March 27, 1956 J. J. KUESER ET AL 2,740,029

SPEED CONTROL FOR LIQUEFIER

Filed April 27, 1953 2 Sheets-Sheet 1

FIG. 1

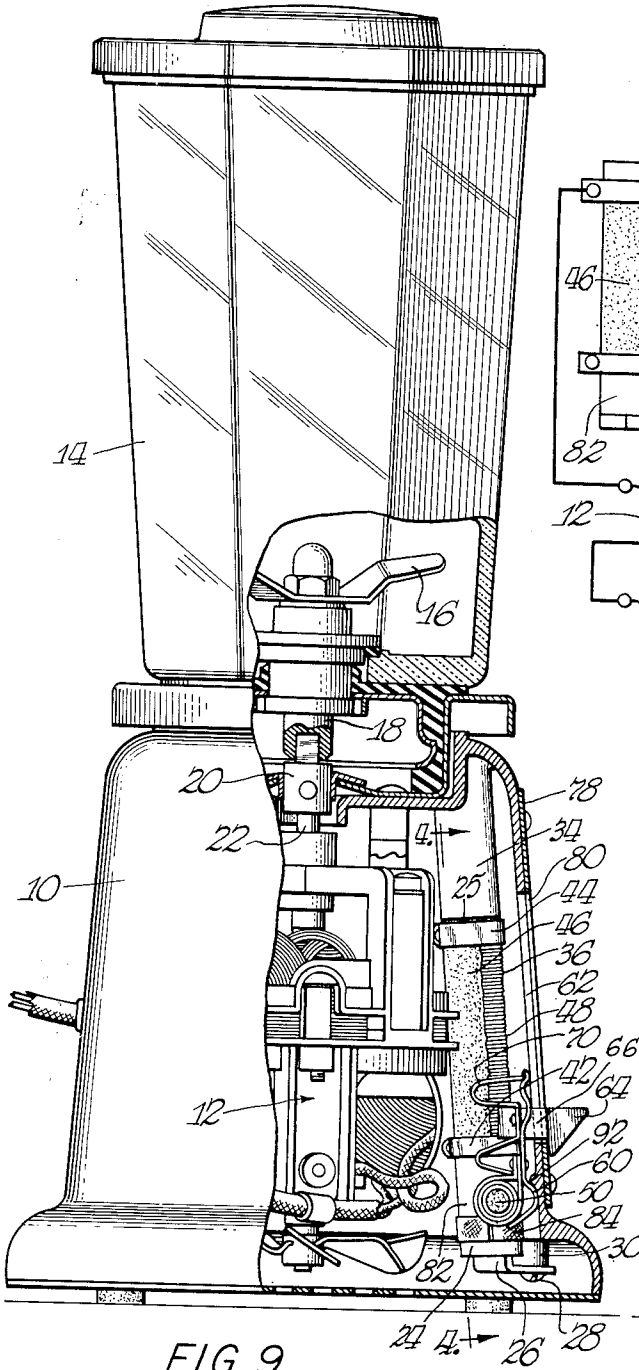


FIG. 3

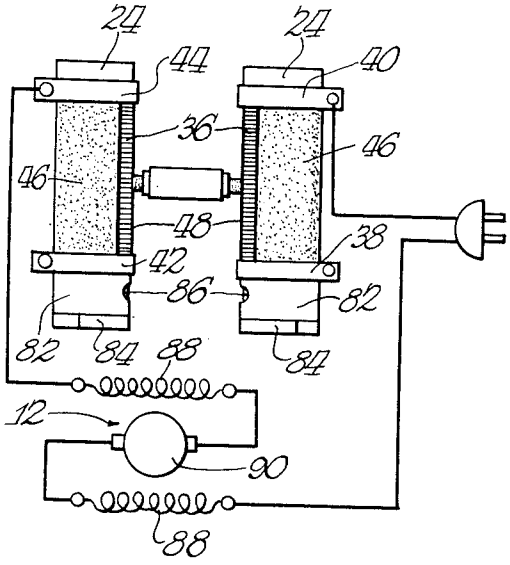


FIG. 2

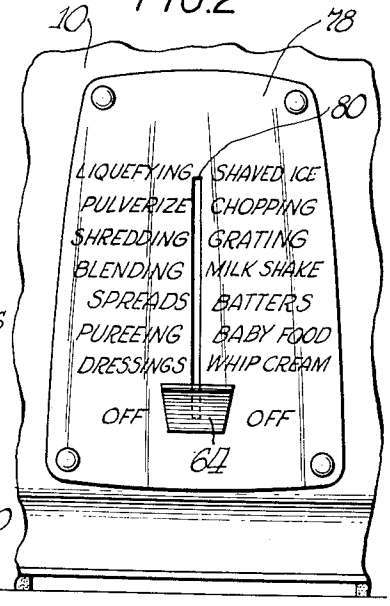
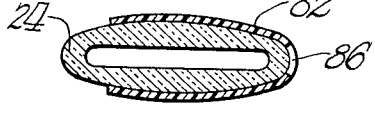


FIG. 9



INVENTORS
JOHN J. KUESER
CHARLES D. VISOS

BY Bair, Freeman & Molinare
ATTORNEYS

March 27, 1956 J. J. KUESER ET AL 2,740,029

SPEED CONTROL FOR LIQUEFIER

Filed April 27, 1953

2 Sheets-Sheet 2

FIG. 4

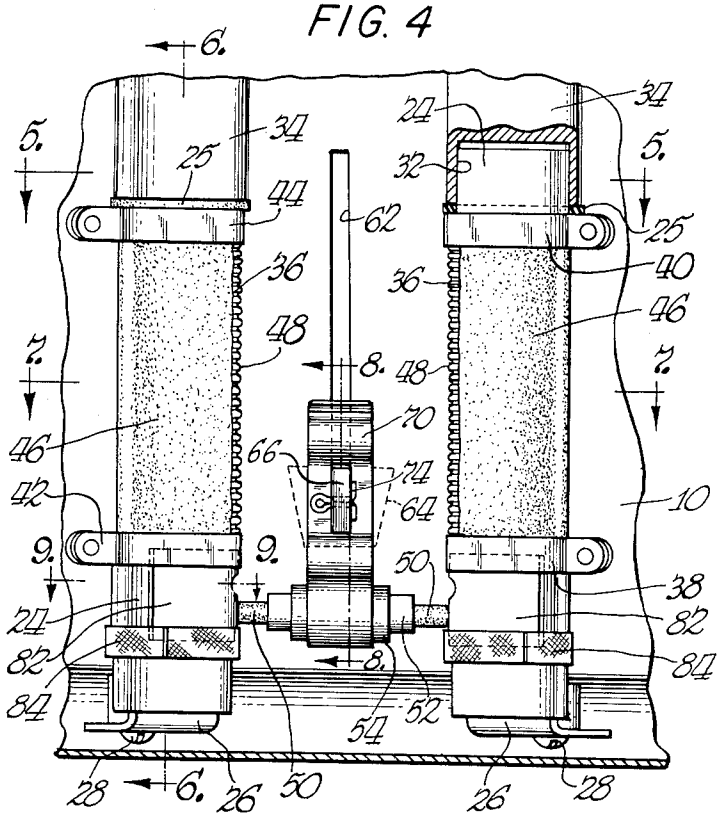


FIG. 6

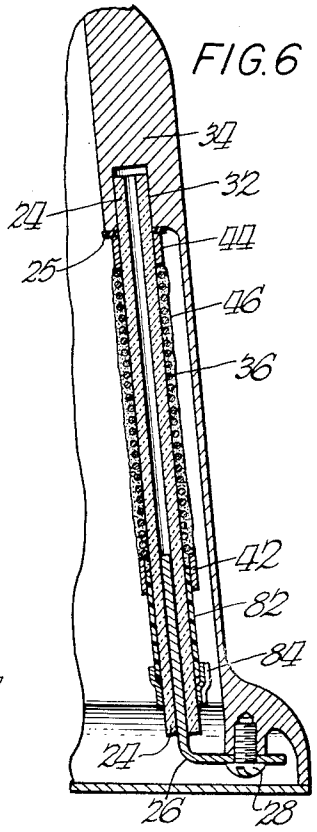


FIG. 5

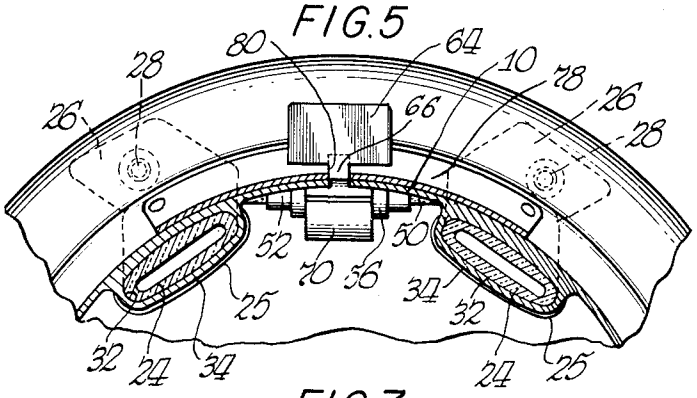


FIG. 8

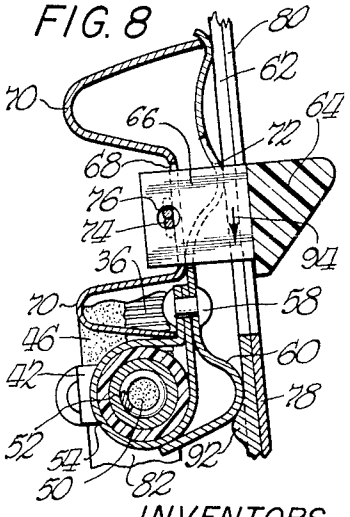
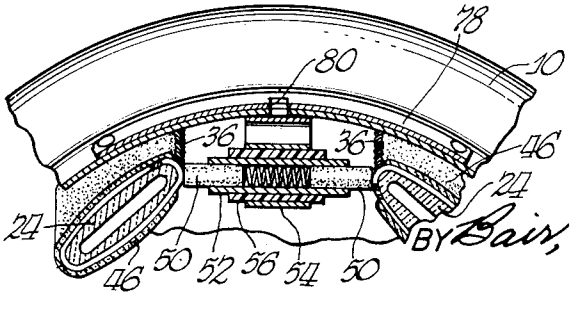


FIG. 7



INVENTORS
JOHN J. KUESER
CHARLES D. VISOS

BY Bair, Freeman & Molinare

ATTORNEYS

United States Patent Office 2,740,029 Patented Mar. 27, 1956

2,740,029

SPEED CONTROL FOR LIQUEFIER

John J. Kueser and Charles D. Visos, St. Louis, Mo., assignors to Knapp-Monarch Company, St. Louis, Mo., a corporation of Delaware

Application April 27, 1953, Serial No. 351,280

5 Claims. (Cl. 201—62)

This invention relates to a speed control for motor driven appliances such as liquefiers.

One object of the invention is to provide a speed controller which is combined with an "off" switch and wherein the control knob for the speed controller is vertically movable with relation to a relatively tall base in which the motor is housed.

Another object is to provide a control device of rheostat-like character to control the speed of the appliance in almost stepless fashion through a range from "low" to "high," the design including an "off" position beyond the low speed end of the knob travel.

Another object is to provide a control device which lends itself to cooperation with a nameplate on which can be imprinted descriptive words for various speed operations such as food preparation notations when the appliance is a liquefier.

Still another object is to provide a combined rheostat and switch wherein a small projection in the base of the appliance cooperates with the speed control knob in such manner that a slider snaps from the extreme low-speed position to a position at the lower end of its travel where a double arc break occurs over a distance of some one-half inch, thereby permitting operation of the appliance on direct current without excessive arcing when the motor is de-energized.

A further object is to provide a rheostat of special construction wherein fiber insulators or the like are provided at the "off" position of the slider so that carbon brushes carried thereby can pass across notches in these insulators wherein any loose particles of carbon may collect, thus preventing the spreading of such particles along the surface of the fiber to form a conductive path and along the turns of the resistance wires which would result in short-circuiting them.

Still a further object is to provide a dual resistance element assembly in the rheostat with a vertical speed adjusting arrangement which makes possible the use of a nameplate with considerable indicia thereon as for different food preparations in relation to the speed of the motor at the various positions of the rheostat knob, the double resistance element arrangement providing one of side-by-side type wherein a slider with spring extended carbon brushes may slide in the space between them, thus eliminating any moving pigtails or wire shunts to make connections to the rheostat, the arrangement being such that only two stationary connections need be provided to the rheostat when wired in the circuit of the motor.

An additional object is to provide a rheostat arrangement that can be readily adapted for mounting in the base of a motor driven appliance and easily controlled by a vertically movable knob on the exterior of the base.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our speed control for liquefiers, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a side elevation of a liquefier to which our present invention has been applied, portions of the liquefier being broken away and other portions being shown in section to illustrate the mounting of our control device in the base of the liquefier.

Figure 2 is a front elevation of a portion of the base showing the nameplate in association with our control device.

Figure 3 is an electro-diagrammatic view illustrating the circuit for the speed control.

Figure 4 is an inside elevation as taken on the line 4—4 of Figure 1 and shows the parts on an enlarged scale.

Figure 5 is a sectional view on the line 5—5 of Figure 4.

Figure 6 is a vertical sectional view on the line 6—6 of Figure 4.

Figure 7 is a horizontal sectional view on the line 7—7 of Figure 4.

Figure 8 is an enlarged sectional view on the line 8—8 of Figure 4 showing the slider in position adjacent the projection which produces snap action; and

Figure 9 is an enlarged sectional view on the line 9—9 of Figure 4.

On the accompanying drawings we have used the reference numeral **10** to indicate the base of a motor driven appliance wherein the motor is shown generally at **12**. The appliance illustrated is a liquefier wherein a bowl **14** is adapted to receive materials to be liquefied by a rapidly rotating cutter blade **16**. This blade is mounted on a shaft **18** connected by a coupling device **20** to the shaft **22** of the motor **12**.

Our speed control device comprises a pair of insulation cores **24** (formed of porcelain or the like) suitably mounted in the base **10** as by clips **26** at their lower ends secured by screws **28** to bosses **30** in the base **10** (see Figure 1) and by extending into sockets **32** of bosses **34** at their upper ends (see Figure 6).

Each of the cores **24** is wound with a resistance coil **36**. The ends of these coils are secured in clamp bands **38**, **40**, **42** and **44** and the clamp bands **40** and **44** serve as terminals for the resistance coils. Between the clamps the coils are covered with insulating cement **46** as shown in Figure 4 with the exception of their adjacent surfaces indicated at **48** with which it is desirable to make contact with carbon brushes **50** of a slider **52**. The slider **52** consists of a tube (see Figure 7) carried in a bracket **54** and insulated therefrom by means of a sleeve **56**.

The bracket **54**, as shown in Figure 8, is secured by a rivet **58** to a corrugated strip-like support **60** adapted to slide along the inner surface of the base **10** back of a vertical slot **62** therein. Means is provided for effecting the sliding movement comprising a knob **64** exterior of the base having a reduced part **66** extending through the slot **62** and into a slot **68** of a corrugated spring **70**. The corrugated strip **60** is also provided with a slot as indicated at **72** through which the part **66** extends. The parts just described are then held assembled by a cotter key **74** extending through an opening **76** of the extension **66**.

On the outside of the base **10** we provide a nameplate **78** with a slot **80** through which the extension **66** also extends and this nameplate may be provided with indicia as shown in Figure 2 to indicate different materials to be worked upon by the liquefier at the various corresponding speeds of the motor **12**. The knob **64** cooperates with this indicia including "off" at the bottom of the nameplate as shown.

U-shaped fiber strips **82** extend partially around the cores **24** adjacent their lower ends as shown in Figures 4 and 9 and are held by the clamps **38** and **42** and by

wrappings of tape or the like **84** as shown in Figure 4. These strips are notched as indicated at **86** for a purpose which will hereinafter appear.

The circuit for the resistance coils **36**, as shown in Figure 3, is in series with the field coils **88** and the armature **90** of the motor **12**. The coils **36**, bridged by the brushes **50** and the slider **52**, constitute a rheostat for varying the current to the motor. Obviously when the brushes **50** are contacting the fiber strips **82**, there is no current flow, but when they contact the coils **36**, the current will flow and the vertical position of the brushes will determine the amount of resistance wire in the circuit of the motor—the higher the brushes, the less wire and therefore the less resistance and the higher the motor speed.

We provide for snap action of the brushes to the "off" position by means of a projection **92** on the inside of the base **10** which, as shown in Figure 8, will retard the downward movement of the slider **52** and the brushes **50** as the knob **64** is pressed downwardly as indicated by the arrow **94**.

Figure 1 shows the "off" position and the normal shape of the corrugated spring **70**. Figure 8 shows this spring tensioned because the corrugated strip **60** is stopped by the projection **92** while the knob **64** has been pressed farther downward. The brushes **50** are still in contact with the coils **36**, but as the knob **64** is pressed further, the lower end of the corrugated strip **60** will snap over the projection **92** and the corrugated spring **70** will spring to its initial shape shown in Figure 1 and in so doing will quickly move the brushes downwardly off the coils **36** and onto the fiber strips **82**, the movement being some one-half inch or so and also providing a double break for minimizing the arc and permitting the use of direct current. This is an important consideration in appliances of this type designed for either A. C. or D. C. operation as the problem of arcing at the time of turning the current off is greater with D. C. than with A. C.

The notches **86** are provided to catch any carbon dust that might be on the brushes **50** and prevent it from being smeared across the fiber **82** where it would form a conducting path. The notches also prevent short-circuiting the turns of the resistance coils **36**. These notches, accordingly, contribute to the efficiency of the slider as an "off" switch for the appliance in addition to being part of the rheostat.

Some changes may be made in the construction and arrangement of the parts of our speed control for liquefier without departing from the real spirit and purpose of our invention, and it is our intention to cover by our claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

We claim as our invention:

1. In a speed control for a motor driven appliance having a base, an elongated resistance element mounted vertically in said base, said base having a vertical slot, a slider movable along said resistance element, means for moving said slider, said means extending through said slot to the exterior of said base, a control knob on said means, one position of said slider being out of contact with said resistance element when said knob is at an end position of limiting movement for de-energizing the motor of said appliance, and means to impart snap action to said slider between its position contacting said end of said resistance element and the out-of-contact position thereof.

2. A speed control for a motor driven appliance having a base comprising a vertically elongated resistance element mounted in said base, said base having a vertical slot, a slider movable along said resistance element, means for moving said slider extending through said slot to the exterior of said base, a control knob on said means, one position of said slider being out of contact with said resistance element at a limiting position beyond the turns of one end thereof for de-energizing the motor of said appliance, said resistance element being provided with a covering of fiber or the like at said limiting position of said slider, said covering being provided with a notch in which the material of said slider may lodge to prevent it from short-circuiting the turns of said resistance element, and means to impart snap action to said slider adjacent the said limiting position thereof.

3. A speed control for a motor driven appliance having a base comprising a pair of elongated resistance elements mounted vertically in said base, said base having a slot between them, a slider movable along said resistance elements and having carbon brushes for contacting the resistance elements, means for moving said slider extending through said slot to the exterior of said base, a control knob on said means, one position of said slider constituting an off position adapted to de-energize the motor of said appliance, said resistance elements, at the off position of said slider, being provided with coverings of fiber or the like provided with notches in which the carbon of the brushes of said slider may lodge to prevent such carbon from short-circuiting the turns of said resistance elements.

4. In a speed control for a motor driven appliance having a base, an elongated resistance element mounted vertically in said base, said base having a slot, a carbon slider movable along said resistance element, means for moving said slider extending through said slot to the exterior of said base, a control knob on said means, one position of said slider being out of contact with said resistance element at a position below said resistance coil constituting an off position adapted to de-energize the motor of said appliance, said coil at said off position of said slider being provided with a covering of fiber or the like provided with a notch in which the carbon of said slider may lodge to prevent such carbon from short-circuiting the turns of said resistance element, means to impart snap action to said slider comprising a resilient connection between said slider and said control knob, and a projection engaged by said slider for tensioning said resilient connection and then effecting snap-over of said means in relation to said projection to result in quick movement of said slider away from the end of said resistance element and toward said off position.

5. In a speed control for a motor driven appliance having a base, an elongated resistance element mounted vertically in said base, said base having a vertical slot, a slider movable along said resistance element, means for moving said slider, said means extending through said slot to the exterior of said base, a control knob on said means, an off position for said slider out of contact with said resistance element adapted to de-energize the motor of said appliance, and means to impart snap action to said slider adjacent said off position comprising a resilient connection between said slider and said control knob, a projection on said base engaged by said slider for tensioning said resilient connection and then effecting snap-over of said means in relation to said projection and resulting in quick movement of said slider away from said resistance element to said off position.

References Cited in the file of this patent

UNITED STATES PATENTS

416,632	Leber	Dec. 3, 1889
803,453	Stevens	Oct. 31, 1905
822,312	Stevens	June 5, 1906
1,225,227	Dunham	May 8, 1917
1,433,740	Nagel	Oct. 31, 1922
1,489,182	Weinberg	Apr. 1, 1924
2,103,922	Van Guilder	Dec. 28, 1937
2,262,912	Behar	Nov. 18, 1941