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3,050,864	8/1962	Sasnett	34/45
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[54] **POP-OUT LINT TRAP AND DOOR INTERLOCK
FOR LAUNDRY APPARATUS**
9 Claims, 5 Drawing Figs.

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34/48

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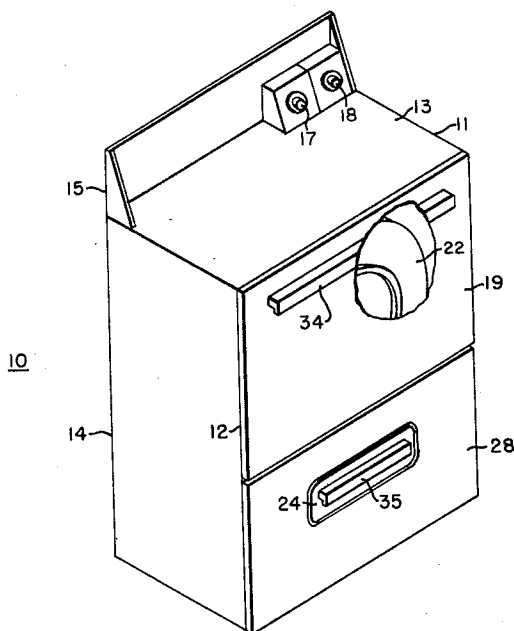
[50] **Field of Search**..... 34/45, 48,
55, 82

[56] **References Cited**

UNITED STATES PATENTS

2,776,826	1/1957	Bennett et al.....	34/82X
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ABSTRACT: A combination interlock and maintenance reminder for clothes dryer apparatus which prevents unintentional restarting of the dryer after interruption thereof, prior to the end of the cycle, and which reminds the operator to keep the lint trap clean. The invention is characterized by a lint filter located at the front of the dryer and operatively associated with the access door thereof such that when the latter is open the lint trap moves partially beyond the front wall of the dryer to thereby remind the user that it should be cleaned. Both the lint filter and the front door cooperate with circuit interrupt means such that both must be closed in order for the apparatus to operate.



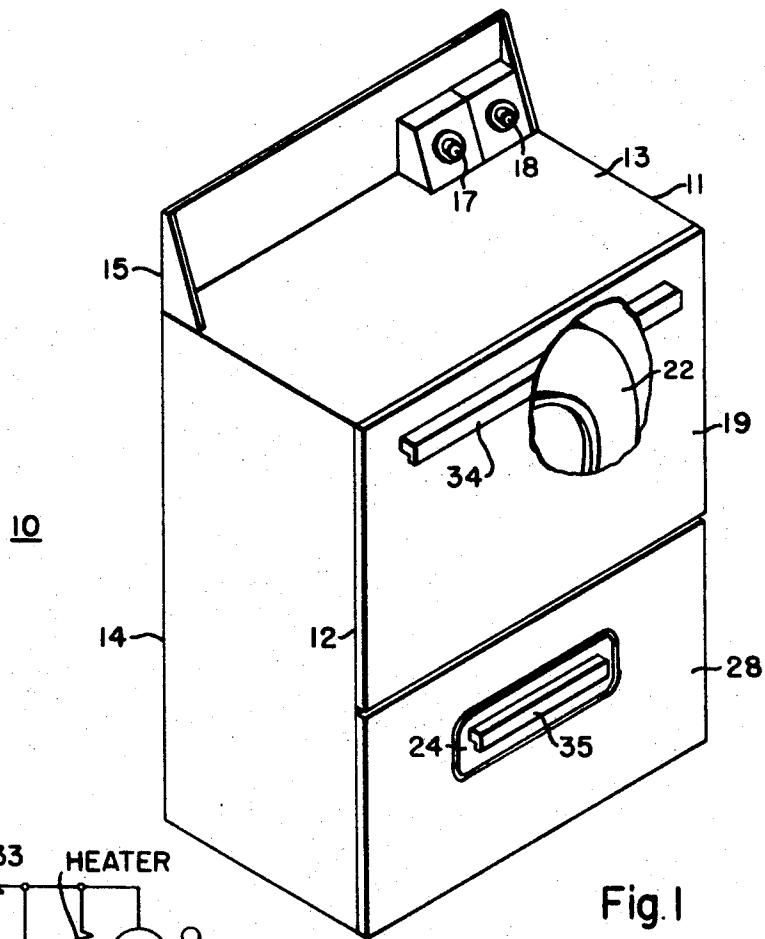


Fig. 1

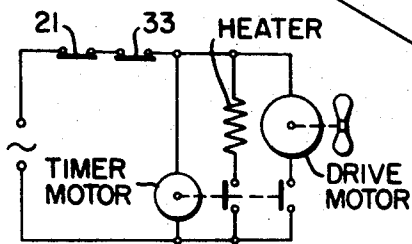


Fig. 5

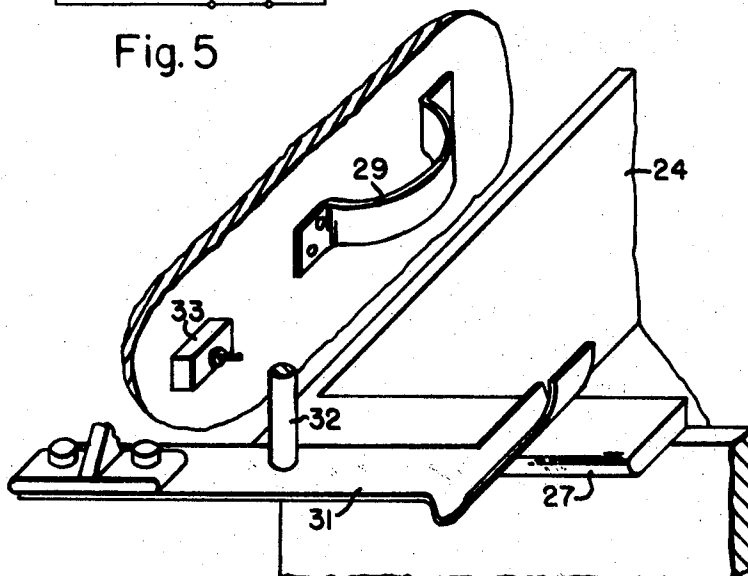


Fig. 4

Fig. 2

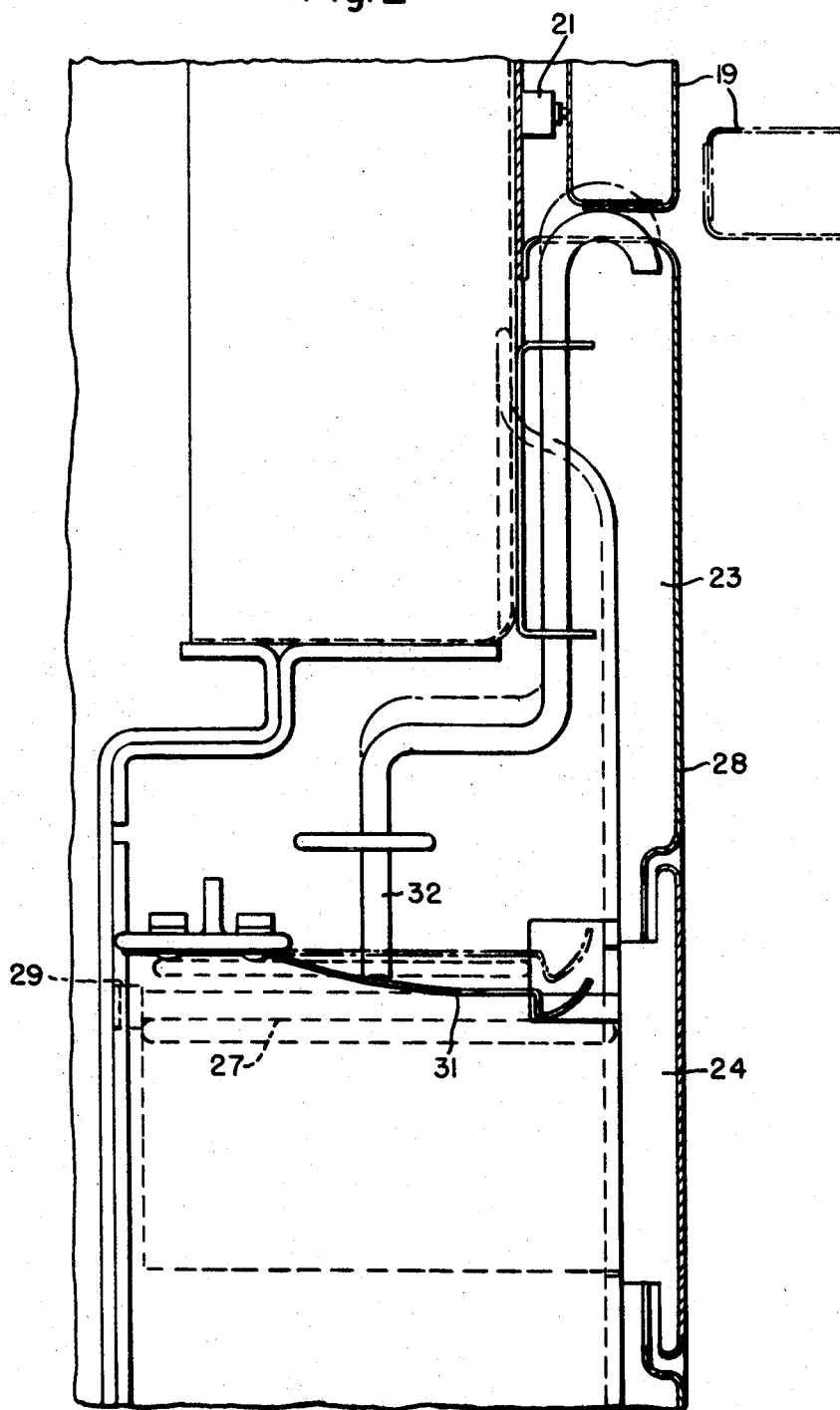
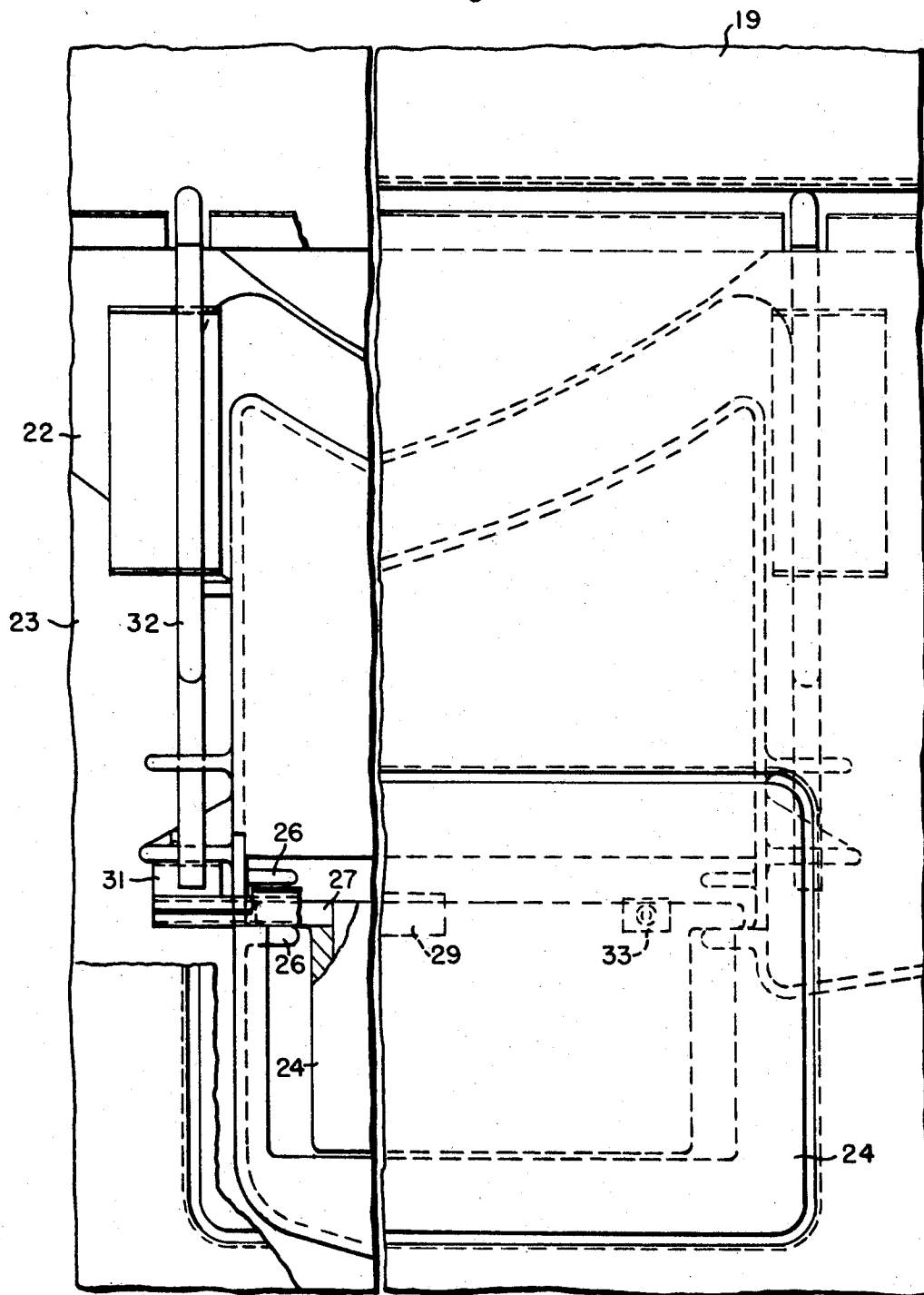


Fig. 3



POP-OUT LINT TRAP AND DOOR INTERLOCK FOR LAUNDRY APPARATUS

BACKGROUND OF THE INVENTION

Most, if not all clothes dryers are provided with a door actuated switch which interrupts operation of the dryer when the door is opened. Such switches usually open the circuit to the main motor, heater and timer motor. The reason for stopping the main motor is a matter of safety, i.e., to prevent the insertion of an arm into the path of a rotating drum. Deenergization of the heater prevents the overheating that would occur when the main motor is stopped, since the motor also drives the fan which effects air circulation. Timer motor stoppage is desirable since its function is only accomplished when timing clothes that are being dried, which is not the case when the heater is off and the basket is stationary.

It will be appreciated from a consideration of the foregoing arrangements that it is quite possible for the dryer to be damaged by mischievous children who may place into the basket, objects not intended to be placed therein. Subsequent closure of the door, in the case where time remains on the timer (i.e. clothes have been removed by a housewife and the timer has not been turned to the "off" position) will restart the dryer. Moreover, the curious child may decide to climb into the basket and close the door, consequences of which are quite apparent.

In view of the foregoing, the general object of this invention is to provide a new and improved clothes dryer.

It is a more particular object of this invention to provide, in a clothes dryer, a new and improved interlock which minimizes the possibility of unintentional operation of the dryer.

Another object of this invention is to provide, in a clothes dryer, a combination maintenance reminder and safety interlock which cooperates to minimize the possibility of accidents and minimize the occurrence of airflow restriction.

BRIEF SUMMARY OF THE INVENTION

Briefly, the above-cited objects are accomplished by the provision, in a clothes drying apparatus, of a pair of series connected switches, both of which must be closed in order for the apparatus to operate. One of the switches is operatively associated with the dryer door while the other is operatively associated with a lint trap. The lint trap is automatically moved out of the airflow path to a position partially beyond the front wall of the dryer where it is plainly visible and readily accessible for cleaning and movement by the operator back into the stream of air.

Further objects and advantages of the present invention will become apparent when considered in view of the description of the preferred embodiment of the invention and drawings forming a part thereof.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a clothes dryer representing the invention;

FIG. 2 is an enlarged fragmentary view, in section, of the lower left corner of the dryer shown in FIG. 1;

FIG. 3 is an enlarged fragmentary view of mounting structure for a lint trap forming a part of the invention; and,

FIG. 4 is a pictorial view, in perspective, of an interlock forming a part of the invention;

FIG. 5 is a schematic diagram of a partial dryer control circuit having both a door switch and a lint trap switch.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, especially FIG. 1, reference character 10 designates generally dryer apparatus comprising cabinet structure 11 including front, top and rear walls 12, 13 and 14, respectively. The top wall 13 has attached thereto a back splasher panel 15 having control knobs 17 and 18 thereon.

Attached to the front wall 12, is a door structure 19 of the "drop-down" type. A switch 21, see FIG. 2, is carried by the front panel in such a position that it is actuated by the door structure, the switch being closed when the door is closed and opened when the door is opened. The primary function of the door, of course, is to provide access to the interior of a drum or basket 22 which is supported by the rear wall 14. For rotation about a substantially horizontal axis. The basket is rotated by means of a conventional motor and belt combination, not shown, which motor also effects operation of air-circulating means, also not shown. The air-circulating means, in a conventional manner, causes air to flow through the various parts of the dryer including an air duct generally indicated at 23.

A lint trap structure 24, in the form of a drawer, is supported for movement into and out of the duct 23 by a pair of guides 26 (FIG. 3) which receive a pair of sidewardly extending flanges 27 (only one being shown) of the lint trap 24. The lint trap is biased to move partially beyond a front wall or panel 28 by a spring 29 mounted on the rear wall of the air duct 23. The foregoing movement is automatically effected when the door structure 19 is opened, as shown in phantom in FIG. 2. This is accomplished through the disengagement of a pair of lock springs 31 (only one shown) which frictionally engage flange 27 of the lint trap 24 (see FIG. 2). The required pressure is provided through the interaction of the underside of the door structure abutting (in the closed position) a pair of slidably mounted rods 32 the lower ends of which engage the lock springs 31. When the door structure is opened, the lock springs which have an upward bias, free the lint trap for forward movement by the spring 29.

A circuit-interrupting switch 33 (see FIGS. 4 and 5) actuated by the lint trap structure 24 is mounted in a series arrangement with the switch 21 such that both switches must be closed in order for the dryer 10 to operate, the switch 33 being closed only when the lint trap is closed. It should now be apparent that opening of the door structure 19 effects opening of the lint trap structure 24, which, both reminds the user of the need for cleaning of the lint trap and the necessity for reinsertion of the lint trap by the operator from outside the dryer to restart the dryer. To facilitate opening and closing of the door structure and the lint trap, they are respectively provided with handles 34 and 35.

Since numerous changes may be made in the above apparatus and different embodiments may be made without departing from the spirit thereof, it is intended that all matter contained in the foregoing description or shown in the accompanying drawings, shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In dryer apparatus having cabinet structure with a basket supported therein for rotation about a substantially horizontal axis; air circulation means and heater structure for warming air circulated by the air circulation means; and means including duct work for channeling the air circulated through the basket in a specific manner; structure including a motor for effecting rotation of the basket and the air circulation means; a front panel structure having an opening in registry with an open front of the basket and door structure carried by the front panel for closing the openings during operation of the dryer; control means for initiating, controlling and timing the operation of the motor and heater structure, in accordance with a selected cycle of operation, the improvement comprising:
 - a lint filter disposed in the path of the circulated air, means cooperating with said door structure for interrupting the operation of said dryer apparatus, means for effecting withdrawal of said lint filter from the path of the circulated air in response to the opening of said door structure, means for preventing continued operation of said dryer apparatus when said door structure has been opened during a cycle of operation,
 - said means for preventing continued operation of said dryer apparatus being operable by said lint trap when moved

back into the path of the circulated air, to continue the cycle of operation.

2. Structure as specified in claim 1 wherein,

said means for preventing continued operation of said dryer apparatus comprises a circuit interrupt switch connected in series with said means cooperating with said door structure for interrupting the operation of said dryer apparatus.

3. In dryer apparatus having cabinet structure with a basket supported therein for rotation about a substantially horizontal axis: means including a circuit for controlling said dryer, an access door and associated switch means, said door when in its open position effects interruption of dryer operation through said door actuated switch means; means forming an air circulation path,

a lint trap or filter normally disposed in said path and means for moving said trap or filter, in response to opening of said dryer door to a position at least partially outside of said cabinet structure;

switch means responsive to said lint trap to complete the control circuit only when said trap is normally disposed in said path;

said means for moving said trap or filter including means normally biasing said lint filter towards said position at least partially outside said cabinet structure; and

means cooperating with said dryer door for preventing movement of said lint filter to said last-mentioned position when said dryer door is closed and said lint trap is in said circulated air path.

4. Structure as specified in claim 3 wherein, said switches are connected in series and closed when said filter is in the path of the circulated air and said door is closed.

5. Structure as specified in claim 3 wherein,

said lint trap comprises a rigid frame member, and

said means for preventing movement of said lint filter comprises at least one spring member movable into frictional engagement with said frame member by means of a rod engaging the lower edge of said door structure when said door structure is closed.

6. In dryer apparatus having cabinet structure with a basket supported therein for rotation about a substantially horizontal axis; air circulation means and heater structure for warming air circulated by the air circulation means; and means including duct work for channeling the air through the basket in a specific manner; structure including a motor for effecting rotation of the basket and the air circulation means; a front panel structure having an opening in registry with an open

front of the basket and door structure carried by the front panel for closing the openings during operation of the dryer; control means for initiating, controlling and timing the operation of the motor and heater structure, in accordance with a selected cycle of operation, the improvement comprising:

a lint filter disposed in the path of the circulated air, means including structure cooperating with said door structure upon opening thereof for effecting movement of said lint filter from the path of the circulated air, and circuit interrupt means operable upon such movement of said lint filter.

7. Structure as specified in claim 6, wherein

said structure cooperating with said door structure serves to retain said lint filter in its original position when said door structure is closed but is ineffective when said door structure is open.

8. Control means for a laundry apparatus having a cabinet housing a rotatable drum and adjacent heater means and means for driving said drum and forcing air through said cabinet in a predetermined flow path, and filter means for filtering the air in said flow path, said cabinet including door means movable between an opened and closed position for access to said drum and further defining means for removably receiving said filter means for insertion through said cabinet into said flow path, said control means including:

a door-actuated switch means which is closed only when said door is closed;

a filter-actuated switch means which is closed only when said filter is disposed within said flow path;

means normally biasing said filter to a position other than said filtering position; and,

latch means for retaining said filtering means in said flow path against said biasing means, said latch means being effective only when said door is in a closed position and said filter means is disposed within said path,

whereby said door must be closed and said filter must be positioned in said flow path to actuate said apparatus and opening said door releases said latch means allowing said biasing means to move said filter to said other position.

9. The control means according to claim 8 wherein said latch means includes a latching arm biased to an inoperative position and a follower rod having one end abutting said arm and the other end abutting said door means, wherein said rod moves said arm against said bias and into engagement with said filter means when said door is moved to said closed position.

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