Nov. 20, 1951 T. B. CHACE ET AL 2,575,489

DISPENSER UNIT

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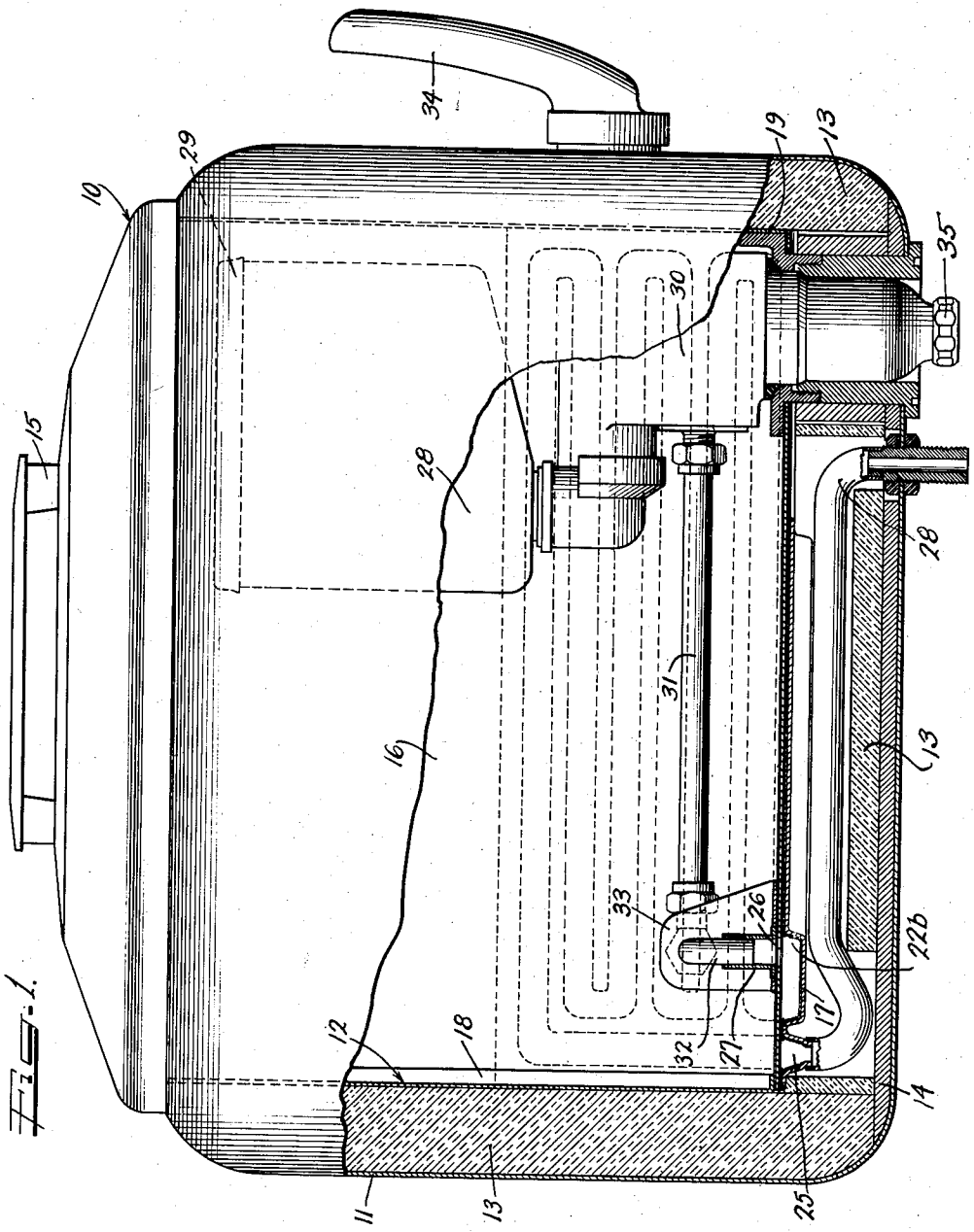

Fig. 1.

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Fig. 2.

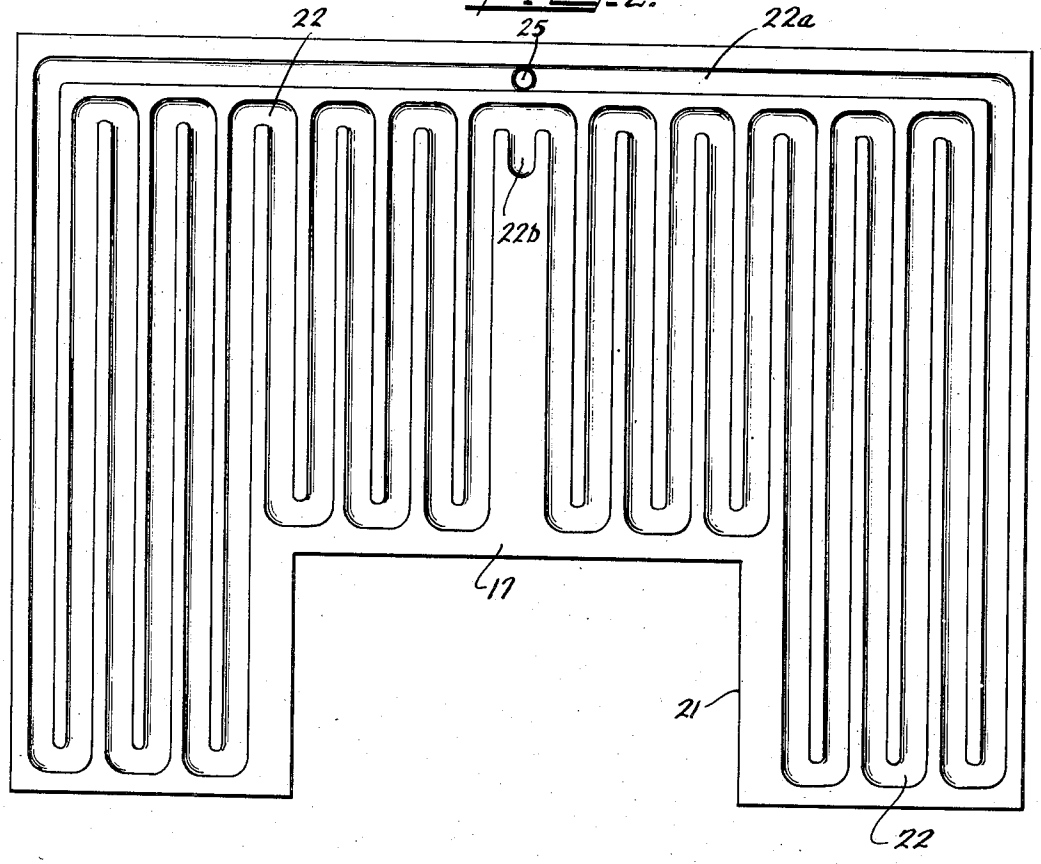
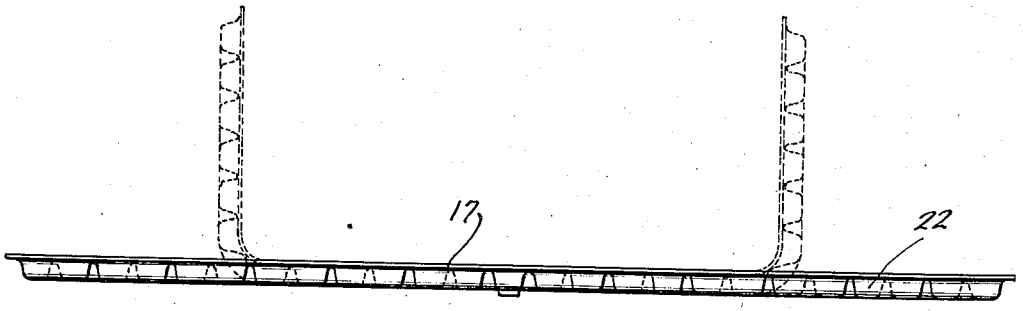


Fig. 3.



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DISPENSER UNIT

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Fig. 4.

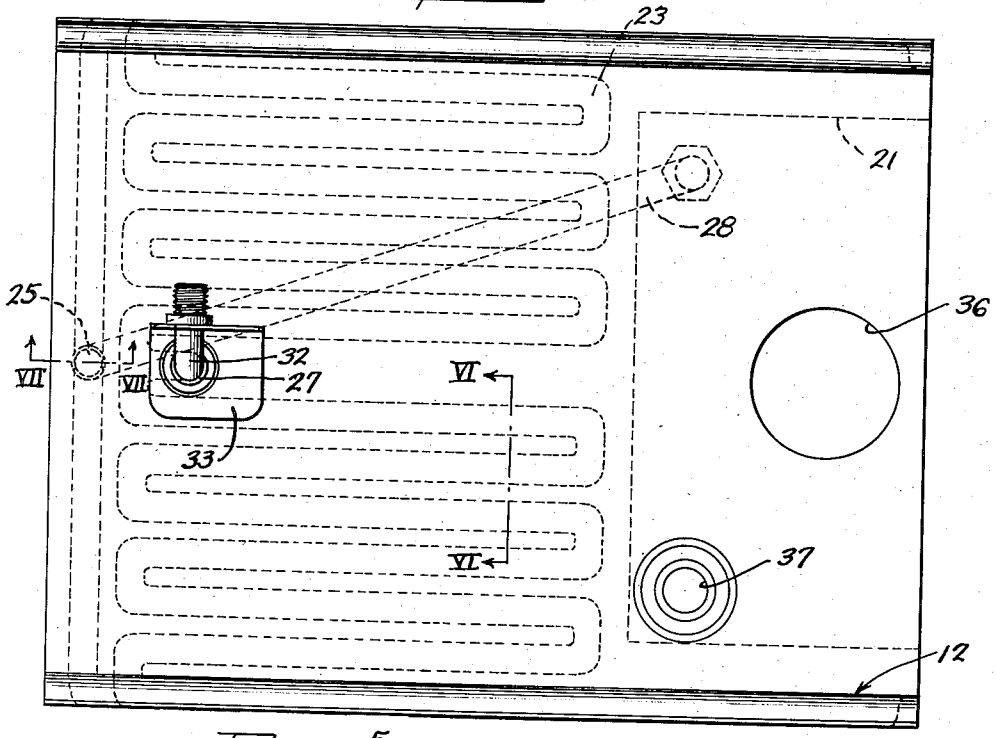


Fig. 5.

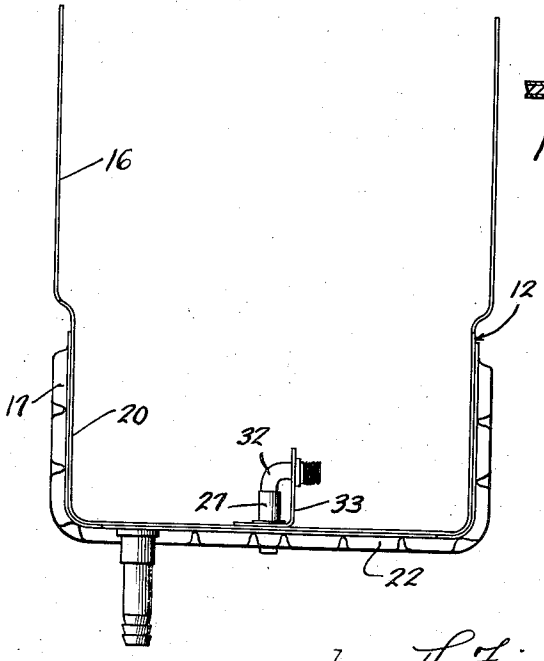


Fig. 6.

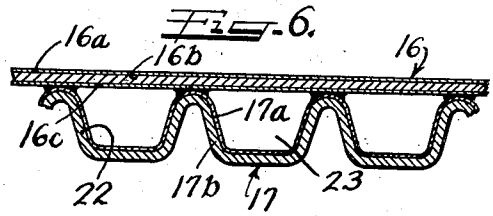
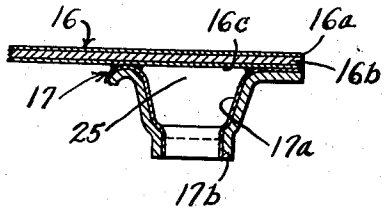


Fig. 7.



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2,575,489

UNITED STATES PATENT OFFICE

2,575,489

DISPENSER UNIT

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Application March 17, 1945, Serial No. 583,196

1 Claim. (Cl. 257—256)

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This invention relates to an improvement in fluid dispenser units or the like. More particularly, the invention pertains to a novel form and construction of a container for use in a fluid dispensing equipment for confining the temperature changing medium and providing a fluid channel for carrying the fluid to be dispensed while it is subjected to the action of the temperature changing medium.

Dispenser units of the type to which the present invention relates are commonly employed in dispensing carbonated beverages of the type wherein a syrup is mixed with carbonated water. Both the syrup and the carbonated water are preferably chilled before mixing and the mixing valve is also preferably chilled.

It is an object of the present invention to provide a dispensing device which efficiently chills the beverage and is constructed in such a manner as to facilitate cleaning. The present invention contemplates the provision of a container which is entirely free from internal obstructions such as cooling coils and the like and, therefore, may be readily cleaned.

The container of the present invention comprises generally a lining member which has a corrugated jacket portion cooperating with at least a portion of the outer surface of said liner to define a fluid passage therebetween for carrying the liquid which is to be subjected to the action of the temperature changing medium. The fluid passage provided in the jacket portion serves to render the internal surface of the liner substantially smooth and free from obstruction. Moreover, both the liner and the jacket may conveniently be fabricated from a material having a high degree of heat conductivity and which is preferably coated with a substance which is non-corrosive and, therefore, unaffected either by the temperature changing medium or by the fluid which is to be subjected thereto.

It is an object of the present invention to provide a container for a dispenser unit or the like which will accommodate the temperature changing medium and will possess all of the aforementioned important attributes in addition to being easy to construct and economical to fabricate.

It is a further object of the present invention to provide a highly efficient form of container for a dispenser unit or the like in which the passage for the fluid to be subjected to the action of the temperature changing medium is formed between cooperating plies of material, one of which forms the internal wall of the container confining the temperature changing medium.

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It is also an object of the present invention to fabricate the container from an inner plate which forms the side walls and bottom of the container and an outer plate having a plurality of corrugations and being bent to correspond generally to the inner plate secured to the exterior of the inner plate in such a way as to form an endless fluid passage therebetween which directs portions of the fluid admitted thereto in two opposite directions from a common inlet to a common outlet.

It is a further object of the present invention to form the aforementioned outer plate of the container in such fashion that one of the streams of the fluid admitted to the passage will pass through that portion of the passage which traverses the side wall and at least a portion of the bottom of the container in its path of travel from the inlet to the outlet for the passage.

It is a still further object of the invention to provide a cut out portion in the outer plate in that portion thereof which cooperates with the bottom of the inner plate of the container to surround the valve means for the dispenser unit.

Another object of the present invention is to provide a container for a dispenser unit or the like in which the material employed in the fabrication of the container provides a high degree of heat conductivity and is also corrosion resistant.

Another and still further object of the present invention is to provide a container for a dispenser unit or the like which comprises a plied construction in which the material forming each ply possesses a high degree of heat conductivity but is coated or clad with a non-corrosive material which will not be adversely affected either by the temperature changing medium or the fluid which is to be subjected thereto.

Another and more specific object of the present invention is to provide a dispenser unit embodying an insulated cabinet, a container disposed in said cabinet for confining a temperature changing medium, said container having at least one wall comprising superposed plies of material constructed and arranged to define therebetween an endless passage of tortuous configuration for the fluid which is to be subjected to the action of the temperature changing medium, means for introducing fluid to the passage and means for discharging the fluid from the passage.

The novel features which we believe characteristic of our invention are set forth with particularity in the appended claim. Our invention itself, however, both as to its manner of construc-

tion and mode of operation, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

Figure 1 is a side elevation with parts in section and broken away of one form of dispenser unit embodying the teachings of the present invention;

Figure 2 is a plan view of of one of the elements or plies of material employed in constructing the container for the temperature changing medium employed in the dispenser device of Figure 1;

Figure 3 represents a side elevation of the part illustrated in Figure 2 and indicating the manner in which it is to be shaped for use in the construction of the container;

Figure 4 is a plan view of the assembled elements or plies of material forming the container of the dispenser unit;

Figure 5 represents an end elevation of the container of Figure 4;

Figure 6 is a partial cross-sectional elevation taken along the line VI—VI in Figure 4; and

Figure 7 is a cross-sectional view taken along the line VII—VII in Figure 4.

The dispenser unit with which the teaching of the present invention is particularly advantageously adapted to be employed is indicated generally in Figure 1 of the drawings by the reference character 10. The unit 10 comprises an outer casing or cabinet 11 in which is disposed a container 12 for accommodating a suitable temperature changing medium such, for example, as ice or the like. A suitable insulating material 13 may be employed to separate the outer wall of the container 12 and the inner wall of the cabinet 11. The cabinet 11 is provided with a stiffening member 14 in its base to assist in supporting the insulating material 13. A removable cap 15 provides access to the interior of the container 12.

The container 12 may advantageously be of plied construction in which a pair of metal plates 16 and 17 are employed as shown in Figures 4 and 5 and cooperate with end plates 18 and 19. The innermost plate 16 is preferably shaped by a bending operation to form the bottom and two side walls of the container 12 and has an indented portion 20 adjacent the base thereof having a transverse dimension somewhat less than the corresponding dimension adjacent the uppermost ends of the side walls, as illustrated in Figure 5. The end walls 18 and 19 as will be seen from Figure 1, are inwardly flanged and correspond in shape to the transverse cross-sectional configuration of the inner plate 16 in order that they may be secured to said plate 16 in any suitable fashion such, for example, as by welding, brazing or other equally applicable fastening means.

The outer plate 17 is preferably formed as illustrated in Figures 2 and 3 having a cut out portion 21 in one edge thereof, is advantageously of one piece construction although it may be formed of a number of complementary sections. The plate 17 which is provided with an embossed or corrugated surface produced by a die-casting or a forging operation to form an endless channel 22 on the surface of the plate. The channel 22 serves to form a passage 23 of tortuous configuration when the plate 17 is welded or otherwise suitably secured to the external surface of the inner plate 16 in the manner indicated in Figure 5. The outer plate 17 is preferably

formed or bent so as to enable it to be secured to the base and lowermost portion of the walls of the bent inner plate 16 at the indented portion 20 thereof so that the overall outer dimension of the assembled plates 16 and 17 will correspond with the transverse dimension of the bent plate 16 adjacent the uppermost end of the wall portions thereof.

The portion 22a of the channel 22 formed in the plate 17 has an inlet connection 25 disposed substantially intermediate its ends (see Figure 7). The plate 16 has an aperture 26 therein (see Figure 1) positioned in the bottom portion of said plate in such fashion that it registers with the dished side of the branch portion 22b of the channel 22 and has associated therewith a suitable outlet connection 27 extending upwardly and internally of the container 12. Thus, the passage 23 formed between the corrugations defining the channel 22 in the plate 17 and the external surface of the plate 16 is adapted to receive a fluid such, for example, as carbonated water introduced through a suitable tube 28 sweated or otherwise secured to the inlet connection 25 for discharge through the outlet connection 27.

A portion of the fluid, in this case carbonated water or the like, is caused to traverse that part of the passage 23 between the inlet connection 25 and the outlet connection 27 therein which represents at least half the overall length of the passage 23. By virtue of the shape of the channel 22 and the plate 17 in which it is formed, the passage 23 traces a tortuous path extending across at least a portion of the bottom of the container 12 and one side thereof. The carbonated water is effectively chilled through conduction by the use of a suitable temperature changing medium which, in such operations may advantageously be ice, an ice and salt mixture or other cooling material, disposed in the container 12 and in contact with the plate 16.

The carbonated water may travel in either of two directions through passage 23 from the inlet connection 25. In each case, the carbonated water traverses a path of a length sufficient to chill it to the desired temperature to render the resulting drink in which it is employed exceedingly palatable. Moreover, the carbonated water passes along the side walls of the container and thence across the bottom of the container where the effect of the cooling medium is greatest.

A suitable container such, for example, as the jar 28 having a removable cover 29 thereon, may be provided inside the container 12 for supplying syrup or other flavoring material to a mixer valve unit 30 to which it is operatively connected. The mixer valve unit 30 which may advantageously take the form of that shown and described in the Lund application Serial No. 406,747, now Patent No. 2,349,441, is connected to the outlet connection 27 for the passage 23 as by means of a suitable connecting tube 31 provided with a pair of detachable couplings at opposite ends thereof. The outlet connection 27 which has an elbow 32 secured thereto and supported against bending by a bracket 33 is adapted to receive in threaded engagement therewith one of the couplings at one end of the connecting tube 31.

The mixer valve unit 30 is designed to mix syrup from the jar 28 with carbonated water supplied from the passage 23 in the proper proportions to produce the desired drink mixture. The mixer valve 30 is operated manually by the manipulation of the handle 34 and the mixed

drink is discharged through the outlet 35 into a suitable glass, cup or other container supported therebelow. The cut out portion 21 of the outer plate 17 is advantageously arranged so as to be spaced about an aperture 36 in the inner plate 16 through which the outlet 35 of the mixer valve 30 projects and a drain opening 37 provided in said plate 16 to facilitate the cleansing of the container 12.

As a result of the previously described construction of the container 12, it will be apparent that the inner plate 16 presents a substantially smooth surface against which the cooling medium is disposed and, thereby, simplifies the construction to the extent that it may be more readily cleaned not only to maintain the desired standard of cleanliness but also to insure utmost efficiency of the cooling medium. Certain cooling mixtures, customarily employed in such dispenser units as that to which the present invention relates, have a tendency to create sludge formations, coatings and other forms of contamination upon the surface of the container in which they are disposed. Thus, unless suitable provisions are made to facilitate the cleaning of the container, it soon becomes not only unsightly but also seriously reduced in the extent of its ability to transmit the cooling effect to the fluid in the coils associated therewith.

The container 12 as illustrated in the accompanying drawings enables the omission of the customary cooling coil from the interior thereof, a feature which aids materially in the ability to thoroughly cleanse the surface of the inner plate 16 so as to prevent sludge, coatings and other forms of contamination resulting from the cooling medium from adhering to its surface. It will be understood that the syrup jar 28 and the connecting tube 31 may be readily disassembled to aid in the cleansing operation, if it should be desired to do so.

As a further aid in maintaining the desired standard of cleanliness and effective operation of the dispenser unit 10, it has been found desirable to form the inner and outer plates 16 and 17 comprising the container 12 from sheet stock which has been coated or clad with a bright metal surface. The bright metal surfaces will not only withstand corrosion and adherence of contaminating films or the like but will also make it possible to use materials which possess a relatively high degree of heat conductivity and are normally deleteriously affected by certain fluids such, for example, as the carbonated water employed in the manufacture of mixed drinks. Thus, the inner plate 16 may be formed from sheet stock having a core 16*b* which may be of copper or other suitable material having a high heat conductive capacity provided with a comparatively thin coating or sheath 16*a*, 16*c* on opposite surfaces of plate 16 composed of stainless steel, silver or the like. The outer plate 17 may likewise be fabricated from sheet stock the bulk of which comprises a copper base and a single comparatively thin coating or sheath 17*a* of stainless steel, silver of the like.

Such a construction as that just described is highly effective for the reason that the stainless steel surface 16*a* applied to the inner wall of the container 12 on the inner plate 16 is resistant to corrosion and adherence of contaminating films such, for example, as those which might result from the use of ice, ice and salt mixture, or other like cooling media. The surface 16*a* protects the copper core 16*b* which ordinarily becomes discolored or otherwise deleteriously affected by contact with such cooling media as are ordinarily employed in dispensing units. The surface 16*c* on the exterior of the plate 16 cooperates with the surface 17*a* on the outer plate 17 when the two plates are secured together to form a completely internally coated passage 23 for the carbonated water which has a tendency both under atmospheric pressure and when under pressure to attack certain metals.

The surfaces 16*c* and 17*a* may advantageously be formed of silver or, if desired, may correspond to the surface 16*a* which is advantageously of stainless steel in that both forms will serve to protect the copper core 16*b* on the copper base 17*b* of the plates 16 and 17, respectively. The surface 16*a* is, in any event, preferably of stainless steel for the reason that it presents a somewhat harder surface and is more satisfactorily resistant to most cleansing operations with a minimum of wear. Such precautions as those employed in the selection of the surface 16*a*, however, are not critical in respect of the selection of the proper coating material for the surfaces 16*c* and 17*a* since they are not additionally subjected to wear.

The use of clad or coated metal sheet stock in the fabrication of plates 16 and 17, thus, enables the use of copper of substantial thickness representing, for example, approximately 80 to 90% of the bulk of the plate 16 inasmuch as the surfaces 16*a* and 16*c* preferably range from 5 to 10% of the bulk of the plate per surface. The use of such a large percentage of copper in the sheet stock enhances the ability of the plate 16 to transmit the effect of the temperature changing medium employed to the fluids contained in the passage 23 with a maximum degree of efficiency. The same principle applies to the fabrication of the outer plate 17.

Experience has taught that the optimum temperature of mixed drinks, of the type in the preparation of which the present type of dispenser unit is particularly advantageously employed, from the standpoint of taste, carbonation and the like, is between 33 and 37° F. With the construction contemplated by the present invention such temperature can be readily secured and maintained over a long period in the life of the equipment.

It will be understood that many modifications may be made in the illustrated embodiment of the invention and that, therefore, the structure illustrated is intended to be employed for illustrative purposes only. The container 12 may take any other suitable form such, for example, as a generally cylindrical shape, without in any way affecting the operation of the device or effectiveness of the container element.

A dispenser unit of the type disclosed herein may conceivably be employed in the production of hot mixed drinks of various types as well as in the mixing and production of cold drinks. It is, therefore, intended that the term "temperature changing medium" should connote any suitable form of medium whether it be heat or cold inducing solid, gaseous or liquid substances or electrical or mechanical means for imparting changes in temperature to one or more of the elements combining to form the product of the dispenser unit.

It is conceivable that a concentrated form of flavoring extract or the like could be employed in the jar 28 for mixture with water or other suitable liquid flowing through the passage 23 and heated by the use of a suitable temperature

changing means disposed within the container 12 to produce, with the aid of the mixer valve 30, a uniformly palatable hot drink. Other similar uses of the teaching of the present invention will be apparent.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claim.

We claim as our invention:

In a fluid dispenser unit or the like, a multi-walled container for confining the temperature changing medium comprising an inner plate having a substantially smooth inner surface presented to the temperature changing medium, said inner plate being bent to form the bottom and at least two side walls of the container, an outer plate having a plurality of corrugations therein bent in a form to correspond generally with that of the inner plate and secured thereto to partially overlay the exterior of the inner plate and to form between said inner and outer plates an endless tubular fluid passage defined by the corrugations in said outer plate, said passage extending along the side walls and at least a portion of the bottom of the container, an inlet and

an outlet at the bottom of the container for admitting to said passage the fluid to be subjected to the action of the temperature changing medium, said passage being so constructed that it divides the fluid into two oppositely flowing streams each of which passes from the inlet through the portion of the passage along the side wall of the container thence along the bottom of said container to the outlet.

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