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E. METCALFE-SHAW

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COOLING SLAB FOR VISCOUS LIQUIDS

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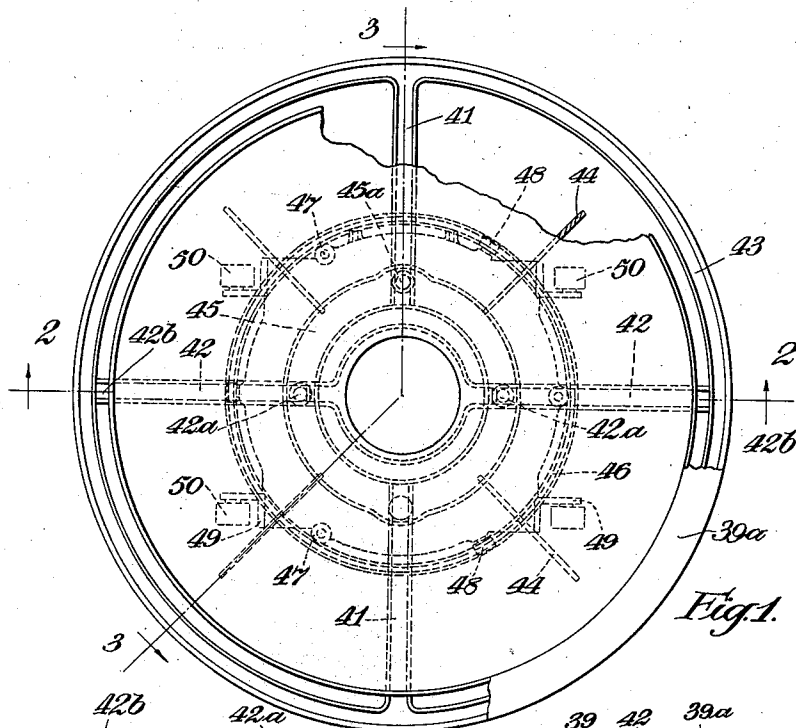


Fig. 1.

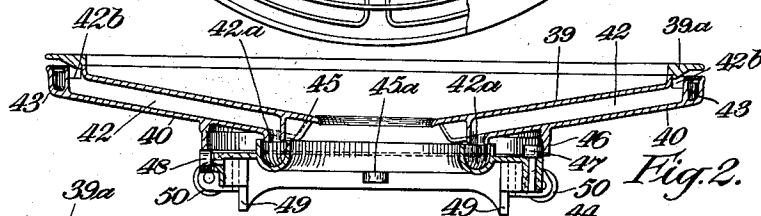


Fig. 2.

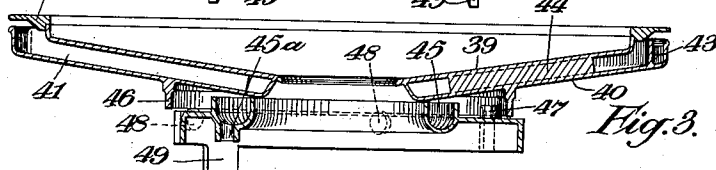


Fig. 3.

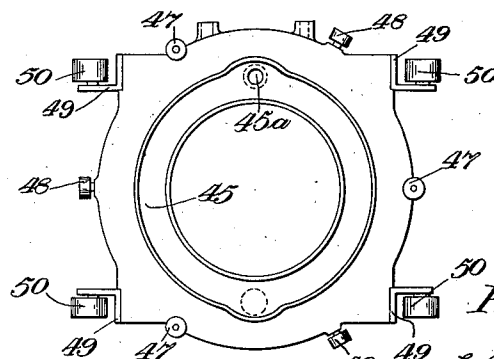


Fig. 4.

E. Metcalfe-Shaw  
INVENTOR

By: Marks & Clerk  
ATTY.

## UNITED STATES PATENT OFFICE

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## COOLING SLAB FOR VISCOUS LIQUIDS

Edward Metcalfe-Shaw, Chiswick, London,  
EnglandOriginal application July 24, 1933, Serial No.  
682,033. Divided and this application June 7,  
1934, Serial No. 729,517. In Great Britain  
July 27, 1932

6 Claims. (Cl. 257-179)

This invention relates to cooling tables or slabs for sugar or other viscous setting or thickening liquids and has for its object to provide an improved table or slab for cooling liquids continuously discharged from a heat treatment device.

The invention is particularly suitable for receiving sugar and the like from sugar cooking apparatus such for example as that forming the subject of my concurrent patent application Serial No. 682,033 filed the 24th July, 1933, from which the present application is divided.

The invention consists in a cooling table or slab for receiving boiled sugar (or other viscous liquid) from a machine for continuously heating sugar, comprising a rotary water-jacketed plate of shallow truncated conical form providing a central discharge aperture to which the sugar is adapted to flow by gravity.

The table may be provided with an annular gutter feed of cooling water, and an annular fixed gutter may be provided below the table for discharging the cooling water.

In the accompanying drawing:—

Figure 1 is a plan view of a cooling table according to the invention.

Figure 2 is a section of the table taken on the line 2—2 of Figure 1. It will be noted in Figure 1 that the peripheral flange or lip of the table is removed to show the annular gutter for the reception of cooling water.

Figure 3 is a section on the line 3—3 of Figure 1.

Figure 4 is a plan view of the supporting carriage.

In carrying the invention into effect according to one convenient mode as described by way of example, the improved cooling table according to the invention comprises a cast iron or other metallic plate element 39 of shallow internal truncated conical form the truncation of which provides a central discharging aperture. A suitable angle for the cone has been found to be about 15° to the horizontal and the truncation aperture may conveniently approximate to one-fifth of the diameter of the table. The table is provided with a water cooling jacket located beneath it which may be cast in one with it.

The preferred form of water cooling jacket for the table comprises a truncated conical element 40 corresponding to or parallel with the conical table having vertical partitions dividing the space between the jacket member and the table into feed channels 41 and outflow channels 42 there being a pair of oppositely disposed channels for both purposes. The feed channels 41 terminate

short of the bottom of the conical jacket and communicate at their upper end with an annular gutter 43 at the periphery of the element 40 which is supplied with cooling water as the table rotates from a suitable tap or pipe connection. To prevent feed water from splashing on to the table 39 it is provided with an extended lip 39a which overlies the gutter 43. The outlet channels 42 at their lower ends terminate in outlet orifices 42a, while at their upper ends the partitions enclosing them are cut away as at 42b to form weirs over which the water from the jacket may overflow into the channels 42. This arrangement affords an appropriate circulation for the water through the jacket which may be further improved by the provision of baffle partitions 44. The feed channels 41 lead the water from the peripheral gutter towards the truncation aperture and the water, after distributing itself through the jacket, rises toward the periphery of the table and flows out over the weirs 42b into the channels 42 which discharge through the orifices 42a into an annular fixed gutter 45 below the table so that the discharge may be effected irrespective of the rotation of the table. The gutter 45 empties itself through outlets 45a into a suitable trough or drain. Cooling water of the required temperature for the table is supplied to the pipe connection hereinbefore referred to through a flexible cold water connection to which steam may be added through a pipe by a nozzle in a mixing chamber.

The member 40 is provided with a downwardly depending annular machined flange 46 the inner peripheral surface of which is engaged by three laterally locating rollers 47 carried on vertical spindles and is supported upon three rollers 48 on radial spindles. The rollers 47 and 48 are mounted on a carriage 49 having wheels 50 adapted to travel on suitable rails supported upon a bracket.

The outer surface of the flange 46 is adapted to act as a pulley by which slow rotation is communicated to the table from a suitable belt drive. The belt is disconnected when the table is to be moved to a position in which the sugar may be discharged directly to a bowl. The table is adapted to discharge in a bowl carried beneath the table in a suitable bracket. The table is carried by the rollers 50 in order that it may be moved with facility from a position in which it may receive boiled sugar from the heat treatment device and into a second position in which the sugar may be discharged direct into the bowl

which may be moved into a suitable position for the purpose.

The cooling table may be provided with a thermometer positioned so that the boiled sugar in  
5 discharging may contact with a sensitive portion thereof.

In the operation of the cooling table it will be appreciated that as the table slowly rotates and the cooling process continues the boiled  
10 sugar discharged from the heat treatment device and lying on the cooling surface 39 will form a layer which is more viscous than the boiled sugar which is being fed to the table. Down over this cooled layer flows more sugar which is cooled  
15 both by radiation and the cooling effect transmitted through the cooled layer so that the layer will be built up to a certain extent. This layer is periodically removed by the operator by lifting the edge of the layer at a suitable point in advance of the sugar feed, slitting the annular layer  
20 radially at the part raised with a pair of scissors. The slit layer is then rolled or partially rolled away from the feed so that as the rotation of the table continues the feed is discharged upon the cleared surface. The slit layer is deposited  
25 through the truncation aperture of the table into a pan or bowl where it melts into or mingles with the previously discharged boiled sugar. If desired, the layer may be slit at two or more  
30 points for convenience in removal and deposit through the aperture.

Whilst the cooling table is particularly suitable for use in connection with the sugar boiling machine described in the specification referred to  
35 above, it may be used in conjunction with any other continuous sugar boiling plant and its use is not confined to cooling sugar but it may be employed in connection with the cooling of other liquids or semi-liquids.

40 Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A cooling table for receiving boiled sugar or other viscous liquid from a machine for  
45 continuously heating such liquid, comprising a rotary water jacketed plate of shallow truncated conical form having a central discharge aperture to which the sugar or other viscous liquid is adapted to flow by gravity.

50 2. A cooling table for receiving boiled sugar

or other viscous liquid from a machine for continuously heating such liquid, comprising a rotary jacketed plate of shallow truncated conical form with a central discharge aperture, an  
5 annular gutter for receiving a feed of cooling water, and an annular fixed gutter below the table for discharging the cooling water.

3. A cooling table for receiving boiled sugar or other viscous liquid from a machine for continuously heating such liquid comprising a rotary  
10 water jacketed plate of shallow truncated conical form having a central discharge aperture, an annular gutter for receiving a feed of cooling water, an annular fixed gutter below the table for discharging the cooling water, and partition  
15 means within the jacket for directing the circulation of cooling water from the feed to the discharge.

4. A cooling table as claimed in claim 3, wherein the partitioning means comprises radial channels for the flow of water from the feed  
20 gutter toward the central discharge aperture, and radial channels receiving water overflowing over weirs thereinto and directing it to discharge outlets over the fixed annular gutter.

5. A cooling table for receiving boiled sugar or other viscous liquid from a machine for continuously heating such liquid, comprising a rotary  
25 plate of shallow truncated conical form having a central discharge aperture to which the sugar or other viscous liquid is adapted to flow by gravity, a jacket for cooling water mounted beneath the plate, an annular flange depending  
30 downwardly from said jacket, and rollers laterally locating and supporting the flange.

6. A cooling table for receiving boiled sugar or other viscous liquid from a machine for continuously heating such liquid, comprising a rotary  
40 plate of shallow truncated conical form having a central discharge aperture to which the sugar or other viscous liquid is adapted to flow by gravity, a jacket for cooling water mounted beneath the plate, an annular flange depending downwardly from said jacket, rollers laterally locating  
45 and supporting the flange, a wheeled carriage carrying said rollers, whereby the table is displaceable towards or away from the heater machine discharge.

EDWARD METCALFE-SHAW. 50