COMMERCIAL LAUNDRY DRYER
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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 and in the process 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. Frequently this cleaning is performed by burning this material with a blowtorch or the like. In dryers 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, 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 designated 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 outwardly 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 32a, extends 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 32a. Likewise the wide end bands 22 are notched at 45 to guide ribs 30, 32 around the outer periphery of each end band 22. Thus the radially outer end of rib 32a 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 removable secured to the inside of rib 32 by a plurality of screws 56 on wall 42 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 32a there is welded a reinforcing bracket 62 and around which the opposite end of the woven belt 50 is adapted to be seated. 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 32a from the apex 70 thereof. The heads of bolts 68 are welded to ribs 32a 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 removable 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 32a 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. 3. The cylindrical frame is 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 32a, 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 being unrolled from 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 engageable 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 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 journaled 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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