Aug. 4, 1942. M. HOFFMAN 2,292,076

FIBER MIXING APPARATUS

Filed Jan. 7, 1941

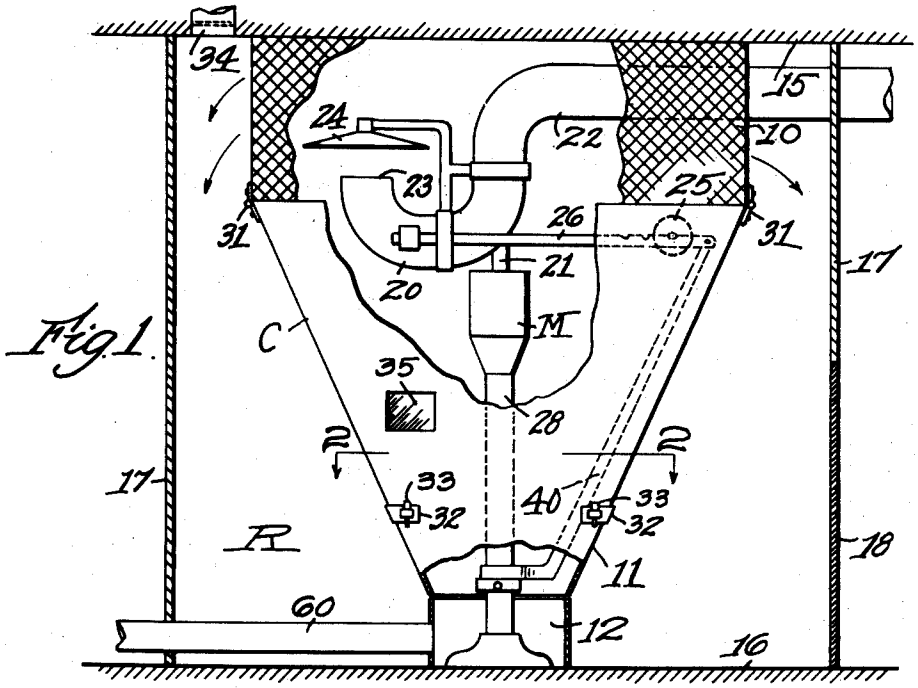


Fig. 1.

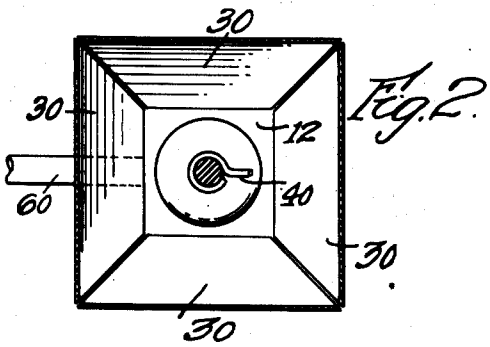


Fig. 2.

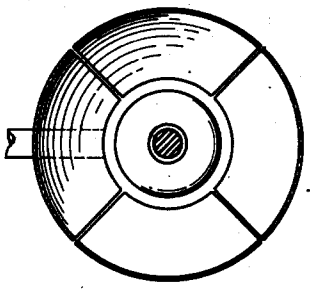


Fig. 3.

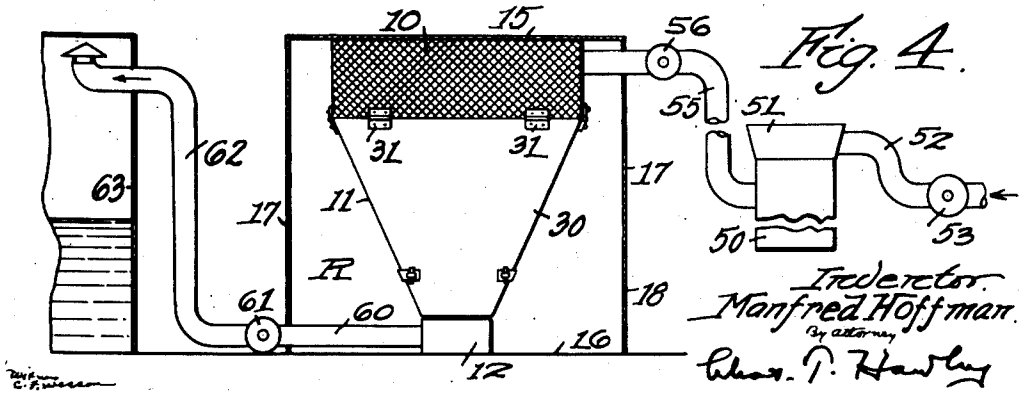


Fig. 4.

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FIBER MIXING APPARATUS

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Application January 7, 1941, Serial No. 373,516

4 Claims. (Cl. 19—146)

This invention relates to apparatus for mixing and uniformly blending fibers used in the manufacture of hats, fabrics, and other products.

It is the general object of my invention to provide improved mixing apparatus which will produce a continuous flow of wool, fur or other fibers through the mixing apparatus, and continuous delivery of blended fibers therefrom to any desired point.

A further object of the invention is to provide mixing apparatus which cleans the fibers at the same time that they are being mixed or blended, and which effectively removes dirt, dust and shives therefrom.

My improved mixing apparatus is easily and economically constructed, may be conveniently cleaned, is readily inspected while in operation, and has been proved highly satisfactory in the production of exceptionally clean uniformly blended fibers.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly set forth in the appended claims.

A preferred form of the invention is shown in the drawing, in which

Fig. 1 is a sectional side elevation of my improved mixing apparatus;

Fig. 2 is a sectional plan view, taken along the line 2—2 in Fig. 1;

Fig. 3 is a view similar to Fig. 2 but showing a modified construction; and

Fig. 4 is a side elevation of an illustrative fiber handling system, with my improved mixing apparatus incorporated therein.

Referring to the drawing, my improved apparatus comprises a casing C having a screened upper portion 10, a downwardly converging lower portion 11, and a collecting chamber 12.

Within the casing C, I provide a fiber distributing and blending mechanism of a commercial type, comprising a tubular distributing arm 20 mounted on a vertical shaft 21 and adapted to receive fibers through a loose axial connection from a fixed supply pipe 22. The fibers are blown through the supply pipe 22 and distributing arm 20 by air under pressure, and are projected from the open upper end 23 of the arm 20 against the under side of a conical deflector 24 which may be provided with propeller-like blades on its under side. This deflector moves around with the arm 20 and is thus held in vertical alignment with the open end 23 of the distributing arm. A counterweight 25 mounted on supports 26 may be adjusted to counterbalance the rotated parts of the distributing mechanism. Any suitable power means, such as a motor M on a fixed post 28, may be provided to rotate the distributing arm 20 and associated parts.

The specific construction of this fiber and blending mechanism forms no part of my present invention. Blending mechanism of quite similar construction is shown in the prior patent to Truslow, No. 1,399,590, issued December 6, 1921.

My improved mixing apparatus is preferably disposed in a mixing room R having a ceiling 15, floor 16, side walls 17, and a door 18 through which the room may be entered for inspection of the apparatus. A screened vent 34 may be provided to keep the room R at atmospheric pressure.

The casing C may be either square or circular cross-section and is shown in Figs. 1 and 2 as of square section. The upper portion 10 is rectangular and the side walls thereof are formed of wire cloth of such mesh that dust, dirt and shives from the wool or other fibers will pass out through the wire cloth, while all useful material will be retained within the casing. The ceiling 15 may conveniently form the top wall of the screened portion 10.

Part of the air which is used to convey the wool or other fibers to the mixing apparatus escapes through the screened portion 10 and tends to carry the waste along with it and out through the wire mesh into the room R, where it collects on the floor and may be removed without stopping the machine.

The lower portion 11 of the casing is preferably formed as a downwardly converging truncated pyramid, with side members 30 hinged at 31 to the lower edges of the screen portion 10, and with the lower edges of the side members converging around the upper edges of the collecting chamber 12.

Any suitable fastening devices, such as slotted arms 32 and pins 33 (Fig. 1), may be provided for holding the side members 30 in the operative relation shown in Figs. 1 and 2. By removing the pins 33, the side members 30 may be swung freely outward to give access to the interior of the casing C for cleaning or other purposes.

The joints between the side members 30 and also between the lower edges of each side member and the associated upper edge of the collecting chamber 12 are preferably left somewhat open, so that additional waste may drop out as the blended fibers move downward toward the collecting chamber.

The side members 30 may be formed of any

suitable smooth, sheet material, such as steel, copper or fiber. The wire cloth in the screened portion 10 should present as smooth a surface as possible so that the fibers will not catch or lodge thereon. One or more glass windows, as 35, may be inserted in the lower casing portion 11 to permit inspection of the interior of the apparatus during operation.

A clearing device or agitator 40 may be pivotally supported at its lower end on the post 28 and may be connected at its upper end to the counterweight supports 26, so that the agitator will rotate with the tubular distributing arm 20 and will thus dislodge the blended fibers from the sides or corners of the casing and will assist their downward movement to the collecting chamber 12. While use of the agitator is desirable, the machine is entirely operative if no agitator is provided.

In Fig. 4 I have shown my improved mixing apparatus included in a fibre handling system comprising an opener 50 having a hopper 51 to which wool or other fibers may be delivered through a pipe 52 by a fan 53. After the fibers have been opened in the usual manner in the machine 50, they are delivered through a pipe 55 and fan 56 to the fixed pipe 22 previously described and are conducted thereby to the distributing arm 20 on the blending mechanism. The collecting member 12 at the bottom of the mixing apparatus is connected by a pipe 60, a fan 61 and pipe 62 to a storage room 63, or the fibers may be forwarded from the pipe 62 to successive machines if so desired.

It will be understood that the fiber handling system shown in Fig. 4 is illustrative only and that my improved apparatus is adapted for use in many other combinations.

An important advantage of my improved apparatus lies in the fact that it can be thus incorporated in a continuously operating system and that the fibers will be thoroughly mixed and blended and will be continuously delivered through the pipes 60 and 62, all without personal attention by an operator.

This is an important improvement over such mixing arrangements as are disclosed in the Truslow patent, in which the blended fibers collect in the bottom of the chamber in which the mixing takes place and must be manually removed therefrom after stopping the apparatus.

In Fig. 3 I have suggested a modified casing construction in which the screened upper portion is cylindrical and the lower portion is circular in cross section and presents the appearance of a truncated cone rather than a truncated pyramid. The operation and advantages are the same as in the form previously described, but with the additional advantages that there are no corners and that the agitator will move around the conical lower casing with uniform clearance.

In cases where only cleaned stock is to be blended, the upper portion 10 of the casing may be imperforate and the separate parts of the lower portion 11 may be closely joined. Or, if found advisable, the upper portion 10 could be made continuous with the sides of the lower portion 11, which could be continued to the ceiling, either in a conical or pyramidal form.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. In a fiber mixing apparatus having a rotatable fiber-distributing and blending device, means to supply fibers to said device and means to rotate said device about a fixed axis, that improvement which comprises a casing for said blending device having an enclosing upper portion, a downwardly converging lower portion, a collecting chamber below said lower portion, and means to agitate the fiber in said converging portion and to thereby advance said fiber to said collecting chamber.

2. In a fiber mixing apparatus having a rotatable fiber-distributing and blending device, means to supply fibers to said device and means to rotate said device about a fixed axis, that improvement which comprises a casing for said blending device having a screened upper portion, a side wall structure forming the lower portion of said casing, a collecting chamber below said side wall structure, means to continuously remove blended fibers from said collecting chamber, and means to agitate and feed downward the blended fibers within said lower portion of said casing.

3. In a fiber mixing apparatus having a rotatable fiber-distributing and blending device, means to supply fibers to said device and means to rotate said device about a fixed axis, that improvement which comprises a casing for said blending device having a screened upper portion, a fiber-collecting chamber, side walls hinged at their top edges to said upper portion and having their lower edges positioned adjacent the edges of said collecting chamber, and means to continuously remove blended fibers from said collecting chamber, said side walls when in operative relation being slightly spaced at their edges from each other and from said collecting chamber to provide additional egress for dirt and waste from said apparatus.

4. An apparatus for mixing and blending fibers, comprising fiber distributing and blending mechanism including pneumatic means for supplying fiber under pressure and means adjacent the outlet of said pneumatic means for deflecting the fibers downwardly, a screen surrounding said mechanism adapted to permit escape of air and fine waste material, and a downwardly converging casing for receiving the useful fibers from said deflecting means, said casing terminating in a collecting chamber of reduced cross sectional area, and means for continuously removing fiber from said collecting chamber, said deflecting means being offset laterally with respect to the central axis of the collecting chamber, whereby the fibers from said deflector impinge upon the sloping wall of said receiving casing and are guided thereby to the collecting chamber, the receiving chamber being in the form of an inverted truncated pyramid comprising a plurality of flat side wall members, and at least one of said side wall members being separately movable from operative position as a section of the downwardly and inwardly inclined wall of said receiving casing, to allow access to the interior of said casing and to facilitate cleaning thereof.

MANFRED HOFFMAN.