

[54] **DISPENSING DEVICE FOR HEATED FLUENT PRODUCTS**

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[51] Int. Cl. **B67d 5/62**

[58] Field of Search .. **222/146 HA, 146 HE, 146 N, 222/146 R, 325; 219/214, 299, 305, 306**

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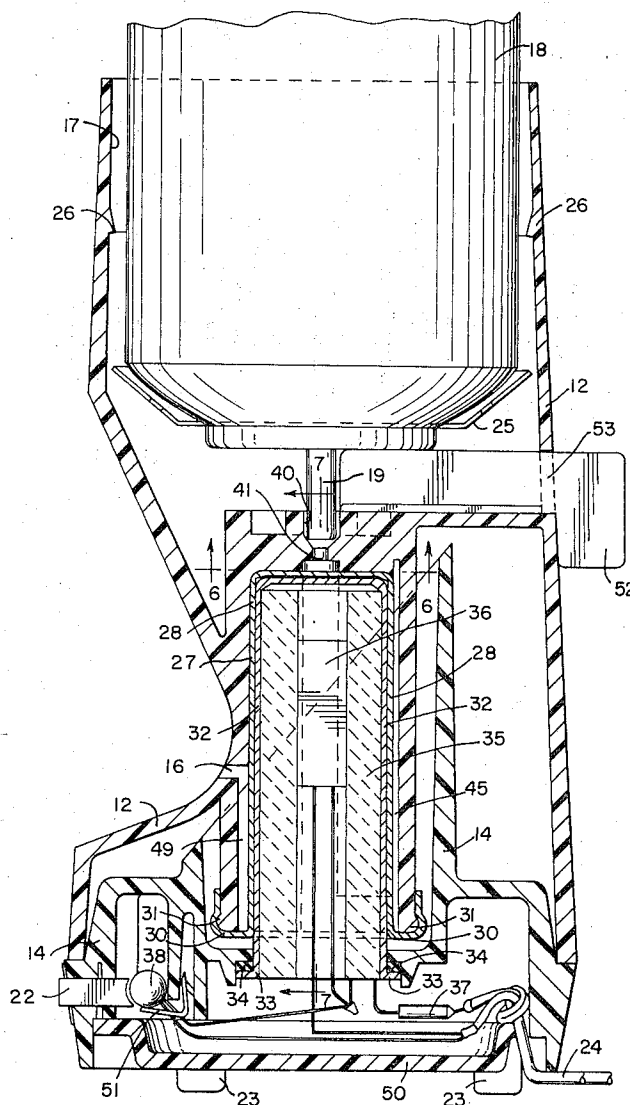
Primary Examiner—Robert B. Reeves

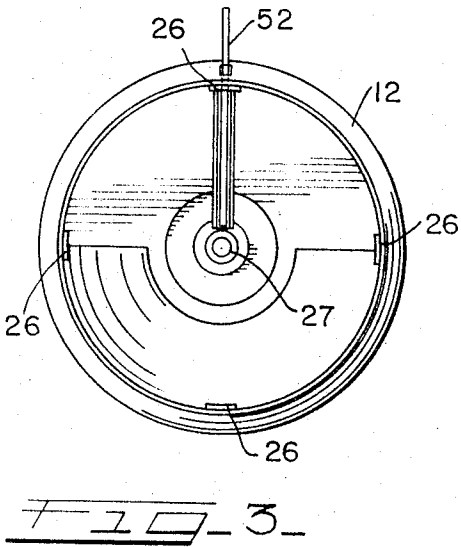
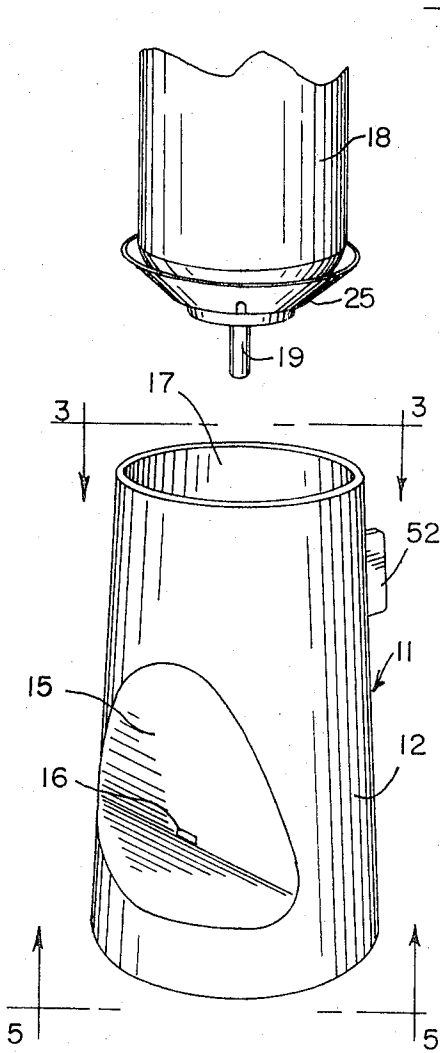
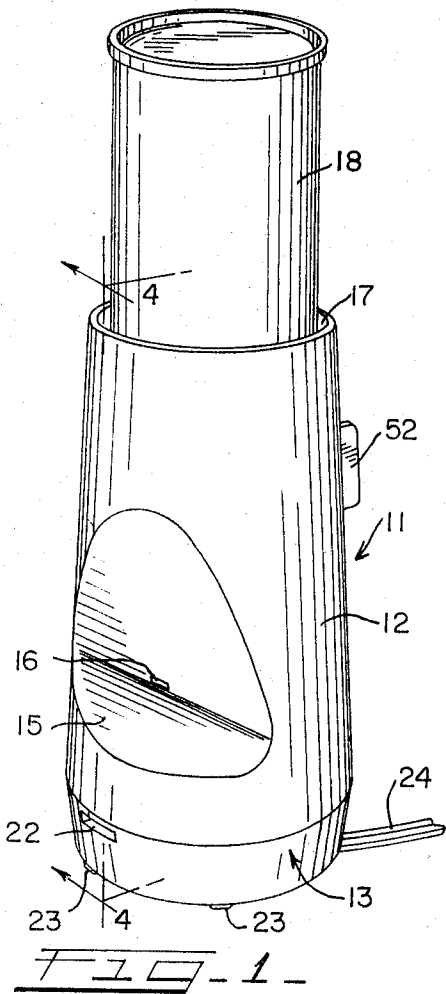
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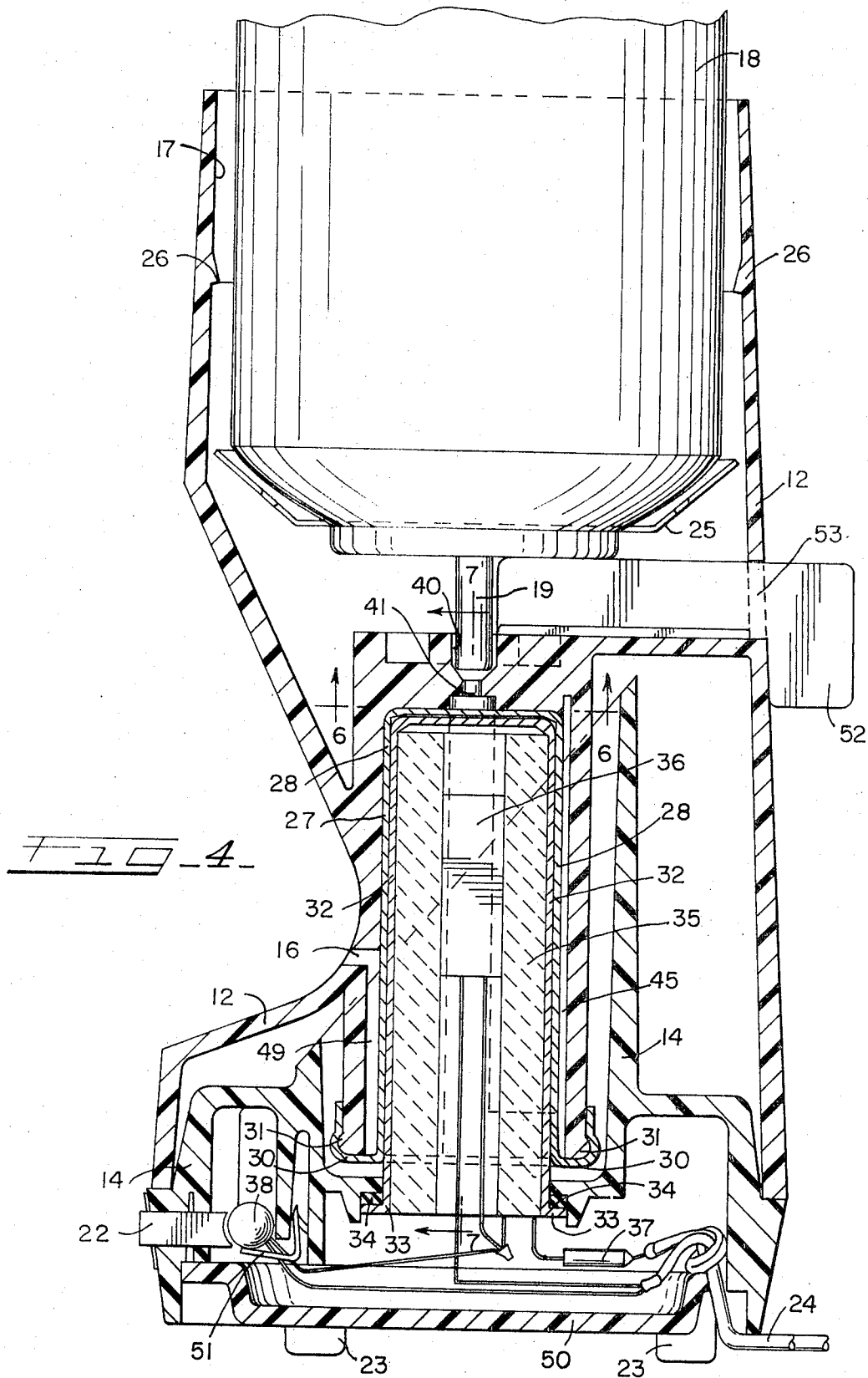
[57] **ABSTRACT**

A dispensing device for dispensing a heated fluent product from a container comprises a base portion having a vertical heating probe, and a body portion having axially aligned recesses for receiving the heating probe and the product container. The product is heated prior to being dispensed by means of a series of passageways formed from channels molded into the inside surface of the probe-receiving recess which convey the product adjacent the heated probe. The vertical alignment of the heating probe and the axial alignment of the recesses in the body portion make the dispensing device more economical to manufacture and more convenient to use. The support provided to the heating probe by the base portion makes the probe easier to store, particularly when still hot. A removable tab extending into the housing of the body portion prevents inadvertent actuation of the dispenser during storage or transit.

7 Claims, 8 Drawing Figures







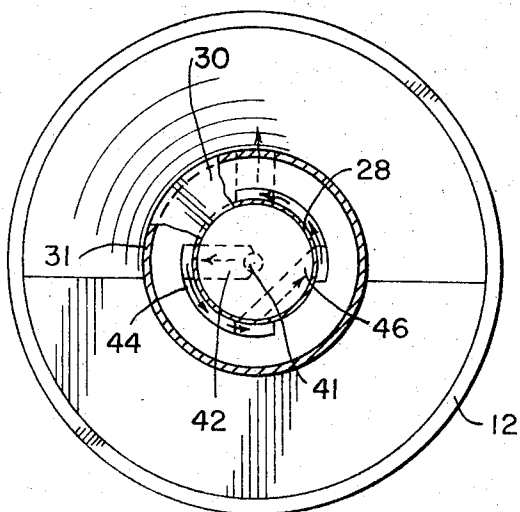


FIG. 5

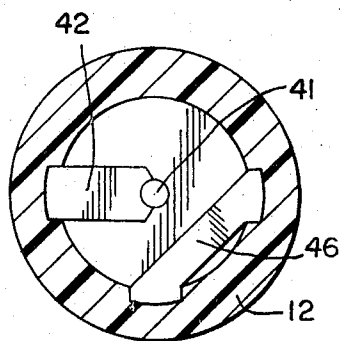


FIG. 6

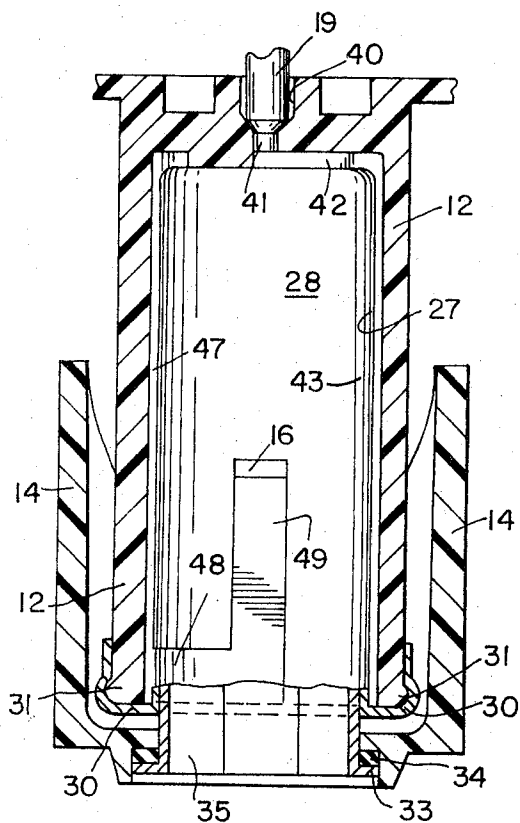


FIG. 7

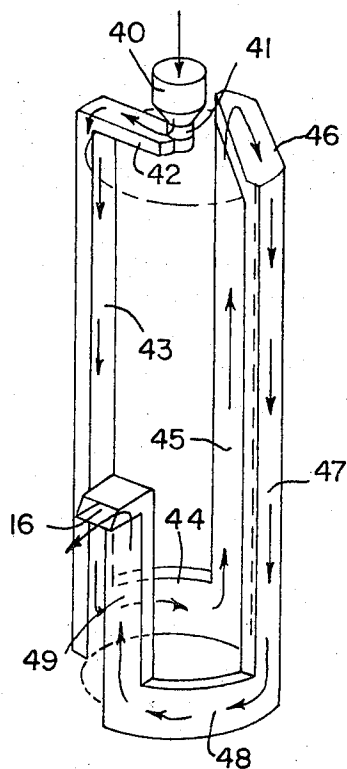


FIG. 8

DISPENSING DEVICE FOR HEATED FLUENT PRODUCTS

BACKGROUND OF THE INVENTION

The present invention relates in general to a dispensing device, and more particularly to a dispensing device which can be attached to the discharge nozzle of a pressurized aerosol-type container or a compressible manual pump-type container to heat the contents thereof as they are discharged for use or consumption.

In recent years various fluid products such as cosmetics, shaving cream, food products, and the like have been packaged either in aerosol form, i.e., packaged in a can under gaseous pressure to render them expendable from the can in controlled amounts by reason of such pressure and in response to manipulation of a spring-biased valve mechanism, or in compressible container form wherein they are dispensed by manual compression of the container. Many of these fluent products benefit from being heated prior to being dispensed. For example, heated shaving cream is more pleasant to use and more effective in softening the beard when the user is finished shaving, and various food products, such as cheese whips, are tastier and more easily served when heated.

One dispensing device which has been particularly successful for this purpose is the device shown and described in the co-pending application of the present inventor, Ser. No. 359,026, filed May 10, 1973, and assigned to the present assignee. This device obtains good heat transfer between its electrical heating element and the fluid product without the complex labyrinth of passageways employed in prior art devices; which made access for cleaning virtually impossible, and which resulted in contamination of subsequent products by remnants of a previously-used product. Furthermore, the aforementioned device utilizes a removable heating element which facilitates submersion of the housing of the device in water for convenient cleaning, and which provides the economy of being able to use a single heating element with multiple dispensing devices.

While the aforementioned dispensing device provided good operational performance, in use its plastic housing was in some cases too light in weight to provide a desired degree of stability, and when permanently attached to a product container was undesirably costly for disposal upon depletion of the container. Furthermore, the removable heating probe assembly of the device was not always convenient to store when removed from the housing; often having to be stored with its heating surface resting on a supporting surface with the attendant danger of burn damage to the surface. Accordingly, the present invention is directed to an improved and more economical construction of the aforementioned fluid dispensing device which makes removal of the heating probe from the housing more convenient, and which provides a higher degree of stability to the dispenser device while in use.

SUMMARY OF THE INVENTION

Accordingly, it is a general object of the present invention to provide a new and improved dispensing device for dispensing a heated fluid product.

It is a more specific object of the present invention to provide an improved dispensing device for dispens-

ing heated fluid products contained in aerosol-type containers or the like.

It is another specific object of the present invention to provide a dispensing device for dispensing a heated fluid product from a container which is more convenient to use.

It is another specific object of the present invention to provide a dispensing device for dispensing a heated fluid product which is more economical to manufacture.

It is a more specific object of the present invention to provide a dispensing device for dispensing a heated fluid product which provides protection against inadvertent dispensing of the product during shipment or storage.

Accordingly, the invention is directed to a dispensing device for dispensing a heated fluid product from a container having a discharge nozzle at one end. The device comprises a base portion comprising a heating probe and a base for supporting the heating probe in a vertical upstanding position, and a body portion comprising a housing having means for receiving the product container, a dispensing port for delivering the product to a user, and a recess for receiving the heating probe. Means comprising a passageway for carrying the product from the discharge nozzle to the dispensing port, at least a portion of the passageway comprising in part a channel molded into the inside surface of the probe-receiving recess, are provided for conveying the product in sufficiently close proximity to the heating probe such that the product is heated prior to discharge.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The invention, together with the further objects and advantages thereof, may best be understood by reference to the following description taken in conjunction with the accompanying drawings, and the several figures of which like reference numerals identify like elements, and in which:

FIG. 1 is a perspective view of a dispensing device constructed in accordance with the invention showing its use in connection with an aerosol-type fluid product container.

FIG. 2 is a perspective exploded view of the dispensing device of FIG. 1 showing the various components thereof, i.e. the product container, the body portion and the base portion, separated and aligned for assembly.

FIG. 3 is a cross-sectional view taken along lines 3—3 of FIG. 2.

FIG. 4 is an enlarged cross-sectional view taken along lines 4—4 of FIG. 1.

FIG. 5 is a cross-sectional view taken along lines 5—5 of FIG. 2.

FIG. 6 is a cross-sectional view taken along lines 6—6 of FIG. 4.

FIG. 7 is a cross-sectional view taken along lines 7—7 of FIG. 6.

FIG. 8 is a diagrammatic view showing the fluid passageways of the dispensing device of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Although it will be appreciated that the principles of

the present invention can be applied to a number of different forms of dispensing devices, the invention finds particular utility with respect to small table-top devices for dispensing heated fluid products, and accordingly will be described with particular reference to an exemplary embodiment wherein the dispensing device receives a pressurized aerosol-type container, wherein the product is discharged under pressure from the container and thereupon passes through one or more passageways adjacent a vertical probe-like heating surface to emerge heated from a dispensing port disposed medially the body portion of the device.

Referring now to the figures in greater detail, and in particular to FIGS. 1 and 2, a table-top dispensing device 10 constructed in accordance with the invention is seen to comprise a body portion 11 having a housing 12 of generally frusto-conical form, and a base portion 13 having a housing 14 of generally cylindrical form. Housing 11 and housing 13 are dimensioned to provide a smooth contiguous outside surface for the dispensing device 10 when the body portion 11 and base portion 13 are in mating engagement.

A wedge-shaped product dispensing recess 15 and a product discharge port 16 centrally disposed therein are provided at the front of housing 12 for the purpose of conveniently dispensing a heated fluid product to the user of the device. A recess 17 is also provided at the top of housing 12 for receiving the major portion of the cylindrical body of an aerosol-type container 18 of the product to be dispensed, the container being inverted and inserted into recess 17 at the top margin of the body housing. The container includes a manually-actuated discharge spout 19 through which the product is dispensed when the user pushes down on the container.

The housing 14 of base portion 13 supports a heating probe 20 in vertical upstanding relationship to the surface on which the dispenser is setting. A hollow cylindrical extension 21 of reduced diameter is provided from the top surface of housing 14 concentric with and spaced apart from heating probe 20 to provide a better engagement between body portion 11 and base portion 13 and to help shield the user of the appliance from inadvertent contact with the probe. An indicator jewel 22 is provided in the base portion to indicate when the heating probe is at operating temperature, and a plurality of skid-resistant rubber feet 23 may be provided underneath the base to aid in providing a stable base for the dispensing device. Alternatively, suitable downwardly-extending projections may be provided on housing 14 for the same purpose. A power cord 24 extending from the bottom of housing 14 conveys line current to the heating probe 20.

Referring now to FIGS. 2, 3 and 4, the product container 18 is seen to be held in position by means of an annular retainer ring 25 which frictionally engages the inside surface of recess 17 and the rim of the dome-shaped inverted end of the container 18. One or more bosses 26 may be provided about the circumference of recess 17 to prevent removal of container 18 once inserted. In practice, the dispensing device 10 may be marketed either with the container 18 in place and secured by retainer ring 25, or may be marketed separately with the proviso that the user insert the product container into the housing.

Referring now to FIGS. 2, 4 and 5, the heating probe 20 is seen to be received by a cylindrical recess 27

molded into the bottom of housing 12. This recess is preferably lined with a complementarily shaped sleeve 28 which is open at its bottom end and closed at its top end to form a liquid-tight receptacle for receiving heating probe 20. Sleeve 28, which may be formed of aluminum or a similar high-heat-conductivity metal, includes a rim portion 30 surrounding its open end to form interconnecting passageways for the product, as will be described presently. The margins of the rim portion 30 are preferably turned upward to engage an annular boss 31 provided at the rim of recess 27 to hold sleeve 28 in position.

The heat transfer portion of heating probe 20 comprises a cylindrically shaped sheath 32 complementarily dimensioned to probe-receiving recess 27. This sheath, which is also preferably constructed of a high-heat-conductivity metal such as aluminum or stainless steel, is enclosed at its top end and opens at its bottom end into the interior of the housing 14 of base portion 13. Sheath 32 is secured to housing 14 by means of a flange 33 provided about its open end, the flange being secured by a suitable high-temperature adhesive or cement 34 to housing 14, or by heat deformation of the adjacent margins of housing 14. Housing 12 and housing 14 are preferably molded of a high-temperature thermoplastic material such as polypropylene, and may be colored to provide an aesthetically pleasing appearance.

To heat sheath 32 to a desired temperature, an electrical heater element 35, which may be a conventional ceramic-body type element, is positioned within and concentric to the sheath. The heater element includes a hollow center core section within which a thermostat 36 is positioned. One side of the incoming line, as represented by line cord 24, is connected by a safety fuse 37 to one terminal of heating element 35. The other terminal of element 35 is connected to the other side of the AC line through thermostat 36, which interrupts current flow to the heating element when the temperature sensed within the element exceeds a predetermined maximum level. A neon indicator lamp 38 is connected across thermostat 36 to provide through indicator jewel 22 an indication to the operator that the heating probe has reached operating temperature and the product can be dispensed.

Referring to FIGS. 4-8, the discharge nozzle 19 of product container 18 seats against a receiving port 40 molded into housing 12. This receiving port is connected by an axially-aligned passageway 41 to a radially-extending channel 42, which connects with a first vertical channel 43 extending longitudinally along the side wall of recess 27. Channel 43 extends to the bottom of recess 27 where it connects with a first circumferential channel 44, which extends part way around the circumference of recess 27 adjacent the open end of the recess. Channel 44 connects with a second longitudinally-extending channel 45, which extends to the top end of recess 27 where it connects with a channel 46 molded into the top of the recess. Channel 46 connects with a third longitudinally-extending passageway 47 which extends downwardly to connect with a second circumferential channel 48 adjacent the open end of the recess. Channel 48 connects with a fourth longitudinal channel 49, which extends part way up recess 27 to connect with discharge port 16.

It will be appreciated that the channels 41-49 molded into housing 12 each have an open side and therefore

cannot function as passageways for conveying the fluid product to discharge port 16 absent a covering over these open sides. In accordance with the aforementioned application of the present applicant, Ser. No. 359,026, this covering is provided in dispensing device 10 by means of sleeve 28, the body portion of the sleeve covering channels 43, 44, 45, 47, 48 and 49, and the end portion of the sleeve covering channels 42 and 46. Alternatively, it will be appreciated that sleeve 28 can be omitted and the same result can be obtained by covering action of the surface of heating probe 20, the latter element being then dimensioned to closely engage the inside wall of recess 27. In either case, the insertion of sleeve 28 or probe 20 effectively converts the three-sided channels 42-49 to four-sided passageways, and to avoid confusion the channels will henceforth be referred to as such. The product flow through passageways 41-49 can be seen in FIG. 8, housing 12 and heating probe 20 being omitted therein for clarity and the flow of the product being indicated by arrows.

The provision of open-sided channels instead of enclosed passageways in housing 12 is of great advantage in manufacturing the dispensing device, since it obviates the need for molding a complex labyrinth of interconnecting passageways into the housing and thereby enables the housing to be formed by a simple single-step molding process. All that is necessary is to mold the channels into the housing with the initial housing molding operation, and then in a subsequent step in the assembly process to insert the sleeve 28 into position. Once sleeve 28 has been firmly seated, all passageways are complete and the product dispenser is ready for service.

Another advantage of the present passageway configuration is that by removing heating probe 20 and sleeve 28 it is possible to thoroughly clean all of the interconnecting passageways. This was not possible with prior-art devices because the passageways were established at the time of the initial molding operation and therefore ready access to the passageways could be obtained only with great difficulty. Furthermore, with the present unit, once the base portion 13 of the dispensing device, with its associated electrical circuitry, is removed from the body portion 11, the entire body housing 12 can be immersed in water and all remnants of the previously-used product can be washed or brushed away.

In accordance with the present invention, for optimum stability and convenience in use and for maximum economy in manufacture the heating probe 20 in dispensing device 10 is arranged in vertical upstanding orientation on base portion 13. To this end, the top surface of the housing 14 of base portion 13 is provided with an annular opening for receiving the heating probe sheath 32, and the circumferential flange 33 provided about the mouth of the sheath 32 is cemented to housing 14 at the rim of the annular opening. The bottom end of housing 14 is preferably closed by means of a cover plate 50, and the four rubber legs 23 are mounted to housing 14 at the circumference of cover plate 50 to provide a stable slip-resistant engagement with a flat supporting surface. Line cord 24 enters the enclosed base housing 14 through an opening provided in cover plate 50, and indicator lamp 38 is held in place against indicator jewel 22 by a spring clip 51.

In operation, once line cord 24 has been connected to a source of line current and heating probe 20 has

reached operating temperature, all the user need do to obtain a heated quantity of the product is to depress container 18. This forces nozzle 19 against the product-receiving port 40, opening the internal valve of the container and discharging the product under pressure into passageway 41. The product progresses along passageway 41 until it reaches passageway 42 where, by reason of the overlying sleeve 28, the product is forced along passageways 42-49 to discharge port 16.

In accordance with another aspect of the invention, means in the form of a removable tab 52 are provided for preventing the discharge nozzle 19 of product container 18 from being accidentally depressed. Tab 52 is disposed edgewise to extend transversely through an aperture 53 provided in housing 12 and into the space between the inverted end of container 18 and inlet port 40. While tab 52 is in position product container 18 cannot be depressed and discharge nozzle 19 cannot be actuated. When tab 52 is removed by the user prior to use of the dispensing device, product container 18 can be depressed to open discharge nozzle 19. The user may reinsert tab 52 at any time to prevent inadvertent actuation of nozzle 19, as when packing the dispensing device in a suitcase.

As the product proceeds along passageways 41-49, it is in direct contact with sleeve 28, which we have seen is formed of a high-heat-conductivity metal such as aluminum. Since this sleeve is in turn in contact with the heater sheath 32, also a metal of high-heat-conductivity, which in turn is in contact with electric heating element 35, a high degree of heat transfer is obtained between heating probe 20 and the product. Thus, the product is thoroughly heated to a desired temperature by the time it is dispensed through aperture 16 to the user.

The ceramic heater element 35 is supplied with current by way of line cord 24, the high-temperature fuse 37 and the thermostat 36. Fuse 37 is provided to interrupt current flow to the ceramic heating element should thermostat 36 fail for any reason and the temperature in the probe become excessive. Normally, thermostat 36 opens when the probe reaches a predetermined maximum temperature, typically in the order of 180°F, and closes when the temperature of the probe falls to a predetermined minimum temperature, typically 160°F. By reason of the thermal mass of electric heater element 35 heat is retained in the probe even when the heating element is not energized, so that a relatively uniform temperature in the range of 160° to 185° is obtained in practice.

The neon lamp 38 is connected across thermostat 36 to indicate by lighting when the thermostat is open and the probe is at operating temperature. When the thermostat is closed lamp 38 is shorted and does not light, indicating that the heating element is heating.

Upon completion of the dispensing operation, the base and body portions of the dispensing device may be separated and the base portion used, if desired, in connection with other body portions for dispensing other products. This results in a significant cost savings, since only one base portion with its attendant heating elements and control circuitry need be purchased for repeated use with various products and dispensers. The provision of sleeve 28 around the heating probe sheath 32 facilitates this, since the probe is not in contact with the dispensed product and therefore need not be cleaned between uses.

The housing 12 of the body portion 11 of the dispensing device may be discarded after the product container 18 has been completely exhausted, or may be utilized in conjunction with another container for either the same or a different product. Should it be desired to use the dispenser to dispense another product, the various passageways of the housing can be cleaned after heating probe 20 and the aluminum sleeve 28 have been removed, as previously described.

It will be appreciated that other shapes and sizes of heating probes can be used, and that the base for supporting the probe can also be of various sizes and shapes. Also, other configurations could be employed for the product conveying passageways, such as a spiral configuration about the inside surface of the probe-receiving recess.

While product container 18 has heretofore been shown as an aerosol-type container, it will be appreciated that other types of dispensers or containers can be used with a dispensing device constructed in accordance with the invention. For example, it would be possible to utilize a container having flexible side walls wherein the user, by squeezing the walls, forces the product out into the dispensing device. Alternatively, a plunger-like arrangement could be provided such that when the plunger is depressed by the user a quantity of the product is forced out into the dispensing device.

The novel vertical arrangement of the heating probe provided by the present invention increases the convenience and utility of the dispensing device, while at the same time reducing its cost. Because probe 20 is held by base portion 13 in a vertical position, the body portion 11 of the dispensing device can be attached to the base portion 13 by merely aligning the heating probe with the probe-receiving recess 27 provided in housing 12. Housing 12 is then pressed down over the base portion until the two housings come into contact, forming a unitary aesthetically pleasing assembly. This arrangement has the advantage of providing a stable support platform for the heating probe 20 because of the wide spacing of mounting feet 23 on housing 14 and the concentration of weight within the housing. If desired, additional weights can be included in the base portion for further stabilization.

Another advantage of the vertical orientation of the heating probe is that the discharge nozzle 19 of product container 18 is axially aligned with the probe-receiving recess 27. This simplifies the arrangement of passageways and provides for more economical manufacture of the body portion, since less material is required and all passageways including the inlet port can be molded in one operation. Since it is contemplated that body portion will be discarded after its attached product container 18 is expended, any cost savings realized in that portion of the dispensing device are particularly desirable.

The storage of heating probe 20 is also facilitated by reason of the attached base, since the probe, even when hot, can be readily stored and will always remain in an upright position. Furthermore, the extension of housing 14 upwardly around probe 20 aids in protecting the user from burns suffered from inadvertent contact with the heating probe surface.

The removable tab assembly provided by the invention for preventing inadvertent actuation of the dispensing device during storage and transit facilitates marketing the body portion of the dispensing device

with the product container installed, thereby adding further to user convenience.

While a particular embodiment of the invention has been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from the invention in its broader aspects, and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of the invention.

I claim:

1. A dispensing device for dispensing a heated fluid product from a container having a discharge nozzle at one end, said device comprising, in combination:

a base portion comprising a heating probe and a base for supporting said heating probe in a vertical up-standing position;

a body portion comprising a housing having top, bottom and side faces, means for receiving said product container on said top face, a dispensing port for delivering said product to a user on said side face, and a recess on said bottom face for slidably receiving said heating probe to render said body portion removable from said base portion;

and

means comprising a plurality of communicating channels, at least two of which extend longitudinally along the inside surface of said probe-receiving recess, and a heat-conductive sleeve inserted into said probe-receiving recess over said channels for forming passageways for conveying said product from said container to said discharge nozzle in close proximity to said probe whereby said product is heated prior to being discharged.

2. A dispensing device as defined in claim 1 wherein said container comprises an aerosol-type container in which said fluid product is contained under pressure.

3. A dispensing device as defined in claim 2 wherein said product container has a normal position when received in said product container recess, and an actuated position when dispensing said product, and in which a removable tab is provided for preventing said product container from being placed in said actuated position during shipment.

4. A dispensing device for dispensing a heated fluid product from an aerosol spray-type container having a discharge nozzle at one end, said device comprising, in combination:

a probe-shaped heating element;

a base portion comprising a housing for supporting said heating element in a vertical position relative to an underlying supporting surface;

a body portion removably mounted to said base portion comprising a housing having top, bottom and side walls, an aperture in said top wall for receiving said product container, a dispensing port in said side wall for delivering said product to a user, and a recess in said bottom wall for slidably receiving said probe-shaped heating element; and

means comprising a passageway in said body portion for conveying said product from said discharge nozzle to said dispensing port, at least a portion of said passageway comprising in part a channel molded into the inside surface of said probe-receiving recess for conveying said product in close proximity to said heating probe to heat said product prior to discharge.

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5. A dispensing device as defined in claim 4 wherein said heating element is cylindrical, and said recess comprises a cylindrical bore in said bottom wall.

6. A dispensing device as defined in claim 4 wherein said housing of said base portion has a substantially flat top wall, a substantially flat bottom wall parallel to and spaced apart from said top wall, and wherein the axis of said probe-shaped heating element is substantially perpendicular to said top and bottom walls.

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7. A dispensing device as defined in claim 6 wherein said base portion has a side wall and wherein the dimensions of the top margin of said base side wall correspond to the dimensions of the bottom margin of said side wall of said body portion to produce the appearance of a single unitary housing when said body and base portions are joined.

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