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APPARATUS FOR USE IN THE MANUFACTURE OF ARTIFICIAL SILK

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Fig. 1.

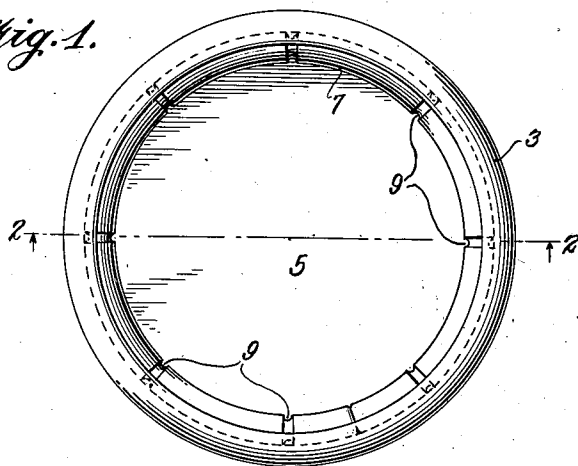


Fig. 2.

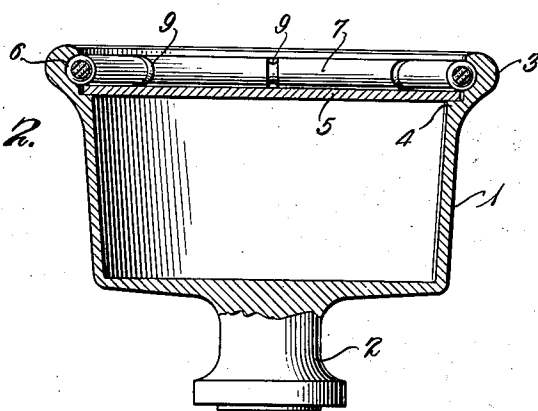
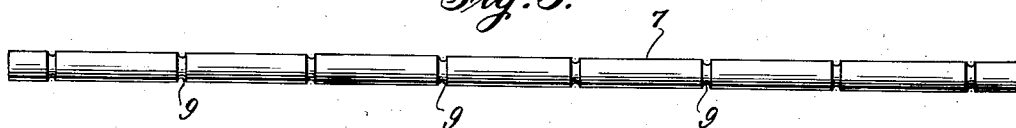


Fig. 3.



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APPARATUS FOR USE IN THE MANUFACTURE OF ARTIFICIAL SILK

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5 Claims. (Cl. 117—27.5)

The present invention relates to improvements in centrifugal pots of the general type employed in the manufacture of artificial silk, and more particularly the invention relates to cover retaining means for such pots.

In the manufacture of artificial silk it is frequently a practice to build up a body of the strandular product upon the interior of a cylindrical spinning pot or bucket. Such pots are usually rotated at relatively high rates of speed, as of the order of several thousand revolutions per minute, and extremely high centrifugal forces are produced therein which may be employed to expel the air, water, acid and other processing liquids from the pots. Generally small holes are provided in the wall of these pots for expelling the said liquids, but it has been found that these holes constitute the most vulnerable part of the pot, due to the combined erosive and corrosive action on the pot caused by the rapid flow through the holes of the substances extracted by the operation. A protective coating which might be employed, for instance, on pots constructed of metal is hardly effective because such erosive and corrosive action is not readily inhibited by the application of such a protective coating, since the walls of the holes are not usually adequately protected in view of the difficulty encountered in an effort to properly coat the same.

This invention contemplates the provision of a modified type of cover retaining means which permits the discharge of liquid from the bucket or pot during the centrifuging while eliminating necessity for said row of openings and the accompanying disadvantages.

It is an object of this invention to provide a cover retainer adapted to be partly received in an annular groove with a portion thereof overlapping a cover disc received within the pot, which retainer is preferably formed of resilient material such as soft rubber and is provided with spaced, reduced portions about which acids and fluids employed in the manufacture of artificial silk or the like are permitted to flow during operation of the pot.

Furthermore this invention contemplates the provision of a ring substitute for the usual ring or split ring seal type cover retainer, which substitute ring has grooves spaced along its length and is formed of soft rubber or other suitable material having the properties of soft rubber whereby it is resilient and resistant to the acids and fluids employed in the manufacture of artificial silk or the like.

A still further object of the invention is the

provision of a spinning pot which is free of perforations in its body thereby to overcome the eroding and corroding effects of acids, water, and other processing liquids passing therethrough during centrifuging and in which the cover retainer therefor is so formed that the said liquids may be discharged therearound.

Other objects and advantages will be apparent from the following detailed description when considered in connection with the accompanying drawing wherein:

Figure 1 is a top plan view of a spinning pot showing a cover retainer in operative position, made in accordance with this invention;

Figure 2 is a vertical section taken on the line 2—2 of Figure 1; and

Figure 3 is a detail view of the cover retainer.

Referring to the drawing in detail, a body 1 of a spinning bucket is provided with a hub 2. Body 1 may be made of any suitable material and it is enlarged or reenforced at its upper edge 3 so as to adapt it to resist the great bursting tendency which exists at high speeds of rotation at this part of the bucket.

The interior of the bucket is also enlarged adjacent edge 3 to provide a shoulder 4 which is adapted to support a circular cover 5, preferably of a composition material such as bakelite. Cover 5 may be perforated at its center if desired, but such construction is not necessary. Said cover 5 is somewhat smaller in diameter than the internal diameter of the bucket above shoulder 4, which permits easy application and removal of the cover and at the same time permits a flow of liquid therearound, as will be hereinafter more fully explained. An annular groove 6 is formed in the inner wall of the bucket above the shoulder 4 and parallel thereto, said groove being spaced from the shoulder an amount substantially equal to the thickness of the cover.

Groove 6 is formed in transverse section as substantially to correspond with the general exterior of a cover-retaining ring 7 adapted to be received therein.

In the embodiment illustrated, ring 7 is shown of soft rubber, since this material has been found suitable to the conditions involved. However, it should be noted that non-corrosive spring metal, or any other material which is yielding, resilient and resistant to the acids and fluids used in the manufacture of artificial silk and the like may be used. Ring 7 is preferably formed by cutting the material in a piece corresponding in length to the circumference of groove 6, as shown in Fig. 3, and fitting the piece into the groove by bringing

its ends together; or it may be formed to annular shape by moulding or die cutting. The stock constituting ring 7 is thicker than the depth of groove 6 so that it projects therefrom to overlap the rim of cover 5 to prevent dislocation of the latter, resulting for example, from the high pressures frequently evolved within the spinning pot.

While the invention at times may be practiced in designing the cover retainer 7 so that it may lie dead when in ring form, it is preferable that it be so constructed that it have a bow-like tension normally to urge it toward the bottom of groove 6, thus insuring its retention at all times against accidental dislocation or movement laterally or longitudinally in the groove. However, it is important that allowance be made for a slight movement of cover 5 from the shoulder 4 to permit escape of the extracted materials around the edge of said cover. This may be accomplished, for example, by affording nominal clearance between cover 5 and the periphery of the retaining ring, or by forming ring 7 of material sufficiently soft that it will be compacted by outward pressure of the cover.

Cover retainer 7, preferably before assembly in the pot, is cut or moulded radially at spaced points to provide therealong a plurality of transverse recesses 9. Said recesses may be of any desired character to permit escape of the extracted liquids outwardly from the interior of the spinning pot and around cover 5, and are preferably annular grooves peripherally formed in the surface of retaining ring 7. Grooves 9 may be made in any convenient size short of appreciably weakening the retaining quality of ring 7, and provide clear channels through which the extracted fluids flow after their escape around cover plate 5, and supporting shoulder 4.

From the foregoing, it will be observed that the described construction materially facilitates the escape of air, water, acids and all other processing fluids from the spinning pots while insuring the retention of cover 5 thereon. In addition, its resilient character permits relative movement between cover and pot body, thus preventing the development of deleterious centrifugal pressures within pot 1.

By eliminating requirement for outlet holes in the body of pot 1, characteristic erosion and corrosion action is prevented, much longer life is imparted to equipment and replacement costs are materially reduced.

While the invention has actually been illustrated and described as being applied to a spinning pot with an imperforate cover, it may be applied to a spinning pot having a cover with a center opening. In such case, the extraction of air and processing fluids would take place during actual spinning operations. The ring construction described here also would prevent the cover from being blown off by pressures resulting from centrifugal force. Ring 7 would, in such case, also obviate requirement for perforations in the spinning pot at any point on its body and eliminate erosion and corrosion action in connection therewith.

While ring 7 has been described and illustrated in connection with a spinning pot, the invention is not to be limited to such application, since it may be applied to any rotating or stationary vessel wherein extracting pressures are developed.

Although the foregoing description and drawing disclose cover retainer 7 and groove 6 as being curved in cross-section, it is obvious that their cross-section may be of any other shape desired, such as squared, octagonal or other convenient configuration. Furthermore, whereas it is preferred that the cross-section characters of cover retainer 7 and groove 6 be in correspondence as shown, it is clear that the invention may be adequately practiced without regard to strict conformation of relative contours.

Various modifications and changes obviously may be made without departing from the spirit of the invention, and it is to be understood that the scope thereof should not be limited other than by that of the appended claims.

I claim:

1. In combination a spinning pot having an internal shoulder and a circular groove adjacent thereto, a cover plate on the internal shoulder and resilient ring shaped element in the groove for retaining the cover plate on the internal shoulder, said ring shaped element having radial recesses disposed therein at spaced points.

2. In combination a spinning pot having an internal shoulder and a circular groove adjacent thereto, a cover plate on the shoulder and a ring member of resilient erosion and corrosion resisting material in the circular groove for retaining the cover plate on the shoulder against the dislodging forces of centrifugal pressures developed within the pot but adapted to yield sufficiently to permit escape of spinning materials between the cover plate and the shoulder, said ring member having a plurality of radial recesses at spaced points therearound for permitting release of the escaped materials.

3. A retaining means for spinning pot covers comprising a resilient cylindrical member having annular recesses disposed therein at longitudinally spaced points.

4. A retaining means for spinning pot covers comprising a resilient cylindrical member in ring shape possessing the property of resisting said shape and having annular recesses disposed therein at longitudinally spaced points.

5. An apparatus for use in spinning artificial silk comprising in combination a spinning pot having an internal shoulder, a cover plate adapted to be supported by said shoulder, the diameter of the cover being less than the diameter of the space above the shoulder to permit the escape of fluids between the cover and shoulder, a circular groove surrounding the inner wall of the pot above the shoulder and a resilient cover retaining member adapted for positioning within the circular groove, said cover retaining member having annular recesses at spaced points therein whereby the escaping fluids are released through the spaces formed by the annular recesses.

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