W. E. ZIERDEN.

CONDENSATION REMOVER.

APPLICATION FILED APR. 12, 1913.

1,116,196.

Patented Nov. 3, 1914.

2 SHEETS—SHEET 1.

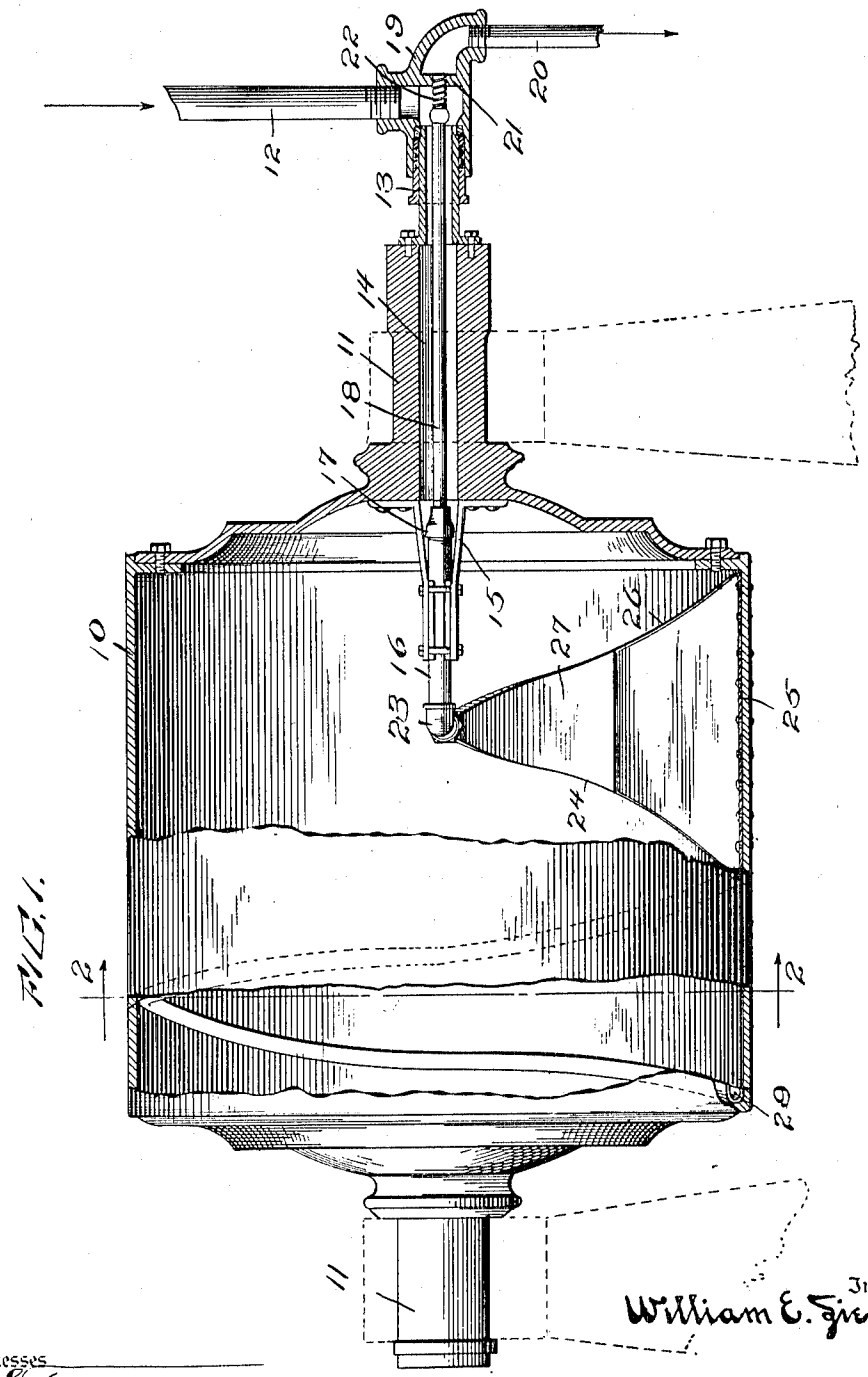


FIG. 1.

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2 SHEETS—SHEET 2.

FIG 2.

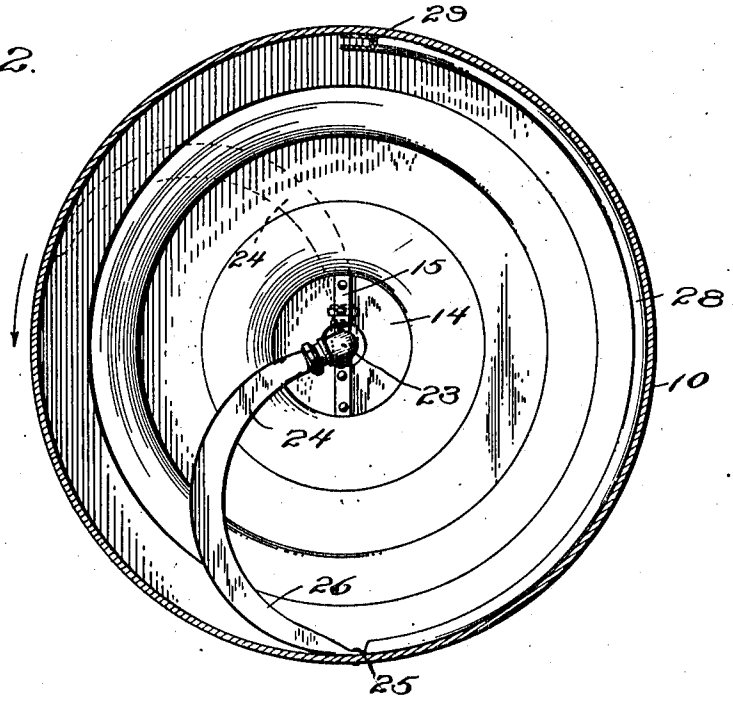
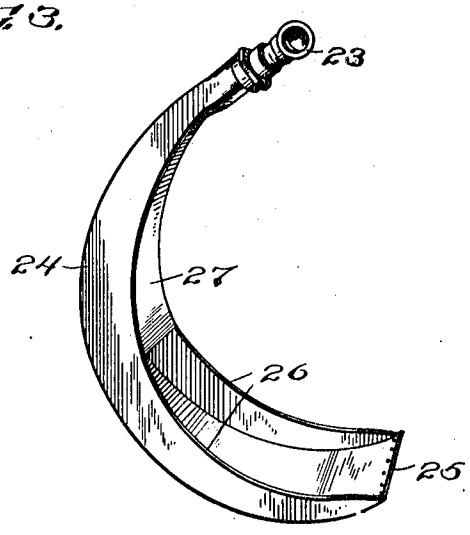


FIG 3.



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UNITED STATES PATENT OFFICE.

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CONDENSATION-REMOVER.

1,116,196. Specification of Letters Patent. Patented Nov. 3, 1914.

Application filed April 12, 1913. Serial No. 760,800.

To all whom it may concern:

Be it known that I, WILLIAM E. ZIERDEN, a citizen of the United States, residing at Johnsonburg, in the county of Elk and State of Pennsylvania, have invented certain new and useful Improvements in Condensation-Removers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to condensation removers and especially to mechanisms for removing the water of condensation from steam heated rollers used for drying or similar purposes.

It is well known that in various arts, as for instance paper making, laundry work, and the like, steam heated rollers are employed for heating, drying and smoothing various materials and that the rollers are thereby subjected to cooling which condenses the steam into water within the roller which is undesirable and detrimental. The present invention provides an improved means for removing such water of condensation from the rollers without impeding in any manner the heating of the rollers by the introduction of steam or the utility of the rollers in performing their function.

In the drawings: Figure 1 is a longitudinal diametrical sectional view of a conventional roller with the improved condensation removing apparatus associated therewith. Fig. 2 is a transverse sectional view taken on line 2—2 of Fig. 1. Fig. 3 is a perspective view of the bailer removed.

Like characters of reference designate corresponding parts throughout the several views.

As shown in the drawings a conventional roller 10 is illustrated which may be considered a steam heated roller employed for any ordinary purpose of drying or the like. As shown the roller is journaled at 11 and is supplied with steam through an inlet pipe 12, steam joint 13 and hollow trunnion 14, the said features being the usual and ordinary features employed in such drums and forming no part of the present invention.

Upon the inner end of the trunnion 14 a spider 15 is erected rigidly supporting a pipe 16 mounted axially of the drum. The pipe 16 is preferably provided with a reducer 17 whereby a smaller pipe 18 passes through the hollow trunnion 14 as indicated. The fitting 19 carries a discharge pipe 20 with an opening 21 through which the condensation is discharged, the pipe 18 terminating in a section 22 of flexible metal pipe rigidly secured to the pipe 18 in any approved manner as by brazing. It is well known that in such joints the trunnions and fittings do not always operate in alinement and that a pipe as the pipe 18 which would extend through the fitting 19 with the rigid extremity would be deflected at times from actual axialarity and the flexible metal extremity is employed to carry the moisture safely through such fitting without the danger of breakage of the pipe 18.

At its inner end the pipe 16 is provided with an elbow 23 to which the bailer shown as a whole at 24 is connected. The bailer comprises a substantially semicircular scoop struck upon an arc of substantially one-half the radius of the drum and having its outer wide end 25 rigidly secured to the inner periphery of the drum, so that the bailer rotates with such drum. Along the edges the bailer is provided with up-standing flanges 26 for substantially one-half its length with a cover portion 27 covering the remaining portion of its length toward its smaller end. It will be apparent therefore, that the bailer is capable of taking water from the bottom of the drum by reason of the narrow condition of the flanges and by reason of their increasing height as shown more particularly at Figs. 2 and 3 and their decreasing width to convey the water backwardly toward the central outlet, the covered portion serving as a funnel so that when the bailer has rotated to dotted line position in Fig. 2 the funnel is standing very nearly erect to convey the water through the pipe 16 and the reduced pipe 18 and through the flexible extremity 22 and the discharge pipe 20.

It has been found by experiment that one bailer in a drum of almost any dimension is sufficient to remove all the water of condensation and that more bailers add to the weight, to the expense and to the liability of breakage. It is desirable, however, to move the water of condensation rapidly into position to be engaged by the bailer for which purpose a spiral 28 is placed in the drum having one end terminating at the extremity of the bailer and coiled helically about the interior of the drum so that as the drum rotates the water of condensation is moved toward and discharged into the

bailer. This worm is preferably constructed U-shaped in cross section as shown at 29 and is preferably not secured in any manner within the drum other than by its own resiliency and friction.

The worm is first wound to a diameter slightly smaller than the interior of the drum and inserted into the drum and released whereupon its own resiliency throws the worm into engagement with the drum and holds it within the drum with sufficient rigidity to perform its function without the necessity of marring the drum for employing rivets or performing the work necessary to secure such worm within the drum. This also permits its ready removal for the purposes of repair or otherwise.

In addition to the water of condensation preventing the proper heating of the drum it is well known that an air pocket is ordinarily formed in the top of the drum by reason of the air entering the cylinder being lighter than the steam. This air pocket prevents the proper application of the heating fluid to the cylinder at that point. The present device effectually removes the air from the cylinder in exactly the reverse order from the order in which the water is removed, that is to say that when the bailer passes the top of the drum as indicated by dotted lines in Fig. 2 a certain amount of air is gathered by the bailer which is carried thereby downwardly until it escapes through the pipes 16, 18 and 19. By this means not only is the water of condensation removed but also the air. In addition to removing the water and air as above described the bailer also aids circulation and proper application of the steam to the inside of the drum by serving as an agitator or fan to agitate the heating fluid as the drum rotates.

I claim:—

1. The combination with a hollow steam heated drum having an axial supply bore, of a pipe extending through said supply bore, an enlarged pipe secured to the first mentioned pipe, such enlarged pipe being disposed axially of the drum, and a bailer communicating with the pipe and extending in substantially a half circle to the periphery of the drum.

2. The combination with a steam heated drum having an axial supply bore, of a bailer located within the drum, a pipe extending through the axial bore, a discharge fitting communicating with the bore, and a flexible extremity secured upon the discharge pipe and inserted within the discharge fitting.

3. The combination with a steam heated drum, of a bailer located within the drum, means to discharge water of condensation from the bailer, and a worm curved normally upon a circle larger than the interior of the drum and held against the inner walls of the drum by its own expanded resiliency.

In testimony whereof I affix my signature in presence of two witnesses.

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Witnesses:
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