

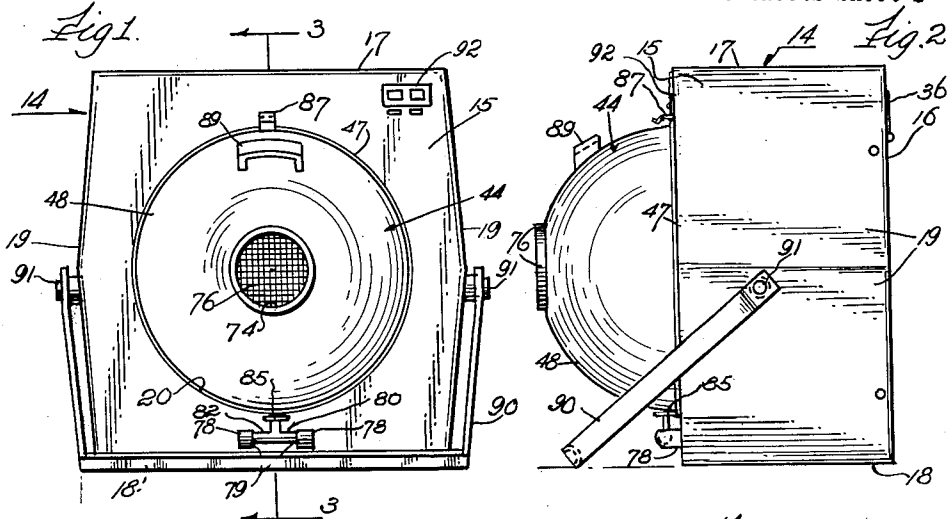
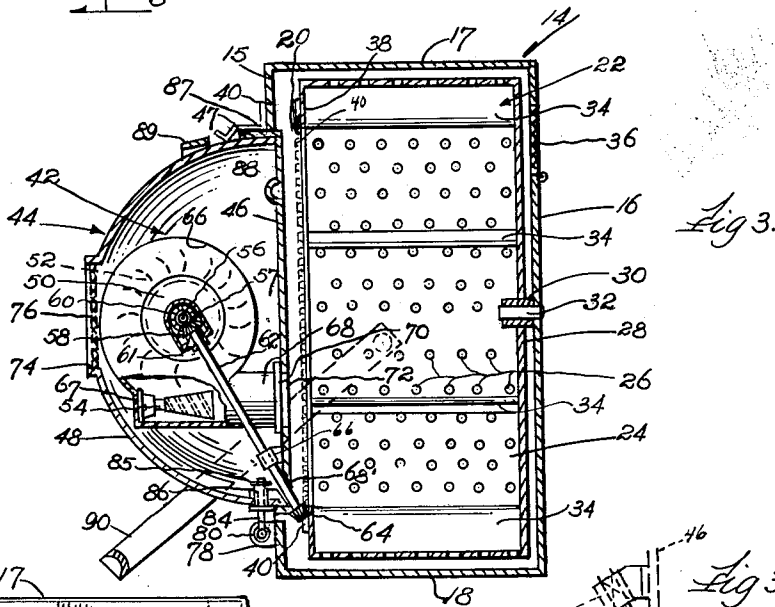
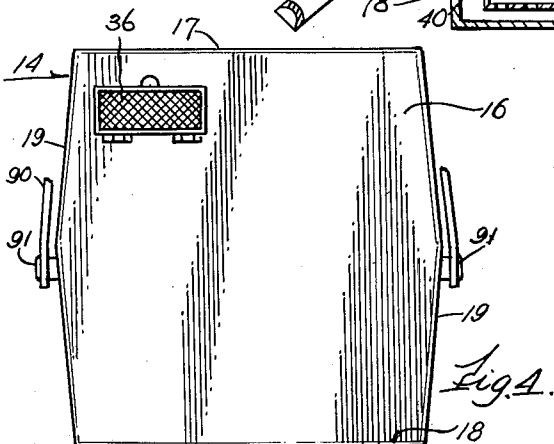
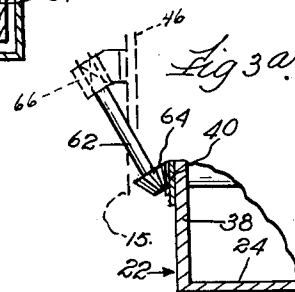
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A. A. TURNER
CLOTHES DRIER

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3 Sheets-Sheet 1



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3 Sheets-Sheet 3

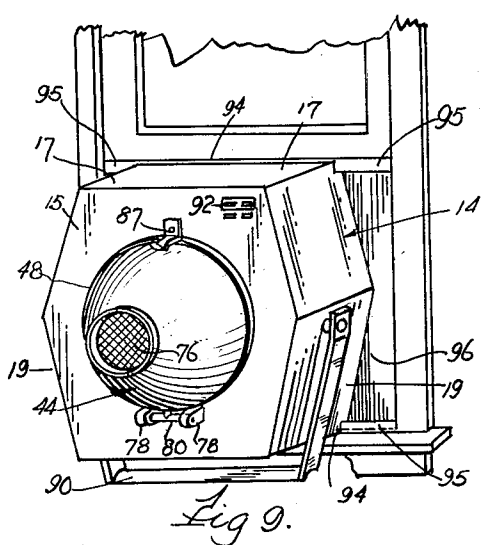
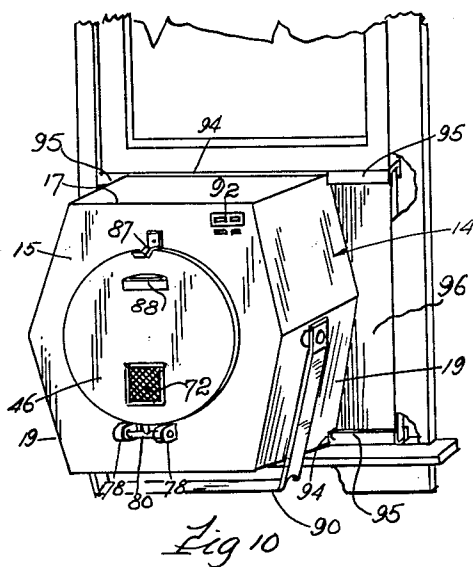
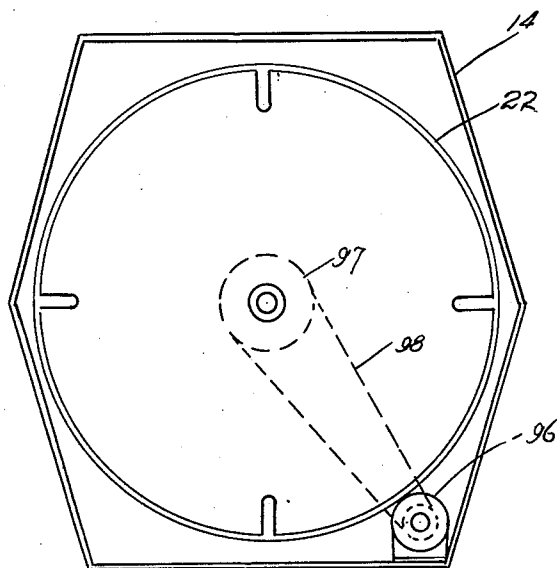


Fig. 11.

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3,064,361 CLOTHES DRIER

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6 Claims. (Cl. 34—91)

This invention relates to improvements in a clothes drier.

One of the objects of this invention is to provide an electrically operated unit which may be selectively used either as a clothes drier or as a room heater.

Another object of this invention is to provide a structure which is portable and of a size to be carried by a person, in which certain of the operating parts are mounted as a unit and positioned relative to the drying drum so that the full capacity of the drying drum is utilized during the clothes drying operation and in which said unit containing the operating parts is positioned inside the drying drum in a retracted position when the structure is not used as a clothes drier so that the overall depth or length of the structure is substantially that of the depth or length of the drying drum.

Another object of this invention is to provide a clothes drier defined in the preceding paragraph which will operate as a room heater when the unit containing certain of the operating parts is positioned inside the drying drum.

Another object of this invention is to provide a clothes drier in which certain of the operating parts are mounted as a unit, which unit is positioned exteriorly of the drying drum and pivoted on a horizontal axis, as well as on a vertical axis to permit said unit to be hinged and rotated relative to the drying drum.

Another object of this invention is to provide a clothes drier of the character set forth in the preceding paragraph whereby rotation of the unit containing the operating parts converts the structure from a clothes drier to a room heater and vice versa.

Another object of this invention is to provide a structure of the foregoing character which is portable which is of such size that it may be used in the living quarters of a home, such as the kitchen or the like, and which may be readily stored in a closet without occupying much storage space.

Another object of this invention is to provide a clothes drier and room heater which may be readily mounted in a window.

Other objects will become apparent as this description progresses.

In the drawings:

FIGURE 1 is a front elevational view of the unit in clothes drying position.

FIGURE 2 is a side elevational view thereof.

FIGURE 3 is a vertical sectional view taken on lines 3—3 of FIGURE 1.

FIGURE 3A is an enlarged view showing the drive shaft, pinion and ring gear on the drying drum.

FIGURE 4 is a rear elevational view of the unit.

FIGURE 5 is a sectional view taken on the same lines as FIGURE 3 but showing the front part containing the blower, heater and motor pivoted away from the drum housing.

FIGURE 6 is a sectional view taken on the same lines as FIGURE 3 but with the front part locked in a reversed position from FIGURE 3 so that it may be used as a room heater.

FIGURE 7 is a front elevational view of FIGURE 6.

FIGURE 8 is an enlarged view of the hinging device.

FIGURE 9 is a front perspective view of the unit positioned in the window and showing the parts positioned for clothes drying operation.

FIGURE 10 is a view similar to FIGURE 9 but show-

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ing the front part positioned for use as a room heater, and

FIGURE 11 is an elevational view taken from the rear showing a modification in which a separate motor is used for rotating the drying drum.

The unit comprises a housing generally indicated at 14, having a front wall 15, a rear wall 16, a top 17, bottom 18, and side walls 19. The side walls 19 slope outwardly from the top and bottom toward the center for purposes of appearance. Any shaped housing may be used. The front wall 15 is provided with an enlarged annular opening 20.

Rotatably supported within the housing 14 is a drying drum or tumbler generally indicated at 22 which comprises an annular body 24 which is provided with spaced perforations 26 throughout. The drum has a rear wall 28 which is centrally provided with a bearing sleeve 30 which is rotatably supported on a shaft 32 fixedly supported on the rear wall 16 of the housing 14. A plurality of spaced inwardly extending ribs or fins 34 are provided for facilitating tumbling of the clothes in the drum, as is well understood. The rear wall 16 of the housing is provided with an opening within which is supported an exhaust and lint filter trap generally indicated at 36, well known in the art, which may be removed for purposes of cleaning and removing the lint. The drum is provided at the front thereof with an annular flange 38 to which is fixedly secured a ring gear indicated at 40.

The electric motor, blower and heating element which are collectively generally indicated at 42 are contained and supported as a unit within a semi-spherical housing or shell generally indicated at 44. The aforesaid elements and housing will sometimes hereafter be referred to as the operating unit. The operating unit is adapted to be pivotally and rotatably mounted as a single unit with respect to the housing 14 so that when it is desired to use the structure as a clothes drier the operating unit is positioned so that the semi-spherical housing 44 is positioned forwardly or outwardly of the front wall of the housing, as best shown in FIGURES 1 to 3 inclusive. This extends the overall length of the drier in drying operation and leaves the tumbler or drum 22 free to be occupied with the clothes to be dried.

When it is desired to use same as a room heater, or when it is desired to carry same as portable unit or to store the unit away so that very little space is occupied in stored position, the semi-spherical shaped housing 44 is rotated and secured as shown in FIGURES 6 and 7 so that the semi-spherical shaped housing 44 is positioned inside the drum 22 with the flat wall of the semi-spherical shaped housing substantially flush with or slightly forwardly of the front wall 15 of the housing 14. In this position the length or depth of the unit is substantially that of the housing 14.

More specifically, the semi-spherical housing generally indicated at 44 comprises an annular flat plate 46 having an annular rim 47 which telescopes on the dome shaped body 48 to secure same together. The dome shaped body 48 is detachable from the flat plate 46 to permit access to the interior of housing 44 for access to the operating units 42, now to be specifically described.

Suitably supported within the semi-spherical housing 44 is the electric motor 50, blower 52 and heating coil 54. The electric motor 50 operates the blower 52 and also serves to rotate the drying drum 22 when the structure is used as a clothes drier. When used as a room heater, the drying drum 22 will be operatively disengaged from the electric motor 50 and hence the drying drum 22 will not be rotated. In this latter condition the electric motor 50 will then only operate the blower 52 and not rotate the drying drum. The heating coil 54 will also then be operating.

The motor 50 has a motor shaft 56 on which is fixedly secured a bevel gear 57 which meshes with bevel gear 58 fixedly secured to drive shaft 62 to drive same. The bevel gears operate to form a right angle drive with a two to one reduction ratio. The drive shaft 62 rotates at one half the speed of the electric motor. A gear case 60 is secured to the motor housing and said gear case has an opening 61 for passage of the drive shaft 62 which also serves as a bearing to support the upper end of the drive shaft.

The drive shaft 62 carries a pinion 64 at the lower end thereof for operative engagement with the ring gear 40 on the drying drum 22 for rotating said drum. The driving shaft 62 is suitably supported on a bracket 66 secured to flat plate 46. The lower end of shaft 62 extends through a suitable opening 68' in the plate 46 so that the pinion 64 is exposed for engagement with the ring gear 40.

It will be understood that the pinion 64 engages the ring gear 40 to drive the drying drum 22 only when the semi-spherical housing 44 is locked in position, as shown in FIGURES 1 to 3 inclusive, i.e. when the unit is used as a clothes drier and not when the semi-spherical housing is in reversed position as shown in FIGURES 6 and 7, such as when the unit is stored or when used as a room heater.

The air turbine or blower 52 is mounted so that the motor shaft 56 of the electric motor 50 also drives the blower 52. The blower 52 is enclosed within a housing generally indicated at 66, the lower end of which is shaped to provide a communicating duct 68 terminating in a outlet opening 70 in the flat plate 46 of the semi-spherical housing 44. A grill 72 covers said opening. The electrical heating element 54 is suitably supported on a porcelain base and suitably secured as at 67 to the wall of the housing within the duct 68 of the blower and in the path of the movement of air from the air turbine to heat the air before it is discharged from the air turbine housing. The air turbine housing 66 is provided with suitable air intake openings as is well understood.

The dome shaped body 48 is provided with an enlarged opening 74 provided with a grill 76 for air to the housing 44.

The motor 50 and blower 52 are suitably supported on brackets secured to the flat plate 46 so that the dome shaped body 48 may be removed for servicing same. The heating element 54 is likewise suitably supported in the duct 68.

The semi-spherical housing 44 is secured to the drum housing 14 so that the housing 44 may be pivoted and rotated with respect to the drum housing 14. Fixedly secured to the front wall 15 of the housing 14, below the enlarged opening 20, are a pair of spaced ears 78, each provided with a transverse opening adapted to receive the opposite ends 79 of the transverse member 80 of a T-shaped hinge member generally indicated at 82 and best shown in FIGURE 8. The upright stem 84 of the T-shaped hinge is suitably received in a bushing 86 fixedly secured to the flange 47 of the flat plate 46 of the semi-spherical shaped housing 44 so that the semi-spherical housing 44 may be rotated 180 degrees on the stem 84 of the hinge as a vertical axis. Suitable washers 85 are fixedly secured to the stem 84 above and below the bushing 86. The T-shaped hinge 82 also permits pivoting or hinging on a horizontal axis of the semi-spherical shaped housing 44 with respect to the drum housing 14, as shown in FIGURE 5, through the transverse member 80 and ears 78.

The semi-spherical shaped housing 44 may thus be selectively positioned and secured in either the clothes drying position shown in FIGURE 3 or in the room heating position shown in FIGURE 6.

A suitable lock generally indicated at 87 is secured to the upper end of the semi-spherical housing 44 to lock it to the drum housing 14 in either position.

The flat plate 46 may be indented as at 88 to provide a handle surface. A handle 89 is also secured to the top of the semi-spherical shaped body 48 and said handle may be conveniently grasped in pivoting and rotating the housing 42.

A U-shaped member 90 is pivotally secured as at 91 to the side walls of housing 14. U-shaped member 90 may be used as a handle in transporting the unit and may be used as a support for the unit when positioned forwardly and downwardly as shown in FIGURE 3, particularly when the semi-spherical shaped housing is positioned outwardly of the housing when same is used as a clothes drier.

Switch means 92 are mounted on the front wall 15 of the drum housing 14 for opening and closing the circuit to the electric motor 50 and heating element 54. The electrical circuit is not illustrated as same is conventional and well understood.

The operation will be understood from the foregoing but briefly described is as follows. When it is desired to use same as a clothes drier, the semi-spherical housing 42 is pivoted, as shown in FIGURE 5, to permit the clothes to be inserted into the drum 22 through the opening 20 in the front wall of the drum housing 14. The semi-spherical housing 44 is then positioned as shown in FIGURE 3 in which the flat plate 46 thereof is facing inwardly toward the drum 22. The pinion 64 will then be in engagement with the ring gear 40. When the switch 92 is closed the electrical circuit will be closed to operate; the motor 50 will through gear 57 and bevel gear 58 rotate the shaft 62 and pinion 64 to rotate the drum 22. Simultaneously the air turbine or blower 52 will be operated to force air through the air turbine housing, past the heating element 54 which is then operating and through the duct 68 and into the rotating drum 22 for the purpose of drying the clothes tumbling in the drum. The hot air is vented through the exhaust filter trap 36 which also traps the lint. After the drying operation, the semi-spherical housing 44 is pivoted away from the front wall of the housing 14, as in FIGURE 5, and the dried clothes may be removed.

In converting the unit to a room heater, the semi-spherical housing 44 which contains the operating unit 42 is pivoted on its horizontal axis, substantially to that shown in FIGURE 5 and then rotated 180 degrees on its vertical axis of rotation and then locked in position, as shown in FIGURE 6. In this position the flat plate 46 faces outwardly and the semi-spherical portion faces inwardly toward the drum 22 and is positioned inside the drum. The pinion 64 will also be facing outwardly and will be disengaged from the ring gear 40 so that no rotation is imparted to the drum. With the switch 92 closed, the electric motor 50 will operate the blower 52. The heating coil 54 will also be operating. The heated air will then be forced outwardly through the outlet forwardly of the unit to heat the room air. In this position none of the heated air will pass into the drum.

In the modification shown in FIGURES 9 and 10, the unit may be mounted in a window to rest on the window sill. The front wall 15 of the unit faces inwardly into the room while the back wall 16 of the housing faces outwardly of the room. Upper and lower bars 94 having their opposite ends channeled as at 95 are secured to the housing 14 and said bars extend laterally of the housing and are suitably secured in any well known manner to the sides of the window member to support the unit in the window. Filler panels 96 are secured in the channels of the bars to close the open area between the unit and the sides of the window frame.

When thus mounted in a window, the unit may be used either as a drier or as a room heater, as previously described. The advantages of mounting the unit in a window is to conserve floor space as well as reduce the humidity of the room due to the exhausted air during

the drying operation from exhausting into the room. In the window unit the exhausted air in the drying operation will be exhausted through the back wall of the unit to the outside. Likewise, the lint trap will be positioned exteriorly of the room.

FIGURE 11 shows a modification in which the rotatable drying drum 22 is operated by a separate electric motor and is not operated by the electric motor in the semi-spherical unit. As shown in FIGURE 11, an electric motor 96 is fastened on the bottom of the interior of the drum housing 14. The drum 22 has fixedly secured to it a wheel 97 which is driven by a belt 98 connected to the drive shaft of the motor 96 to rotate the drum 22. In this instance, a separate switch is provided for operating the motor 96. The construction shown in FIGURE 11 is identical to that previously described in connection with FIGURES 1 to 10 inclusive, except for the elimination of the bevel gears 57 and 58, drive shaft 62, pinion 64 and the ring gear 40 on the drying drum, since same were used to rotate the drum. In this modification the electric motor in the semi-spherical housing is used solely for the purpose of operating the blower or air turbine. If desired, the motor 50 may be eliminated if it is embodied as part of an air blower 52, as is well understood in the art. In all other respects the construction is the same as described in connection with the foregoing Figures.

It will be understood that various changes and modifications may be made from the foregoing without departing from the spirit and scope of the appended claims.

I claim:

1. In a structure of the character described comprising a housing having an enlarged opening, a rotatable drum supported within said housing, means for rotating said drum, said rotatable drum having an opening accessible through said enlarged housing opening, a second housing, a heating element and a blower supported in said second housing, an inverted T-shaped member including a stem portion and a transverse portion for supporting said second housing with respect to said first housing, one of said portions secured to the second housing and the other portion secured to the first housing so that the second housing is pivotally mounted for rotation about its own axis on the first housing so that the second housing may be selectively positioned and secured in either of two positions with respect to said housing opening; in one of said positions the second housing is positioned to extend substantially within said first housing so that the heated air from the blower is directed outwardly of the housing for heating a room and in the other of said selected positions said second housing is positioned to extend substantially outside said first housing so that heated air from the blower is directed inwardly into the drum for drying the clothes within said drum.

2. In a structure of the character described comprising a housing having an enlarged opening, and having vent means for flow of air therethrough, a rotatable drum supported within said housing, means for rotating said drum, said rotatable drum having an opening accessible through said enlarged housing opening, a second housing, a heating element and a blower supported in said second housing, a connecting member secured to said housing and to said second housing for supporting said second housing in relation to said housing, said connecting member having means for pivotally and rotatably supporting said second housing so that the second housing may be selectively positioned and secured in either of two positions with respect to said housing opening to close said housing opening, in one of said selected posi-

tions the discharge end of the blower is directed outwardly of the drum and in the other of said selected positions the discharge end of the blower is directed inwardly in the direction of the drum.

3. In a structure of the character described comprising a housing having an enlarged opening, and having vent means for flow of air therethrough, a rotatable drum supported within said housing, means for rotating said drum, said rotatable drum having an opening accessible through said enlarged housing opening, a second housing, a heating element and a blower supported in said second housing, a connecting member secured to said housing and to said second housing for supporting said second housing in relation to said housing, said connecting member having means for pivotally and rotatably supporting said second housing so that the second housing may be selectively positioned and secured in either of two positions with respect to said housing opening to close said housing opening; in one of said selected positions the second housing is positioned to extend substantially within said first housing so that the discharge end of the blower is directed outwardly of the drum and in the other of said selected positions the second housing is positioned to extend substantially outside said first housing so that the discharge end of the blower is directed inwardly in the direction of the drum.

4. In a structure defined in claim 3 in which the rotatable drum is adapted to receive articles to be dried and said drum is rotated when the second housing is positioned substantially exteriorly of the first housing and in which the rotatable drum is stationary and the heated air is exhausted into the room when said second housing is positioned substantially interiorly of the first housing.

5. In a structure defined in claim 3 which is mounted in the window of a room.

6. In a structure of the character described comprising a housing having an enlarged opening and having vent means for flow of air therethrough, a rotatable drum supported within said housing, means for rotating said drum, said rotatable drum having an opening accessible through said housing opening, a substantially semi-spherical shaped housing, a heating element and a blower supported in said semi-spherical shaped housing, a connecting member secured to said housing and to said semi-spherical shaped housing for supporting said semi-spherical shaped housing in relation to said housing, said connecting member having means for supporting said semi-spherical shaped housing so that said semi-spherical shaped housing may be selectively positioned manually and secured in either of two positions with respect to said housing opening; in one of said selected positions the semi-spherical portion of said semi-spherical shaped housing extends substantially within said drum housing so that the discharge end of the blower is directed outwardly of the drum and in the other selected position the semi-spherical portion of said semi-spherical shaped housing is positioned to extend substantially outside said drum housing so that the discharge end of the blower is directed inwardly in the direction of the drum.

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