container is substantially cylindrical.

13. The invention as recited in claim 11 wherein said protrusions are at least partially curvilinear.

14. The invention as recited in claim 11 wherein at least one of said protrusions extends above the upper surface of said base member.

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