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S. NICKO  
TAPPING PIPES HAVING PIERCING MEANS FOR  
TAPPING BEVERAGE CONTAINERS  
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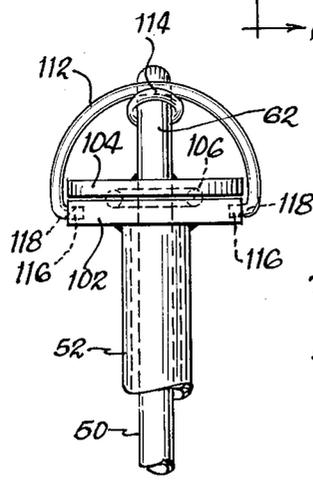
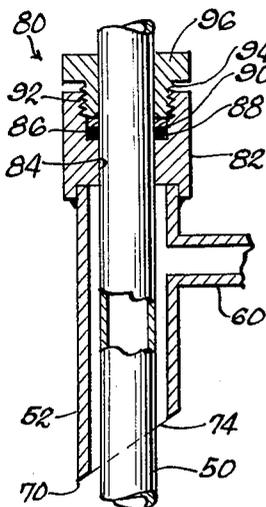
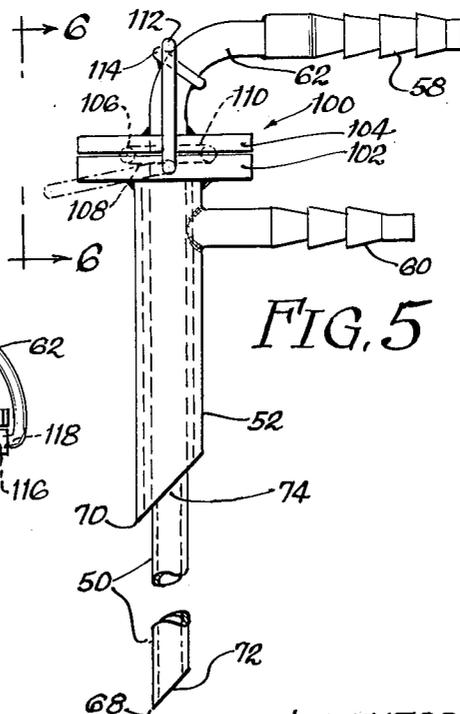
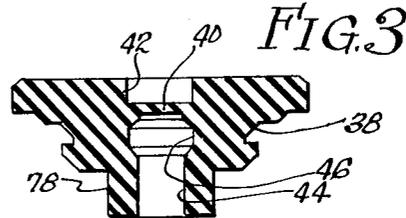
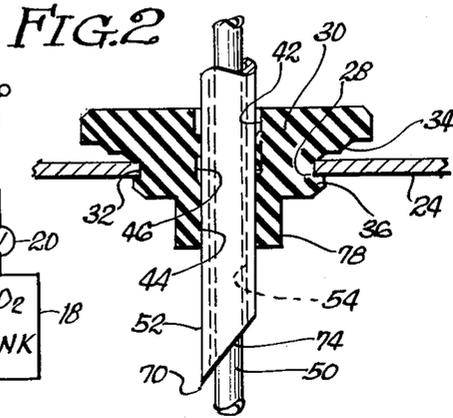
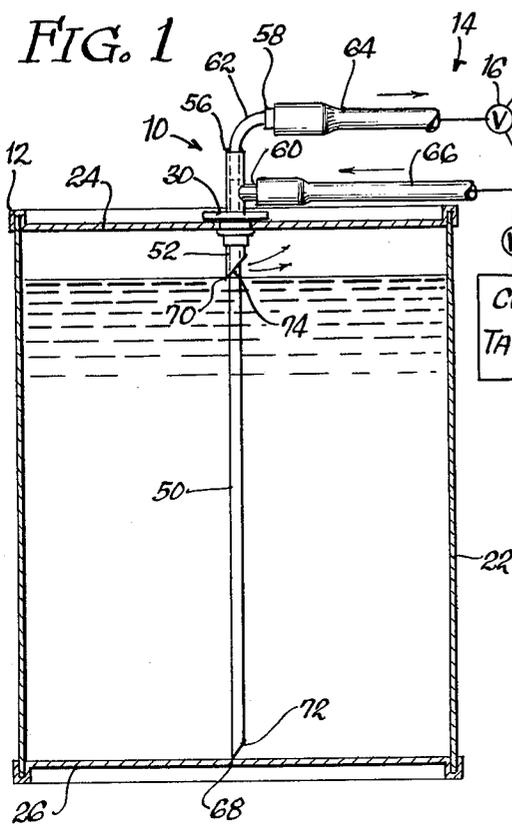


FIG. 4

FIG. 6

INVENTOR  
Stanley Nicko  
By  
McDougal, Herak & Scott  
Attys

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**TAPPING PIPES HAVING PIERCING MEANS FOR TAPPING BEVERAGE CONTAINERS**

Stanley Nicko, Chicago, Ill., assignor to Flake Ice Machines, Inc., Chicago, Ill., a corporation of Illinois

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2 Claims. (Cl. 222-82)

This invention relates to new and improved tapping pipes for use in dispensing beer or other beverages from cans or other containers. The tapping pipes are especially well suited for use in connection with a beverage dispenser of the type disclosed and claimed in my co-pending application, Serial No. 276,515, filed April 29, 1963, now Patent No. 3,195,779, issued July 20, 1965.

One object of the present invention is to provide a new and improved tapping device having inner and outer concentric tapping pipes for introducing gas under pressure into a beverage can or other container, and for withdrawing the beverage therefrom.

A further object is to provide such a new and improved tapping device in which the inner tapping pipe extends substantially below the lower end of the outer tapping pipe, and in which the lower ends of both pipes are cut off at a diagonal and are formed with sharp points for penetrating a diaphragm or closure on the beverage container.

Another object is to provide such a new and improved concentric or coaxial tapping device having means forming a seal between the upper end portions of the inner and outer tapping pipes.

A further object is to provide such a new and improved tapping device having means for disengageably securing the inner tapping pipe within the outer tapping pipe, so that the tapping device may readily be assembled and disassembled for cleaning.

Another object is to provide such a new and improved tapping device having sealing means for closing the upper end of the space between the inner and outer tapping pipes.

Further objects and advantages of the present invention will appear from the following description, taken in connection with the accompanying drawings, in which:

FIG. 1 is an elevational section showing a beverage can which is fitted with a tapping device to be described as an illustrative embodiment of the present invention.

FIG. 2 is an enlarged fragmentary elevational section showing the manner in which the tapping device is inserted through the diaphragm of a rubber closure plug on the beverage container.

FIG. 3 is an elevational section showing the rubber closure plug in its initial state, before the tapping device is inserted through the plug.

FIG. 4 is a fragmentary elevational section showing a modified tapping device which is constructed so that the inner tapping pipe may readily be removed from the outer tapping pipe.

FIG. 5 is an elevational view showing another modified tapping device having a quick action clamp removably securing the inner tapping pipe within the outer tapping pipe.

FIG. 6 is a fragmentary elevation taken generally as indicated by the line 6-6 in FIG. 5.

It will be seen that FIG. 1 illustrates a tapping device 10 as used in connection with a beverage container 12 for holding beer, carbonated beverages or the like. It will be understood that the tapping device 10 may also

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be used in connection with bottles or other types of containers.

The tapping device 10 forms part of a beverage dispensing system 14 whereby the beer or other beverage may be dispensed from a faucet or valve 16 which receives the beverage from the can 12. The beverage is forced out of the can 12 by supplying carbon dioxide or other gas under pressure to the can 12, preferably from a carbon dioxide tank or cylinder 18. A valve assembly 20 may be connected between the carbon dioxide tank 18 and the tapping device 10, to regulate the pressure of the carbon dioxide and also to provide for shutting off of the flow of carbon dioxide.

The illustrated beverage can 12 is of the usual type, made of thin sheet metal or equivalent material. Typically, the can 12 may have a capacity of one gallon. As shown, the can 12 has a substantially cylindrical side wall 22 which is closed by upper and lower end walls 24 and 26.

The upper wall 24 of the can 12 is formed with a single opening 28 which is closed and sealed by a plug or closure 30 made of rubber or other soft rubber-like material. The plug 30 is preferably of the construction disclosed and claimed in the above-mentioned co-pending application, Serial No. 276,515. The plug 30 may be molded in one piece from rubber, synthetic rubber or various soft resilient plastic materials.

As shown, the plug 30 is generally in the form of a circular disc and is provided with an annular peripheral groove 32 for receiving the top wall 24 of the can 12 around the opening 28. Annular flanges 34 and 36 project outwardly from the plug 30 above and below the groove 32 for retaining the plug in the opening 28. The outside diameter of the plug 30 at the bottom of the groove 32 should be substantially larger than the diameter of the opening 28 so that the plug 30 will be compressed to a substantial extent when it is inserted into the opening. In this way the plug 30 will form a tight seal for the opening 28. Moreover, the sealing action of the plug is enhanced by the provision of an outwardly and upwardly flaring frusto-conical wall or surface 38 at the upper side of the groove 24 and on the underside of the flange 34. The tapering surface 38 is adapted to be compressed against the top wall 24 so as to form a tight seal therewith.

As shown to advantage in FIG. 3, the plug 30 has an imperforate central diaphragm 40 which is adapted to be penetrated by the tapping device 10. The diaphragm 40 prevents the escape of the beverage or the carbonation until the tapping device is inserted. The plug 30 is inserted immediately after the can 12 has been filled and is effective to seal the can during shipment and storage, prior to use in the dispenser 14.

The diaphragm 40 is formed integrally with the plug 30 and is interposed between an upper axial bore or opening 42 and a lower axial bore or opening 44. Just below the diaphragm 40, the lower bore 44 is formed with an enlarged annular recess or cavity 46 which is adapted to receive the remnant or flap formed by the diaphragm 40 after it has been punctured by the tapping device 10. If it were not for the recess 46, the diaphragm might be severed entirely from the plug and might drop into the beverage in the can 12. It is undesirable to permit the diaphragm to drop into the beverage, because there is a possibility that the diaphragm may clog the dispenser or may be dispensed through the faucet 16 with the beverage.

The illustrated tapping device 10 comprises an inner tapping pipe 50 through which the beverage is withdrawn from the can 12. The inner pipe 50 is relatively long and is adapted to extend to a point closely adjacent the bottom of the can 12 so that virtually all of the beverage can be withdrawn by the inner pipe.

The tapping device 10 also comprises an outer tapping pipe 52 which is concentrically received around the inner pipe 50. The inside diameter of the outer pipe 52 is greater than the outside diameter of the inner pipe 50 to provide an annular space or opening 54 therebetween, through which the carbon dioxide or other gas is introduced into the beverage can 12. The outer pipe 52 is relatively short and is adapted to extend only a short distance into the can 12 so that the carbon dioxide is introduced into the upper portion of the can. Thus, the inner pipe 50 extends a considerable distance below the lower end of the outer pipe 52.

In the construction shown in FIG. 1, a welded or brazed joint 56 is formed between the upper end of the outer pipe 52 and the upper portion of the inner pipe 50. The welded joint 56 closes the upper end of the annular space 54 and also forms a secure mechanical connection between the inner and outer pipes 50 and 52.

As shown in FIG. 1, hose or terminal fittings 58 and 60 are connected to the upper ends of the inner and outer pipes 50 and 52. For convenience, the upper end of the inner pipe 50 is bent laterally to form an elbow section 62. The hose fitting 58 is adapted to receive a flexible hose or tube 64 which extends to the faucet 16.

The hose fitting 60 extends laterally or radially at right angles from the outer pipe 52 and is adapted to receive a hose or tube 66 which is connected to the valve assembly 20 for the carbon dioxide tank 18.

The lower ends of the inner and outer pipes 50 and 52 are formed with sharp points 68 and 70 for penetrating the diaphragm 40 of the closure plug 30. In this case, the points 68 and 70 represent the sharpened extremities of diagonal end surfaces 72 and 74 which are formed on the lower ends of the inner and outer pipes 50 and 52.

At its lower end, the plug 30 has a reduced sleeve or nipple portion 78 which projects downwardly from the plug. The lower bore 44 extends axially through the sleeve portion 78. The diameter of the bore 44 should be considerably less than the diameter of the outer tapping pipe 52 so that the sleeve portion will be stretched to a considerable extent when the outer tapping pipe is inserted through the bore 44. In this way, the sleeve portion 78 tightly grips the outer tapping pipe 52 and prevents the tapping device from being pushed outwardly through the plug 30 by the gas pressure in the can 12. The pressure of the gas on the sleeve increases the gripping action of the sleeve. It will be apparent that the sleeve provides a tight seal around the outer tapping pipe 52. Moreover, a seal is provided at the point where the diaphragm 44 was punctured by the outer tapping pipe 52.

FIG. 4 illustrates a modified tapping device 80 which is constructed so that the inner tapping pipe 50 may readily be removed from the outer tapping pipe 52. This construction facilitates the cleaning of the tapping device. It will be seen that the outer tapping pipe 52 is provided with a head or end fitting 82 which is welded or otherwise secured to the upper end of the pipe 52. The inner pipe 50 extends through and is guided by an axial bore 84 formed in the head 82. The bore 84 has an enlarged upper portion 86 which is adapted to receive an O-ring or other sealing ring 88, which may be made of rubber, synthetic rubber, various plastics, or other soft resilient materials. The O-ring 88 is adapted to form a seal between the outside of the inner pipe 50 and the inside of the head or end fitting 82.

In this case, an annular collar or flange 90 is brazed or otherwise secured to the outside of the inner tapping pipe 50 and is adapted to be inserted into the enlarged bore

86 for engagement with the upper side of the O-ring seal 88. The upper end of the bore 86 has internal threads 92 to receive the external threads 94 on an annular retainer or bushing 96. The lower end of the bushing 96 is engageable with the flange or collar 90 so as to press the collar against the O-ring 88.

The tapping device 80 may be disassembled by manually unscrewing the bushing 96 and withdrawing the inner pipe 50 from the outer pipe 52 and the end fitting 82. Thus, it is easy to disassemble and clean the tapping device 80.

FIGS. 5 and 6 illustrate another modified tapping device 100 which may be disassembled very quickly and easily. In this case, the upper end of the outer tapping pipe 52 is provided with an outwardly projecting annular flange 102. A similar flange 104 is provided on the inner pipe 50, opposite the upper side of the flange 102. An O-ring or other sealing ring 106 is adapted to form a seal between the flanges 102 and 104. The O-ring 106 may be made of rubber, synthetic rubber, various plastics, or other soft resilient materials. The O-ring 106 is preferably confined in circular cavities or recesses 108 and 110 formed in the opposite faces of the flanges 102 and 104.

The flanges 102 and 104 are normally clamped together by a clamping bail 112 which is swingably mounted on the flange 102 and is adapted to snap over a detent 114. It will be understood that the position of the bail 112 may be reversed as between the flanges 102 and 104. As shown, the bail 112 is generally semicircular. The ends of the bail 112 are bent inwardly to form inwardly projecting pivots 116 which are rotatably received in radial bores 118 formed in the flange 102. In this case, the detent 114 takes the form of a collar or flange which is welded or otherwise secured to the elbow portion 62 of the inner pipe 50, above the flange 104.

The tapping device 100 may be disassembled simply by swinging the bail 112 downwardly to disengage the bail from the detent 114. The inner pipe 50 may then be withdrawn from the outer pipe 52. It is easy to remove the O-ring 106 from the cavity 108 in the lower flange 102.

The tapping device 100 is reassembled by replacing the O-ring 106, inserting the inner pipe 50 through the outer pipe 52, and swinging the bail 112 upwardly with sufficient force to snap it over the detent 114. The interference between the bail 112 and the detent 114 provides sufficient clamping force upon the O-ring 106 to insure that the O-ring will maintain a perfect seal.

Various other modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims.

I claim:

1. In a tapping device for beverage containers or the like, the combination comprising inner and outer concentric tapping pipes with an annular opening extending downwardly therebetween, means forming a welded joint between the upper end of said outer pipe and the outside of said inner pipe, said joint providing a solid integral seal between said outer and inner pipes, said pipes having terminal fittings for connecting the upper ends of said pipes to hoses or the like, said inner pipe being substantially longer than said outer pipe and extending substantially below the lower end of said outer pipe, each of said pipes having a diagonal lower end surface with a sharp point for penetrating a rubber diaphragm or the like on a beverage container.
2. In a tapping device for beverage containers or the like, the combination comprising an elongated inner pipe for withdrawing the beverage from the container,

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an outer pipe disengageably received around said inner pipe in concentric relation thereto and providing an annular space between said inner and outer pipes for introducing gas under pressure into the container, a pair of opposite radial flanges on said inner and outer pipes, 5  
 said flanges having opposed radial faces, a sealing ring between said opposed radial faces of said flanges to form a seal therebetween, a clamping bail swingably mounted on one of said flanges, 10  
 and means engageable by said bail for clamping the flanges together, said inner pipe extending substantially below the lower end of said outer pipe, 15  
 each of said pipes having a lower end with a sharp point for penetrating a diaphragm or the like on the beverage container.

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LOUIS J. DEMBO, *Primary Examiner.*

RAPHAEL M. LUPO, *Examiner.*