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FLOCKING DEVICE

Filed Nov. 26, 1958

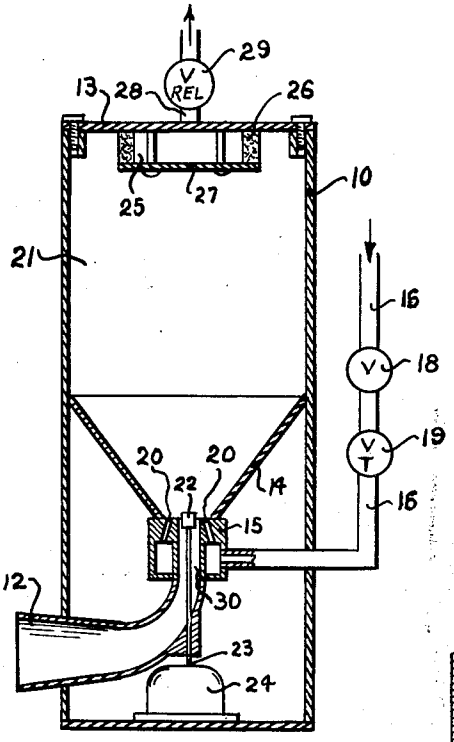


FIG. 1

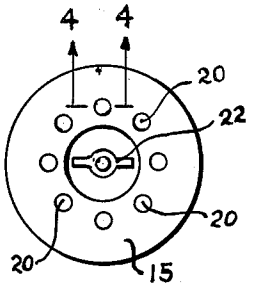


FIG. 3



FIG 4

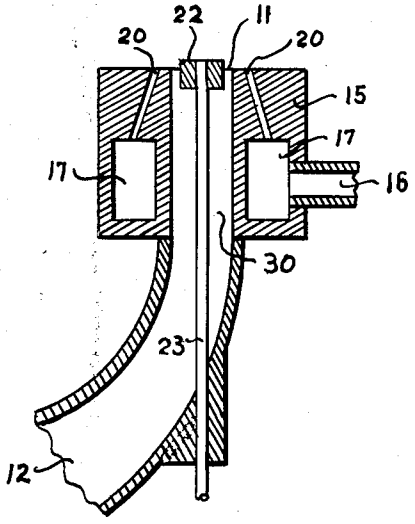


FIG. 2

INVENTOR.

Frank R. Kobee

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FLOCKING DEVICE

Frank R. Kobee, 1839 Macombe St., Toledo, Ohio

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5 Claims. (Cl. 222—195)

The present invention relates to a flocking device and more particularly to apparatus for applying material such as metal fibers, glass fibers, plastic covered fibers, metal covered fibers, powder or finely divided material, or the like.

It has been proposed heretofore to provide such apparatus, but as a practical matter there have been several serious disadvantages with the types of apparatus used. In many commercial forms of flock appliers, for example, the flock is not distributed evenly or uniformly, the flock is applied too loosely, the flock becomes clogged in the device, the discharge can not be properly regulated and they require complicated mechanisms in the supply chamber to keep the flock agitated.

One object of this invention is to provide a flocking device that provides a dense layer of fibers.

Another object of the invention is to provide a flocking device that provides a uniform layer of fibers.

Another object of this invention is to provide a flocking device that utilizes air currents to agitate the fibers in the supply chamber.

Another object of this invention is to provide a flocking device that uses air to deliver the fibers.

Another object of this invention is to provide a flocking device that can regulate the delivery of the fibers.

Another object of this invention is to provide a flocking device with a greater air inlet velocity than air outlet velocity.

With the foregoing and other objects in view, reference is now made to the following specification and accompanying drawings in which the preferred embodiment thereof is illustrated.

In the drawings:

FIG. 1 is a vertical section of my novel flocking device.

FIG. 2 is an enlarged view in vertical section taken through the air inlet and mixture outlet unit.

FIG. 3 is a top plan view of the air inlet and mixture outlet unit shown in FIG. 2.

FIG. 4 is a sectional view taken along line 4—4 of FIG. 3.

Referring to the drawings by the characters of reference, the device includes a material container **10** adapted to receive fibers or other finely divided material for discharge therefrom through the discharge orifice **11**. The fibers then pass through the mixing chamber **30** and are discharged through the discharge nozzle **12**. The material container **10** is of any preferred construction of formation having a cover member **13** at the top thereof which is removable for the purpose of filling the supply container with fibers. The bottom of the material container **10** is provided with a funnel shaped member **14** which converges toward the discharge orifice **11**. The funnel shaped member **14** terminates adjacent the air inlet member **15** which surrounds the discharge orifice **11**.

A compressed air inlet line **16** extends from the source of compressed air supply (not shown) to the annular air chamber **17**. A shut off valve **18** and a throttle valve or pressure control valve **19** are located in the inlet line **16**. Air passageways **20** extend from the annular compressed air chamber **17** to the supply chamber **21**. The air passageways **20** converge upward vertically and at the same time they slant with the vertical as shown in FIG. 4. The air passageways **20** surround the discharge orifice **11** and terminate very close thereto.

An agitator member **22** is located partially in the discharge orifice **11** and partially in the supply chamber **21**

and is secured to a motor shaft **23** that is powered by the motor **24**.

A filtered air chamber **25** is located in the upper portion of the supply chamber **21** adjacent the cover member **13** and is provided by the filter member **26** and the plate member **27**. A filtered air discharge passageway **28** communicates the filtered air chamber **25** with the atmosphere. A relief valve **29** is located in the discharge passageway **28**.

When my novel flocking device is put in operation the fibers are placed in the supply chamber **21**. The cover member **13** is removable for this purpose. The shut off valve **21** is then opened to allow compressed air to flow from the air passageway **16** into the annular compressed air chamber **17**. The air then flows through the air passageways **20** at a high velocity. The flow of air from the air passageways **20** provides a spiral turbulent effect which mixes the fibers and the air. The air carrying fibers with it then passes through the outlet orifice **11** into the mixing chamber **30** and is exhausted through the discharge nozzle **12**. The unit is held in such a position that the discharge nozzle **12** directs the flow of air and fibers onto the surface to be coated. The velocity of the fibers as they are discharged from the discharge nozzle **12** causes the fibers to deposit in a dense layer. The velocity of the air flowing from the air passageways **20** prevents fibers from settling or collecting around the discharge orifice **11**.

The discharge of air and fibers from the supply chamber **21** can be regulated by regulating the flow of air entering the supply chamber by means of the throttle or pressure control valve **19**.

If more incoming air is needed to provide greater turbulence to properly mix the air and fibers the relief valve **29** is opened thereby allowing more air to enter through the inlet passageways **20** without increasing the flow of air from the discharge orifice **11**. The filter member **26** removes the fibers from the air that is bled from the supply chamber **21** through the relief valve **29**.

When fibers are used that tend to cling together or form bunches the agitator **22** is used to break up the clinging or bunched fibers. The air and fibers are then further mixed in the mixing chamber **30**. The motor **22** may be operated by electricity or compressed air. The agitator is located partially in the supply chamber **21** and partially in the mixing chamber **30**. The shape of the agitator member **22** may be varied depending on the type of material to be discharged. In some cases the agitator member **22** may be so shaped that it helps feed the fiberous material into the mixing chamber **30**. The motion provided the agitator member **22** may also be varied depending on the type of material that is to be discharged.

The preferred operation and the preferred apparatus have been illustrated and described, but changes and modifications therein can be made without departing from the scope of the invention as defined in the claims.

What I claim is:

1. In an apparatus for applying material such as flock or powder, the combination of a material container provided with a downwardly converging funnel shaped lower portion, a discharge passageway extending from the bottom of said material container to a discharge nozzle, a horizontal annular wall extending between said discharge passageway and said funnnel shaped portion, an air supply passageway terminating in an annular air chamber surrounding said discharge passageway and a circular row of air inlet passageways extending from said air chamber to the upper surface of said annular wall, said air inlet passageways slanting inwardly and upwardly in two planes with respect to the vertical axis of said funnel shaped portion.

2. An apparatus for dispensing fiberous or granular

material, comprising a material container provided with a downwardly converging lower wall portion, a discharge passageway extending from the bottom of said material container to a discharge nozzle and a plurality of air inlet passageways communicating the lower part of said material container with a source of air supply, said plurality of air inlet passageways arranged around said discharge passageway, each of said plurality of air inlet passageways slanting inwardly and upwardly in two planes with respect to the vertical axis of the discharge passageway, whereby an upwardly converging whirling motion is imparted to the air entering said material container.

3. An apparatus for dispensing fiberous and granular material, comprising a material container provided with a downwardly converging frusto-conical shaped lower portion, a discharge passageway extending from the central portion of the lower base of said frust-conical shaped portion to a discharge nozzle, an annular air chamber surrounding said discharge passageway and communicating with a source of air supply and a plurality of air inlet air passageways arranged around said discharge passageway and communicating said annular air chamber with said material chamber adjacent said discharge passageway, said air inlet passageways slanting inwardly and upwardly in two planes with respect to the vertical axis of said frusto-conical shaped portion.

4. An apparatus for dispensing fiberous and granular material, comprising a material container provided with a downwardly converging frusto-conical shaped portion, a discharge passageway extending from the central portion of the lower base of said frusto-conical shaped portion to a discharge nozzle, an air supply passageway terminating in an annular air chamber surrounding said discharge passageway and a plurality of air inlet passageways communicating said annular air chamber with said material container adjacent the periphery of said discharge passageway, said plurality of air inlet passageways arranged around said discharge passageway, said air inlet passageways slanting inwardly and upwardly in two planes with respect to the vertical axis of said frusto-conical shaped portion whereby a cone shaped layer of whirling air is provided above said discharge passageway.

5. An apparatus for dispensing fiberous and granular material, comprising a material container, the lower portion of said material container comprising a downwardly converging frusto-conical shaped portion, a discharge passageway extending from the central portion of the lower base of said frusto-conical shaped portion, an air supply passageway and a plurality of air inlet passageways communicating said air supply passageway with said material container adjacent the periphery of said discharge passageway and arranged around said discharge passageway, each of said air inlet passageways slanting inwardly and upwardly in two planes with respect to the vertical axis of said frusto-conical shaped portion whereby an upwardly converging layer of whirling air picks up material from the lower portion of said material container adjacent said air inlet passageways and transmits said material while suspended in air to said discharge passageway.

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