Aug. 27, 1963 N. J. PANSING ETAL 3,102,008

DOMESTIC APPLIANCE

Filed Jan. 23, 1958 5 Sheets-Sheet 1

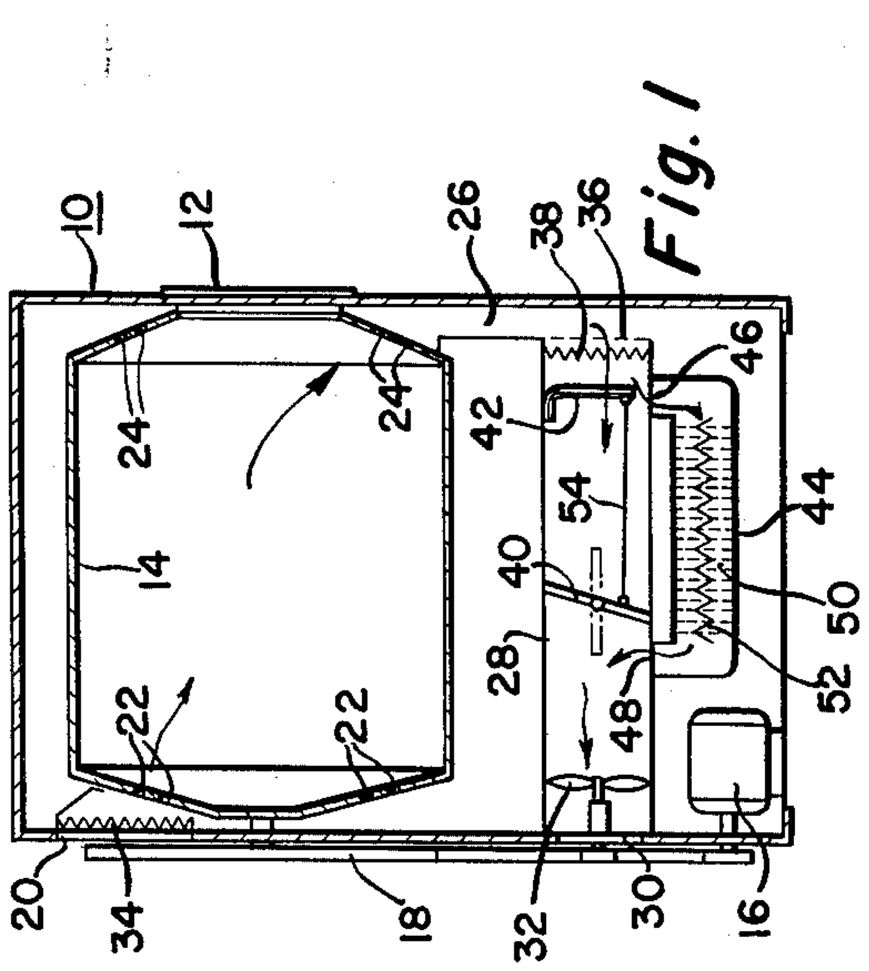

Fig. 1

Fig. 4

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DOMESTIC APPLIANCE

Filed Jan. 23, 1958 5 Sheets-Sheet 2

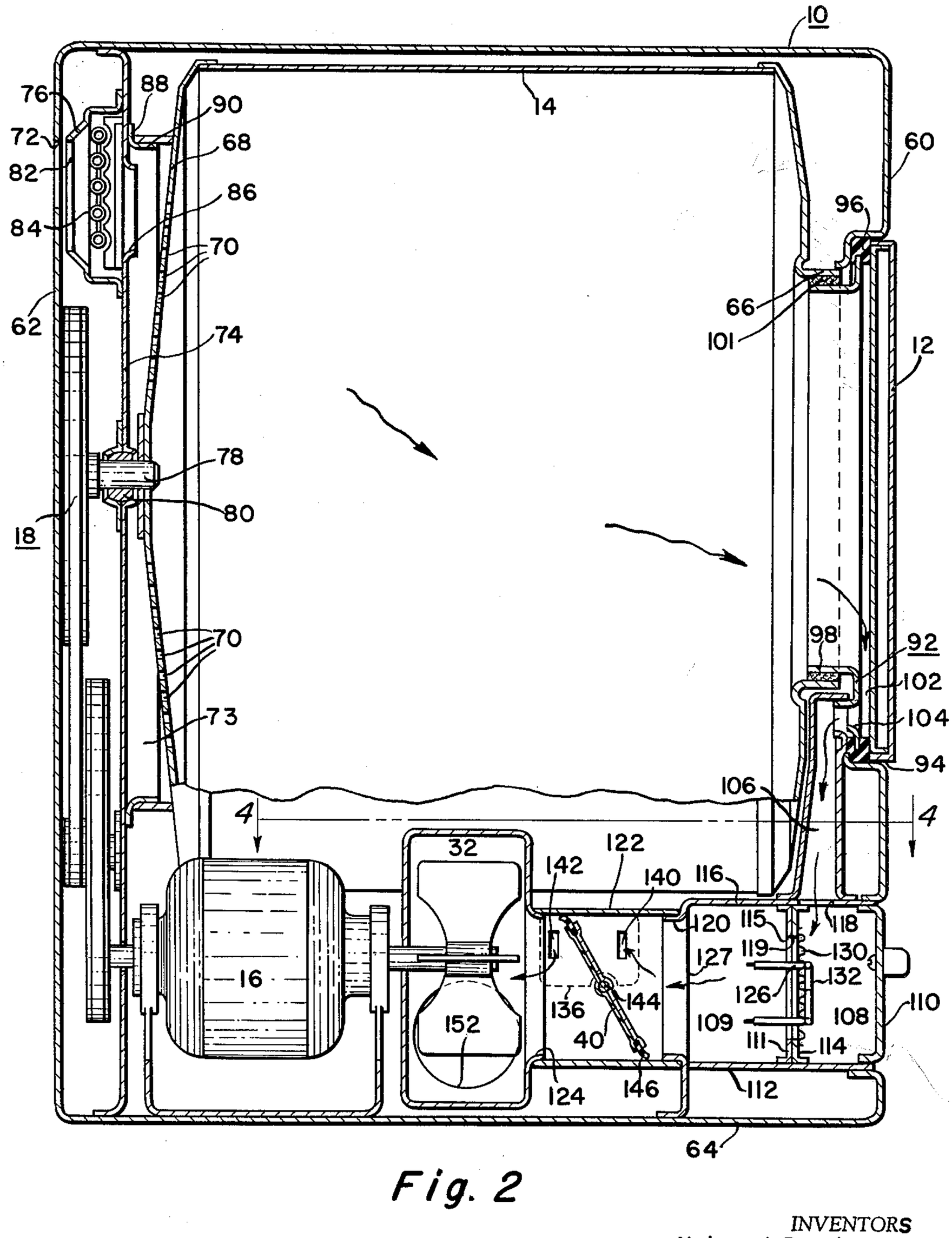

Fig. 2

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DOMESTIC APPLIANCE

Filed Jan. 23, 1958 5 Sheets-Sheet 3

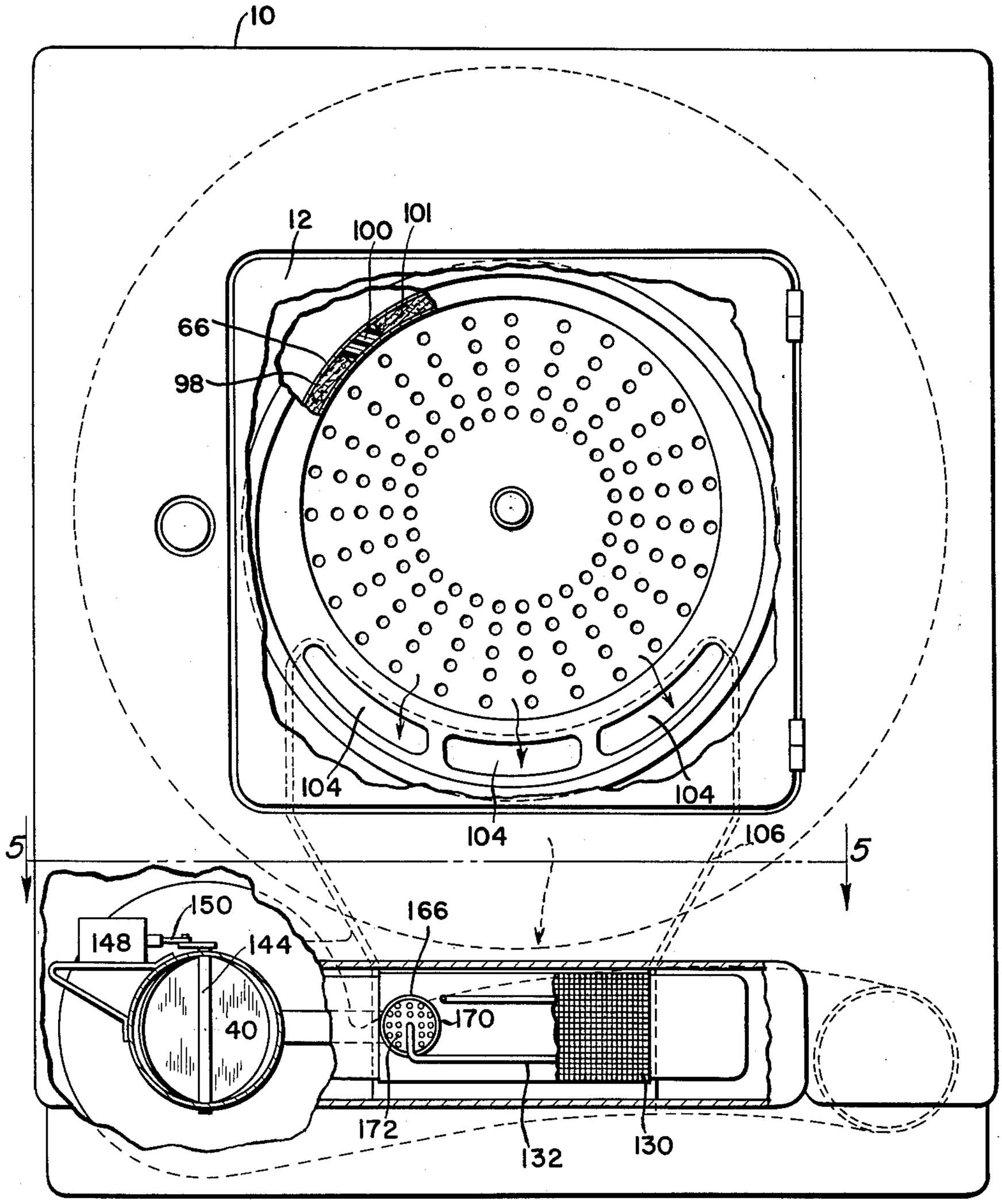

Fig. 3

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DOMESTIC APPLIANCE

Filed Jan. 23, 1958

5 Sheets-Sheet 4

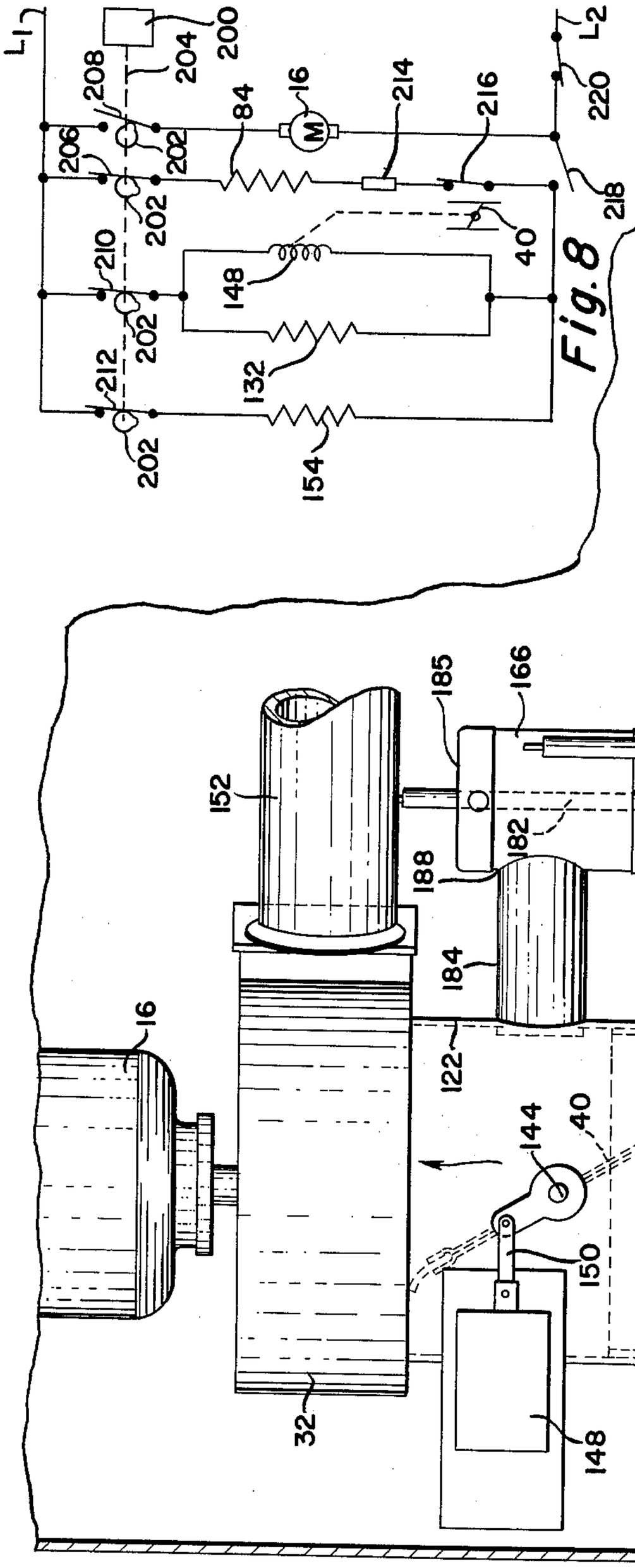

Fig. 8

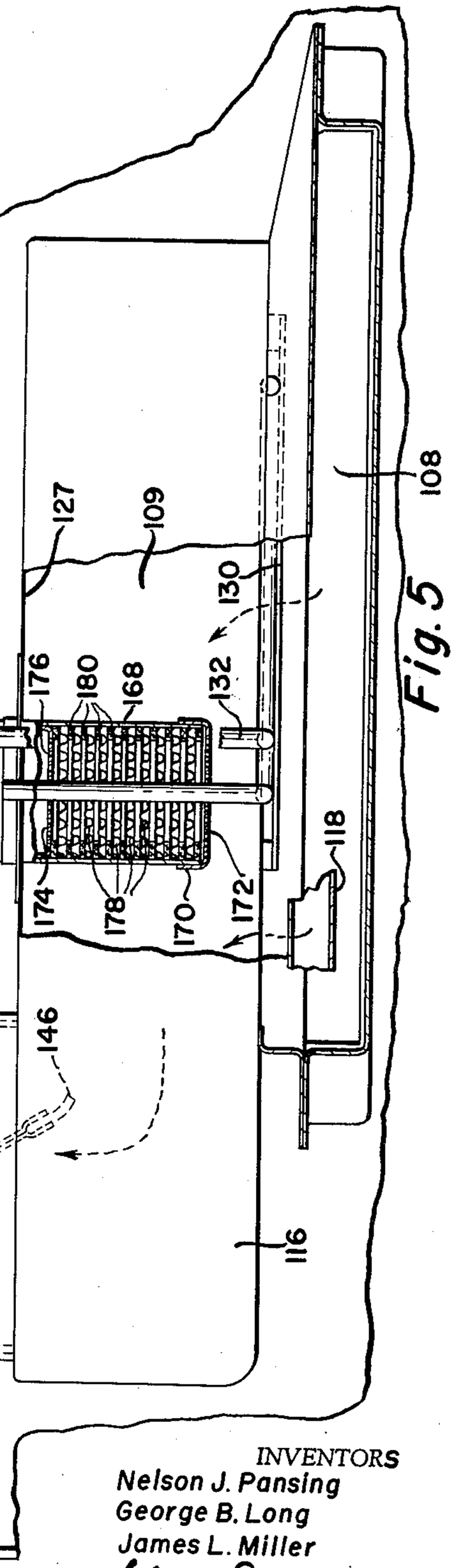

Fig. 5

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DOMESTIC APPLIANCE

Filed Jan. 23, 1958 5 Sheets-Sheet 5

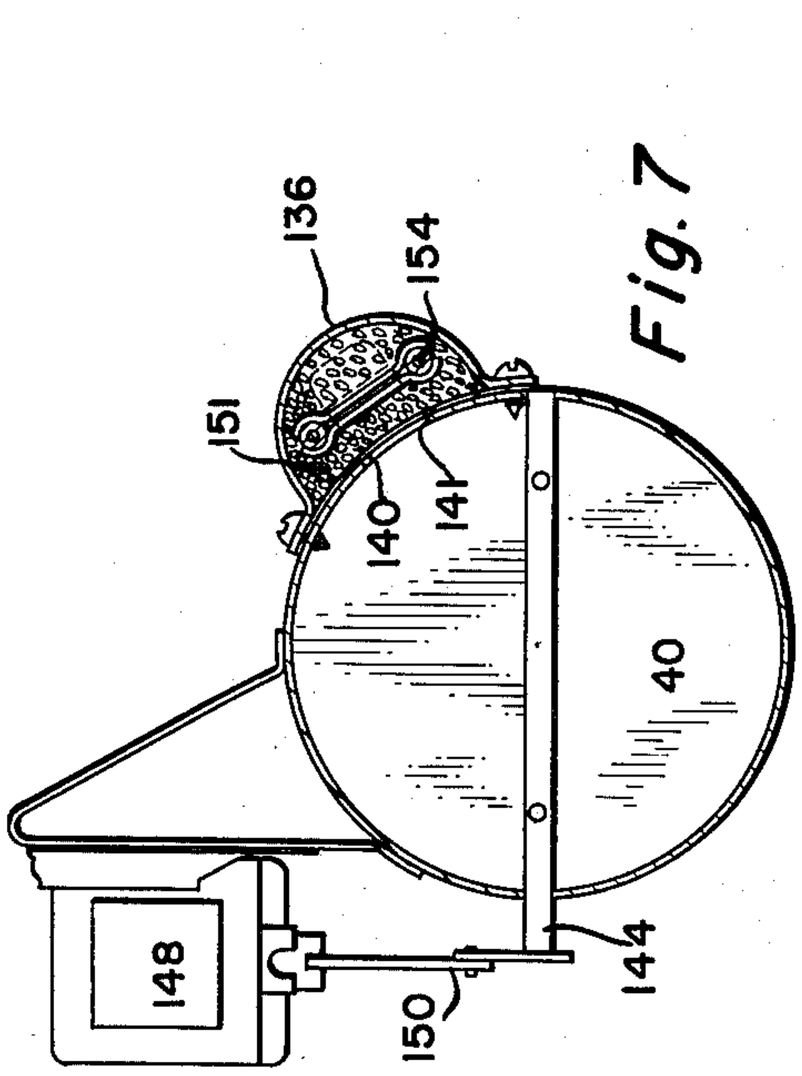

Fig. 7

Fig. 6

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United States Patent Office

3,102,008

Patented Aug. 27, 1963

3,102,008
DOMESTIC APPLIANCE

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Filed Jan. 23, 1958, Ser. No. 710,772
16 Claims. (Cl. 34—79)

This invention relates to a domestic appliance and more particularly to a clothes dryer having an improved means for collecting and destroying lint evolved during the clothes drying operation.

The evolution of lint has been a major disadvantage in the operation of clothes dryers. In copending application Ser. No. 635,635, filed January 23, 1957, a novel method for collecting and eliminating the lint by a burning process is taught. An improved arrangement is advanced in application Ser. No. 698,193, filed November 22, 1957, now Patent 3,001,295, wherein a delay is incorporated in a control system for lint burning to prevent any escape of smoke or odor to the areas surrounding the clothes dryer. In these copending cases, the filter arrangement utilized to oxidize smoke and odor is disposed in the main line air flow of the clothes dryer. These arrangements, although effective, require the disposition of the filter or catalytic element in a manner to restrict continuously air flow through the dryer for most efficient smoke elimination. This invention proposes to obviate this difficulty by placing the smoke and odor filter element in a bypass arrangement, thereby to leave unhindered the normal dryer air flow during all portions of the drying cycle except that portion directed to burning lint.

Accordingly, it is an object of this invention to provide an improved lint burner for clothes dryers.

It is a further object of this invention to incorporate a dryer air flow bypass wherein the filter or catalyst element is disposed outside the main flow of dryer air.

It is also an object to bypass air flow to the filter element in response to air flow temperatures.

More particularly, it is an object of this invention to use a bypass arrangement for the smoke and odor filter as an improvement in the replacement and servicing of these filters.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a sectional side view showing a diagrammatic representation of a dryer incorporating a lint burner having a bypass filter element;

FIGURE 2 is a vertical sectional view of a clothes dryer equipped with the preferred embodiment of this invention;

FIGURE 3 is a front view, with parts broken away, of a clothes dryer incorporating a second embodiment of this invention;

FIGURE 4 is a fragmentary sectional view, taken along the line 4—4 of FIGURE 2 and showing a thermally responsive bypass damper;

FIGURE 5 is a fragmentary sectional view of the second embodiment taken along lines 5—5 of FIGURE 3;

FIGURE 6 is a fragmentary sectional view of a lint burning and bypass arrangement similar to that shown in FIGURE 4 in which the bypass damper is made responsive to a solenoid;

FIGURE 7 is a sectional view taken along line 7—7 of FIGURE 6 illustrating the solenoid operated bypass damper and preferred bypass embodiment; and

FIGURE 8 is a schematic wiring diagram of one method

of operating the improved lint burning arrangement of this invention.

In accordance with the diagrammatic representation of FIG. 1, a dryer cabinet 10 having an access door 12 is adapted to enclose a rotatable tumbling drum 14 driven by a motor 16 and a belt-and-pulley system, shown generally at 18. Within the cabinet 10 an air flow path through the dryer cabinet (as illustrated by air flow arrows) is defined by an air inlet 20, apertures 22 in the rear wall of the drum 14, apertures 24 in the front wall of this drum, a front duct 26, an exhaust duct 28 and air exhaust outlet 30. Adjacent the inlet 20 to the dryer is a primary heater 34 which is energized during the clothes drying operation. A blower 32 also driven by motor 16 serves to exhaust heated air from the duct 28 and circulates heated air through the tumbling drum. Disposed within the exhaust duct 28 is the lint eliminating means including a collecting plate 36 and a lint burner 38. A damper 40 is made thermally responsive to air flow through the duct 28 by a bimetallic element 42 located closely adjacent the lint burning element 38.

The system described hereinabove provides for collecting the lint on a screen 36 during air flow through the tumbling drum and for subsequent burning of the lint collected on the screen. However, the smoke and odor which is evolved during such a burning process must be eliminated to make an effective improvement on the drying operation. For this purpose a bypass duct 44 is located parallel to the exhaust duct 28 and has an inlet 46 located in close proximity to the lint burner and an exhaust opening 48 in the duct 28 downstream of air flow damper 40. Within the bypass duct or chamber an amount of filtering agent or catalyst 50 is arranged to be activated quickly by a second heater 52 located also in this bypass duct.

A brief review of the lint burning operation as associated with the schematic representation of FIG. 1 will help in understanding the various complete embodiments set forth more fully hereinbelow. To initiate a clothes drying operation, the clothes are introduced to the tumbling drum 14 through cabinet access opening 12. By any conventional control mechanism the drying operation is started by energizing primary heater 34 and motor 16. The operation of the prime mover will, in turn, rotate the tumbling drum 14 through the pulley-belt arrangement 18 while simultaneously driving the blower 32 to set up an air flow through the tumbling drum and past the moist clothes to be dried. The agitation produced by the tumbling action will cause lint to be loosened from the fabric surface. This lint will follow the course of the air flow out of the tumbling drum through drum ports 24 into the front duct 26. However, as air flows past the screen 36, lint is entrained thereon and held adjacent a lint burning heater 38. At any selected point in the dryer's operating cycle or in response to reduced air flow resulting from lint build-up on the surface of screen 36, the lint burning heater 38 is energized. At the same time, the catalyst activating heater 52 is energized to bring this smoke and odor filter to its functional or effective temperature (600°–1200° F.). One of the purposes of this invention is to prevent the initiation of the lint burn process until the catalyst filter element is up to temperature. As the lint burning heater 38 starts to heat, the bimetallic strip 42, in response to this heating and through a link 54, starts to move the damper 40 from its phantom-line open position to its full-line closed position. During this heat-up period the air flow across heater 38 is sufficient to hold the temperature of the lint collecting screen 36 somewhat below the ignition temperature of the lint. In this interim the filter 50 is given the time necessary to become activated. With damper 40 tightly sealed in response to the fully heated condition of the bimetallic element 42, total

air flow is forced through the bypass chamber 44 and is proportionately reduced by correctly sizing bypass opening 46 in accordance with the desired bypass air flow. To be correctly sized, the opening 46 must be sufficiently air flow restrictive to hold the temperature at the collecting plate 36 above the ignition temperature of the lint and the interior of the bypass chamber 44 at a temperature within the aforementioned functional range for the catalyst.

At the termination of the lint burning process it is again desirable to keep the filter element in the path of all air flow until all of the smoke and odor resulting from the burning process has ceased or been eliminated. The bimetallic element 42 again serves this advantage. After the deenergization of heater 38 with the blower 32 in operation, the bimetallic element 42 starts to cool and in so doing, forces link 54 in a direction to open damper 40. The time it takes for the bimetallic element to operate is sufficient to permit all smoke and odor to pass through the filter element in the bypass chamber 44. Thus, air being exhausted through exhaust opening 30 is lintless, smokeless and odorless.

With reference to FIGS. 2 and 6, the preferred embodiment of the bypass lint drying system will now be described, like elements carrying the same numerals as set forth in FIG. 1. A dryer cabinet 10 having an access door 12, a front wall 60, rear wall 62 and a base 64 is adapted to enclose a clothes tumbling drum 14. The drum 14 is formed with an access opening 66 in line with an access door 12 which is adapted to close an opening 94 in the front wall 60 of the cabinet. The rear wall 68 of the tumbling drum is perforated at 70 to admit air to the interior of the drum which is received first through an air inlet 72 in rear wall 62 of the cabinet. A bulkhead 74 extending vertically from the base 64 of the cabinet to the cabinet top and parallel to the rear wall 62 serves to support a primary heater housing 76 and a rotatably mounted shaft 78 of the tumbling drum 14 in a bearing 80.

The primary heater housing 76 has an opening 82 in line with the cabinet inlet 72 and is formed to retain the primary heater 84. Permitting air flow from the heater housing to the tumbling drum, bulkhead 74 is formed with an aperture 86 adjacent the heater 84. To restrict the heated inlet air within an annular chamber 73 between the bulkhead 74 and the rear wall 68 of the drum, a collar 88 is fastened on the drum side of the bulkhead, thus providing an annular ledge on which a seal 90 of felt or any other suitable material is placed. A front air flow baffle, shown generally at 92, is held in spaced relation to the opening 94 in the cabinet front wall 60 by a resilient spacer 96. A collar portion 98 of the air flow baffle extends axially inwardly within the access opening 66 of the tumbling drum. Bearings 100 of nylon or other suitable wear resistant material serve to rotatably support the front end of the tumbling drum 14. In between the bearings, the voids are filled with a seal material 101 to prevent the escape of air between the telescoping collars 66 and 98 (FIG. 3). The air flow baffle 92 is so spaced by spacer 96 from the inside of access door 12 that an air passageway 102 is formed. This passageway 102 leads to apertures 104 in the baffle and thus into a front duct 106. Disposed below the front duct 106 is a lint receiving chamber 108 provided with an access door 110. The chamber 108 is defined by a base wall 112, side walls 113, a rear wall 114 and a top wall 116. In line with the front duct 106 an opening 118 is located in top wall 116 of the chamber which extends over the entire opening of the duct. Air exhaust from the chamber 108 is effected through an opening 119 in rear wall 114 to an air collecting chamber 109 therebehind. Chamber 109 is defined by the same top and bottom walls as is chamber 108, namely top wall 116 and bottom wall 112. In addition, a front wall 111 lies adjacent the rear wall 114 of chamber 108 and has an opening 115 in line with the outlet 119 from this chamber 108. Side walls 117 and a rear partition 127 complete the enclosure. To provide exhaust from the chamber 109 to the blower inlet 124, a flanged opening 120 is formed in the partition 127 adjacent the blower inlet and spaced therefrom. A short duct 122 completes the connection between the flanged opening 120 and the blower 32 and thus provides a closed air flow path through the dryer and past the lint burning system.

Disposed between the inlet opening 118 to the chamber 108 and the exhaust 120 from chamber 109 is a lint collecting and burning element, shown generally at 126. The rear wall 114 of chamber 108 extends between the bottom 112 and top 116 of the chamber and serves to support the lint collecting screen 130 and lint burning element 132 in close proximity to each other and overlying opening 119. Thus, it is apparent that lint entrained in the air flow initiated by the operation of blower 32 will follow the air flow path from the drum 14 through the passageway 102 and into the front duct 106. From this point, air flows into the lint collecting chamber 108 through the top opening 118 and through the opening 115, 120 on its way to the inlet 124 of the blower. However, particles entrained in the air are trapped on screen 130 as the air passes therethrough. Disposed thusly, the lint may be selectively burned by energizing the heating element 132 in accordance with procedures described hereinafter. Periodic removal of any ash which forms during the burning process is effected by removing the access panel 110.

During the lint burning process it is necessary to restrict air flow over the heating element 132 to effect a sufficient rise in temperature above the ignition point of the lint collecting on the screen 130. For this purpose and arranged in connection with the duct 122 is a bypass pod 136. The pod 136 is formed in a manner that permits it to closely overlie the periphery of the duct 122 and is secured thereto as by screws 138. With the exception of openings 140 and 142, the pod 136 is essentially airtight. When placed on the duct 122 the openings 140 and 142 are in line with identical openings cut into the wall of the duct 122. (See, for example, duct opening 141 in line with opening 140 in FIG. 7.) A damper 40 is pivotally mounted on a shaft 144 and carries a seal of felt or other suitable material 146 about its periphery to effect a tight sealing relationship with the periphery of duct 122 when the damper is in closed position. Selective operation of the damper is provided by a solenoid 148 through a linkage 150 (FIG. 7) connecting the solenoid to the shaft 144. Thus, it may be seen that with the damper 40 in closed position, air flow through the duct 122 is completely stopped and bypass circulation is initiated through the pod 136. By this means airflow is caused to leave the duct 122 entering the pod through opening 140. Air again reenters the duct 122 on the downstream side of the damper 40 through its exhaust opening 142. During this period air flowing through the bypass proceeds through a filtering agent 151 which effectively removes smoke and odor from the gas being passed thereover. The filtering or catalyst agent 151 may be comprised of an aluminum oxide material impregnated with a platinum base deposit. Air flow during the normal drying operation, as during the lint burning cycle, is provided by the blower 32 which draws air through the drum, the lint burner, and the bypass and exhausts this flow through a conduit 152 to the area outside the dryer in any conventional manner.

As shown in FIGS. 4 and 6, the catalyst pod 136 is heated by a heating element 154 while the lint burning is done by a separate heater 132. This arrangement provides for energizing the catalyst pod to bring the filtering agent or catalyst up to activating temperature prior to burning the lint collected on screen 130. For instance, heating element 154 could be energized whenever the motor 16 is running. In this way the catalyst filter will have reached a functional temperature by the time the lint burn cycle is initiated. This is done so that no smoke

will escape to the area surrounding the dryer during the period in which the air is being bypassed over the catalyst but in which the catalyst is not yet functional or effective. It is, of course, within the purview of this invention to connect the heaters **154** and **132** in series so that the same heater may perform both the lint burning and catalyst warming function. Of course, it is necessary to bring the filter to its functional temperature before it is effective to remove smoke and odor. In this series arrangement, therefore, the catalyst or filter heater is necessarily of higher wattage than in the parallel arrangement so that the filter can be heated more quickly.

A complete description of the drying cycle will be set forth later in connection with the wiring diagram. However, briefly stated, air flow through the tumbling drum during the normal drying cycle will be through the dryer inlet opening **72**, past primary heater **84** and into the tumbling drum **14**. From this point it proceeds to the lint collecting chamber by way of the passageway **102** and front duct **106**. In moving through the aperture **115, 119** the air is filtered by screen **130** on which the lint is trapped. The filtered air then proceeds through the duct **122** in which the damper **40** is disposed in a wide-open position, and thence by way of blower outlet **152** in a conventional manner to the dryer exhaust. Whenever it is desired to eliminate the lint collecting on the screen **130**, the heater **132** is energized. However, in order to prevent the smoke generated during the burning process from being exhausted into the laundry-room, a catalyst filter is disposed within bypass pod **136** and the smoke filled air caused to pass therethrough. For this purpose damper **40** is closed by means of solenoid **148**, tightly sealing off air flow past the damper. Air flow is thus reduced in passing through the relatively small openings **140** and **142** in the bypass pod. It has been found that the apertures **140** and **142** should be sized in a manner to provide an air flow of from 1 to 5 c.f.m. With this flow of air, the amount of filtering agent or catalyst within the pod **136** is effective to remove any smoke and odor entrained in the air as a result of the burning process. At the conclusion of the burning cycle and the deenergization of heater **132**, damper **40** may remain closed for a slightly longer period to insure that all smoke is passed through the bypass pod **136**.

An alternate arrangement of the preferred embodiment is seen in FIG. 4 wherein the damper **40** is made thermally responsive to air flow temperature by a bimetallic element **158**. This arrangement is utilized to provide the delay necessary to bring the catalyst filter agent **151** up to functional temperature where the heater **154** is energized simultaneously with heater **132**. The element **158** is disposed in a manner to provide thermally responsive damper actuation in the same way that bimetallic element **42** was described with reference to FIG. 1. With greater particularity, the bimetallic element is secured at **160** to a flange **162** fastened to the rear wall **127** of the air collecting chamber **109**. At the opposite end of the bimetallic strip **158** the element is fastened to the damper linkage **150** which is adapted to rotate shaft **144** of the damper **40**. In this arrangement it may be seen that air flow entering the lint collecting chamber **108** from front duct **106** is caused to pass over the heat responsive element **158** which is disposed in front of the damper duct **122**. As air passes over the lint burning element **132** the air is warmed and this, in turn, actuates the bimetallic element **158** to close damper **40** through linkage **150**. By the time that element **158** has reached an extreme heated position, damper **40** is in tightly sealed relationship with the duct **122** and the air flow is proportionately reduced by passing it through bypass pod **136**. As the bimetallic element slowly closes the damper **40**, the gradual reduction in air flow causes the temperature of the lint collecting plate to rise to the ignition temperature of the lint collected thereon in response to the heating of element **132**. By this

time the catalyst or filter agent within the bypass pod **136** has been brought to its activated or functional temperature and all of the smoke generated is eliminated as the reduced air flow passes through this bypass element.

A second embodiment of the bypass arrangement is best seen in FIGS. 3 and 5 wherein the lint collecting chamber **108**, the lint collecting screen **130** and the lint burn element **132** are disposed in the air flow path in a manner similar to that of the preferred embodiment. Although the collecting screen **130** is shown upstream of the heater **132**, it could as well be reversed as in the preferred embodiment. Instead of the bypass rod referred to in connection with FIG. 4, this embodiment utilizes a cylinder **166** having one section thereof **168** projecting within the air receiving chamber **109**. Disposed over the end **168** is a cap **170** which is ported at **172** to permit restricted air flow from the chamber **109** through the cylinder **166**. A disc-like baffle **174** is disposed within the cylinder **166** and similarly ported at **176** to facilitate air flow through the cylinder. Sandwiched between the baffle **174** and the end cap **172** is a series of catalyst screens **178** spaced apart by annular washers **180**. Centrally located within the cylinder **166** is a continuation **182** of the lint burning heater **132**. Although this arrangement shows heaters **182** and **132** in series, these heaters may be separate and independently energized. A duct **184** connects the outer section **188** of the cylinder **166** to damper duct **122**, in a manner to complete the bypass arrangement around the damper **40**. A second end cap **185** serves to close the open end of section **188** and position the heating element **182** within the cylinder.

This arrangement shows the damper **40** actuated by the solenoid **148** which, by way of any conventional timing arrangement, is selectively energized to close off air flow through the damper duct **122**. With the damper closed, the duct **122** is tightly sealed and air flow to the blower **32** is forced around the damper **40** by way of the bypass cylinder **166**. Since it is desirable to minimize the restriction to air flow across the collector screen **130**, the disposition of the catalyst screens within the cylinder **166** provides a novel method by which increased air flow exposure to a catalyst is obtained without restricting normal dryer air flow during periods when damper **40** is opened. Thus, the blower **32** is unhindered by the resistance of the catalyst screens **178** during all portions of the dryer cycle except lint burning.

Reference may now be had to FIGS. 2 and 5 for an explanation of air flow through a dryer provided with this embodiment of a catalyst bypass. With the blower **32** in operation, air is drawn into the dryer cabinet **10** through the inlet opening **72** and warmed by primary heater **84** prior to entering tumbling drum **14** through the rear wall ports **70**. The tumbling action of the clothes in the presence of the heated air causes the air to give up moisture to the circulating air. This agitation, of course, adds also an amount of lint which, along with the vapor or moisture, is carried with the air through the front opening **66** of the drum, the passageway **102** and into the front duct **106**. Air is received in the lint collecting chamber **108** and passes over lint collecting screen **130** which overlies an opening **115, 119** in partitions **111, 114** dividing the lint collecting chamber **108** and the rear air receiving chamber **109**. At this point the lint has been filtered or strained from the air which then passes the damper **40** and is forced by the blower **32** to the outside by way of conduit **152**.

Upon initiation of a lint burning procedure in this second embodiment, the heating element **132** is energized. In the arrangement of FIG. 5, one element comprised of portions **132** and **182** is utilized both to burn the lint collected on the screen **130** and to warm and activate the catalyst screens **178** in the bypass cylinder **166**. After a sufficient time has elapsed to permit the catalyst screens **178** to warm by means of heating element portion **182**, the solenoid **148** is energized to tightly close the damper

40. Air flow is thus restricted to 1–5 c.f.m. across the collecting screen **130** which consequently heats to the lint ignition temperature and burns the lint. Should you wish to energize solenoid **148** simultaneously with the heating element **132**, **182** and still prevent the escape of any smoke or odor, it is necessary to place increased heater length within the cylinder (i.e. increase the wattage to which the catalyst is exposed). The smoke and odor evolved during this burning process follows a bypass course through the bypass cylinder **166** and in so doing is oxidized from the air by the catalyst elements **178**. The smokeless, deodorized reduced air flow then continues its return to the downstream side of the damper **40** by way of the connecting duct **184** and is then exhausted to the outside by the blower.

The operation of a clothes dryer embodying the preferred concepts of lint burning and bypass smoke elimination will now be fully described in connection with a simplified schematic wiring diagram set forth in FIG. 8. The dryer wiring system is connected into any conventional power source L_1, L_2 found generally in all residences. In the wiring arrangement of FIG. 8 the power source is shown generally as 115 volts utilizing the same potential for controls, motor and primary heater. However, it has been found that drying speed is improved greatly by placing the primary heater **84** on 230 volts so that the power supply may be increased during the drying process. A conventional timer motor **200** is adapted to drive a series of cams **202** secured to a shaft **204**. A series of switches **206**, **208**, **210** and **212** are selectively and independently operated by the rotation of cams **202**. The primary heater circuit includes the timer switch **206**, the primary heating element **84**, a thermostatic control for the heater **214** and a high limit safety switch **216** installed adjacent the primary heater. The motor circuit includes a motor **16** and a motor switch **208**. A centrifugal safety switch **218** located within the motor is adapted to close when the motor **16** comes up to running speed and is located in a manner to prevent power flow to the primary heater **84** and to the dryer circuit when the motor **14** either fails to run or come up to operating speed. The lint burn circuit includes a timer switch **210**, a solenoid **148** which operates a lint burn damper **40** and a lint burn heating element **132**. Where the catalyst heater **154** is maintained separate from the lint burn heater as in FIG. 6, the catalyst heater circuit will include a timer switch **212** and the heating element **154**.

The timer operated switches are so sequentially arranged that upon setting of the timer to some predetermined timing period, the switches **206** and **208** are closed to energize the primary heating element **84** and the motor **16**, in accordance with conventional practice. Preferably, the swicth **206** opens approximately ten minutes before the start of the lint burning cycle in order that the tumbling drum driven by the motor **16** will be rotated for a short period with the heating element deenergized. This serves the two-fold purpose of eliminating wrinkles from the clothes being tumbled, while at the same time allowing the dryer to cool. Next, the lint burning cycle is initiated by the closing of timer switch **210**. The closure of switch **210** thus energizes the solenoid **148** to close the damper **40** while simultaneously energizing the lint burn heater **132**. Air flow through the duct **122** is stopped by damper **40** and forced through the bypass pod **136** for the balance of the lint burning process. Where a separate heater is provided for the catalyst bypass such as heater **154** in pod **136**, the timer switch **212** is closed in advance of switch **210** in order to give the catalyst or filtering agent a sufficient time to reach its activated temperature. This time interval will vary, depending on the catalyst used. However, it has been found that 15–20 minutes is sufficient to activate a catalyst comprised of a platinum or palladium coated chrome nickel wire where a low wattage element of approximatley 200 watts is used.

In this regard switch **212** may be closed at the start of the drying cycle to heat the catalyst. By the time the drying cycle reaches the lint burning portion, the catalyst is heated to around 1200° F. and thus effective to eliminate the smoke and odor passing thereover. Air flow through the bypass pod will, of course, lower the temperature of the catalyst. However, the lint burning is completed before the catalyst reaches a temperature of 600° F., its lower functional limit. Where it is desired to energize the catalyst heater **154** in advance of the lint burn heater **132** but not during the entire cycle, the wattage available within the pod **136** may be increased to effect a shorter warm-up time. The reduced air flow minus whatever smoke and odor was entrained therein then passes out of the bypass chamber on the downstream side of the damper **40** and is exhausted by the blower **32** in any conventional manner outside the dryer cabinet **10**. It will be apparent that the timer actuated switches **210** and **212** might be closed at any other time during the drying cycle and need not necessarily be closed at the end of this cycle. The wiring system might also include a door switch **220** as a safety feature to close down all dryer functions whenever the access door **12** is opened.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. In combination; a clothes dryer including an outer cabinet; a tumbling drum rotatable in said outer cabinet; said tumbling drum having air inlet means and outlet means; a blower for circulating heated air through said drum from said inlet means to said outlet means; an air discharge duct communicating with said outlet means and including means forming a lint burning zone and an air control zone downstream from said lint burning zone; said lint burning zone including a lint collecting means and a lint burning means, a damper in said duct in said air control zone for permitting air flow through said duct; means for effecting operation of said damper; a catalyst housing associated with said air control zone and having a greater resistance to air flow than said duct; said housing having an inlet aperture connected to said duct between said damper and said lint collecting means and an outlet aperture connected to said duct on the opposite side of said damper from said inlet aperture; and means for concurrently actuating said damper to direct air to said housing and energizing said lint burning means to burn said lint.

2. In combination; a clothes dryer including an outer cabinet; a tumbling drum having a substantially imperforate peripheral wall rotatable in said outer cabinet; said tumbling drum having a rear perforated wall and a front opening; said rear perforated wall including air inlet means; a blower for circulating heated air through said drum to said front opening; an air discharge duct communicating with said front opening; a damper adapted to close said duct, means for effecting damper closure, a bypass conduit having a greater resistance to air flow than said duct and connected to said duct upstream of said damper for receiving the air circulation when said duct is closed and including a container having a catalyst means and a first heating element therein; a lint collector in said duct upstream of said damper and the junction of said bypass conduit with said duct, and a second heating element adjacent said collector; said first heating element being energized to activate said catalyst means before said second heating element is energized to burn said lint.

3. In combination, a clothes dryer including an outer cabinet; a tumbling drum rotatable in said outer cabinet; said tumbling drum having a rear perforated wall and a front opening; said rear perforated wall including air inlet means; a blower for circulating heated air through said drum to said opening; an air discharge duct communicating with said opening; a damper adapted to close said duct; means for effecting damper closure; a bypass conduit having a greater resistance to air flow than said duct

and connected to said duct upstream of said damper for receiving the air circulation when said duct is closed; a lint eliminator in said duct upstream of said damper and the junction of said bypass conduit with said duct and including means to collect said lint and means to burn said lint; catalyst means in said conduit for consuming the products of combustion; and means for conditioning said catalyst means for consuming the products of combustion before said burning means burns said lint.

4. In combination, a clothes dryer including an outer cabinet, a tumbling drum rotatable in said outer cabinet, said tumbling drum having a rear perforated wall and a front opening, said rear perforated wall including air inlet means, a blower for circulating heated air through said drum to said opening, heating means located adjacent said rear perforated wall for drying said clothes, an air discharge duct communicating with said opening, a damper in said duct adapted to close said duct, means for effecting damper closure; a bypass conduit having a greater resistance to air flow than said duct and connected to said duct upstream of said damper for receiving the air circulation when said duct is closed; a heater in said conduit, a lint eliminator in said duct upstream of said damper and the junction of said bypass conduit with said duct and including means for collecting and burning said lint, altering means in said conduit activated by said heater for oxidizing the products of combustion, and means for energizing said heater before burning said lint.

5. In combination, a clother dryer including an outer cabinet, a tumbling drum rotatable in said outer cabinet, said tumbling drum having a rear perforated wall and a front opening, said rear perforated wall including air inlet means, a blower for circulating heated air through said drum to said opening, primary heating means located adjacent said rear perforated wall for drying said clothes, an air discharge duct communicating with said opening, a damper in said duct adapted to close said duct in one position, means for effecting damper closure, a bypass conduit having a greater resistance to air flow than said duct and connected to said duct upstream of said damper for receiving the air circulation when said damper is in closed position, catalyst means in said conduit, a lint collector in said duct upstream of said damper and the junction of said bypass conduit with said duct, secondary heating means for burning said lint and activating said catalyst means, and means including said secondary heating means for activating said catalyst means before burning said lint.

6. In combination, a clothes dryer including an outer cabinet, a tumbling drum rotatable in said outer cabinet, said tumbling drum having a rear perforated wall and a front opening, said rear perforated wall including air inlet means, a blower for circulating heated air through said drum to said opening, primary heating means located adjacent said rear perforated wall for drying said clothes, an air discharge duct communicating with said opening, a damper in said duct adapted to closed said duct in one position, means for effecting damper closure, a bypass conduit having a greater resistance to air flow than said duct and connected to said duct upstream of said damper for receiving the air circulation when said damper is in closed position, catalyst means in said conduit, a lint collector in said duct upstream of said damper and the junction of said bypass conduit with said duct, means for burning said lint, and secondary heating means for activating said catalyst means before burning said lint.

7. In combination, a clothes dryer including an outer cabinet, a tumbling drum rotatable in said outer cabinet, said tumbling drum having a rear perforated wall and a front opening, said rear perforated wall including air inlet means, a blower for circulating heated air through said drum to said front opening, an air discharge duct communicating with said front opening, a damper in said duct for selectively limiting the circulation of said air through said duct, a bimetallic element associated with

said duct upstream of said damper, means responsive to said bimetallic element to close said damper in response to a rise in temperature, a bypass conduit having a greater resistance to air flow than said duct and connected to said duct at one end thereof upstream of said damper for receiving the air circulation when said damper is in air flow limiting relationship to said duct and connected at the other end thereof to said duct downstream of said damper and upstream of said blower, means in said bypass conduit for altering smoke and odor in said air, a lint collector in said duct upstream of said damper and the upstream junction of said bypass conduit with said duct, and a lint burning heating element adapted to actuate said bimetallic element to close said damper before burning said lint.

8. In combination, a clother dryer including an outer cabinet; a tumbling drum having an imperforate peripheral wall rotatable in said outer cabinet; said tumbling drum having a rear perforated wall and a front opening; said rear perforated wall including air inlet means; a blower for circulating heated air through said drum to said front opening; an air discharge duct communicating with said front opening; a damper adapted to close said duct, means for effecting damper closure; a bypass conduit having a greater resistance to air flow than said duct and connected to said duct at a junction upstream of said damper for receiving the air circulation when said duct is closed and including a container having a series of spaced catalyst screens therein; a lint collector in said duct upstream of said damper and the said junction of said bypass conduit with said duct, a heating element having one portion adjacent said collector to burn said lint and another portion through said container to activate said screens, and means for effecting energization of said portions in a manner to activate said screens before burning said lint.

9. In combination, a clothes dryer including an outer cabinet, a tumbling drum having an imperforate peripheral wall rotatable in said outer cabinet, said tumbling drum having a rear perforated wall and a front opening, said rear perforated wall including air inlet means, a blower for circulating heated air through said drum to said opening, an air discharge duct communicating with said opening, a damper adapted to close said duct, a bypass conduit having a greater resistance to air flow than said duct and connected to said duct upstream of said damper for receiving the air circulation when said duct is closed and including a container having a series of spaced catalyst means and a first heating element therein, a lint collector in said duct upstream of said damper and the junction of said bypass conduit with said duct, and a second heating element adjacent said collector, said first heating element being energized to activate said catalyst means before said second heating element is energized to burn said lint.

10. A clothes dryer including a drying compartment having air inlet means, an exhaust duct, and bypass means having a greater resistance to air flow than said duct and connected to said duct; means for circulating heated air through said compartment, said duct and said bypass means, means downstream from the said connection of said bypass means with said duct for selectively directing said air through said bypass means or said duct, means for operating said selectively directing means; lint collecting means in said duct upstream of said directing means and the said connection of said bypass means with said duct; smoke and odor eliminating means in said bypass means; heating means adapted to burn said lint on said collecting means and to energize said eliminating means; and control means connected to said operating means and said heating means for effecting concurrently the actuation of said smoke and odor eliminating means and the direction of said air through said bypass means.

11. The combination of claim 10 wherein the smoke and odor eliminating means is comprised of a plurality

of catalyst screens in spaced stacked relationship to each other.

12. The combination of claim 10 wherein the means for selectively directing air through said bypass means is comprised of a damper adapted to close said duct to force said air through said bypass means.

13. The combination of claim 12 wherein said control means includes thermally responsive means in said duct for actuating said damper.

14. A dryer including a drying compartment having air inlet means, a duct and a purification chamber connected to said duct, means downstream from the junction of said chamber with said duct for restricting said duct and having a first and second position, means for effecting operation of said restricting means, means for circulating a first quantity of gaseous medium through said duct when said restricting means is in its first position and for circulating a second quantity of gaseous medium through said purification chamber when said restricting means is in its second position, and means for eliminating foreign matter from said gaseous medium including a foreign matter collecting surface in said duct upstream from said restricting means and said junction, a gaseous medium altering means in said chamber, heating means for burning said foreign matter, and means for controlling said eliminating means to actuate said altering means before said heating means burns said foreign matter.

15. A dryer including a drying compartment having air inlet means, a duct and a purification chamber connected to said duct, means for selectively circulating a first quantity of gaseous medium through said duct and a second quantity of gaseous medium through said purification chamber, means for effecting operation of said selectively circulating means, and means for eliminating foreign matter from said gaseous medium including a foreign matter collecting surface in said duct upstream from the said connection of said chamber with said duct during the circulation of said first quantity of gaseous medium, a gaseous medium altering means in said chamber during the circulation of said second quantity of gaseous medium, heating means having one portion for burning said foreign matter on said collecting surface during the circulation of said second quantity and another portion for actuating said altering means, and means for controlling said portions to actuate said altering means before burning said foreign matter.

16. A fabric drying compartment having air inlet means and outlet means, duct means connected to said outlet means, bypass means having a greater resistance to air flow than said duct means and connected to said duct means; means selectively effectively connectible in air flow impelling relationship to said duct means or said bypass means for circulating air through said duct means or said bypass means; means operable to selectively effectively connect said circulating means to said duct means or said bypass means; and lint elimination means including a lint collecting and burning surface in said duct means upstream of the junction of said bypass means with said duct means, means in said bypass means for altering smoke and odor, and heating means controllable for burning said lint after activating said altering means while air is circulating through said bypass means.

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