March 19, 1935. D. B. REPLOGLE 1,994,873

DUSTING TOOL FOR AIR METHOD CLEANING SYSTEMS

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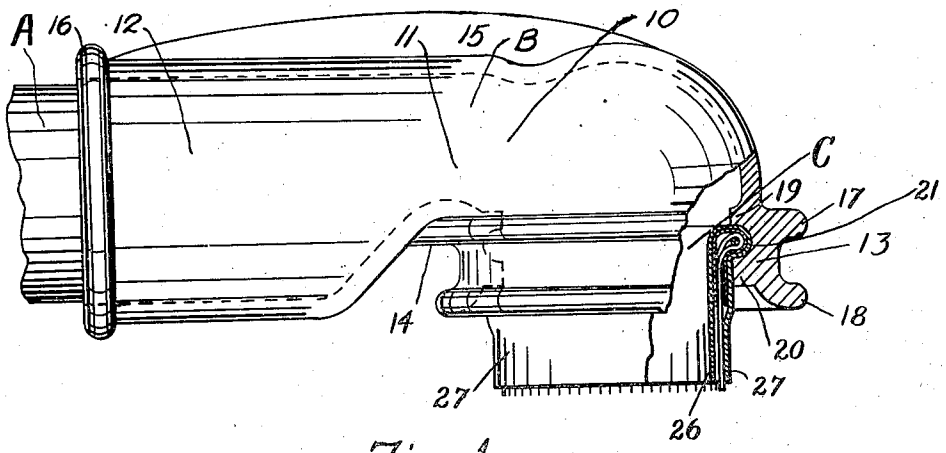



Fig. 1

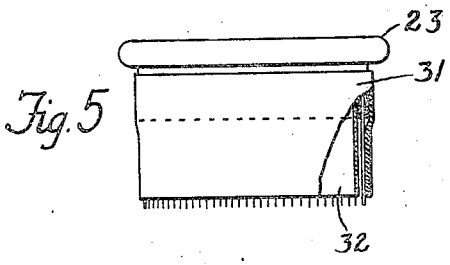



Fig. 5

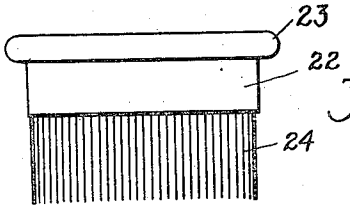



Fig. 2

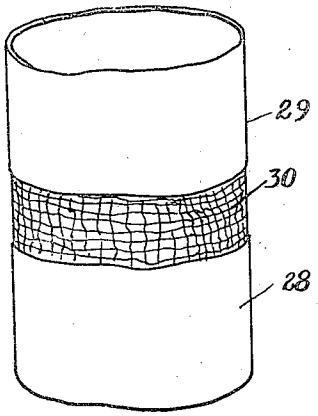



Fig. 4

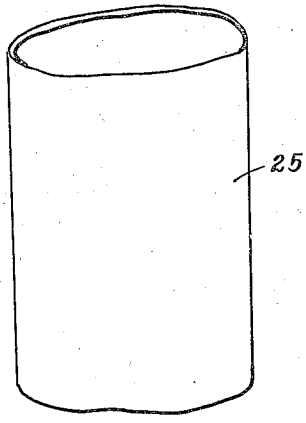



Fig. 3

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## DUSTING TOOL FOR AIR-METHOD CLEANING SYSTEMS

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Application January 7, 1933, Serial No. 650,729

12 Claims. (Cl. 15—158)

The invention relates to dusting tools designed for use in connection with so-called pneumatic or suction cleaning systems, particularly to air-method systems of the type disclosed in my prior Patent No. 1,533,271, dated April 14, 1925, application Serial No. 279,467, filed February 26, 1919. Systems of this type are known commercially under the registered trade-mark "Air-Way". The present application contains subject matter in common with my prior application Serial No. 550,786, filed July 14, 1931, entitled "Furniture dusting tool" and is in part a continuation thereof. This application also contains matter in common with my application Serial No. 15,529, filed March 14, 1925; with my application Serial No. 297,969, filed Aug. 7, 1928, and with my application Serial No. 525,008, filed March 24, 1931.

In systems of this character the dusting tool is hollow in order to permit air to pass therethrough, and constitutes in effect a nozzle for the cleaner. It will be understood that in accordance with the teachings of my aforesaid patent and application No. 550,786 any number of intermediate extension members may be interposed between the dusting tool and the source of suction, and these individual members may themselves be used for cleaning purposes and serve as nozzles.

Inasmuch as the dusting tool is to be employed for cleaning furniture and the like, it is important to avoid injuring the furniture, and accordingly it is one of the objects of the present invention to provide the tool with a surface which will not mar the object being cleaned. It is also important to confine the stream of air entering the tool to the tips of the brush, thereby insuring rapid movement of the air current and producing a maximum cleaning effect.

According to my invention I employ a body member composed preferably of rubber or other suitable material which serves as a connector between a detachable brush element and a suction pipe or nozzle, and provide a brush element with means detachably fitting the body member, and with a skirt or wall composed of soft material which will not mar the surface to be cleaned, and which extends to substantially the tips of the bristles or application elements of the brush.

Among the principal objects of the present invention, therefore, are to provide a dusting tool which will be readily applied to the suction pipes or nozzles of a pneumatic cleaning apparatus, and to provide means to confine the incoming air substantially to the tips of the bristles of the dusting element in order to accomplish its greatest cleaning effect. Other objects of the invention will appear from a consideration of the accompanying drawing and the further detailed description in which are set forth illustrative embodiments of the invention.

In the drawing,

Fig. 1 is a side elevation partly in section showing one form of the dusting tool applied to a suction pipe, and a skirted brush element inserted in the mouth of the tool;

Fig. 2 is an elevation of a brush element adapted to fit in the body portion of the tool, but not provided with the protecting skirt;

Fig. 3 is an elevation of a tube of soft flexible material adapted to be combined with the brush element of Fig. 2 in order to form a protecting skirt such as is shown in the combined tool in Fig. 1;

Fig. 4 is a modification of Fig. 3;

Fig. 5 is an elevation of a modified form of brush element provided with a protecting skirt portion.

Referring particularly to Fig. 1 of the drawing, A denotes a suction pipe or nozzle constituting an element of a portable or stationary cleaning system. The nozzle may be either round or flat, or of any other suitable shape. The element A may constitute a detachable portion of the cleaning system. The reference letter B denotes the body member of a dusting tool preferably composed of rubber or other soft material, and is adapted to serve as a connecting member between the suction pipe or nozzle A and a detachable dusting element. The body member B as shown is of the type disclosed in my prior application Serial No. 550,786, filed July 14, 1931, but may be of the type disclosed in my prior Patent No. 1,403,524, dated January 17, 1922, so far as the broad features of the present invention are concerned. Likewise the brush element C may be of the general type shown in my Patent No. 1,403,524, to which is applied a skirt of soft material extending substantially to the tips of the bristles, or according to the embodiment disclosed in the present drawing may be of the general type set forth in my prior application Serial No. 550,786, in which the bristles or application elements are secured within an annular metallic channel member to which, in accordance with the present invention, a protecting and confining skirt is applied.

Referring more in detail to the body member B, the same is provided with a passageway 10 extending therethrough, and provided with a

reduced throat intermediate its enlarged ends 12 and 13. The end 12 is shaped to provide an enlarged portion opening into the main passageway 10 adapted to receive the pipe or nozzle A. The end 12 may be made oval in cross section so as to readily cooperate with a nozzle which may be either round or flat, as set forth in detail in my application Serial No. 470,511, filed July 24, 1930. The opposite end 13 is enlarged to provide a mouth in which is mounted the brush C. Intermediate the ends is a cut-away or reduced portion 14 producing the restricted throat 11, and opposite the reduced portion is a longitudinally extending rib 15 which is preferably thickest opposite the reduced portion and is intended to prevent collapsing of the tool when pressure is applied during use. External reinforcing ribs are provided, one numbered 16 at the end to which the nozzle A is applied and other ribs 17 and 18 adjacent the mouth portion.

Within the mouth of the tool are formed two flexible and resilient ribs or walls integral with the rubber body of the tool, providing between them a groove or pocket 21 which is adapted to receive an external flange of the brush element. In applying the brush element the walls or ribs 19 and 20 are distorted and forced apart or sprung by the flange of the brush element, and are thus caused to grip the flange of the tool owing to the resilience of the walls of the pocket.

A brush element such as is shown in Fig. 2 may be used with the body member, a skirt to be hereinafter described being applied to the brush element. As shown, the brush element comprises an annular channel member 22, preferably of thin resilient metal, provided with an external flange 23 between which the bristles 24 are held in the manner set forth in my copending application Serial No. 550,786, the flange 23 being adapted to engage within the groove 21 in the mouth portion of the body member. The dusting element may be manufactured in any of the ways described in my application referred to above.

In Fig. 3 there is shown a tube designated by the reference numeral 25, which is composed of soft flexible material, preferably rubber, although leather or cloth may be used. The tube is folded over the brush element shown in Fig. 2, forming inner and outer skirts 26 and 27, both of which extend substantially to the tips of the bristles, as shown in the assembled view in Fig. 1. It will be noted that a portion of the tube extends over the metallic flange 23 of the annular channel member in which the bristles are secured, and this portion of the tube will be engaged within the groove 21 of the body member of the tool, being held in position by the annular metallic flange 23.

In Fig. 4 there is disclosed a modification of the tube in which, instead of employing a single member, a composite tube is employed consisting of end portions 28 and 29 composed of resilient material such as rubber or the like and an intermediate portion 30 of cloth which is intended to extend over the flange 23 of the brush. The purpose of employing this intermediate cloth section is to produce a better fit between the dusting element and the body of the tool, it being found that in some instances better results are obtained by the contact between the cloth of the skirt forming tube and the rubber of the body member than would be obtained where both materials are of rubber.

In Fig. 5 there is disclosed a brush element similar to that shown in Fig. 2, to which a skirt 31 is secured in any suitable manner as by glueing or the like. The skirt extends around the lower portion of the brush only and not about the external flange. This skirt may be formed of any suitable material, preferably resilient and flexible, as for example, rubber, or a leather or cloth skirt may be employed without departing from the broad features of the invention. An inner skirt 32 may be likewise employed, if desired, or may be omitted without seriously detracting from the effectiveness of the brush element.

It will be noted that in the various modifications of the invention the skirt is of soft material which will not mar the surface being cleaned, and is of sufficient stiffness and length to confine the entering air substantially to the tips of the bristles 24. Either a single or a double skirt may be employed. Where a single skirt is employed it is preferable that the same be mounted on the outside of the bristles, rather than on the inside.

As previously explained, the skirt may be applied to a brush element of the type shown in my Patent No. 1,403,524, wherein the bristles are embedded in a body of hard material such as wood, gutta percha or the like, which is grooved to receive a rib formed on the body member of the tool, or the skirt may be applied to a brush of the type disclosed in my application Serial No. 550,786, wherein the bristles are supported within a flanged metallic channel member. In each instance the function of the skirt is to soften the tool so as to prevent marring of furniture and to confine incoming air currents to substantially the tips of the bristles or to the proximity of the point of contact of the agitating brush with the surface to be cleaned.

The tubes disclosed in Figs. 3 and 4, from which the protecting and confining skirts are to be formed, may be rapidly cut from much longer tubes. In the case of the composite tubes shown in Fig. 4, a long composite tube may be initially formed by uniting successive strips of rubber and cloth and forming the same into a tube, which is then cut into successive lengths, each length including a cloth strip intermediate two rubber strips.

What I claim is:

1. A brush for a suction cleaner, comprising a hollow annular metallic backing provided with an integral hollow bead for attachment to a corresponding groove in a body member, bristles carried by the backing and projecting therefrom, and a flexible non-metallic skirt carried by the backing and extending substantially to the tips of the bristles of said brush.

2. A brush for a suction cleaner, comprising a hollow annular metallic backing provided with an integral hollow external bead for attachment to a corresponding groove in a body member, bristles carried by the backing and projecting therefrom and a flexible non-metallic skirt carried by the backing and having internal and external portions extending substantially to the tips of the bristles of said brush.

3. In a suction cleaner, a resilient nozzle having an annular recess formed therein provided with resilient walls, a metallic annular backing having a hollow annular bead sprung within said pocket and held by the resilience of said walls, an annular floor engaging application member carried by the backing and projecting therefrom, and a flexible non-metallic double skirt member carried by the backing and extending substantial-

ly to the tip of said application member, one portion of the skirt member being at the interior of the application member and one portion at the exterior thereof.

4. A brush for a suction cleaner, comprising a hollow annular non-resilient backing having annular external means adapted to coact with complementary connecting means in a suction tube, bristles secured within the backing and projecting therefrom and a separate skirt member of soft flexible material secured to the backing externally thereof and extending substantially to the tips of the bristles.

5. A brush for a suction cleaner, comprising a hollow annular non-resilient backing having external means adapted to coact with complementary connecting means in a suction tube, an annular application member secured within the backing and projecting therefrom and a skirt member of soft flexible material carried by the backing and extending substantially to the tip of the application member, said skirt member having portions at the interior and exterior of said application member.

6. In a suction cleaner, a nozzle having an annular pocket formed therein and having resilient walls, an application member sprung within the pocket and held by the resilience of said walls, and a flexible skirt portion extending substantially to the tip of said application member, said skirt being in the form of a flexible tube folded over the portion of the application member which fits into said pocket.

7. A hollow cleaning attachment for a suction cleaner comprising an annular channel member having an external flange adapted to be detachably engaged in a corresponding groove in a resilient body member, an application element retained within the channel, and a skirt carried by the channel member and extending substantially to the tip of the application element, said skirt having a portion extending over the external flange of said annular member.

8. A brush for a suction cleaner, comprising a hollow annular backing provided with an external bead for attachment to a corresponding groove in a body member, bristles carried by said backing and projecting therefrom, and a skirt portion carried by said brush and extending substantially to the tips of the brush to confine the flow of air entering the brush to the proximity of the point of contact of the brush with the surface to be cleaned, said skirt being in the form of a flexible tube having a portion extending over the external bead and adapted to fit into the groove of said body member.

9. A hollow brush for attachment to a suction cleaning tool, comprising a ring member, bristles secured within the ring member, and a skirt of soft flexible material carried by the ring member and extending substantially to the tips of the bristles, said skirt comprising a flexible tube folded over the brush and extending internally and externally of the brush.

10. A brush as set forth in claim 9, wherein the tube is formed of two sections of rubber connected by a cloth section adapted to extend over the top of the ring.

11. A hollow brush for attachment to a suction cleaning tool, comprising a ring member, bristles secured within the ring member, and a skirt of soft flexible material carried by the ring member and extending substantially to the tips of the bristles, the skirt being adhesively secured to the ring member.

12. A hollow brush for attachment to a suction cleaning tool, comprising a ring member, bristles secured within the ring member, and a skirt of soft flexible material carried by the ring member and extending substantially to the tips of the bristles, said skirt being double and comprising a pair of skirt members adhesively secured to the inner and outer surfaces respectively of the ring.

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