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METHOD OF AND APPARATUS FOR STERILISING LIQUID FOODSTUFFS
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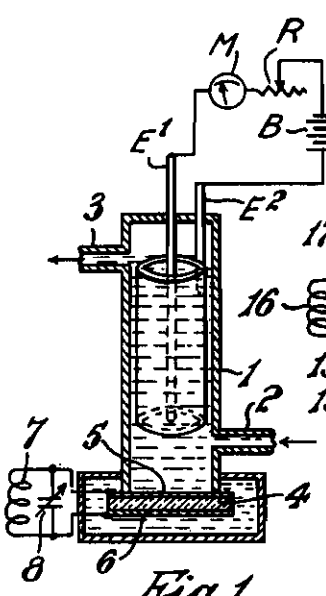

Fig. 1.

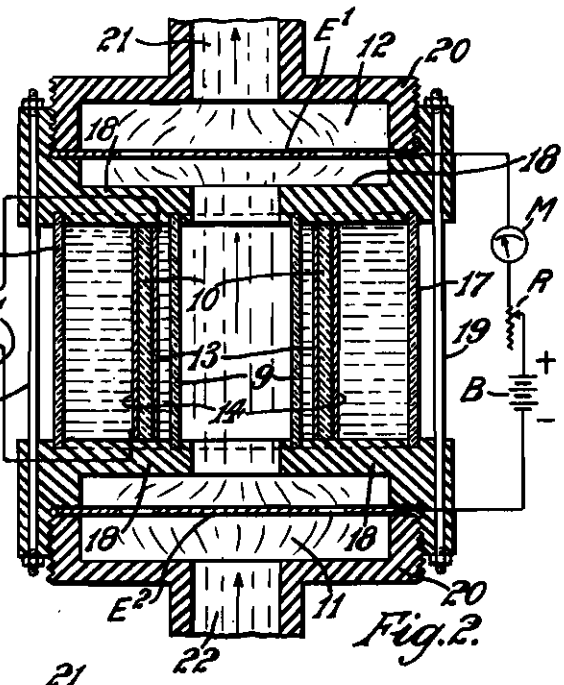

Fig. 2.

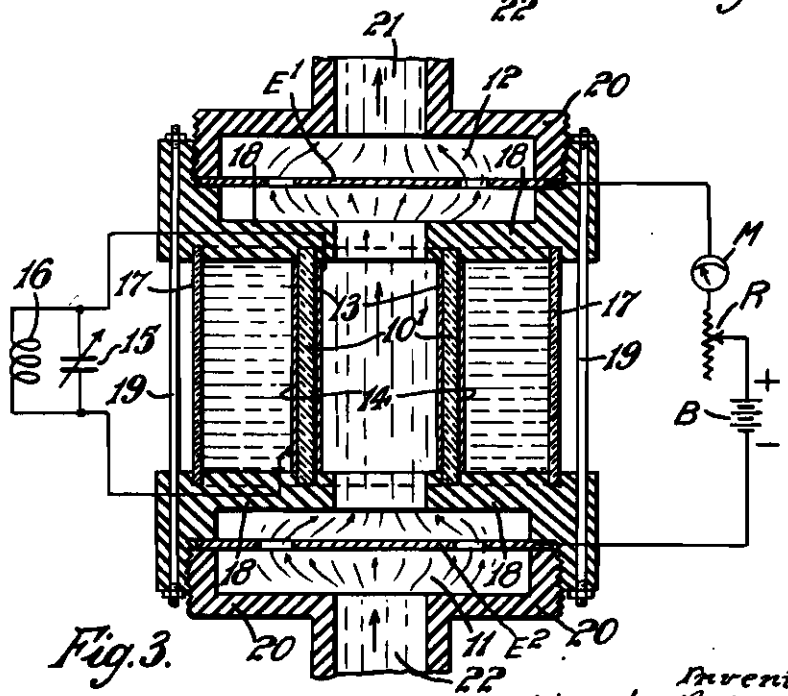

Fig. 3.

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METHOD OF AND APPARATUS FOR STERILISING LIQUID FOODSTUFFS

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This invention relates to a method of and apparatus for sterilising alimentary liquids such as fruit juices, wines, beer and milk.

In accordance with the invention metallic ions are injected into a current of the alimentary liquid and are effectively dispersed therein by simultaneously subjecting said liquid to oscillations of supersonic frequency generated by a crystal-controlled (piezo-electric) oscillatory circuit.

A preferred form of apparatus for carrying out the method of the invention comprises a cell having electrodes therein for ionisation of the liquid under treatment by electrolysis, at least one of said electrodes (the anode) being constructed of a preferably oligodynamically active, metal. One or more walls of said cell are adapted to transmit to the liquid flowing therethrough supersonic oscillations generated by a crystal-controlled parallel resonant circuit, by locating the actual oscillating crystal adjacent to or in the wall or walls of the cell, thereby dispersing the metallic ions generated in the vicinity of the electrodes throughout the liquid.

For example, a cylindrical cell having ionising electrodes and inlet and outlet for the liquid under treatment, is provided with an end wall constructed of a sheet of piezo-electric quartz and forming part of a crystal-controlled parallel resonant oscillatory circuit through (tin foil) electrodes attached to opposite sides of said quartz sheet.

In order that the invention may be more clearly understood, reference is made to the accompanying drawings, which illustrate diagrammatically and by way of example, three embodiments of apparatus suitable for carrying the same into practical effect, and in which:

Fig. 1 shows one embodiment;

Fig. 2 a second embodiment; and

Fig. 3 is a third embodiment.

Referring to Fig. 1, 1 denotes a cylindrical cell with inlet and outlet 2 and 3 respectively for the liquid under treatment. Within said cell 1 is located a cylindrical perforated anode E^2 surrounding an axially arranged cathode E^1, said electrodes being connected to a battery B and a series rheostat R and an ammeter M.

The base of cell 1 is formed by a piezo-electric sheet 4 of quartz, having sheets of foil 5 and 6 on opposite sides whereby said quartz sheet is connected to a parallel resonant oscillatory circuit consisting of the inductance 7 and variable condenser 8. This circuit is tuned by means of the condenser 8 to the resonant supersonic frequency of the crystal 4, the resulting oscillations being thus transmitted directly through the liquid passing through cell 1.

In the embodiments shown in Figs. 2 and 3, the cell is again essentially cylindrical in shape, but the quartz crystal is located either adjacent the curved wall, or in the curved wall, instead of at the end. The cell is provided with end compartments 11 and 12, containing the perforated anode E' and the perforated cathode E^2 respectively, connected to a battery B by means of the rheostat R and the ammeter M.

The middle portion of the cell is somewhat constricted and bounded by a cylindrical glass wall 9 (Fig. 2). Concentrically surrounding glass wall 9 is the piezo-electric crystal 10 of cylindrical form, having sheets of metal foil 13 and 14 secured to the inner and outer curved surfaces thereof, whereby said cylindrical crystal forms part of the parallel resonant oscillatory circuit consisting of the inductance 16 and the variable condenser 15.

The cylindrical crystal 10 is itself located in an annular chamber the inner walls of which is constituted by the glass wall 9 and the outer wall by a further cylindrical glass wall 17. Said chamber is closed by end pieces 18 of ebonite or other insulating material, and is filled with a liquid insulator, such as petroleum or liquid vaseline.

In the embodiment of Fig. 3, the construction is similar to that of the embodiment of Fig. 2, but with the essential difference that the curved walls of the ionising cell are bounded directly by the piezo-electric crystal 10' itself, which also serves to separate the alimentary liquid undergoing treatment from the insulating liquid in the annular chamber formed by the cylindrical crystal 10' and the outer glass cylinder 17. In both the embodiments of Figs. 2 and 3, 19 denotes connecting bolts, threaded at the ends, for assembling and fixing the end pieces 18 in position. The members 20, which are also constructed of insulating material, are screw-threaded and adapted to be screwed into the end pieces 18 to form the electrode chambers 11 and 12 respectively; 21 and 22 are the outlet and inlet respectively for the alimentary liquid under treatment.

According to a fourth embodiment (not shown) the quartz crystal cylinder depicted in Figs. 2 and 3 is replaced by the composite crystal cylinder forming the subject of our Application Serial No. — of even date.

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