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CONDENSATE SIPHON

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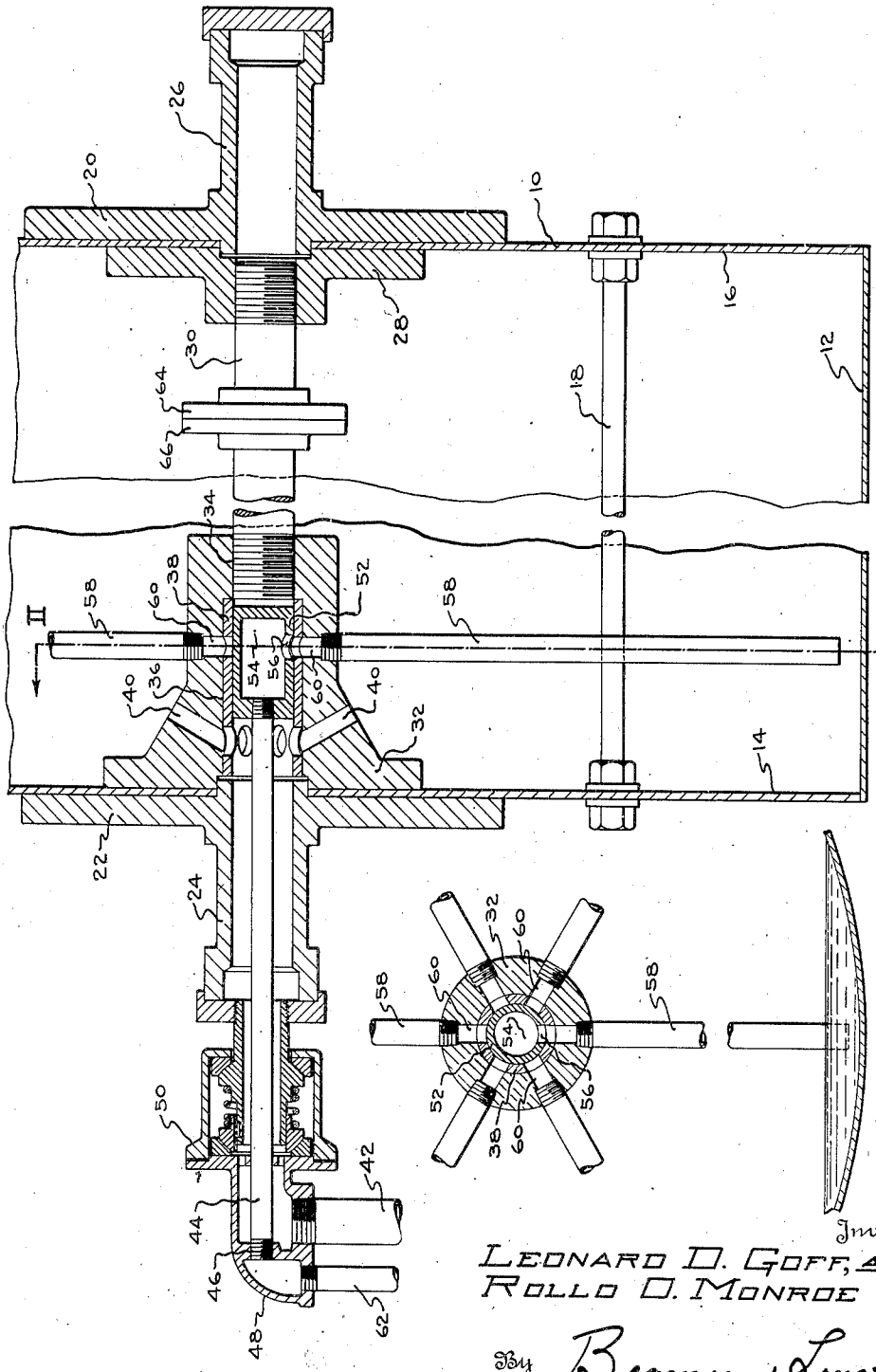


Fig. 1

Fig. 2

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CONDENSATE SIPHON

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2 Claims. (Cl. 34—4)

The present invention relates to improvements in apparatus for removing condensate from steam heated rotated cylindrical drying drums, such as used in slashers in textile mills and in paper making. More particularly, the apparatus is designed for convenient installation in drying drums already in use having a plurality of tie bolts radially spaced from the axis of rotation and extending between the ends of the drum.

One object of the invention is to provide an apparatus which is capable of maintaining a minimum water level at all times in the drying drum, thus assuring higher cylinder temperatures and permitting increased production.

Another object is to provide condensate removing apparatus for drying drums capable of being conveniently installed in drums now in operation.

A further object resides in providing a novel apparatus of the type described having a plurality of radial siphon pipes which rotates with the drum as a unit; each pipe, in succession, upon being rotated into a vertical plane having communication with a common discharge.

These and other objects and advantages of the present invention residing in the combination, construction, and arrangement of parts will more fully appear from the detailed description to follow when considered in connection with the appended claims.

In the drawing,

Fig. 1 is a fragmentary vertical cross-sectional view taken on the longitudinal center line of a drying drum embodying the present invention, and

Fig. 2 is a cross-sectional view taken on line II—II of Fig. 1 of the siphon and siphon selector mechanism.

The drying drum in connection with which the present invention is illustrated is of well-known construction and has been generally designated by reference character 10. It comprises a cylindrical outer surface 12 spaced and supported by end members 14 and 16. A plurality of radially spaced and positioned tie bolts 18 lend structural support to the end members 14 and 16, which are in turn concentrically supported by flanges 20 and 22 having as integral parts thereof the journal members 24 and 26 which are supported in suitable bearings upon the machine frame (not shown). Prior to the installation of the present invention the drum will consist of a pair of internal flange portions similar to the flange 28, which carry a central supporting shaft 30.

The rotary siphon adaptor of the present invention, in the form illustrated in the drawing, comprises a flanged part 32 having a central threaded portion 34 and a bored out portion 36 in which a replaceable sleeve 38 is received. The sleeve 38 and the flanged part 32 are ported at 40 so as to admit live steam to pass up through the conduit 42 through the passage surrounding the pipe 44 and out through the ports 40 into the interior of the drum 10. The pipe 44 is threaded at 46 into the fixed distributor head 48 carrying the rotary joint 50. At its opposite end the pipe 44 is threaded into a siphon selector 52 having a central chamber 54 and a single port 56. The selector 52 is closely fitted within the sleeve 38 and is held against rotation through the connection of the pipe 44 with the fixed part 48. Threaded in the flanged part 32 is a plurality of radially extending siphon pipes 58 which communicates with aligned radial passages 60 defined in the flanged part 32 and the sleeve 38. The pipe 44 through the distributor 48 communicates with a discharge pipe 62 leading to some suitable reservoir or outlet for the condensate removed from the drum.

In operation, as the drum rotates, the siphon pipes 58 rotate therewith as a unit and are successively brough into communication with the port 56 of the selector 52. Communication between the pipes 58 and the port 56 will take place during the time the particular pipe 58 in communication is swinging through an arc of several degrees. During this period the particular pipes 58 in communication with the ports 56 will be capable of discharging condensate upwardly into the chamber 54 and outwardly to the exterior of the drum through the pipe 44 and the pipe 62. When the particular discharging pipe 58 has traveled through a sufficient arc as to be out of communication with the port 56, the condensate will continue to stand in the pipe while the same is rotated throughout substantially 360° and is again brought into communication with the port 56. This avoids the necessity of the condensate having to be siphoned up through the full length of the pipe 58 each time the same is brought into communication with the port 56. This feature permits the siphoning of the condensate from the drum with a relatively small amount of condensate present therein and results in maintaining the water level at a minimum at all times.

To describe the installation of the above described siphon to the type of drying drum 10 illustrated, a workman enters the interior of the drum 10 through a manhole (not shown) and cuts the supporting pipe 30 in two to permit the re-

moval of the left hand flange corresponding to the flange 28 shown in the drawing. The flanged part 32 is then substituted for one of the flanges 28, and with the siphon pipe 58 in position and located between the tie rods 18 the supporting rod is then threaded into the flanged part 32 at 34 and the two parts of the supporting pipe 38 united by being threaded into coupling flanged parts 64 and 66.

Having described the invention, what we claim is new and wish to be secured by Letters Patent is:

1. A rotary siphon designed for installation in a drying drum concentric with its axis of rotation, comprising a flange part having a hollow interior adapted to be entirely supported and housed within the drum, ports through said part for discharging steam into the interior of the drum, a plurality of radially disposed siphon pipes supported upon said flange part and communicating with the interior thereof, a siphon selector adapted to be held against rotation and having a single port therein, said siphon pipes being successively brought into communication with said selector port upon rotation of the drum.

2. In a steam heated drum, a siphon for removing condensate from the drum comprising a body entirely supported from within the drum and concentrically located with reference to the axis of rotation of the drum, said body having a cylindrical concentrically located recess opening through one end thereof, a replaceable hollow cylindrical sleeve closely fitted into and engaging the wall of said recess, aligned radial passages in said body and sleeve, a plurality of siphon pipes threaded into said body and communicating with said passages to constitute an extension thereof, said pipes being solely supported from said body, a siphon pipe selector in the form of a hollow cylindrical valve having an inlet port and an outlet port, said valve being closely fitted in said sleeve to form a fluid seal with said inlet port in the same radial plane with said passages in said sleeve, a fixed discharge pipe communicating with said outlet port of said valve and holding said valve against rotation in said sleeve, said valve having successive communication with the passages in said sleeve in communication with the siphon pipe in the lowermost position while sealing the remaining passages in said sleeve, and a supporting shaft concentric with the axis of rotation of said drum and engaging with the hub portion of said body.

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