June 2, 1936. C. A. HUTTINGER 2,042,529

PROCESS OF AND MEANS FOR SPINNING RAYON THREAD

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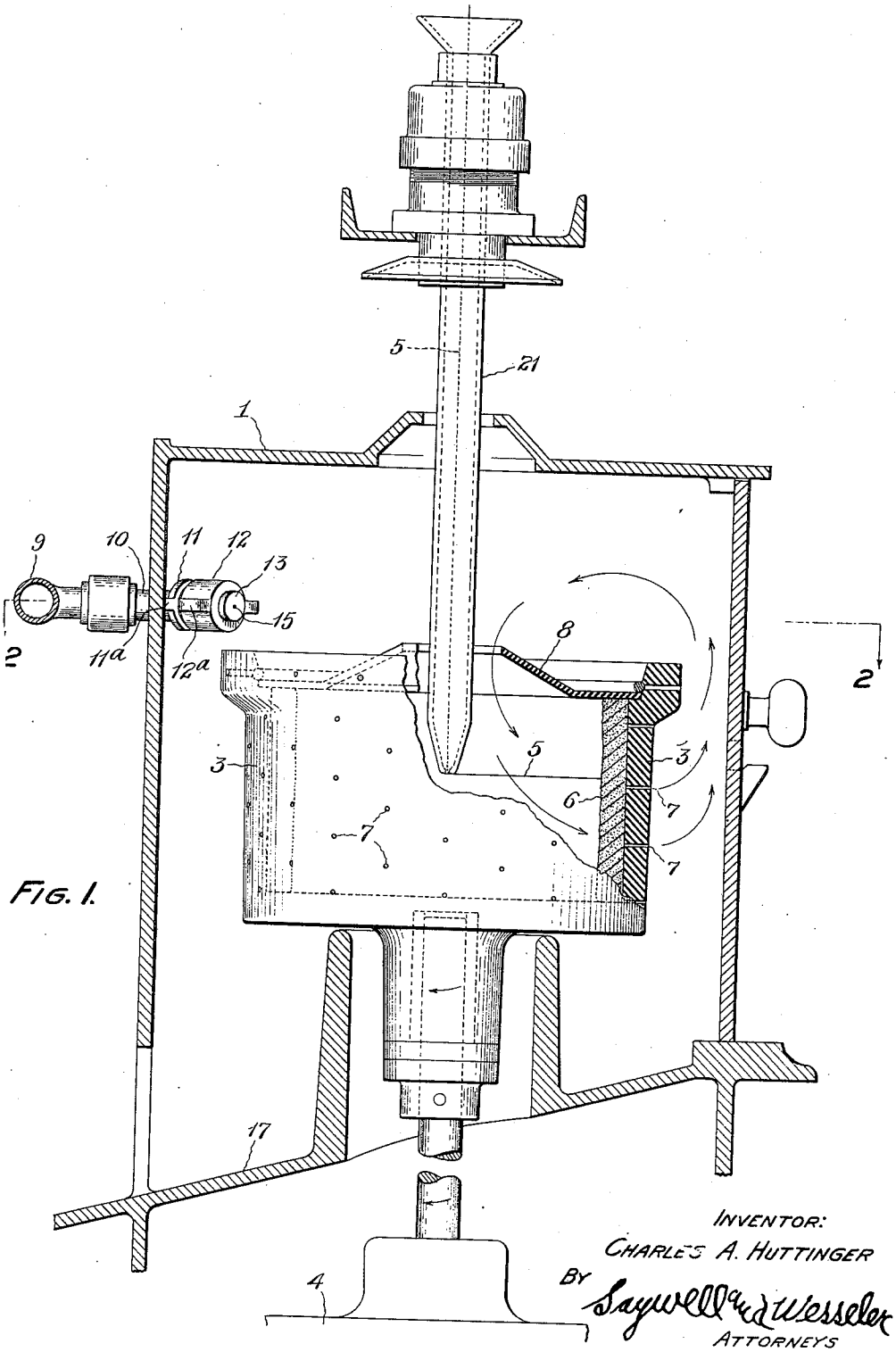


FIG. 1.

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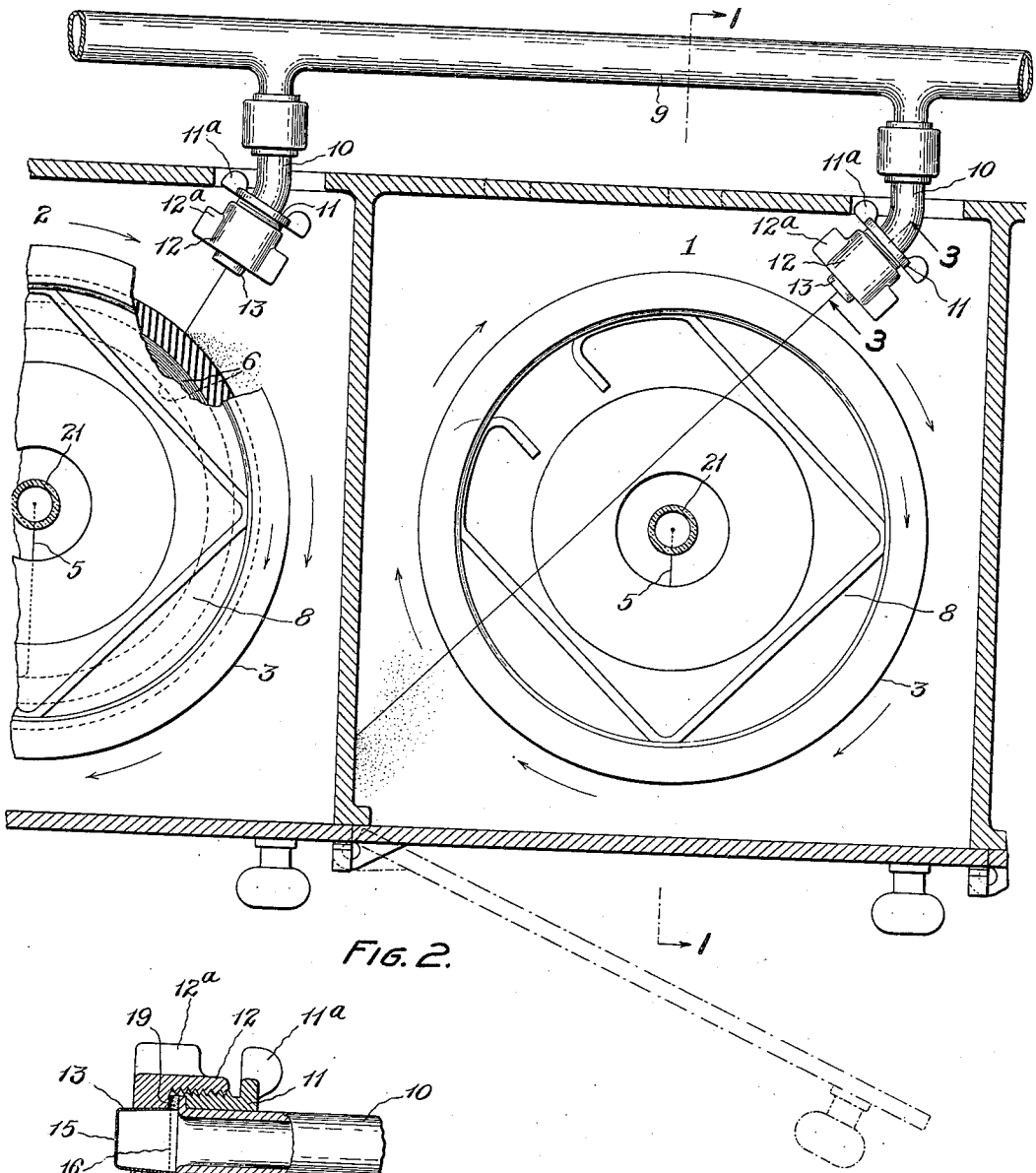


FIG. 2.

FIG. 3.

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PROCESS OF AND MEANS FOR SPINNING RAYON THREAD

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Application December 13, 1932, Serial No. 646,993

16 Claims. (Cl. 18—8)

My improvements particularly relate to a process of spinning rayon thread, and means therefor, by which the deleterious action of chemicals on the rayon spinning apparatus and the spun product, and particularly the action of salts thereon, is prevented. It is well known that the materials utilized in the making and spinning of rayon contain or produce various salts, particularly sodium sulphate, which crystallize upon the rayon product and upon the apparatus by which the product is spun or centrifugally collected. This necessitates frequent stopping of the spinning machines to permit a washing thereof to remove these deposits. Also, because of the deposits, greater power is required to run the spinning machines. Further, in the case of pot spinning, the lid of the pot is prevented by these deposits from fitting down as tightly to the body of the pot as it would if these deposits were not present. My improvements obviate these operating difficulties and increase the economy of operation. I illustrate my improvements by reference to pot spinning in which the thread is collected in the usual cake form upon the inside wall of the pot by centrifugal action.

The annexed drawings and the following description set forth in detail certain steps and means illustrating my improved process and exemplifying my improved apparatus, such steps and means illustrating, however, only a few of the various series of steps by which my improved method may be worked and but two of the various sets of means in which the improved apparatus may be embodied.

In said annexed drawings:

Figure 1 is a vertical transverse section through a pot chamber, there also being shown a spinning pot, a rayon cake in process, and means for rotating the pot, the pot being shown partly in elevation. This view is taken in the plane indicated by the line 1—1, Figure 2;

Figure 2 is a plan section, taken in the plane indicated by the line 2—2, Figure 1, the view showing one complete pot chamber and its contained spinning pot; as also, a fragmentary portion of a second pot chamber and its contained pot, the cover of the pot in the latter chamber being shown partly broken away and the pot therebeneath being shown in section; and

Figure 3 is an axial section, upon an enlarged scale, of a liquid conduit and a cooperating spray-nozzle forming part of the improved apparatus and utilized in the working of the improved process, the view being taken in the plane indicated by the line 3—3, Figure 2.

Referring to the annexed drawings in which the same parts are indicated by the same respective numbers in the different views, a battery of rayon pot chambers is suggested by the numbers 1 and 2, Figure 2, within each of which is mounted a spinning pot 3 which is rapidly rotated, in a manner well known to those skilled in the art, by a motor 4, and into which when so rotated is led the thread 5 which has been set up in a precipitating bath. This thread 5 is collected in the form of a cake 6 upon the inside wall of the pot 3 by centrifugal action and the reciprocating movements of the thread-conducting members 21, Figure 1. The pot 3 is provided with a plurality of ports 7 through which liquid from the spun thread is thrown from the pot 3 during the spinning action, this liquid flowing over the inclined floor 17 to a suitable drain. The pot 3 is provided with a cover 8 which is securely fastened to the pot during the spinning action.

My improvements consist in spraying into the pot chamber 1 outside of the pot 3 any suitable liquid, preferably water, which will hold in solution the salts which tend to crystallize on the spinning machinery and obtain access to the product, such liquid spray also dissolving any such salts which may have gathered on the machinery. I effect these results by creating a mist of the salt-dissolving liquid in the pot chamber 1 which, when water is used as the salt-dissolving medium, results in a highly humid atmosphere in the pot chamber 1. Any suitable liquid may be utilized which will hold the deleterious salts in the pot chamber in solution. Weak sulphuric acid will serve as such liquid, under certain conditions. Also steam will serve, under certain conditions, by forming dilute sulphuric acid and thus preventing the formation of the deleterious salts.

In the event the deleterious salts have already gathered on the spinning machinery, my improved process speedily dissolves them and thereafter prevents further deposition of salts. In the event none of these salts have been deposited upon the machinery at the time my process is applied, the process keeps in solution the salts thereafter presented by the thread-gathering operation and prevents their deposition upon the apparatus within the pot chamber 1.

In the forms of the invention illustrated, the aforesaid mist is created either by spraying the dissolving liquid against the outside surface of the wall of the rapidly rotating pot, as shown at the left hand side of Figure 2, the creation of the mist or the vaporizing of the spray being assisted by the circulation which is set up within the pot chamber and the spinning pot, by the centrifugal action, as indicated by the arrows in Figures 1 and 2, the centrifugal action also preventing the sprayed liquid from entering the pot 3 through the ports 7 thereof; or the mist is created by projecting the spray of salt-dissolving liquid against the wall of the pot chamber, as shown at the

right hand side of Figure 2, and thus producing the mist by the breaking up of the spray by impact, and by the natural circulation set up in the pot chamber by the spinning action. Any other suitable method of creating the mist of salt-dissolving liquid in the pot chamber may be utilized.

Besides dissolving the deleterious salts, or preventing their formation, the dissolving liquid will reduce the amount of hydrogen sulphide and other gases in the pot chamber to the extent of the solubility of such gases in the dissolving water or in the chemically-treated dissolving solution. If the sphere of action of the dissolving liquid is limited to that part of the pot chamber exteriorly of the spinning pot, an alkaline spray can be utilized which will dissolve all of the hydrogen sulphide.

For the purpose of furnishing the salt-dissolving liquid in spray form, I show by way of illustration, a header conduit 9 provided with branches 10, preferably formed of lead pipe, each branch 10 intersecting and projecting through an externally-threaded bushing 11, Figure 3, having finger pieces 11*a* and engaged by a nut 12 intersected by a spun nozzle member 13 secured in the nut 12 by an inner end flange 14. The nut 12 is formed with finger pieces 12*a*. An end flange 20 is formed on the branch conduit 10. Interposed between the flange 20 and the flange 14 are a screen 16 and an annular packing ring 18. The flange 14, packing 18 and screen 16 are locked between the end flange 20 and a shoulder 19 formed in the nut 12. The flange 20 also serves to hold the spraying device on the branch conduit 10. This spun nozzle member 13 is formed with a small port 15 in its outer projecting face through which the salt-removing liquid is sprayed, as indicated in Figure 2.

What I claim is:

1. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a rotating spinning pot and projecting a spray of a salt-dissolving solution against the outside surface of the wall of the spinning pot.

2. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a rotating spinning pot and projecting a spray of a sodium-sulphate-dissolving liquid against the outside surface of the wall of the spinning pot.

3. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a rotating spinning pot and projecting a water spray against the outside surface of the wall of the spinning pot.

4. Apparatus for spinning rayon thread comprising a pot chamber, a perforated spinning pot therein and means for rotating the pot, means for conducting a thread to the pot and collecting the same therein, and means for discharging a liquid spray into the chamber outside of the pot.

5. Apparatus for spinning rayon thread comprising a pot chamber, a perforated spinning pot therein and means for rotating the same, means for conducting a thread to said pot and collecting the same therein in cake form, and means for projecting a liquid spray against the inner surface of the wall of the pot chamber.

6. Apparatus for spinning rayon thread comprising a pot chamber, a perforated spinning pot therein and means for rotating the same, means for conducting a thread to said pot and collecting the same therein in cake form, and means for projecting a liquid against the outer face of the spinning pot.

7. Improvements in processes of spinning rayon thread by the centrifugal method of collecting the same in a spinning pot, consisting in preventing the crystallization of salts contained in the liquid coming from the spinning pot by subjecting such liquid to the action of a salt-dissolving solution in the spinning pot chamber outside of the spinning pot.

8. Improvements in processes of spinning rayon thread by the centrifugal method of collecting the same in a spinning pot, consisting in preventing the crystallization of salts contained in the liquid coming from the spinning pot by subjecting such liquid to the action of a water mist in the spinning pot chamber outside of the spinning pot, said mist being sufficiently heavy to hold the salts in solution.

9. Improvements in processes of spinning rayon thread by the centrifugal method of collecting the same in a spinning pot, consisting in preventing the crystallization of salts contained in the liquid coming from the spinning pot by subjecting such liquid to the action of a humid atmosphere in the spinning pot chamber outside of the spinning pot, the humidity of said atmosphere being maintained sufficiently high to hold the salts in solution.

10. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a perforated spinning pot rotating in an enclosing chamber spaced from the pot, and subjecting the liquid coming from the spinning pot to the action of a salt-dissolving solution in the space between the pot and the chamber wall.

11. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a perforated spinning pot rotating in a chamber enclosing and spaced from the pot and projecting a water spray against the inner surface of the wall of said chamber.

12. Apparatus for spinning rayon thread comprising perforated thread-collecting means, a chamber enclosing and spaced from said means, and means for vaporizing liquid in the space between said collecting means and said chamber.

13. Improvements in processes of spinning rayon thread consisting in centrifugally collecting the thread in a spinning pot rotating in an enclosed chamber spaced from the pot, and projecting a salt dissolving medium into the space between the pot and the chamber wall.

14. Apparatus for collecting filaments of artificial origin comprising thread collecting means, means for rotating said thread collecting means, a chamber surrounding said thread collecting means and means for projecting a liquid within said chamber outside of said thread collecting means.

15. Apparatus for collecting filaments of artificial origin comprising centrifugal thread-collecting means, means for rotating the same, and means for subjecting non-collecting surfaces of the thread-collecting means to the action of a liquid.

16. Apparatus for collecting filaments of artificial origin comprising centrifugal thread-collecting means, means for rotating the same, and means for projecting liquid against the outer surface of said collecting means.

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