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APPARATUS FOR UNIFORMLY DYEING RAYON CAKES

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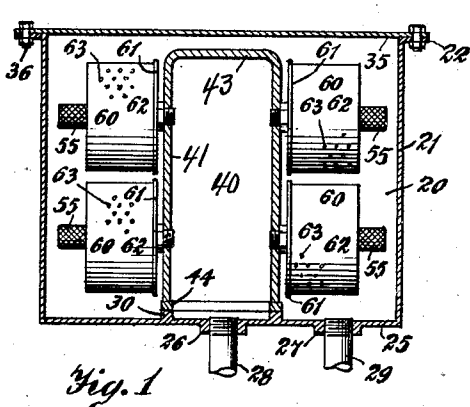


Fig. 1

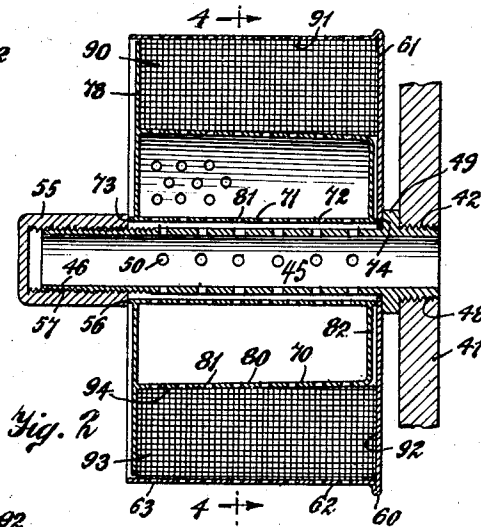


Fig. 2

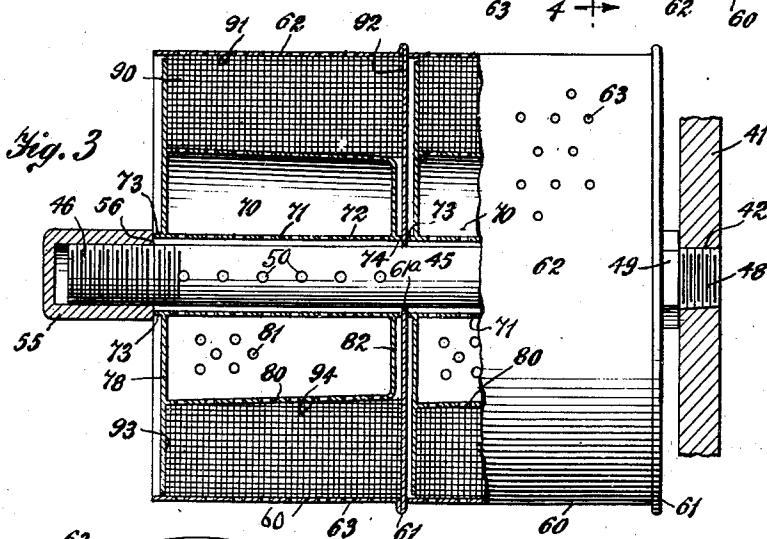


Fig. 3

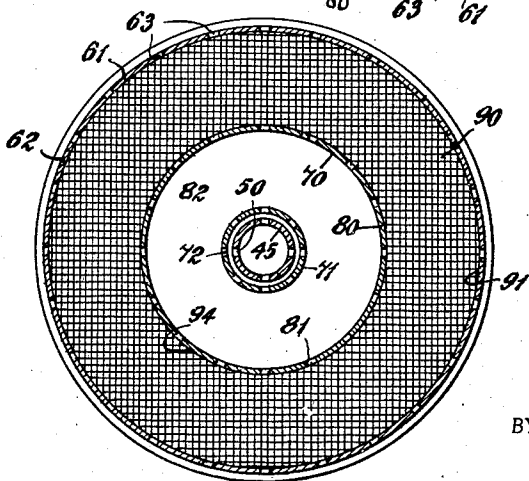


Fig. 4

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APPARATUS FOR UNIFORMLY DYEING
RAYON CAKES

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3 Claims. (Cl. 68—189)

This invention relates to apparatus for uniformly dyeing rayon cakes.

The object of the invention relates to the apparatus for dyeing rayon cakes at a predetermined density, to secure uniform dyeing through all parts of the cakes.

The second object of the invention is the production of apparatus of a size which will enable rayon cakes of predetermined dimensions, to be uniformly compressed to a predetermined density to secure uniform dyeing.

The third object of the invention relates to the apparatus for dyeing a plurality of rayon cakes and the like, independently of one another at predetermined densities to secure uniform dyeing when treated with dye liquor.

The fourth object of the invention relates to the apparatus for dyeing rayon cakes and the like, the cakes treated being originally of somewhat longer dimensions than said apparatus, to produce cakes after being compressed of uniform densities throughout all portions thereof. The thickness of the cakes before being treated are such that they can be easily positioned in the apparatus.

The fifth object of the invention relates to the apparatus for uniformly dyeing rayon cakes and the like of various dimensions, and producing apparatus which will suit the various dimensions of rayon cakes of different manufactures.

The sixth object of the invention relates to the apparatus for treating rayon cakes and the like of various dimensions to produce cakes of uniform densities and changing the nature thereof.

In the drawing Fig. 1 represents a vertical section of an operating tank and its appurtenances, with portions in full lines, for simultaneously dyeing a plurality of rayon cakes at a predetermined density; Fig. 2 is an enlarged longitudinal section of a rayon cake and its appurtenances for dyeing the same; Fig. 3 is a view similar to Fig. 2 with portions in full lines, of a pair of rayon cakes and their appurtenances for dyeing the same and Fig. 4 indicates a section of Fig. 2 on the line 4, 4.

Referring to Figs. 1, 2 and 4, an operating tank 20, is indicated with the cylindrical wall 21, having the flange 22, at its upper end and having the bottom wall 25.

Bosses 26 and 27, with threaded openings are integral with the wall 25. Pipes 28 and 29 respectively, have their upper ends in threaded engagement with the threaded openings in the

bosses 26 and 27. An annular projection 30, extends up from the inner face of the wall 25.

A cover 35, is provided for the top open end of the wall 21, and is detachably bolted to the flange 22, by means of the bolts 36.

A carrier 40, having the cylindrical wall 41, with threaded openings 42, the top wall 43, and the bottom annular end 44, is positioned upon the annular projection 30, of the operating tank 20, and detachably supported thereon.

Supporting spindles 45, at their outer ends have the threaded shanks 46, and at their inner ends are shown with the threaded shanks 48. An hexagonal spacer portion 49, is indicated adjacent to each of the shanks 48. The shanks 48, are in threaded engagement with the threaded openings 42, of the wall 41, of the carrier 40. Each of the spindles 45, is indicated with the openings 50, extending through its wall. A cap 55, with the bearing end 56, and the thread 57, on its inner cylindrical face is in threaded engagement with each threaded shank 46.

Baskets for the cakes of rayon to be treated are each designated in its entirety by the numeral 60. Each of said baskets in this instance, comprises the disc shaped supporting wall 61, with the axial opening 61a and which has integral therewith and at right angles thereto the cylindrical outer wall 62. Perforations 63, extend through the wall 62.

The baskets 60 at their ends opposite the walls 61 are open. In each basket 60, is detachably positioned the adjuster designated in its entirety by the numeral 70. Each adjuster 70, comprises the cylindrical core 71, with the perforations 72. The ends of the core 71, are indicated at 73 and 74.

An outer disc shaped closing wall 78, extends from and is integral with the core 71, and the outer face of said wall 78, is spaced somewhat from the end 73, of the core 71.

From the wall 78, extends one end of the outer tapered adjusting wall 80, having the perforations 81. The wall 80, joins with the disc shaped end wall 82, at a point somewhat distant from the end 74, of the core 71.

Referring to Fig. 3, the wall of the carrier is again shown at 41, with one of its threaded openings 42.

A supporting spindle is again indicated at 45, with its threaded shank 46, at one end and the threaded shank 48 at its other end with the spacer portion 49. The openings for the spindle are again shown at 50. The cap 55, is again indicated with its bearing end 56. In this instance

a pair of the baskets 60, for the rayon cakes to be treated are supported on the spindle 45. Each of the baskets again comprises the supporting wall 61, which has integral therewith the outer cylindrical wall 62, with the perforations 63. The adjuster for such basket is again indicated at 70, with its core 71, having the perforations 72. Each core 71, is again provided with the ends 73, and 74. The outer disc shaped closing walls are again shown at 78. From each of the walls 78, extends one end of its adjacent tapered adjusting wall 80, having the perforations 81. The walls 80 join with the disc shaped end walls 82, at a point somewhat distant from the ends 74, of the cores 71. It will be noted in this instance, see Fig. 3, that the wall 61, of the outermost basket bears against the end 73, of the core of the adjacent adjuster 70, and that the bearing end 56, of the cap 55, bears against the end 73, of the core 71, of the outermost adjuster 70.

The rayon cakes treated by the apparatus are each designated in its entirety by the numeral 90. Each of the rayon cakes is shown with the outer cylindrical face 91, the bottom flat face 92, the top flat face 93, and the inner tapered face 94.

To dye the rayon cakes 90, they are positioned in the baskets 60, as indicated in the drawing. The cakes 90 when inserted into the baskets 60, are somewhat longer than the latter, and the thickness of the cakes are such that they may be easily located in the space between the basket 60 and the adjuster 70.

The outer cylindrical face 91, of each cake treated bears against the inner face of the wall 62, of its basket 60, the bottom flat face 92, bearing against the inner face of the supporting wall 61.

The adjuster 70, bears with its outer circumferential portion of the closing wall 78, upon the flat top face 93, of the cake 90, and the tapered adjusting wall 80, bears against the inner tapered face 94, of said cake 90.

After the rayon cakes 90 and the adjusters 70, are placed in their baskets 60, the caps 55 are screwed onto the shanks 46, of the supporting spindles 45, and their bearing ends 56, are brought to bear against the ends 73, of the cores 71, of the adjacent adjuster 70. Thereby the closing walls 78, of the adjusters 70, are brought to bear against the top flat face 93, of each cake 90, and the said cakes are forced in place with the required predetermined pressure in each of the baskets 60, to secure a uniform density through all portions of the cakes operated upon.

The dye liquor may now be forced through the pipe 28, and enter the supporting spindles 45. The dye liquor is forced through the openings 50, of the supporting spindles 45, and then flows through the perforations 72, of the core 71, of each adjuster 70. The dye liquor is then forced uniformly through all portions of the cakes 90, with a uniform pressure. The liquor after passing through the rayon cakes escapes from the baskets 60, through the perforations 63, of the walls 62, and is dropped into the operating tank 20. From the latter the dye liquor escapes just described the dye liquor flows through the rayon cakes from their inner to their outer faces.

A four-way valve and pump, not shown, is connected to the pipes 28 and 29.

If desired, the dye liquor may enter the operating tank 20, through the pipe 29, and it will be forced through the perforations 63, of the walls 62, of the baskets 60. The liquor then

flows through the cakes 90, from their outside to their inside and escapes through the perforations 81, of the wall 80, of the adjuster 70. The liquor then flows through the perforations 72, of the cores 71. The liquor next flows through the openings 50, and enters the supporting spindles 45, and from the latter it enters the carrier 40 and is finally led away through the pipe 28. By means of the operations just described the dye liquor flows through the rayon cakes from their outer faces to their inner faces as already referred to.

Various modifications may be made in the invention and the present exemplification is to be taken as illustrative and not limitative thereof.

Having described the invention I claim:

1. In an apparatus for dyeing rayon cakes the combination of a supporting spindle having perforations, a plurality of baskets having outer cylindrical walls with perforations coaxial with and supported on the spindle, each of said baskets being adapted to support a rayon cake having an inner tapered longitudinal face, an adjuster in each basket and coaxial therewith, a core for each adjuster surrounding the supporting spindle, each adjuster having an outer tapered wall with perforations adapted to bear against the tapered face of its coacting rayon cake, each adjuster having a disc shaped wall at one end adapted to bear against one of the rayon cakes and a wall at its other end, means to longitudinally move each adjuster to simultaneously compress the rayon cakes to a desired pressure and density.

2. In an apparatus for dyeing rayon cakes having inner tapered faces, the combination of a basket having a cylindrical wall with perforations for supporting a rayon cake, a supporting spindle for the basket having perforations, coaxial with and extending through the basket, an adjuster adjustably positioned in the basket, said adjuster comprising a core having perforations and surrounding said spindle, said adjuster having an outer tapered wall with perforations and having a disc shaped wall at one end extending into the basket with its circumferential edge bearing against the inner face of the cylindrical wall of the basket, a disc shaped wall at the other end of the adjuster extending into the basket and means coacting between the adjuster and the supporting spindle to longitudinally position the adjuster in operative position, the tapered wall of the adjuster bearing against the tapered face of the rayon cake in the basket to compress said cake to a predetermined pressure and density.

3. In an apparatus for uniformly dyeing rayon cakes, the combination of an operating tank having a cylindrical wall and a bottom wall, pipes leading through and connected to said bottom wall; a carrier detachably supported over the bottom wall, a supporting spindle having perforations and a spacer portion extending from the outer face of the carrier, a pair of baskets each comprising a cylindrical wall with perforations, said wall being open at one end and a disc shaped wall at the other end, the latter having an axial opening, each axial opening being positioned around the supporting spindle, one of said disc shaped walls bearing against the spacer portion of the supporting spindle, an adjuster for each basket, each adjuster comprising a disc shaped closing wall at one end and a disc shaped end wall at the other end, the disc shaped walls connected by an outer tapered adjusting

wall having perforations, a cylindrical core having perforations connecting the disc shaped walls of the adjuster and surrounding the supporting spindle; the said core having its ends extending respectively beyond the disc shaped closing wall and the disc shaped end wall of the adjuster, one end of one of said cores bearing against the inner face of the disc shaped supporting wall of its coacting basket and the other end of the core bearing against the outer face of the disc shaped supporting wall of the second basket, and a cap

with a bearing end in threaded engagement with the outer end of the supporting spindle and bearing against the adjacent end of the core of the second adjuster; the other end of the core of the second adjuster bearing against the disc shaped supporting wall of the coacting basket, each of said baskets supporting a rayon cake having an inner tapered face adapted to be pressed by the tapered adjusting wall of its coacting adjuster.

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