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MIXING NOZZLE

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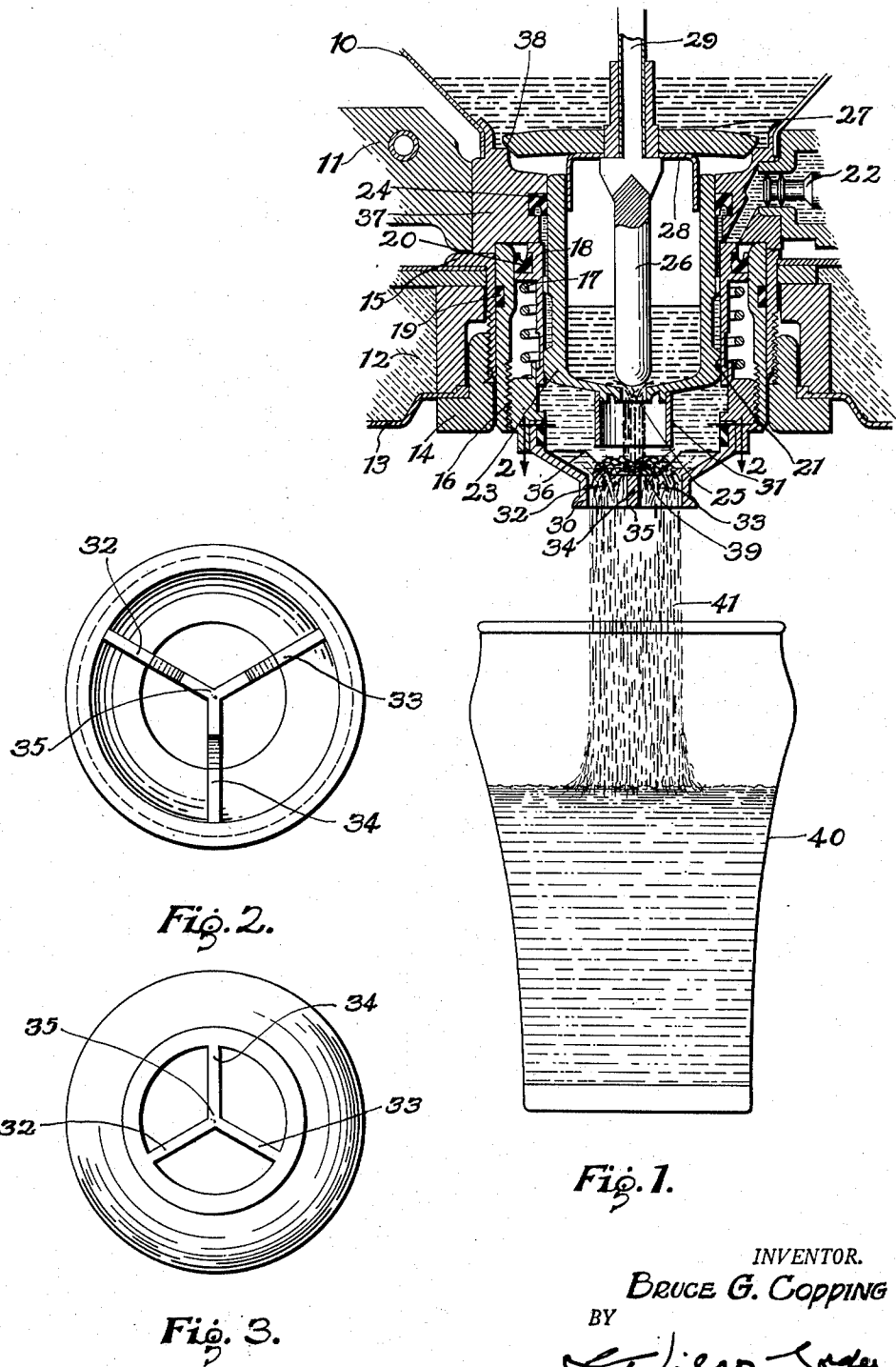


Fig. 1.

Fig. 2.

Fig. 3.

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MIXING NOZZLE

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2 Claims. (Cl. 225—21)

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This invention relates to the soft drink industry, and more particularly to a new and improved mixing nozzle intended for use on beverage dispensers, and the like.

In the preparing of carbonated beverages at soda fountains and similar outlets, broad experience has indicated the desirability of mixing the flavoring syrup and carbonated water, which comprise the principal ingredients of the finished beverage, immediately before serving, the flavor and quality of the syrup being best maintained in this manner, and the highest degree of carbonation in the water being thereby effected. To this end, devices have heretofore been manufactured which have as their function the measuring and mixing of carbonated water and beverage syrup, immediately before, or concurrently with, their being directed into a glass or similar container from which they are served to the customer. Such devices must operate with speed and accuracy, and it is desirable that the components of the drink be automatically mixed at that time, thereby eliminating an additional operation—that of stirring—on the part of the busy soda dispenser.

The difficulty in securing the last mentioned result lies not only in bringing the ingredients together in a satisfactory manner, but also in the fact that when mixing occurs within the dispenser, a residue of diluted syrup remains therein, and particularly in the nozzle portion, which residue will, if left for any length of time, form mold. Also, flies and other insects are naturally attracted to any such sticky surface, all of which is undesirable from a standpoint of sanitation.

An object of this invention is to provide a mixing nozzle which effects its intended function, yet which leaves no residue of diluted syrup in the dispenser, after serving a drink.

Another object is to provide simplicity in such a device.

A still further object is to provide economy of manufacture.

Another object is to effect ease of maintenance in a mixing nozzle.

Another object is to provide an absolute minimum of moving parts in such a structure.

These and other objects are accomplished by means of my improved mixing nozzle, a full and complete understanding of which is facilitated by reference to the drawings herein, in which:

Fig. 1 is a vertical sectional view, fragmentary in part, showing that part of a beverage dispenser with which the instant invention is immediately concerned;

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Fig. 2 is an enlarged horizontal cross-sectional view of certain structure illustrated in Fig. 1, taken along the line 2—2 thereof, looking in the direction of the arrows; and

Fig. 3 is a bottom view of the general nozzle structure illustrated in Fig. 2.

Like numerals refer to corresponding parts in the various views of the drawings.

Referring now to Fig. 1, 10 represents the lower portion of a syrup tank, preferably fabricated of stainless steel, and calculated to hold a soft drink syrup. 11 is a cooling coil casting which forms no part of the instant invention; 12 is a sheet of insulation contained in the metallic shell 13, which surrounds the dispenser; and 14 is a lower half bushing, which may be threadably engaged with upper half bushing 15.

16 indicates the composite lower valve body, which in conjunction with return spring 17 cooperates with movable sleeve 18 in a manner described during the further progress of this specification. A seal ring 19 is placed between 15 and 16, and a lower seal 20 between 16 and 18.

A helical capillary nozzle of the type generally described in my co-pending application, Serial No. 585,886, filed March 31, 1945, for Nozzles, now Patent No. 2,511,529, issued June 13, 1950, is indicated by the numeral 21, carbonated water entering the device through water inlet 22.

23 is a syrup cup operatively mounted with movable sleeve 18, in conjunction with an upper seal 24, and having a syrup outlet 25. A lower syrup valve 26 is fixedly mounted in syrup cup 23; and an upper syrup valve 27 operates adjacent 23, in conjunction with syrup valve guide 28. An air vent tube 29 is associated with upper valve 27 in such a manner as to permit free entry of syrup into cup 23 during the filling period in a given operational phase of the dispenser.

A nozzle 30 is securely affixed to valve element 16, and a shield 31 is secured to syrup cup 23 adjacent outlet 25 thereof.

Special attention is now directed to the internal construction of nozzle 30 (Figs. 2 and 1), the outer contour of which device is more or less conventional in form.

Said nozzle is provided with a plurality of horizontally extending fins or vanes 32, 33, and 34, which meet at a common point 35, in the center of the throat of the nozzle piece, this central meeting point of the three vanes being squarely beneath the syrup outlet hole 25 in the valve. The vanes are of a width suitable for accomplishing their intended functions as described in detail hereafter, yet not to interfere

with the free passage of syrup and carbonated water through the nozzle, and as shown in the drawing (Fig. 1), may be stepped down as at 36, in order to better accommodate the interior dimensions of the dispenser.

In operation, the device works as follows:

Carbonated water enters through inlet 22, and being directed downwardly through helical capillary nozzle 21, forces syrup cup 23 downwardly against the pressure of spring 17, this serving to unseat lower syrup valve 26 from opening 25, and at the same time to simultaneously close upper syrup valve 27 against upper valve body 37 as at points 38, syrup valve guide 28 facilitating this operation. A pre-determined amount of syrup has entered cup 23 during the time that the carbonated water is turned off and the upper valve opened, lower syrup valve 26 obviously being closed against 25, at such time.

Now that the force of carbonated water entering through 22 has opened valve 26, a stream of syrup passes through 25 and impinges on intersection point 35 of the three vanes 32, 33, and 34, said syrup stream being broken up by its impinging upon said point. At the same time, carbonated water is flowing downwardly through the throat of nozzle 30, and the breaking up of the syrup stream, as indicated at 39 (Fig. 1) enables the carbonated water to pick up the syrup and mix thoroughly with it, entering the glass 40 as a finished beverage, 41.

The foregoing is in contrast with practices heretofore known to the art, where, in the absence of the intersecting vanes disclosed herein, the stream of syrup remains substantially intact in falling into the glass, and because of its greater weight and higher viscosity than carbonated water, running to the bottom of the glass, and not being adequately broken up or mixed with the carbonated water. This, in turn, requires an additional stirring operation on the part of the soda dispenser, involving both loss of time and what may be more undesirable, loss of carbonation in the drink, as such is presented to the customer. The potability of carbonated beverages depends, in substantial part, upon the degree of carbonation at which they are served, and attainment and preservation of the desired degree in this connection has long been a problem in the industry.

When the supply of carbonated water to inlet 22 is shut off, the pressure in the system is immediately so reduced as to allow spring 17 to return cup 23 quickly against valve 26, thereby closing the valve and stopping the flow of syrup. However, a certain amount of water still remains in the capillary nozzle, and this flows downwardly by gravity, and washes the interior of the nozzle and particularly vanes 32, 33, and 34, and intersection point 35, thus leaving the nozzle clean and free from any trace of syrup after each dispensing operation. The desirabil-

ity of this in eliminating the possibility of mold formation and avoiding an attraction for insects, is obvious.

From the foregoing, it is apparent that I have shown and described a unique mixing nozzle, which automatically accomplishes the desired result of breaking up a syrup stream, and thereby enabling adjacent carbonated water to mix thoroughly with the syrup before reaching a glass, or other container in which the finished drink is merchandised. That my invention has the further advantage of keeping the nozzle free from any syrup, between operations. That the entire arrangement is simple, economical, easy and cheap to manufacture, embraces no service problems, and is entirely satisfactory for its intended purposes.

While I have described in some detail certain structure herein, it will be understood that this is by way of example, and does not have any limiting implications whatsoever, it being intended that the claims herein should be accorded a construction and scope fairly in keeping my contribution to the art.

I claim:

1. In a device of the character described, a syrup tank, a valve communicating with said tank, a syrup cup adjacent said valve, valve means regulating the flow of syrup from the cup, said first-mentioned valve being closed when the second is opened, a capillary nozzle surrounding said syrup cup, means for directing carbonated water to said nozzle, and a mixing nozzle mounted adjacent the capillary nozzle, said mixing nozzle being provided with a plurality of vanes extending across the normal path of downward flow of syrup from the syrup cup, said vanes diffusing syrup at such time, and mixing such with carbonated water in the mixing nozzle.

2. In a device of the character described, a source of water, a source of syrup supply, a nozzle communicating with said former source, a valve regulating flow of the syrup, and a plurality of vanes in said nozzle extending across the normal path of downward flow of the syrup, whereby said syrup is diffused and mixed with the water.

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