April 30, 1935. J. J. TOWNSEND 1,999,430

COOKING APPARATUS

Filed March 30, 1932 2 Sheets-Sheet 1

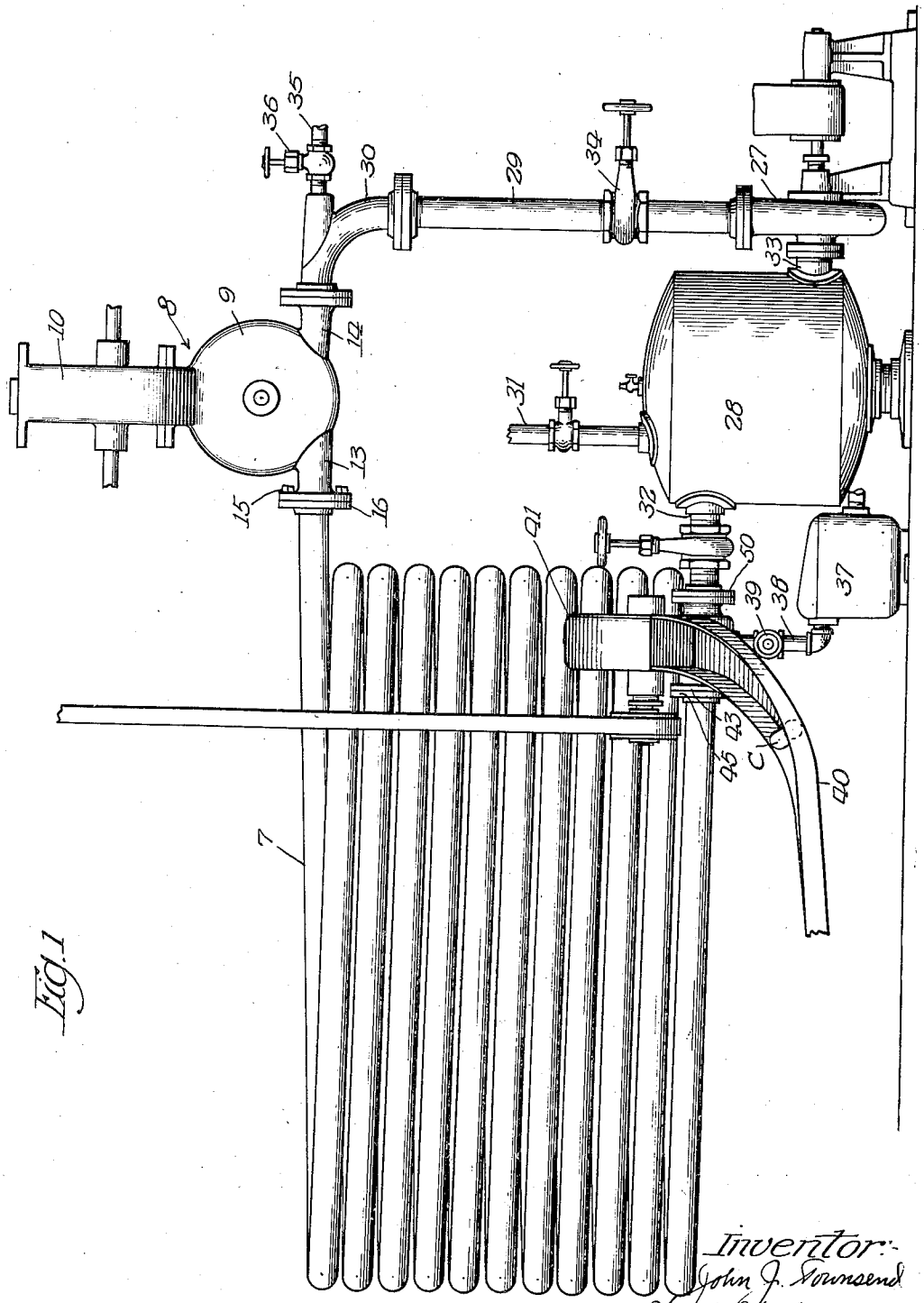


Fig. 1

Inventor:
John J. Townsend
By Reed & Gerlach
his Attys.

April 30, 1935. J. J. TOWNSEND 1,999,430

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Filed March 30, 1932 2 Sheets-Sheet 2

Fig. 2

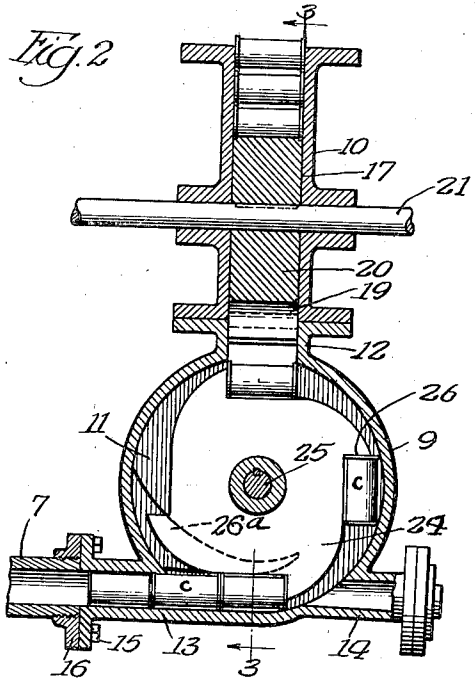


Fig. 3

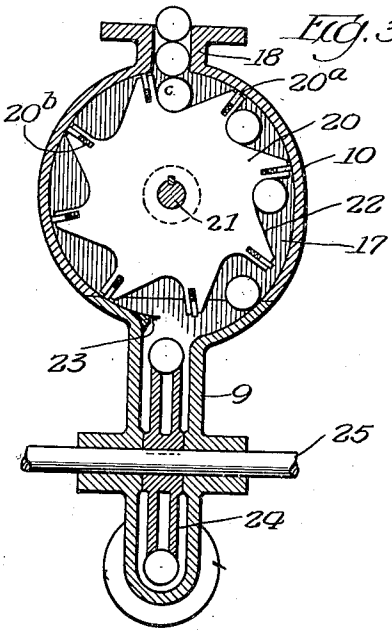


Fig. 4

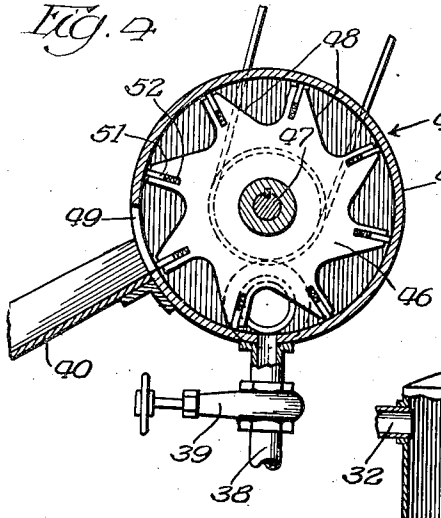
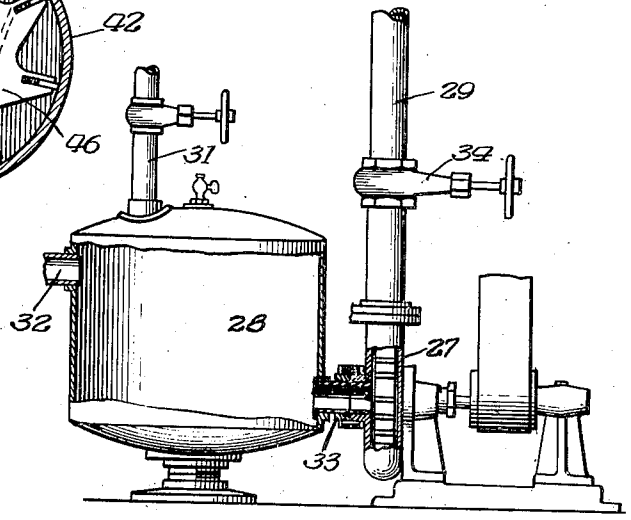


Fig. 5



Inventor:
John J. Townsend
By Fred Gerlach
his Atty.

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COOKING APPARATUS

John J. Townsend, Camden, N. J., assignor to John Schmidt, Buffalo, N. Y.

Application March 30, 1932, Serial No. 601,994

9 Claims. (Cl. 126—272)

The invention relates generally to apparatus for cooking or processing food products. More particularly the invention relates to that type of apparatus which is designed expressly for use in connection with the cooking of canned food products and comprises a pipe which is adapted to have the can placed therein in end-to-end relation and then to have steam injected through it for cooking purposes.

One object of the invention is to provide a cooking apparatus of this character which comprises a pressure-tight device for feeding the cans into alignment or registry with the inlet end of the pipe and embodies means for discharging a stream of fluid under pressure against the cans so as to force them into the pipe.

Another object of the invention is to provide a cooking apparatus of the character under consideration which embodies a pressure-tight device for discharging the cans from the outlet end of the pipe onto a chute or conveyor, and includes means whereby a stream of water under pressure may be introduced into the inlet end of the pipe, after injection of steam for cooking purposes, so as to cool the cans and feed them to the discharge device at the outlet end of the pipe.

A further object of the invention is to provide a cooking apparatus of the aforesaid type which comprises a water tank at the outlet end of the pipe and embodies a power-driven pump for forcing water from the tank into the inlet end of the pipe for can-feeding or discharging purposes.

A still further object of the invention is to provide a cooking apparatus of the type under consideration which is generally of new and improved construction, may be manufactured at a comparatively low cost and is exceedingly efficient in operation.

In addition it is contemplated as one of the objects of the invention, to provide a method of cooking canned food products which contemplates introducing the cans in end-to-end relation into a pipe, then injecting steam into the pipe for cooking purposes and finally delivering a stream of water under pressure into the inlet end of the pipe in order to cool the cans and discharge them from the pipe.

Other objects of the invention and the various advantages and characteristics of the present cooking apparatus and method will be apparent to those who are skilled in the art from a consideration of the following detailed description.

The invention consists in the several novel features which are hereinafter set forth and are more particularly defined by claims at the conclusion hereof.

In the drawings which accompany and form a part of this specification or disclosure and in which like numerals of reference denote corresponding parts throughout the several views:

Figure 1 is a side elevation of a cooking apparatus embodying the invention;

Figure 2 is a vertical longitudinal section of the pressure-tight device for feeding the cans into alignment or registry with the inlet end of the pipe;

Figure 3 is a transverse section of the feed device taken on the line 3—3 of Figure 2;

Figure 4 is a vertical transverse section of the pressure-tight device for discharging the cans from the outlet end of the pipe; and

Figure 5 is a vertical longitudinal section of the water tank at the outlet end of the pipe and the pump for pumping water from the tank into the inlet end of the pipe for can-feeding, cooling and discharging purposes.

The apparatus which forms the subject matter of the invention is designed for use in cooking cans c of food products and comprises a pipe 7. This pipe is preferably bent so that it is in the form of a coil, as illustrated in Figure 1 of the drawings, and is adapted to have the cans c fed therein in end-to-end relation, by means of a pressure-tight feed device 8. The latter is associated with the inlet end of the pipe 7 and comprises a pair of vertically extending cast metal casings 9 and 10. The casing 9 defines a cylindrical chamber 11 and embodies a flanged can inlet 12 in the top portion thereof and a flanged can outlet 13 and a flanged fluid inlet 14 in its bottom portion. The outlet 13 extends horizontally and substantially tangentially with respect to the chamber 11 and is secured by bolts 15 to a flange 16 on the inlet end of the pipe 7. The fluid inlet 14 is aligned with the can outlet 13 and also extends substantially tangentially with respect to the chamber 11. The casing 10 is disposed directly above the casing 9 and defines a cylindrical chamber 17. It extends at right angles to the casing 9 and embodies a can inlet 18 at the top portion thereof and a flanged can outlet 19 at its bottom portion. The outlet 19 is aligned with, and is bolted or otherwise secured to, the flanged inlet 12 and forms with the latter a vertical passageway between the two chambers 11 and 17. The can inlet 18 is vertically aligned with the can outlet 19 and is adapted to receive the cans c from any suitable type of conveyor or feed mechanism. The cans are conveyed from the

inlet 18 to the outlet 19 by means of a rotor 20. This rotor is mounted rotatably in the chamber 17 by means of a shaft 21 and embodies an annular series of pockets 22 in the periphery thereof for receiving the cans from the inlet 18. The shaft 21 extends through the side walls of the casing 10 and is adapted to be driven in any suitable manner so as to rotate the rotor 20. During rotation of the rotor, the pockets 22 pass in rotative succession under the inlet 18, receive the cans, and then discharge the cans into the outlet 19. A finger 23 is suitably secured in the inlet 12 of the casing 9 and serves to divert the cans downwardly from the pockets into the chamber 11. Radially extending spring-pressed plates 20a form a fluid-tight connection between the rotor 20 and the sides of the casing 10. These plates are slidably mounted in radial slots 20b in the rotor and are located between the pockets 22. From the inlet 12, the cans are conveyed to the outlet 13 of the casing 9 by means of a rotor 24. This rotor is mounted rotatably in the chamber 11 by a shaft 25 and has pockets 26 in the periphery thereof for receiving the cans c from the inlet 12. The shaft 25 extends transversely through the casing 9 and is driven in any suitable manner and at the proper speed so as to effect rotation of the rotor. During rotation of the rotor, the cans drop into the pockets 26 and are conveyed successively to the bottom portion of the casing where they are deposited in a position wherein they are coaxially aligned with the outlet 13. In order positively to effect discharge or ejectment of the cans from the pockets 26, a finger 26a is provided. This finger is secured to the lower part of the casing 9 so that it projects opposite to the direction of rotation of the rotor 24. It operates, during drive of the rotor, to eject forcibly and positively the cans from the pockets (see Figure 2).

The cans c, after alignment or registry thereof with the outlet 13 of the casing 9, are forced into the pipe 7 by means of a centrifugal pump 27 which is connected to a water tank 28 and delivers a stream of water into the fluid inlet 14 through a pipe 29 and an elbow 30. The tank 28 receives water from any suitable source through a valve-controlled pipe 31 and is connected by a valve-controlled pipe 32 to the outlet end of the pipe 7. The pump 27 is connected to receive water from the tank 28 by way of a pipe connection 33 and is driven in any suitable manner. The pipe 29 is connected to the outlet of the pump 27 and is provided with a gate valve 34 whereby communication between the pump and the fluid inlet 14 may be cut off. The elbow 30 extends between and is connected to the pipe 29 and the inlet 14 of the casing 9. When the valve 34 is open and the pump 27 is driven, a stream of water is delivered into the bottom portion of the casing 9 through the inlet 14. This stream of water flows into the pipe and acts on the cans in such a manner that they are forced in end-to-end relation into the pipe 7. In the operation of the apparatus, the feed device 8 and the pump 27 are operated until the pipe 7 is completely filled with the cans c. After filling of the pipe, the feed device and pump are stopped and the water is permitted to drain from the pipe 7 into the water tank 28.

Cooking of the food within the cans c is effected by introducing steam into the pipe 7 by a steam pipe 35. This pipe is provided with a valve 36 and is connected to the elbow 30 so that it discharges into the fluid inlet 14. When the valve 36 is opened, a jet of steam is introduced into the end of the pipe 7 through the inlet 14 in the bottom portion of the casing 9. This jet flows through the pipe 7 and heats the cans c for cooking purposes. A steam trap 37 is connected by a pipe 38 to the outlet end of the pipe 7 and receives the steam after circulation thereof through the pipe 7. The pipe 38 is provided with a valve 39 so that the steam trap may be cut off when a stream of water is circulated through the pipe 7 for can-feeding purposes.

After the cooking operation, the cans c are discharging from the pipe 7 onto a chute or conveyor 40 by means of a pressure-tight, can-discharging device 41. This device comprises a cast metal, substantially cylindrical casing 42 which is provided with a flanged inlet 43. The latter is aligned with the outlet end of the pipe 7 and is secured in place by bolts (not shown) which extend through a flange 45 on the pipe 7. In addition to the casing 42, the discharge device 41 comprises a rotor 46. This rotor is mounted on a shaft 47 and embodies pockets 48 in the periphery thereof. The shaft 47 extends through the central portion of the casing 42 and is driven in any suitable manner so as to effect rotation of the rotor. During rotation of the rotor, the cans are introduced into the pockets 48 and are carried around the casing 42 to a discharge opening 49 from which they pass onto the conveyor or chute 40. The pipe 32 is connected to a fluid outlet 50 for the casing and communicates with the outlet end of the pipe 7 by way of the outlet 50 and the can inlet 43. The cans c are forced successively into the casing 42 of the discharge device 41 and into the path of the rotor, by operating the pump 27 so as to deliver a stream of water into the pipe 7 and force the cans through the pipe. When the pump 27 is operated to feed the cans into the pipe 7 or to effect discharge of the cans in combination with the feed device 41, the valve for the pipe 32 is opened so that the water flows from the pipe 7 into the tank 28. The pipe 38 for the steam trap 37 is connected to and receives steam from the bottom portion of the casing 42, when steam is introduced into the pipe 7 by the pipe 35. Radially extending spring plates 51 serve as fluid-tight connections between the rotor 46 and the sides of the casing 42. These plates are slidably mounted in slots or recesses 52 in the rotor 46 and are positioned between the pockets 48.

The operation of the apparatus is as follows:

When it is desired to fill the pipe 7 with the cans c, the valve 39 is first closed so as to cut off the steam trap 37 and then the valve in the pipe 32 is opened so as to establish communication between the outlet end of the pipe 7 and the water tank 28. Thereafter, the gate valve 34 is opened and power is applied to the pressure-tight feed device 8 and the centrifugal pump 27. During drive or operation of the feed device 8, the cans are deposited from the inlet 18 of the casing 10 to the outlet 19 by the rotor 20 and are shifted successively into alignment with the inlet end of the pipe 7 by the rotor 24. The latter carries the cans from the inlet 12 of the casing 9 into a position wherein they are coaxial with the outlet 13. As the cans are brought successively into alignment with the inlet end of the pipe 7, the stream of water which is introduced into the fluid inlet 14 by the centrifugal pump 27 strikes against the cans and forces them into the pipe 7. After the pipe 7 is filled with the cans, the feed device 8 and the centrifugal pump 27 are stopped and the gate valve 34 is closed. Upon drainage of the water in the pipe into the tank 28, the valve

in the pipe **32** is closed and the valves **36** and **39** are opened. Upon opening of the valve **36**, steam flows through the pipe **7** and effects cooking of the goods or products within the cans *c*. After the cooking operation, the valves **36** and **39** are closed and a discharge of the cans is effected by starting the discharge device **41** and flushing the cans **7** towards the discharge device **41** by introducing a stream of water by way of the centrifugal pump **27**. During operation of said discharge device, the cans *c* are successively received from the outlet end of the pipe **7** under pressure of the stream of water in the pipe and are rotated bodily by the rotor **46** to a point or position wherein they are discharged onto the chute or conveyor **40**. The tank **28** is initially filled with water from the pipe **31**.

The herein described apparatus is exceedingly simple, as far as construction is concerned, and comprehends the simultaneous discharge and cooling of the cans from the pipe **7**. It has proved in practice to be exceedingly efficient in operation and reduces to a minimum the time necessary to effect complete cooking of the canned goods.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an apparatus for cooking canned goods, the combination of a comparatively long, inclined pipe, means for feeding the cans in end to end relation into the high end of the pipe, and a valve-equipped pipe associated with the feed means and leading to said high end of the inclined pipe, for delivering a heating medium into the last mentioned pipe for cooking purposes.

2. In an apparatus for cooking food products in cylindrical cans of uniform diameter, the combination of a pipe of circular cross section and slightly larger than the diameter of the cans, means for introducing the cans in end to end relation into one end of the pipe and forcing them through the pipe so as to fill the latter, and valve-controlled pipe means connected to the pipe for supplying steam therethrough for cooking purposes.

3. In an apparatus for cooking food products in cylindrical cans of uniform diameter, the combination of a comparatively long, inclined pipe of circular cross section and slightly larger than the diameter of the cans, means connected to the high end of the pipe for feeding the cans in end to end relation into the pipe, a valve controlled pipe associated with the feed means and leading to said high end of the inclined pipe for delivering a heating medium into the last mentioned pipe for cooking purposes, and a mechanical discharge device for the cans at the low end of the pipe.

4. In an apparatus for cooking canned goods, the combination of a pipe, mechanical means for successively positioning the cans in longitudinal alignment with one end of the pipe, means for delivering a stream of liquid under pressure against the cans so as to force them, one at a time and in end to end relation, from said first mentioned means into the pipe, and means for supplying a heating medium to the pipe in order to heat the cans for cooking purposes while they are in the pipe.

5. In an apparatus for cooking food products in cylindrical cans of the same diameter, the combination of a pipe of circular cross section and of slightly larger diameter than the cans, a device for successively positioning the cans in longitudinal alignment with one end of the pipe comprising a casing connected to said one end of the pipe, means for delivering a stream of water into the casing so as to impinge against the can-ends and force the cans, one at a time and in end to end relation, into the pipe, and means for supplying a heating medium to the pipe in order to heat the cans for cooking purposes while they are in the pipe.

6. In an apparatus for cooking canned goods, the combination of a pipe, a device for successively positioning the cans in longitudinal alignment with one end of the pipe comprising a casing connected to said one end of the pipe, controllable means for delivering a stream of water into the casing so as to impinge against the can-ends and force the cans, one at a time and in end to end relation, into the pipe, means whereby the water may be drained from the pipe after stoppage of said means, and means for injecting a heating medium into the pipe for cooking purposes, after filling of the pipe with cans and drainage of the water therefrom.

7. In an apparatus for cooking canned goods, the combination of a pipe, means for feeding the cans in end to end relation into one end of the pipe, means for supplying a heating medium to the pipe in order to heat the cans for cooking purposes while they are in the pipe, a discharge device for the cans at the other end of the pipe, and means for delivering liquid under pressure into the pipe after cooking so as to force the cans through the pipe to the discharge device.

8. In an apparatus for cooking food products in cylindrical cans of uniform diameter, the combination of a pipe of certain cross section and of slightly larger diameter than the cans, means for feeding the cans in end to end relation into one end of the pipe, means for supplying a heating medium to the pipe in order to heat the cans for cooking purposes while they are in the pipe, a mechanical device for laterally discharging the cans at the other end of the pipe, and means for delivering a stream of water into the said one end of the pipe so as to cool the canned goods after cooking thereof and to force the cans through the pipe to the discharge device.

9. In an apparatus of the character described, the combination of a water tank, a pipe having one end thereof connected to the tank and positioned so as to discharge into said tank, a device for successively positioning cans containing food products in longitudinal alignment with the other end of the pipe, means for pumping water from the tank and discharging it into said other end of the pipe so that it impinges against the can-ends and forces the cans one at a time and in end to end relation into the pipe, and means for supplying a heating medium to the pipe in order to heat the cans for cooking purposes while they are in the pipe.

JOHN J. TOWNSEND.