

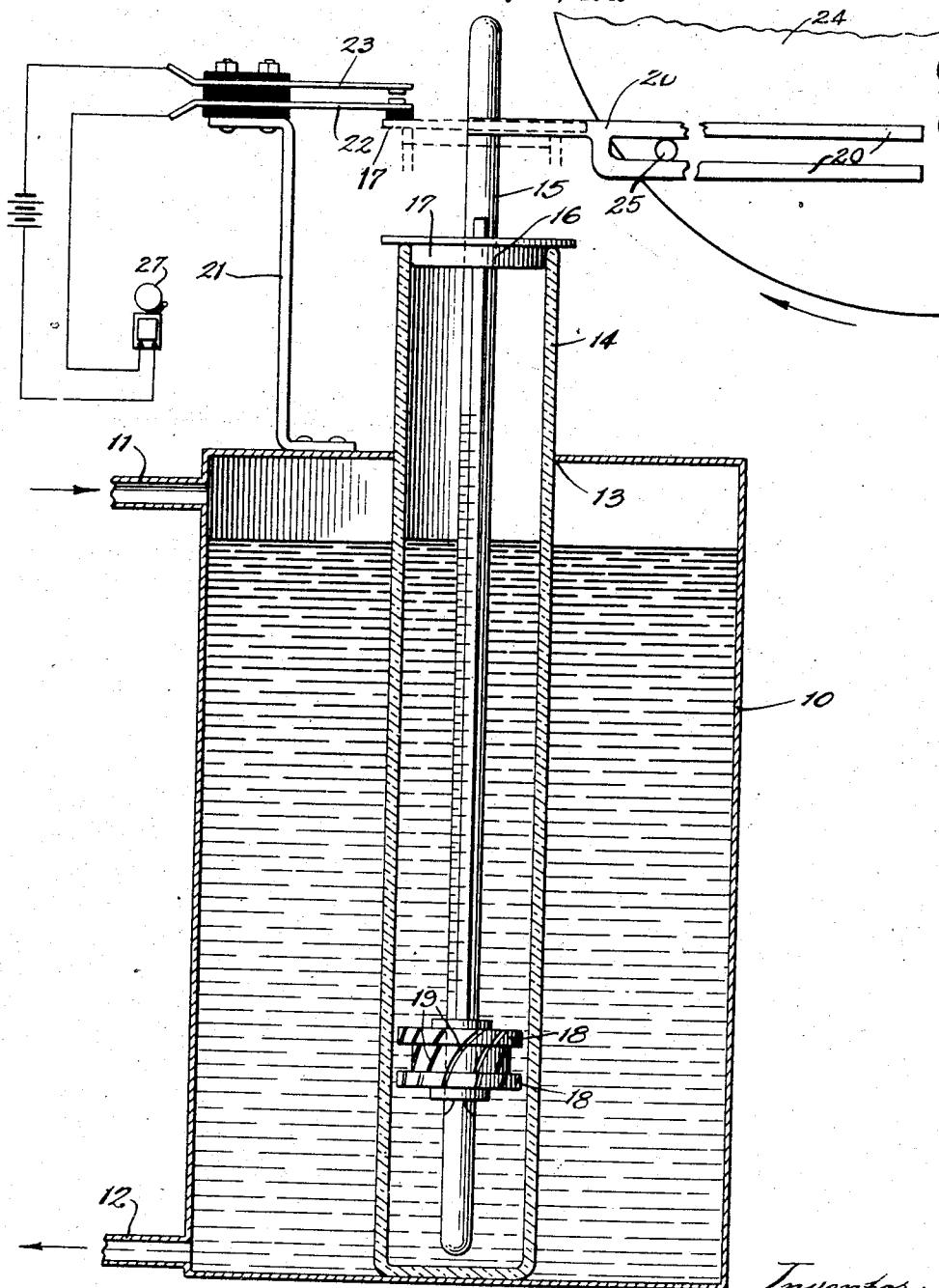
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CONSISTOMETER

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CONSISTOMETER

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1

This invention relates to a consistometer or device for testing or determining the consistency or body of a material, such as an oil or fat, which thickens upon chilling.

In the forming of certain products, as, for example, when an oil or fat is hydrogenated, it is important to determine what sort of "body" it has obtained and how it will behave in a baking mix. The determination of the usual constants, such as an iodine number, etc., does not, however, provide this information and it is difficult to obtain the information with accuracy.

An object of the present invention is to provide means for obtaining in a reliable manner the consistency of an oil or fat or any other liquid which has the property of thickening upon cooling or chilling. A further object is to provide an extremely simple machine which will indicate the data for determining the consistency of such a liquid and which requires a minimum of attention. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated in a preferred embodiment by the accompanying drawing in which the single figure sets out in vertical section, apparatus in which my invention may be carried out.

In the illustration given, 10 designates a tank for providing a cooling or chilling bath and is provided with inlet 11 and outlet 12. The top wall of the tank 10 is provided with an opening 13 adapted to loosely receive a glass tube 14.

Within the glass tube 14, I prefer to place a thermometer 15 which passes through a loose opening 16 in the closure 17 for the tube. The thermometer 15 is fitted just above its mercury bulb with a thick sleeve 18 fixedly secured thereto, which may be of metal or other suitable material and which has upon its face longitudinal spiral slots 19, as indicated in the drawing. The sleeve diameter is a little less than the inside diameter of the glass tube. By having the slots 19 in an inclined or spiral arrangement, the fat within the tube is not channeled upon vertical movement of the sleeve.

Fixed to the upper end of the thermometer is an arm 20 which extends to any mechanical actuator for raising and lowering it. The actuator raises the thermometer so as to alternately immerse and withdraw the sleeve from the oil in the tube at a uniform speed and length of stroke. One specific means for alternately raising and lowering the member 20 is illustrated in the drawing as a circular disc 24 mounted for rotation and driven by any suitable means. The

2

disc 24 is equipped with a pin 25 which engages the elongated shaft 20 and raises it and lowers it during the rotation of disc 24. The arm 20 is bifurcated and receives between the two parallel portions thereof the pin 25 so that upon rotation of 24, the pin positively moves the shaft and thereby the member 15 in the two directions.

Mounted upon the top wall of the tank 10 is a bracket 21 carrying the contact members 22 and 23. Wires lead from such members to the signal device 27 for actuation of the signal when the contacts are closed.

As a specific example of operation, the following is set out: Oil or fat heated to a given temperature, such as 50° C., at which the material is liquid, is placed in the glass tube 14 which, by way of example, may be about 5" in length and 3/4" in diameter. The tank 10 is filled with a bath of cold water at, say, 10° F. The actuator 20 is set into operation and alternately raises the thermometer and sleeve out of the liquid and then immerses it at any desired speed, say, several times a minute. The tube 14 and its contents are free to spin so that the oil is stirred but none lodges on the sides of the tube. As the oil cools and its consistency increases, the tube and contents are lifted out of the bath by the frictional effect of the thermometer and sleeve passing through the oil. When the tube is lifted sufficiently high to engage the contact arm 22, as indicated by dotted lines in the drawing, the contact is closed and a bell or other signal rings and indicates the end point of the test. The temperature is now read and this value is used in comparison with that obtained with a standard.

The above specific example is set out merely as an illustration. Temperatures are relative and, in some instances, the oil or fat need not be heated at all. The term "chilling" is used in the appended claims as intended to indicate the cooling of a heated liquid or reduction in temperature of an unheated material which is normally liquid. The dimensions of the glass tube may be varied widely, as desired. While I prefer to have a thermometer serve as a means for reciprocating the sleeve, it will be understood that other equivalents may be employed for setting out the temperature while utilizing a friction member for lifting the tube. The temperature reading ranges can be changed by variations in the temperature of the cooling bath and also in the design of the sleeve. The length or stroke of the thermometer may be varied considerably from an extremely short movement to

3

one which actually carries the thermometer and sleeve outside of the liquid, while accomplishing the new result of lifting the tube a sufficient distance to give the information required.

While in the foregoing specification, I have set out details of construction and specific conditions of operation, it will be understood that variations from these may be wide without departing from the spirit of my invention.

I claim:

1. A device for determining the consistency of materials, such as oils and fats, which when in liquid form thicken upon chilling, comprising a tank for containing a chilling medium, a tube for containing such liquid and adapted to be suspended in said medium, said tube being adapted to be reciprocated within said medium, a sleeve slidable within said tube, and means for reciprocating said sleeve within said tube until upon the thickening of the liquid the tube moves with said sleeve a predetermined distance.

2. A device for determining the consistency of materials, such as oils and fats, which when in liquid form thicken upon chilling, comprising a tank for containing a chilling medium, a tube for containing such material in liquid form and adapted to be suspended in said medium for vertical movement, a sleeve slidable within said tube, said sleeve having spiral slots therein, and means for reciprocating said sleeve within said tube whereby upon the thickening of the material the tube moves with said sleeve a predetermined distance, said last-mentioned means including means for indicating the temperature of the material upon the said movement of said tube.

3. A device for determining the consistency of liquids, such as oils and fats, which when in liquid form thicken upon chilling, comprising a tank for containing a chilling medium, a tube for containing such material in liquid form and adapted to be suspended in said medium for vertical movement, a thermometer supported in said tube for reciprocable movement, a sleeve carried by said thermometer within said tube, and means for reciprocating said thermometer within said tube whereby upon the thickening of the liquid the tube moves with said sleeve.

4. A device for determining the consistency of liquids, such as oils and fats, which when in liquid form thicken upon chilling, comprising a tank for containing a chilling medium, a tube for containing such material in liquid form and adapted to be suspended in said medium for vertical movement, a thermometer supported in said tube for reciprocable movement, a sleeve carried by said thermometer within said tube, and means for reciprocating said thermometer within said tube whereby upon the thickening of the liquid the tube moves with said sleeve, said sleeve having grooves extending between its upper and lower faces.

4

5. A device for determining the consistency of liquids, such as oils and fats, which when in liquid form thicken upon chilling, comprising a tank for containing a chilling medium, a tube for containing such material in liquid form and adapted to be suspended in said medium for vertical movement, a thermometer supported in said tube for reciprocable movement, a sleeve carried by said thermometer within said tube, means for reciprocating said thermometer within said tube whereby upon the thickening of the liquid the tube moves with said sleeve, and signal means actuated by the raising of the tube for indicating the end of the test.

6. A consistometer comprising a tank for containing a chilling medium having an opening in its upper wall, a tube extending into said tank through said opening and reciprocable therethrough, a closure for said tube having an opening therein, a thermometer reciprocable through the opening in said closure, a sleeve having slots therein fixed to the lower portion of said thermometer, and means for raising and lowering said thermometer within said tube.

7. A method for measuring the consistency of normally solid oils and fats, comprising heating the solid material to render it liquid, supporting the liquid in a movable tube within a chilling bath, reciprocating a friction member within the tube until the liquid thickens and the tube is lifted a predetermined distance, and determining the temperature within the liquid at the instant of such movement of the tube.

8. A device for determining the consistency of materials, which when in liquid form thicken upon chilling, comprising a tank adapted to contain a chilling medium, a tube adapted to contain such liquid and to be suspended in said medium, a member slidable within said tube and having at least a portion thereof adjacent the walls of the tube, and means for reciprocating said member within said tube whereby upon the thickening of the liquid the tube moves with said member a predetermined distance.

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