July 15, 1958 J. D. WARHUS 2,842,864

CLOTHES DRYING MACHINES

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FIG. 1

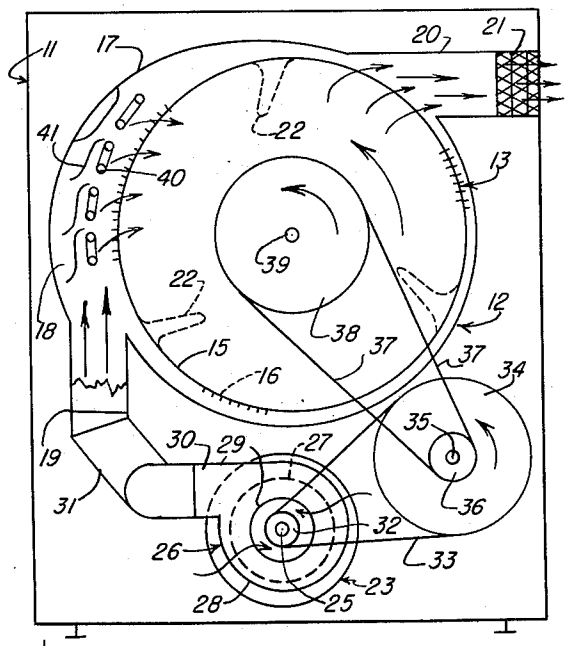


FIG. 2

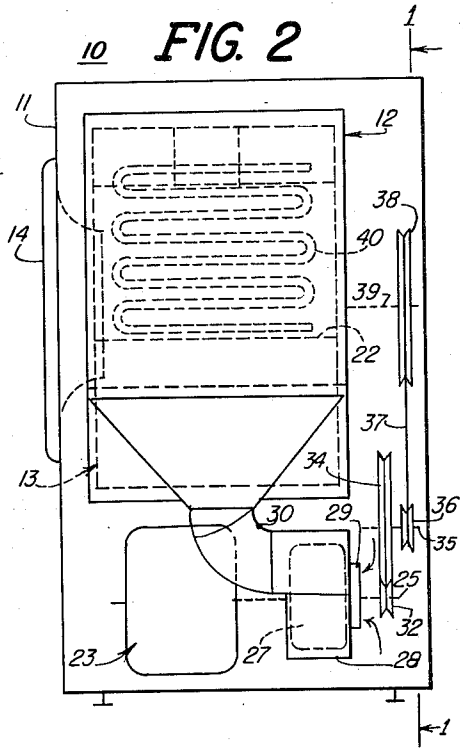
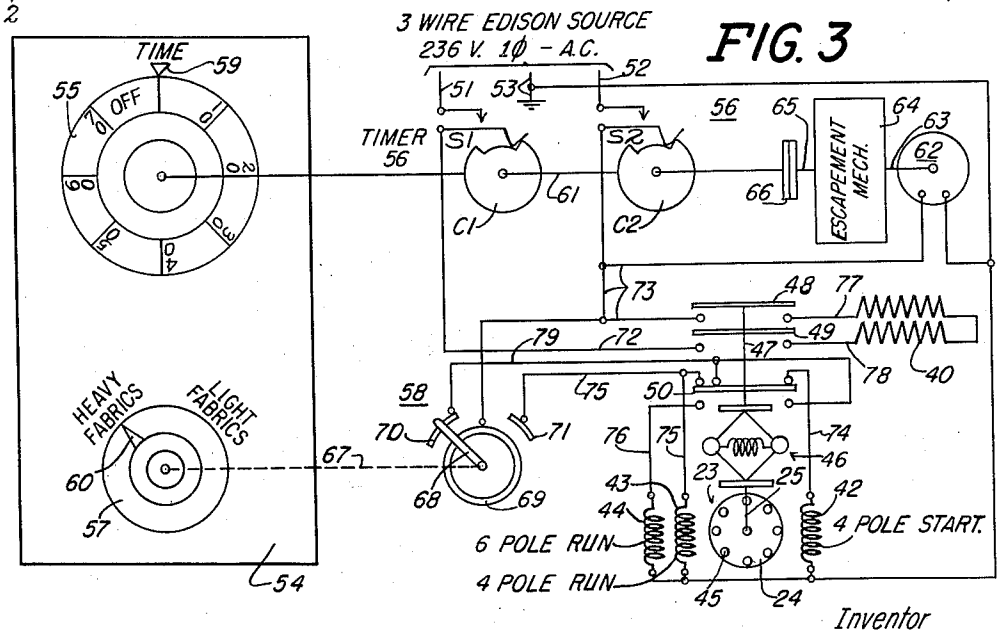


FIG. 3



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CLOTHES DRYING MACHINES

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7 Claims. (Cl. 34—45)

The present invention relates to clothes drying machanies of the home laundry type, and more particularly to improved control circuits therefor that facilitate selective presetting of the drying conditions thereof to accommodate the drying of different types of fabrics in a ready and simple manner.

An object of the invention is to provide in a clothes drying machine of the character noted, an improved control circuit incorporating an electric drive motor of the two-speed split-phase induction type, whereby the mere preselection of the operating speed of the drive motor presets the drying conditions of the machine respectively suitably to light fabrics and to heavy fabrics.

Another object of the invention is to provide in a clothes drying machine, an improved control arrangement of the character noted, in which the selection of one of the two drive motor speeds automatically presets one of two corresponding tumbling speeds of the clothes-receiving drum and one of two corresponding rates of circulation of hot air through the drum, whereby this selection automatically presets one of two corresponding temperatures for the hot air current respectively suitably to light fabrics and to heavy fabrics.

A further object of the invention is to provide in a clothes drying machine, a control circuit of improved and simplified connection and arrangement facilitating ready presetting of the machine to the drying of fabrics of widely different character under substantially ideally individual drying conditions.

Further features of the invention pertain to the particular arrangement of the elements of the clothes drying machine and of the control circuit therefor, whereby the above-outlined and additional operating features thereof are attained.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawing, in which:

Figure 1 is a schematic illustration of a clothes drying machine embodying the present invention, this view comprising, in part, a vertical sectional view taken from the rear of the machine in the direction of the arrows along the line 1—1 in Fig. 2;

Fig. 2 is a schematic illustration of the clothes drying machine, this view comprising, in part, a vertical sectional view taken from the side of the machine in the direction of the arrows along the line 2—2 in Fig. 1; and

Fig. 3 is a diagrammatic illustration of the control circuit incorporated in the machine of Figs. 1 and 2.

Referring now to Figs. 1 and 2 of the drawing, the clothes drying machine 10 there illustrated and embodying the features of the present invention comprises an upstanding substantially box-like housing 11 enclosing a substantially tubular casing 12, that, in turn, encloses a substantially cylindrical drum 13 adapted to receive the clothes to be dried and mounted for rotation about a substantially horizontal axis. The front wall of the

housing 11, the front wall of the casing 12 and the front wall of the drum 13 have aligned front openings therein that are selectively opened and closed by a cooperating front door 14 carried by the front wall of the housing 11. The drum 13 includes a substantially cylindrical perforated side wall 15 (the perforations being indicated at 16), and the casing 12 includes a substantially scroll-shaped side wall 17, the side walls 15 and 17 being arranged eccentrically with respect to each other so as to define a heating chamber 18 therebetween adjacent to the left-hand side of the machine 10, as viewed from the rear. Also the casing 12 is provided with a downwardly directed air inlet conduit 19 communicating with the lower portion of the heating chamber 18 and with an outwardly directed air discharge conduit 20 disposed on the right-hand side of the machine 10, as viewed from the rear. Further the extreme outer end of the air discharge conduit 20 communicates with the exterior through a cooperating opening provided in the right-hand side wall of the housing 11, as viewed from the rear; and within the outer end of the air discharge conduit 20 there is arranged a lint trap 21. Also the side wall 15 of the drum 13 carries a plurality of angularly space-apart and inwardly radially directed clothes tumbling vanes 22, three of the vanes 22 being indicated.

Also the machine 10 comprises an electric drive motor 23 of the two-speed split-phase induction type including a rotor 24 (see Fig. 3) provided with an operating shaft 25, as well as a blower or fan 26 including a rotor 27 directly secured to the operating shaft 25 and a casing 28 enclosing the rotor 27. The casing 28 is of substantially scroll-shape including an air intake port 29 and an air discharge port 30, the air discharge port 30 being connected to the air inlet conduit 19 by a tube 31. Also the extreme outer end of the operating shaft 25 carries a pulley 32 that is connected by a belt 33 to a pulley 34 carried by an idler shaft 35. Further, the idler shaft 35 carries a pulley 36 that is connected by a belt 37 to a pulley 38 carried by a stub shaft 39; which stub shaft 39 is suitably secured to the rear wall of the drum 13.

In view of the foregoing, it will be understood that when the drive motor 23 is operated the drive shaft 25 is rotated effecting operation of the blower 26 and rotation of the drum 13, in the counterclockwise direction as viewed from the rear of the machine 10. More particularly, the rotating operating shaft 25 rotates the rotor in the casing 28, so that air in the housing 11 is drawn into the intake port 29 and discharged via the discharge port 30, the tube 31 and the air inlet conduit 19 into the heating chamber 18. Also the rotating operating shaft 25 rotates the idler shaft 35 and the rotating idler shaft 35 rotates the stub shaft 39, whereby the drum 13 is rotated as previously noted, so that the clothes tumbling vanes 22 effect tumbling of the clothes in the rotating drum 13.

Arranged within the heating chamber 18 is an electric heating element 40 of substantially sinuous form, and a series of louvers 41; whereby the air introduced into the heating chamber 18 is directed by the louvers 41 over the heating unit 40 and thence through the perforations 16 formed in the side wall 15 of the rotating drum 13; whereby the current of air is heated and passes into the drum 13 into contact with the clothes tumbling therein. The current of air leaves the drum 13 through the perforations 16 formed in the side wall 15 adjacent to the air discharge conduit 20; which current of air passes through the lint trap 21 and thence to the exterior. Accordingly, it will be understood that the air taken into the blower 26 is circulated across the electric heating unit 40; whereby it is heated and dried incident to energization of the electric heating unit 40. The hot current of air then passes through the drum 13 into contact with the clothes

tumbling therein so as to effect evaporation of the moisture carried thereby; and ultimately the air is discharged from the drum 13 via the air discharge conduit 20 and the lint trap 21 to the exterior of the housing 11.

The machine 10 further comprises a control circuit, as illustrated in Fig. 3, that includes the drive motor 23 of the two-speed split-phase type previously mentioned, and specifically of the 4-pole-6-pole type. More particularly, the motor 23 also comprises a stator, not shown, that carries a 4-pole start winding 42, a 4-pole run winding 43, and a 6-pole run winding 44; the rotor 24 is provided with a squirrel-cage winding 45; and the operating shaft 25 carries a speed-responsive device 46 that governs an operating element 47 carrying three contact bridging members 48, 49 and 50. The contact bridging member 48 governs an associated pair of front contacts; the contact bridging member 49 also governs an associated pair of front contacts; and the contact bridging member 50 governs a set of three back contacts and a pair of front contacts, all for a purpose more fully explained hereinafter. More particularly, when the rotor 24 is at rest and also at a speed below a critical speed, the contact bridging members 48 and 49 occupy their open positions, and the contact bridging member 50 closes the set of three back contacts and opens the pair of front contacts. On the other hand, when the rotor 24 is rotated at a speed above the critical speed, the speed-responsive device 46 governs the operating element 47 to close the contact bridging members 48 and 49 and to operate the contact bridging member 50 so as to open the set of three back contacts and to close the pair of front contacts.

In the arrangement: when the motor 23 is operated as a 4-pole motor, the normal full load operating speed thereof is approximately 1725 R. P. M.; and when the motor 23 is operated as a 6-pole motor, the normal full load operating speed thereof is approximately 1140 R. P. M. Accordingly, when the motor 23 is operated as a 4-pole motor, the drum 13 is rotated at a speed of about 56 R. P. M., and when the motor 23 is operated as a 6-pole motor, the drum 13 is rotated at a speed of about 37 R. P. M., by virtue of the speed-reduction achieved by the arrangement including the idler shaft 35. Preferably the drum 13 has a diameter of about 26"; whereby it is rotated at a peripheral speed in the general range 350 to 410 feet per minute, when the motor 23 is operated as a 4-pole motor; and whereby it is rotated at a peripheral speed in the general range 230 to 270 feet per minute when the motor 23 is operated as a 6-pole motor.

Continuing the reference to Fig. 3, the control circuit further comprises a three-wire Edison source of current supply of 236-volts, single-phase, A. C., including two outside ungrounded conductors 51 and 52 and a neutral grounded conductor 53. Also the front wall of the housing 11 carries a control plate 54, that, in turn, carries a first manually operable control knob or dial 55 forming a part of a timer 56, and a second manually operable control knob or dial 57 forming a part of a switch 58. The dial 55 carries time indicia that cooperates with a time index marker 59 carried by the plate 54; while the dial 57 carries an index pointer 60 that cooperates with indicia "heavy fabrics" and "light fabrics" carried by the plate 54. More particularly, the timer 56 is provided with a rotatably mounted operating shaft 61 carrying two insulating control cams C1 and C2 respectively cooperating with two sets of switch springs S1 and S2, the outer end of the operating shaft 61 carrying the manual dial 55, as previously noted. Also the timer 56 comprises a timer motor 62 of the synchronous type provided with an operating shaft 63 that is connected to escapement mechanism 64 provided with an operating shaft 65. The inner end of the operating shaft 61 is connected to the operating shaft 65 by a friction clutch 66 that accommodates rotation of the operating shaft 61 by the manual dial 55 independently of the escapement mechanism 64.

In the arrangement, when the manual dial 55 is rotated out of its off position into its variable on or time position, operation of the timer motor 62 is initiated; whereby the escapement mechanism 64 drives the operating shaft 61 through the friction clutch 66 step by step back into its off position, so that operation of the timer motor 62 is arrested while the manual dial 55 occupies its off position.

The switch 58 comprises a rotatably mounted operating shaft 67, the outer end of which carries the manual dial 57 and the inner end of which carries a contact wiper 68 that cooperates with a contact ring 69 and selectively with two angularly spaced-apart contact segments 70 and 71. More particularly, when the manual dial 57 occupies its heavy fabrics position, the operating shaft 67 is rotated to cause the contact wiper 68 to engage the contact segment 70, thereby to connect together the contact ring 69 and the contact segment 70. On the other hand, when the manual dial 57 occupies its light fabrics position, the operating shaft 67 is rotated to cause the contact wiper 68 to engage the contact segment 71, thereby to connect together the contact ring 69 and the contact segment 71.

In the circuit arrangement: the outside conductor 51 is connected to one switch spring of the set S1 and the other switch spring of the set S1 is connected to a conductor 72; the outside conductor 52 is connected to one switch spring of the set S2 and the other switch spring of the set S2 is connected to a conductor 73, and the neutral conductor 53 is commonly connected to one terminal of the timer motor 62, and to one terminal of each of the windings 42, 43 and 44 of the drive motor 23. The other terminal of the timer motor 62 is connected to the conductor 73; the other terminal of the winding 42 is connected to a conductor 74, the other terminal of the winding 43 is connected to a conductor 75; and the other terminal of the winding 44 is connected to a conductor 76. The conductor 73 is further connected to the contact ring 69 and to the left contact of the pair associated with the contact bridging member 48; the conductor 72 is further connected to the left contact of the pair associated with the contact bridging member 49; the right contact associated with the contact bridging member 48 terminates a conductor 77 that is connected to one terminal of the heating unit 40; and the right contact of the pair associated with the contact bridging member 49 terminates a conductor 78 that is connected to the other terminal of the heating unit 40. The conductor 74 is connected to the right-hand back contact of the set associated with the contact bridging member 50; the middle back contact of this set is connected to a conductor 79; and the left-hand back contact of this set is connected to the conductor 75. The right-hand front contact associated with the contact bridging member 50 is also connected to the conductor 79; and the left-hand front contact of this set is connected to the conductor 76. Further, the conductor 79 is connected to the contact segment 70; and the conductor 75 is further connected to the contact segment 71.

In the circuit arrangement, when the timer switch 56 occupies its off position, the sets of switch springs S1 and S2 occupy their open positions, thereby to interrupt the circuits for operating the timer motor 62 and the drive motor 23 and for energizing the electric heater 40.

In operating the machine 10, the housewife places the wet clothes to be dried into the drum 13 when the front door 14 occupies its open position, and then closes the front door 14 with respect to the housing 11. Next, the housewife determines whether the clothes that have been placed in the drum 13 comprise heavy fabrics or light fabrics; and for the purpose of the present description, it is assumed that the clothes mentioned comprise heavy fabrics so that the manual dial 57 is rotated into its heavy fabrics position illustrated. Finally, the housewife determines the appropriate drying time and correspondingly rotates the manual dial 55 out of its off position into its variable or time position. In the ar-

rangement, the skirt of the manual dial **55** has been illustrated as being calibrated in minutes on a scale from 10 to 70; however, this scheme is entirely illustrative and is in no way critical.

When the manual dial **55** is rotated out of its off position into its variable on or time position, the operating shaft **61** is rotated with respect to the operating shaft **65** by virtue of the provision of the friction clutch **66**, and the control cams C1 and C2 operate the sets of switch springs S1 and S2 into their closed positions; whereby the outside conductors **51** and **52** are respectively connected to the conductors **72** and **73**. The connection of potential to the conductor **73** completes a circuit for operating the timer motor **62**; whereby the escapement mechanism **64** is operated step by step as time proceeds to effect step-by-step rotation of the operating shaft **61** back into its off position. More particularly, the manual dial **55** is initially rotated from its off position in the clockwise direction into its variable or time position; and the operating shaft **61** is rotated further in the clockwise direction by the timer motor **62** through the escapement mechanism **64** and friction clutch **66** and ultimately back into its off position at the conclusion of the set time interval.

Also the application of potential to the conductor **73** completes parallel circuits for energizing the 4-pole start winding **42** and the 4-pole run winding **43** of the drive motor **23**. Specifically, the conductor **73** is connected via the contact ring **69** and the contact wiper **68** to the contact segment **70** and thence to the conductor **79**; the conductor **79** is connected to the middle back contact of the set associated with the contact bridging member **50** and consequently to the right-hand back contact and to the left-hand back contact of this set and thus to the conductors **74** and **75**. Accordingly of the winding **41** is energized between the conductor **74** and the neutral conductor **53**; while the winding **43** is energized between the conductor **75** and the neutral conductor **53**; whereby operation of the drive motor **23** is initiated. Specifically, rotation of the rotor **24** is initiated, and when the same is accelerated to a speed somewhat in excess of one-half of its normal 4-pole operating speed, the speed-responsive device **46** is operated to move the contact bridging member **50** from its normal position into its operated position. Movement of the contact bridging member **50** out of its normal position interrupts the previously traced circuits for energizing the windings **42** and **43**; while movement of the contact bridging member **50** into its operated position completes a circuit for energizing the 6-pole run winding **44**. The last-mentioned circuit includes the conductors **79** and **76** and the front contacts of the set now closed by the contact bridging member **50**. Hence at this time, the windings **42** and **43** are deenergized and the winding **44** is energized; whereby the rotor **24** is accelerated on into its normal 6-pole running speed of about 1140 R. P. M.

Also when the speed-responsive device **46** is operated in the manner described above, the contact bridging members **48** and **49** are operated into their closed positions connecting the conductors **77** and **78** to the conductors **73** and **72**; whereby a circuit is completed, also including the closed sets of switch springs S2 and S1, for energizing the heating unit **40** across the outside conductors **51** and **52** of the three-wire Edison source.

The operating drive motor **23** operates the blower **26** and rotates the drum **13**, while the energized heating unit **40** produces heat, all in the manner previously explained. At this time, the drum **13** is rotated at a relatively low tumbling speed of about 37 R. P. M. by virtue of the operation of the drive motor **23** as a 6-pole motor. Similarly, the blower **26** is operated at a relatively low speed in order to deliver a relatively low volume of air to the heating chamber **18** by virtue of the operation of the drive motor **23** as a 6-pole motor. Since the heating unit **40** develops a predetermined wattage when connected across the outside conductors **51** and **52** it is apparent that the temperature thereof, and consequently the ultimate temperature of the air stream passing through the rotating drum **30**, is inversely proportional to the rate of flow of the current of air blown thereover. Accordingly, in the present instance, since a relatively low rate of flow of air is circulated over the heating unit **40**, the temperature thereof is relatively high; whereby the current of air is heated to a relatively high temperature with the result that the tumbling clothes in the rotating drum **31** are heated to a relatively high temperature that is suitable to the drying of heavy fabrics.

At the conclusion of the time interval preset upon the manual dial **55**, the timer **56** is rotated back into its off position, as previously explained, whereby the control cams C1 and C2 operate the sets of switch springs S1 and S2 back into their open positions to interrupt the circuits for operating the timer motor **62** and for operating the drive motor **23** and for energizing the heating unit **40**. Specifically, operation of the timer motor **62** is arrested when the manual dial **55** occupies its off position; and when operation of the drive motor **23** is arrested, the speed-responsive device **46** restores the contact bridging member **50** back into its back position repreparing the circuits for energizing the 4-pole start winding **42** and the 4-pole run winding **43** of the drive motor **23**. Also the contact bridging members **48** and **49** are returned into their open position interrupting further points in the circuit for energizing the heating unit **40**. At this time, the drying cycle has been completed and the clothes may be removed from the drum **13** after the front door **14** is moved into its open position.

Considering now the operation of the machine **10** to effect a drying cycle involving light fabrics, the housewife rotates the manual dial **57** into its light fabrics position and rotates the manual dial **55** into the desired time position, after placing the fabrics in the drum **13** and closing the front door **14**. Rotation of the manual dial **57** into its light fabrics position operates the switch **58** into its corresponding position; whereby the contact wiper **68** disengages the contact segment **70** and engages the contact segment **71**, for a purpose more fully explained below. When the manual dial **55** is rotated out of its off position into its variable on or time position, the control cams C1 and C2 close the sets of switch springs S1 and S2, completing the circuit for operating the timer motor **62** and for energizing the windings **42** and **43** of the drive motor **23**, in the manner previously explained. In this case, the circuit for energizing the 4-pole start winding **42** includes the conductors **73**, the contact ring **69**, the contact wiper **68**, the engaged contact segment **71**, the conductor **75**, the left-hand back contact engaged by the bridging member **50**, the bridging member **50**, the right-hand back contact engaged by the bridging member **50** and the conductor **74**; while the circuit for energizing the 4-pole run winding **43** includes the conductor **73**, the contact ring **69**, the contact wiper **68**, the engaged contact segment **71** and the conductor **75**. Accordingly, rotation of the rotor **24** is initiated in the manner previously explained; and when the critical speed thereof is reached, the speed-responsive device **46** is operated to move the contact bridging member **50** from its normal restored position into its operated position. When the contact bridging member **50** disengages the three back contacts of the associated set, it interrupts the above-traced circuit for energizing the 4-pole start winding **42**, but it does not interrupt the previously traced circuit for energizing the 4-pole run winding **43**. When the contact bridging member **50** engages the pair of front contacts, it prepares the circuit for energizing the 6-pole run winding **44**; which circuit is not completed in the present instance since the contact wiper **68** disengages the contact segments **70** and engages the contact segment **71** in the light fabrics position of the manual dial **57**. Accordingly, in the present example, the energization of the 4-pole run winding **43** is continuous so that

the rotor 24 is accelerated on into its 4-pole running speed of about 1725 R. P. M.

The operation of the drive motor 23 as a 4-pole motor when the manual dial 57 occupies its light fabrics position, brings about rotation of the drum 13 at a relatively high tumbling speed of about 56 R. P. M. and operation of the blower 26 at a relatively high air movement rate so that a relatively high rate of air circulation over the heating unit 40 takes place with the result that the current of air is heated to a relatively low temperature bringing about a corresponding heating of the tumbling clothes in the rotating drum 13 to a relatively low temperature; which temperature is suitable to the drying of light fabrics. In passing, it is mentioned that the operation of the speed-responsive device 46 in this case also operates the contact bridging members 48 and 49 into their closed position to effect energization of the heating unit 40, in the manner previously explained.

At the conclusion of the time interval set upon the manual dial 55, the timer motor 62 returns the timer 56 back into its off position; whereby the control cams C1 and C2 return the sets of switch springs S1 and S2 back into their open positions so as to interrupt the circuits for operating the timer motor 62 and the drive motor 23 and for energizing the heating unit 40; whereby the operation of the machine 10 is terminated in the manner previously explained, so that the clothes may be removed from the drum 13 after opening of the front door 14 with respect to the housing 11.

By way of recapitulation, it is pointed out that when the machine 10 is operated in either its heavy fabrics cycle or in its light fabrics cycle, the time interval of operation is selectively set by the manual dial 55 and the rate of heat production by the heating unit 40 is constant, as the heating unit 40 has a predetermined and fixed wattage rating. The cycle or drying condition of the machine 10 is preset by the position of the selector switch 58; whereby in the heavy fabrics position of the selector switch 58, the drive motor 23 is operated as a 6-pole motor at a full load running speed of about 1140 R. P. M.; and whereby in the light fabrics position of the selector switch 58, the drive motor 23 is operated as a 4-pole motor at a full load running speed of about 1725 R. P. M. When the drive motor 23 is operated as a 6-pole motor, the drum 13 is rotated at a relatively low tumbling speed of about 37 R. P. M.; and when the drive motor 23 is operated as a 4-pole motor, the drum 13 is rotated at a relatively high tumbling speed of about 56 R. P. M. Similarly, when the drive motor 23 is operated at a 6-pole motor, the blower 26 is operated at a relatively low volume of air movement; and when the drive motor 23 is operated as a 4-pole motor, the blower 26 is operated at a relatively high volume of air movement. Since the heating rate of the heating unit 40 is constant, the temperature to which the current of air is heated is substantially inversely proportional to the rate of air movement thereacross; whereby the temperature of the air current is respectively relatively high and relatively low when the air movement is respectively relatively low and relatively high. Accordingly, the tumbling clothes in the drum 13 are heated to a relatively high temperature when the selector switch 58 occupies its heavy fabrics position, which temperature is suitable to the drying of heavy fabrics; on the other hand, the tumbling clothes in the drum 13 are heated to a relatively low temperature when the selector switch 58 occupies its light fabrics position, which temperature is suitable to the drying of light fabrics.

In the foregoing explanation of the mode of operation of the machine 10, it is intended that the expression "heavy fabrics" should embrace not only fabrics that are in fact heavy in weight, but also those fabrics which carry a great weight of moisture to be dried therefrom; and that the expression "light fabrics" should embrace not only fabrics that are in fact light in weight, but also those fabrics which carry a small weight of moisture to be dried therefrom. Thus ordinary cotton and linen fabrics comprise "heavy fabrics"; whereas silk, rayon, nylon, Orlon, etc., fabrics comprise "light fabrics." Moreover heavy cotton turkish towels would comprise "heavy fabrics"; whereas light cotton tea towels would comprise "light fabrics."

This classification of fabrics is not intended to be a rigorous one, but rather an indication of the character thereof with respect to the temperature at which these fabrics are ordinarily dried in clothes drying machines of the home laundry type.

In view of the foregoing, it is apparent that there has been provided in a clothes drying machine of the home laundry type an improved and simplified control circuit therefor, whereby the drying cycle of operation of the machine may be selectively and readily set by selectively setting the speed of operation of the two-speed split-phase drive motor for the machine.

While there has been described what is at present considered to be the preferred embodiment of the invention, it will be understood that various modifications may be made therein, and it is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

What is claimed is:

1. In a clothes drying machine including a drum mounted for rotation about a substantially horizontal axis and adapted to receive and to tumble the clothes to be dried, a casing enclosing said drum, a blower operative to translate a current of air in said casing and through said drum and into contact with the clothes tumbling therein, and a heater operative to heat said current of air so as to effect evaporation of the moisture carried by the clothes tumbling in said drum; the combination comprising an electric drive motor operative to rotate said drum and to operate said blower, said motor being of the two-speed split-phase induction type including a start winding and two corresponding run windings, said motor being operated at its relatively high speed when a first of its run windings is energized to effect a relatively high tumbling speed of rotation of said drum and a relatively high air volume operation of said blower, said motor being operated at its relatively low speed when a second of its run windings is energized to effect a relatively low tumbling speed of rotation of said drum and a relatively low air volume operation of said blower, operation of said heater in conjunction with said high tumbling speed of rotation of said drum and said high air volume operation of said blower effecting a relatively low temperature in said drum suitable to the drying of light fabrics, operation of said heater in conjunction with said low tumbling speed of rotation of said drum and said low air volume operation of said blower effecting a relatively high temperature in said drum suitable to the drying of heavy fabrics, switching apparatus having first and second positions respectively selecting said first run winding and said second run winding to be energized, means for selectively operating said switching apparatus into its first and second positions, a device responsive to the speed of said motor and having corresponding start and run positions, means governed by said device for energizing both said start winding and a predetermined one of said run windings in the start position thereof and for energizing only the selected one of said run windings in the run position thereof, and a master switch for controlling both the energization of said motor and the operation of said heater.

2. The clothes drying machine combination set forth in claim 1, wherein said first run winding has N poles and said second run winding has M poles, where N and M are even numbers and M>N.

3. The clothes drying machine combination set forth in claim 2, where $N=4$ and $M=6$.

4. The clothes drying machine combination set forth

in claim 1, wherein said low tumbling speed of rotation of said drum corresponds to a peripheral speed thereof in the general range 230 to 270 ft./min. and said high tumbling speed of rotation of said drum corresponds to a peripheral speed thereof in the general range 350 to 410 ft./min.

5. In a clothes drying machine including a drum mounted for rotation about a substantially horizontal axis and adapted to receive and to tumble the clothes to be dried, a casing enclosing said drum, a blower operative to translate a current of air in said casing and through said drum and into contact with the clothes tumbling therein, and a heater operative to heat said current of air so as to effect evaporation of the moisture carried by the clothes tumbling in said drum; the combination comprising an electric drive motor operative to rotate said drum and to operate said blower, said motor being of the two-speed split-phase induction type including a start winding and two corresponding run windings, said motor being operated at its relatively high speed when a first of its run windings is energized to effect a relatively high tumbling speed of rotation of said drum and a relatively high air volume operation of said blower, said motor being operated at its relatively low speed when a second of its run windings is energized to effect a relatively low tumbling speed of rotation of said drum and a relatively low air volume operation of said blower, operation of said heater in conjunction with said high tumbling speed of rotation of said drum and said high air volume operation of said blower effecting a relatively low temperature in said drum suitable to the drying of light fabrics, operation of said heater in conjunction with said low tumbling speed of rotation of said drum and said low air volume operation of said blower effecting a relatively high temperature in said drum suitable to the drying of heavy fabrics, switching apparatus having first and second positions respectively selecting said first run winding and said second run winding to be energized, means for selectively operating said switching apparatus into its first and second positions, a device responsive to the speed of said motor and having corresponding start and run positions, means governed by said device for energizing both said start winding and a predetermined one of said run windings in the start position thereof and for energizing only the selected one of said run windings, in the run position thereof, and a manually settable timer for controlling both the energization of said motor and the operation of said heater.

6. In a clothes drying machine including a drum mounted for rotation about a substantially horizontal axis and adapted to receive and to tumble the clothes to be dried, a casing enclosing said drum, a blower operative to translate a current of air in said casing and through said drum and into contact with the clothes

tumbling therein, and a heater operative to heat said current of air so as to effect evaporation of the moisture carried by the clothes tumbling in said drum; the combination comprising an electric drive motor of the two-speed split-phase induction type including a start winding and two corresponding run windings, a first drive connection between said motor and said drum, whereby said drum is rotated at a relatively high tumbling speed and at a relatively low tumbling speed is responsive to operation of said motor respectively at its relatively high speed and at its relatively low speed, a second drive connection between said motor and said blower, whereby said blower is operated at a relatively high volume of air movement and at a relatively low volume of air movement in response to operation of said motor respectively at its relatively high speed and at its relatively low speed, operation of said heater in conjunction with said high tumbling speed of rotation of said drum and said high volume of air movement operation of said blower effecting a relatively low temperature in said drum suitable to the drying of light fabrics, operation of said heater in conjunction with said low tumbling speed of rotation of said drum and said low volume of air movement operation of said blower effecting a relatively high temperature in said drum suitable to the drying of heavy fabrics, switching apparatus having first and second positions respectively selecting said first run winding and said second run winding to be energized, means for selectively operating said switching apparatus into its first and second positions, a device responsive to the speed of said motor and having corresponding start and run positions, means governed by said device for energizing both said start winding and a predetermined one of said run windings in the start position thereof and for energizing only the selected one of said run windings in the run position thereof, and a master switch for controlling both the energizing of said motor and the operation of said heater.

7. The clothes drying machine combination set forth in claim 6, wherein said first drive connection comprises a direct connection between an operating shaft of said motor and a rotor of said blower, and said second drive connection comprises speed-reduction mechanism arranged between the operating shaft of said motor and said drum.

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