

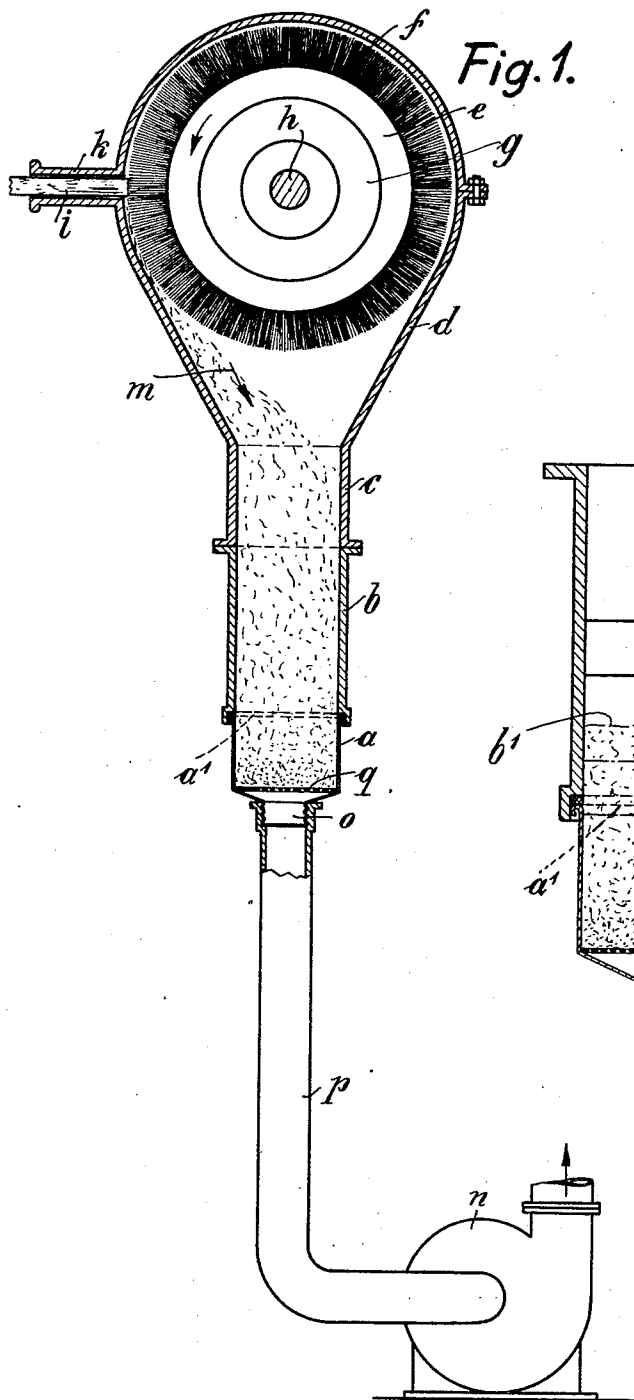
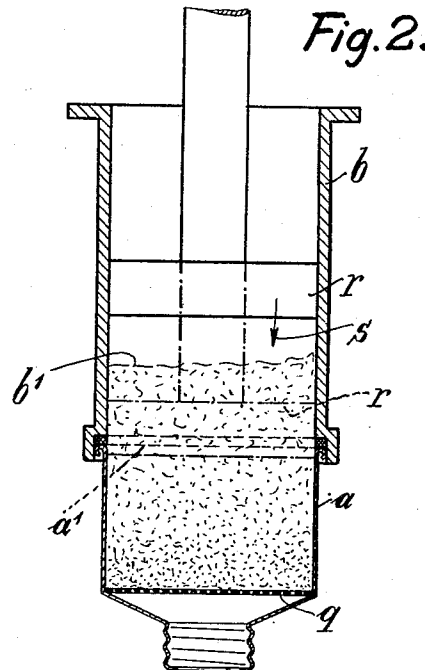
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PURIFYING DEVICE FOR AIR AND GAS AND METHOD OF PRODUCING THE SAME

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PURIFYING DEVICE FOR AIR AND GAS AND
METHOD OF PRODUCING THE SAMEGerhard Karl Emil Heinrich Stampe, Lubeck,
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12 Claims. (Cl. 252—2.5)

This invention relates to a method of and apparatus for producing purifiers for air and gas.

One of the principal objects of the invention is the provision of a method of and an apparatus for filling with a fibrous filtering material the canister of a purifier usable in connection with a gas mask.

A special object of the invention is the provision of an apparatus adapted to partly or entirely fill the canister of a small purifier with a fibrous filtering material which canister may be fastened directly to the face piece of a gas mask.

Another object of the invention is to provide an apparatus of this character which allows the filling process to be executed in a simple manner and to obtain an efficient layer of fibrous filtering material within said canister. With this object in view the apparatus is constructed in such a manner that no loss of fibres may occur, and that the fibres are subjected to a slight pressure within the canister.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawing and the appended claims.

The invention consists in certain features hereinafter explained by reference to the accompanying drawing.

In this drawing Fig. 1 represents in vertical section an apparatus for carrying out the method of the invention.

Fig. 2 is a sectional view showing in a somewhat larger scale the casing of the purifier and the tubular member in place on said casing, the parts being shown after the necessary amount of fibres has been brought in such a position that the filling action by pressing may be completed.

In the construction shown in the drawing, the canister *a* forming the casing of the purifier is removably connected to a tubular body or member *b*, the other end of which is connected to the lower cylindrical outlet end *c* of a casing *d* within which a brush *e* is mounted on a cylinder or roller *g*, which is fixed to a shaft *h* for rotation. The brush has sharp bristles *f* or the like adapted to break up the state of cohesion and to disseminate fibrous matter introduced in form of a body *i* into the casing *d* through a pipe *k*. The fibrous body *i* may have been manufactured in any suitable manner for instance by pressing fibrous material, such as wadding, felt, asbestos or wool, into a shape suitable to be inserted through pipe *k*. By the ro-

tating brush the fibrous body *i* is broken up and the individual fibres are isolated. The fibres are then whirled away in the direction of arrow *m* by a current of air created within the canister *a*, the tubular member *b* and the casing *d* by a blower *n*. This blower is connected to the attachment pipe *o* of the canister *a* by means of a pipe *p* to which said attachment pipe *o* is removably connected during the filling action.

The fibres are thereby stapled or accumulated on the foraminous bottom or sheet *q* located within the casing *a*. They are held together only by the walls of the canister *a*, by the perforated sheet *q* and by a second perforated sheet or cover (not shown) to be placed on the canister *a* for closing its open end after the filling operation has been finished.

If the perforated sheet *q* is placed as shown in both figures of the drawing the casing *a* is filled entirely or nearly entirely by the fibres in the manner described above. The sheet *q* on which the individual fibres are stapled or assembled may, however, be placed otherwise so that not the entire casing is filled with these fibres, but only a portion of it, so that the layer formed by the fibres occupies only part of the height of the casing.

If the space within the casing between the perforated sheet *q* and the bottom *a*¹ of the casing is very small and especially if it is a question of manufacturing small but very efficient gas mask canisters it is not possible to accumulate by means of the air current alone a sufficient quantity of fibrous matter within this limited space of the casing. The individual fibres, if brought into this space solely by the action of the current of air, are arranged somewhat loosely so that they have still a certain elasticity. The mass of fibres accumulated within the canister *a*, therefore, tends to rise somewhat owing to said elasticity after the current of air has ceased, and the fibres will tend to swell over the edge of the canister. It is necessary, therefore, to close the canister at the bottom *a*¹, while the fibrous mass is slightly pressed together. This can be done in any suitable manner e. g. by applying to the fibrous mass a slight mechanical pressure.

To facilitate the application of mechanical pressure the tubular body or member *b* has been provided. This tubular member further serves to prevent loss of fibres which might egress from the casing *a* on account of their elasticity after the air current has ceased. It is of course necessary to provide a tight connection

between the casing *a* and the tubular member *b*.

If, after stopping the blower *n*, the air current has ceased and the mechanical pressure shall be applied to the fibrous mass contained within the canister *a* and within a part of the tubular member *b* connected thereto (which may be filled up to the line *b'* shown in Fig. 2), the parts *a* and *b* are disconnected from the pipe *p* of the blower *n* and the outlet end *c* of the casing *d* respectively, the connection between the parts *a* and *b* still being upheld. Then a plunger or piston *r* is introduced into the open end of the tubular member *b*, which piston may be pushed forward within said cylinder *b* by any suitable means for instance by hand in the direction of the arrow *s* until it reaches the position shown in dash-and-dotted lines so that the fibres are pressed fully into the casing *a*.

The tubular member containing the piston *r* may then be disconnected from the canister *a* whereupon a perforated cover plate (not shown) may be fastened to the bottom of the canister thus closing the casing and enclosing the slightly pressed fibrous mass.

It is preferred to push the piston *r* a small distance into the casing *a* as is shown in Fig. 2 in order to efficiently prevent the pressed fibres to issue from casing *a* while the tubular member *b* together with the piston *r* is disconnected from said casing and before closing it.

Instead of being drawn into the canister *a* by a suction current of air the fibres may be pressed by air under pressure into said canister.

The canister *a* may be of any suitable cross-section e. g. of circular cross-section, the tubular member *b* being of course of the same cross-section.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

I claim:

1. Method of producing a purifier containing fibrous filtering material located in a canister, consisting in disintegrating a coherent fibrous mass into individual fibres, conveying said fibres by a current of air into said canister and into a part of a tubular member removably connected to said canister, applying mechanical pressure upon said fibres located within said tubular member to press them into said canister and confining said fibres against lateral movement during the pressing operation.

2. Method of producing a purifier containing fibrous filtering material located in a canister, consisting in disintegrating a coherent fibrous mass into individual fibres, conveying said fibres by a current of air into said canister and into a part of a tubular member removably connected to said canister, confining said fibers against lateral pressure in said tubular member during the subsequent operation introducing a piston into said tubular member for applying mechanical pressure upon said fibres located within said tubular member to press them into said canister.

3. In an apparatus for filling the canister of a purifier with fibrous filtering material, a canister to be filled, a receptacle containing the fibrous filtering material in form of irregularly placed individual fibres, said receptacle having an outlet, a tubular member separate from said receptacle and removably connected to said outlet and to

said canister, and means for creating within said receptacle, said conduit and said canister a current of air adapted to carry said fibres from said receptacle into said canister.

4. In an apparatus for filling the canister of a purifier with fibrous filtering material, means for breaking up the state of cohesion of fibrous matter and for disintegrating said fibrous matter into individual fibres, a casing enclosing said breaking up means and having an outlet, a canister, a tubular member removably connected to said outlet and to said canister, and means for creating within said casing, said tubular member and said canister a current of air.

5. In an apparatus for filling the canister of a purifier with fibrous filtering material, means for breaking up the state of cohesion of fibrous matter and for disintegrating said fibrous matter into individual fibres, a canister, a conduit removably connected to said canister and adapted to guide said individual fibres from said breaking up means into said canister, means for creating within said conduit and said canister a current of air adapted to carry said fibres through said conduit into said canister.

6. Apparatus for filling the canister of a purifier with fibrous filtering material, comprising a casing, a shaft mounted in said casing, a roller-shaped brush having sharp bristles and mounted upon said shaft to rotate therewith, a pipe arranged upon and issuing into said casing and adapted to allow the fibrous filtering material to enter said casing in a cohering state, said brush adapted to come into contact when rotating with the fibrous material within said casing and to disintegrate it into individual fibres, said casing having an outlet, a canister, a conduit connected to said outlet and comprising a tubular member removably connected to said canister, a perforated sheet arranged within said canister, and means for creating within said casing, said conduit and said canister a current of air adapted to carry said fibres into said canister to be accumulated upon said perforated sheet.

7. Apparatus for filling the canister of a purifier with fibrous filtering material, comprising a casing, a shaft mounted in said casing, a roller-shaped brush having sharp bristles and mounted upon said shaft to rotate therewith, a pipe arranged upon and issuing into said casing and adapted to allow the fibrous filtering material to enter said casing in a cohering state, said brush adapted to come into contact when rotating with the fibrous material within said casing and to disintegrate it into individual fibres, said casing having an outlet, a canister, a conduit connected to said outlet, comprising a tubular member removably connected to said canister, which is adapted to receive a piston for pressing down upon the fibres in said canister after the filling action has been completed, a tube removably connected to the canister, and leading to a blower adapted to create within said casing, said conduit and said canister a current of air adapted to carry said fibres into said canister.

8. In an apparatus for filling the canister of a purifier with fibrous filtering material, a receptacle containing the fibrous material in the form of irregularly placed individual fibers, said receptacle being formed with an outlet, a tubular member in communicable connection with said receptacle through said outlet, a canister, and means for creating within said receptacle, said tubular member and said canister a current of

air adapted to carry said fibers from said receptable into said canister.

5 9. In an apparatus for filling the canister of a purifier with fibrous filtering material, a container in which the fibrous material in the form of irregularly placed individual fibers is positioned, said container being formed with an outlet, a canister, means adjacent to said outlet for retaining said canister during the filling operation, and means for creating within said container and said canister a current of fluid adapted to carry said fibers from said container into said canister.

10 10. A method of producing a purifier containing a fibrous filtering material positioned in a canister, consisting in disintegrating a coherent fibrous mass into individual fibers, conveying said fibers by a current of fluid into a canister and adjacent to said canister, confining said fibers against lateral movement during the subsequent portions of the process, and then pressing said fibers, both those adjacent to said canister and those within said canister, so that a compacted filtering mass is produced within the purifier canister.

11. In a method of producing a purifier canister filled with a fibrous filtering material, the steps of disintegrating a coherent fibrous mass into individual fibers, conveying said fibers by a current of fluid to a position adjacent the purifier canister, confining said fibers against lateral movement while in this position, and then pressing said fibers into the purifier canister to form a compacted filtering mass. 80

12. A method of filling the canister of a purifier with fibrous filtering material comprising the steps of conveying disintegrated fibrous material by a current of fluid into the canister to be filled and adjacent to said canister, confining the portion of said fibrous material which is adjacent to said canister against lateral movement during the subsequent portion of the process, and then pressing said fibrous material so that the portion adjacent said canister is pressed into the canister in order to form a compacted fibrous filtering mass. 85 90 95

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