

April 28, 1936.

M. CASSE

2,038,643

APPARATUS FOR THE TREATMENT OF HATS AND OTHER ARTICLES

Filed Feb. 23, 1933

2 Sheets-Sheet 1

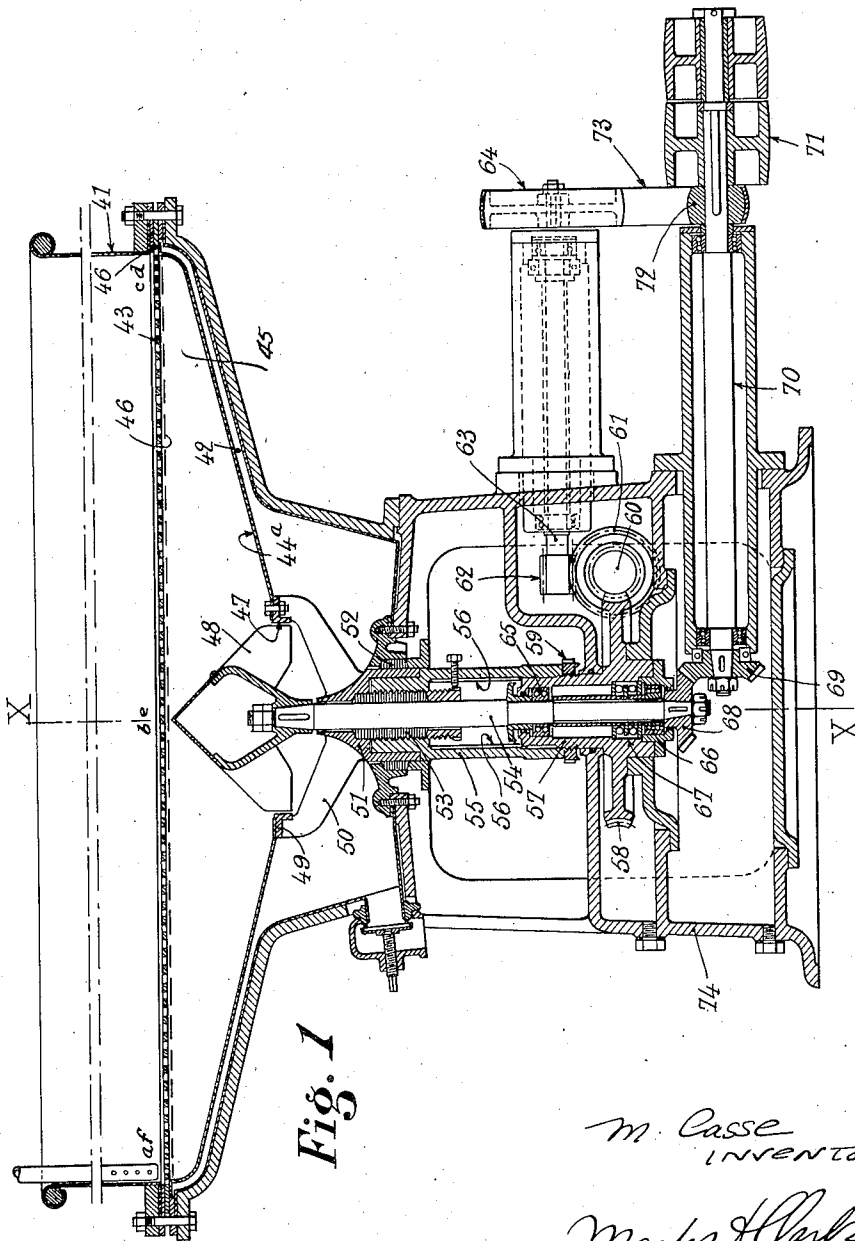


Fig. 1

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2 Sheets-Sheet 2

Fig. 3

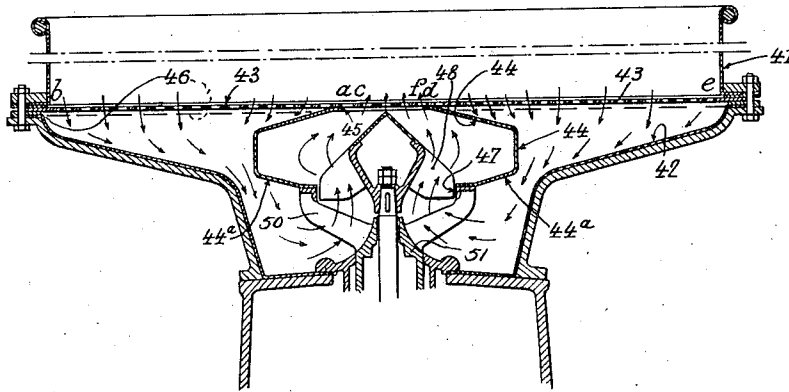
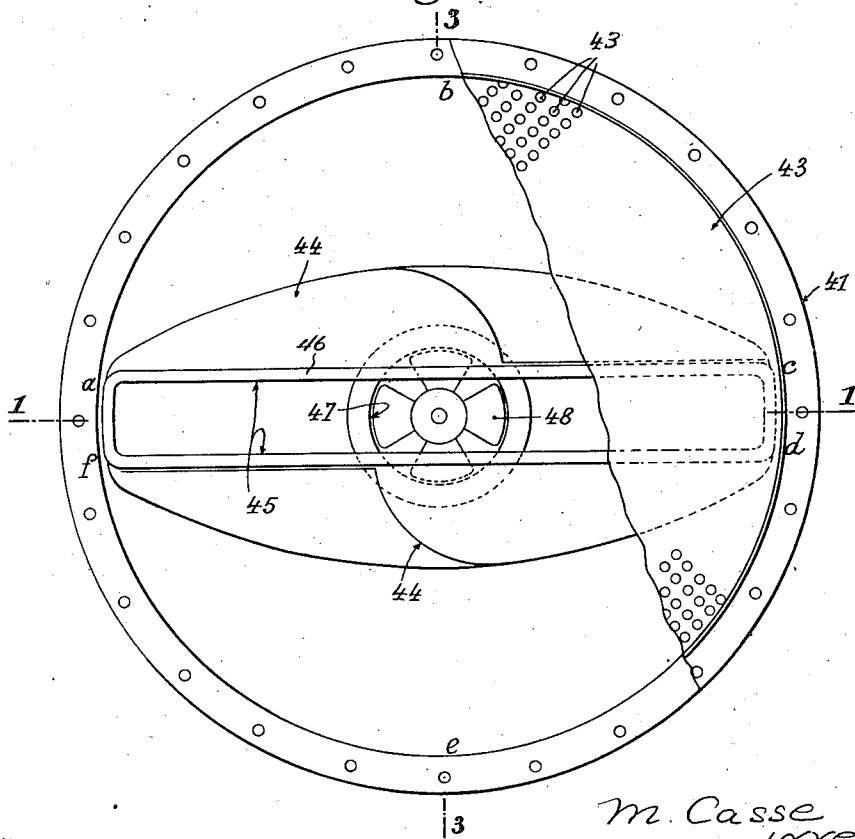


Fig. 2



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UNITED STATES PATENT OFFICE

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APPARATUS FOR THE TREATMENT OF
HATS AND OTHER ARTICLES

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In France March 16, 1932

5 Claims. (Cl. 8—19)

Apparatus are known in which the hats or other articles to be treated are immersed in a suitable bath for washing, sizing, or dyeing, said bath flowing in a stationary perforated receptacle.

5 These apparatus generally comprise a propeller for causing the dyeing or other bath current to enter and to leave the perforated receptacle at two different points thereof.

10 In order to uniformize the washing, sizing or dyeing, the rotation of this propeller is periodically reversed, and the direction of the bath current is also reversed, the mass of the hats or other treated articles traveling thus from one portion of the perforated wall to the other portion thereof.

15 The propeller has a low speed, and a relatively small power of suction, so that it is by no means capable of affording a good and useful result, as the latter depends upon the degree of suction of the bath through the hats or other articles. For
20 instance a perfect effect is obtained by compelling the dye to completely pass through the felt, that is, to color it throughout its whole thickness.

25 The reversal of the direction of the bath current besides the difficulties of its mechanical or electric realization, displaces in the bath the whole mass of the hats as one unit.

30 The changes of the relative position of each hat or other article, which provides for example for the uniformity of the dyeing, is thus not assured in an absolute manner. If after the displacement of the hats which takes place at the moment of the reversal of motion of the propeller, the hats occupy such a position that a part of the perforate wall is not covered therewith, the
35 bath current passes almost exclusively through this uncovered part of the wall and thus produces no useful effect. Moreover the perforate wall which is used is only one-half of the whole wall.

40 The present invention has for its object a process for the treatment of hats or other articles by a bath for washing, sizing, dyeing or other, permitting to obviate the aforesaid drawbacks.

45 This process is chiefly remarkable in this that it consists in subjecting said bath to flow during one operation always in the same direction and in causing a relative motion between a preferably perforated receptacle containing the articles to be treated and the direction of said bath, whereby
50 the regions through which the bath enters and leaves said receptacle are displaced on the surface of the latter.

55 The invention also relates to an apparatus for the application of the said process, this apparatus being chiefly remarkable in this that it comprises

in combination, a preferably perforated receptacle containing the articles to be treated, means for causing the bath current to flow through said receptacle and means for causing a relative transverse motion of said receptacle with respect to
5 the direction of said bath current.

The bath is delivered into the receptacle or other perforated receptacle through a portion of its perforated wall and is sucked through another portion of this wall, the surface of this second
10 portion being preferably larger than that of the inlet portion.

The hats or other articles are thus applied against this second portion of the wall. Since the receptacle has a relative motion with respect
15 to the direction of the bath current each of the hats or other article comes successively before the part at which the bath enters; it is driven by the current, away from this part of wall and as the current proceeds towards the place of the
20 wall at which its passage is the easiest, that is to say towards the parts which are the less covered, the corresponding hat will be applied against one of these places.

25 Thus, each hat enters the current individually and the layer of hats through which the suction is produced is made uniform constant and automatic. The chief part of the surface of the perforated wall is used for the suction, which pro-
30 duces the really useful effect. Moreover the capacity of suction and the yield of the pump are much greater than those of a propeller.

35 It is to be remarked that at the moment when the hats float freely in the receptacle after they have been detached from the wall, they are unfolded. They fold up again when they reach the suction wall, but they have traversed the chamber in the unfolded state. Moreover they do not
40 fold up once more upon the same diametrical plane.

Hence, the effect of the dyestuff is increased in very great proportions, since, in fact, each hat is taken individually and is placed freely in the current arriving during a certain time and always
45 in the same direction. Due to this process it becomes possible to avoid the eddies in the bath which would necessarily have the effect of disturbing the felt. The work becomes practically very uniform, while permitting the dyer to verify
50 in a very easy manner the action of the operation without stopping or slackening same. This is so much more important that the dyer is not obliged to change his customs. The described ap-
55

paratus has, in fact, the outer appearance of the vessels employed in all dye works.

Lastly, the surface of suction of the apparatus is very great with reference to the surface of delivery, this again increasing the efficiency of the operation, as the felt pieces are distributed over this surface in a very uniform manner and are subjected in this position to the action of the bath.

In the accompanying drawings, given solely by way of example:

Figure 1 is a vertical longitudinal section of an apparatus according to the invention, in which the pump conduits are subjected to a continuous movement of rotation, the section being taken on line I—I of Figure 2.

Figure 2 is a plan view thereof with parts broken away.

Figure 3 is a section of Figure 2 on line 3—3.

According to the example of execution, the apparatus comprises a cylindrical receptacle 41 with vertical axis, provided with a conical bottom 42 forming the suction conduit of the pump, and with a flat perforated bottom 43 which divides it into two chambers. The upper cylindrical chamber contains the articles to be dyed. The lower conical chamber contains a diametrical hollow piece or conduit or pan 44 whose upper wall is open according to a rectangular slot 45 (Figure 2), being diametrically situated in the receptacle 41. This aperture 45 is framed by a flat flange 46 which makes contact, with the least possible play, with the lower face of the perforated bottom 43. At its lower part, the conduit 44 has a circular opening 47, in which rotates the wheel of the helico-centrifugal pump 48. The two lateral walls of the piece 42 have the usual form (Figure 2) of the spiral chambers of centrifugal pumps, and uniformly distribute, in the rectangular slot 45 the bath being set in motion by the wheel 48. The hollow piece or pan 44 rests on a ring 49. This ring 49 is secured by arms 50 to the hub 51 whose axis coincides with the axis X—X of the machine and preferably consists of an alloy which resists the chemical action of the bath. The lower wall 44^a of conduit 44 is perforated and leaves a passage for pieces 49, 50, 51. This wall 44^a is moreover conical.

The hub 51 extends out of the conical receptacle 42 through a stuffing-box 52. In the interior of this hub 51 and of a stuffing-box 53 is situated a shaft 54 carrying keyed thereon the wheel 48. The piece 51 is concentric and secured to a steel piece 55 having openings 56 affording access to the stuffing-box 53. This piece 55 is slidably keyed, at its lower part, to the hollow hub 57 of a toothed wheel 58 and rests upon a threaded ring 59 which is screwed on the hub 57 and which permits of adjusting its height and in consequence of causing the flat flanges 46 of the piece 44 to make contact, with a slight play, with the lower face of the perforated bottom 43. The toothed wheel 58 meshes with a worm 60. This worm 60 is driven, by a second toothed wheel 61 which is, itself, driven by a worm 62 which is made in one with a shaft 63 which carries at its other end a pulley 64.

The shaft 54 traverses the hub 57 in which it is guided by two ball bearings 65—66 and by the thrust bearing 67. On the lower end of the shaft 54 is fixed a bevel gear wheel 68, meshing with a second bevel gear wheel 69 mounted on the horizontal shaft 70. This shaft 70 is driven by the pulley 71 which receives the action of

a transmission gear or of a motor, not shown. A small pulley 72 fixed on the shaft 70 communicates the movement to the pulley 64 by means of a belt 73.

As indicated in the figures, the aforesaid parts are supported by and contained in a frame 74, which supports the conical receptacle 42.

The operation is the following. The shaft 70 drives, by means of the wheels 69 and 68, the pump wheel 48, and by the transmission 10 72—73—64—63—62—61—60—58 the piece 44 always in the same direction. The bath is thus sucked in the cylindrical receptacle by the two segments *abc* and *def* and is expelled through the diametrical slot 45 *acdf* (Figure 2) in the 15 direction of the arrows as of Figure 3. These two segments *abc* and *def* form the orifice of the suction conduit, this latter being formed by the receptacle 42. Thus the delivery conduit 44 is rotated and the bath caused to flow in receptacle 41 at an always variable part of the bottom 43.

The articles to be dyed, which are driven by the current of the bath, thus come against the two aforesaid segments and the suction obliges the bath to traverse them. The slow rotation of 25 the diametrical slot *acdf* brings the delivery orifices progressively and successively under each of these articles and obliges each of them at this moment to leave the bottom, to float freely and individually in the bath, and as they are drawn 30 along by the current which passes preferably through the regions of suction which are the least provided with articles to be treated, they are uniformly distributed over the parts of the perforated wall through which the suction is taking place at this moment.

An apparatus analogous to the one above described but not comprising a stuffing-box might be constructed by suspending above the receptacle 41 the mechanisms above described and by having 40 the receptacle traversed by the axis of the vertical pump and by suspending the piece 44 on a second hollow shaft concentric with the first.

Obviously the invention is by no means limited to the methods of execution represented and described which have been chosen only by way of 45 example.

Having now described my invention what I claim as new and desire to secure by Letters Patent is:

1. An apparatus for the treatment of hats and like articles by means of a bath, consisting of a stationary receptacle for said articles, delivery means causing said bath to flow during one operation always in the same direction, guiding means causing said bath to circulate within the receptacle and pass through said articles, and other means causing the position of the guiding means to vary axially with respect to said stationary receptacle.

2. An apparatus for the treatment of hats and like articles by a bath comprising, in combination a stationary receptacle having a perforated bottom adapted to contain said articles, delivery means for said bath causing it to flow through said bottom always in the same direction, and means for varying the position of said delivery means with respect to the receptacle.

3. An apparatus for the treatment of hats and like articles by a bath comprising, in combination a stationary receptacle with perforated bottom adapted to contain the articles to be treated, a pump for delivering the bath current through the bottom of said receptacle, guiding means on said 75

pump, said pump always causing the bath to circulate in said guiding means in the same direction, and means for varying the position of the guiding means of said pump with respect to the
5 receptacle.

4. An apparatus according to claim 3 in which the pump is provided with conduits pivotally mounted on its guiding means and located adjacent said bottom of the stationary receptacle,
10 and further comprises driving means operatively connected with these conduits.

5. An apparatus for the treatment of hats and like articles by a bath comprising a pump adapted to always operate in one and the same direction

and to cause the bath to flow in one and the same direction and provided with conduits having an elongated section pivotally mounted on the delivery end of said pump, a stationary receptacle
5 having a flat perforated wall therein dividing said receptacle into two superposed chambers, one of these chambers containing said articles and the other chamber containing said pump which is adapted to deliver said bath into said other chamber through the medium of said conduits having a
10 diametrically elongated aperture in contact with said perforated wall, and driving means operatively connected with said conduits for rotation.

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