

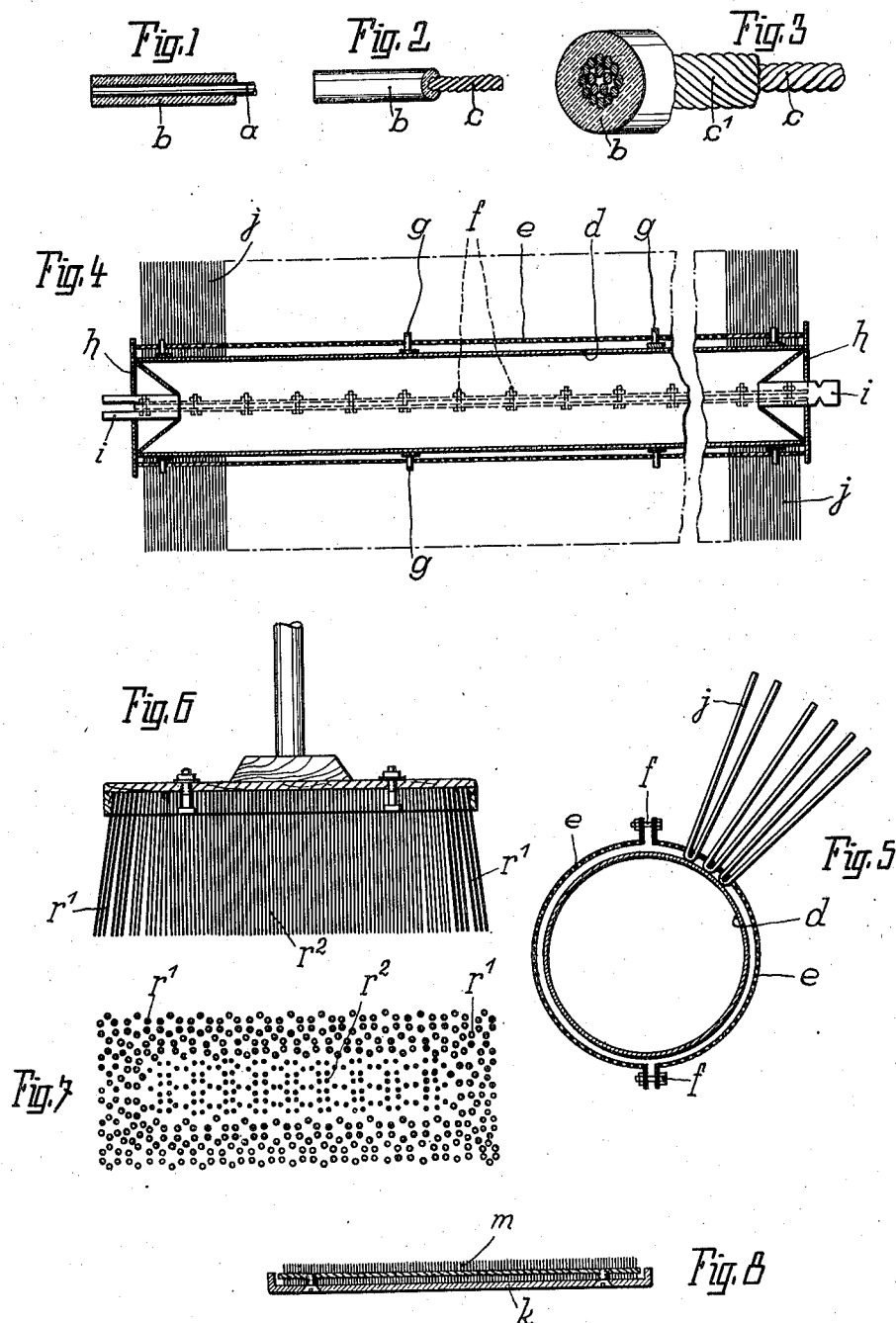
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BRISTLE FOR CLEANING DEVICES

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BRISTLE FOR CLEANING DEVICES

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The present invention relates to a bristle for cleaning devices such as brooms, brushes, cleaning rollers, mats and the like, which are furnished with bristles and the cleaning devices incorporating the bristles. In the case of brushes, wire bristles are sometimes used instead of the plassava bristles which are mostly employed in such cleaning devices. However, wire bristles are liable to rust or corrode rapidly under the action of moisture and thus have only a limited life. Moreover such brushes can only be employed where the scouring action of the wire bristles is desired, or at least is not detrimental. Further, in the rollers of street sweeping appliances, bristles consisting of a steel wire enveloped in rubber have been provided. So far as the sweeping action of the rubber envelope and its reinforcement by the insertion of steel wire are concerned, such brushes have been satisfactory but the steel wire is not sufficiently elastic even when made of very good material, i. e., is readily distorted, does not revert to its rectilinear form and is liable to break. Consequently such bristles also are not satisfactory for appliances in which the bristles are subjected to large stresses such as occur more particularly in mechanically driven or rapidly moving appliances or those in which the direction of motion frequently changes.

According to the present invention a bristle which can withstand the most severe stresses is obtained by making its core of a high grade elastic wire rope and providing the core with a sheath of tough rubber or rubber-like material. A wire rope consisting of elastic wires such as high grade steel wires for instance, forming the core of the rubber sheath, has a high elasticity and thus a considerably greater life than a steel wire. To this extent the effect is similar to the effect of a wire rope as a driving belt in a comparison with a wire. In addition a bristle core consisting of singly or multiply cabled wires affords a better surface for the attachment of the rubber coating because the rubber or like material becomes firmly embedded in the helical grooves in the wire rope. The use of a wire rope also affords the advantage that even if individual wires break they remain associated with the remaining wires and do not emerge from the bristle.

Due to the number and fineness of the individual wires a varying elasticity of the bristles can be obtained in accordance with the purpose for which they are to be utilized and in this way bristles of different elasticity can be associated with one appliance, in that for example the out-

side row or rows of bristles are stiffer so that these bristles effect the removal of coarse dirt or the like whereas the inner bristles which are more elastic, remove the finer dirt.

In the accompanying drawing:

Fig. 1 shows a bristle with an inserted wire,

Fig. 2 shows a bristle with a singly cabled wire rope as the insertion,

Fig. 3 shows a bristle with a multiply cabled wire rope as the insertion, Figs. 1 to 3 all being on a considerably enlarged scale.

Figs. 4 to 8 show examples of appliances equipped with such bristles,

Figs. 4 and 5 showing longitudinal and cross sections through a cleaning roller,

Figs. 6 and 7 side view and bottom view of a broom,

Fig. 8 a cross section through a mat.

The bristle shown in Fig. 1 consists of a high grade steel wire *a*, e. g., a crucible cast steel wire, or a bundle of such wires, and a sheathing *b* of tough rubber or tough rubber-like material enclosing the wire insertion over its entire length. The rubber or like sheath is shown broken away from the core at the right hand and for the sake of clarity.

In Fig. 2, the bristle consists of a rope or cable *c* of fine wires of high grade steel constituting a core and a sheath *b* of tough rubber or rubber-like material.

A particularly elastic bristle having a long life and therefore specially suited to the present purpose, is shown in Fig. 3. This bristle has as core a wire rope *c* of high grade elastic wires enclosed in a surrounding cable *c'* also consisting of high grade elastic wires, the sheathing *b* of rubber or rubber-like material being applied to the outside of the core.

In general it is sufficient for the individual wires of the wire rope to have a thickness of a fraction of a millimeter.

Figs. 4 and 5 show a cleaning roller for street-sweeping machine, provided with bristles according to Fig. 2 or Fig. 3. The body of the roller is shown by way of example as consisting of a tubular section *d* on which apertured sheet metal peripheral elements *e* are secured so as to be spaced from the body in the radial direction; the peripheral elements are held together by bolts *f*. Provided on the tubular body *d* are pins *g* to prevent axial displacement of the peripheral elements *e*. The two ends of the tubular body *d* are closed by discs *h* carrying the shaft *i*. As indicated in Fig. 5 the bristles are threaded in U-shape through the apertures in the peripheral

elements *e*. The bristles *f* may be in accordance with Fig. 2, i. e., may have a singly cabled core, but preferably they are as shown in Fig. 3, i. e., consist of a multiply cabled core with a sheath of rubber or similar material. A street sweeping roller provided with such bristles has a life more than thirty times that of a street sweeping roller provided with piassava bristles. The bristles do not break so that the roller can be used until the bristles have been worn away to a very considerable extent without detriment to the sweeping action. Such a sweeping roller also enables the washing rollers which are otherwise customary for asphalt paving to be dispensed with because a street sweeping machine with bristles according to the invention can be used equally well for stone paving as for asphalt paving.

In the case of cleaning rollers provided with bristles arranged in lines, the outermost row or rows of the lines could for instance be stiffer, i. e., provided with a core according to Fig. 1 for example, whereas the inner rows of the lines consist of the elastic bristles in accordance with Fig. 3 or Fig. 2.

Figs. 6 and 7 show a broom, particularly suitable for street sweeping purposes, provided with bristles in accordance with Fig. 1 and Fig. 2 or Fig. 1 and Fig. 3 or Fig. 2 and Fig. 3. With such brooms it is frequently desirable for the bristles of the outer row or rows *r'* to be stiffer than the bristles of the inner rows *r* so that

the outer bristles perform the rough cleaning work and the inner bristles perform the lighter cleaning work. The greater stiffness of the outer bristles is obtained by using a wire or wires of smaller elasticity for these bristles or by using wires of the same elasticity but in a greater number or associated in manner different from the wire or wires of the inner bristles so as to give a greater stiffness.

Fig. 8 shows a doormat provided with bristles in accordance with Figs. 1, 2 or 3. In this case, the backing *k* of metal, wood or the like, carries relatively short bristles *m*.

In all cases the bristles may be inserted individually as indicated in Fig. 5 or in bundles as indicated in Fig. 7.

What I claim and desire to secure by Letters Patent is:

1. A bristle for brushes, brooms and like cleaning devices comprising a core of tempered steel wire rope enclosed in a surrounding cable of tempered steel wires, and a sheathing of a tough, elastic, waterproof and resilient substance bonded to said core.

2. A cleaning device provided with bristles comprising a core of tempered steel wire rope enclosed in a surrounding cable of tempered steel wires, and a sheathing of a tough, elastic, waterproof and resilient substance bonded to said core.

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