Dec. 18, 1962 E. M. TOELLNER 3,068,587

HAIR DRIER

Filed March 28, 1958 2 Sheets-Sheet 1

Fig.1

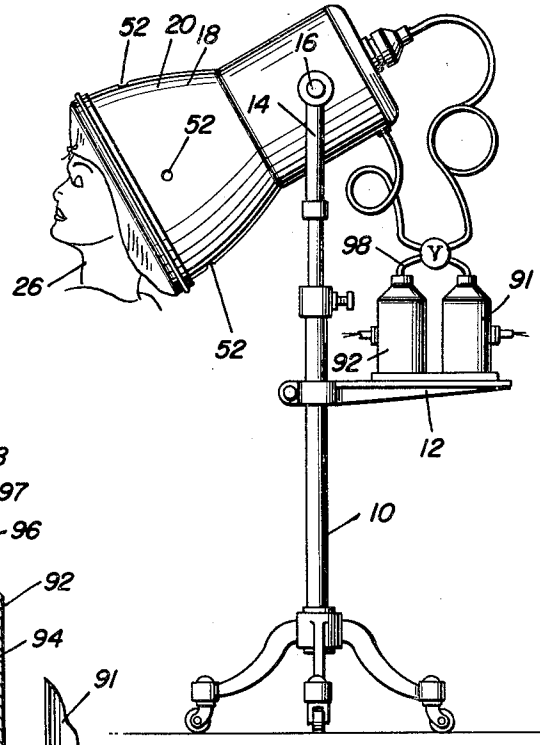

Fig.6

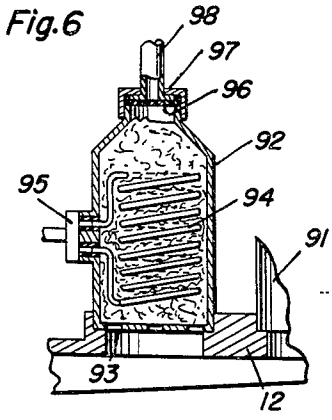

Fig.7

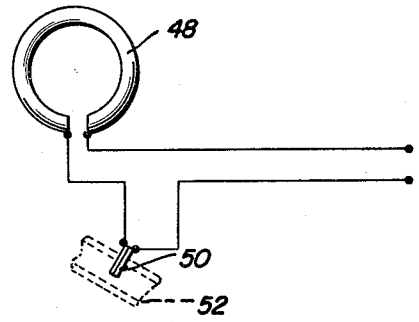

Fig.5

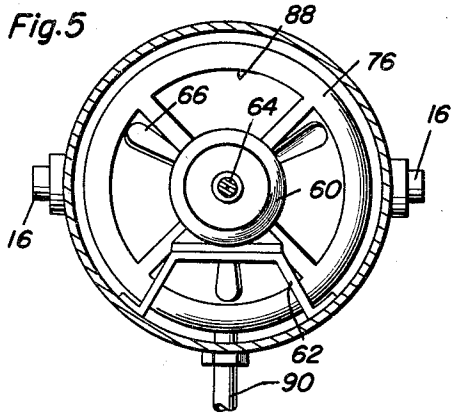

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Fig.2

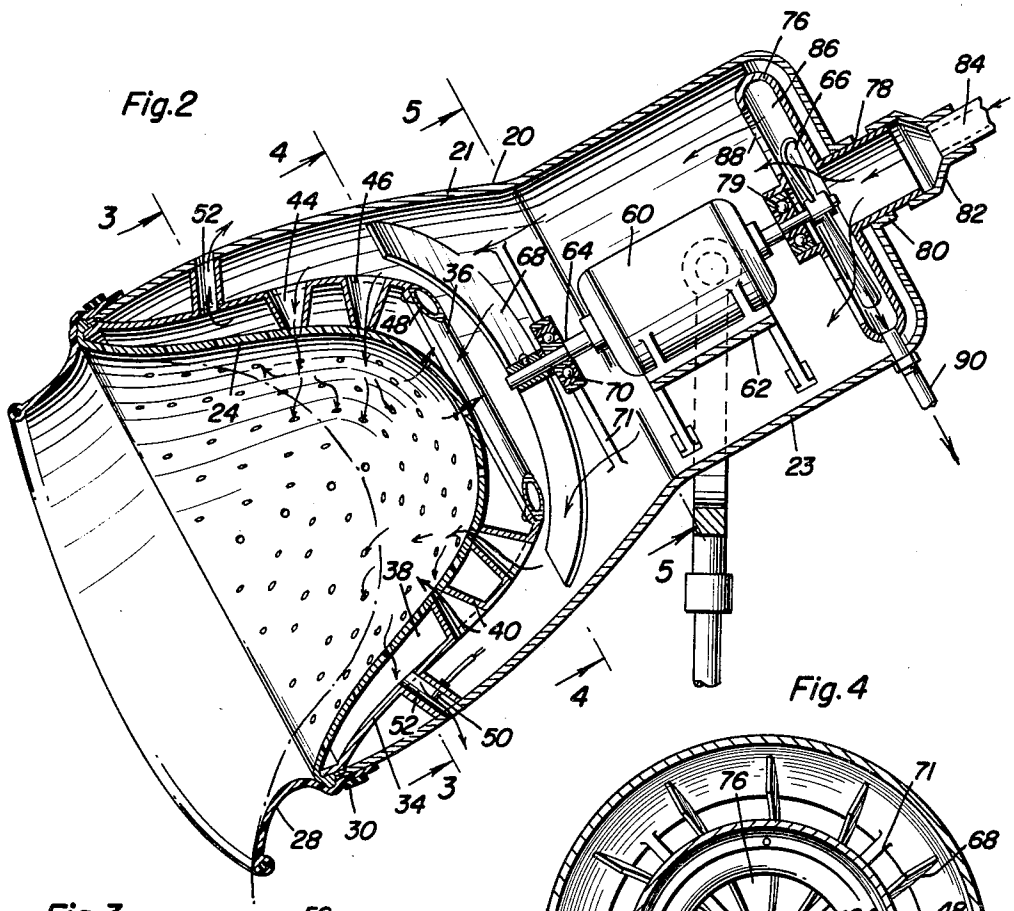


Fig.3

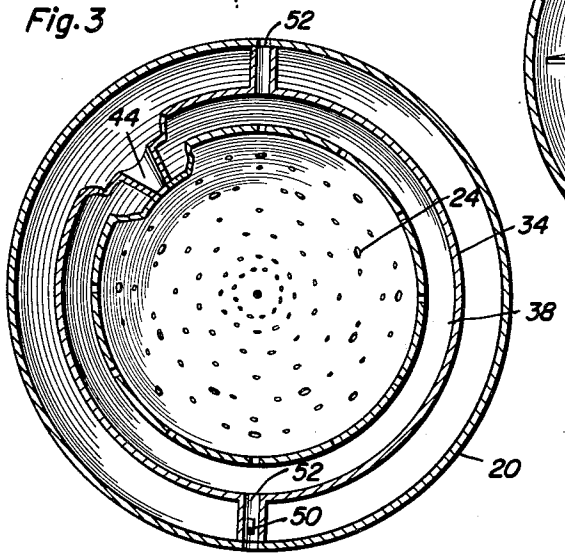
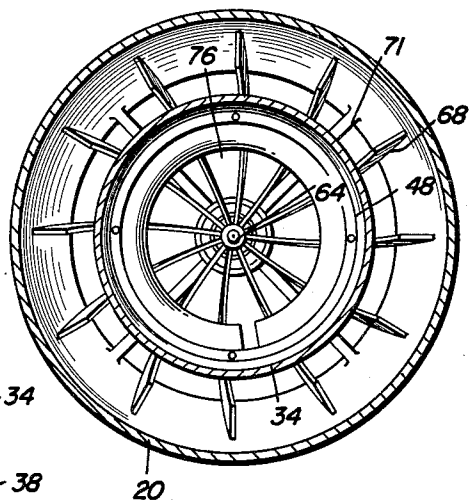


Fig.4



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United States Patent Office 3,068,587
Patented Dec. 18, 1962

3,068,587

HAIR DRIER

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Filed Mar. 28, 1958, Ser. No. 724,760
1 Claim. (Cl. 34—48)

This invention relates to hair driers and more particularly to a commercial type of hair drier having a number of improved features.

In brief, the invention is embodied in a hair drier which enables a person's hair to be comfortably dried in a much briefer time than is presently required by commercially available driers. This is achieved by a controlled flow of air through the drier. The air acts as a vehicle to carry the moisture away from the hair. A desiccant is used to dehydrate the air entering the drier to as low a moisture content as possible. The exhaust air temperature is controlled so as to maintain the drying operation at as high a level as possible and still not make the person uncomfortably hot. By using these principles, the time required to dry a person's hair is reduced from 40 minutes, which is the accepted or usual time requirement, to 16 minutes.

The hair drier is preferably used with a stand that supports the main housing within which most of the parts of the drier are assembled. There is a single motor in the main housing which operates both a primary fan and a secondary or recirculating fan. A regeneration circuit is operatively connected with the primary fan in order to bleed off a small fraction of the air for passing through a desiccant container (silica gel). In this way the drier, while it is in operation, automatically restores the desiccant. A second desiccant container has the principal air passing through it and entering the main inlet of the primary fan. The regeneration circuit, then, would include the primary fan, a small fraction air bleed connected with it, and one of two desiccant containers. Meanwhile the other of the pair of desiccant containers is used for the primary function of dehydrating the air before it enters the drier housing.

After entering the housing, the air is passed through a circuitous travel in and around the hair of the user with a part of the air being exhausted but while exhausting, having exposed thereto a thermo-responsive element. This automatically controls the heater in the housing, separating it from control of the person whose hair is being dried. This has been found to be a source of difficulty. Persons using the drier often forget the temperature control which they are ordinarily provided with until the drier becomes too hot. Then these persons will quickly turn the control to have the drier become as cool as possible and as quickly as possible. This ruins the efficiency of the drier and most of all, makes it uncomfortable for the user.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an elevational view of a typical drier constructed in accordance with the invention.

FIGURE 2 is an enlarged longitudinal sectional view of the drier in FIGURE 1.

FIGURE 3 is a transverse sectional view taken on the line 3—3 of FIGURE 2.

FIGURE 4 is a transverse sectional view taken on the line 4—4 of FIGURE 2.

FIGURE 5 is a transverse sectional view taken on the line 5—5 of FIGURE 2.

FIGURE 6 is a sectional view of a typical desiccant container forming a component of the invention.

FIGURE 7 is a schematic view showing the heater and the thermostatic control for the heater.

In the accompanying drawings there is a stand **10** on which support **12** is adjustably mounted. Upper yoke **14** is adjustably associated with the stand and has a pair of trunnions **16** by which the main housing **18** of the drier **20** is supported. Locks (unshown) are connected with the trunnions, yoke and housing to hold the housing **18** in the correct orientation.

The housing has a smoothly curved inner wall **24** within which the hair of the person **26** is to be fitted. Annular, flexible shroud **28** is attached, for example by band **30**, to the open end of housing **20**. Wall **24** is perforated for the free movement of air therethrough as shown by the arrows. A second wall **34** has a central opening **36** in its inner end and in axial alignment with the main longitudinal axis of the housing **20**. Wall **34** follows the contour of wall **24** but is spaced therefrom to provide an air duct **38** therebetween. Supporting ribs **40** extend between walls **24** and **36** to hold them properly spaced from each other and to form annular rows of air passageways **44** and **46** respectively (FIG. 2). Opening **36** has heater **48** at its marginal edge. This heater is preferably an electric heater whose energization is controlled by a thermostatic element **50** (FIGS. 7 and 2) located in one of the discharge ports **52** that registers the ambient atmosphere with passageway **38**. Port **52** is one of a plurality of such ports to exhaust a small quantity of air to the atmosphere and is made by short ducts extending between walls **34** and the wall **21** of the housing **20**.

Air circulation is obtained by an electric motor **60** that is mounted on the motor mount **62** in the neck **23** of housing **20**. The motor has a shaft **64** that has impellers **66** and **68** respectively secured to it. The impeller **68** has broadly curved blades and is located rather close to the heater **48** and in a part of the space between walls **34** and **21**. To prevent vibration and shaft wobble, a substantial bearing **70** is carried by supports **71** in the housing **20** and is located near the impeller **68**. This is the secondary air circulating fan while the air impeller **66** is part of the primary fan, being attached to the opposite end of shaft **64**. It is in a fan casing or shroud **76** that has a main air inlet duct **78** at its center and a motor shaft bearing **79** carried by it and through which a part of shaft **64** is passed. Duct **78** extends through a sleeve **80** at the neck end of the housing **20** and this supports and secures the sleeve **78** in place. Coupling **82** attaches air conduit **84** to the duct **78** and is in registry with the duct. The primary air enters duct **78** through conduit **84** and enters the chamber **86** in the fan casing **76**. The main air is passed through large ports **88** in the wall of casing **76** but a fractional part of the air is bled through pipe **90** that is attached to a peripheral part of the casing **76**. A centrifugal bleed is achieved in order to constitute a part of a regeneration circuit for the air.

Two containers **92** and **91** are carried on support **12** and they each contain a desiccant, for example silica gel. The bottoms of the containers, see FIGURE 6, each have openings **93** and these openings constitute an air passage for the containers. This will be either the entrance or discharge depending on the direction of flow. A heater **94** is in container **92** (identical to container **91**) and has an electric plug connection **95** for a source of electrical potential. Filter, for example screen **96** is at the neck of the container **92** and is near coupling **97** that connects the pipe **98** to the top of the container **92**.

In use the regeneration circuit operates in this way: a small fraction of air is bled from the primary fan through pipe **90** to the desiccant container **92**. This

container contains silica gel that is saturated or partially saturated and is being regenerated. This fraction of air removes the water vapor liberated from the desiccant by the heater **94** while the heater is doing its job as a moisture liberating agent. Hence, the bled air is used to cool the desiccant after and during regeneration so that it may be used almost immediately thereafter. Since it is cooled with dehydrated air, the capacity of the desiccant after regeneration is not decreased by the cooling air. Having assumed that container **92** is in the regeneration circuit, container **91** is the container that is being used for hair drying in the illustration of FIGURE 1. Therefore, the ports in the bottom of container **91** are air inlet ports, while the ports (passages **93**) in the bottom of container **92** are simultaneously serving as air discharge ports.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

In a hair drier which has a housing and means in which to accommodate the hair to be dried, said housing having means including a port through which to discharge from the housing air which has been passed over the hair to be dried, a heater in said housing, means responsive to the temperature of the air passing through

said discharge port for controlling said heater, an electric motor in said housing, a primary blower and a recirculation blower driven by said motor and located in said housing, said primary blower having an air inlet and an air outlet to propel air toward and into said recirculation blower, a desiccant container registered with said inlet, means associated with said desiccant container for regenerating the desiccant, and means to conduct a fractional part of the air delivered by said primary blower to the desiccant container to cool the desiccant during regeneration.

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