

[54] **LINT TRAP FOR A CLOTHES DRYER**

3,304,624 2/1967 Czech.....34/82

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[57] **ABSTRACT**

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A lint trap is provided on the door of a clothes dryer where it is readily visible and accessible for cleaning. The lint trap is generally coextensive with the opening to the dryer basket and has a flange portion which, when the door is closed abuts the front baffle around the perimeter of the opening so that all air exiting from the basket must pass through the lint trap prior to coming into contact with any relatively cool surface. The flange supports a separable perforated filter guard and a fine mesh removable screen filter. The guard protects the screen and the lint deposited thereon from the clothes as they tumble within the dryer.

[52] U.S. Cl.....**34/82, 55/507, 55/509, 55/511, 55/529**

[51] Int. Cl.....**F26b 21/02**

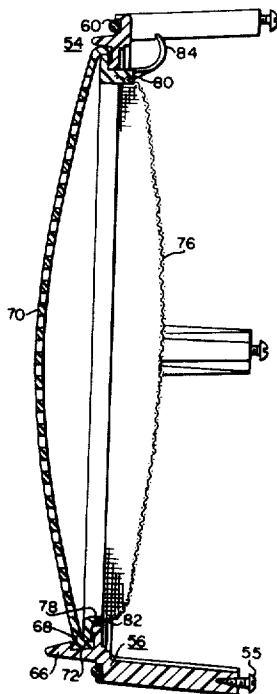
[58] Field of Search .....34/82; 55/490, 495, 500, 507, 55/509, 511, 529

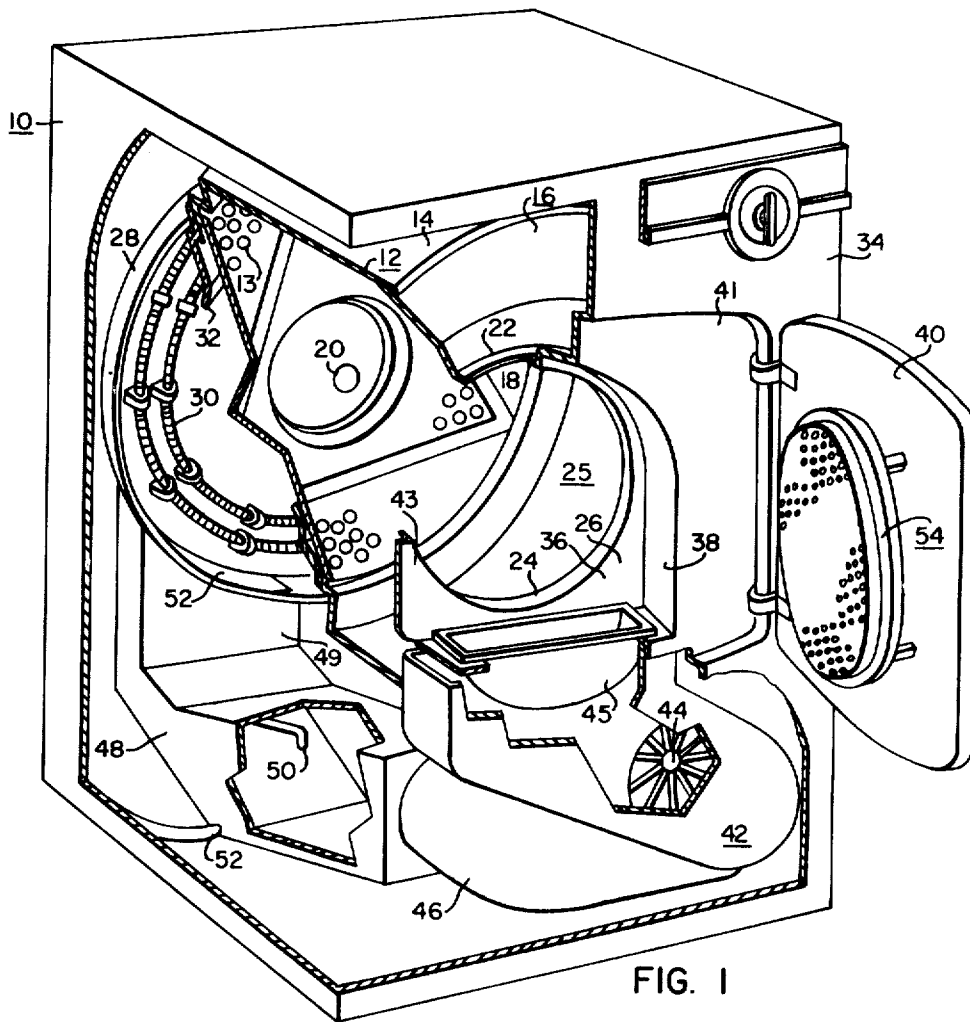
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**UNITED STATES PATENTS**

2,958,138 11/1960 Ashby.....34/82 X

**10 Claims, 4 Drawing Figures**





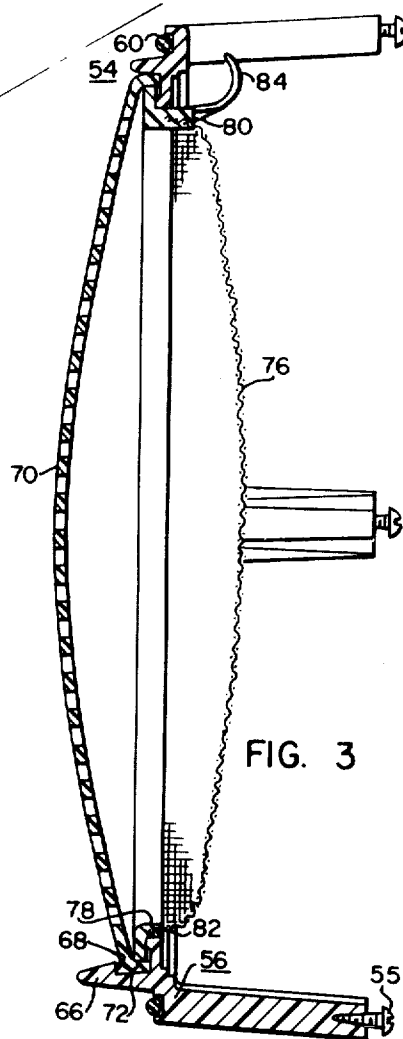
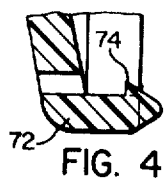
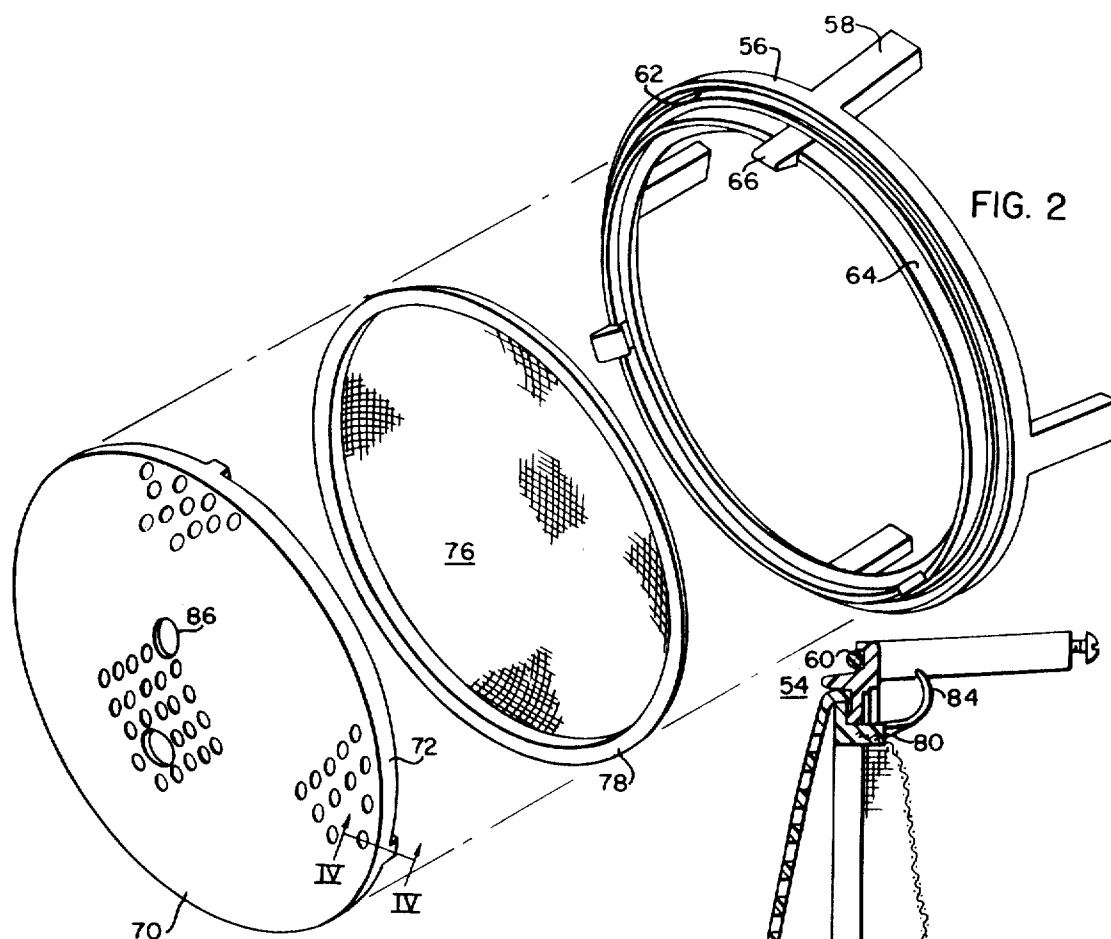
WITNESSES

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## LINT TRAP FOR A CLOTHES DRYER

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates to a clothes dryer apparatus and more specifically to a lint trap for removing the lint from the moist, lint-laden air after the air has passed over the clothes in the dryer basket and before the lint has an opportunity to deposit itself on the moist visible surfaces surrounding the air exit.

This invention also relates to a lint trap having a generally larger filtering area so as to maintain sufficient volumetric air-flow while having a fine mesh screen for removing virtually all lint from the air as it passes through.

## 2. Description of the Prior Art

In previous dryer apparatus, particularly that of the assignee of the present invention, a lint filter or collector was placed so as to cover the opening of a conduit leading from a chamber adjacent the air outlet of the basket to the intake of an exhaust fan. This arrangement removed most of the lint from the moist, lint-laden exhaust air. However, the area adjacent the air outlet of the basket was generally cooler than the air exiting the basket and thereby caused a degree of condensation thereon. This lead to the deposition of some of the lint in the air on the walls enclosing this area which, upon opening the dryer door, were quite visible to the user. This lint could also be picked up by the clothes as they were removed from the dryer.

Another filter apparatus is described in U.S. Pat. No. 2,675,628 which shows a relatively coarse mesh screen carried by the door of a dryer, and dished so as to project into the flange-defined tub opening. The air exiting from the tub passes through the coarse screen. However, supplemental downstream filtering is required to effectively remove the lint from the exhausting air. Thus, such filter also permits moisture laden lint to contact and adhere to the cooler surfaces which are readily visible to the user when the door is opened. Also, such screen is exposed to the clothes tumbling within the dryer which would either pick up the lint from the screen as they passed thereover or knock it through the coarse screen so that it may subsequently be deposited on moist visible surfaces.

The lint trap of the present invention is generally coextensive with the opening of the basket so that the exhaust air is effectively filtered before it contacts any cool surfaces, thereby eliminating unsightly lint collection on them, and includes a lint guard which protects the filter and the lint collected thereon from the tumbling clothes. Also the lint trap of the present invention is especially useful in a condenser type dryer wherein the warm moist air after being filtered is passed through a condenser to lower its moisture content and then reheated for recirculation over the clothes. This type dryer thereby eliminates exhausting the moist air normally associated with dryers and requires a higher degree of filtration so that lint does not continue to collect in inaccessible areas such as the condenser. For this reason the previous filter screens associated with dryers having an air exhaust are not completely adequate. Accordingly, a filter providing higher efficiency filtering, but without unduly impeding the flow of air through the system is desirable. Such is attained in the present lint trap due to its fine mesh screen covering a generally large cross-sectional area.

These, and other advantages of the lint trap of the present invention, such as it being readily visible so the user knows when to clean it and being readily accessible, for removal and cleaning will become apparent in the following description.

## SUMMARY OF THE INVENTION

A lint trap is provided which comprises essentially three components. The first comprises a support frame having legs for attaching it to the inside of the dryer door at a spaced relation therefrom. The support frame generally comprises an annular flange having a groove therein retaining an O-ring for sealing the flange with the baffle surrounding the opening to the basket, and a shoulder, radially inward of the groove for supporting a lint guard.

The lint guard is a separable perforated molded plastic cap having a surface which generally bulges toward the clothes basket and fits within the basket opening when the door is closed.

The lint guard terminates in a peripheral flange in which a fine mesh screen is mounted in a resilient plastic frame coextensive with the flange as held by resilient, radially inwardly projecting fingers. The frame has a hook extending therefrom for gripping the frame to facilitate removal from the guard.

As assembled the screen and frame are held in the lint guard which in turn is held in the support frame which is mounted on the door of the dryer. The lint guard and screen can be easily removed from the support frame without removing it from the door.

## DRAWING DESCRIPTION

FIG. 1 is a perspective view, partly broken away, of an electric dryer having the lint trap of the present invention mounted on the door;

FIG. 2 is an exploded elevational view of the lint trap;

FIG. 3 is a cross-section of the assembled lint trap; and

FIG. 4 is an enlarged cross-section of a long line IV—IV of FIG. 2.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

The dryer apparatus is seen in FIG. 1 to include cabinet structure 10 enclosing a cylindrical clothes basket 12 having a perforate rear wall 13, an imperforate annular wall 14 and a front wall 16. Front wall 16 has on opening 18 therein providing access to the interior of the basket and an exit port for air circulating through the basket.

The basket 12 is rotationally supported within the cabinet 10 by bearing structure 20 mounted between the cabinet and rear wall 13 of the basket and by an annular flange 22 framing opening 18 engaging a rearwardly formed flange 24 about a concentric opening 25 of the front baffle 26.

The cabinet 10 has a front wall 34 having an opening 36 generally in alignment with opening 25 of front baffle 26 and somewhat larger. A flange 38 extends forwardly from the front baffle 26 to the periphery of opening 36 connecting the baffle 26 and the cabinet. A door structure 40 is hingedly mounted for movement between an open and closed position on the cabinet adjacent the opening 36. It is noted that the door 40 when closed, is in a recess 41 in the front wall of the cabinet so that its front face is flush with the cabinet front. A deeper recess 43, of a depth corresponding to the width of the flange 38 is formed between the baffle 26 and inner surface of door 40 when the door is closed. This recess encompasses the opening 18 to the basket.

The bottom portion of flange 38 has an opening therein communicating with one end of air duct 42 therebelow, the other end of which is in communication with a fan 44 mounted on the bottom of the cabinet. A clothes guard, generally comprising a perforate tray 45, is placed over the opening for purposes to be explained later.

A second air passage 46 leads from the fan to a condenser chamber 48 which includes a nozzle 50 therein for continually spraying cool water when the dryer is running as is well known in the art and a drain 52 for disposing of the water collected in the condenser.

From the condenser chamber 48, another air duct 49 leads to an opening 52 in a heater housing 28 supported in the cabinet adjacent the rear wall 13 and which contains resistance heaters 30 and a shroud 32 for directing the air.

It can thus be seen that with door 40 closed the air within the dryer would circulate in a closed system over the heater elements 30 through the perforate rear wall 13, over the clothes within the basket 12 where it picks up moisture and lint, out the baffle opening 36 and through the tray 45 and duct 42 to the fan 44 from whence it is forced through the condenser chamber 48 where it is cooled and the moisture is deposited and then back to the heater for recirculation.

The lint trap generally designated 54 is mounted on the back of door 40 such as by screws 55 (FIG. 3) and preferably includes a one piece molded plastic support structure generally comprising a circular collar 56 (FIGS. 2-4) with a plurality of mounting legs 58 extending from one face thereof. This structure is located in the recess 43 when the door is closed. The length of the legs 58 is such that with door 40 closed, an O-ring 60 carried in a groove 62 on the face of the collar opposite the legs provides a seal between the collar 56 and the baffle 26 about opening 25. The legs 58 also serve as standoffs so that the entire area between the filter carried by the support structure, and the inner face of the door is in open communication with the mouth of the clothes guard 45.

A circular flange 64 projects from the collar 56 on the same side as the O-ring and radially inwardly thereof so as to have a circumference which will fit within opening 25 when the door closed. A plurality of short resilient clip means 66, also molded integrally with the flange, are generally tapered as they extend therefrom with that portion adjacent the flange providing a shoulder 68.

A separable filter guard 70 also preferably molded of plastic comprises a circular dish-shaped perforated surface having a circumferential flange 72, the outside diameter of which is substantially the same as the inside diameter of the flange 64 of collar 56 so as to fit therewithin. Flange 72 also has a plurality of short radially inwardly extending resilient fingers 74 integrally molded therewith.

A fine mesh circular filter screen 76 is supported in a circular frame 78 having an outside diameter substantially the same as the inside diameter of flange 72 so as to be able to fit therewithin. Frame 78 comprises a generally narrow planar portion 80 which terminates at the radially inwardly edge in a shoulder 82 projecting therefrom and having the edge of the filter screen 76 molded therein. An integrally molded finger grip 84 further extends from frame 78 in the same general direction as the shoulder 82 and at the radially inward edge thereof.

Thus the lint trap can be assembled in the following manner: The screen 76, and frame 78 can be placed in flange 72 of filter guard 70 such that shoulder 82 and thus finger grip 84 are extending away from guard 70. Resilient fingers 74 have sufficient movement to permit the frame 78 to pass thereover and then snap back to normal position to releasably retain the frame therein. The guard 70 and screen 76 as thus assembled can be placed in circular flange 64 in much the same manner, with the resilient clip means 66 having sufficient movement to permit assembly and snapping back to normal position to retain in assembled position. The screen and guard are inserted such that the guard is bulging in the same direction flange 64 projects which thus sandwiches the filter screen between the guard 70 and collar 56.

Disassembly for cleaning or replacement purposes is substantially the reverse procedure with guard 70 having a plurality of oversized apertures such as at 86 to permit the insertion of human fingers to facilitate gripping the guard to pull it away from support collar 56 secured to the door 40. The guard 70 and screen and frame 78 are similarly separated with one hand holding the guard 70 and the other gripping hook 84 and pulling the frame past the resilient fingers 74.

It thus can be seen that with door 40 closed, the lint trap is sealed against the baffle such that the moist, lint-laden air exiting from the basket must immediately pass through the filter without coming in contact with any cooler surface on which the moisture could condense. The only surface such lint-laden air contacts is lint guard 70 which overlies the screen to protect it, and the lint thereon, from the tumbling clothes in the basket and which is subjected to the interior of the basket and not likely to be at a condensing temperature. Also, the filter area encompasses substantially the entire opening 25 permitting sufficient airflow even as lint collects on the screen.

The clothes guard 45 functions primarily to maintain a perforate guard over the inlet opening of duct 42 for permitting airflow while blocking the opening from small articles of clothing such as socks being dropped therein.

It is noted that the clothes guard 45 is illustrated as being of the same form as the conventional lint trap. The reason is that such structures are conventionally and inexpensively available and do not detract in any way from the performance of the dryer embodying the invention. However it will be appreciated that the clothes guard 45, to perform its guarding function, may also simply take the form of a relatively coarse mesh, planar screen in a perimetric frame.

Thus, the moist-lint-laden air is filtered by lint trap 54 substantially cleaning the lint from the air with a fine mesh screen providing substantial area so as to not interfere with normal airflow, thereby eliminating the unsightly lint accumulation on cooler visible surfaces in the air passageway and providing lint free air to the condenser so as to keep the drain therein from becoming plugged.

To insure that the relationship between airflow volume, filtering efficiency, and resistance to airflow is appreciated, the following is noted. By providing a relatively large area filtering screen 76, as distinguished from the relatively lesser area screen provided in the prior art structure denoted clothes guard 45, for a given volume of airflow the velocity of the air per unit area of the filtering surface is reduced and, accordingly, the filtering efficiency for a filter of this character is improved. Further, since the resistance to airflow imposed by a given filtering surface is a function of the velocity through the filtering surface, the reduced velocity through the larger filter area results in a lower resistance to airflow under any given condition of lint buildup on the screen or filtering surface. Hence a larger quantity of lint can be collected upon the larger area filtering surface without an inordinate drop in the air volume in the dryer.

I claim as my invention:

1. A lint trap for laundry apparatus comprising:

filter means including a filter screen and frame means supporting said screen about its perimeter;  
guard means overlying said filter means, said guard means comprising a perforated dish having a perimetric flange, the inner surface of which is generally coextensive with said frame means;

a plurality of resilient fingerlike members supported on said flange, each having an inwardly projecting component whereby said filter means is releasably retained within the flange of said guard means by said resilient members; and, means for releasably supporting said filter means as retained within said guard means in proper disposition on said laundry apparatus.

2. The lint trap of claim 1 wherein said perforated dish, said perimetric flange and said resilient fingerlike members are integrally molded, preferably of plastic.

3. A lint trap for a clothes drying apparatus having a structure housing a rotatable clothes receiving basket therein and defining an opening for access to the interior of said basket, and door means hingedly supported on said housing structure for closing said access opening, said lint trap comprising:

support means mounted on the side of said door facing said opening when in a closed position, said support means including a collar having means on one side for spacing said collar from said door and flange means on the other side generally coextensive with said opening, said collar further supporting a plurality of resilient clip means extending beyond said flange and each defining a component extending radially inwardly of said flange;  
guard means generally coextensive with said flange and removably retained within said flange by said resilient clip means; and,

filter means removably supported by said guard means.

4. The lint trap of claim 1 wherein said means for releasably supporting said filter means as retained within said guard means in proper disposition includes a collar member having a flange projecting thereabove on one side of said collar generally coextensive with the outer surface of the perimetric flange of said guard means and means extending from the opposite side of said collar for mounting said collar on said apparatus.

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5. The lint trap of claim 4 wherein said collar further includes a plurality of resilient clip means projecting from said flange on said collar and each having a radially inwardly extending lip whereby said filter means as retained within said guard means is releasably supported within said flange on said collar by the lips on said clip means extending over said guard means.

6. Structure of claim 3, wherein said guard means comprises a perforate surface having a perimetric flange and a plurality of resilient fingers projecting radially inwardly therefrom.

7. Structure of claim 6 wherein said filter means comprises: a fine mesh screen; and, generally circular resilient frame means supporting said

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screen therewithin.

8. Structure of claim 7 wherein said fingers resiliently retain said filter means in said flange of said guard means.

9. Structure of claim 6 wherein said guard means is a generally concave surface projecting into said opening and said frame supporting said screen is sandwiched between said guard means and said support collar.

10. The lint trap of claim 4 wherein said collar, said flange on said collar, said means for mounting said collar, and said clip means projecting from said flange are integrally molded, preferably of plastic, to form a unitary support means.

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