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HEAT RECLAIMER FOR GAS FIRED DRYERS

Filed Oct. 18, 1961

2 Sheets-Sheet 1

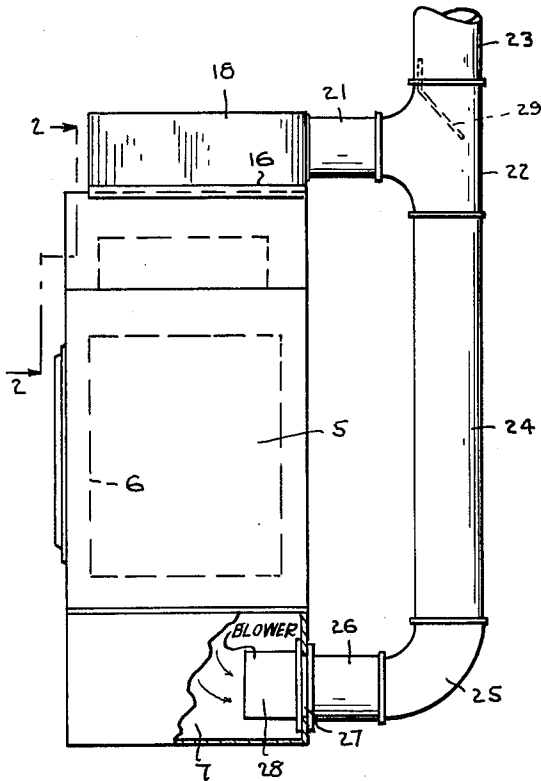


FIG. 1.

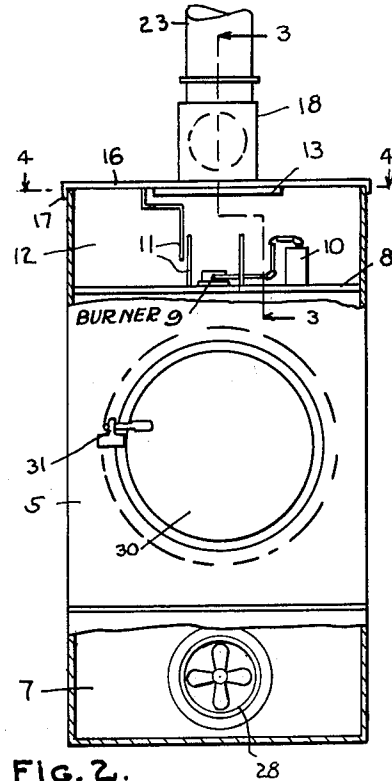


FIG. 2.

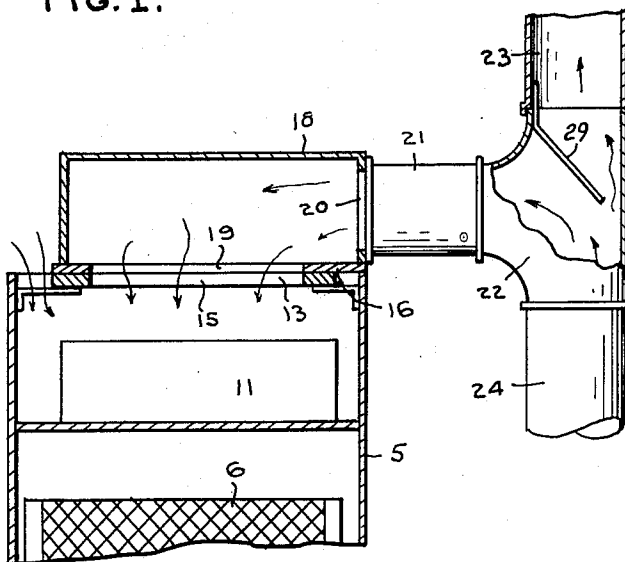


FIG. 3.

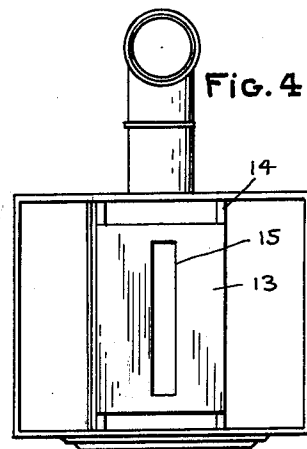


FIG. 4.

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2 Sheets-Sheet 2

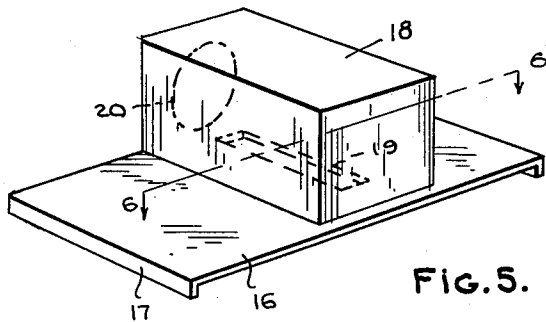


FIG. 5.

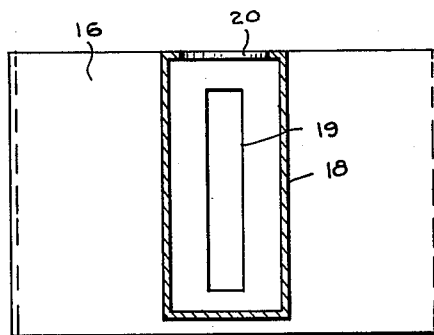


FIG. 6.

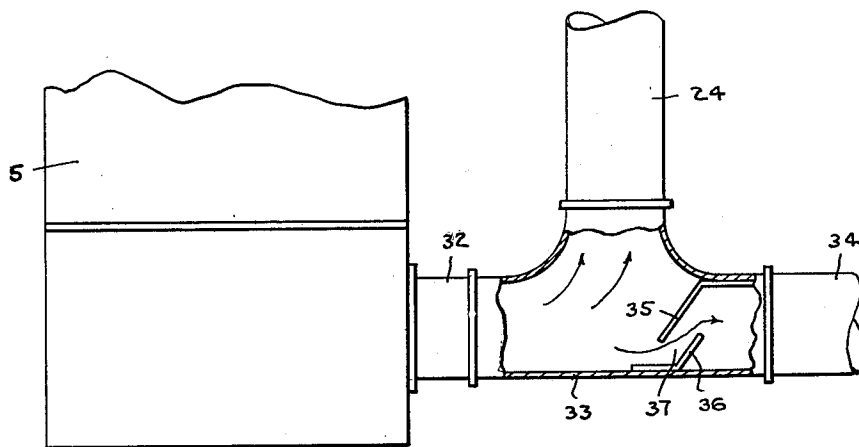


FIG. 7.

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1

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HEAT RECLAIMER FOR GAS FIRED DRYERS
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1 Claim. (Cl. 263—33)

This invention relates to clothes dryers and has particular reference to a clothes dryer of the tumbler type that is gas heated.

The invention has particular reference to such a dryer that has been modified in a manner to collect heated air that has been directed through the machine and through the tumbler and to recirculate heated air discharged from a lint trap whereby a major portion of the preheated air is redirected over the top of the device for recirculation through the drum.

Clothes dryers of the type generally illustrated in this application embody an upper chamber wherein is disposed a gas burner and a hot plate against which the flames from the burner are directed and turned downwardly to force the hot air through the machine. Hot plates in such an arrangement are not new nor is the burner mechanism and associated baffles novel in this application. The invention herein comprises a hood device having a pan or plate that overlies the major portion of the heat chamber and spaced from one side of the machine to permit the entrance of oxygen and with the plate being provided with a generally rectangular hood that is slotted at its bottom through the plate and communicating with and corresponding to a slot formed in the hot plate and with the hood being connected by conduits from the lint trap so that preheated air from the lint trap will be directed upwardly and into the hood for discharge downwardly through the slots to effectively superheat the air and with moist air escaping upwardly past a baffle for discharge from a stack.

Novel features of construction and operation of the device will be more clearly apparent during the course of the following description, reference being had to the accompanying drawings wherein has been illustrated the preferred forms of the device and wherein like characters of reference are employed to denote like parts throughout the several figures.

In the drawings:

FIGURE 1 is a side elevation of a dryer device constructed in accordance with the invention, parts being broken away from purpose of illustration,

FIGURE 2 is a front elevation of the machine, parts being broken away for purpose of illustration,

FIGURE 3 is a slightly enlarged section through the upper portion of the machine, taken substantially on line 3—3 of FIGURE 2,

FIGURE 4 is a horizontal section taken substantially on line 4—4 of FIGURE 2,

FIGURE 5 is a perspective view of the hood and its supporting plate,

FIGURE 6 is a horizontal section taken substantially on line 6—6 of FIGURE 5, and

FIGURE 7 is a view partly in section and partly in elevation showing a slightly modified form of the device.

Referring specifically to the drawings, there has been illustrated a casing 5, wherein is disposed the usual and well known rotary tumbler 6. The casing 5 is partitioned adjacent its bottom to form a lint trap 7. The casing 5 adjacent its upper end is partitioned as at 8 to support the well known gas burner 9, having a source of supply 10. The usual baffles 11 are supported in the upper chamber 12 for directing the flames from the burner 9 directly against the bottom of a fixed, relatively heavy hot plate 13. The hot plate 13 is supported in any desirable manner, as by brackets 14, anchored to the walls constituting the closure for the chamber 12. The hot plate 13, see par-

2

ticularly FIGURE 4 is slotted at 15, for a purpose to be presently described. The chamber 12 is normally open at its top and is normally partially closed by the hot plate 13.

Adapted to be disposed over the open side of the chamber 12 and to overlie the major opening thereof, is a cap plate 16, provided upon its ends with reinforcing lips 17 whereby the plate 16 may be supported upon the casing against shifting. The plate 16 may be fixedly connected in any desirable manner to the end walls of the chamber 12. The forward edge of the plate 16 is slightly spaced from the forward edge of the casing 5 for providing a relatively narrow opening for the full width of the machine so as to permit the entry of fresh air and oxygen to the chamber 12. Intermediate the length of the plate 16, there is provided a generally rectangular hood 18, connected to the plate 16 in any desirable manner and with the plate 16 constituting the bottom of the hood 18. The plate 16 intermediate the width of the hood 18 is slotted at 19 and with the slot 19 being identical to the slot 15 of the plate 13 and also registering with the slot 15 whereby the preheated air may be directed from the hood downwardly to the slots 19 and 15 to be discharged in the area of the flames from the burner 9. The hood 18 is cylindrically apertured at its rear end as at 20 for the coupling connection with a cylindrical conduit 21. The conduit 21 is connected to a T-fitting 22 and the fitting 22 at its upper end has connection with a discharge stack 23. The lower end of the fitting 22 has connection with a vertically disposed conduit 24. The conduit 24 has connection at its lower end with an L-fitting 25 and the fitting 25 at its opposite end is connected to a horizontal conduit 26 that communicates with a discharge opening 27, communicating with the lint trap 7. Inwardly of the opening 27, there has been provided any suitable blower or forced draft device 28. The conduits 21 to 26 and the fittings 22 and 25 are preferably formed of any suitable sheet metal and are preferably cylindrical in cross section. Fixed within the fitting 22 is a baffle 29, the baffle being slightly spaced from the rear wall of the fitting 22 to form a relatively restricted opening for the escape of moist air. The casing 5 is of course provided with the usual and well known access door 30, having latch mechanism 31.

In FIGURE 7, there has been illustrated a slightly modified form of the device, wherein the air from the dryer is discharged by the blower 28 into a relatively short conduit 32, having connection with a T-coupling 33. The T-coupling has connection with the conduit 24, similar to the first form of the invention. The T-coupling 33 has a discharge conduit 34, being so designed in cases where the air is to be finally discharged through the wall of a building. Disposed within the coupling 33 is a pair of baffle plates 35 and 36, the baffle plates 35 and 36 being in overlapping relation to form a relatively constricted escape opening 37, whereby the moist air being discharged from the device may be conducted from the conduit 34 for exhaust outwardly of the machine. All parts, with the exception of the actual mechanism of the dryer assembly are preferably formed of sheet metal of relatively light gauge.

In the use of the device, the plate 16 and its attached hood 18 are assembled, with the slot 19 being preformed into the plate 16. Conduits 21, 24 and 26 and the couplings 22 and 25 are assembled in their respective openings 20 and 27 and the blower 28 installed. Within the burner in operation, heated air is directed downwardly through the casing 5 and through the tumbler 6, effectively engaging the clothes in the tumbler and passing downwardly to the lint trap 7. The blower 28 picks up the heated air and forces it through the conduits upwardly for discharge into the hood 18 where it is directed downwardly through the slots 15 and 19 to be further heated

and recirculated through the machine, moist air will pass upwardly beyond the baffle 29 for escape from the stack 23. The preheated air in the form of the invention illustrated in FIGURE 7 is recirculated in a similar manner but the moist air is forced to escape through the conduit 34, past the baffles 35 and 36, the dry air passing upwardly through the conduit 24 to be again recirculated and this action continues until the clothes are thoroughly dry and permits only the dry air to enter the hood 18 to be again heated as it passes through the slots 15 and 19.

The lips 17 of the plate 16 are primarily to reinforce the plate 16 against warping under the influence of the heat and, while the lips have been shown as being turned downwardly, it will of course be apparent that these lips may be upstanding and other means provided to support the plate 16 over the chamber 12 against accidental movement. The blower 28 is of any desirable construction, such as presently employed in dryers of this type and the blower may be of a fan type or the well known squirrel cage type and forms no part of the present invention.

It will be apparent from the foregoing that a very novel air recirculation means has been provided for the well known tumbler type of dryer that is heated by a gas burner. The device is simple, strong, easily assembled over the conventional dryer and by such recirculation of the reheated air, there has been a very remarkable decrease in the cost of gas consumption amounting to substantially 50 to 60% in the actual cost of the gas consumption. The structure requires no alterations to the existing dryer devices other than the slotting of the hot plate 13.

It is to be understood that the invention is not limited to the precise construction shown, but that changes are contemplated as readily fall within the spirit of the invention as shall be determined by the scope of the subjoined claim.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

A heat reclaimer, in combination with a clothes dryer of the type comprising a casing that includes an upper heat generating chamber means, an intermediate chamber means including rotary drum dryer means and a lower lint chamber means, said chambers all being communicating, said upper chamber being open at the top, a hot plate supported in the opening at the top of the upper

chamber and flush with said opening, said hot plate being provided with a longitudinal slot, a gas burner supported upon a partition element arranged between the upper and intermediate chambers in a manner to direct a flame against the hot plate, means for supplying fuel to the burner, baffles supported within said upper chamber for directing the flame from the burner directly against the bottom of the hot plate, a cap plate extending across the opening of the heat chamber to close the opening for its major width and to define a relatively narrow opening leading into the heat chamber for conducting air to the heat chamber, the said cap plate comprising reinforcing lips at its opposite ends which seat upon the marginal edges of opposite side walls of the casing, the said cap plate being provided with a longitudinal slot which is in alignment with the slot in said hot plate, a hood fixed upon said cap plate, said hood communicating with a conduit at its rear end, said lint chamber being provided with a suction blower, said suction blower communicating with a conduit rearwardly of said casing, the first and second named conduits being coupled to a vertical conduit for the escape of heated air that is passed downwardly from said heat generating chamber and through the rotary drum dryer means in the intermediate chamber and to the lint chamber, a discharge stack connected to said vertical conduit, couplings connecting said first and second named conduits to said vertical conduit and an angled baffle plate disposed in the coupling for the first named conduit whereby air flowing from said blower will have a portion thereof deflected by said baffle plate to said hood and downwardly through the slots of said cap plate and said hot plate, a portion of the air passing upwardly and about said baffle to said discharge stack.

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