No. 779,537. PATENTED JAN. 10, 1905.

S. J. DUNKLEY.

CANNING MACHINE OR APPARATUS.

APPLICATION FILED MAY 12, 1902.

2 SHEETS—SHEET 1.

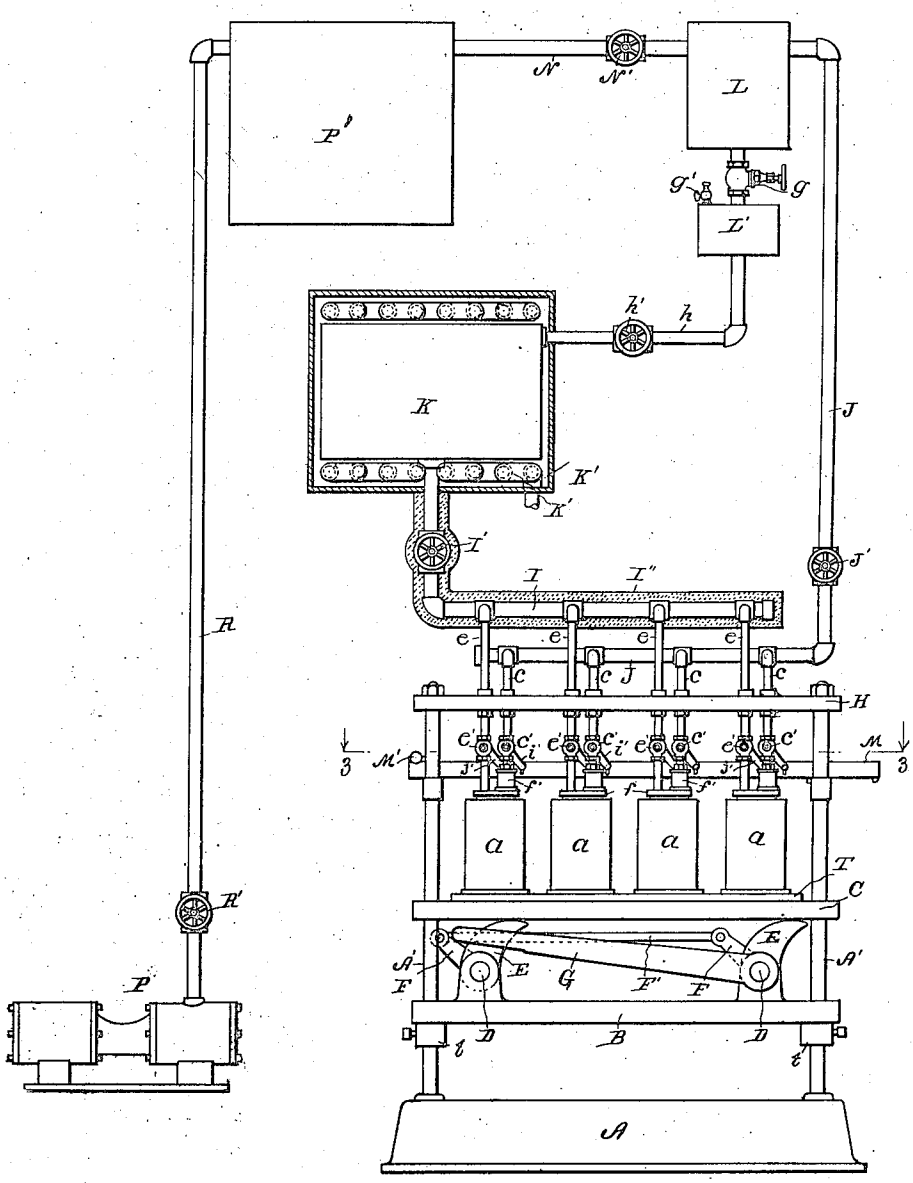


Fig. 1

Witnesses:

Wm. Geiger

H. D. Munday.

Inventor,

Samuel J. Dunkley.

By Munday, Evarts & Adcock

his Att'ys.

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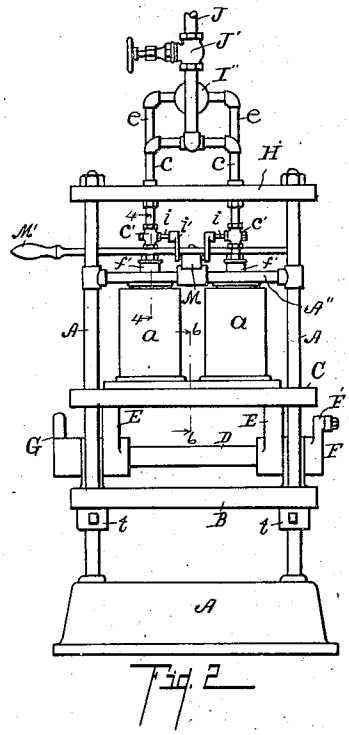


Fig. 2

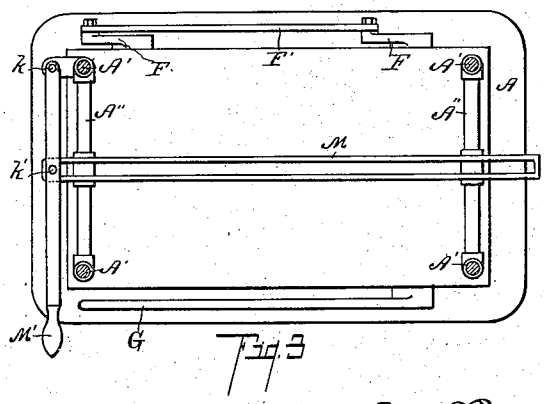


Fig. 3

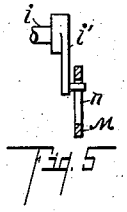


Fig. 5

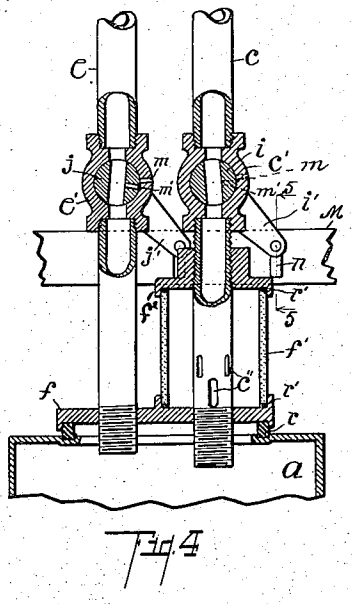


Fig. 4

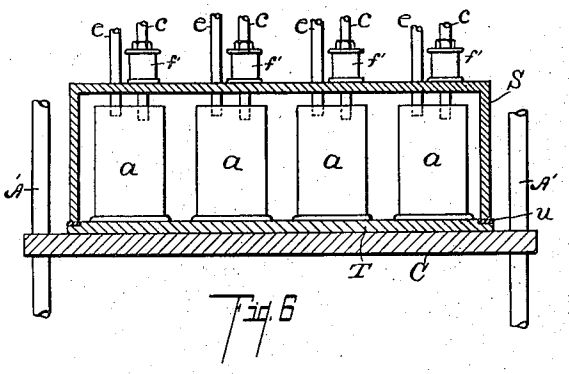


Fig. 6

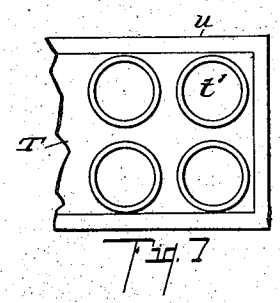


Fig. 7

Witnesses:

Wm. Gager

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No. 779,537. Patented January 10, 1905.

UNITED STATES PATENT OFFICE.

SAMUEL J. DUNKLEY, OF KALAMAZOO, MICHIGAN, ASSIGNOR TO DUNKLEY COMPANY, OF KALAMAZOO, MICHIGAN, A CORPORATION OF MICHIGAN.

CANNING MACHINE OR APPARATUS.

SPECIFICATION forming part of Letters Patent No. 779,537, dated January 10, 1905.

Application filed May 12, 1902. Serial No. 107,032.

To all whom it may concern:

Be it known that I, SAMUEL J. DUNKLEY, a citizen of the United States, residing in Kalamazoo, in the county of Kalamazoo and State of Michigan, have invented a new and useful Improvement in Canning Machines or Apparatus, of which the following is a specification.

This invention relates to improvements in canning machinery, and particularly to improvements in machinery or apparatus for filling cans and eliminating the air therefrom.

Heretofore heating and actual boiling have generally been relied on almost exclusively to eliminate air or drive the air from the fruit or other material that is being canned, and also much annoyance has been experienced by the overflow of the syrup, fluid, or liquor when the can is being filled. This results in waste and the soiling of the outside of the can or receptacle, and the method used also requires the constant attention of an attendant, and only one or two cans can be filled at the same time.

It is the object of this invention to provide a convenient and speedy apparatus or machine by means of which a large number of cans may be filled at a single operation, the apparatus being so constructed that the cans will be filled to the proper level automatically, which will operate to create a vacuum within the can, thereby eliminating the air such as is retained inside of berries, like raspberries, or in the interstices in any material, thereby avoiding the necessity of agitating the contents of the jar or can by heating the same to expand the air and drive it out in that way, by means of which it will be possible in the filling of fruit-cans or the like to use but a given quantity of the syrup or fluid and return any surplus to the supply-tank, and by use of which the fruits may be preserved in cans so as to retain their natural condition with full flavor, and by use of which injury and disintegration of the fruit by undue agitation by heating or boiling may be avoided.

My invention consists, in connection with a supply-tank for the syrup and a heater for heating the same, of a series of sealing-caps adapted to be temporarily sealed to the cans or vessels and each provided with a filling-pipe and an exhaust-pipe extending through the same, a platform or support for holding a series of cans, and means for forcing the cans or vessels and the temporary sealing-caps therefor together, by means of which the air may be quickly and economically exhausted simultaneously from a number of cans or vessels and from the interstices of the berries, fruit, or other contents to be preserved in the cans, and by which a series of cans may also be rapidly and economically filled with hot syrup or other liquid to a uniform height without overflow or waste and the hot syrup or liquid caused to enter all the interstices, thus filling the cans or vessels solidly full, so that when the cans or vessels thus filled are removed from the machine and then hermetically sealed by hermetically securing their permanent caps or covers thereon while the contents are still hot from the heated syrup or liquid the berries and fruit therein will properly keep and preserve without the necessity for further processing or sterilization in many instances or with very slight further heating or sterilization in other instances, thus causing the berries or fruit to retain their natural condition and full flavor, and thus also saving much labor and expense. To enable the cans or vessels to be uniformly filled always to the exact height or extent desired or required, the exhaust tube or pipe of each sealing-cap extends a little below the mouth or lower end of the supply-pipe.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown or described.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of an apparatus or machine embodying my invention, some of the parts, as the supply-tank and the like, being shown in conventional form. Fig. 2 is an end elevation of the same, taken from the right end of Fig. 1. Fig. 3 is a sectional plan view taken on line 3 3 of Fig. 1 looking down, no cans be-

ing shown in position and the can-seat plate being omitted. Fig. 4 is an enlarged detail sectional view on a line corresponding to line 4 4 of Fig. 2 through the connections for a single can, showing the inlet and discharge pipes and the gaskets upon the glass cylinder arranged to permit the inspection of the contents during the operation. Fig. 5 is a sectional view on the line 5 5 of Fig. 4, showing the method of controlling the stop-cocks in the pipes leading to and from the cans; and Figs. 6 and 7 show a modification.

In the drawings similar letters of reference refer to similar parts throughout the several views, and all of the sectional views are taken looking in the direction of the arrows at the ends of the section-lines.

Referring to the drawings, A is a suitable base having standards A′ A′ near each corner thereof extending upwardly and connected by a plate H at or near the top. A platform B is supported adjustably on the standards A′ A′ by suitable collars *t*, having set-screws therein.

C is the platform or support upon which the series of cans rest, the same preferably having a can-seat plate T, furnished with seats or sockets *t′*, for the cans corresponding to the size or diameter of the same, and *ffff* are temporary sealing-caps for the cans or vessels, the support C for the cans or vessels and the series of temporary sealing-caps *f* being the one movable in respect to the other to enable the cans and sealing-caps to be forced together to seal the cans during the air-exhausting and filling operations. In practice I prefer to make the can-support C the movable member. It contains holes near each corner and is freely movable up and down on the standards A′. This movement is effected evenly and satisfactorily by four cams E, supported on the shafts D D, which have bearings in suitable brackets secured to the platform B. The cams are connected and paralleled by the levers F F and a rod F′ between the same and are actuated by means of the lever G and serve to raise the platform C evenly. The cans *a a* are placed on this movable platform C. Extending down through the plate H above are pairs of tubes *e c*. (Detailed in Fig. 4.) The tubes *e* are to supply the syrup to the cans, and the tubes *c* are vacuum-tubes, which are intended to create vacuums within the cans *a a* and to draw off any surplus syrup or liquor that may be introduced within the same. A pair of these tubes *e c* extend through each cap *f*, which is adapted to be temporarily secured (directly or indirectly) to the can or vessel by an interposed gasket or packing-ring *r*. A glass inspection-cylinder *f′*, open at the top and bottom, is preferably interposed between the cap *f* and a supplemental head f^2, with which the exhaust-tube *c* is provided. Gaskets *r′* fit between the ends of the cylinder *f′* and cap *f* and head f^2 to insure tight joints. The pipe *c* has openings *c″* to permit the liquid to enter the glass inspection-cylinder *f′*. The vacuum-tube *c* extends a little below the supply-tube *e*. The pipes *e* and *c* are supplied with stop-cocks *e′ c′*, the valves of which, *i j*, are controlled by means of a common lever M′ and bar M, connected by a pivot at *k′*, (see Fig. 3,) so that all the valves may be turned simultaneously. The valves are so positioned in relation to each other that on movement of the bar M a suction or vacuum is created in the cans in the first instance and the supply-pipes then gradually opened, thus facilitating the elimination of air before the introduction of any liquid.

Where fruit is being canned, the fruit is preferably placed in the can before the syrup. This action causes all the interstices in the fruit to become vacuums, so that they readily absorb and take into their substance any syrup introduced into the can. As soon as the can is filled so that the liquid or syrup comes to the level of the bottom of the suction or vacuum pipe *c* the syrup or other liquid is drawn off by the suction and the can cannot be filled to a higher point than this. The lever M′ is then moved to shut off the supply of syrup or liquid. The vacuum can be allowed to continue for some time, when it may be shut off and the cans removed and then sealed up ready for use, when they can be processed in any way desired, or in most instances the work is complete.

The vacuum or suction pipes *c* are connected to the common pipe J as branches thereof. This pipe J contains a valve J′ and leads upwardly into a tank L. The pipe N leads from the tank L to a suitable vacuum-pump or exhaust-chamber to put on the necessary suction. The valve *g* is in the bottom of the tank L and opens into an auxiliary tank L′. A small cock *g′* is in the top of this auxiliary tank and will permit any syrup or liquid in the tank L to be drawn off at this point. The valve *g* can then be closed and a pipe *h*, which leads from the bottom of the auxiliary tank L′ to the main supply-tank K, can be opened, and in this way the syrup or liquid will be returned to the supply-tank K, where it can be delivered through the supply-pipes *e* to the cans again, the syrup being heated in any practical way by steam-coils or direct heat or any other way.

The pipe I, leading from the supply-tank K, is connected to the supply-pipes *e*, which constitute branches of the same. The valve I′ is in the pipe I for controlling the same independent of the supply-pipes *e* below. The supply-pipe I may have a steam-jacket or a non-heat-conductor covering I″. The air-exhaust device P may be of any suitable kind, but is preferably a vacuum-pump, and an exhaust-chamber P′ is also preferably interposed in the exhaust-pipe N between the pump and the sealing-caps *f*.

K′ is a heater of any suitable kind for heating the syrup or liquid. The heater K′ may preferably be a steam jacket or coil, and the heat may be applied to the syrup or liquid in the supply-pipe I or while in the supply-tank, or both, or in the kettle or other vessel where the syrup is made. The syrup or liquid as it enters the cans or vessels should be heated to a temperature of about 212° to 240° Fahrenheit, varying with the different kinds of berries or fruit operated upon. After the cans or vessels are filled with the hot syrup or liquid the vacuum therein is broken by admission of air, this being done by suitable air-inlets *m m′*, which are opened after the filling operation is completed, thus permitting the cans to be readily separated from their caps. These air-inlets *m m′* are preferably located in the valves *i j* and their casings *c′ e′* and may thus be opened and closed by the same means which operate the valves themselves.

As illustrated in the drawings, the valves *i j* are shown in position for open communication between the sealing-caps and the exhaust device and supply-tank, the operating-bar M being to the right. By moving the operating-bar M to the left, so as to give the valves about a quarter-turn, communication with the exhaust-pump and supply-tank is closed, and the openings *m* in the valves *i j*, in connection with the openings *m′* in the casings and the main ports through the valves, admit the outer air to the sealing-caps to break the vacuum and permit the ready separation of the cans or vessels from the sealing-caps, as will be readily understood by reference to Fig. 4 of the drawings.

The sealing-caps *f* are rigidly secured together through the series of pipes *e c* and are preferably made in separate pieces and independently adjustable, as shown in the drawings.

In the modification illustrated in Figs. 6 and 7 there is substituted for the series of individual sealing-caps *f* a vacuum-chamber S, which embraces all of the supply and exhaust pipes and surrounds the cans or vessels *a*, the same being closed by a packing *u* and the plate T, upon which the cans rest and which is provided with sockets *t′* to receive or register the cans with the exhaust and supply pipes. The plate T rests on the movable support or platform C.

The operation is as follows: The series of cans or vessels *a* are placed in the series of registering sockets *t* in the plate T on the movable platform C. The support C is then moved up by the operation of the cams E and lever G and the cans pressed against the series of sealing-caps. The valve-operating bar M is then moved to the right, thus first opening the valves *i*, which connect with the exhaust device, so that the air is first exhausted from the cans, when the further movement of the valves opens the communication through the valves *j* with the supply-tank. The heated liquid or syrup then flows into the cans, filling the same all uniformly to the level determined by the projecting lower end of the exhaust-pipes, any surplus being drawn off through the exhaust-pipes. As soon as it appears through the glass inspection-cylinder *f′* that the cans are all uniformly filled the valve-operating bar M is moved to the left, thus closing communication between the sealing-caps and exhaust device and supply-tank and admitting the outer air to break the vacuums in the series of cans or vessels, so that the same may be readily removed from the sealing-caps, and then the support C is again lowered.

I claim—

1. A canning machine or apparatus comprising in combination a supply-tank for the syrup or liquid, a heater therefor, an air-exhaust device or pump, a series of can-sealing caps each having an exhaust-pipe and a supply-pipe extending through the same and adapted to enter the mouth or opening of the can, and a reciprocating platform or support upon which the cans or vessels rest and by which the cans or vessels are forced against said sealing-caps, and means for controlling the communication between said exhaust-pipes and exhaust devices and said supply-pipe and supply-tank, whereby the air is simultaneously exhausted from a number of cans, and the cans then simultaneously filled while the air is exhausted therefrom, substantially as specified.

2. A canning machine or apparatus comprising in combination a supply-tank for the syrup or liquid, a heater therefor, an air-exhaust device or pump, a series of can-sealing caps each having an exhaust-pipe and a supply-pipe extending through the same and adapted to enter the mouth or opening of the can, and a reciprocating platform or support upon which the cans or vessels rest and by which the cans or vessels are forced against said sealing-caps, and means for controlling the communication between said pipes and said exhaust devices and between said supply-pipe and supply-tank, whereby the air is simultaneously exhausted from a number of cans, and the cans then simultaneously filled while the air is exhausted therefrom, the exhaust-pipes extending slightly below the mouth or lower end of the supply-pipes to cause all the cans to be filled uniformly without waste or overflow, substantially as specified.

3. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps and adapted to enter the mouth or opening of the can and communicating respectively with said exhaust devices and supply-

tank, and valves for controlling such communication, a platform or support for the cans and means for forcing together the sealing-caps and cans, substantially as specified.

4. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps and adapted to enter the cans, and provided with valves, a platform or support for the cans, and means for forcing together the sealing-caps and cans, and means for operating said valves, substantially as specified.

5. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps and adapted to enter the cans and provided with valves, a platform or support for the cans, and means for forcing together the sealing-caps and cans, and means for simultaneously opening said valves in the exhaust-pipes and subsequently simultaneously opening said valves in the supply-pipe, substantially as specified.

6. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps and adapted to enter the cans and communicating respectively with said exhaust device and supply-tank, and valves for controlling such communication, a platform or support for the cans, and means for forcing together the sealing-caps and cans, said exhaust-pipes extending slightly below the lower ends or mouths of the supply-pipes, substantially as specified.

7. The combination with an exhaust device, of a supply-tank, a series of sealing-caps, each having communication with the exhaust device and with the supply-tank, valves for controlling such communication, a platform or support for a series of cans, and means for forcing the cans and sealing-caps together, and means for operating said valves to first open communication between the exhaust device and the series of sealing-caps, and then between the supply-tank and the series of sealing-caps, substantially as specified.

8. The combination with an exhaust device, a supply-tank, a series of sealing-caps, a series of exhaust-pipes extending through said caps and communicating with the exhaust device, a series of supply-pipes extending through said caps and communicating with said supply-tank, a platform or support for a series of cans, means for forcing the cans and sealing-caps together, and a supplemental tank in communication with the pipe leading to the exhaust device, the supply-pipe of each sealing-cap being adapted to enter the can, substantially as specified.

9. The combination with an exhaust device, of a supply-tank K, supply-pipe I, a series of branch pipes *e*, exhaust-pipe J, a series of branch exhaust-pipes *c*, tank L, tank L′, sealing-caps *f*, to which said branch supply and exhaust pipes are connected, and through which the interior of each can is connected with the supply and exhaust, and movable platform C, and means for controlling the communication between the sealing-caps and the exhaust device and supply-tank, substantially as specified.

10. The combination with an exhaust device, of a supply-tank K, supply-pipe I, a series of branch supply-pipes *e*, exhaust-pipe J, a series of branch exhaust-pipes *c*, tank L, tank L′, sealing-caps *f* to which said branch supply and exhaust pipes are connected, movable platform C, said supply and exhaust pipes *e* and *c* being furnished with valves and mechanism for operating said valves, one pair of said supply and exhaust pipes *e c* projecting through each cap into the can sealed thereby, substantially as specified.

11. The combination with an exhaust device, of a supply-tank K, supply-pipe I, a series of branch supply-pipes *e*, exhaust-pipe J, a series of branch exhaust-pipes *c*, tank L, tank L′, sealing-caps *f* to which said branch supply and exhaust pipes are connected, movable platform C, cams E and levers G for operating said platform, said supply and exhaust pipes *e* and *c* being furnished with valves and mechanism for operating said valves, one pair of said supply and exhaust pipes *e c* projecting through each sealing-cap into the can sealed thereby, substantially as specified.

12. The combination with an exhaust device, of a supply-tank, a sealing-cap having supply and exhaust pipes extending through the same and adapted to enter the mouth or opening of the can sealed by said cap, valves for each of said pipes and means for operating said valves, a can platform or support, and means for forcing the sealing-cap and can together, substantially as specified.

13. The combination with an exhaust device, of a supply-tank, a sealing-cap having supply and exhaust pipes extending through the same and adapted to enter the mouth or opening of the can sealed by said cap, and means for controlling said pipes, a can support or platform and means for forcing the sealing-cap and can together, said exhaust-pipe extending below the supply-pipe, substantially as specified.

14. The combination with an exhaust device, a supply-tank, a sealing-cap having communications through the same into the interior of the can sealed thereby with the exhaust device and with the supply-tank, a reciprocating can-support, mechanism for operating

said support, valves in said exhaust and supply pipes, and means for successively opening first the exhaust-pipe valve and then the supply-pipe valve, substantially as specified.

15. The combination with an exhaust device, a supply-tank, a sealing-cap having communications through the same into the interior of the can sealed thereby with the exhaust device and with the supply-tank, a reciprocating can-support, mechanism for operating said support, valves in said exhaust and supply pipes, means for successively opening first the exhaust-pipe valve and then the supply-pipe valve, and a supplemental tank in communication with the exhaust-pipe for collecting and returning to the supply-tank the surplus syrup or liquid, substantially as specified.

16. In a canning apparatus, the combination of the base A with standards A', an adjustable platform B, a movable platform C on which the cans are placed, cams supported on the adjustable platform with suitable levers for actuating the same, a plate H toward the top of said standards, a pair of tubes *e c* at suitable intervals through the plate H adapted to project into the mouth of the can to be filled, one of which pipes is a supply-pipe and the other of which is a suction-pipe, the mouth of the suction-pipe being below the mouth of the supply-pipe, valves in said pipes for controlling the same, a connecting-arm to said valves connected to the same and timed to operate to open the suction-pipe in advance of the supply-pipe, and a suitable supply-tank connected to the supply-pipes and a suitable valve in an exhaust-pipe connected to the several pipes leading to the cans, all coacting substantially as described, for the purpose specified.

17. In a canning apparatus, the combination of a supply-pipe, a suction-pipe, the end of which is a little below the mouth of the supply-pipe, a sealing-cap *f* through which said pipes extend into the can sealed thereby, a glass cylinder *f'* open at the top and bottom, a supplemental cap f^2, gaskets *r'* at the ends of said glass cylinder, and a gasket *r* between the cap and can whereby the air can be exhausted from the can and its contents to create vacuums in all the interstices whereby when a syrup is introduced it will be absorbed into the contents of the can, substantially as specified.

18. In a canning apparatus, the combination of a supply-pipe, a suction-pipe the end of which is a little below the mouth of the supply-pipe, a sealing-cap through which said pipes extend into the can sealed by said cap, gaskets for said caps, valves for said pipes and means for operating said valves, whereby the air can be exhausted from the can and its contents to create vacuums in all the interstices whereby, when a syrup is introduced it will be absorbed into the contents of the can, for the purpose specified.

19. In a canning apparatus, the combination of a can-sealing cap, a supply-pipe through the same, an exhaust-pipe through the same both projecting into the can sealed by said cap, and a suitable gasket on the cap to fit on the can, valves for said pipes and means for operating said valves whereby the air can be exhausted from the can and then the syrup or liquor introduced which will then be readily absorbed into the contents of the can, for the purpose specified.

20. In a canning apparatus, the combination with a sealing-cap, of a supply-pipe, an exhaust-pipe, the mouth of which is a little below the mouth of the supply-pipe, valves for said pipes and means for operating said valves, whereby the point to which the can will be filled by the syrup or liquid is under control, both of said pipes extending through said sealing-cap into the can sealed thereby.

21. In a canning apparatus, the combination with a series of sealing-caps, of a supply-pipe and an exhaust-pipe for and extending through each cap into the can sealed thereby, a valve in each of said pipes with arms thereon having lateral pins, a bar with transverse slots therein embracing the pins on the arms of the valves whereby the valves can all be operated simultaneously and suitably timed to open the exhaust-pipes in advance of the supply-pipes, substantially as and for the purpose set forth.

22. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps, a platform or support for the cans, and means for forcing together the sealing-caps and cans, said supply and exhaust pipes being provided with air-inlets and means for opening and closing the same, so that after the air-exhausting and filling operations are completed the vacuum in the cans may be broken to permit the separation of the cans from the sealing-caps, substantially as specified.

23. In a canning machine or apparatus, the combination with a supply-tank for the syrup or liquid, of a heater, an air-exhaust device, a series of can-sealing caps, a series of pairs of exhaust and supply pipes extending through said caps and provided with valves, a platform or support for the cans, and means for forcing together the sealing-caps and cans, and means for operating said valves, said valves being provided with air-inlets to break the vacuum in the cans or vessels after the filling operation is completed, substantially as specified.

24. The combination with an exhaust device, a supply-tank, a series of sealing-caps,

a series of pairs of supply-pipes and exhaust-pipes extending through said sealing-caps, means for controlling the communication between said sealing-caps and said supply-tank, a reciprocating platform or support for a series of cans, and mechanism for reciprocating said supports, said supply and exhaust pipes being provided with air-inlets and means for opening and closing the same, so that after the air-exhausting and filling operations are completed the vacuum in the cans may be broken to permit the separation of the cans from the sealing-caps, substantially as specified.

25. The combination with an exhaust device, of a supply-tank, a sealing-cap having supply and exhaust pipes extending through the same, a can platform or support, means for forcing the sealing-cap and can together, air-inlets and valves for opening and closing said supply and exhaust pipes and air-inlets, substantially as specified.

26. The combination with an exhaust device, a supply-tank, a sealing-cap having communication with the exhaust device and with the supply-tank, a reciprocating can-support, mechanism for operating said support, valves in said exhaust and supply pipes, means for successively opening first the exhaust-pipe valve and then the supply-pipe valve, and air-inlets opened and closed by said valves, substantially as specified.

SAMUEL J. DUNKLEY.

Witnesses:
H. M. MUNDAY,
WM. GEIGER.