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WOVEN BRISTLES FOR BRUSHES  
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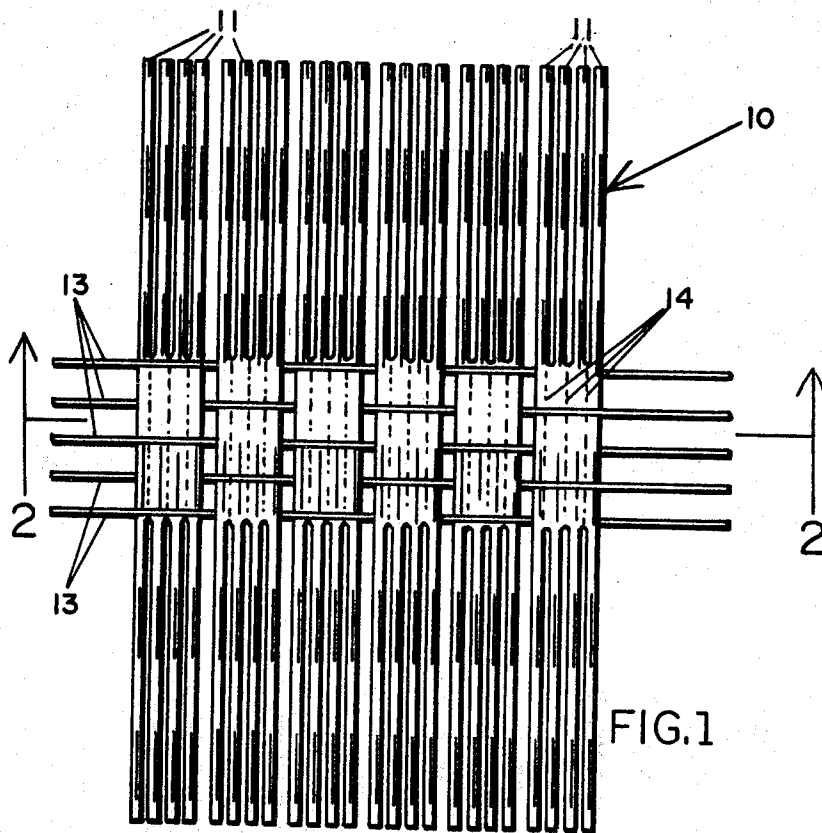


FIG. 1

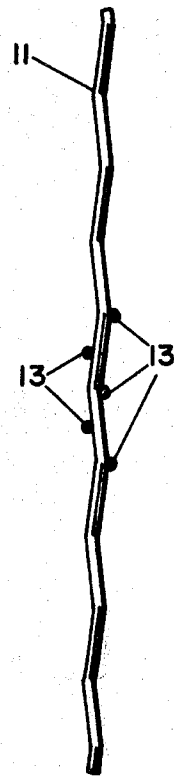


FIG. 3

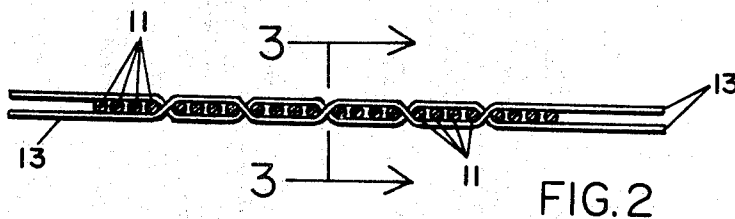


FIG. 2

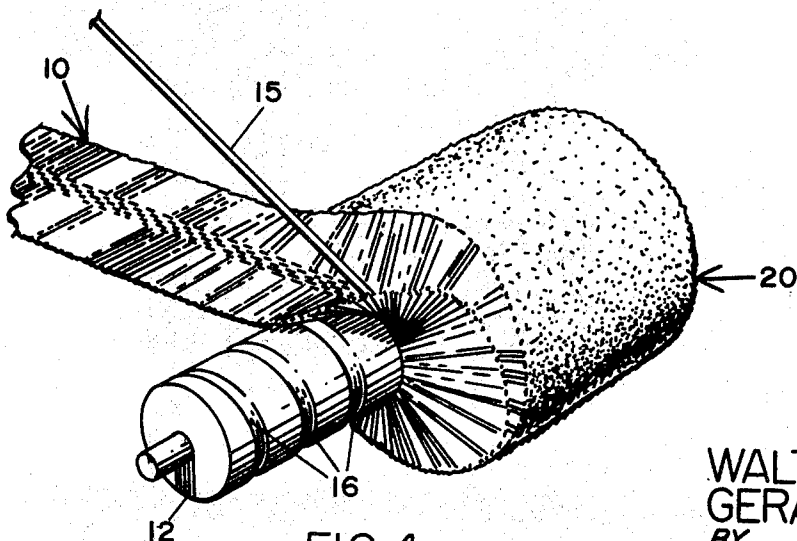


FIG. 4

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## WOVEN BRISTLES FOR BRUSHES

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4 Claims

### ABSTRACT OF THE DISCLOSURE

A woven plastic bristle unit for winding on cores of a mechanical broom or rotary brush consisting of a plurality of equal-sized groups of bristles of equal length, and a plurality of wire warp members interwoven in the groups of bristles to form a unitary sheet of bristles and the bristles of each group being fused at their mid-portion to the wire warp members.

Our invention relates to bristles for a mechanical sweeper broom or rotary brush and the method of preparing the bristles for fabricating the broom and has for its principal object the provision of an extremely simple, inexpensive and readily practised method of producing the mechanical sweeper broom or rotary brush from a length of my prepared woven plastic bristles made preferably of polypropylene.

At the present time, there are two methods of fabricating a mechanical sweeper broom or rotary brush, both of which are either laborious, costly or ineffectual to produce an efficient product. The first method is a manual one which requires a highly skilled operator who feeds bundles of precut plastic bristles onto a cable being wound on a core. The operator must flex the bundle of bristles and place the exact mid-portion of the bristles at the position of the cable entering the groove on the core as the core is rotated. At the same time, the operator must spread the bristles in the bundle so that the first bristle engaged by the cable in the groove will not leave a gap between it and the bristles of the previous bundle. Also as the bristles in the bundle must themselves be spread evenly so that there are no gaps as well as no crowding of the bristles. At its best, the broom or brush manufactured by this laborious method is composed of unevenly spaced bristles that will not sweep efficiently or properly. It can be seen that the broom or brush produced will depend largely on the skill and patience of the operator.

The second method of manufacturing brooms or brushes of the type described or of replacing the worn bristles thereof, is by winding on the core a length of channel member of factory preassembled or prebent bristles anchored therein. In this method the bristles are prebent and preassembled by special machinery and then anchored in a length channel member. The channel member with the anchored bristles along the full length thereof is then fed by the operator into the spiral groove in the broom or brush core. This method is extremely expensive and considering the fact that the bristles wear very quickly and must be replaced quite often the need for an equally efficient but less costly method of producing evenly spaced and anchored bristles for brooms and brushes is apparent.

Therefore, a further object of our invention is to provide a method of placing bristles on a mechanical sweeper broom or rotary brush that is not laborious, requires no special skills of the operator and will result in an article having evenly spaced bristles properly anchored on the core of the brush.

Another object of the present invention is to provide

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a mechanical sweeper broom or rotary brush with a length of crimped or straight bristles that are held evenly together singly or in groups by woven strands of wire and the like at their midportion as the bristles are fed onto the core of the broom in fabricating the latter.

A still further object of the present invention is to provide a mechanical sweeper broom or rotary brush whose bristles may be replaced on the core by the use of the conventional and inexpensive machinery now being used for feeding individual bristles on the core.

With these and other objects in view, the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

FIG. 1 is a plan view of our woven bristles ready for mounting on a core.

FIG. 2 is a cross sectional view taken along the line 2—2 of FIG. 1.

FIG. 3 is a cross sectional view taken along 3—3 of FIG. 2.

FIG. 4 is a plan view of a core of a rotary brush being wound with a length of our woven bristles.

Referring to the drawing wherein like numerals are used to designate similar parts throughout the several views, the numeral 10 refers to a length of our preassembled bristles unit 11 ready to be wound on a core 12. The bristles 11 are formed in groups of four as best shown by FIG. 2. Although each group of bristles 11 consists of four single and equal length of bristles 11, any number of such bristles 11 may be grouped together.

The machinery used to manufacture the unit of preassembled bristles 11 places the individual bristles 11 side by side and conveys them to a weaving machine that weaves the warp or wires 13 in and out of the selected grouping of bristles 11. Here shown are five wires 13 forming the warp, the wires 13 being equally spaced and at the exact midposition of the bristles 11 where the bend will occur when the bristles 11 are wound on the core 12. Again more or less wires 13 forming the warp may be used as found necessary to hold the groups of bristles 11 together.

Simultaneous with the weaving the wires 13 onto the bristles 11, the midportion of the bristles 11 are heat treated to effect a fusion as at 14 to effect a fusion of the wires 13 and the plastic bristles 11 and keeps the wires 13 positioned at the center portion of the bristles 11 at all times forming a unitary group at the position of the woven wires 13. This results in a sheet of plastic bristles 11 made of groups of four individual bristles 11 fused together to the wire 13 at their midportion and the groups of bristles 11 being held evenly together by the length of the woven warp or wires 13.

As seen by FIG. 4, the winding of the core 12 to form a broom or brush with my preassembled bristles 11 is accomplished very simply and quickly. The core 12 is placed on a lathe or similar machinery for slowly rotating the core 12 during the winding operation. As in the conventionally wound brushes, a cable 15 is secured at one end to the end of the spiral groove 16 and our sheet 10 of bristles 11 are placed between the core 12 and the cable 15 with the fused portion 14 at the position of the groove 16. Now as core 12 is slowly rotated, the cable 15 bends the fibers 11 and forces the bent portion deep into the groove 16. All that the operator need do is be certain that the mid-portion of the fibers 11 are engaged by the

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cable 15 and forced into the groove 16 until the other end of the spiral groove 16 has been reached, the wires 14 are then cut and the cable end affixed to the core 12 thereby completing the mechanical sweeper broom on rotary brush 20.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A woven plastic bristle mat for a broom sweeper or the like and comprising a plurality of plastic bristles of substantially equal length arranged side-by-side in a single flat layer which forms a planar sheet having a thickness no greater than one bristle with no stacking of bristles, said bristles being divided into uniplanar groups which are laterally spaced from each other and each of which contains one or more bristles, at least three warp members interwoven among and between said groups with two of said warp members contacting one side of each group and a central one of said warp members contacting an opposite side of each group and these relative positions alternating from group to group, said warp members being located at a central portion of said bristles midway between the ends thereof, and the bristle or bristles in each group being fused to said warp members for retention of the bristles in the form of a sheet to thereby form said mat, the bristles being bendable at the central portion thereof.

2. The woven plastic bristles mat as claimed in claim 1 in which said warp members comprise metal wires.

3. A woven plastic bristle mat for a broom sweeper or the like and comprising, a plurality of plastic bristles of substantially equal length arranged side-by-side in a single layer which forms a uniplanar sheet having a thickness no greater than one bristle with no stacking of bristles, said bristles being divided into planar groups each

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of which contains more than one bristle with the bristles in each group contacting each other in side-by-side relation and the groups of bristles being spaced from each other, at least three metal wire warp members interwoven among and between said groups with a central one of said warp members contacting one side of the bristles in each group and two warp members on opposite sides of said central warp member contacting an opposite side of the bristles in each group and these positions relative to a group alternating from group to group, said wire warp members being located at a central portion of said bristles midway between the ends thereof, and the bristles in each group being fused to said warp members and to each other to inhibit displacement of the bristles, the bristles being bendable at the central portion thereof.

4. The woven plastic bristle mat as claimed in claim 1 in which each of said groups contains a plurality of bristles all lying in one plane, and the bristles in each group are fused to each other as well as to said warp members.

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