May 19, 1970 S. G. MILLER ET AL 3,512,268

COMMERCIAL LAUNDRY DRYER

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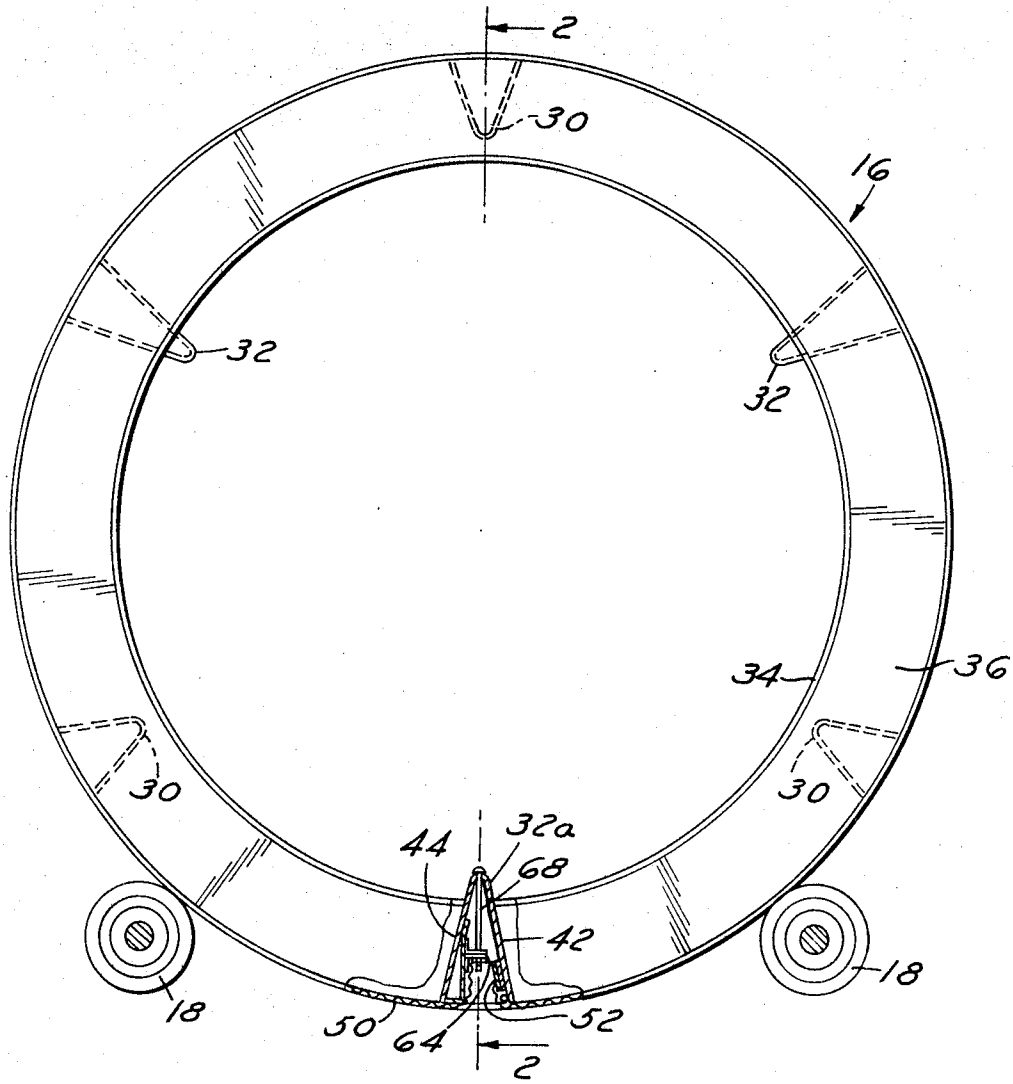
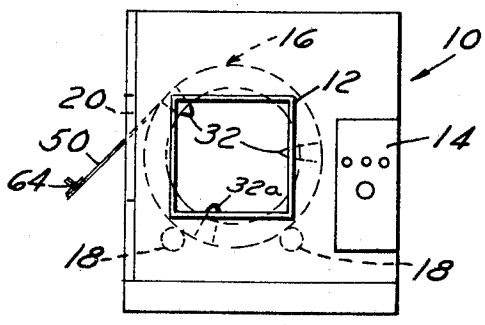


FIG. 1

FIG. 4



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FIG. 2

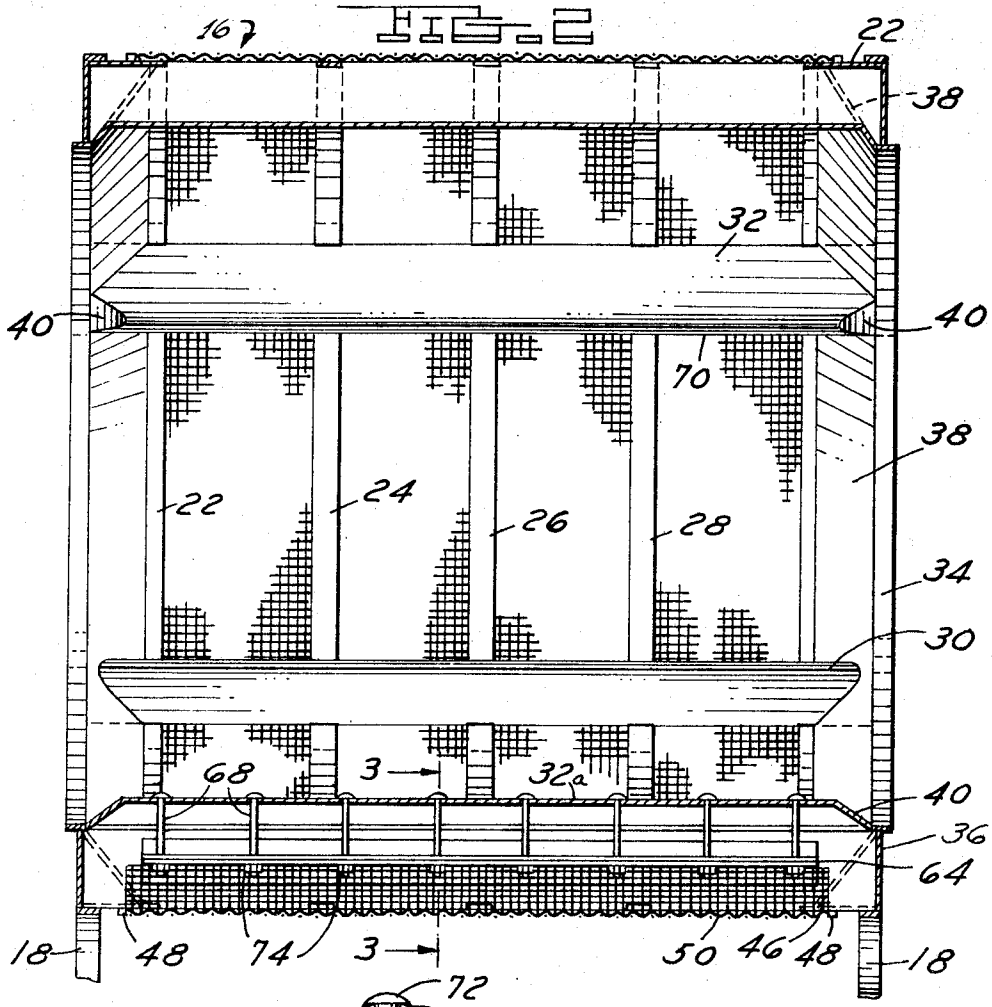
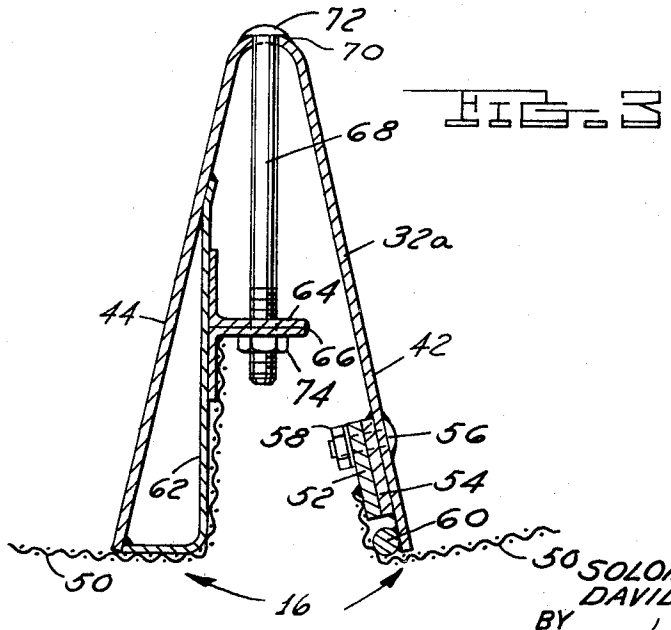


FIG. 3



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COMMERCIAL LAUNDRY DRYER

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U.S. Cl. 34—108 7 Claims

ABSTRACT OF THE DISCLOSURE

An industrial clothes dryer having a rotatable drying cylinder in the form of a cylindrical frame around the periphery of which is secured a woven wire belt that is easily removed and replaced for cleaning.

This invention relates to industrial laundry dryers and more particularly to a drying cylinder for such dryers.

Laundry dryers conventionally employ a drying cylinder, the outer peripheral surface of which is perforated in some fashion to enable the extraction of moisture from the clothes or other cloth material in the dryer. However, in the case of industrial or commercial dryers it often happens that plastic bags in which clothes, etc. are delivered to the laundry find their way into the dryer. Under the elevated temperatures at which the dryer operates such plastic bags fuse to the periphery of the drying cylinder to the point of plugging the perforations therein and reducing the efficiency of the dryer considerably. As a consequence, periodically the perforations set around the periphery of the cylinder have to be cleaned to remove such fused plastic material and other accumulations. Infrequently this cleaning is performed by burning this material with a blowtorch or the like. In dryers as conventionally constructed the process of cleaning the cylinder is an awkward one since neither the cylinder nor the skin which forms its outer periphery is easily removable. It is, therefore, an object of the present invention to provide an industrial or commercial dryer in which the peripheral surface of the drying cylinder can be readily removed and replaced for servicing.

FIG. 1 is an end view, partly in section, showing the drying cylinder of a dryer according to the present invention.

FIG. 2 is a sectional view taken along the line **2—2** in FIG. 1.

FIG. 3 is a sectional view along the line **3—3** in FIG. 2.

FIG. 4 is a generally diagrammatic view of a dryer incorporating a drying cylinder of the present invention.

Referring to FIG. 4 first, a commercial or industrial dryer is there shown with an outer casing **10** provided with an opening **12** on one or opposite sides thereof. Opening **12** is adapted to be closed by a door (not illustrated). At one side of casing **10** there is arranged a panel box **14** which houses the electrical controls for the dryer. The drying cylinder, generally desigated **16**, is supported within casing **10** for rotation on a horizontal axis by any suitable means such as rollers **18**. Means (not illustrated) are provided for rotating cylinder **16** and for directing heated dry air into cylinder **16** and exhausting the moist air from casing **10**. At one side thereof casing **10** is provided with an opening **20** generally at the level of cylinder **16**. A suitable closure (not illustrated) is provided for closing opening **20**.

Referring now to FIGS. 2 and 3, cylinder **16** comprises a welded steel framework consisting of a pair of circular end bands **22** and intermediate circular reinforcing bands **24**, **26** and **28** which are interconnected by a series of longitudinally extending ribs **30**, **32**. As is shown in FIG. 1, ribs **30**, **32** are arranged alternately within cylinder **16**,

each being generally triangular in cross section and ribs **32** having a greater radial dimension than ribs **30**. At opposite ends of the cylinder **16** large openings are defined by metal bands **34** and annular plates **36** are welded around their inner periphery to bands **34** and around their outer periphery to the end bands **22**. Also within cylinder **16** and adjacent each of the bands **34** there is arranged a generally conically shaped end wall **38** which is welded around its inner periphery to plate **36** and around its outer periphery to end band **22**. As is shown in FIG. 3, the conically shaped end walls **38** slope axially inwardly and radially outwardly from bands **34** to end bands **22**.

End walls **38** are notched at regularly spaced intervals to receive the end portions of ribs **30**, **32**. Ribs **30**, **32** extend the full length of cylinder **16** and are welded at their ends to the annular plates **36** at opposite ends of the cylinder. Since ribs **32** have a radial extent greater than conical end walls **38** and annular plates **36**, the portions of ribs **32** extending radially inwardly beyond bands **34** are notched at an angle as shown in FIG. 3 and closed by a small cover plate **40** welded thereto. Ribs **30**, **32** not only provide baffles within the cylinder for assisting in agitating the contents thereof when the cylinder is rotated, but also provide rigid reinforcements to the cylinder frame.

One of the ribs **32**, designated **32*a***, opens radially outwardly throughout substantially its entire length. In other words, bands **24**, **26** and **28** terminate at the outer edges of the side walls **42**, **44** of rib **32*a***. Likewise the wide end bands **22** are notched as at **46** to a guide rim **48** around the outer periphery of each end band **22**. Thus the radially outer end of rib **32*a*** between the guide rims **48** forms an open pocket.

The outer peripheral surface of cylinder **16** is in the form of a woven wire belt **50**. At one end thereof as shown in FIG. 3 belt **50** has a bar **52** extending the full width thereof. To the inside of wall **42** and adjacent the radially outer end thereof there is welded a bar **54** against which bar **52** is adapted to be seated. Bar **52** is adapted to be removably secured to the inside of rib **32** by a plurality of screws **56** on wall **42*a*** which register with openings in bar **52** and which are adapted to receive nuts **58**. A round metal rod **60** along the radially outer edge of wall **42** provides a rounded corner around which the woven belt **50** extends. To the inside of the opposite side wall **44** of rib **32*a*** there is welded a reinforcing bracket **62** and around which the opposite end of the woven belt **50** is adapted to be extended. The latter end of belt **50** is brazed to a pair of steel angles **64** which are welded together as at **66**. Angles **64** are provided with a series of apertures therein which register with a series of bolts **68** extending radially outwardly through rib **32*a*** from the apex **70** thereof. The heads of bolts **68** are welded to ribs **32*a*** as at **72**. Belt **50** is adapted to be arranged taut around the periphery of cylinder **16** by drawing angles **64** radially inwardly as by tightening nuts **74** on the inner ends of bolts **68**.

Belt **50** is a metallurgical woven belt which is readily flexible and which provides an open mesh material. It is preferably woven from high carbon steel wire having a diameter of .080". It will be appreciated however that any flexible wire belt which possesses the required strength and flexibility may be used as the outer peripheral skin for the cylinder.

Since belt **50** is removably attached to cylinder **16** in the manner illustrated in FIG. 3, it will be appreciated that it may be removed from the cylinder when required with a minimum of time and effort. The side opening **20** in casing **10** is provided for facilitating removal of the belt. When the panel closing opening **20** is removed and cylinder **16** rotated to a position wherein rib **32*a*** is accessible through opening **20**, the nuts **74** can be removed

from the outer ends of bolts **68** so that the angles **64** can be disengaged from the bolts **68** and the woven wire belt **50** thus drawn out through opening **20** as illustrated in FIG. 4. Belt **50** can be unrolled from the drum by rotating the drum and completely removed therefrom by removing nuts **58** from the ends of bolts **68** so as to enable the bar **52** to be removed from these bolts. The belt as a whole can be simply and readily removed from the cylinder to facilitate substantial servicing of the belt and particularly cleaning the belt. After the belt is removed from the cylinder it can be cleaned in any suitable fashion at a location away from the dryer. After the belt has been serviced it can be replaced on the dryer by simply reversing the operation previously described; namely: first securing bar **52** to rib **32***a*, rotating the cylinder to wrap the belt around the outer periphery thereof and then tightening the belt in place by threading nuts **74** inwardly on bolts **68**.

With the particular angle arrangement for the belt illustrated it will be observed that if the thread on the ends of bolts **68** become stripped it is a simple matter to break the welds at **72**, retracting the bolts **68** and replacing them with new ones.

I claim:

1. A dryer having a drying cylinder comprising a generally cylindrical frame and an open mesh belt formed of flexible material extending around the outer periphery of said frame, said frame comprising a plurality of axially spaced, circumferentially extending metal bands and a plurality of axially extending, circumferentially spaced ribs secured to said bands around the inner peripheries thereof, at least one of said ribs including a pair of side walls which open in a radially outward direction, at least some of said bands terminating at said one rib so that the radially outer end of said rib is open throughout a major portion of its length, the opposite ends of said belt extending into said rib from the radially outer end thereof and being removably secured thereto.

2. A dryer as called for in claim **1** wherein the opposite ends of said belt are provided with apertured reinforcing means thereon, said one rib having a plurality of fastening elements therein engagable with the apertured reinforcing members.

3. A dryer as called for in claim **2** wherein said fastening members for one end of the belt comprise threaded studs on said one rib over which the apertured reinforcing members at said one end of the belt is adapted to be engaged and including nuts threaded on said studs for tightening the belt circumferentially around the outer periphery of the frame.

4. A dryer having a drying cylinder comprising a generally cylindrical frame, said cylindrical frame having a series of annular ribs spaced apart axially of the cylinder and interconnected by a plurality of axially extending ribs spaced circumferentially around the periphery of the cylinder, an open mesh belt formed of a material sufficiently flexible to enable the belt to be manually wrapped around said cylinder while the belt assumes the condition of a generally flat web and to enable the belt to be manually unwrapped from the cylinder into the condition of a generally flat web, said belt having a width corresponding generally to the axial width of said cylinder, means removably anchoring one end of said belt to one of said axially extending ribs so as to permit ready removal and reanchoring of said one end of the belt to said one rib, said belt being wrapped tightly around said cylinder and having its opposite end also secured to said one axially extending rib, the means securing said opposite end of the belt to said one axially extending rib including a plurality of fasteners which when actuated in one direction tend to pull the belt tightly around the cylinder frame and when actuated in the opposite direction loosen the belt from around the cylinder frame and enable physical separation of said opposite end of the belt from said one axially extending rib.

5. A dryer as called for in claim **4** wherein said fasteners comprise threaded members.

6. A dryer as called for in claim **4** including a casing in which said cylinder is journalled for rotation, said casing having an opening therein adjacent the periphery of said cylinder, said opening having a width corresponding to at least the width of said belt, the outer periphery of said cylinder being accessible through said opening for enabling the belt to be wrapped around and unwrapped from around the cylinder.

7. A dryer as called for in claim **4** wherein said belt comprises a woven wire belt.

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