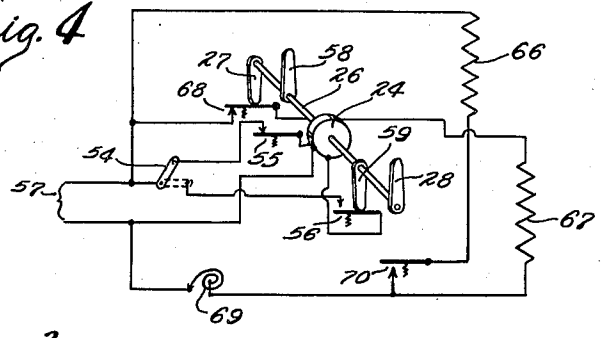
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STERILIZER

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Fig. 4



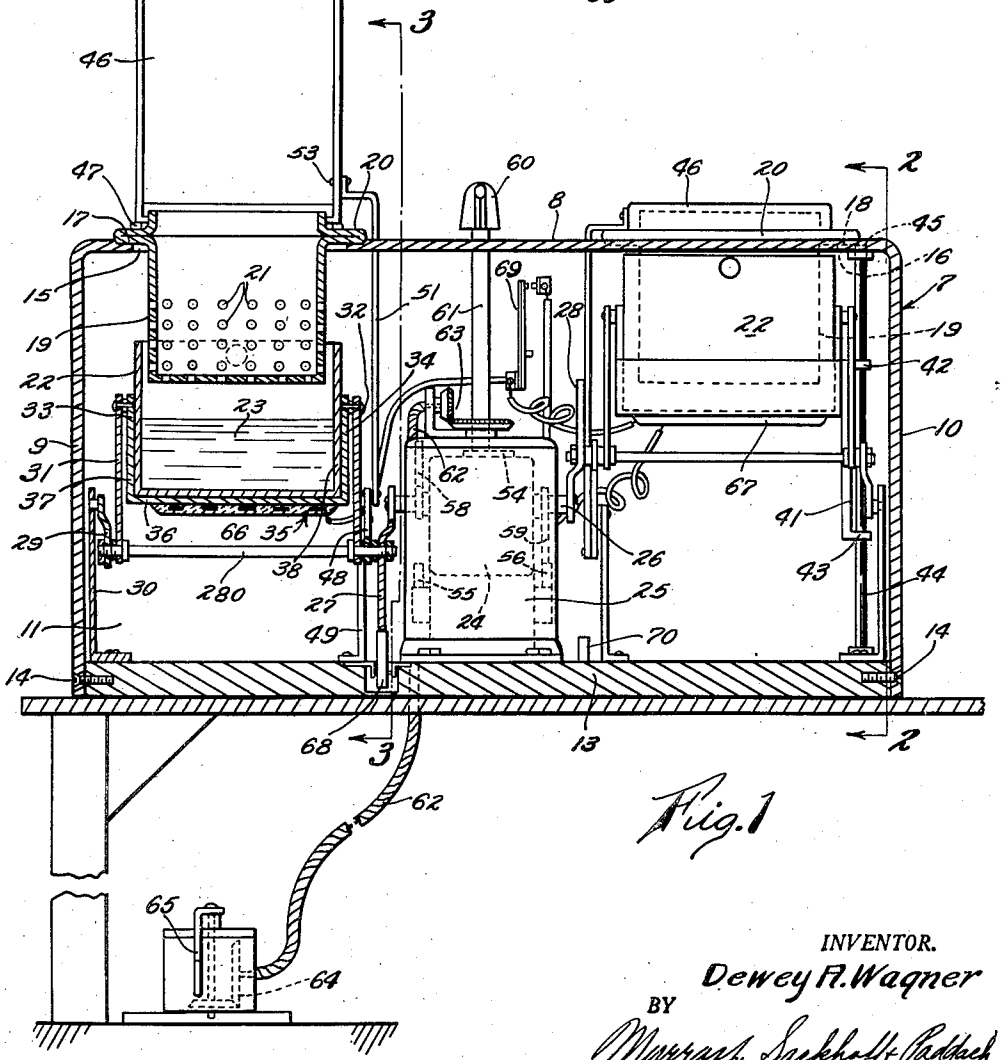


Fig. 1

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STERILIZER

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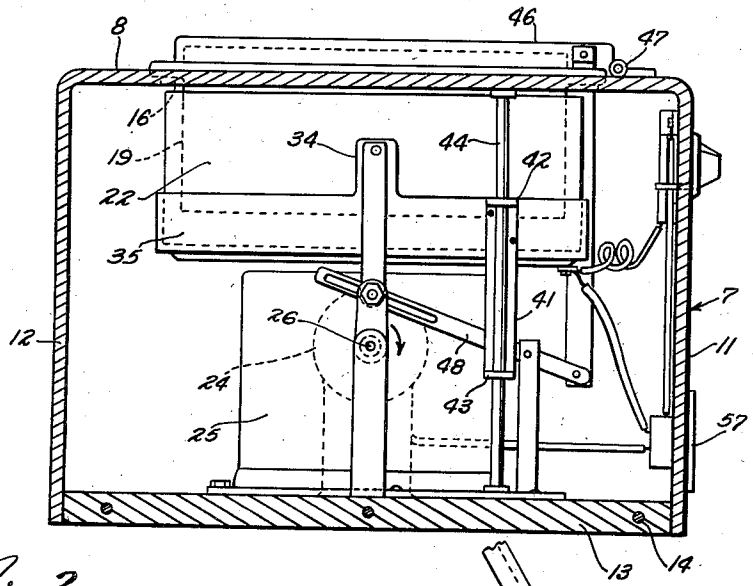


Fig. 2

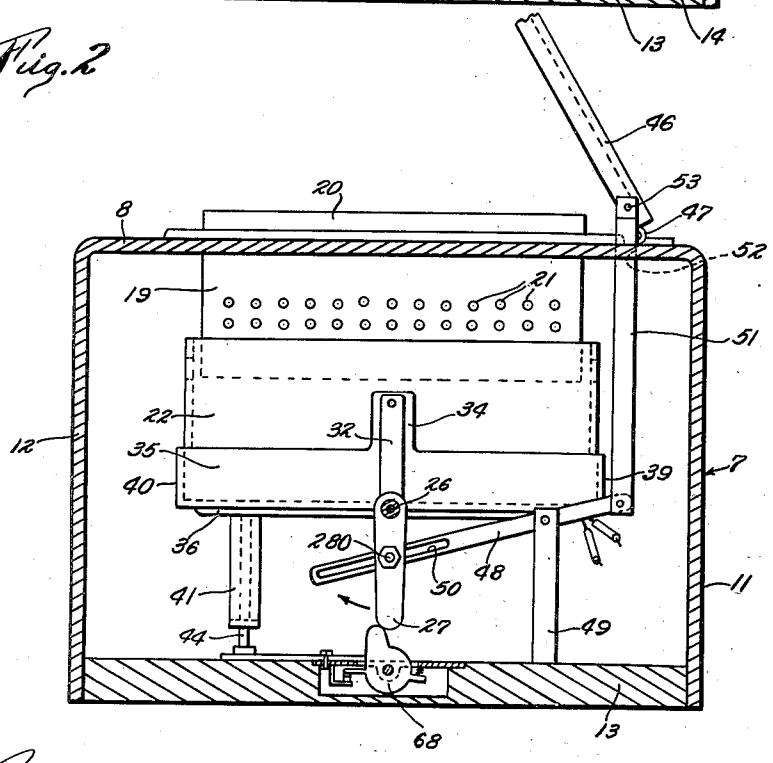


Fig. 3

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UNITED STATES PATENT OFFICE

2,499,891

STERILIZER

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Application March 26, 1946, Serial No. 657,101

11 Claims. (Cl. 21—100)

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This invention relates to improvements in sterilizing devices and is particularly directed to a sterilizer for use in barber and beauty shops, or doctors' offices.

It is well known that a definite, minimum period of time is required for a particular sterilizing fluid to effectively destroy bacteria and other micro-organisms on articles subjected to its action. Quite frequently, and particularly at a time when an operator is busy, the sterilization of his instruments is neglected, or he fails to place them in the sterilizing fluid for the requisite period of time thereby subjecting succeeding patients or customers to potential infections. The normal use of the present device includes the employment, by the operator, of two complete sets of instruments to the end that while one set is presented for use by the device the other will be under sterilization. It is therefore an object of this invention to provide in a sterilizer a pair of instrument sterilizing mechanisms which are oppositely actuated so that one mechanism assumes an instrument sterilizing position whilst the other mechanism is in an instrument dispensing position, each of said mechanisms having a positive acting closure for precluding the removal of the instruments under sterilization until the sterilizer is operated to reverse the positions of the mechanisms.

Another object of the invention is to provide in a sterilizing device having the foregoing features an efficient means for heating the sterilizing medium in each mechanism.

A further object of the invention is to provide a simplified, accessible means for removing from my sterilizing cabinet the cooperating instrument trays and the pans for containing sterilizing fluid so that they may be readily and regularly cleaned.

A still further object of the invention is to provide a compact sterilizing device of the above mentioned character which has a durable and simplified construction, is efficient in use, attractive in appearance and relatively inexpensive to manufacture.

Other objects will be apparent from the following specification and drawings which illustrate a preferred embodiment of my invention, said invention consisting in certain novel combinations and arrangements of parts hereinafter described and particularly set out in the appended claims.

In the accompanying drawings:

Fig. 1 is a fragmental, cross-sectional view taken through the transverse center of my sterilizer, the parts of the sterilizing mechanism shown on the right hand side thereof being illustrated in full lines.

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1.

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Fig. 4 is an electrical wiring diagram for my sterilizer, mechanical parts therein being also shown diagrammatically.

My sterilizing device comprises a cabinet 7 having a top wall 8 integrally united with side walls 9 and 10, a rear wall 11 and a front wall 12. The bottom of the cabinet is closed by a base 13 which is secured to the lower edges of the side, end and front walls by countersunk screws 14. Spaced openings 15 and 16 are formed through the top wall of the cabinet and a marginal depression 17—18 is formed in the top around each opening 15—16 respectively. A pair of open topped, rectangularly shaped instrument trays 19 are carried by the top wall of the cabinet and as illustrated in Fig. 1, the trays are provided with a flange 20 extending outwardly from the four side walls thereof adjacent the open top. These flanges serve to position each tray centrally of its respective opening for the purposes to be described hereinafter.

The lower halves of each of the instrument trays side walls are provided with perforations 21. A pan 22 for the reception of sterilizing fluid 23 is disposed beneath each of the trays and is adapted for vertical reciprocation between a lower instrument dispensing position indicated on the left-hand side of Fig. 1 and in Fig. 3, and an upper instrument sterilizing position indicated in the right-hand side of Fig. 1 and in Fig. 2.

A drive means for vertically reciprocating the pans in opposite directions comprises a motor 24 mounted upon the base 13 and enclosed in an air tight housing 25. The motor drives a crank shaft 26 which has radially extending from its ends oppositely projecting, crank arms 27 and 28. As the two mechanisms for connecting the crank arms to their respective sterilizing pans are identical in construction, a description of one of said mechanisms will be set forth, it being understood that the remaining mechanism operates in the same manner, but in an opposite direction. The crank arm 27 is rotatably connected to a horizontal rod 280, said rod freely engaging the outer end of a crank arm 29 which is journaled in a standard 30 mounted upon the base. A pair of links 31—32 are pivoted in spaced relationship on the rod 280 and at their upper ends are freely pinned to ears 33 and 34 extending upwardly from a carrier 35.

The carrier has a bottom wall 36, side walls 37 and 38, back wall 39 and a front wall 40, said carrier being adapted to snugly receive the lower portion of the sterilizing pan 22. The carrier is held in a level position during reciprocating movement by means of a guide which takes the form of an elongated bracket 41 fixed to the carrier by welding, or the like, and having its upper and lower ends turned outwardly into apertured ears 42 and 43 for receiving a guide rod 44. The guide

is secured at its lower end to the base and is insertable in an opening 45 formed in the top wall 8 of the cabinet (Figs. 1 and 2).

Each of the instrument trays are provided with a closure member 46 swingably mounted upon the top of the cabinet by hinges 47. The closure members are operated from the cranks 27—28 for the respective instrument trays by means of a lever 48 pivoted intermediate its ends on standard 49 supported by the base 13 and having an elongated slot 50 formed in one end for engaging the rod 28 for the crank arm 27. The free end of the lever is pivoted to the lower end of a connecting rod 51, the upper end of said rod passing through an opening 52 in the top wall of the cabinet and being pivotally fastened at its upper end to the closure member 46 by a loose rivet 53.

The crank shaft 26 of the motor 24 is adapted to make a one-half (½) revolution with each throw of a double pole, double throw switch 54 and to this end the motor circuit is controlled by two normally closed switches 55 and 56, located within the housing 25 and alternately actuated by arms 58 and 59 respectively. As indicated in Fig. 4, when the switch 54 is in its full line position, switch 55 is closed and completes a circuit to the motor 24 from a source of electricity 57. Upon a one-half (½) revolution of the crank shaft 26, the arm 58 will open switch 55 and stop the motor, whereby the crank arms 27 and 28 will be in vertical positions and the sterilizing pans will be in opposite sterilizing and dispensing positions. During said crank shaft rotation arm 59 has rotated to its upwardly projecting position and switch 56 has closed. Manual rotation of the switch 54 to its dotted line position will then complete a circuit to the motor 24 through switch 56 thereby completing the cycle of the motor control.

The switch 54 may be manually operated exteriorly of the cabinet by a switch lever 60 which is connected to the switch 54 by a rotatable shaft 61. A pedal control for the switch 54 comprises a flexible cable 62 connected to the shaft 61 by a pair of beveled gears generally indicated at 63. The lower end of the cable is connected with a pair of beveled gears 64 which in turn is connected to a lever 65 reciprocable in a horizontal plane and adapted to be moved by the foot of an operator.

When each instrument tray and sterilizing pan are in their adjacent sterilizing positions indicated at the right-hand side of Fig. 1 and in Fig. 2 the sterilizing fluid is heated by means of electric heating coil units 66—67. These heating coils are imbedded in insulating material which is secured by any suitable means to the bottom of the carriers, and as most clearly illustrated in Fig. 4, the heating coils are alternately connected to the source of supply 57 upon each one-half (½) revolution of the crank 26. The crank arm 27 engages normally closed switch 68 when it is in its downwardly extending position illustrated in Fig. 1. The closing of said switch connects the heater 67 to the source of supply through a thermostat 69 when the carrier for said heater is in its upper sterilizing position. When the crank shaft has been turned a one-half revolution from the position indicated diagrammatically in Fig. 4, the crank arm 28 will close a normally opened switch 70, thereby introducing a current through the heater coil 66 when its carrier is in the upper sterilizing position.

It will therefore be noted that when the sterilizing pans have been alternately raised to their sterilizing positions relative to their respective instrument trays, so that sterilizing fluid 23 enters the trays through the perforations 21 formed in the latter, the lever mechanism controlling the closure member securely holds said member in closed position so that instruments cannot be removed from the tray. In this position also I have provided means whereby the heating element for the pan is actuated thereby effecting a saving in electric current consumption.

It will also be understood that the trays 19 for my device are positioned centrally of the openings 15 and 16 formed in the top wall of the cabinet 8 by means of the cooperation between the marginal depressions 17 and 18 respectively surrounding the openings and which receive the flanges 20 of the trays. Manifestly the trays may be readily removed from the cabinet and it will further be noted that the plan dimensions of the pans 22 are less than the dimensions of the openings 15 and 16 so that upon removal of the trays from said openings the pans may be raised from their respective carriages through said openings for cleaning purposes.

What is claimed is:

1. In a sterilizer the combination of a cabinet, a perforate tray mounted in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent the tray and adapted for telescopic reception of said tray, a closure member for the tray, drive means for vertically reciprocating the pan, and a closure actuating means connected with the drive means for alternately moving the closure to opened and closed positions relative to the tray.

2. In a sterilizer the combination of a cabinet, a perforate tray mounted in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent the tray and adapted for telescopic reception of said tray, vertical guide means for the pan, a closure member for the tray hingedly mounted upon the cabinet, a crank mounted within the cabinet, a drive mechanism for the crank, links for connecting the crank end to the pan, a lever within the cabinet slidably associated with the crank, a connecting rod pivoted to the end of the bell crank, and means for pivotally connecting the upper end of the rod to the closure member.

3. In a sterilizer the combination of a cabinet, a perforate tray mounted in the cabinet, a carrier disposed beneath the tray, vertical guide means for the carrier, a pan for sterilizing fluid disposed upon the carrier beneath the tray and adapted for telescopic reception of said tray, a closure member for the tray hingedly mounted upon the cabinet, a crank mounted within the cabinet, a drive mechanism for the crank, links for connecting the crank to the carrier, a lever within the cabinet slidably associated with the crank, a connecting rod pivoted to the free end of the lever, and means for pivotally connecting the upper end of the rod to the closure member.

4. In a sterilizer the combination of a cabinet having a top, side and end walls, an opening formed in the cabinet top, a marginal depression formed in the top around the opening therein, a perforate instrument tray having a flange extending outwardly therefrom and receivable in the marginal depression, a vertically reciprocated carrier disposed beneath the tray, a pan for the reception of sterilizing fluid removably mounted upon the carrier and surrounding the bottom portion of the tray, said pan having smaller plan dimensions than the opening in the cabinet top

whereby the pan can be removed through the opening upon the removal of the tray therefrom.

5. In a sterilizer the combination of a cabinet, a pair of perforate instrument trays mounted in spaced relationship in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent each tray and each adapted for telescopic reception of its respective tray, a closure member for each tray, drive means for vertically reciprocating the pans in opposite directions, and closure actuating means connected to the drive means for alternately moving the closures to opened and closed positions.

6. In a sterilizer the combination of a cabinet, a pair of perforate instrument trays mounted in spaced relation in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent each tray and each adapted for telescopic reception of its respective tray, a closure member for each tray, drive means for elevating one pan to a sterilizing position and simultaneously lowering the other pan to an instrument dispensing position, and closure actuating means associated with the drive means for covering each tray with its closure when the respective pan is in a sterilizing position.

7. In a sterilizer the combination of a cabinet, a pair of perforate instrument trays mounted in spaced relation in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent each tray and each adapted for telescopic reception of its respective tray, a closure member for each tray hingedly mounted upon the cabinet, a crank shaft mounted within the cabinet, a motor for the shaft, a pair of crank arms mounted on the shaft and extending in opposite directions therefrom, means for de-energizing the motor when one pan is in an upper sterilizing position and the opposed pan is in a lower instrument dispensing position, links for connecting each crank arm with a pan, a lever slidably associated with each crank arm, a connecting rod pivotally fastened to the free end of each rod, and means for pivotally securing the upper end of each rod to its respective closure member.

8. In a sterilizer the combination of a cabinet, a pair of perforate instrument trays mounted in spaced relation in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent each tray and each adapted for telescopic reception of its respective tray, a closure member for each tray hingedly mounted upon the cabinet, a crank shaft mounted within the cabinet, a motor for the shaft, a pair of crank arms mounted on the shaft and extending in opposite directions therefrom, means for de-energizing the motor when one pan is in an upper sterilizing position and the opposed pan is in a lower instrument dispensing position, links for connecting each crank arm with a heating element, a lever slidably associated with each crank arm, a connecting rod pivotally fastened to the free end of each rod, means for pivotally securing the upper end of each rod to its respective closure member, a thermostatically controlled heating element for each pan, and means responsive to the upper position of each pan for energizing said pan.

9. In a sterilizer the combination of a cabinet, a perforate instrument tray stationarily mounted in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent the tray for vertical movement between an operative sterilizing position surrounding the instrument tray and an opposed nonsterilizing position remote from said tray, drive mechanism for reciprocating the pan between its said sterilizing and nonsterilizing positions, and a positive closure actuating means synchronized with the drive means for alternately closing and opening the member when the pan is in said sterilizing and nonsterilizing positions respectively.

10. In a sterilizer the combination of a cabinet, a perforate instrument tray stationarily mounted in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent the tray for vertical movement between an operative sterilizing position surrounding the instrument tray and an opposed nonsterilizing position remote from said tray, drive mechanism for reciprocating the pan between its said sterilizing and nonsterilizing positions, a positive closure actuating means synchronized with the drive means for alternately closing and opening the member when the pan is in said sterilizing and nonsterilizing positions respectively, electric heating means fixed beneath the pan, a power switch for the heating means, and means made operative when the pan is in its sterilizing position for closing the power switch.

11. In a sterilizer the combination of a cabinet, a perforate instrument tray stationarily mounted in the cabinet, a pan for sterilizing fluid disposed within the cabinet subjacent the tray for vertical movement between an operative sterilizing position surrounding the instrument tray and an opposed nonsterilizing position remote from said tray, drive mechanism for reciprocating the pan between its said sterilizing and nonsterilizing positions, a positive closure actuating means synchronized with the drive means for alternately closing and opening the member when the pan is in said sterilizing and nonsterilizing positions respectively, thermostatically controlled, electric heating means fixed beneath the pan, a power switch for the heating means, and means made operative when the pan is in its sterilizing position for closing the power switch.

DEWEY A. WAGNER.

No references cited.

Certificate of Correction

Patent No. 2,499,891 March 7, 1950

DEWEY A. WAGNER

It is hereby certified that errors appear in the printed specification of the above numbered patent requiring correction as follows:

Column 4, line 46, for the words "bell crank" read *lever*; column 5, line 61, for "heating element" read *pan*; column 6, line 7, for "pan" read *heating element*; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of July, A. D. 1950.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.