

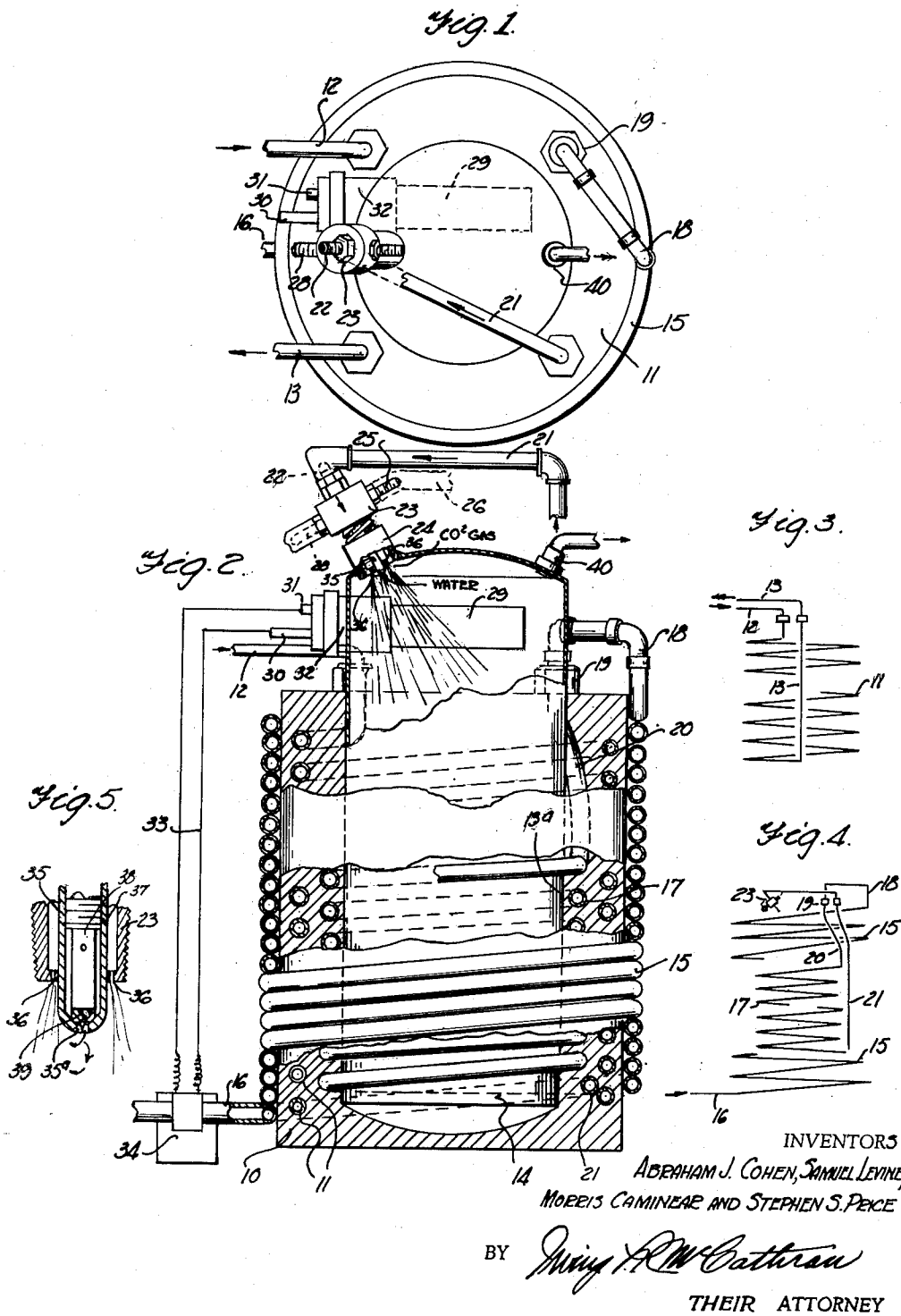
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CARBONATOR COOLER

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CARBONATOR COOLER

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1 Claim. (Cl. 261-11)

1

This invention relates to carbonator coolers, and has for one of its objects the production of a simple and efficient carbonator cooler having a multiple stage water cooling means, and means for spraying cooled water in a manner whereby the water molecules are imprisoned by carbon dioxide for obtaining a superior carbonated water of high volume content.

A further object of this invention is the production of a simple and efficient method of cooling and spraying the cooled water to imprison the water molecules within a spray of carbon dioxide to obtain a superior carbonated water of high volume content.

Other objects of this invention will appear throughout the following specification and claim. In the drawing:

Figure 1 is a top plan view of the carbonator cooler;

Figure 2 is a central vertical sectional view thereof, certain parts being shown in section;

Figure 3 is a diagrammatic view of the refrigerating coil with its inlet and outlet;

Figure 4 is a diagrammatic view of the primary cooling coil, secondary cooling coil, inlet and sprayer;

Figure 5 is an enlarged vertical detail sectional view of the lower end of the spray assembly.

By referring to the drawing in detail, it will be seen that 10 designates a refrigerated block, preferably consisting of solid metal cast in a mould and having a refrigerating element such as the coil 11 embedded therein, as shown in Figure 2. A suitable refrigerant or refrigerating agent is forced through the coil 11 by means of a conventional type compressor, not shown. An inlet 12 and an outlet 13 provide a connection between the conventional compressor and the coil 11 to facilitate circulation of the refrigerant through the refrigerating coil 11 in the conventional manner.

The refrigerated block 10 is provided with a socket 13^a, preferably centrally located in the block 10, the socket 13^a being closed at one end and open at the opposite end thereof. A carbonator cooler storage tank 14 is snugly fitted or embedded within the socket 13^a of the block 10 and the outer end of the tank 14 preferably extends beyond the outer end of the block 10, as shown in Figure 2.

A primary stage water cooling coil 15 encircles the refrigerated block 10 for substantially its entire length and fits snugly against the outer face of the block 10. Water enters the coil 15 through the supply pipe 16, which of course may

2

be provided at any point with a control valve or shut-off of a conventional type. A secondary cooling coil 17 is embedded in the refrigerated block adjacent the storage tank 14, the refrigerating coil 11 being located intermediate the coils 17 and 15, as shown in Figure 2. The outer end of the primary stage water cooling coil 15 is connected to the outer end of the secondary cooling coil 17 by means of a junction pipe 18, a union 19, and a feed pipe 20. The cooled water then passes from the bottom of the secondary cooling coil 17 through pipe 21 to the water inlet 22 of the sprayer assembly 23 and then into the adapter 24 of the assembly 23. The water is then sprayed into the storage tank 14 in the manner shown in Figure 2. Carbon dioxide enters through connection 25 to which a suitable source of supply 26, shown in dotted lines, is connected in a conventional manner. A suitable relief valve is carried in the connection 28 to provide a suitable pressure relief means. A carbonated water outlet 40 is carried by the tank 14.

One particular type of sprayer which may be used, is that type of sprayer set forth in our co-pending application entitled Molecular Spray Carbonator Assembly, filed November 9, 1950, Serial Number 194,904. It is important, however, that the sprayer be of a type where the water and carbon dioxide are discharged into the storage tank simultaneously in a manner whereby the water molecules are imprisoned by the carbon dioxide as they are discharged into the tank 14 from the sprayer to obtain a carbonated water of high volume content. However, the present invention relates primarily to the carbonator cooler in combination with a sprayer of a suitable type. The details of the sprayer, however, may be varied within the scope of the present invention.

A conventional level control device 29 is carried within the outer end of the tank 14 below the sprayer 23, to maintain proper level of storage of carbonated water within the tank 14. This level control device is provided with conventional electrodes 30 and 31 which are carried within the adapter 32. No claim is made to the detail structure of the control since the control is of a conventional type well known, and is sold upon the market. The electrodes 30 and 31 are electrically connected by means of wires 33 to a suitable water pump 34 of any conventional type communicating with the intake line 16 to control the flow of water through the coil 15 and sprayer 23 in conjunction with the level control device 29.

It should be noted that fresh water is pumped into the coil 15, which coil encircles the outer

3

portion of the refrigerated metallic block 10 for a primary stage of cooling. The water then passes through the coil 17 which is embedded within the refrigerated block 10 for a secondary stage of cooling. The water finally is then sprayed into the stainless steel tank 14, which tank 14 also is embedded or fitted within the refrigerated block 10 to provide a third stage of cooling. As shown, the refrigerated block 10 consists of a cast metal block having a refrigerating coil 11 embedded within the moulded block, a suitable refrigerant being forced through the coil 11 in any conventional manner.

The supply of water fed to the tank 14 is electrically controlled at all times by the conventional electrodes 30 and 31 of the control device 29. The control device 29 controls the operation of the water pump 34 in any desired conventional manner. The sprayer assembly 23 is provided with a single water discharge element 35. Carbon dioxide is introduced into the tank 14 through orifices 35 which surround the single orifice 35^a at the base of the assembly 23. The sprayer assembly preferably is constructed to discharge water into the tank 14 with terrific force, such as is set forth in our co-pending application above identified, so as to create a whirling water mist which agitates the water within the carbonator tank 14 whenever water is being introduced therein.

The water discharge element comprises the discharge tube 37 having the single discharge aperture or orifice 35^a at the bottom thereof. A stem 38 fits in the tube 37 and is provided with angular or spiral vanes 39 to create a whirling water mist which is discharged through the orifice 35^a into the tank 14 to agitate the water as above set forth.

It should be understood that certain detail changes may be made in the present structure without departing from the spirit of the invention, so long as these changes fall within the scope of the appended claim. Furthermore, the details of the sprayer and control device may be varied within the scope of the present invention to adapt themselves to the general assembly illustrated. Having described the invention, what we claim as new is:

A carbonator cooler of the class described comprising a refrigerated block consisting of a solid cast body, a refrigerating coil embedded within

4

said block, said refrigerating coil having an inlet and outlet means exteriorly of the block, said block having a socket closed at one end and open at the other end, a tank fitted in said socket and projecting beyond the open end of said block, an exterior primary stage water cooling coil encircling the exterior face of said block and snugly fitting thereagainst, a secondary water cooling coil embedded within said block in close proximity to said socket and tank, the refrigerating coil being interposed between the exterior primary stage water cooling coil and the embedded secondary water cooling coil, the primary and secondary water cooling coils being connected in series, an inlet means connected to one end of the primary coil, a water spray discharge nozzle connected to the discharge end of said secondary coil, said nozzle being carried by the outer end of said tank outwardly of said block, means for supplying carbon dioxide to said nozzle in a manner whereby a mixture of a water spray and carbon dioxide is discharged into the upper end of said tank for a third stage of cooling through a single fitting upon said tank, a level control device carried within the outer end of said tank and inwardly spaced relative to said nozzle in the path of the spray discharge of said nozzle and above said refrigerated block to maintain a proper level of storage of carbonated water within the tank, and a water pump connected to said primary coil and controlled by said level control device for controlling the supply of water to said primary coil.

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