May 24, 1932. R. F. GRAHAM 1,859,389

APPARATUS FOR PASTEURIZING BEER OR OTHER LIQUIDS

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FIG. 1.

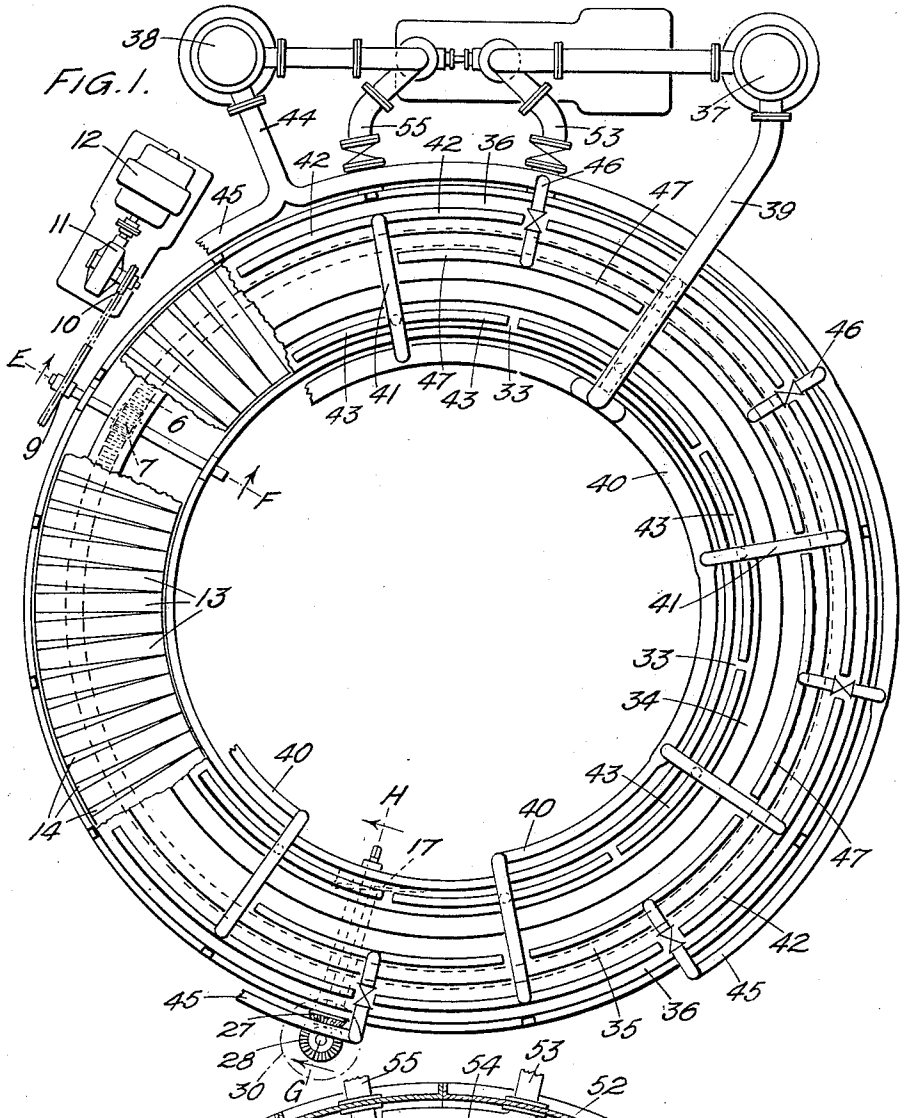


FIG. 2.

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FIG. 3.

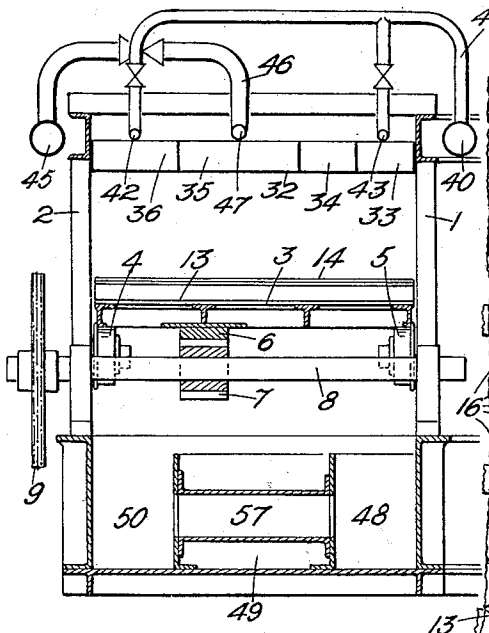


FIG. 5.

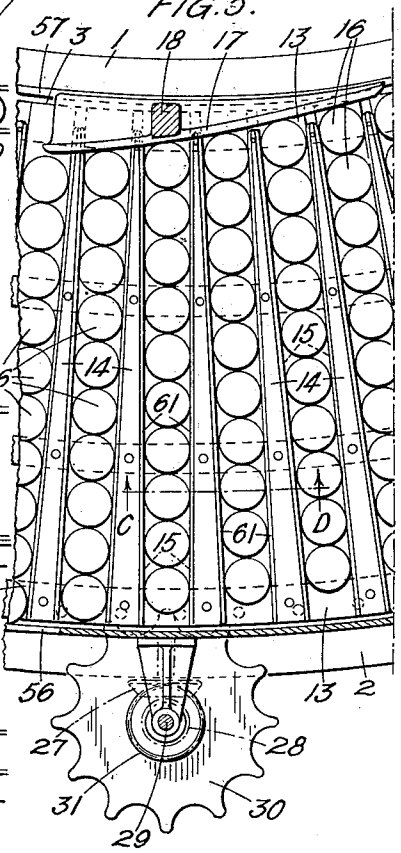


FIG. 4.

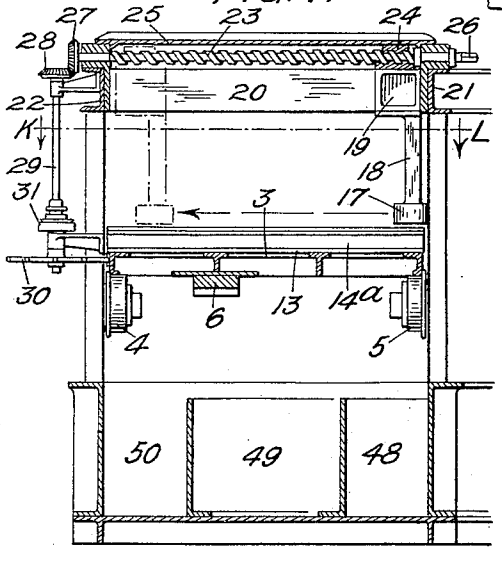
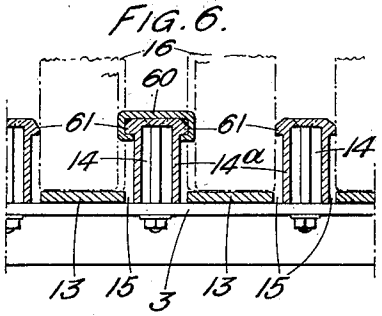


FIG. 6.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR PASTEURIZING BEER OR OTHER LIQUIDS

Application filed December 9, 1930, Serial No. 501,112, and in Great Britain September 5, 1930.

This invention relates to apparatus for pasteurizing beer or other liquids by the method in which a sealed container with the liquid therein is submitted to a stream or spray of heated pasteurizing liquid.

The invention is a modification of an apparatus for pasteurizing beer and other liquids by the method described above comprising a platform or carrier for the liquid containers, a guide of spiral form to engage the containers and cause them to move across the carrier on relative movement of the carrier and guide and means to direct streams or a spray of pasteurizing liquid on to the containers, the carrier being preferably rotatable and the guide fixed so that the carrier makes a number of revolutions during the movement of the containers across it.

The present invention comprises apparatus of the kind described for pasteurizing beer or other liquids wherein the guide to engage the containers and cause them to move across the carrier on relative movement of the carrier and guide is a cam or member of comparatively short length extending at an angle from the edge of the carrier.

Preferably the guide or cam is of such length and at such an angle that a container while in engagement with it is caused to move across the carrier a distance equal to the diameter of the container.

According to a further feature of the invention means are provided to cause the guide or cam to traverse across the carrier.

One form of apparatus according to the present invention will now be described with reference to the accompanying drawings wherein:—

Fig. 1 shows a plan view with parts broken away,

Fig. 2 shows a half plan of the drainage tanks,

Fig. 3 shows a section on the line E—F of Fig. 1 and to a larger scale,

Fig. 4 shows a section on the line G—H of Fig. 1 to a larger scale and with the piping omitted;

Fig. 5 shows a section on the line K—L of Fig. 4 to an enlarged scale and

Fig. 6 shows a section on the line C—D of Fig. 5 and to a still larger scale.

Referring to Fig. 3, two concentric rings of standards 1, 2 are connected at the top and towards the bottom by radial members. A platform or carrier 3 of ring form is supported at its edges on rollers 4, 5 carried on the standards. The framework of the platform carries on its underside a rack 6 by which it is connected through a pinion 7 mounted on a shaft 8, and gearing 9, 10, 11 (see Fig. 1) to a driving motor 12. The platform or carrier is constructed of parallel sided metal radial plates 13 carried on the framework (see Figs. 5 and 6). Between each pair of plates there is thus a tapering space in which is placed a tapering radial member 14 of such a width as to leave narrow slots 15 between its edges and the adjacent edges of the plates 13. Said tapering radial members 14 have their sides bent downwards as shown at 14*a* in Fig. 6 so that they stand at a slightly higher level than the plates 13 and constitute means to bear against the liquid containers. The containers are indicated at 16 and the plates 13 are of a width corresponding to the diameter thereof.

A guide or cam 17 of comparatively short length extends close to the carrier 3 at an angle from the edge of the carrier as shown in Fig. 5. Said guide or cam is cast integral with and extends from the lower end of a vertical stem 18 which at its upper end at 19 is of rectangular box form with its side faces flat to act as bearing surfaces and slide in a box shaped guide 20 extending across the carrier. The box shaped guide is bolted at its upper end to the top structural members 21, 22 extending round the apparatus. A screw 23 carried in bearings in the ends of the box shaped guide 20 extends across the top thereof and engages a threaded hole in a member 24 bolted to the box form top 19 of the stem 18. The box guide 20 is extended upwards to form a container for the screw 23 and is closed by a removable cover 25. One end of the screw is squared at 26 to receive an operating handle and the other end is connected through gearing 27, 28 and a vertical shaft 29 to a star wheel 30 which

projects into the path of a pin carried on the carrier. 31 indicates clutch mechanism.

The guide or cam 17 is disposed with its one end adjacent the point at which the bottles are fed to the carrier 3 and it is of such a length and at such an angle that a container while in engagement with it is caused to move across the carrier 3 a distance equal to the diameter of the container.

A series of shallow trays 32 are supported on the framework so as to extend completely over the platform 3. Said trays are divided by concentric strips into compartments which are perforated at the bottom. It will be noticed in Fig. 3 that there are two comparatively narrow inner compartments 33, 34, a wider middle compartment 35 and an outer compartment 36. 37 is a low temperature heater and 38 a high temperature heater for the pasteurizing fluid. The heater 37 is connected by a pipe 39 to a pipe 40 extending round the inner edge of the apparatus. The pipe 40 is connected by branch pipes 41 to perforated pipes 42 extending over the compartment 36 and to branch pipes 43 extending over the compartments 33. In the form of the invention illustrated the compartments 33 and 34 are connected and may be considered as a single compartment. The heater 38 is connected by a pipe 44 to a pipe 45 extending round the outer edge of the apparatus and said pipe 45 is connected by branches 46 to perforated pipes 47 extending over the intermediate compartment 35. Suitable controlling valves are provided in the several pipes.

By this arrangement low temperature pasteurizing fluid is supplied to the compartments 33, 34 and 36 and high temperature fluid to the compartment 35. It will be understood, however, that other arrangements of piping and mixing valves may be provided whereby fluid of any desired temperature may be supplied to compartments which may be greater in number than those illustrated.

Concentric drainage tanks 48, 49 and 50 are arranged under the carrier 3 and are supported on the framework of the apparatus. The two outer tanks 48 and 50 are connected together by pipes 51. 52 is an outlet pipe for the liquid from the tanks 48 and 50 and which is connected by the pipe 53 with the low temperature heater 37. 54 is a similar outlet pipe from the intermediate tank 49 and which is connected by the pipe 55 with the high temperature heater 38.

Automatic feed apparatus may be provided to deliver the liquid containers 16 to the carrier 3 at the feeding point and automatic apparatus may also be provided to receive the containers from the point 56 (see Fig. 5). It will be understood, however, that the delivery of the containers to and from the carrier may be by hand.

In operation a container 16 is fed to the platform 3 at the point 57 (see Fig. 5) and is carried round thereby. After a complete revolution the guide or cam 17 causes it to move across the carrier 3 a distance equal to its own diameter. When it reaches the end of the cam or guide another container is fed to the carrier 3 and takes up a position adjacent to the first mentioned container. They are then carried round for a complete revolution until the second container engages the cam by which it and the first mentioned container are moved across the carrier a distance equal to the diameter of the containers. Thus containers are continually fed to the apparatus and after approximately a complete revolution are pushed across the carrier until they reach the point 56 at which they are removed. During the first part of their travel pasteurizing liquid is supplied to the compartments 33, 34, 35 and 36, and passing through the perforated bottoms of the trays descends as a spray over the containers. The liquid during the first part of their travel supplied through the compartments 33 and 34 may be at a temperature of say 100 to 110° F. During the next several revolutions they are submitted to liquid at a higher temperature supplied to the compartment 35 at say 140° F. During the latter part of their travel they are submitted again to cooler liquid at 100 to 110° F. supplied through the compartment 36. The pasteurizing liquid passes through the spaces 15 between the tapered members 14 and the radial plates 13 to the collecting tanks 48, 49 and 50 in which it is collected and from which it is returned to the heating apparatus 37 and 38.

When it is desired to remove all the containers from the apparatus the guide is moved across the carrier by means of the screw 23 at the upper end of the stem 18. Thus it may be hand operated from the end 26 or the clutch mechanism may be put into its operating position whereby the cam 17 is moved in a step by step manner from the star wheel 30.

Though the guide or cam 17 is shown at the inner edge of the platform or carrier it will be understood that it may be at the outer edge when the containers will be fed to the platform at the outer edge and removed at the inner edge.

60 indicates a cap which may be placed over a radial member 14 to reduce the width of the space between adjacent radial members when smaller containers are to be treated. Said cap is slid into place and retained by ribs 61 on the sides of the member 14.

What I claim is:—

1. Apparatus for pasteurizing liquids comprising a circular carrier, radial guides on said carrier adapted for accommodating radial rows of liquid containers which contact one with another, a single guide comprising a cam of comparatively short length extend-

ing at an angle to one edge of the carrier, driving means for producing relative rotational movement of said carrier and guide whereby said guide engages successively the nearest container of the radial rows and thereby causes each row in succession to move radially of the carrier, and spraying means for directing pasteurizing liquid on to the containers.

2. Apparatus for pasteurizing liquids according to claim 1, wherein the guide is of such length and at such an angle that each row of containers when engaged by it is caused to move across the carrier a distance equal to the diameter of a container.

3. Apparatus for pasteurizing liquids comprising a circular carrier, radial guides on said carrier adapted for accommodating radial rows of liquid containers which contact one with another, a single guide comprising a cam of comparatively short length extending at an angle to one edge of the carrier, driving means for producing relative rotational movement of said carrier and guide whereby said guide engages successively the nearest container of the radial rows and thereby causes each row in succession to move radially of the carrier, traversing means for moving the guide radially of the carrier, and spraying means for directing pasteurizing liquid on to the containers.

4. Apparatus for pasteurizing liquids according to claim 3 wherein the guide is carried at the lower end of a stem having at the top a member with a threaded aperture engaged by a screw extending across the carrier.

5. Apparatus for pasteurizing liquids comprising a circular carrier, radial guides on said carrier adapted for accommodating radial rows of liquid containers which contact one with another, a single guide comprising a cam of comparatively short length extending at an angle to one edge of the carrier, driving means for producing relative rotational movement of said carrier and guide whereby said guide engages successively the nearest container of the radial rows and thereby causes each row in succession to move radially of the carrier, a stem carrying the guide at its lower end and having a threaded aperture at its upper end, a traversing screw engaging said aperture and extending across the carrier, lateral bearing surfaces at the upper end of said stem, a guide for said bearing surfaces extending across said carrier, and spraying means for directing pasteurizing liquid on to the containers.

Dated this 26th day of November, 1930.

ROBERT FINDLAY GRAHAM.