Nov. 27, 1945. O. C. BEARDSLEY 2,389,715

APPARATUS FOR REMOVING DUST FROM FEATHERS

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Fig. 1

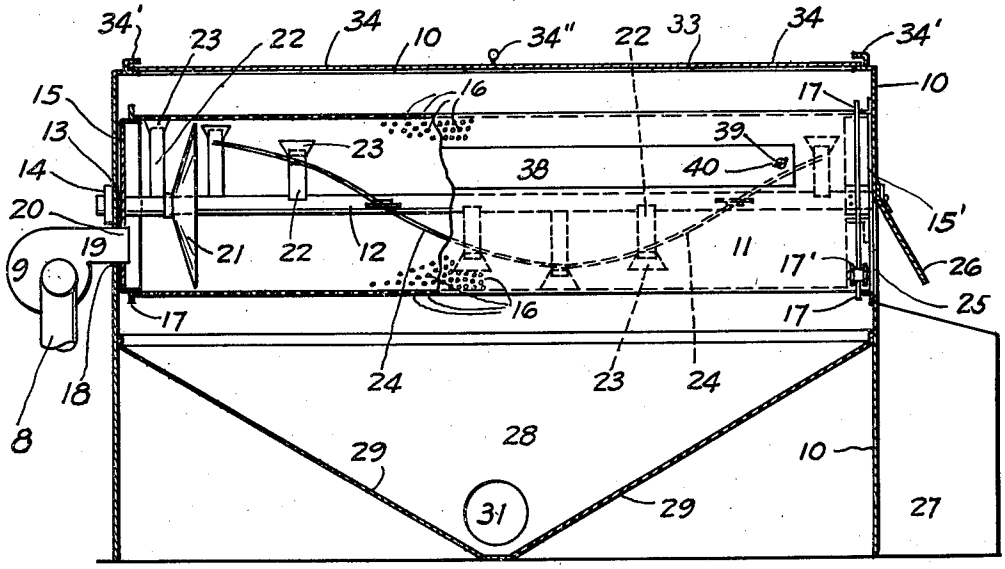


Fig. 2

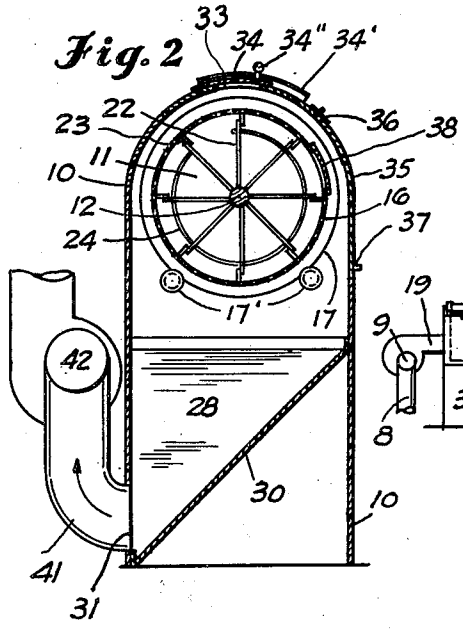
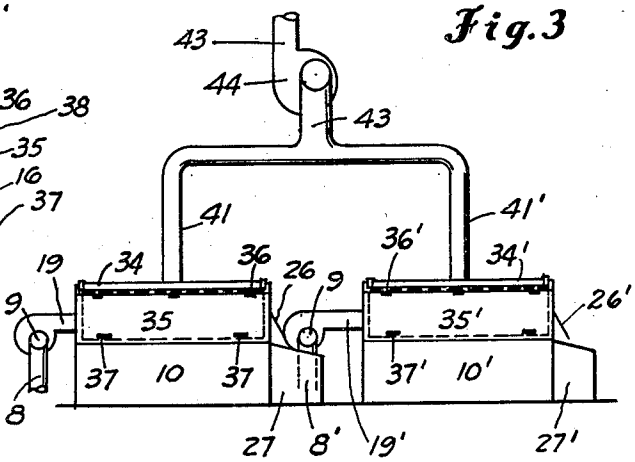


Fig. 3



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APPARATUS FOR REMOVING DUST FROM FEATHERS

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2 Claims. (Cl. 209—21)

This invention relates to apparatus for removing dust from feathers.

In order to utilize coarse feathers and particularly feathers from chickens for pillows and mattresses it is necessary that the shafts and quills be broken up to provide soft filling and to prevent the sharp points of and from the quills from protruding through the coverings. It is also especially important to remove the scales from the inside of the quills that would be subject to decay. It has been customary to first pass such feathers between rotary teeth of what is called a curling machine, whereby the shafts and quills are suitably broken up and the contents of the quills released and all pulverized portions become a part of the same mass.

Difficulty has been found in removing the pulverized portions which are usually called dust. Attempts have been made to separate the dust and the feathers by currents of air introduced in excessively long containers, but the whole mass ordinarily becomes packed together and unsatisfactory results follow.

It is therefore an object of this invention to provide means whereby the dust may be rapidly separated from the feathers; and a particular object is to provide an apparatus with a relatively short perforated cylinder into which the mass from the curling machine may be deposited therein, agitated and subjected to currents of air both blown into and sucked from the cylinder for removing all the dust from the feathers.

With these and other objects to be hereinafter stated I have illustratively exemplified my invention by the accompanying drawing of which:

Figure 1 represents an elevation of the apparatus with the front portions removed and some other parts broken away. Figure 2 is a side elevation with the front portion of the housing removed. Figure 3 is an elevation with reduced dimensions showing two housings and units coupled together for successive operations.

Like numerals on the different figures represent like parts.

Numeral 8 represents a supply tube from any source with a fan 9 for forcing the materials and air into a housing 10. The cylinder 11 is longitudinally disposed freely over a shaft 12 through the cylinder, the shaft being rotatably mounted in ordinary bearings 13 at each end of the housing and adapted to be turned by a pulley 14 by any suitable power. The cylinder is closed across the front end by a cap 15 and the opposite end is open as 15' and is perforated throughout with small holes approximating $\frac{1}{32}$ inch in diameter, a portion of the perforations for convenience being indicated by numeral 16. Suitable sheaves 17 are rotatably connected to the housing for supporting the weight of the cylinder on its rims 17, and to facilitate turning of the cylinder when necessary for cleaning the inside thereof.

The housing is provided with an intake port 18, into which a feed pipe 19 is adjusted for supplying the masses of crushed feathers through port 20 into the cylinder. Spaced back from the port 20 is a conical disc or baffle 21 which is centrally attached to the shaft with the periphery thereof spaced approximately one inch from the inner wall of the cylinder. When feathers and dust are blown against the baffle while it is rotated by the shaft, they are whirled outward and the dust loosened therefrom, and all pass through the space around the baffle inside the cylinder walls. The feathers will not pass through the perforations of the cylinder because of their fluffy formation, but the dust can and readily does pass therethrough.

In order to keep the feathers and dust agitated and to gradually move the feathers along through the cylinder, a series of arms 22 are attached at their inner ends to the shaft and extend outwardly to near the wall of the cylinder and in spaced and spiral relation with each other, and being reinforced in such positions by rod 24 connecting the arms together. Paddles indicated by 23 and preferably formed of leather or other pliable material are attached at the outer ends of the arms, which may ride adjacent to the inner walls of the cylinder and prevent any feathers from lying undisturbed or packed against the wall. The arms move consecutively against the feathers while the shaft is turned and thus gradually move the feathers to the rear opening of the cylinder where they are discharged out through a doorway 25 under door 26 of the housing into any suitable receptacle 27.

While the feathers are being so moved through the cylinder with the loosened dust therefrom the carrying current of air blows a large portion of the dust outward through the perforations where it is gathered in a hopper 28 beneath. Approximately three fourths of the air entering with the feathers passes out from the cylinders through the perforations with the dust and the remaining air carries the feathers out through the cylinder as stated. The hopper is provided with sloping sides 29 and converging end 30. An outlet port 31 is provided at the bottom of the hopper and this is larger than the port 20; and a relatively large suction tube 41 is extended from the port

31 for carrying the dust away, and a larger fan 42 provided for desired suction by the tube 41.

As the tube 41 carries a larger volume of air than the port 20 it is necessary to provide an additional supply of air to the hopper to prevent the feathers from being sucked down against the inner walls of the cylinder while the dust is being blown and sucked from the feathers through the perforations.

In order to provide this additional air a narrow opening or valve port 33 is provided longitudinally along the top of the housing and a valve plate 34 for regulating the size of the opening is slidably positioned under guide clips 34' at each end with a handle 34'' for operating the plate. This additional air is sucked around the cylinder and tends to draw out the dust therefrom beneath and into the hopper and outward therefrom. It is important that the valve be so adjusted to provide the proper supply of air to facilitate the removal of dust from the cylinder and from the hopper.

For the most practical operation a cylinder is preferably approximately 6 to 8 feet in length by 2 feet in diameter. When a cylinder is too long the current of air entering from port 20 ordinarily becomes dissipated or weak by escape through the perforations with portions of the dust and then even with an extra supply of air from above the dust may not be fully carried away. In cases where the passage of the feathers through one short cylinder does not remove all the dust it is advisable to use one or more duplicate units indicated by 10' similar to the first assembly. In such a case the second unit may be provided with a suction tube 8' and a feed tube 19' for conducting the feathers into the second cylinder from which they will be discharged into the second receptacle 27'. Where several units are so used together it is advisable that the discharge tubes 41 and 41' may be joined into one larger tube 43 with a correspondingly large fan 44. In practice it is more economical to use several units in successive operation than to endeavor to provide labor for returning the feathers through the first cylinder twice or a second time.

Occasionally after considerable periods of use some of the broken quills may become lodged in the perforations and in order to remove the same from the inside of the cylinder a door 35 is mounted in the housing on hinges 36 and provided with handles 37 for operating. A corresponding door 38 is provided along the cylinder and normally retained in position by studs 39 and nuts 40, or door 38 may be itself a section of the cylinder wall. In order to rotate the cylinder the inner end of the nozzle 19 is first withdrawn therefrom.

Having described my invention I claim as new:

1. In an apparatus for removing dust from feathers, comprising, an elongated housing having an opening in the front end thereof, a feed tube mounted in the opening for supplying currents of air and feathers to be cleaned, a cylinder disposed longitudinally and horizontally through the housing and having relatively small perforations throughout the walls thereof for the escape of dust from feathers in the interior thereof, a cap across the front end of the cylinder having a doorway for the air currents and feathers from the feed tube the rear end of the cylinder being open and a doorway in the casing adjacent the open end of the cylinder for the escape of feathers from the cylinder, a shaft rotatably mounted centrally through the cylinder, means for rotating the shaft, a disc affixed to the shaft a relatively short distance behind the cap for scattering the feathers and loosening dust therefrom when fed into the cylinder, arms extended from the shaft in spiral and spaced relation with each other, resilient paddles carried on the outer ends of the arms adapted to sweep around adjacent the inner walls of the cylinder for agitating the feathers and for separating the dust therefrom and for causing the feathers to travel through the length of the cylinder, a hopper beneath the cylinder for gathering the dust from the cylinder, a suction tube projected from the base of the hopper for drawing the dust through the perforations in the cylinder and from the hopper and having a capacity for carrying a greater amount of air than the feed tube, an adjustable valve along the top of the housing for admitting air to the housing above the cylinder for carrying dust from the outside of the cylinder into the hopper and for supplying sufficient air to the housing to prevent the suction from retarding the flow of feathers through and from the cylinder.

2. In an apparatus described in claim 1, together with, a receptacle for gathering the feathers when discharged from the cylinder and housing, a tube extended from such receptacle for transferring such feathers to a second cylinder for removal of any remaining dust therefrom, said housing having a door in one side thereof and said cylinder having a corresponding door in one of its sides to facilitate the removal from the perforations of quills and clogging matter, sheaves carried by the housing for supporting the cylinder in rotatable disposition to facilitate the cleaning thereof.

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