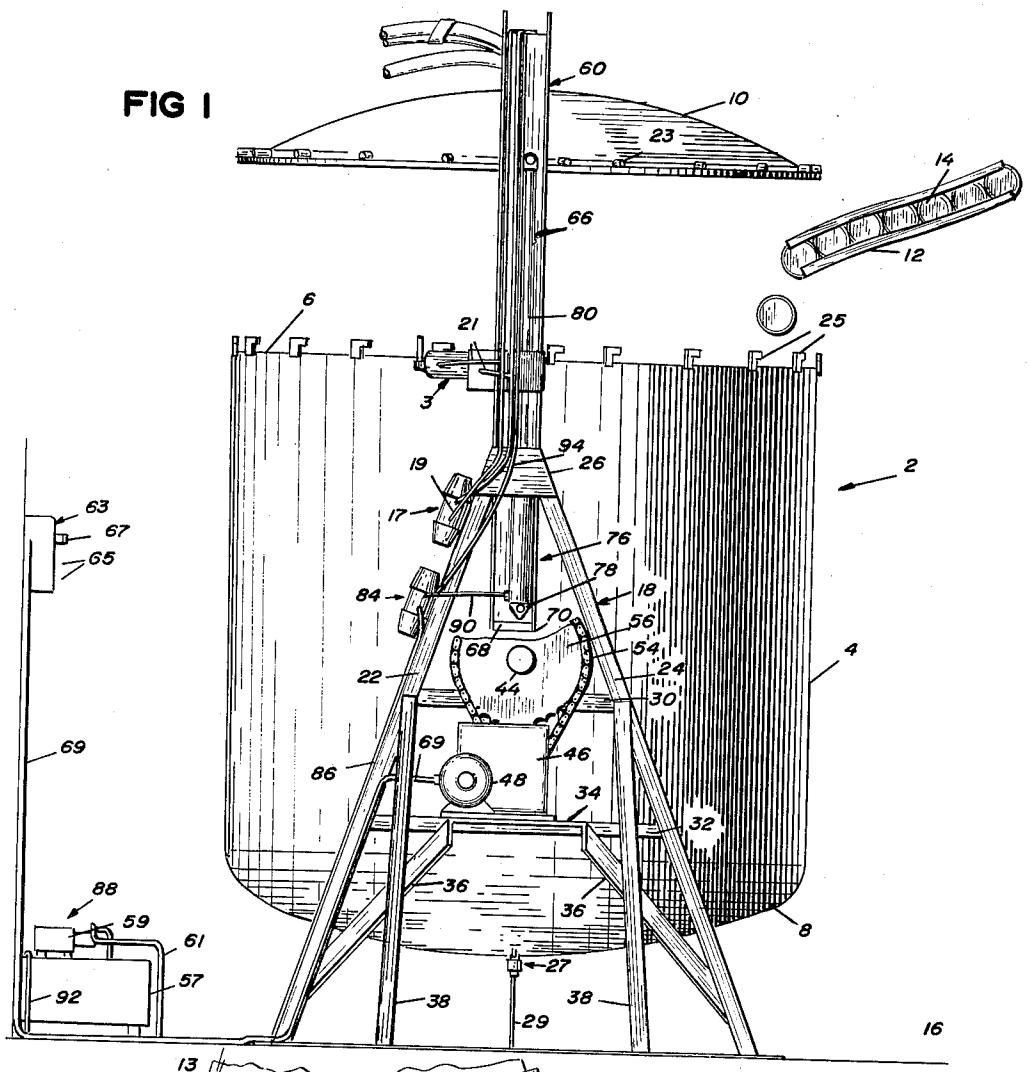
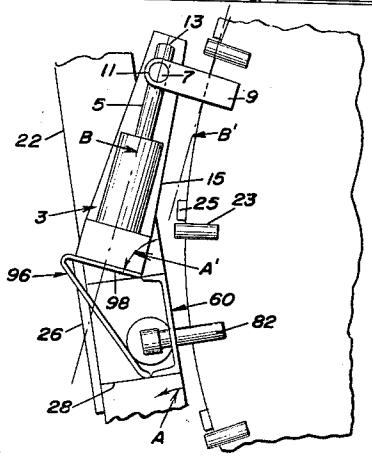
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AUTOMATICALLY OPERABLE TILTABLE RETORT

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FIG 1





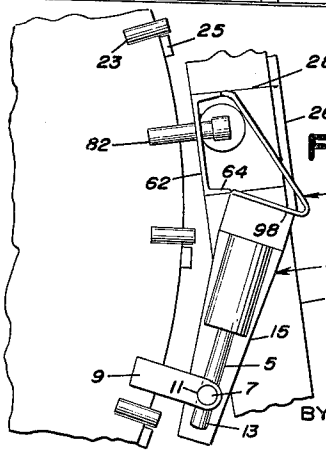


FIG 4

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AUTOMATICALLY OPERABLE TILTABLE RETORT

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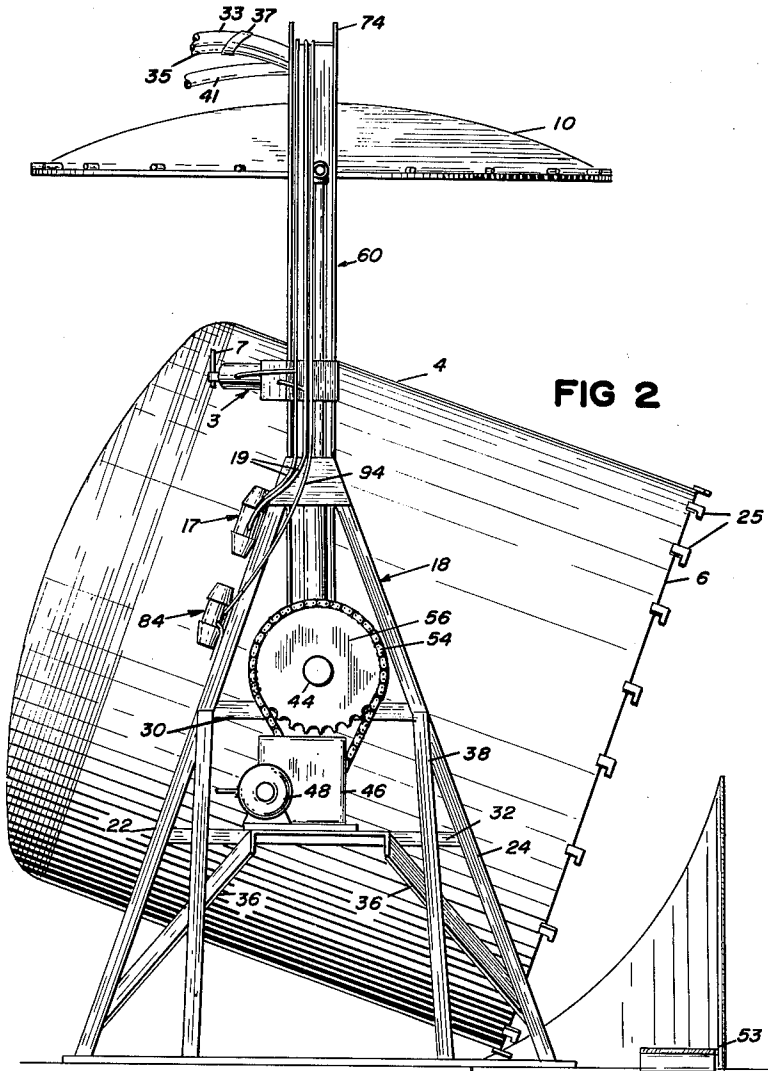


FIG 2

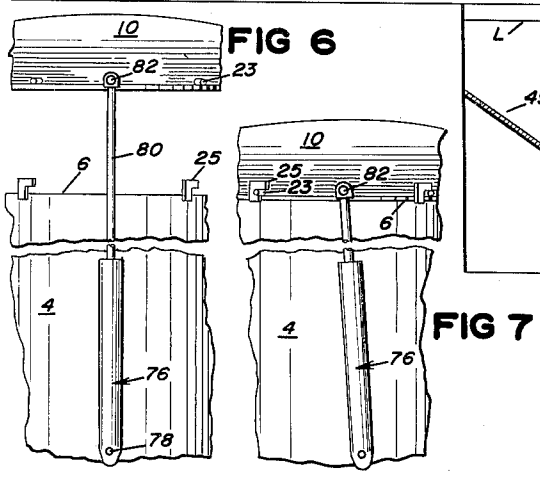


FIG 6

FIG 7

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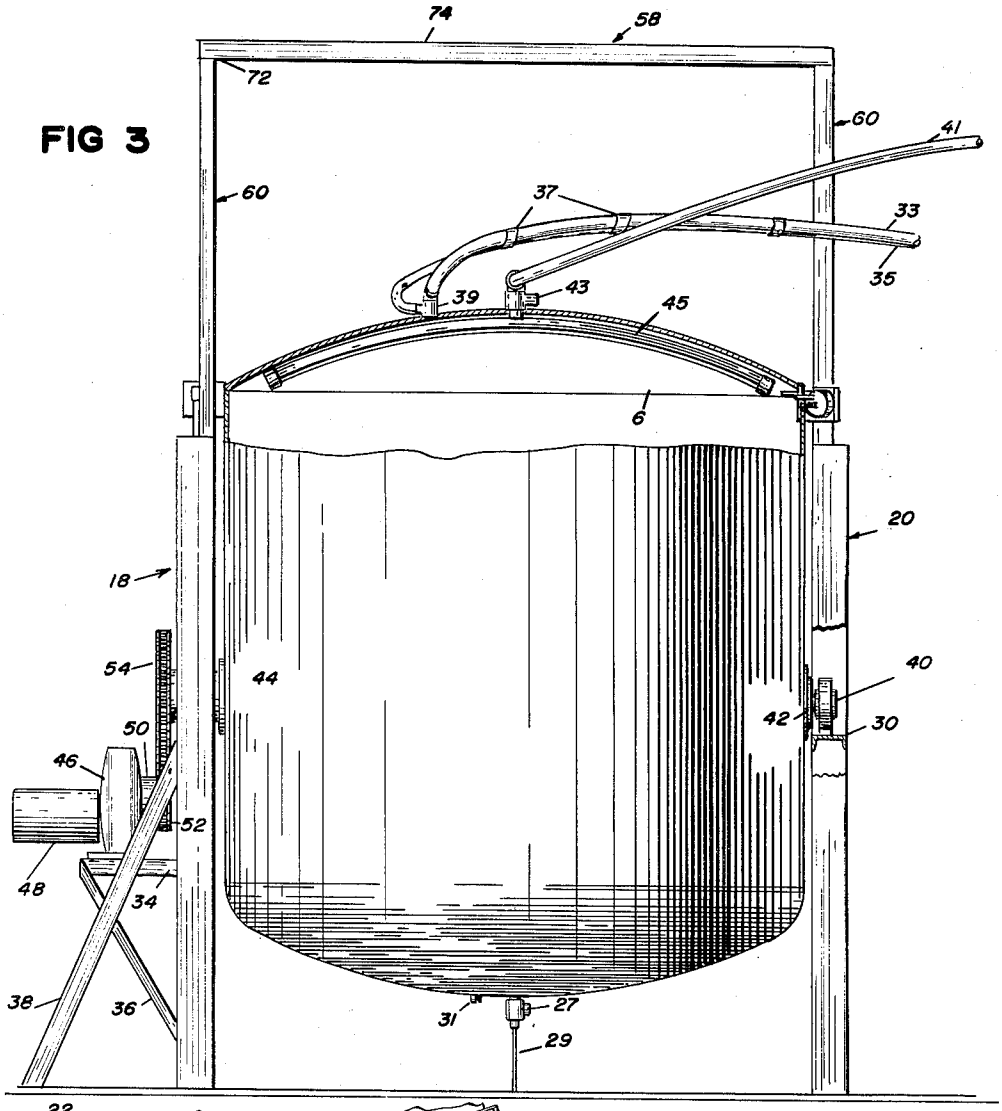
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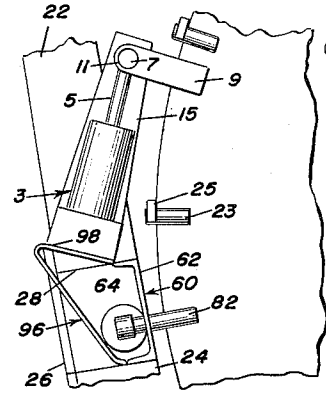
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AUTOMATICALLY OPERABLE TILTABLE RETORT

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FIG 3





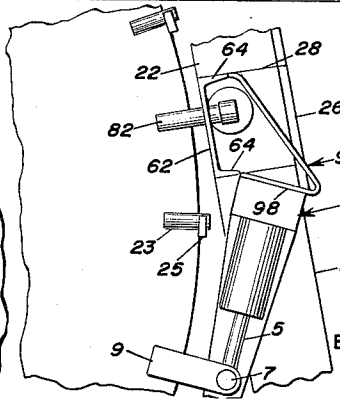


FIG 5

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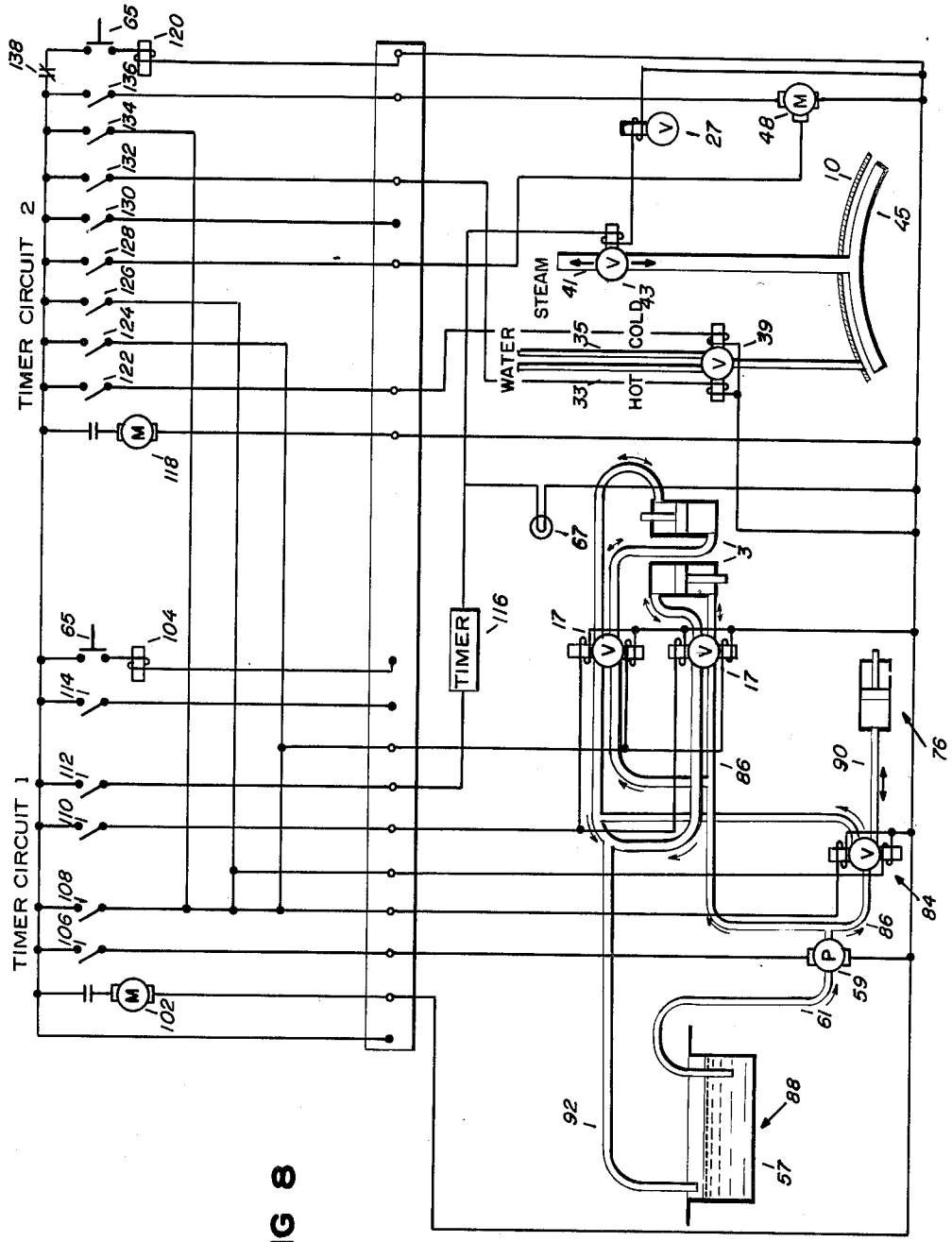


FIG 8

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United States Patent Office

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3,209,673

AUTOMATICALLY OPERABLE TILTABLE RETORT

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Filed May 27, 1963, Ser. No. 283,305
11 Claims. (Cl. 99—251)

The present invention relates generally to an automatically operable tiltable retort. More particularly, this invention pertains to an apparatus and method particularly adapted to the batch processing of various products and/or articles, for example, to the batch processing of canned products. In its broadest sense, however, the present invention may be advantageously used in the batch processing of various other products and discrete articles used in or produced as a result of diverse industrial operations.

Heretofore, batch processing of canned foods has been suggested. It is the usual practice to exhaust as much air as practicable from the cans by thermal or mechanical means, before they are closed and hermetically sealed. The filled and closed cans, after they leave the closing machine, are manually placed in receptacles known as retort baskets or crates. The baskets are mechanically hoisted and lowered into vertical retorts. After a retort has been loaded with baskets of cans, the cover of the retort is closed and sealed and steam under suitable pressure is admitted to the retort for an appropriate time for effecting sterilization of the filled and closed cans. Upon completion of the sterilizing operation, it is necessary in many instances to partially cool the cans in water, to reduce the pressure therein to a sufficiently low value, before the retort can be opened to the atmosphere preparatory to removing the cans therefrom. Such pressure cooling is usually necessary for cans of substantial size, but is not usually necessary for smaller size cans. In either case, the baskets of cans are mechanically withdrawn from the retorts and passed through an elongated tank or cooling canal containing cooling water in which the baskets are immersed. After cooling sufficiently the cans are removed from the baskets individually by hand. Handling of the cans in the manner above-described necessitates considerable manual labor and the use of a large number of baskets. Those baskets occupy considerable floor space which would otherwise be available for processing equipment. This is obviously objectionable. Moreover, the productive capacity of the retorts is substantially reduced by the space occupied by the individual baskets and by the space permitted between the number of baskets included in each load or batch. Presently, manual handling of the sealed cans both before and after sterilization oftentimes results in dropping of the cans, or one or more cans forcefully coming in contact with other cans of the batch. The result is that a slight opening may occur in the cans. Subsequent passing of the cans through the water of the cooling canal results in cooling of the contents thereof. Additionally, a partial vacuum therewithin is produced, as a result of which, should any of the cans have openings therein, cooling water from the canal, which is unsterile, will be drawn into the cans through the openings contaminating the contents thereof.

With regard to the smaller cans presently subject to various industrial processing, it is presently known to automatically deliver the individual filled and closed cans into a body of water within a vertical retort, after which the water is discharged from the retort, the cans are steam sterilized and the bottom of the retort is opened and the cans are discharged through the atmosphere onto a suitable conveyor or the like. This procedure is used primarily in an effort to reduce the cost of labor. However, with regard to cans of large sizes and less resistant structure, this procedure is not used in view of the prohibitive amount of spoilage resulting, in particular, from the discharging operation.

Analogously, it is presently well known to subject many food products to preparatory treatment under liquids preliminary to canning, preserving or other industrial processing. For example, apples are usually blanched before canning by being placed in brine or water and subjected to a high vacuum, or by heating in water for several hours at 120° F. Potatoes, after peeling, are immersed in a 0.5% sodium bisulfite solution to prevent browning. Hominy is treated with boiling lye solution, followed by bleaching, and leaching with water. Dry beans may be soaked in water for as long as 16 hours to obtain optimum quality, before blanching and canning. Fish, after dressing, are immersed in strong brine for as long as 2 hours to extract moisture from the tissue. In walnut shelling operations, small pieces of nut meats are separated and recovered from intermingled shell fragments by immersing the mixture in water under vacuum to effact an increase in the apparent specific gravity of the shell fragments, sufficient to obtain subsequent flotation separation of the meats from the shells.

It is presently the usual procedure to place the articles or products in baskets for transfer into and subsequent removal from suitable treating tanks or receptacles, prior to canning or other industrial processing thereof. This requires a substantial amount of time and involves the necessary equipment for handling the baskets. Alternately, articles are placed directly into the treating receptacle, subsequently involving either manual or other upward removal of the articles, or downward discharge from the receptacle through the atmosphere. If such a procedure is followed, the depth in the receptacle of articles is quite limited, whether the articles be discharged downwardly through the atmosphere, or whether they be manually or otherwise unloaded upwardly from the receptacle. Downward discharge is usually presently preferred since upward mechanical removal from a battery of receptacles introduces a factor of substantial complexity.

Still further, in industrial process, it is presently known to treat articles, both metallic and non-metallic, in baths or solutions for various purposes. As an example, suitable receptacles for pickling baths or oxidizing baths are well known. In addition, baths for cleaning, coloring, coating, or baths for other purposes, specifically with regard to non-metallic articles, are also presently well known. Such articles are usually quite small. As a result, the present practice is to place them in baskets or containers, said baskets or containers subsequently being immersed in and removed from the bath. Filling the baskets or containers involves a substantial amount of time. And, the productive volumetric capacity of the bath is substantially reduced since placement of the baskets or containers therewithin produces a substantial amount of unused space therebetween.

In an effort to obviate many of the above defects, it has heretofore been suggested that a fluid bath be provided into which various products and/or articles, such as, for example, canned goods, can be directly introduced. It has additionally been heretofore suggested that, subsequent to processing of the products and/or articles within the bath, such products and/or articles be discharged from the bath into a liquid column whereby the discharge of the products and/or articles from the bath is cushioned, thus attempting to preclude damage thereto. However, this procedure and the apparatus therefor requires manual operation and, as a result, constant manual attention to the apparatus. In addition, the size of the

apparatus is limited in view of certain practical considerations, which are considered readily apparent, and, therefore, the productive capacity of any one fluid bath is accordingly reduced. Since manual operation and constant manual attention is necessary, a battery of such fluid baths must each be attended by an individual operator, or, where one operator controls and operates the battery, each fluid bath of the battery will begin and terminate its process at a different time than the remaining fluid baths.

Accordingly, one of the primary objects of the present invention is to provide an apparatus and method particularly adapted to the batch processing of various products and/or articles, for example, canned products, which apparatus and method is not subject to the aforesaid disadvantages. More specifically, a primary object of the present invention is to provide an automatically operable apparatus and an unusually efficient method requiring little manual attention particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products.

A further primary object of the present invention is to provide an automatically operable apparatus and an unusually efficient method particularly adapted to the batch processing of canned products, said apparatus comprising a fluid bath and said method comprising delivering the canned products thereto, said fluid bath being of extensive volumetric capacity, whereby the potential productive capacity thereof is substantially increased. Still a further primary object of the present invention is to provide an apparatus and method particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, said apparatus comprising a fluid bath and said method comprising delivering said canned products to said fluid bath, said fluid bath being of extensive volumetric capacity and being particularly adapted to the congregation thereof in a battery of such fluid baths without increasing the manual attention and operation required thereof.

An additional and still further primary object of the present invention is to provide an apparatus and method particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, said apparatus comprising a fluid bath and said method comprising delivery of said canned products to a fluid bath, said apparatus and method being automatically operable and requiring little manual operation and attention and being unusually efficient regardless of the size of the canned product.

Another and still further primary object of the present invention is to provide an apparatus and method particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, said apparatus and method being automatically operable and requiring little manual operation and attention and providing a cushion for the canned products during all phases or sequences of the process, whereby the possibility of damage to the canned products is substantially, if not completely, eliminated. In accordance with this object of the present invention, the apparatus is so constituted and arranged as to, and the method comprises, maintaining the canned products within a fluid bath during all phases or sequences of the process, whereby the fluid bath provides a cushion.

Additional, still further, and yet more specific objects of the present invention are: (a) to provide an apparatus particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, comprising an automatically operable tiltable retort that is rotatable between one position in which said retort is particularly adapted to accept or have said canned products discharged thereinto, and another position in which said retort is substantially angularly displaced with respect to said one position, whereby said retort is particularly adapted to discharge said canned products subsequent to the processing treatment thereupon and with respect thereto; (b) to provide an apparatus particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, comprising an automatically operable tiltable retort having hydraulic circuit means and electrical circuit means for the complete automatic operation thereof from a single conveniently located control station, whereby said apparatus requires little manual operation and manual attention; (c) to provide an apparatus particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, comprising an automatically operable tiltable retort having hydraulic circuit means and electrical circuit means for the complete automatic operation thereof, said hydraulic circuit means and said electrical circuit means being operable from a single conveniently located control station, whereby said apparatus is particularly adapted to the congregation thereof into a battery of automatically operable tiltable retorts, and; (d) to provide an apparatus particularly adapted to the batch processing of various products and/or articles, such as, for example, canned products, comprising an automatically operable tiltable retort having hydraulic circuit means and electrical circuit means for the complete automatic operation thereof from a single conveniently located control station, said tiltable retort being of extensive volumetric capacity and of extensive potential productive capacity and said apparatus is particularly adapted to the congregation of said tiltable retorts into a battery thereof, said battery of tiltable retorts being substantially simultaneously operable completely throughout each of the phases or sequences of the batching process.

The invention lies in the combination, construction, arrangement, and disposition of the various components and means incorporated in an automatically operable tiltable retort constructed in accordance herewith, and in the steps comprising the method developed in accordance herewith. The present invention will be better understood and objects other than those specifically set forth above will become apparent when consideration is given to the following detailed description. Such description refers to the annexed drawings, presenting the preferred and illustrative embodiment of the invention and wherein:

FIGURE 1 is a side elevational view of an automatically operable tiltable retort constructed in accordance with the present invention, and illustrating certain component parts in one position;

FIGURE 2 is a view similar to FIGURE 1, but illustrating said component parts in another position;

FIGURE 3 is a front elevational view, partially in section, of the automatically operable tiltable retort illustrated in FIGURES 1 and 2;

FIGURE 4 is an enlarged fragmental plan view of certain component parts of the automatically operable tiltable retort illustrated in FIGURES 1 to 3, said component parts being in one of the positions thereof;

FIGURE 5 is a view similar to FIGURE 4, but illustrattrating the component parts in another of the positions thereof;

FIGURE 6 is an enlarged fragmental side elevational view of certain component parts of the automatically operable tiltable retort illustrated in FIGURES 1 to 3, said component parts being in one of the positions thereof;

FIGURE 7 is a view similar to FIGURE 6, but illustrating the component parts in another of the positions thereof, and;

FIGURE 8 is a schematic view illustrating an hydraulic circuit means and an electrical circuit means for automatically operating the tiltable retort illustrated in FIGURES 1 to 3.

It is to be understood that, while the tiltable retort constructed in accordance with the present invention is ren-

dered completely automatically operable by means of an hydraulic circuit, it is within the scope of this invention to render said tiltable retort completely automatically operable by means of a pneumatic circuit means, should that be found desirable. Thus, in the ensuing description, an hydraulic circuit means will be particularly disclosed. However, in the appended claims, generic terminology such as fluid circuit means will be employed and, it is to be understood, that such terminology is intended to encompass both hydraulic and pneumatic circuit means.

Additionally, in the ensuing description, an automatically operable tiltable retort constructed in accordance with the present invention, and a method comprising certain steps in accordance with the present invention, will be disclosed as being particularly adapted to the batch processing of such products and/or articles as canned goods. However, it will be understood that the present invention, in its broadest sense, is as well adapted to the batch processing of any suitable product and/or article used in or produced as a result of diverse industrial operations, whether such product and/or article be edible or inedible, and whether such product and/or article be metallic or non-metallic. The appended claims, therefore, are to be given their broadest reasonable interpretation as encompassing any handling or treatment process capable of being performed by the automatically operable tiltable retort constructed in accordance herewith and capable of reasonably involving the steps comprising the method developed in accordance herewith. While, as pointed out above, the present invention is particularly adapted to the handling or treatment of canned products, in its broadest sense, the present invention is not limited thereto, and may be used in connection with any suitable product and/or article capable of being handled by the automatically operable tiltable retort constructed in accordance herewith and capable of being processed by the steps comprising the method developed in accordance herewith.

Reference is now made more specifically to the drawings for purposes of explaining the detailed aspects of the instant development.

Referring now to the drawing, there is illustrated therein an automatically operable tiltable retort, generally designated by the reference character **2**. The retort comprises a tank or container **4** which may be fabricated of any suitable material and in any suitable manner. Preferably, the tank or container **4** is of generally cylindrical configuration, though any suitable configuration may be used. The tank **4** has an upper open end **6** and a closed or imperforate lower end **8**. The upper open end **6** of the tank or container **4** is particularly adapted to be hermetically sealed or closed by a lid or cover **10**, in a manner to be more particularly described hereinafter. A track **12**, of known conventional construction, which may lead from, for example, a can-closing machine, extends at a downward inclination to the upper open end **6** of the tank or container **4** for delivering thereto filled and closed cans **14**. While the closed or imperforate lower end **8** of the tank or container **4** is preferably of curvilinear configuration, as illustrated in the drawings, it is to be understood that any suitable configuration may be used.

The cylindrical tank or container **4** is particularly adapted to be rotatably or tiltably supported upon any suitable planar surface **16**. To this end, a pair of supports is provided, one of such supports being generally designated by the reference character **18** and the other of such supports being generally designated by the reference character **20**. The supports **18** and **20** are oppositely disposed and coaxially aligned with respect to one another, for a purpose to be described hereinafter. Each of the supports **18** and **20** comprises a plurality of legs **22** and **24**, said legs being angularly disposed with respect to one another so that the supports are of generally triangular configuration. A connector plate **26** is positioned substantially adjacent the apex of each of the supports **18** and **20** and is fixedly secured, in any suitable manner, to each of the legs **22** and **24** thereof, whereby the legs **22** and **24** of each of the supports are fixedly secured with respect to one another. However, the longitudinal dimensional extent of the legs **22** and **24** of each of the supports **18** and **20** is less than that required for the legs to meet at the apex of the triangle defined thereby. In other words, the vertical dimension of the triangle defined by each of the supports **18** and **20** is of less vertical extent than it would be if the dimension of the legs **22** and **24** along the longitudinal axis thereof was chosen so that the legs were positioned in contact with one another at the actual apex of said triangle. In accordance with this construction, there is provided, therefore, a bore or passageway **28** extending through each of the supports **18** and **20** substantially adjacent the actual apex thereof. As particularly illustrated in FIGURES 4 and 5, this bore or passageway **28**, the purpose of which will be described hereinafter, is defined by the legs **22** and **24** of each of the triangular supports **18** and **20** and the connector plates **28** fixedly securing the legs **22** and **24** of each of the supports with respect to one another. Thus, the bore or passageway is of generally rectangular configuration.

Each of the triangular supports **18** and **20** further comprise at least one horizontal brace **30** positioned and extending between and fixedly connected to each of the legs **22** and **24** thereof. The horizontal brace **30** may be fabricated of any suitable material and in any suitable manner, and performs the function, in addition to performing the function of providing stability to each of the triangular supports **18** and **20**, of providing a platform upon which suitable bearings are particularly adapted to be positioned, in a manner to be hereinafter described, said bearings rotatably or tiltably journalling the tank or container **4**. An other horizontal brace **32** is positioned and extends between and is fixedly connected to, in any suitable manner, the legs **22** and **24** of the triangular support **18**. This horizontal brace **32** may be fabricated of any suitable material and in any suitable manner, and is particularly adapted to have fixedly connected thereto a platform **34**. The platform **34**, which may be fabricated of any suitable material and in any suitable manner, extends laterally outwardly of the triangular support **18**, and is particularly adapted to the purpose of providing a support or platform for the means to rotate or tilt the container **4**, said rotating or tilting means being particularly described hereinafter. It is preferable that the outer end of the platform **34** be provided with stabilizing braces **36** positioned and extending between and connected to, in any suitable manner, said outer end and each of the legs **22** and **24** of the triangular support **18**. With particular reference to FIGURE 1, it can be seen that two such stabilizing braces **36** preferably are provided, one such stabilizing brace connected to and extending between the leg **22** and the outer end of the platform **34** and the other brace connected to and extending between the leg **24** and the outer end of the platform. This particular construction is of importance when it is realized that the platform **34** is, in effect, a cantilever beam, the outer end of which has a tendency to flex in a generally counterclockwise direction, in view of the weight of the means for rotating or tilting the tank or container **4** positioned thereupon. And, due to the weight of these component parts, to be hereinafter described, it is preferable that an other pair of stabilizing braces **38** be provided. The stabilizing braces **38** are positioned and extend between the legs **22** and **24** of the triangular support **18**, to which the braces **38** may be connected in any suitable manner, and the planar surface **16**. The braces **38** are angularly disposed with respect to the triangular support **18**, and, therefore, it is considered readily apparent that lateral support for the triangular support **18** is provided.

As pointed out above, the tank or container **4** is rotatably or tiltably journalled or positioned upon and with

respect to each of the triangular supports 18 and 20. To this end, one bearing 40 is positioned upon and suitably fixedly connected to the horizontal brace 30 positioned and extending between the legs 22 and 24 of the triangular support 20. This bearing 40 may be of any suitable known conventional construction and is particularly adapted to have a first shaft 42, non-rotatably or non-tiltably connected to the tank or container 4 in any suitable manner, rotatably or tiltably journalled therewithin. An other shaft 44, non-rotatably or non-tiltably connected to the tank or container 4 in any suitable manner, is coaxially aligned with the shaft 42 and is particularly adapted to be rotatably journalled within another bearing (not shown) positioned upon and suitably fixedly secured to the horizontal brace 30 positioned and extending between the legs 22 and 24 of the triangular support 18. In accordance with this construction, the shafts 42 and 44 comprise, together, an axis, positioned substantially or generally medially of the vertical extent of the tank or container 4, about which axis the tank or container is rotatable or tiltable. It can be said, therefore, that the shafts 42 and 44 define an axis of rotation or tilting.

As pointed out above, the platform 34 is particularly adapted to provide support for a drive means for rotating or tilting the tank or container 4 about its axis of rotation, said axis of rotation being positioned medially of the height thereof. To this end, a gear reduction box of suitable known conventional construction is fixedly positioned upon and secured to the platform 34 in any suitable manner. A reversible electric motor 48, of any suitable known conventional construction, is structurally positioned with respect to the gear box 46 in any suitable manner and is particularly adapted to have the rotational speed of the output shaft thereof reduced by the gear box in a manner considered apparent to those skilled in the art. In this manner, as is considered readily apparent, a rotational output of increased torque is provided. The output shaft 50 of the gear box 46 is so constituted and arranged and is particularly adapted to drive a driving sprocket 52 of any suitable known conventional construction, in a manner considered readily apparent. The driving sprocket 52, itself, is so constituted and arranged and is particularly adapted to be mutually cooperatively engageable with a sprocket chain of any suitable known conventional construction which, in turn, is so constituted and arranged and is particularly adapted to be mutually cooperatively engageable with a driven sprocket 56 (FIGURE 1). The driving sprocket 52, the sprocket chain 54 and the driven sprocket 56, when taken together and in conjunction with one another, provide a further gear reduction finally defining the rotational speed of the shaft 42 and 44, which shaft, as pointed out above, define the axis of rotation of the tank or container 4 about which the tank or container is particularly adapted to be tilted. Thus, as is considered readily apparent to those skilled in the art, sufficient rotational output torque is provided to the shafts 42 and 44 for tilting the tank or container 4 about the axis defined thereby.

As pointed out above, the legs 22 and 24 of each of the triangular supports 18 and 20 are not of such longitudinal dimensional extent along the longitudinal axis thereof as to come in contact with one another at the actual apex of the triangle defined thereby. As a result, and as also pointed out above, there is, therefore, provided the bore or passageway 28 extending through each of the triangular supports 18 and 20. A housing, generally designated by the reference character 58, is particularly adapted to be fixedly positioned upon and secured with respect to the triangular supports 18 and 20. The housing 58 comprises a pair of longitudinally extensive generally vertically extending legs, generally designated by the reference character 60, which legs may be fabricated of any suitable material and in any suitable manner. Preferably, and with particular reference now to FIGURES 4 and 5, the legs 60 are of generally U-shaped or channel-shaped configuration, having a bite wall 62 and a pair of outwardly extending walls 64. The walls 64 are fixedly positioned upon and secured with respect to the legs 22 and 24 of of each of the triangular supports 18 and 20 in any suitable manner. As pointed out above, the bore or passageway 28, which may additionally be defined as a channel, is defined, at least in part, by the legs 22 and 24 and the connector plate 26 of each of the triangular supports 18 and 20. It will be seen, with reference to FIGURES 4 and 5, that the channel 28 is, additionally, defined by the bite wall 62 of each of the vertical legs 60. The vertical legs 60 are longitudinally extensive in a generally vertical direction and extend from a point well below the connector plate 26 to a point well above the upper open end 6 of the tank or container 4. Each of the legs 60 is provided with a longitudinally extensive slot 66, for a purpose to be described hereinafter. A generally horizontally extending platform 68, of any suitable configuration and fabricated in any suitable manner, is positioned at the lower end 70 of each of the legs 60 and is fixedly secured between and with respect to the outwardly extending walls 64 thereof in any suitable manner. Fixedly connected to the upper end 72 of each of the legs 60 in any suitable manner, and positioned and extending therebetween, is a horizontally extending leg 74. Preferably, the leg 74 is of the same general configuration as the vertically extending legs 60, though the legs 74 may be of any other suitable configuration. Thus, the horizontally extending leg 74 of the housing 58 has a bite wall and outwardly extending walls as do each of the vertically extending legs 60, whereby the horizontal leg is of generally U-shaped or channel-shaped configuration. If desired, the horizontal leg 74 may be fabricated of the same material and in the same manner as the vertically extending legs 60. It will be understood, in accordance with this construction, that the channel-shaped configuration of the vertical legs 60 and the horizontal leg 74 of the housing 58 provide a recess or channel or housing for the fluid lines of the hydraulic circuit means rendering the tiltable retort 2 completely automatic, all as will be more fully described hereinafter. Additionally, each of the vertically extending legs 60 of the housing 58 provide a recess or channel or housing for the hydraulic means that performs the function of raising and lowering the lid 10, as also will be more particularly described hereinafter.

With specific regard now to the lid 10, the same is positioned within the housing 58 and between the vertical legs 60 thereof for vertical movement with respect to the upper open end 6 of the tank or container 4. The lid 10 can be constructed of any suitable material and in any suitable manner and may be of any suitable configuration. Of course, since the tank is preferably of cylindrical configuration, as pointed out above, the configuration of the lid 10 is preferably generally annular and is, therefore, particularly adapted for mutual cooperative engagement to the upper open end 6 thereof. When the lid 10 is positioned upon and with respect to the upper open end 6 of the tank or container 4, the latter is capable of and is particularly adapted to be hermetically sealed, as will subsequently be made apparent.

As pointed out above, an hydraulically operable or fluid operable means is provided for vertically moving the lid 10 with respect to the upper open end 6 of the tank or container 4 and between positions hermetically sealing the tank or container and opening the same to the atmosphere. To this end, a fluid operable piston-cylinder combination, generally designated by the reference character 76, is positioned upon the platform 68 of each of the vertically extending legs 60 of the housing 58. The piston-cylinder combination 76 may be of any suitable known conventional construction, and is, of necessity, for a reason that will become apparent hereinafter, rotatably positioned or mounted upon and with respect to each of the vertically extending legs 60 and the platform 68 thereof. As indicated by the reference character 78, each of the

piston-cylinder combinations 76, are rotatably positioned or mounted upon each of the vertically extending legs 60 closer to one of the outwardly extending walls 64 thereof than the other. With particular reference now to FIGURES 6 and 7, and in accordance with this construction, it can be seen that the piston-cylinder combinations 76 are capable of rotation or pivotal movement in a generally counterclockwise direction. The amount or degree or extent of such rotational or pivotal movement is relatively small, since little is required, as will be made clear hereinafter. A piston rod 80 of conventional construction, extends upwardly and outwardly from each of the piston-cylinder combinations 76. Each of the piston rods 80 is longitudinally extensive and extends vertically upwardly along the vertically extending legs 60 of the housing 58 and between the outwardly extending walls 64 thereof. Thus, it is considered readily apparent that the piston-cylinder combinations 76 and the piston rods 80 are positioned and contained within the channel, recess or housing defined by the bite wall 62 and the outwardly extending walls 64 of each of the vertically extending legs 60 of the housing 58. A pin 82, fabricated in any suitable manner and of any suitable material, and of any suitable configuration, is fixedly connected to the upper end of each of the piston rods 80. As pointed out above, the vertically extending legs 60 of the housing 58 are each of them provided with a slot 66. The pin 82, connected to each of the piston rods 80, is particularly adapted to extend through the slots 66 and be fixedly connected to the lid 10 in any suitable manner. Thus, it can be seen that the pins 82 extend laterally inwardly of the housing 58 and provide a fixed connection between the lid 10 and the piston rods 80 comprising, at least in part, the fluid operable means for raising and lowering the lid 10 with respect to the upper open end 6 of the tank or container 4. The fluid operable means for raising and lowering the lid 10 comprises, further, an hydraulically or fluid operable valve for supplying operating fluid to and from each of the piston-cylinder combinations 76. The valve, generally designated by the reference character 84, may be of any suitable known conventional construction and is fixedly positioned upon and secured with respect to the leg 22 of the triangular support 18 in any suitable manner. Preferably, the valve 84 is a solenoid operated valve having an inlet, an outlet, and a return or drain line. As particularly shown in FIGURE 1, a fluid supply line 86 supplies fluid to the solenoid operated valve 84 from a suitable source of fluid supply, generally designated by the reference character 88, and to be more particularly described hereinafter. The outlet from the solenoid operated valve 84 is connected to the piston-cylinder combination 76 positioned upon the triangular support 18 by means of a fluid line, as indicated by the reference character 90. Preferably, the fluid line 90 performs the double function of supplying fluid to the piston-cylinder combination 76 and returning fluid from the piston-cylinder combination, to and through the solenoid operated valve 84 and returning or draining to the source of fluid supply by means of a drain line, indicated by the reference character 92. In accordance with this construction, therefore, the solenoid valve 84 is of the double-acting solenoid type having two positions: In one position, the solenoid valve 84 directs fluid from the source of supply 88, to and through the valve, and to the piston-cylinder combination 76 by means of the fluid line 90. In the other position of the solenoid valve 84, the same directs fluid from the piston-cylinder combination 76, through the fluid line 90, to and through the valve 84 and returning the fluid to the source of supply 88 by means of the drain line 92. In effect, therefore, the solenoid valve 84 has a supply position and a drain position. The solenoid operated valve 84 also supplies fluid from the source of supply 88 to the other piston-cylinder combination 76 positioned upon and secured with respect to the triangular support 20. To this end, a fluid line 94 is connected to the fluid line 90, extends along the vertical leg 60 positioned upon and secured with respect to the triangular support 18, within the channel defined thereby, along the horizontal leg 74 of the housing 58, and within the channel defined thereby, and, finally, downwardly along the other vertical leg 60, within the channel defined thereby, to the other piston-cylinder combination 76 positioned upon and secured with respect to the triangular support 20. It is considered readily apparent, that the fluid line 94 is contained completely within the channel or recess defined by the vertically and horizontally extending legs of the housing 58. And, preferably, the fluid line 94 is secured with respect to the bite wall of each of the vertical legs 60 and the horizontal leg 74 in any suitable manner. Let it be said, that the fluid lines 90 and 94 together comprise a fluid line for supplying fluid to and draining fluid from each of the piston-cylinder combinations 76.

The lid 10, as pointed out above, moves vertically longitudinally toward and away from the upper open end 6 of the tank or container 4. To this end, there is provided a means for guiding the movement of the lid 10 vertically longitudinally of the housing 58 and with respect to the upper open end 6 of the tank or container. As pointed out above, the slot 66 is provided in the bite wall 62 of each of the vertically extending legs 60 of the housing 58. And, this slot 66 is particularly adapted to be mutually cooperatively engageable with the pin 82 connected to the upper end of each of the piston rods 80 as the pin 82 moves vertically longitudinally within and along the slot. Though not shown, it is considered readily apparent that the slot 66 is of generally L-shaped configuration having a short horizontally extending leg at the lower end of the longitudinally extensive vertical leg. This is necessary since, as will be described more fully hereinafter, the lid or cover 10 rotates in a generally clockwise direction, when viewed downwardly in FIGURE 1, so that the lid or cover may be hermetically sealed with respect to the upper open end 6 of the tank or container 4. In accordance with this construction, and in view of the fact that the pins 82 are fixedly connected to the lid or cover 10, the pins must have the horizontal leg of the slot 66 within which to be positioned or disposed when the lid or cover is rotatably moved to a hermetically sealed position with respect to the upper open end 6 of the tank 4.

Means is provided for rotatably moving the lid or cover 10 from a position in which the same is hermetically sealed with respect to the upper open end 6 of the tank or container 4 to a position in which said lid or cover is capable of being moved vertically longitudinally of the housing 58 towards and away and with respect to the upper open end. In this connection, a bracket is fixedly positioned upon and secured with respect to each of the vertically extending legs 60 of the housing 58, in any suitable manner, and at a ponit therealong, substantially adjacent the upper open end 6 of the tank or container 4. The brackets, generally designated by the reference character 96, may be fabricated of any suitable material and in any suitable manner, and are preferably of triangular configuration, as is particularly illustrated in FIGURES 4 and 5. Each leg of the triangular brackets 96 is connected to the outwardly extending walls 64 of each of the vertically extending legs 60 of the housing 58. This may be accomplished in any suitable manner, as for example, by using spot-welding techniques. Again, with reference to FIGURES 4 and 5, and particularly with reference to FIGURE 4, it will be seen that each leg of each of the triangular brackets 96 is disposed or positioned at an acute angle with respect to a vertical plane through the bite wall 62 of the vertically extending legs 60, said acute angle being developed by extending an annulus from said plane to the legs of each of the triangular brackets 96 in a generally counterclockwise direction. The acute angles defined by the legs of each of the

triangular brackets 96 and the vertical plane through the bite wall 62 of each of the vertical legs 60 are generally designated by the reference characters A and A', it being understood that, preferably, the acute angle A' is of greater angular extent than the acute angle A. Additionally, the acute angle A' is chosen so that a plane taken at right angles to the leg 98 of each of the triangular bracket 96, generally designated by the reference character B, is disposed in substantially parallel relationship with respect to a tangent B' to the annulus defined by the upper open end 6 of the cylindrical tank or container 4. The purpose for this particular relationship will subsequently be particularly described.

The means for rotatably moving the lid or cover 10 comprises, further, an hydraulically or fluid operated piston-cylinder combination, generally designated by the reference character 3, fixedly positioned upon and secured with respect to each of the triangular brackets 96 in any suitable manner. Again, with reference to FIGURES 4 and 5, it can be seen that the piston-cylinder combinations 3, are fixedly positioned upon and secured with respect to the leg 98 of each of the triangular brackets 96. Each of the piston-cylinder combinations 3 comprise a piston rod 5 extending outwardly of and from the cylinder thereof. A vertically extending pin 7 is connected to the outer end of each of the piston rods 5 and a laterally extending lug 9 is fixedly connected upon and secured with respect to the lid or cover 10, in any suitable manner, and extends laterally outwardly thereof. It is to be noted that the lugs 9, which may be fabricated of any suitable material, and in any suitable manner, are particularly adapted to be mutually cooperatively engageable with each of the vertically extending pins 7 for a purpose to be particularly described hereinafter. Thus, each of the lugs 9 is provided with a vertically extending bore or passageway 11 extending therethrough, whereby the lugs may, in fact, be mutually cooperatively engageable with the vertically extending pins 7. Preferably, and as is particularly illustrated in FIGURES 4 and 5, each of the lugs 9 extends laterally outwardly from the lid or cover 10 at substantially right angles with respect to the tangent B'.

As just pointed out, the vertically extending pins 7 are particularly adapted to be mutually cooperatively engageable with the lugs 9 and, specifically, with the bore or passageway 11 extending therethrough. Thus, the pins 7 are particularly adapted to be positioned or disposed within a cooperating bore or passageway 11, when the lid or cover 10 is in its lowermost position, in which lower position the lid or cover is particularly adapted to be rotated to a position in which the same is hermetically sealed with respect to the upper open end 6 of the tank or container 4. Since, as pointed above, the lugs 9 are fixedly connected upon and secured with respect to the lid or cover 10, the lugs will move with the lid or cover when the latter is vertically longitudinally moved to a position away from the upper open end 6 of the tank or container 4, exposing the interior of the tank or container to the atmosphere. Of course, in this latter position, the lugs 9 are disengaged from mutual cooperative engagement with the vertically extending pins 7.

In order for the vertically extending pin 7 to rotatably move the lid or cover 10 to a position hermetically sealing the upper open end 6 of the tank or container 4, by means of its mutual cooperative engageability with the laterally outwardly extending lugs 9, the pin 7 is longitudinally movable along a path disposed in substantially parallel relationship with respect to the plane or axis B, which, as pointed out above, is, itself, disposed in substantially parallel relationship with respect to the tangent B'. To this end, the pin 7 is longitudinally movable within a slot 13 provided within and extending longitudinally of a bracket 15. Each of the brackets 15 may be fabricated of any suitable material and in any suitable manner and, preferably, is fixedly positioned upon and secured with respect to the piston-cylinder combinations 3. The brackets 15 may be of any suitable configuration and, as is particularly illustrated in FIGURES 4 and 5, are of polygonal configuration having at least two sides thereof converging towards one another. As is considered readily apparent, the brackets 15 and the slots 13 therewithin and extending longitudinally thereof perform the function of guiding the movement of the vertically extending pins 7 along the longitudinally extending path described above.

In order to secure the fluidic operation of each of the piston-cylinder combinations 3, there is provided a valve, generally designated by the reference character 17, which may be of any suitable known conventional construction having an inlet, a plurality of outlets, and a drain or return port. Preferably, it is desirable that the valve 17 be of conventional double-acting solenoid construction having at least two positions: One position in which fluid is supplied from the source of fluid supply 88 to one of the chambers of each of the piston-cylinder combinations 3 on one side of the piston thereof, while fluid from the other chamber on the other side of the piston thereof is returned to the source of supply, and an other position in which fluid from the source of supply 88 is supplied to the other chamber of each of the piston-cylinder combinations 3 on the other side of the piston thereof, while fluid in the one chamber on the one side of the piston thereof is returned to the source of supply. Thus, the double-acting solenoid valve 17 is of such construction as to supply and exhaust fluid to and from, respectively, each of the piston-cylinder combinations 3 and, to this end, the valve is fixedly positioned upon and secured with respect to the leg 22 of the triangular support 18 in any suitable manner. A plurality of fluid supply lines 19, connected one each to the outlets from the valve 17, extend longitudinally of the vertically extending leg 60 positioned upon the triangular support 18, longitudinally along the horizontally extending leg 74, and downwardly along and longitudinally of the other vertically extending leg 60, positioned upon the triangular support 20, of the housing 58. The fluid supply lines 19 are positioned and completely contained within the channel or recess as defined by the bite wall 62 and the outwardly extending walls 64 of each of the vertically extending legs 60 of the housing 58, and the similarly disposed walls of the horizontally extending leg 74 thereof. Preferably, the fluid supply lines 19 are secured to the bite wall 62 of each of the vertically extending legs 60 and the bite wall of the horizontally extending leg 74 in any suitable manner. In this manner, fluid is supplied from the source of fluid supply 88 to the piston-cylinder combination 3 positioned with respect to the triangular support 20. To supply fluid from the source of supply 88 to the piston-cylinder combination 3 positioned with respect to the triangular support 18, the fluid supply lines 19 are provided with branch fluid supply lines 21. Though not shown, the drain or return port from the valve 17 is connected, in any suitable manner, to the drain or return line 92, in a manner similar to that of the valve 84. As pointed out above, the lid or cover 10 is positionable in hermetically sealed relationship to the upper open end 6 of the tank or container 4. To this end, means is provided for hermetically sealing the lid or cover 10 with respect to the upper open end 6. Thus, a plurality of positioning pins 23 are fixedly secured upon and with respect to the lid or cover 10 in any suitable manner and are spaced annularly about the periphery thereof. The positioning pins 23 extend laterally outwardly of the lid or cover 10 and are particularly adapted to be mutually cooperatively engageable with a cooperating one of a plurality of positioning lugs 25. The positioning lugs 25 are fixedly secured upon and with respect to the upper open end 6 of the tank or container 4 in any suitable manner. Since the positioning lugs 25 are particularly adapted to be mutually cooperatively engageable with the positioning pins 23, the annular spacing of the

positioning lugs about the periphery of the tank or container 4 substantially adjacent the open upper end 6 thereof is substantially equal to the annular spacing of the positioning pins 23. Preferably, the positioning lugs 25 are of substantially L-shaped configuration having a vertically extending leg and a horizontally extending leg. The length of the vertically extending leg is chosen so that the distance between the horizontal leg and the upper open end 6 of the tank or container 4 is substantially equal to the diametral extent of the positioning pins 23. Thus, when the positioning pins 23 are disposed or positioned between the horizontal leg of the positioning lugs 25 and the upper open end 6, the lid or cover 10 will be positioned in firm abutting relationship with the upper open end and, therefore, hermetically sealed with respect thereto and with respect to the tank or container 4.

There is provided a means for draining the tank or container 4. The drain means comprises any suitable valve of known conventional construction, such as a single-acting solenoid valve that is suitably biased to a closed position, by such means as a spring, until and unless the coil thereof is energized. The drain valve, designated by the reference character 27, is fixedly secured to the underside of the lower end of the tank or container 4, in any suitable manner, and is centrally disposed with respect thereto. A fluid return line 29 is connected to the drain valve 27 and is particularly adapted to drain fluid from the tank or container 4 and return the same to the source of fluid supply 88, as by suitable connection to the return or drain line 92.

Additionally, a means is provided for relieving pressure within the tank or container 4, as will be more particularly described hereinafter. The pressure relief means comprises a pressure relief valve 31 that may be of any suitable known conventional construction. Thus, the pressure relief valve 31 may be a valve that is biased to a closed position, by such means as a spring, thereby permitting flow of fluid in one direction only, and, as presently required, from within the tank or container 4 to therewithout. Preferably, the valve 31 is adjustable, whereby the amount of pressure within the tank or container 4 required to open the valve against the bias or force of such means as a spring can be readily adjusted. The pressure relief valve 31 is fixedly positioned upon and secured with respect to the underside of the lower end of the tank or container 4 in any suitable manner and, preferably, is positioned substantially adjacent the drain valve 27.

With particular reference now to FIGURE 3, there is provided means for providing ingress of fluid, and specifically hot and cold water, to the tank or container 4. The means for providing ingress of hot and cold water to the tank or container 4 comprises a hot water supply line 33, and a cold water supply line 35. The fluid supply lines 33 and 35 may be fabricated of any suitable material and in any suitable manner and, preferably, are held in immediately adjacent relationship with respect to one another, for purposes of convenience, by means of the clamps 37. The fluid supply lines 33 and 35 are connected to a valve 39 of any suitable known conventional construction. Preferably, the valve 39 is of a conventional double-acting solenoid type valve having two positions: One position in which the valve directs fluid from the hot water supply line 3 to the interior of the tank or container 4 and an other position in which the valve 39 directs fluid from the cold water supply line 35 to the interior of the tank or container. The double-acting solenoid valve 39 is fixedly positioned upon the lid or cover 10 in any suitable manner, for directing or providing ingress of hot and cold water to the interior of the tank or container 4, and, as such, is vertically movable with the lid 10.

A means is also provided for providing the ingress of steam to the interior of the tank or container 4. Such a means preferably comprises a fluid or steam supply line 41 which may be fabricated of any suitable material and in any suitable manner. The steam supply line 41 is connected to a valve 43 which may be of any suitable known conventional construction. Preferably, the valve 43 is of known solenoid operable conventional construction, biased to a closed position, by such means as a spring, and movable to an open position upon actuation of the coil thereof to admit steam to the interior of the tank or container 4. In a similar manner, as with respect to the valve 39, the valve 43 is positioned upon the lid or cover 10 in any suitable manner, and, as such, is vertically movable therewith. The outlet of the valve 43, extending through the lid or cover 10, is connected to a spreader conduit 45, which conduit may be fabricated of any suitable material and in any suitable manner. The spreader conduit 45 is positioned fixedly upon and with respect to the underside of the lid or cover 10 and is of substantially the same curvilinear configuration. The spreader conduit 45 extends outwardly toward the periphery of the lid or cover for the efficient spreading and diffusion of steam within the tank or container 4 when the lid or cover 10 is hermetically sealed with respect thereto. It is conceivable, and within the scope of the present invention, that the spreader conduit be provided with perforations along the curvilinear extent thereof, depending upon the particular type and specific degree of diffusion of entering steam desired.

With particular reference now to FIGURE 2 of the drawings, it will be seen that a means is provided for conveying a treated product and/or article, such as canned products, to a point of suitable discharge. To this end, a trough or cooling channel 47 is provided which may be of any suitable configuration and which may be fabricated in any suitable manner. Positioned within the trough or cooling channel 47, in any suitable manner, is a deflector plate 49. The deflector plate 49 is angularly disposed with respect to the walls of the trough, whereby the deflector plate is capable of directing treated products and/or articles from the tank or container 4 to a suitable endless conveyor belt, generally designated by the reference character 51 and now to be described. The endless conveyor belt 51 which may be of any suitable known conventional construction, comprises an upper run 53 and a lower run 55. The lower run 55 is positioned or disposed to be operable within the trough or cooling channel 47 substantially adjacent the deflector plate 49. Thus, it can be seen, that the lower run 55 of the endless conveyor belt 51 is so constituted and arranged as to accept or pick up discharged treated products and/or articles near the bottom of the trough 47 and convey the treated products and/or articles upwardly and outwardly of the trough to a point of discharge.

The trough or cooling channel 47 preferably is maintained substantially filled with any suitable fluid, such as water, and preferably cool water. Thus, a fluid bath within the trough or cooling channel 47 is provided. Preferably, the fluid in the trough or cooling channel 47 is constantly recirculated to maintain the fluid therewithin at a relatively low temperature. Thus, the fluid bath is actually a cooling fluid bath. Recirculation of the fluid within the trough or cooling channel 47 may be accomplished in any suitable known conventional manner (not shown). The fluid bath within the trough or cooling channel 47 performs the function, in addition to cooling the treated products and/or articles discharged thereinto, of acting or providing a cushion when such products and/or articles are discharged from the tank or container 4. The level of fluid is such that the trough or cooling channel 47 is, as pointed out above, substantially filled. In this manner, the deflector plate 49 is completely immersed as is the lower run 55 of the conveyor belt 51. However, the level of the fluid is maintained somewhat below that of the upper run 53, as indicated by the reference character L, so that the lower run 55 is capable of conveying the discharged treated products and/or articles upwardly and outwardly of the fluid bath, and the

upper run is capable of returning without the fluid bath to once again enter the trough or cooling channel 47 adjacent the bottom thereof. In this connection, it is within the scope of the present invention to provide suitable conventional means for, in addition to constantly recirculating the fluid within the trough or cooling channel, maintaining the level of the fluid within the trough substantially constant.

With reference now once again to FIGURE 1, as pointed out above, means is provided for supplying fluid to the hydraulic circuit means for raising and lowering the lid or cover 10 with respect to the upper open end 6 of the tank or container 4 and for rotatably moving said lid or cover between a position hermetically sealing said tank or container and a position in which said lid or cover is vertically movable with respect thereto. Said fluid supply means, generally designated by the reference character 88, comprises a fluid supply tank 57, which may be of any suitable construction and configuration, a pump 59, which may be of any suitable known conventional construction, and, preferably, is electrically operable, the fluid supply line 61 and the return or drain line 92, which, as pointed out above, is suitably connected to the drain or return ports of the double-acting solenoid valves 17 and 84 and the outlet of the drain valve 27.

Finally, an electrical control box, generally designated by the reference character 63, is provided for controlling the various electrical circuits responsible for the complete automatic operation of the tiltable retort 2 of the present invention to at least one complete cycle. The control box 63 may be of any suitable known conventional construction, comprising, generally, a number of conventional ON-OFF switches 65 corresponding to the number of electrical circuits necessary and required for the complete automatic operation of the retort 2. Additionally, an indicator light 67 is provided for a purpose to be described hereinafter. An electrical lead or supply line 69 is connected to the control box 63 and extends therefrom to the various solenoid operated valves of the retort 2 and to the reversible electrical motor 48 supplying electrical energy thereto. As pointed out above, and as will become even more apparent hereinafter, the single electrical control box 63 is all that is necessary for the complete automatic operation of a plurality, that is, a battery, of tiltable retorts 2 constructed in accordance with the present invention.

In practicing the present invention, with the apparatus illustrated and described hereinabove, it is assumed that a previous complete cycle of operations or sequence of events has been completed, in which case the tank or container 4 has been filled, to an appropriate level, with hot water admitted to the tank or container by means of the hot water line 33 and the solenoid operated valve 39. It will be understood, that the term "appropriate level" is intended to mean a level of water somewhat below the upper open end 6 of the tank or container 4, since, when the tank or container is filled with canned products 14, the level of water therein will be volumetrically displaced towards the upper open end. Admitting hot water to the tank or container 4 prior to introduction therewithin of canned products 14 provides for heating the canned products, even the contents thereof, and prevents cracking. At the same time, a water column of appropriate height is provided to cushion the admission of the canned products 14 into the tank or container 4 and the descendency of the canned products towards the bottom thereof. Assuming this condition to exist, a complete cycle of operations or sequence of events of an automatically operable tiltable retort 2 constructed in accordance with the present invention is as follows:

The pump 59 is placed in operation to pump up and provide fluid pressure in the fluidic circuit means comprising the fluid operable means for moving the lid 10 with respect to the upper open end 6 of the tank or container 4 between positions hermetically sealing the tank or container and opening the same to atmosphere, and the fluidically operable means for rotatably moving the lid or cover 10 between a position in which the same is hermetically sealed with respect to the upper open end of the tank or container and a position in which the lid or cover is capable of being moved vertically towards and away from said upper open end. As pointed out above, the fluidically operable means for vertically moving the lid 10 with respect to the upper open end 6 comprises, generally, the rotatably mounted fluidically operable piston-cylinder combinations 76, the piston rod 80, the laterally inwardly extending pins 82, and the fluidically operable valve 84 for controlling and supplying operating fluid to and from each of the piston-cylinder combinations 76. In turn, the fluidically operable means for rotatably moving the lid or cover 10 with respect to the upper open end 6 of the tank or container 4 comprises, generally, the triangularly configured brackets 96, the piston-cylinder combinations 3, the generally vertically extending pins 71, the laterally inwardly extending lugs 9, the polygonally configured brackets 15, and the double-acting solenoid valve 17 for controlling and supplying fluid to and exhausting fluid from each of the piston-cylinder combinations 3. Having provided the fluidic circuit means with a proper amount or degree of fluid pressure, the fluidically operable means for vertically moving the lid or cover 10 with respect to the upper open end 6 of the tank or container 4 is operated to vertically move the lid or cover in a direction towards the upper open end. When the lid or cover 10 is positioned upon and with respect to and in abutting engagement with the upper open end, the fluidically operable means for rotatably moving the lid or cover is operated to rotate the lid or cover in a generally clockwise direction as viewed in FIGURES 4 and 5, to dispose the positioning pins 23 between the horizontally extending leg of the positioning lugs 25 and the upper open end of the tank or container. At this point, it will be seen that the means for hermetically sealing the lid or cover 10 upon and with respect to the upper open end 6 of the tank or container 4, comprising the positioning pins 23 and the positioning lugs 25, is operable to hermetically seal the upper open end of the tank or container with respect to the atmosphere. Having thus far filled the tank or container 4 with hot water at a desired temperature, and to an appropriate level, thence admitting canned products 14 into the tank or container from the track 12 in a suitable manner, the descendency of the canned products 14 into and downwardly of the tank or container 4 being cushioned by the level of water therewithin, and hermetically sealing the upper open end 6 of the tank or container with respect to the atmosphere, steam under appropriate and proper pressure is admitted to the interior of the tank or container by means of the steam line 41 and the solenoid operated valve 43. Simultaneously with the admission of steam interiorly of the tank or container 4, the solenoid operated drain valvle 27 is opened to discharge and rain the hot water from the tank or container and return the same to the source of fluid supply 88 by means of the drain line 29 and the drain or return line 92. This is easily accomplished, as is considered readily apparent to those skilled in the art, by gravity and by the steam presure exerted on the column of hot water in the tank or container 4 as steam under appropriate pressure is admitted thereto. After the hot water has been discharged from the tank or container 4, the drain valve 27 is closed and the canned products 14 within the tank or container are steam processed at appropriate pressure and temperature for an appropriate length of time to effect, for example, sterilizing thereof. Preferably, steam under a pressure of 15 p.s.i.g. and a temperature of 252° F. is admitted interiorly of the tank or container 4, it having been found that steam, under this pressure, and at this temperature, provides satisfactory results. As pointed out above, when the canned products 14 are delivered to

the interior of the tank or container 4, the level of the water column therewithin and the volumetric capacity thereof, provides a cushion for the canned products, whereby the latter sink gently and slowly through the water towards the bottom of the tank or container. Thus, the canned products 14 are effectively guarded against injury. During the sterilizing operation, the canned products 14 remain quiescent within the tank or container 4 so that there is no risk of injury to the cans at that time.

Upon completion of the sterilizing operation, the solenoid operated valve 39 is operated to admit cold water interiorly of the tank or container 4, by means of the cold water line 35. Cooling water, admitted under appropriate pressure, discharges steam from the tank or container 4 by means of the pressure relief valve 31. As pointed out above, upon completion of the sterilizing operation, it is necessary that cooling water be admitted interiorly of the tank or container 4 to partially cool the canned products 14, to reduce the pressure therein to a sufficiently low value, before the tank or container can be opened to the atmosphere preparatory to removing the canned products therefrom. Having admitted cooling water interiorly of the tank or container 4 under appropriate pressure and to an appropriate level, the pump 59 is again placed in operation to pump up fluid pressure and provide fluid pressure within the fluidic circuit means comprising, as pointed out above, the fluidically operable means for rotating the lid or cover 10 with respect to the upper open end 6 and the fluidically operable means for vertically moving the lid or cover with respect to the upper open end. Having pumped up fluid pressure in the fluidic circuit or fluidic circuit means, as just defined, the double-acting solenoid operated valve 17 is operated to supply fluid to the piston-cylinder combinations 3 of the fluidically operable means for rotating the lid or cover 10 to move the same to a position in which it is capable of being moved vertically away from the upper open end 6 of the tank or container. Thence, the fluidically operable means for raising or lowering the lid or cover 10, that is, the fluidically operable means for vertically moving the lid or cover with respect to the upper open end 6, is operable to raise the lid or cover 10 away from the upper open end 6, thereby exposing the interior of the tank or container 4 to the atmosphere. The reversible electric motor 48 is now placed in operation to tilt the tank or container 4 to a position illustrated particularly in FIGURE 2. When the tank or container 4 reaches the position illustrated in that figure, it will be seen that the upper open end 6 of the tank or container is positioned substantially adjacent the trough or cooling channel 47 whereby the canned products 14 contained within the tank or container are dischargeable into the trough or cooling channel. The canned products 14, as they are discharged from the tank or container 4, descend upon the deflector plate 49 and onto the lower run 55 of the endless conveyor belt 51. In this manner, the canned products 14 are capable of and are discharged to a suitable point, such as a can labelling machine. As pointed out above, subsequent to completion of the sterilizing phase of operations, cooling water was admitted to the tank or container 4 to an appropriate level and volumetric capacity and the steam discharged therefrom. In addition to the function of cooling the canned products 14 as performed by the cooling water, the latter also performs the function of providing a fluidal cushion as the canned products 14 are discharged from the tank or container 4 into the trough or cooling channel 47. Of course, once the canned products 14 are discharged into the trough or cooling channel 47, the level of fluid therein, as generally designated by the reference character L, continues to provide a fluidal cushion for the canned products 14 as they are discharged from the tank or container 4 onto the deflector plate 49 and thence to the lower run 55 of the endless conveyor belt 51. There is provided, therefore, a continuous fluid cushion completely surrounding or encompassing the canned products 14 subsequent to the sterilizing phase of operations as the canned products are cooled and subsequently discharged from the tank or container 4 to the endless conveyor belt 51 and, finally, to a suitable point of discharge, such as a can labelling machine. Having discharged the canned products 14 from the tank or container 4, and the cooling water contained therewithin, the reversible electric motor 48 is operable now to return the tank or container to a vertical position, as illustrated in FIGURES 1 and 3. Once again, in this position, the tank or container 4, and the automatically operable tiltable retort 2 as a whole, is ready to have another batch of canned products 14 positioned therewithin and subjected to the particular process or treatment desired, such as the sterlizing process disclosed herewithin. Prior to discharging the next batch of canned products 14 into the tank or container 4, the solenoid valve 39 is again positioned to admit hot water into the tank or container. And, subsequent to the admission of hot water to the tank or container 4 to an appropriate level and volumetric capacity, the pump 59 is again placed in operation to pump up fluid pressure in the fluidic circuit means readying the fluidically operable means for raising and lowering the lid or cover 10 and the fluidically operable means for rotating the lid or cover thereof. This description, thus far, defines one complete cycle of operations and each and everyone of the phases thereof of an automatically operable tiltable retort 2 constructed in accordance with the present invention. As pointed out above, the tiltable retort 2 is completely automatically operable and, therefore, the above defined sequence of events or phases of operation are particularly adapted to be automatically performed without manual attention and control, other than the manual act of initiating the operation of the tiltable retort 2.

With a view towards the complete automatic operation of the tiltable retort 2, and with particular reference now to FIGURE 8, it is preferred that an electrical circuit be operatively associated with the component parts of the tiltable retort, described above, and comprising the fluidic circuit means for raising and lowering the lid or cover 10 and the fluidic circuit means for rotating the same, and other of such component parts as, for example, the solenoid operated valves 39 and 43, and solenoid operated drain valve 29. In describing the electric circuit means illustrated in FIGURE 8, and the sequence of operations thereof as applied to the sequence of operations described above, it will be understood that the electric circuit means comprises known conventionally constructed components suitable to the purpose of the present invention. However, it will be further understood that, while the illustrated electrical circuit is a preferred embodiment and combination of component parts thereof, the same may be varied considerably in detail without departing from the present invention. Thus, any suitable electric circuit comprising known conventional components of suitable construction may be operatively associated with one another in any suitable manner and operatively associated with the component parts of the automatically operable tiltable retort 2 constructed in accordance with the present invention and described above, as long as the electrical circuit and the components parts thereof are chosen and operatively associated with respect to one another in such a manner as to enable the retort 2 to efficiently operate through each of the phases or sequences of a treatment or process, such as the treatment or process described above, with little manual control and/or attention other than the manual act of initiating the operation of the retort. The electrical circuit illustrated in FIGURE 8 is operable from the single conveniently located control box 63 having operatively associated therewith, in any suitable manner, the ON-OFF switches 65 for placing the electrical circuit into operation. Thus, assuming, as pointed out above, that one complete cycle has been completed and the tank or con-

tainer 4 is filled with hot water to a suitable level, the ON-OFF switch 65 controlling TIMER CIRCUIT NO. 1 is moved to an ON position. TIMER CIRCUIT NO. 1 comprises a timer motor 102 which is placed into operation when the switch 65 is moved to an ON position actuating a start solenoid 104. The timer motor 102 and the start solenoid 104 may be of any suitable known conventional construction, the former being operatively associated, in a well known manner, with a rotatable shaft having a plurality of cam disks positioned thereupon in such a manner as to rotate therewith. Having activated TIMER CIRCUIT NO. 1, the first cam disk (not shown) closes a switch 106 which, in turn, places the pump 59 in operation for pumping up fluid pressure in the fluidic circuit means, in the manner as described above. The cam disk (not shown) for actuating switch 106 is of such configuration as to maintain the pump in operation substantially completely throughout the period of activation of TIMER CIRCUIT NO. 1. It is necessary that the pump 59 be maintained in operation substantially completely throughout the period of activation of TIMER CIRCUIT NO. 1, such necessity becoming manifest hereinafter. Switch 108 is now closed by another cam disk for moving the double-acting solenoid operated valve 84 to a position enabling fluid to exhaust from the piston-cylinder combinations 76 to the source of fluid supply by means of the drain line 92. Once connected to the source of supply 88, the piston-cylinder combinations 76 will easily and efficiently exhaust fluid pressure therefrom by virtue of the force of gravity upon the lid or cover 10; that is, the weight of the lid or cover 10 is applied to the fluid in the piston-cylinder combinations through the piston rods 80 and forces the same therewith out through the solenoid valve 84 and to the source of supply 88 by means of the return line 92. While only one piston-cylinder combination 76 is illustrated in FIGURE 8, it is to be remembered that two such combinations are provided, as pointed out above. In succession, the switch 110 is now closed by still another cam disk operating the double-acting solenoid valve 17 to a position supplying fluid from the source of supply 88 to that chamber of the piston-cylinder combinations 3 which will result in rotational movement of the lid or cover 10 in a generally clockwise direction, as viewed in FIGURES 4 and 5, hermetically sealing the lid or cover with respect to the upper open end 6 of the tank or container 4. Simultaneously therewith, since the piston-cylinder combinations 30 are of the double-acting type, the other chamber of each one thereof has the fluid pressure therewithin exhausted therefrom through the solenoid valve 17 to the source of supply 88 by means of the return line 92. For purposes of illustration, two solenoids valves 17 have been illustrated in FIGURE 8. As pointed out above, however, only one such valve is necessary, though, of course, the two solenoid valves 17 illustrated in FIGURE 8 may be used. The cam disk for actuating the switch 106 is now ineffective to maintain the switch 106 in a closed position, whereby the pump 59 is stopped. A still further cam disk now places the switch 112 in a closed position, operating the solenoid operated valve 43 to an open position for admitting steam under appropriate pressure and at an appropriate temperature, as described above, to the interior of the tank or container 4. Simultaneously, the switch 112 actuates a timer 116, of any suitable known conventional construction, which timer may be preset in any suitable manner to the desired length of time for the sterilizing phase of operations as described above. The indicator lamp 67 is activated when the timer 116 is activated to indicate to an operator when the sterilizing phase of the operations has begun. As will become apparent hereinafter, the indicator lamp 67 will also indicate when the sterilizing phase of the operations has terminated. Simultaneously, with activation of the timer 116 and the solenoid operated valve 43, the drain valve 27 is operated to drain hot water from the tank or container 4 by means of the drain line 29 and the return line 92, it being understood, as pointed out above, that hot water within the tank or container will easily and efficiently discharge therefrom by gravity flow and a force applied thereto resulting from the pressure of the steam admitted to the interior of the tank or container. Once sufficient steam has been admitted to the tank or container 4, the cam disk actuating the switch 112 is no longer effective to maintain the switch in a closed position, whereupon the switch opens and the solenoid valve 43 is deenergized, thence moving to a closed position. However, as is considered readily apparent, the timer 116, which has been preset, as pointed out above, will continue to run, maintaining the indicator lamp 67 in an activated condition, until the length of time chosen for the sterilizing phase of operations has been terminated. At that time, the timer 116 will open the circuit to the indicator lamp 67, thus deenergizing or deactivating the same. In a deactivated condition, the indicator lamp 67 warns an operator that the cycle of operations thus far described has been completed, whereupon the canned products subjected to the process or treatment are ready to be discharged from the tank or container 4 and conveyed to a suitable point of discharge, such as a can labelling machine. The TIMER CIRCUIT NO. 1 is provided with an additional switch 114, should it be decided to alter the phase or sequence of operations thus far described, or to add a sequence thereto.

To complete one complete cycle of operations of the automatically operable tiltable retort 2 constructed in accordance with the present invention, an operator, having been informed that the sequence of operations described above have been completed by deactivation of the indicator lamp 67, now places switch 65 controlling TIMER CIRCUIT NO. 2 in an ON position. TIMER CIRCUIT NO. 2 comprises, generally, the same basic component part, of any suitable known conventional construction, comprising the TIMER CIRCUIT NO. 1. Thus, moving the switch 65 controlling TIMER CIRCUIT NO. 2 to an ON position places a timer motor 118, of known conventional construction, into operation by means of the start solenoid 120. The timer motor 118 is operatively associated with a rotatable shaft (not shown) having a plurality of cam disks (not shown) positioned thereupon to rotate therewith, said cam disks controlling switches 122 to 136, inclusive, as will now be described. The switch 122 is closed by a first cam disk, said switch controlling the circuit to the solenoid valve 39 and energizing the same to a position for admitting cooling water to the interior of the tank or container 4 by means of the cold water line 35. As cooling water is admitted to the interior of the tank or container, the steam contained therewithin is discharged therefrom by means of the pressure relief valve 31. Having admitted cooling water to an appropriate level, the switch 122 is opened, thereby deenergizing the solenoid valve 39, precluding further admission of cooling water into the tank or container 4. The switch 124 is closed by an other cam disk, which switch places the pump 59 into operation and, simultaneously therewith, energizes the solenoid valve 17 (two such valves being illustrated in FIGURE 8) to an opposite position than the one described above. In this opposite position, and with fluid pressure in the fluidic circuit means having been developed and pumped up by the pump 59, fluid pressure is admitted to that chamber of the piston-cylinder combinations resulting in rotational movement of the lid or cover 10 in a generally counterclockwise direction as viewed in FIGURES 4 and 5. Since the piston-cylinder combinations are double-acting combinations, as pointed out above, fluid pressure from that chamber of such combinations resulting in rotational movement of the lid or cover 10, in a generally clockwise direction as viewed in FIGURES 4 and 5, will be exhausted therefrom by means of the return line 92. Having rotation-

ally moved the lid or cover **10** to a sufficient extent enabling the same to be vertically movable away from the upper open end **6**, the switch **126** is closed by still an other cam disk, which switch is connected to the circuit controlling the pump **59**, whereby the pump **59** will be maintained in operation, and, simultaneously therewith, is connected to the circuit controlling the solenoid valve **84**. Thus, the solenoid valve **84** will be energized and moved to a position to admit fluid pressure to the piston-cylinder combinations **76** for raising or vertically moving the lid or cover **10** away from the upper end **6**. The piston-cylinder combinations **76**, as illustrated in FIGURE 8, are preferably of the single-acting type. As such that chamber of the combinations oppositely disposed with respect to the chamber thereof into which fluid pressure is admitted and from which fluid pressure is exhausted, is vented to the atmosphere. In a manner considered readily apparent, therefore, the piston-cylinder combinations **76** are operable smoothly and efficiently. The configuration of the cam disk (not shown) for closing the switch **126** is such as to maintain the switch **126** closed, after the lid or cover **10** has reached the position of FIGURE 1, so that the pump **59** is maintained in operation, whereby fluid pressure of sufficient magnitude is maintained in the fluid circuit. A still further cam disk, (not shown) closes switch **128**, placing the reversible motor **48** into operation, and tilting the tank or container **4** from the position shown in FIGURES 1 and 3 to the position shown in FIGURE 2. Once all of the canned products **14** have been discharged from the tank or container **4** into the trough or cooling channel **47**, for conveyance to a suitable point of discharge, such as a can labelling machine, the switch **130** is closed by a still further cam disk (not shown), whereby the reversible motor **48** is reversibly operated to rotatably move the tank or container **4** from the position illustrated in FIGURE 2 to the positions illustrated in FIGURES 1 and 3. Once back in a generally upright position, the tank or container **4**, from which the cooling water has been discharged along with the canned products **14**, is ready to be, in effect, primed for an other cycle of operations. Still a further cam disk (not shown) closes switch **132** for energizing the solenoid valve **39** and moving the same to a position for admitting hot water into the tank or container **4** by means of the hot water line **33**. The cam disk (not shown) controlling the switch **126** is now, finally, ineffective to maintain the pump **59** in a condition of operation. However, simultaneously with the opening of the switch **126**, an other cam disk (not shown) closes the switch **134** which is connected into the circuit including the pump **59**, thereby maintaining the pump in an operating condition so that sufficient fluid pressure is maintained in the fluidic circuit and the lid or cover **10** is maintained in the position shown in FIGURE 1. As is the case with the TIMER CIRCUIT NO. **1**, a switch **136** and an associated cam disk (not shown) is provided, should it be desired to alter TIMER CIRCUIT NO. **2** or add a sequence of operations thereto. An interlock **138** for the steam valve **43**, of any suitable known conventional construction, is included in TIMER CIRCUIT NO. **2** to preclude accidental energization or activation of the solenoid operated steam valve during the sequence of operations controlled by TIMER CIRCUIT NO. **2**. That is, only during those sequences of operations controlled by TIMER CIRCUIT NO. **1**, when the upper open end **6** is hermetically sealed by lid or cover **10**, can steam valve **43** be energized. In this manner, accidental discharge of and scalding and injury to adjacent personnel is prevented. One complete cycle of operations of the automatically operable tiltable retort **2** has thus been described. And, the tiltable retor **2** is primed and ready for the next batch of canned products **14**. It is considered readily apparent, in accordance with the above construction, that the automatically operable tiltable retort requires little manual operation and little manual attention. In addition, it is also considered readily apparent that the tiltable retort **2** is particularly adapted to be congregated into a battery of the same, such a battery being operable, automatically, from the single conveniently located control box **63**. As pointed out above, the electrical circuit, comprising TIMER CIRCUIT NO. **1** and TIMER CIRCUIT NO. **2**, is subject to many and various modifications, which modifications may be resorted to without departing from the field and scope of the present invention.

It is to be understood that terminology such as "upper," "lower," "inwardly," "outwardly," and other similar terminology, is used in the above description of the automatically operable tiltable retort **2** constructed in accordance with the present invention, and in the appended claims, for exemplary purposes and to facilitate an understanding of the present invention. As such, it is intended that this terminology be considered in its normal and literal sense, and be afforded every reasonable interpretation attributable thereto. However, such terminology is not intended by way of limitation but, as pointed out above, is intended by way of exemplification and to facilitate an understanding of the present invention as defined above and in the appended claims.

After reading the foregoing detailed description of the preferred and illustrative apparatus and method of the present invention particularly adapted to the batch processing of various products and/or articles, it will be understood that the objects set forth at the outset of this specification have been successfully achieved.

I claim:

1. An apparatus particularly adapted to the batch processing of various products or articles comprising, in combination:

A. a tank
  (1) of generally cylindrical configuration,
  (2) having an annular upper open end,
  (3) an imperforate lower end,
  (4) and an annularly configured lid particularly adapted to vertical movement with respect to said upper open end,
  (5) said tank being particularly adapted for rotation about an axis medially of the vertical extent thereof as defined by said upper open end and said imperforate lower end;

B. a plurality of supports rotatably positioning said tank upon a planar surface, said supports comprising, in turn:
  (1) a plurality of longitudinally extensive legs angularly disposed with respect to one an other,
  (2) a connector plate fixedly connecting said legs with respect to one an other,
  (3) said legs and said connector plates defining a generally rectangularly configured recess extending through each of said supports,
  (4) at least one horizontal brace positioned and extending between the legs of each of said supports,
    (a) each of said one horizontal braces providing a platform particularly adapted to support a bearing,
    (b) each of said bearings being oppositely disposed and coaxially aligned and having rotatably journalled therewithin a shaft fixedly connected to said tank and defining said axis of rotation;
  (5) and a platform extending laterally outwardly of one of said supports and being fixedly connected thereto;

C. means for rotating said tank about said axis, said means comprising, in turn:
  (1) a reversible motor positioned upon said laterally outwardly extending platform and mediately operatively associated with the shafts defining said axis of rotation;

D. a housing of generally channel-shaped configuration fixedly positioned upon and with respect to said supports, said housing comprising, in turn:
(1) a plurality of generally vertically extending legs of substantially channel-shaped configuration,
(2) and a generally horizontally extending leg of substantially channel-shaped configuration positioned and extending between said vertically extending legs,
(3) said vertically extending legs being positioned within and extending through the rectangularly configured recess of each of said supports and being fixedly secured to the legs thereof;

E. fluidically operable means for vertically moving said lid with respect to the upper open end of said tank and between positions hermetically sealing said tank and exposing the interior thereof to the atmosphere, said means comprising,
(1) at least one pivotally mounted fluidically operable piston-cylinder combination,
(2) a piston rod connected to said piston-cylinder combination and extending vertically upwardly and outwardly thereof,
(3) a pin extending laterally inwardly of and through said housing,
(4) a double-acting solenoid valve for supplying fluid pressure to and exhausting fluid pressure from said piston-cylinder combination,
(5) and a fluid line connected and providing communication between said solenoid valve and said piston-cylinder combination;

F. means for guiding the movement of said lid vertically longitudinally of said housing and vertically with respect to the upper open end of said tank, said means comprising,
(1) a vertical longitudinally extensive slot,

C. fluidically operable means for rotatably moving said lid between a position in which the same is hermetically sealed with respect to the upper open end of said tank and a position in which said lid is vertically movable with respect to said upper open end, said means comprising, in turn:
(1) at least one triangular bracket,
(2) at least one piston-cylinder combination fixedly positioned upon and secured with respect to one leg of said bracket,
(3) at least one polygonally configured bracket fixedly connected to said piston-cylinder combination,
(4) a vertically extending pin,
(5) at least one laterally outwardly extending lug,
(6) at least one double-acting solenoid valve for supplying fluid pressure to and exhausting fluid pressure from each of a plurality of chambers of said piston-cylinder combination,
(7) and a fluid line connected and providing communication between said solenoid valve and said piston-cylinder combination;

H. means for hermetically sealing said lid upon and with respect to the upper open end of said tank comprising, in turn:
(1) a plurality of positioning pins,
(2) and a plurality of positioning lugs;

I. means for draining said tank comprising, in turn:
(a) a single-acting solenoid valve
(b) fixedly positioned upon and secured with respect to the imperforate lower end of said tank;

J. means for relieving pressure from interiorly of said tank comprising, in turn:
(1) an adjustable pressure relief valve
(2) fixedly positioned upon and secured with respect to the lower imperforate end of said tank;

K. means selectively controlling and providing ingress of hot and cold water to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof comprising, in turn:
(1) a plurality of fluid supply lines,
(2) and a double-acting solenoid valve;

L. means controlling and providing the ingress of steam to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof comprising, in turn:
(1) a fluid supply line,
(2) a single-acting solenoid valve
(3) and a spreader conduit for diffusing steam interiorly of said tank;

M. means for conveying a treated product or article to a point of discharge subsequent to discharge of said products or articles from said tank, said means comprising, in turn:
(1) a cooling channel,
(2) an endless conveyor belt cooperatively associated with said cooling channel
(3) and a deflector plate positioned within said cooling channel and being particularly adapted to direct discharged produtcs or articles from said tank onto and upon the lower run of said endless conveyor belt;

N. means providing a fluid supply to the fluidically operable means for vertically moving said lid with respect to the upper open end of said tank and between positions hermetically sealing said tank and exposing the interior thereof to the atmosphere and the fluidically operable means for rotatably moving said lid between a position in which the same is hermetically sealed with respect to the upper open end of said tank and a position in which said lid is vertically movable with respect to said upper open end;

O. and means providing a supply of electrical energy and rendering said apparatus completely automatically operable throughout a complete cycle of operations thereof, said means comprising, in turn:
(1) a single conveniently located control box,
(2) whereby said apparatus requires little manual control and attention other than the manual act of initiating the cycle of operations of said apparatus.

2. An apparatus particularly adapted to the batch processing of various products or articles comprising, in combination:

A. a tank
(1) having an upper open end
(2) and a lid,
(3) said tank being particularly adapted for rotation;

B. a plurality of supports rotatably positioning said tank upon a planar surface, said supports comprising, in turn:
(1) a plurality of legs
(a) fixedly connected with respect to one an other
(b) defining a recess therebetween and extending through said supports;

C. means positioned upon one of said supports for reversibly rotating said tank;

D. a housing fixedly positioned upon and with respect to said supports, said housing comprising, in turn:
(1) a plurality of generally vertically extending legs,
(a) said vertically extending legs being positioned within and extending through the recess in each of said supports and being fixedly secured to said legs,
(2) and a horizontally extending leg positioned and extending between said vertically extending legs;

E. fluidically operable means for vertically moving said lid with respect to the upper open end of said tank and between positions hermetically sealing said tank

and exposing the interior thereof to the atmosphere;

F. means for guiding the movement of said lid vertically longitudinally of said housing and vertically with respect to the upper open end of said tank;

G. fluidically operable means for rotatably moving said lid between a position in which the same is hermetically sealed with respect to the upper open end of said tank and a position in which said lid is vertically movable with respect to said upper open end;

H. means selectively controlling and providing the ingress of hot and cold fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof;

I. means controlling and providing the ingress of a treating fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof;

J. means for conveying a treated product or article to a point of discharge subsequent to the discharge thereof from said tank,

(1) said last-named means being so constituted and arranged as to provide for cooling of said discharged products or articles and to provide a cushion therefor as they are discharged from said tank;

K. and means providing a fluid supply to the fluidically operable means for vertically moving said lid and for rotatably moving said lid with respect to the upper open end of said tank.

3. In an apparatus as defined in claim **2**, wherein:

E. said fluidically operable means for vertically moving said lid comprises, in turn:

(1) at least one pivotally mounted fluidically operable piston-cylinder combination,

(2) a piston rod mediately connected to said lid,

(3) and a valve for supplying fluid pressure to and exhausting fluid pressure from said piston-cylinder combination,

(a) whereby said piston-cylinder combination vertically moves said lid away from said upper open end upon the application of fluid pressure thereto and enables said lid to vertically move towards said upper open end by virtue of the force of gravity thereupon as fluid pressure is exhausted therefrom.

4. In an apparatus as defined in claim **3**, wherein:

G. said fluidically operable means for rotatably moving said lid comprises, in turn:

(1) at least one piston-cylinder combination mediately positioned upon a cooperating vertically extending leg of said housing,

(a) said piston-cylinder combination having a piston rod

(b) mediately connected to said lid,

(2) and a valve for supplying fluid pressure to and exhausting fluid pressure from each of a plurality of chambers of said piston-cylinder combination.

5. In an apparatus as defined in claim **4**, wherein:

H. said means selectively controlling and providing the ingress of hot and cold fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof comprises, in turn:

(1) a valve

(a) positioned upon said lid

(b) for vertical movement therewith.

6. In an apparatus as defined in claim **5**, wherein:

I. said means controlling and providing the ingress of a treating fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof comprises, in turn:

(1) a valve

(a) positioned upon said lid

(b) for vertical movement therewith.

7. An apparatus particularly adapted to the batch processing of various products or articles comprising, in combination:

A. a tank

(1) having an upper open end

(2) and a lid,

(3) said tank being particularly adapted for rotation;

B. a plurality of supports particularly adapted to rotatably position said tank upon a planar surface, said supports comprising, in turn:

(1) a plurality of legs

(a) fixedly connected with respect to one another

(b) and defining a recess therebetween and extending through said supports;

C. means positioned upon one of said supports for reversibly rotating said tank;

D. a housing fixedly positioned upon and with respect to said supports, said housing comprising, in turn:

(1) a plurality of generally vertically extending legs,

(a) said vertically extending legs being positioned within and extending through the recess in each of said supports and being fixedly secured to said legs,

(2) and a horizontally extending leg positioned and extending between said vertically extending legs;

E. fluidically operable means for vertically moving said lid with respect to the upper open end of said tank and between positions hermetically sealing said tank and exposing the interior thereof to the atmosphere, said means comprising, in turn:

(1) at least one pivotally mounted fluidically operable piston-cylinder combination,

(2) a piston rod mediately connected to said lid,

(3) and a valve for supplying fluid pressure to and exhausting fluid pressure from said piston-cylinder combination,

(a) whereby said piston-cylinder combination vertically moves said lid away from said upper open end upon the application of fluid pressure thereto and enables said lid to vertically move towards said upper open end by virtue of the force of gravity thereupon as fluid pressure is exhausted therefrom;

F. means for guiding the movement of said lid vertically longitudinally of said housing and vertically with respect to the upper open end of said tank;

G. fluidically operable means for rotatably moving said lid between a position in which the same is hermetically sealed with respect to the upper open end of said tank and a position in which said lid is vertically movable with respect to said upper open end, said means comprising, in turn:

(1) at least one piston-cylinder combination mediately positioned upon a cooperating vertically extending leg of said housing,

(a) said piston-cylinder combination having a piston rod

(b) mediately connected to said lid,

(2) and a valve for supplying fluid pressure to and exhausting fluid pressure from each of a plurality of chambers of said piston-cylinder combination;

H. means selectively controlling and providing the ingress of hot and cold fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof, said means comprising, in turn:

(1) a valve

(a) positioned upon said lid

(b) for vertical movement therewith;

I. means controlling and providing the ingress of a treating fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof, said means comprising, in turn:

(1) a valve

(a) positioned upon said lid

(b) for vertical movement therewith;

J. means for conveying a treated product and/or article to a point of discharge subsequent to the discharge thereof from said tank,

(1) said last-named means being so constituted and arranged as to provide for cooling of said discharged products and/or articles and to provide a cushion therefor as they are discharged from said tank;

K. and means providing a fluid supply to the fluidically operable means for vertically moving said lid and for rotatably moving said lid with respect to the upper open end of said tank.

8. In an apparatus as defined in claim **2**, wherein:

L. means is provided for hermetically sealing said lid upon and with respect to the upper open end of said tank comprising, in turn:

(1) a plurality of positioning pins

(a) fixedly connected to said lid,

(2) and a plurality of positioning lugs

(a) fixedly connected to said tank,

(b) said positioning lugs being mutually cooperatively engageable with said positioning pins.

9. In an apparatus as defined in claim **7**, wherein:

L. means is provided for hermetically sealing said lid upon and with respect to the upper open end of said tank comprising, in turn:

(1) a plurality of positioning pins

(a) fixedly connected to said lid,

(2) and a plurality of positioning lugs

(a) fixedly connected to said tank,

(b) said positioning lugs being mutually cooperatively engageable with said positioning pins.

10. In an apparatus as defined in claim **9**, wherein:

M. means is provided for draining said tank;

N. and means is provided for relieving pressure from interiorly of said tank.

11. An apparatus particularly adapted to the batch processing of various products or articles comprising, in combination:

A. a tank

(1) having an upper open end

(2) and a lid.

(3) said tank being particularly adapted for rotation;

B. at least one support particularly adapted for rotatably positioning said tank upon a planar surface;

C. means positioned upon said support for reversibly rotating said tank;

D. fluidically operable means for vertically moving said lid with respect to the upper open end of said tank and between positions hermetically sealing said tank and exposing the interior thereof to the atmosphere;

E. means hermetically sealing said lid upon and with respect to the upper open end of said tank;

F. means for guiding the movement of said lid vertically longitudinally of said housing and vertcially with respect to the upper open end of said tank;

G. fluidically operable means for rotatably moving said lid between a position in which the same is hermetically sealed with respect to the upper open end of said tank and a position in which said lid is vertically movable with respect to said upper open end;

H. means selectively controlling and providing the ingress of hot and cold fluid to the interior of said tank when the lid is hermtically sealed with respect to the upper open end thereof;

I. means controlling and providing the ingress of a treating fluid to the interior of said tank when the lid is hermetically sealed with respect to the upper open end thereof;

J. means for conveying a treated product or article to a point of discharge subsequent to the discharge thereof from said tank;

(a) said last-named means being so constituted and arranged as to provide for cooling of said discharged products or articles and to provide a cushion therefor as they are discharged from said tank;

K. and means providing a fluid supply.

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