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AIR AGITATED LAUNDRY DRIER

Original Filed April 26, 1960

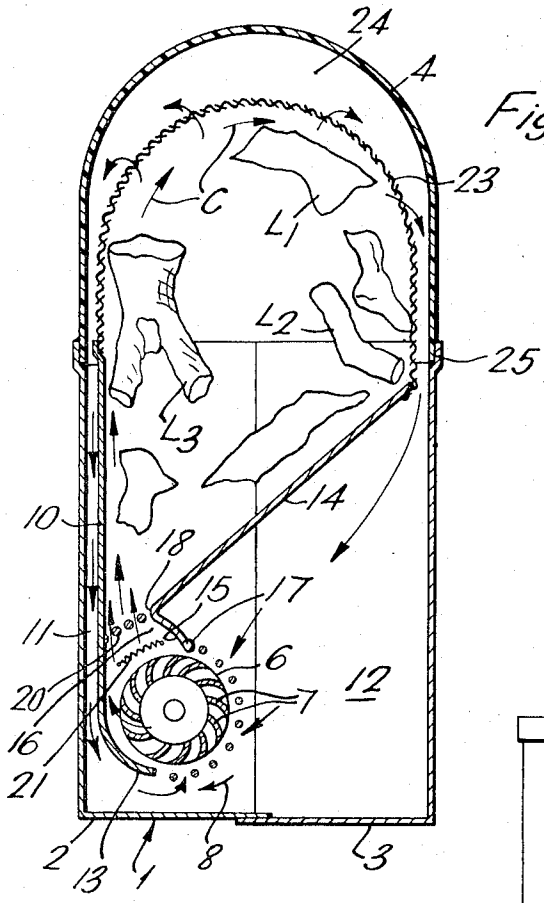
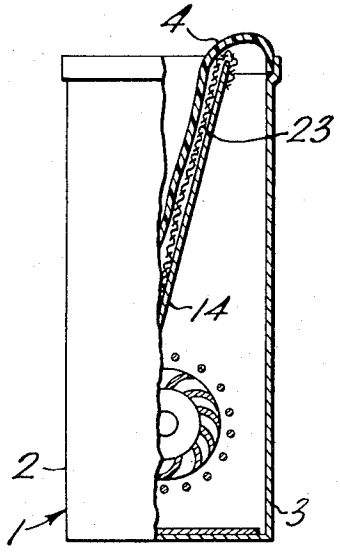


Fig. 1.

Fig. 2.



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AIR AGITATED LAUNDRY DRIER

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Original application Apr. 26, 1960, Ser. No. 24,807, now Patent No. 3,152,876, dated Oct. 13, 1964. Divided and this application Sept. 1, 1964, Ser. No. 393,500
Claims priority, application Germany, Apr. 28, 1959, L 33,124
4 Claims. (Cl. 34—151)

This invention relates to laundry driers. The application is a division of application Serial No. 24,807 filed April 26, 1960, now Patent No. 3,152,876.

Laundry driers have hitherto commonly fallen into one of two classes. In the simpler forms of drier, the clothes are hung or otherwise supplied so as to be stationary and a stream of warm air is blown past them: the most elementary form of drier relies simply on convection from a heat source below the laundry. One disadvantage with such driers is that even if the clothes are expertly arranged, one corner of some item is likely to remain damp long after the rest has dried off because it has been shielded in some way from the drying air stream; the laundry is not fit for use or storage until all items are completely dry, so that just for the one damp item the drier has to be kept in operation long after most of the laundry is bone dry, thus wasting time and heat. This disadvantage can be minimized by supporting the clothes in widely spaced relation, but this merely aggravates another disadvantage of the apparatus, which is its bulk. Efforts to improve matters by special supporting arrangements merely make the drier difficult to load and unload or unable to accept varying types of laundry. The other main class of laundry drier is the tumbler drier, in which a drum containing the laundry is rotated in a stream of warm air. Because the clothes are continually falling through the drying stream and shifting their position, they tend to dry evenly. The tumbler drier is consequently a relatively efficient and time-saving device, but it is inevitably rather bulky and tends to be expensive and also noisy.

The invention, by contrast with the two types of drier above mentioned, provides a laundry drier operating on an entirely new principle, whereby the clothes are kept in agitation within a drying chamber by one or more streams of warm air directed into it. The drying chamber is preferably defined in part by flexible means, such as can collapse into a small space after use. The drier according to the invention may accordingly be compact, and due to the agitation of the clothes may nevertheless have the advantages of the tumbler drier.

One embodiment of the invention will now be described by way of example with reference to the accompanying somewhat diagrammatic drawings in which:

FIGURE 1 is a vertical section taken through a laundry drier in operative condition, and

FIGURE 2 is a vertical section through the FIGURE 1 laundry drier, in condition for storage.

Referring to the drawings, the laundry drier there shown comprises a rectangular open topped casing **1** formed in two rigid parts **2**, **3** telescoping together as will be apparent from a comparison of the two figures. The casing **1** is closed at its top by an impervious hood **4** of lightweight flexible material. In the operative condition of the drier the blower, to be described, produces a pressure above atmospheric in the casing **1** and its hood **4**; due to this pressure the hood adopts the erect position indicated in FIGURE 1 wherein it encloses a substantial volume. When the blower is not operating the hood **4** can be collapsed into the casing **1**, as shown in FIGURE 2.

Near the bottom of the casing **1** and to the left-hand side thereof as seen in FIGURE 1 there is mounted for rotation about a horizontal axis **5** a cylindrical rotor **6** having a series of similar curved blades **7** extending parallel to the axis and arranged in a ring thereabout: the blades are concave facing the direction of rotation, indicated by the arrow **8**, and have their outer edges leading. The means for driving and supporting the rotor **6** are of conventional type and are not shown.

A partition **10** of sheet material extends down the left-hand side of the casing **1** parallel to the adjacent wall thereof and defines therewith a narrow duct **11** leading to an air inlet region **12** at the bottom of the casing. The bottom part of the partition **10** is curved towards the rotor **6** whereby to provide a guide wall **13** therefor. A second wall **14** slopes downward towards the rotor **6** from a line close to but spaced from the wall of the casing **1** opposite the partition **10**. The second wall **14** has its lower portion return-bent to form a main guide wall portion **15** subtending a small angle (some 20°) at the rotor axis **5** and defining with the rotor a gap **16** which, in the particular embodiment shown, converges in the direction of rotor rotation. The line of nearest approach of the main guide wall portion **15** to the rotor **6** is about diametrically opposite that of the guide wall **13** provided by the partition **10**, and both lines of nearest approach are well spaced from the rotor. The main guide wall portion **15** terminates at the air inlet region **12** in a rounded-out lip **17** and on the outlet side merges into the remainder of the wall **14** in a rounded nose **18**.

The rotor **6** on rotation co-operates with the guide means formed by the main guide wall portion **15** and the guide wall **13** to induce a flow of air from the inlet region **12** through the path of the rotating rotor blades to the interior of the rotor and thence again through the path of the rotating blades to the outlet side of the rotor. The flow paths through the rotor are shown by the chain dotted lines F. The lower parts of the partition **10** and second wall **14** form, above the nose **18**, a diffuser. The rotor **6** and guide means therefor just described form the blower previously referred to.

The wall **14** is pivoted adjacent the nose **18** to accommodate the telescoping of the casing parts **2**, **3**.

A grid or perforated plate **20** extends between the partition **10** and the second wall **14** at the level of the nose **18**. Electric heater means are provided below the grid **20**, as diagrammatically shown at **21**. The partition **10** and second wall **14**, together with the side walls of the casing **1** form an asymmetrical hopper **22** in which is placed damp laundry to be dried (certain items are indicated at L_1, L_2 etc.). The hopper **22** is closed at its upper part by a light flexible netting **23** or perforated light flexible sheet material. This netting **23** in the storage condition of the drier folds down into the hopper together with the hood **4**, as show in FIGURE 2: together with the hood it can be detached from the casing **1** to permit loading of laundry into the hopper **22**, and removal of laundry therefrom. In the operative condition of the drier wherein the blower produces a slight superatmospheric pressure the netting **23** can extend upwardly within the erected hood **4**, but in spaced relation thereto so that there is always a free space **24** within the hood which communicates with the duct **11** at one side and the gap **25** between the top of the second wall **14** and the adjacent casing wall.

In operation of the drier the clothes in the hopper **22** tend to collect at the bottom of it over the grid **20**. The upwardly directed stream of air leaving the rotor **6** impinges on the clothes and throws them upwards, causing a circulation of clothes as shown by the arrows C. Clothes which have been thrown up fall on the sloping second wall **14** and slide back to the grid **20**, whereupon

the process is repeated. Air leaves the hopper through the netting **23** and returns through the space **24**, duct **11** and gap **25** to the inlet region **12**.

The drier illustrated can clearly be made very compact and will be seen to have many of the advantages of a tumbler drier without its bulk and complication.

The electric heater **21** can be replaced by a heat exchanger connected in a central heating system.

I claim:

1. A laundry drier comprising an outer enclosure, a hopper-shaped laundry containing chamber within the outer enclosure, and a blower discharging a stream of warm air upwardly from the bottom of the chamber to maintain the laundry in agitation as the air passes through the chamber, said chamber being asymmetrical with one wall sloping more than the opposite wall.

2. A drier as claimed is claim **1**, wherein the blower comprises a bladed cylindrical rotor and guide means extending the length thereof, the guide means cooperating with the rotor on rotation thereof to set up a flow of air which twice traverses the path of the rotating rotor blades, the rotor and guide means having the same length and extending substantially the width of the chamber.

3. A drier as claimed in claim **1**, wherein the upper part of said enclosure is of light-weight flexible material which in operation of the drier is maintained erect due to pressure above atmospheric maintained by the blower and which when the blower is not operating can collapse within the chamber.

4. A drier as claimed in claim **3**, wherein the chamber is covered by a foraminous light-weight flexible material which in operation provides a proportion of the effective volume available for the laundry during agitation thereof and which at other times can be accommodated within the chamber.

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