This invention relates to feather cleaning and sterilizing machines wherein a batch of feathers contained in a pillow, or the like, is cleaned and renovated and finally delivered to the pillow in a sanitary and fluffed condition.

An important object of the invention resides in the provision of means whereby a batch of soiled feathers is induced into a chamber and subjected to an agitating or heating operation to remove dust and dirt, and subsequently treated with live steam, and a deodorant, if desired, and then treated with hot air to dry the batch, and finally introducing cool air whereby said batch of feathers is reduced to a clean, cool, sanitary and fluffed condition.

Another object is to provide suction means whereby the feathers are drawn into the cleaning chamber for treatment as aforesaid, such suction means also serving to remove foreign matter deposited in said chamber, to induce a flow of hot air through the feathers, and then a flow of cold air through the same, and finally to deliver said feathers to the ticking normally containing the batch of feathers.

A further object of the invention is to provide means to prevent the clogging of the discharge end of the cleaning chamber with feathers, said means being operable in conjunction with certain beaters within said chamber and being controlled to become operative only at the screen positioned in said discharge end.

A still further object is the production of a mechanism whereby the feathers entrained with the air currents discharged into the screen are restrained from clogging or closing the air ports normally provided for the escape of the air.

Other objects and advantages of the invention will be apparent as the nature thereof is better set forth, and it will be seen that changes within the scope of the claims may be resorted to without departing from the spirit of the invention.

In the drawings:

Figure 1 is a longitudinal central sectional view, partly in elevation, of the apparatus. Fig. 2 is an end elevation thereof as viewed at the left of Fig. 1.

Fig. 3 is a sectional view, slightly enlarged, on the line 3—3 of Fig. 1.

Fig. 4 is a sectional view, slightly enlarged, on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view of the upper portion of a pillow ticking and showing the means employed for introducing the feathers thereto and to prevent clogging of the screen positioned over the discharge ports of the air currents.

Fig. 6 is a plan view of said anti-clogging means.

Fig. 7 is a plan view of the screen. Fig. 8 is a plan view of an annulus associated with said means.

Referring now more in detail to the accompanying drawings wherein like characters of reference denote similar parts throughout the several views, 5 indicates the treating chamber which is defined by a drum 6, the sides thereof carrying a rotatable shaft 7 mounting a plurality of beaters 8, said shaft being provided with a pulley 9 adapted to be belted to any suitable source of power. One end of said drum 6 is provided with an inlet opening 10 to which is connected the branch 11 leading from the chute 12 the upper portion of said chute being provided with a hopper 13 having a hinged door 20.

The other end of said drum 6 is provided with a discharge opening 15, closed by a screen 16, piping 17 connecting said opening to the intake end of a fan 18, the discharge end of the latter being coupled to a conduit 19 having its upper end normally open to the atmosphere. As shown in Figs. 1 and 2, said drum 6 may be supported by a cradle 20 to assure a sturdy arrangement, while the upper portion of said drum is provided with brackets 21 mounting a chest 22, containing coiled piping 23 adapted to receive a heating medium, such as steam, from the piping 24, one end of said chest being closed by a hinged shutter 25, whilst the other end is provided with a screened opening 26.

Without implying any limitation in the use of the machine it is preferred to treat at one time the normal contents of the ticking of a pillow in order that it may be assured that the original contents, in a cleaned condition, will be returned to the ticking after the several operations have been performed. Thus, the ticking may be emptied of its contents into the hopper 13 after the door 14 has been elevated, such contents then gravitating to the bottom of the chute 12 to the screened opening 21 through which any foreign matter such as sand or similar heavy particles descends into the receptacle 28 for subsequent removal.

The feathers are now in a position and condition to be delivered into the treating chamber 5 of the drum 6 by way of the inlet opening 10, the means employed for transporting the feathers to said chamber being the air currents induced by said suction fan 18. As shown in Fig. 1, said
branch 11 and said piping 17 are provided with valves 29 and 30, respectively, and when both valves are opened and the fan started, the air currents will draw the batch of feathers into said chamber by way of opening 16, said screen 16 in opening 15 preventing the passage of any feathers to the piping 17 but allowing free passage of the air currents as will be well understood.

The rotatable beaters 8 mounted on shaft 7 are driven as aforesaid, agitate and literally "beat" the feathers to remove and extract the residual dust and dirt therefrom, whereupon said fan 18 is stopped and the valves 29 and 30 are opened. In order to thoroughly clean and sterilize the feathers, I propose to admit steam into said chamber 5 by way of pipe 31, the temperature in said chamber being observed by the thermometer 32, and the built-up pressure therein being regulated by the gauge 33 and controlled by the relief-valve 34. It will be understood that during the admission and retention of the steam within said chamber, said beaters 8 are in operation thus agitating the feathers and assuring that the steam will penetrate and operate on each individual feather.

After these cleaning and sterilizing operations certain chemicals or disinfectors may be introduced into the chamber 5 from a suitable container 35.

In order to thoroughly dry and stuff the feathers a stream of hot air is next passed through the chamber 5, said hot air being drawn from the steam chest 22 by means of fan 18, the shutter 25 being swung to the position indicated by the dotted lines in Fig. 1, thus closing the hopper 13 whilst valves 29 and 30 are opened. The air is, of course, drawn originally through the screened opening 26 into the chest 22 where it is heated by the steam coils 23 and from said chest it passes through chute 12 and into the chamber 5 by way of opening 16.

Finally, the hinged shutter 25 is swung back to its original position thereby closing said steam chest and shutting off the passage of hot air to said chamber 5. In order to permit the passage of cold air to the chamber 5 the hopper closure 14 is opened and said cool air currents are introduced through fan 18 into said chamber 5 by way of chute 12 and opening 16, said cool air currents operating to thoroughly cool the feathers within said chamber before their delivery to the original container. The batch of feathers being ready for delivery to the ticking A, screen 16, mounted on slide 16a, (see Figs. 1 and 3), is withdrawn, and the operating fan 18 now draws the batch from the chamber 5 and delivers it to the ticking A by way of conduit 19 and piping 36, valves 37 and 38 being interposed in the conduit 19 and piping 36, respectively, which are operated to open and close these elements during the aforesaid manipulations.

It is obvious that when the feathers are initially drawn into the drum 5 by the air currents induced by the fan 18, said feathers will try to escape through said screen 16 in the outlet 15, thus clogging said screen and shutting off the passage of the induced air currents. In order to remove such accumulations of feathers on said screen I propose to provide means in the nature of a wiper which comprises an arm 39 having its hub 40 splined to said shaft 7 and being rotatable therewith so that the wiper element 41 will intermittently engage the surface of said screen 16 and remove the clinging feathers. Manifestly the wiper 41 only engages the screen during a small portion of its rotation and in order to reduce unnecessary wear it is important that the wiper be temporarily removed from its normal contact with the interior surface of the end wall of the drum 5. To that end said hub 40 is slidably mounted on the key 42, (see Figs. 1 and 4), and normally assumes the position shown in said Fig. 1. However, when the wiper 41 leaves the screen 16 its arms 39 encounters the circular track or rib 43 which slides 10 the hub 45 along said shaft 7 and the wiper is spaced from the side wall of the drum. As the rotating wiper approaches the screen 16 it leaves the track and the spring 44 returns the wiper to its operative position. This is a feature of some importance.

When the feathers are discharged into the ticking A they travel along with the air currents and in order that the operation may be successful it is vital that the air currents escape from the ticking. As the interstices in the fabric comprising the ticking are not sufficient to release said air currents, it has been proposed to provide openings for the release of the air, and in order to prevent the escape of the feathers, certain screening has been interposed. Here again the efficiency of such an arrangement is seriously impaired in that the feathers will attach themselves to the screen, clog the same and prevent the escape of the air currents. As will presently appear, I provide screened openings to release the air and also means to prevent clogging of said openings.

The aforesaid means comprises an annulus 45 having a plurality of radially directed arms 46, 48, (see Fig. 8), whose inner ends engage the end of the piping 36, (see Figs. 5 and 6), said annulus being provided with a circumferential flange 47 over which the open end portion of the ticking A may be slipped and tied by the element B. It will be seen that said arms 46, the adjacent internal walls of the annulus and the sides of the piping 36 unite to define openings for the escape of the air currents that carry the feathers into the ticking. In order to close said openings against the escape of said feathers, I interpose a screening 48 having an open frame 49 to permit the entrance of the piping 36, and also including an outer frame 50 of said arrangement 41. Said screen normally rests on the upper edge of said annulus 45 as shown in Fig. 5, whereupon the ring 52 threadedly engages said annulus 45 to mount the parts in the positions indicated, the arrangement being such that said screening 48 may be oscillated or completely rotated when assembled as aforesaid. When the feathers enter the ticking A, the air currents will escape through the screened openings between the radial arms 46 and in order to dislodge any feathers clogging said screen it is only necessary to grasp handle 51 and rotate said screen on the piping 36. In view of the provision of brushes 53, suitably carried by said arms 46, the accumulations of feathers will be readily scraped from the screen during its operation as aforesaid. Thus, an arrangement is provided to permit the escape of the transporting air currents and means is adopted to remove the cause of a serious impairment to this essential arrangement.

I claim:

1. A machine of the class described comprising a treating chamber having an inlet and outlet for feathers, rotatable beaters mounted within said chamber, a feather-receiving chute 75...
leading to said inlet, a heating chest having one end open to the atmosphere, a shutter interposed between said chest and said chute and adapted to be operated to close said chute at its upper end and place said chest in communication with said treating chamber, and an exhaust fan having its intake end connected to the outlet of said chamber and adapted to draw heated air from said heating chest through said chamber and to draw cool air through said chamber when said shutter is closed.

2. A machine of the class described comprising a treating chamber having an inlet and an outlet for feathers, an exhaust fan connected to said outlet to draw feathers into said chamber, a screen mounted in said outlet, rotatable basters mounted in said chamber, a shaft supporting said basters, a rotatable member carried by said shaft and adapted to contact said screen to remove the accumulations of feathers thereon and means carried by one of the side walls of said chamber and adapted to engage said rotatable member and slide the same along its supporting shaft.

3. A machine of the class described comprising a treating chamber having an inlet for feathers and a screened outlet in one of its walls, means for withdrawing air through said outlet to draw feathers into said chamber, means mounted in said chamber and engageable with said screened outlet to prevent the accumulation of feathers thereon, and means for retracting said screened outlet engaging means from contact with said wall during a portion of its movement.

4. A machine of the class described comprising a treating chamber having an inlet for feathers and an outlet in one of its walls, a screen mounted in said outlet, means for withdrawing air through said screen to draw feathers into said chamber, an arm rotatably mounted in said chamber and having a wiper portion engageable with said screen to remove feathers accumulated thereon, and a rib carried by said wall to be engaged by said arm and to retract said wiper portion from contact with said wall during the partial rotation of said arm.

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