

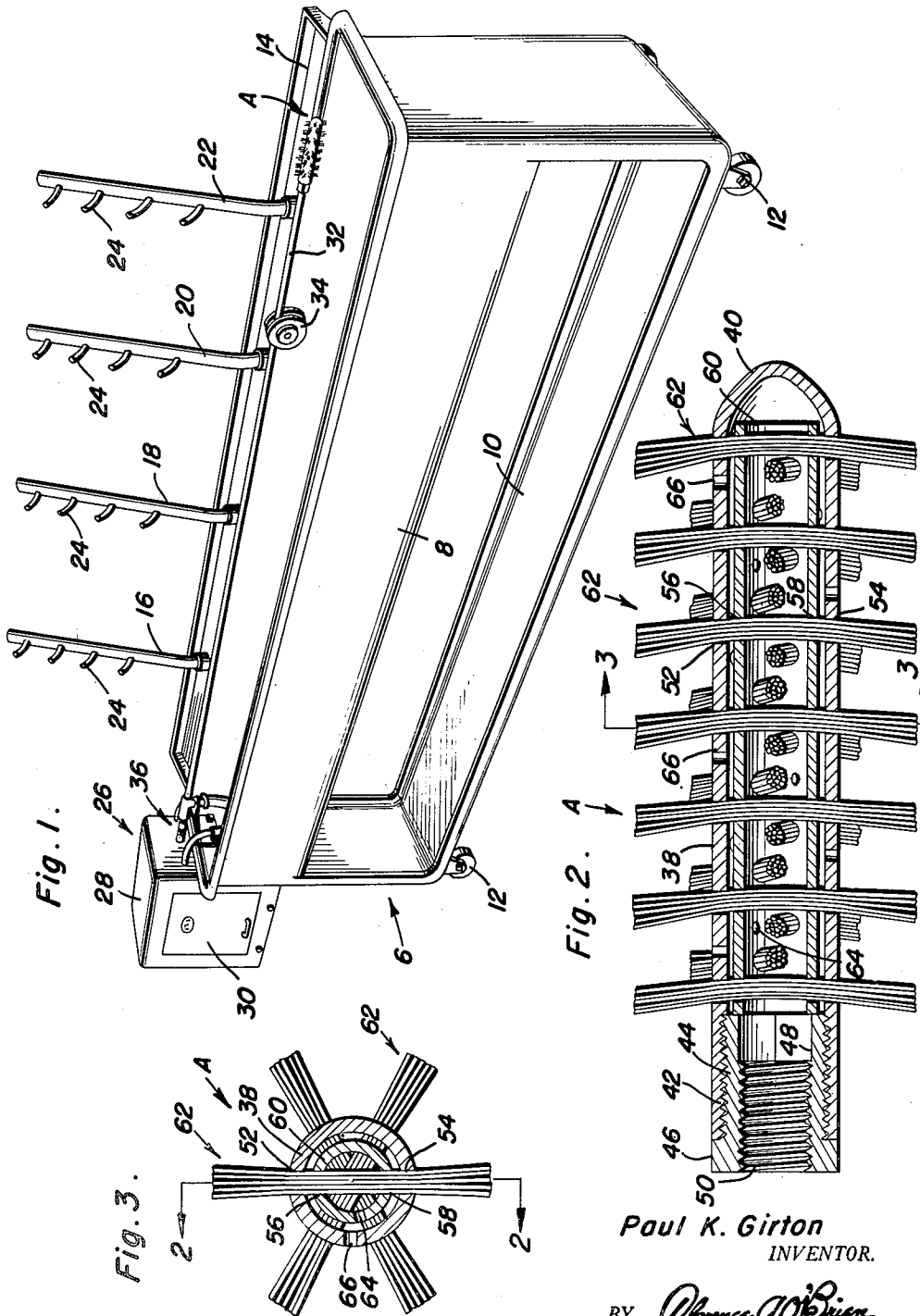
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FOUNTAIN BRUSH FOR SANITARY PIPE WASHING EQUIPMENT

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## UNITED STATES PATENT OFFICE

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FOUNTAIN BRUSH FOR SANITARY PIPE  
WASHING EQUIPMENT

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1 Claim. (Cl. 15—128)

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This invention relates to a new and useful specially constructed rotary bristle brush of a so-called fountain-type which is expressly made for attachment to a hollow rotatable shaft constituting a salient part of sanitary pipe washing equipment which is extensively used in modernized dairies and food plants.

By way of introduction, the equipment above referred to is characterized by an elongated portable tank for systematic handling of ten-foot lengths of sanitary tubing through which hot milk is piped. The tank is primarily used for soaking of the tubes or pipes prior to brushing and rinsing. Suitable storage facilities are provided for handling the pipe sections and fittings, valves and miscellaneous accessories. Vertically disposed, suitably included pipe racks, fitted with rubber covered racking pins, are employed and arranged contiguous to the tank for convenient racking of said pipe sections. In the heavy-duty construction herein shown, an appropriate motorized pump and circulating unit is mounted on one end of the tank, and, by way of a universal joint, imparts motion to a rotary drive shaft. The latter drives the improved fountain-brush and supplies the desired cleansing solution to said brush.

The primary object of the present invention is to provide a new style brush, distinct from other types, in which manufacturers and users will find their needs fully met, contained and at all times handily available.

Usually, the tufts of bristles, which are commonly individual nylon strands, are either molded to the core means or wired and thus anchored in place. Such modes of attachment are, however, objectionable. Therefore, a prominent object of this invention is to provide tufts which are removable, whereby to permit replacement when the bristles have become unduly damaged and worn to a state of inefficiency.

Not only is it highly desirable to have the tufts replaceable, but they should be of standard diameters and made up in sets, the lengths of those of one set being longer or shorter than those of another set. So, it is another object to supply the user with sets of tufts of varying lengths with the sets exchangeable, thus permitting the one core to be employed to make up brushes of differing sizes capable of brushing out both large and small pipes.

A still further object has to do with a two-part core construction wherein the parts are telescoped and in spaced concentric relationship, said parts having pairs of diametrically opposite holes for

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the individual tufts and the latter being "threaded" through and lodged in coacting holes, whereby, when the parts are longitudinally adjusted and fastened, the holes are shifted slightly out of alignment in a manner to clinch and securely clamp said tufts in wanted positions.

Then, too, it is an object of the invention to arrange the tufts at widely spaced intervals and to provide the two core parts with wash water emitting ports.

Last, but not least, the unique method pursued in assembling the brush step-by-step is significantly important. To this end, it is a further object to prepare each brittle batch or tuft by temporarily binding the bristles together into a uniform bunch and desired diameter and sealing them in such condition by way of a readily melt-able adhesive. Then, each tuft is "threaded" in place by inserting and passing it through the aligned tuft adapting and clamping holes in the stated core parts. Now, with the complete set of tufts mounted and the parts adjusted and made fast for secure clamping of the tufts, the finished brush is immersed in boiling water to melt and remove the adhesive and to ready the brush for safe and clean use.

Other objects and advantages will become more readily apparent from the following description and the accompanying illustrative drawings:

In the accompanying sheet of drawings, wherein like numerals are employed to designate like parts throughout the views:

Figure 1 is a perspective view of sanitary pipe washing equipment used in dairies and food plants and provided with the fountain brush herein under advisement.

Figure 2 is an enlarged view of the brush per se with the parts appearing in section and elevation, said parts being fully assembled to provide a complete brush, the section being on the line 2—2 of Figure 3.

Figure 3 is a cross-section on the line 3—3 of Figure 2.

Briefly summarized and by way of introduction to the detailed description, the brush is characterized by an outer barrel internally screw-threaded at one end, said barrel having water discharge ports and also having a plurality of pairs of diametrically opposite holes for reception and partial anchorage of individual tufts of bristles, a sleeve telescoping concentrically and shiftably in said barrel and also having water discharge ports and pairs of diametrically opposite holes for reception and partial anchorage of said tufts, a plurality of tufts, each tuft being lodged in com-

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plemental pairs of holes in the sleeve and barrel, respectively, and a screw-plug threaded into said barrel in end thrust contact with said sleeve, said plug serving to shift the sleeve, relative to the barrel, to slightly disalign the respective barrel and sleeve holes, whereby to flex the intermediate portions of the tufts so that latter are thus clinched and clamped by the hole disalignment of said barrel and sleeve.

Referring now to the drawings by distinguishing reference numerals and accompanying lead lines, the aforementioned sanitary pipe or tube washing equipment is denoted, as a unitary structure, by the numeral 6 in Fig. 1. It is understood, of course, that the novelty is directed to the brush, though it has been deemed necessary to show so much of the equipment as is considered essential to an understanding and full appreciation of the type of brush disclosed and claimed. To this end, the equipment is characterized by an elongated tank 8 having a shelf structure 10 rollable on casters or the like 12. There is a tray or the like 14 along one longitudinal edge portion of the tank. In practice, the tank has suitable drainage facilities and is of a size for soaking, brushing and rinsing sanitary pipes. The aforementioned racks are vertically disposed uprights 16, 18, 20 and 22 having rubber-covered rows of pins 24 which serve to permit pipe sections to be laid and racked thereon. The motorized machinery at the left-hand end is denoted by the numeral 26 and embodies a casing 28 with a door 30. On the interior of the casing is a circulating pump and motor and drive arrangement to impart rotation to the tubular brush driving shaft 32. This shaft is supported at its outer end portion on an appropriate guide fixture 34 in the tank and the inner end portion of the shaft joins up with a source of power by way of a universal joint 36 which allows the shaft to be swung up and out of the way for attaching and detaching the pipe sections which are to be brushed.

The invention is directed to the particular construction of the brush and, as before stated, this is characterized by a rigid metal outer barrel 38, which, if desired, has a pilot-like closing nose 40 at one end. The opposite end is internally screw-threaded, as at 42, and a screw plug 44 is screwed into said screw-threaded end. The plug is provided with an external tool grip or nut 46 and also with an internal nut or tool grip 48. The screw threads 50 are to accommodate conforming screw threads on the coacting end of the rotary driving shaft 32. The barrel is provided at longitudinally spaced points with pairs of tuft accommodating holes, the holes of one pair being denoted, for instance, by the numerals 52 and 54, respectively. These holes are adapted to line up with complementary holes 56 and 58 in a sleeve which is fitted telescopically and concentrically in the barrel, the sleeve being open-ended and denoted by the numeral 60. The description of a pair of tuft holes in the barrel and a complementary pair in the sleeve will serve to illustrate the principle, it being understood that this "pairing of holes" is multiplied and that the pairs of holes are not only longitudinally spaced but are circumferentially arranged in order to locate the tufts 62 at the desired circumferential points in relation to the barrel. The sleeve has water circulating openings or ports 64, and similar ports 66 are provided in the barrel. These series of holes 64 and 66 permit the cleaning solution, which comes through the hollow drive shaft 32

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and passes through the hollow plug, to be emitted in fountain-like jets from the barrel, in an obvious manner. All of the tufts are the same in construction and a description of one will suffice for all. That is to say, each tuft is made up of nylon bristles of uniform lengths. Each batch of bristles is bunched together and a meltable sealing compound or suitable adhesive is employed. The bristles are immersed in the adhesive and thus bonded together so that the tuft is actually a single unit at the time of manufacture. By then, lining up the accommodation holes in the sleeve and barrel respectively, the tuft may be inserted and "threaded" through said holes. At this time, the sleeve is, of course, loose and no interference is met in threading the tuft home. Now, after all of the tufts are thus installed, the screw plug is tightened up and the sleeve is moved in relation to the barrel. By thus subjecting the sleeve to end-thrust pressure, the coacting holes 52, 54, 56, and 58 are shoved slightly out of alignment with each other. This serves to bend the intermediate portions of the tufts, as shown in Fig. 2, and consequently the end portions are not only lodged but clinched and clamped securely between the sleeve and barrel by the whole disalignment action.

After the brush is thus assembled, it is dipped into boiling or scalding water and the adhesive is thus melted. Now, the previously bonded individual nylon bristles or strands are freed. However, the tufts are still clamped in place in an obvious fashion.

It is to be understood that the barrel and sleeve and coacting parts as an assemblage go to make up what may be broadly referred to as "core means" in the claims. Specifically, however, the core means is made up of coacting parts or, more particularly, of a sleeve adjustably mounted within the confines of the special barrel.

In view of the foregoing description taken in conjunction with the accompanying drawings, it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention, the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and within the scope of the appended claim.

Having described the invention, what is claimed as new is:

A fountain-type brush for use in connection with a sanitary pipe washing tank and rack construction of the class described comprising a core assembly embodying an outer barrel internally screw-threaded at one end and closed at the other end, said barrel having water discharge ports and also having a plurality of pairs of diametrically opposite holes for passage and partial retention of individual tufts of bristles, a sleeve telescoping concentrically and shiftably in said barrel and also having water discharge ports and pairs of diametrically opposite holes for reception, passage and retention of said tufts, a plurality of tufts of bristles, each tuft being lodged in complementary pairs of holes in the sleeve and barrel, respectively, the intermediate portion of each tuft bridging the bore in said sleeve and a screw-plug threaded into said barrel in end thrust contact with an adjacent end of said sleeve, said plug serving to shift the sleeve, relative to the barrel,

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to slightly disalign the respective barrel and sleeve holes, whereby to flex the intermediate portions of the tufts so that the latter are thus clinched and clamped by the hole disalignment of said barrel and sleeve.

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