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APPARATUS FOR CONGEALING LIQUIDS

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Inventor

[Signature]

By

[Signature]
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APPARATUS FOR CONGEALING LIQUIDS.

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To all whom it may concern:

Be it known that I, HERBERT SIECK, a citizen of the United States, residing at Hinsdale, in the county of Du Page and State of Illinois, have invented certain new and useful Improvements in Apparatus for Congealing Liquids, of which the following is a specification.

This invention relates to improvements in apparatus for congealing liquids and is particularly adapted, though not necessarily limited in its use, for the purpose of congealing fats and milk, or fats, oils, and milk in the manufacture of margarine and oleomargarine.

In the present exemplification of this invention the description will be confined to an apparatus for the manufacture of margarine.

Heretofore the apparatus commonly used in this art consisted of a rectangular open tank containing water at a low temperature. The emulsion is run into the water at one end of the tank and the particles of congealed emulsion, which rise to the surface of the water are moved to the other end of the tank by manually operated hoes or rakes. The crystals are removed from the tank by the use of hand operated scoops or nets, allowed to drain for a time and then transferred to a truck.

This method is open to a number of objections, the first being the large amount of labor required, second, that in the operation of scooping out the congealed particles often times brings them in contact with the workers' hands and arms which is objectionable from a sanitary point of view; third, that the time of chilling the emulsion is not constant being dependent entirely on the efforts of the men operating the rakes or hoes, and fourth, that the time of draining the crystals is not constant, being also dependent entirely on the efforts of the men operating the nets or scoops.

To overcome these objections and difficulties and to provide an improved apparatus of this character which will be simple, durable and comparatively cheap in construction and effective, efficient and automatic in operation is one of the objects of the present invention.

To the attainment of these ends and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty in substantially the construction, combination and arrangement of the several parts, hereinafter more fully described and claimed and as shown in the accompanying drawing.

Referring more particularly to the drawing—

Figure 1 shows a vertical longitudinal section of the apparatus as taken along the line A—A, Figure 2.

Figure 2 shows a plan view of the apparatus.

Figure 3 shows a modified form of conveyor.

Figure 4 shows still another modified form of conveyor.

The apparatus consists essentially of an open vat or tank 1, of any desired size and configuration and constructed of any material suitable for the purpose. Inside this tank 1, is provided a false floor or horizontal partition 2, extending to both sides of the tank but terminating short of either end. Under one end of this partition 2, is a propeller 3, fitted to a shaft 4, which latter is supported by a bearing 5, and passes through the end of the tank through a stuffing box 6. This shaft is rotated by means of a pulley 7, or other suitable means.

Beneath the partition 2, are placed cooling coils 8, provided with a suitable inlet 24, and an outlet 23, for the admission of a cooling medium such as ammonia, cold brine, etc., by which the temperature of the congealing liquid in the vat may be regulated. At the other end of the tank are one or more pipes 9, which are perforated for the purpose of admitting air supplied through a pipe 10, and being discharged into the congealing liquid will cause violent agitation of the congealing liquid at that point. A thermometer 20, which has communication with the interior of the tank may be provided if desired for ascertaining the temperature of the contents of the tank.

The congealed material is automatically removed from the surface of the congealing liquid and from the tank preferably by means of a conveyor 12, carrying suitable bearings 13. These bearings carry shafts 14, on which are fitted suitable rollers or sprockets 33 on which runs the conveyor belt preferably made of a flexible screen 11. This conveyor, if desired, may also be formed of a series

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of perforated elements 25, linked together with flexible connections 26, as shown in Figure 3, or may be constructed of a series of elements 27 flexibly connected by means of screens 28 shown more in detail in Figure 4.

If desired, the belts or screens may be provided with suitable flights to prevent the congealed particles from sliding down the belt or screen. The shaft 14, is rotated through the sprockets or pulleys 17, and 18, connected by a belt or chain 20. Sprocket 18, rotates on the shaft 19, which passes through and is secured to the framework 12, of the conveyor and is supported on suitable bearings 30. This allows the lower end of the conveyor to be raised for inspection and cleaning also when it is required to clean out the tank 1. A suitable stop 19, may be provided on the frame 12, to limit the movement of the frame in one direction so as to properly position the lower end of the frame. A pipe 21, serves for the admission of the emulsion to be congealed and the flow of the emulsion may be regulated by valve 32.

In operation, the tank or vat is filled to a predetermined level 31, with any suitable congealing liquid. The propeller 3 is then set in motion and a circulation of the liquid in the tank is thereby effected causing it to pass under the partition 2, away from the propeller, then up and back over the partition and then down again to the propeller, 35, 3. A cooling medium is then circulated through the coils 5, to bring the liquid in the tank to the proper temperature. Air is then admitted through the openings in the pipes 9, and the conveyor is set in motion in the direction indicated by the arrows in Figure 1. The emulsion to be congealed is then allowed to flow into the tank from the pipe 21. The congealed particles rise to the surface of the congealing liquid and are carried by the liquid to the conveyor belt 11. By means of the moving conveyor the congealed material is not only carried to the top of the conveyor and dropped into a truck 22, or other suitable conveyor but the congealed material will be allowed to drain back into the tank as it is conveyed by the conveyor.

If desired and as a means for directing the congealed particles upwardly to the top of the congealing liquid and towards the conveyor, suitable deflectors may be provided, such deflectors 34, which may be arranged upon the upper side of the horizontal partition 2, and may be arranged to extend upwardly therefrom and incline in a direction towards the conveyor and are of a size to be engaged by the congealed particles as they are held in suspension in the congealing liquid.

What is claimed as new is:--

1. An apparatus for congealing liquids embodying a tank for the congealing medium, means within the tank for regulating the temperature of the congealing medium, a conveyor extending into the tank and mounted upon the tank for bodily pivotal movement to swing into and out of the tank, and means for agitating the congealing medium; the said conveyor operating to remove the congealed liquid and being normally disposed in a position that the congealed material will drain into the tank as it is being removed by the conveyor.

2. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a circulation of the congealing medium within the tank, means for introducing a fluid into the congealing medium for agitating the latter, a conveyor operating to remove the congealed liquid from the congealing medium, a portion of the conveyor extending into the tank, means mounting the conveyor for adjustment with respect to the tank, and means operating to limit the extent of adjustment of the conveyor with respect to the tank and in one direction.

3. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a horizontal flow of the said medium in one direction in the upper portion of the tank and in an opposite direction in the lower portion of the tank, means for introducing a fluid into the congealing medium for agitating the latter, means for automatically removing the congealed liquid from the said medium and as the liquid is congealed, and means for directing the congealed liquid towards the last recited means.

4. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a horizontal flow of the said medium in one direction in the upper portion of the tank and in an opposite direction in the lower portion of the tank, means for introducing a fluid into the congealing medium for agitating the latter, means for automatically removing the congealed liquid from the said medium and as the liquid is congealed, and deflectors for directing the congealed liquid towards the last recited means.

5. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a horizontal flow of the said medium in one direction in the upper portion of the tank and in an opposite direction in the lower portion of the tank, means for introducing a fluid into the congealing medium for agitating the latter, and means for automatically removing the congealed liquid from the said medium and as the liquid is congealed, the first recited means embodying a partition intermediate the top and bottom of the tank and spaced
above the latter, the ends of the partition terminating short of the ends of the tank and a mechanical circulation creating device below the partition.

6. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a horizontal flow of the said medium in one direction in the upper portion of the tank and in an opposite direction in the lower portion of the tank, means for introducing a fluid into the congealing medium for agitating the latter, means for automatically removing the congealed liquid from the said medium and as the liquid is congealed, the first recited means embodying a partition intermediate the top and bottom of the tank and spaced above the latter, the ends of the partition terminating short of the ends of the tank and a mechanical circulation creating device below the partition, and a pipe beneath the said partition and through which pipe a temperature controlling medium is adapted to be circulated.

7. An apparatus for congealing liquids, embodying a tank for the congealing medium, means for inducing a horizontal flow of the said medium in one direction in the upper portion of the tank and in an opposite direction in the lower portion of the tank, means for introducing a fluid into the congealing medium for agitating the latter, means for automatically removing the congealed liquid from the said medium and as the liquid is congealed, the first recited means embodying a partition intermediate the top and bottom of the tank and spaced above the latter, the ends of the partition terminating short of the ends of the tank and a mechanical circulation creating device below the partition, and one or more deflectors projecting above the partition and directed towards the fourth recited means.

In testimony whereof I have signed my name to this specification, on this 15th day of October, A. D. 1921.

HERBERT SIECK.