Feb. 20, 1973 R. E. HARTUNG 3,716,925

HUMIDIFIER ATTACHMENT FOR CLOTHES DRYERS

Filed Oct. 12, 1971

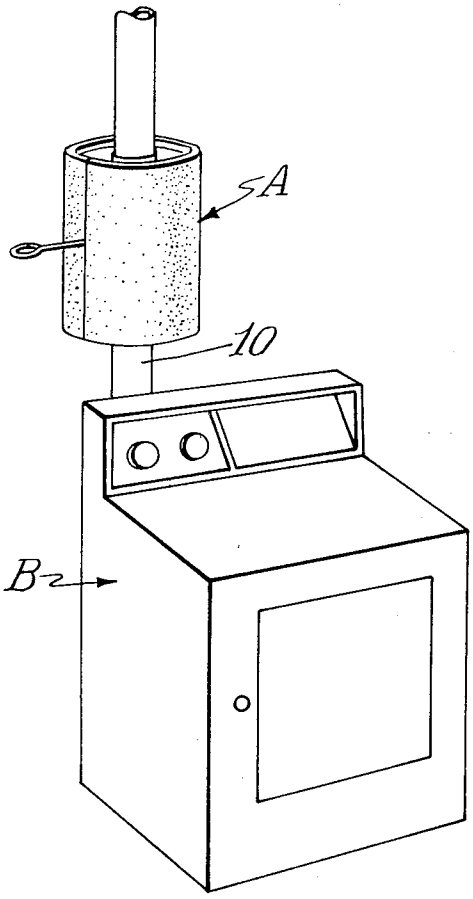


FIG. 1

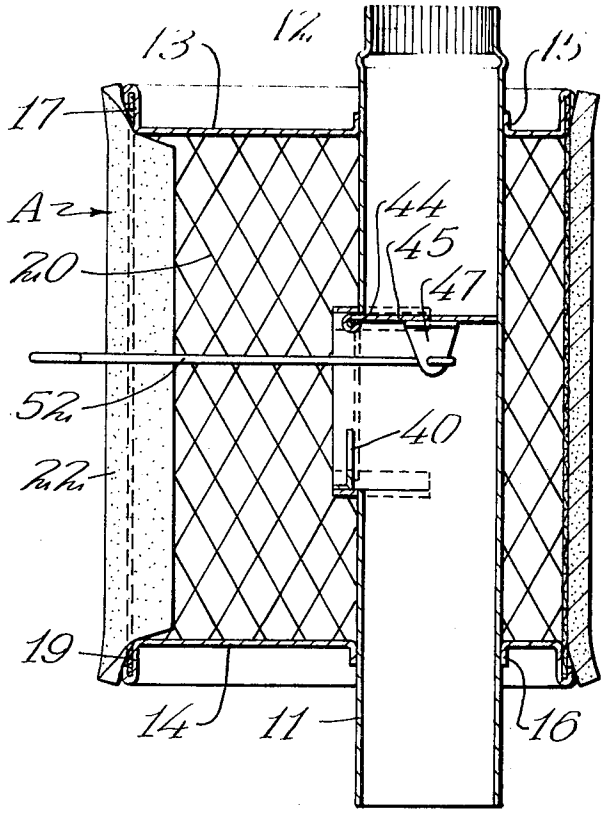


FIG. 2

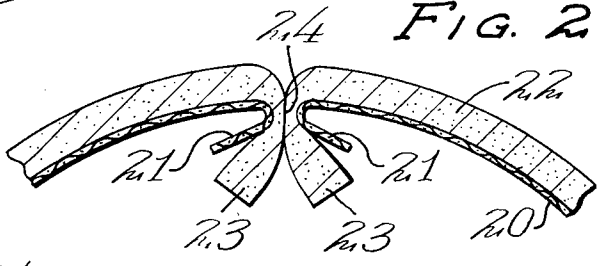


FIG. 3

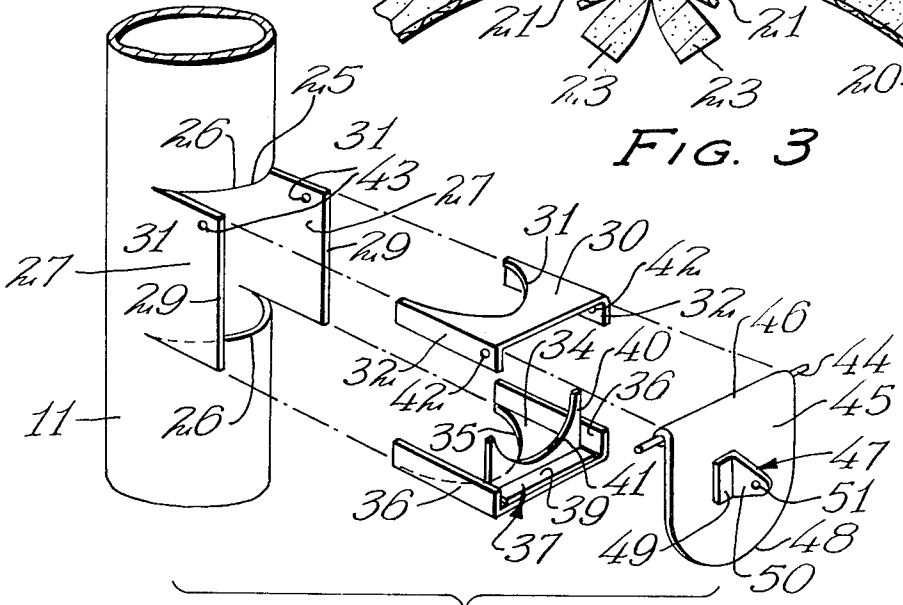


FIG. 4

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HUMIDIFIER ATTACHMENT FOR CLOTHES DRYERS

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Continuation-in-part of abandoned application Ser. No. 869,846, Oct. 27, 1969. This application Oct. 12, 1971, Ser. No. 187,970

Int. Cl. F26b *21/00*

U.S. Cl. 34—80 5 Claims

ABSTRACT OF THE DISCLOSURE

A humidifying chamber is provided in the vent pipe from a clothes dryer, and the air vented may be by-passed through the chamber to deliver heated moist air to the area near the dryer. A damper controls the flow of air so that the hot moist air may be vented to outside atmosphere when desired.

This is a continuation-in-part of my application for "Humidifier Attachment for Clothes Dryers," Ser. No. 869,846, filed Oct. 27, 1969, now abandoned.

This invention relates to an improvement in humidifier and deals particularly with a device for utilizing moisture vented from a clothes dryer.

BACKGROUND OF THE INVENTION

Conventional clothes dryers heat the wet clothing from the washing machine to evaporate the moisture therefrom. The moist air being vented from the dryer is normally vented to outer atmosphere. Obviously, the air being vented contains considerable moisture.

In the colder climates, the humidity drops very materially in cold weather. As a matter of fact, many homes are equipped with humidifiers which add to the moisture in the air during the winter months, and are also equipped with dehumidifiers for removing moisture from the air during the summer months. Under normal circumstances, the moisture removed from clothing in a clothes dryer is not utilized, but is merely vented to atmosphere.

SUMMARY OF THE INVENTION

An object of the present invention resides in the provision of a simple device designed to fit into the vent pipe leading from the clothes dryer to outer atmosphere. This device comprises a chamber encircled by filtering material capable of supporting moisture and through which moisture laden air may pass. The section of the vent pipe which extends through the chamber is provided with a by-pass opening and a damper is provided which is operable in one extreme position to close the vent pipe and to open the by-pass opening, and which is operable in its other extreme position to close the by-pass opening and to open the vent pipe. As a result, the moisture laden air may be either directed inside the house or outside thereof, depending upon the position of the damper.

A feature of the present invention resides in the provision of a device of the type described which may operate to distribute moist air inside of the house at times when the humidity within the house is low, and which will permit the moist air to vent to outer atmopshere at times when humidity is high. By merely operating a damper, all of the moisture removed from clothes in a clothes dryer may be distributed within the house at times when the air within the house lacks moisture, aiding materially in distributing the proper amount of moisture in the air.

These and other objects and novel features of the present invention will be more clearly and fully set forth in the following specification and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing a clothes dryer, and showing the humidifying apparatus used in conjunction therewith.

FIG. 2 is a vertical sectional view through the humidifying device shown in FIG. 1.

FIG. 3 is a sectional detail showing the manner in which the substantially cylindrical screen is formed.

FIG. 4 is an exploded view showing the damper structure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The humidifying device is indicated in general by the letter A, and the clothes dryer is indicated in general by the letter B. The dryer B may be either electric or gas operated. The dryer B is provided with a vent pipe **10** which normally leads through the wall of the house or through a window opening so as to terminate outside of the house. The vent pipe **10** is normally made of short sections of sheet metal tubing which are crimped at one end in order to telescope into a section of similar tubing.

The humidifier A includes a section of tubing **11** of standard length and size which may take the place of a section of the tubing normally used. A section of tubing **11** is provided with a crimped upper end **12** which is of slightly reduced size so as to fit in the uncrimped end of the next adjacent section. A pair of spaced sheet metal rings **13** and **14** encircle the tube section **11**. The rings **13** and **14** are provided with short cylindrical flanges **15** and **16** respectively which fit snugly about the pipe **11** and which may be welded or otherwise fixed to the pipe. The rings **13** and **14** are provided with peripheral flanges **17** and **19** respectively which act to support a substantially cylindrical screen **20** made of expanded metal or similar foraminous material.

Clothes dryers such as B usually are located as near as possible to a wall in order to conserve space. The upper end of the vent pipe is usually connected to an elbow directed to a section leading through the wall. The vertical portion of the vent is usually spaced a few inches from the wall to accommodate the elbow. In order not to disturb this arrangement, the short cylindrical flanges **15** and **16** are preferably eccentrically arranged. These aligned flanges are so arranged that the tubing section **11** is close to one side of the screen **20**, as is indicated in FIG. 2 of the drawings.

As indicated in FIGS. 2 and 3 of the drawings, the screen **20** is formed of a rectangular sheet of foraminous material which is bent in a generally cylindrical form, and in which the substantially abutting edges **21** are bent inwardly and rearwardly to provide a slot therebetween which extends parallel to the axis of the screen. The screen **20** acts as a support for a filter blanket **22** which is generally similar to the filter blankets used in the inlets of

hot air furnaces and the like, and which may be made of glass fibers or similar material capable of separating lint and similar foreign particles from the air, while still permitting air to pass readily therethrough.

The filter blanket **22** comprises a rectangular strip of filter material which is of a width substantially equal to the height of the screen **20**, and which is of a length slightly in excess of the circumference of the screen **20**. As is indicated in FIG. 3 of the drawings, the ends **23** of the filter blanket are forced through the slot **24** between the ends **21** of the screen **20** and the blanket is frictionally held in place. The structure is such that the blanket may be removed and replaced or washed and replaced whenever it becomes necessary to do so. However, in view of the fact that the movement of air through the blanket is in an outward direction, lint and other foreign particles are deposited on the inner surface of the blanket, and little maintenance is required.

The damper construction is best shown in FIGS. 2 and 4 of the drawings. An opening **25** is provided in the pipe by cutting a pair of parallel cut lines **26** through approximately one half the circumference of the pipe and normal to the axis thereof. The parallel cut lines **26** are connected by a central cut line extending longitudinally of the pipe. The portions of the pipe on opposite sides of the longitudinal cut line are bent outwardly into flat or parallel relation to form parallel wings **27** which extend tangentially to the surface of the pipe section **11** and which have parallel forward edges **29** which were previously joined before the longitudinal cut line was made. A top closure plate **30** connects the upper edges **31** of the wings **27**. The closure plate **30** is provided with a semicircular notch **31** which is of proper radius to fit snugly against the pipe section **11**. The plate **30** is provided with parallel downwardly extending flanges **32** which lie outwardly of the upper portions of the wings **27**. The flanges **32** are connected to the wings **27** by any suitable means such as by spot welding.

A bottom closure plate **34** is provided which is generally similar to the plate **30**. The bottom closure plate **34** includes a semi-circular notch **35** adapted to fit the contour of the pipe section **11**. This bottom plate **34** is provided with parallel side flanges **36** which are spot-welded or otherwise secured to the outer surfaces of the wings **27**. Both the closure plates **30** and **34** are co-extensive with the wings **27** so as to provide a rectangular tubular passageway.

An angle bracket **37** includes a flange **39** which is spot-welded or otherwise secured to the upper surface of the lower closure plate **34**. The bracket also includes a vertical panel **40** which extends upwardly at right angles to the flange **39**. The flange **40** is provided in its upper surface with a notch **41** having a radius of curvature which is slightly less than the radius of curvature of the inside wall of the tubular section **11**.

The flanges **32** of the upper closure plate **30** are provided with aligned apertures **42** extending therethrough and the wings **27** are provided with registering openings **43**. A pivot shaft **44** extends through the openings and supports a damper **45**. The damper **45** is provided with a bearing **46** extending along one end and is of a width to snugly fit between the wings **27** and against the inner surface of the bracket flange **40**, as well as the closure plate **30**. When in engagement with the flange **40**, the marginal edge of the damper slightly overlaps the edge of the notch **41**. The end **48** of the damper is rounded to fit the curvature of the inner surface of the tube section **11**. In one extreme position, the damper forms a closure for the passage formed between the wings **27**. When in its other extreme position, the damper completely closes the outlet pipe **11** above the level of the wings **27** as is indicated in full lines in FIG. 2 of the drawings.

An angle bracket **47** has one flange **49** welded or otherwise secured to the damper **45** to extend forwardly therefrom in a vertical position of the damper. The angle bracket **47** includes a second flange **50** having an aperture **51** extending therethrough. A damper operating a rod **52** extends through the aperture **51** and is pivotally connected to the bracket **47**. The arm **52** extends between the ends **23** of the filter blanket **22** to be manually operated externally of the device.

If it is desired to take advantage of the moisture removed in the clothes drying process for humidifying the air, the arm **52** is pushed inwardly into the position shown in FIG. 2 of the drawings, swinging the damper **45** across the pipe **11** so as to close the opening to the vent. The moisture leaving the dryer is then by-passed through the discharge damper housing between the wings **27** and into the interior of the screen **20** from where it may flow through the filter blanket to the ambient atmosphere.

The moisture laden air is thus distributed into the room in which the dryer is located, and excess moisture collects in the filter blanket and gradually evaporates. Obviously, the extent to which the air is humidified depends on the frequency of use of the clothes dryer, the volume of clothes being dryed, and other such variables. However, all of the moisture which is in the clothing when it is put into the dryer is delivered to the ambient air, and the device aids materially in imparting moisture to the air.

The damper **45** will normally remain in position to close the pipe **11** without the use of any latching means. The damper is light in weight, and the rod **52** is frictionally engaged between the ends of the filter blanket and will normally remain in adjusted position. Furthermore, when the dryer is in operation, there is usually a slight pressure build-up within the humidifier tending to hold the damper in a set position.

When it is desired to direct the moist air outside of the house, the operating arm **52** is pulled outwardly, swinging the damper **45** down against the flange **40** and opening the passage to outer atmosphere through the vent pipe **10**. During the winter months, the heat and moisture generated by the dryer may be used to assist in heating and moistening the air within the house. During the summer months when the humidity is normally high, the heat and moisture is directed to outer atmosphere through the vent in the usual manner.

In accordance with the patent statutes, I have described the principles of construction and operation of my Humidified Attachment for Clothes Dryers and while I have endeavored to set forth the best embodiment thereof, I desire to have it understood that changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. In combination with a clothes dryer within a building and a dryer vent duct extending from the air outlet of the dryer to outer atmosphere, the vent duct including a series of vent pipe lengths in telescoping relation,

a pair of imperforate discs supported in spaced relation on one of said lengths of vent pipe,

a foraminous wall secured to, and between, said discs and encircling said one length of vent pipe in spaced relation thereto,

a filter blanket encircling said foraminous wall,

a tubular damper housing extending at generally right angles to said vent pipe within said foraminous wall,

said vent pipe having an opening therein communicating with the interior of said tubular damper housing,

a damper pivotally supported by said damper housing and swingable from a position closing said vent pipe and opening said damper housing, to a second position closing said damper housing and opening said vent pipe,

the area between said discs and inwardly of said foraminous wall providing a chamber for catching lint

and other particles issuing from said clothes dryer air outlet, and

means for pivoting said damper between said positions.

2. The structure of claim 1 and in which said foraminous wall includes a narrow slot extending parallel to the axis of said one vent pipe section, and in which said filter blanket includes ends extending through said slot and frictionally engaged therein.

3. The structure of claim 2 and in which said means for pivoting said damper includes an arm pivotally connected to said damper and extending through said slot and between the ends of said filter blanket.

4. The structure of claim 1 and in which said damper pivoting means includes an arm pivotally connected to said damper and extending through said wall.

5. The structure of claim 1 and in which said vent pipe extends through said pair of discs near the periphery thereof.

References Cited

UNITED STATES PATENTS

2,009,823	7/1935	Van Vulpen et al.	237—5
2,686,978	8/1954	Herbster	34—90
2,316,421	4/1943	Hans	237—12.3 B
3,064,360	11/1962	Sholin	34—91
3,066,423	12/1962	Solem	34—86
3,256,616	6/1966	McGoldrick	34—218

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