Dec. 3, 1929. A. C. SPOONER 1,737,738

RENDERING APPLIANCE

Filed Nov. 21, 1927

Fig. 1.

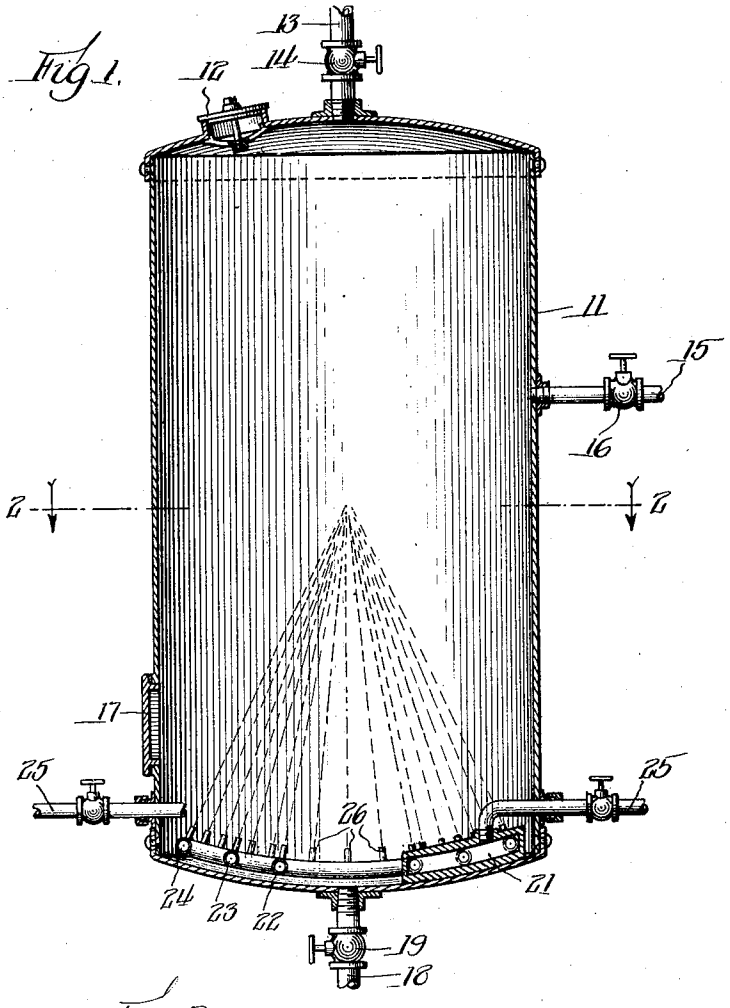
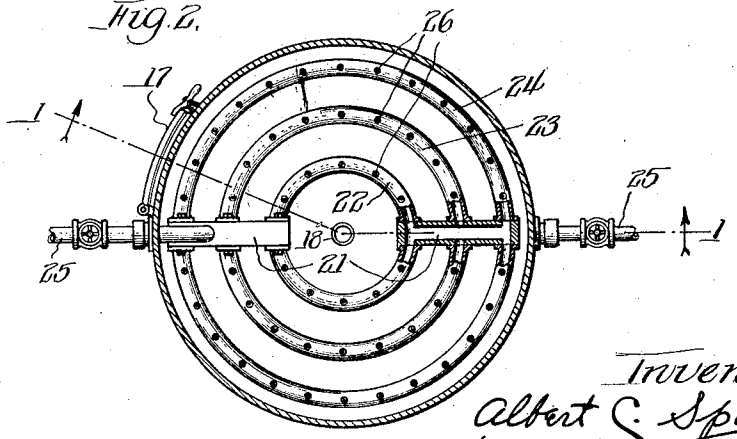


Fig. 2.



Inventor:
Albert C. Spooner
By Walter M. Fuller
atty.

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UNITED STATES PATENT OFFICE

ALBERT C. SPOONER, OF CHICAGO, ILLINOIS

RENDERING APPLIANCE

Application filed November 21, 1927. Serial No. 234,654.

My invention relates to appliances or types of apparatus for rendering bodies or mixtures of miscellaneous materials, whereby to melt or try out the greases and supply them for various uses, such as the manufacture of soap.

In fat and grease rendering tanks of the usual, present-day construction, perforated, false bottoms are used for supporting the heterogeneous materials undergoing treatment, and, due to the heat and weight to which such plates are subjected, they become deformed and are a source of expense on account of the labor required to keep them in reasonably good working condition. One object of the new invention is to avoid the use of such plates.

The present, improved structure is of greater capacity than the old appliances, it operates more efficiently, effectively and economically, the grease produced is in better condition, the tankage is in such a state that it may be pressed to better advantage, and the tank as a whole has a longer, useful life.

To the accomplishment of these and other desirable objects, I have devised the present preferred embodiment of the invention, illustrated in the accompanying drawing, forming a part of this specification, and in the views of which like reference characters have been employed to designate the same parts.

In this drawing,—

Fig. 1 is an upright section through the rendering tank, on the line 1—1 of Fig. 2; and

Fig. 2 is a horizontal section on line 2—2 of Fig. 1.

Referring to the drawing, it will be perceived that the apparatus includes a suitably-supported, upright, cylindrical tank or receptacle 11 having a manhole 12 in its top wall by means of which the tank may be charged or filled with the mixture of diversified and promiscuous materials, such as garbage, to undergo the steam treatment, such top of the tank having a vent pipe 13 equipped with a suitable controlling valve 14.

At about two-thirds of its height, or any other appropriate point, the side wall of the tank has a drain pipe 15, also supplied with a valve 16.

The side wall of the tank, near its bottom, has a door 17, and the bottom wall of the receptacle is furnished with a drain pipe 18 having a valve 19.

Resting on the downwardly dished or curved bottom of the tank, I provide a steam distributor composed, in the present instance, of a pair of opposite, hollow manifolds 21, 21, registering, side apertures in which are joined or connected together by substantially-semicircular pipe-sections 22, 23, 24 of different lengths and radii, so that the structure as a whole may be compared to three circular, concentric pipes connected together by the manifolds, which supply steam under pressure to them, such elements 21, 21 receiving their steam through a pair of pipes 25, 25 communicating with a convenient boiler or steam generator, not shown, the pipes being equipped with suitable control valves.

The three circular pipes have small nozzles 26, 26 which direct all of the issuing steam jets to about the same central point of and on the axis of the tank, thus providing a plurality of concentric cones of steam with an approximate common apex at the point where the jets converge.

The appliance is operated substantially as follows:

A suitable quantity of the garbage or other material to under go treatment in the apparatus is introduced into the tank through the top manhole, and a relaively small quantity of water added thereto.

Vent valve 14 is almost closed, and valves 16 and 19 are fully shut, but the valves in the steam-supply pipes 25, 25 are opened, so that steam under substantial pressure is discharged from the converging nozzles.

These upwardly-directed jets of steam liquefy those constituents in the garbage contents capable of being brought to a liquid condition, and the body of garbage gradually descends as its lower section is thus progressively cut off or removed, the heated liquids being projected to the center of the tank and rising therethrough, while the colder con-

tents descend around the outer portion of the tank.

In this way, after a period of time, all of the contents of the tank are undergoing circulation, descending at the outer part of the tank and rising through its center.

It is important that this circulation should be established as quickly as possible in order to secure economy of operation, and the directing of these steam jets in the manner indicated is a substantial aid in accomplishing such desired result.

That is to say, the jets of steam progressively remove the undersections of the mixture, melting those parts capable of such treatment and directing them all toward the center of the tank, in this manner keeping the hot contents more or less away from the tank wall, and thus prolonging its life, since otherwise it is subject to corrosion by reason of the acids present.

In view of the functioning of these steam jets, a lesser quantity of water may be used in the tank than has heretofore been customary, with a resulting economy in steam consumption.

After the circulation of the contents of the tank has been established and they become fully heated, the steam, instead of being more or less quickly condensed, creates a pressure in the top of the tank, thereby automatically causing the steam issuing from the nozzles to percolate directly upwardly through the material rather than be projected in the previous cone formation.

Thus the circulation of the contents ceases and they become cooked by the steam, thereby permitting the fats and grease to accumulate in the top of the tank without becoming fouled by the other constituents of the mixture.

After the contents of the receptacle have undergone this treatment for an adequate period of time, the steam supply is shut off, the valve 16 is opened to drain off the molten fats and greases from the top portion of the tank, the liquid remainder is drained off through pipe 18 by opening valve 19, and the solid residue is removed from the tank through the door 17 and pressed or squeezed to express the entrapped fats and greases, it being desirable to leave a sufficient quantity of such residue to cover the steam distributor, thus affording a blanket protecting the latter in some degree from the acids present in the tank during its operation.

Among the advantages which may be mentioned, resulting from the use of the improved appliance, is the saving of steam required because no great quantity of water is needed to assist in establishing the initial circulation of the contents of the tank.

Owing to the efficiency of action of the new apparatus, a greater quantity of material may be treated in the tank than has heretofore been usual, due to the lesser quantity of water employed, the actual reduction in water used representing an operating saving.

Owing to the manner in which the improved appliance functions, there is no loss of heat occasioned by blow holes through the mixture, which, under such circumstances, does not circulate properly or to the best advantage.

In the present appliance the greatest motion of the bodies constituting the mixture and the most intense heat occur at the center of the tank, that is, at a point farthest from the metal sheets, thus protecting the latter, while a relatively-gentle, downward movement and comparatively-moderate heat occur along the upright, metal wall of the tank.

Inasmuch as the first or initial circulation of the relatively-solid material is comparatively quickly established by this novel appliance, the whole treatment of the material can be performed in a less time than has been common practice.

The tankage is cooked to a condition resembling sawdust, making it capable of easy handling, and it presses with facility because it is not substantially gummy, thus resulting in a saving in the press sack material or press cloths.

In short, it may be stated that one of the prime purposes of the steam distributor in the form and style employed is to produce a relatively quick and complete circulation of the material undergoing treatment with a minimum amount of water, with a maximum efficiency, and with a little wear and tear on the apparatus as possible.

Various minor, mechanical changes may be incorporated in the structure described without departure from the heart and essence of the invention as defined by the appended claims, and without the loss or sacrifice of any of its material benefits and advantages.

I claim:

1. In a rendering appliance, the combination of a tank, a hollow member in the lower portion of said tank, delivery nozzles for said member having inwardly upwardly directed discharge openings aimed at substantially the same point, and means to admit steam under pressure into said member for discharge from said member through said nozzle openings in the form of jets converging to said point.

2. In a rendering appliance, the combination of a tank, hollow means in the lower portion of said tank, a set of delivery nozzles for said hollow means, a second set of delivery nozzles for said hollow means located nearer to the center axis of the tank than said first set of nozzles, all of said nozzles having inwardly upwardly directed discharge openings aimed at substantially the same point, and means to admit steam under pressure into said member for discharge from

said member through all of said nozzle openings in the form of two sets of jets converging to said point.

3. In a rendering appliance, the combination of a tank, a circular pipe in the lower portion of said tank, delivery nozzles for said pipe having inwardly upwardly directed discharge openings aimed at substantially the same point, and means to admit steam under pressure into said pipe for discharge from said pipe through said nozzle openings in the form of a cone of jets converging to said point.

4. In a rendering appliance, the combination of a tank, a plurality of concentrically arranged circular pipes in the lower portion of said tank, delivery nozzles for said pipes, all of said nozzles having inwardly upwardly directed discharge openings aimed at substantially the same point, and means to admit steam into said pipes for discharge from said pipes through said nozzles in substantially the form of concentric cones of steam having a common apex.

In witness whereof I have hereunto set my hand.

ALBERT C. SPOONER.