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TUBULAR BRAID

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Fig. 1.

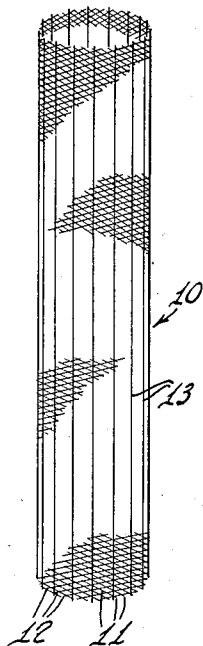
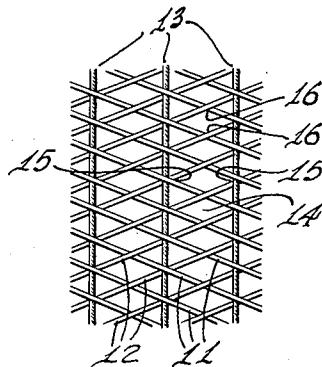


Fig. 2.



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TUBULAR BRAID

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This invention relates to tubular braid, and more particularly to tubular braid for use, among other purposes, in the manufacture of hair dressing accessories, such as foundations, curlers, rollers, and the like.

These articles have heretofore generally been made of round tubular braid of relatively stiff threads, such as artificial horsehair or the like, branded with the threads crossing over and under one another but ununited at their crossing. The braids have been made either of single threads, or a plurality of threads braided as one, the latter being commonly known as "diamond" braid. Such braid is generally of open mesh construction, the meshes being substantially square in shape, with two of their opposed right angles extending in the direction of the longitudinal axis of the braid. The braid is highly stretchable lengthwise with a consequent objectionable deformation. In some instances, to reduce their stretchability, the articles have been made of round tubular lace braid wherein the threads are interlaced or interwoven at their junction or crossing.

Both types of braid, however, are subject to numerous disadvantages, particularly that they do not have sufficient body and that they do not maintain their shape in use but tend to flatten or deform, especially when stretched or when subjected to lateral or radial compression.

I have found that a marked improvement in round tubular braid for the purposes mentioned may be effected by incorporating in the braiding unbraided elastic warp threads under considerable tension.

Tubular braiding having unbraided elastic warp threads has many advantages: it has considerable body and is not easily deformed in use; it has greater resistance to lateral or radial compression, both in its unstretched and its stretched condition; it is not easily crushed or collapsed; when subjected to tension it will not flatten but will maintain substantially its original braided form; and its stretchability is limited and controlled by the elastic warp threads.

My improved tubular braid may be made with the usual braiding machines according to ordinary braiding technique. A braiding machine that may be used conveniently is one of the sinuous-orbit type in which the bobbin carriers are moved in intersecting paths. The elastic warp threads are carried on stationary under-bobbins and, during the braiding operation, they are drawn off the bobbins under tension and

incorporated in the braid on the form or mandrel on which it is made.

In the accompanying drawing I have illustrated the invention more or less diagrammatically.

Figure 1 is a perspective view of a round tubular braid embodying unbraided elastic warp threads incorporated under tension; and

Fig. 2 is a view of a section of the tubular braid on an enlarged scale.

Having reference now to the drawing, 10 indicates the round tubular braid generally, while 11 and 12 indicate the interbraided threads. For simplicity of illustration I have shown a braid in which each strand consists of a single thread, but it is to be understood that the strands may consist of two or more separate threads braided as one as in "diamond" braid. The strands or threads 11 and 12 are preferably of artificial horsehair, generally consisting of threads of a suitable cellulose derivative or a regenerated cellulose, although they may be of other relatively stiff and inelastic material suitable for use in a braiding machine.

The elastic strands or threads 13 may be of rubber or other suitable elastic material. These strands may consist of an elastic cord covered with a winding of textile thread, or they may consist of uncovered elastic threads. Preferably, I employ covered threads in which the elastic or rubber core has been incorporated under tension.

In the braiding operation, the threads 11 and 12 are drawn under normal braiding tension from the bobbins on which they are carried over a suitable form or mandrel, generally of cylindrical shape, in such manner that the threads will cross over and under one another in opposite helical directions. In the particular form of braid illustrated, the threads 11 and 12 are unconnected at the points where they intersect or cross.

The elastic warp threads 13 extend the entire length of the tubular braid, and are preferably spaced apart equal distances circumferentially of the tube. During the braiding operation these elastic warp threads are drawn off the stationary under-bobbins, on which they are carried, under considerable tension, preferably such as to stretch them substantially to their full extent. Any suitable tensioning devices, either weight actuated or spring actuated, may be employed.

It will be noted that the elastic warp threads 13 as shown are not interbraided with the braided strands 11 and 12, but that they preferably lie between these strands and are frictionally held thereby. For instance, on referring to Fig. 2, 55

where the elastic warp threads 13 are shown in their normal or unstretched condition, it will be observed that the strands 11 extending helically in one direction pass over each of the elastic threads 13, while the strands 12 that extend in the opposite helical direction, pass under each elastic thread.

In Fig. 2 the elastic threads are shown as disposed in the tubular braid to lie at points where the braided threads 11 and 12 cross each other, and in the braiding operation they are ordinarily so incorporated. However, when the braid is delivered from the machine, the elastic warp threads generally tend to slide slightly sidewise to one side or the other of the crossing points.

As braided, the meshes of the tubular braid 10 are substantially square-shaped. When, however, the braid is delivered or removed from the machine, the elastic warp threads 13, which as heretofore noted, are incorporated in the braid in stretched condition, spring back to their normal length and thus contract the meshes into substantially rhombic form 14 shown in Fig. 2. Each rhombiform mesh has two acute angles 15 and two obtuse angles 16, the acute angles 15 extending in planes substantially perpendicular to the longitudinal axis of the tube. By reason of the contracted form of the meshes, the tubular braid in unstretched condition has far greater resistance to lateral or radial compression than a similar braided tube made without elastic warp threads. The braid is also more resistant to compression when stretched because of the greater tension of the elastic warp threads in their stretched condition. Should the braid be compressed, it will immediately upon release of the compressive force return to its normal shape, due to the elasticity of the warp threads.

The tubular braid may be of different diameters and of different forms or shapes. For use in the manufacture of hair dressing accessories, I generally make the braid in round tubular form and in diameters of from three-eighths to seven-eighths of an inch, although the tube may be made of larger or even of smaller diameter.

The contraction of the meshes 14, in the unstretched condition of the braid, is a characteristic feature of my invention; however, it will be understood that the braid may be made of meshes of different sizes so as to form a tubular braid of either a finer or a coarser mesh. The braided threads, as well as the elastic warp threads, for ornamental effect, may be of different colors. If desired, the threads themselves or the braid as a whole may be lacquered or otherwise treated with waterproofing or water-repellant material.

While I have described my improved tubular braid as particularly suitable for the manufacture of hair dressing accessories, it may be used for other purposes and in other arts. When used for hair dressing accessories, the tube is generally cut into pieces of the desired length, and the cut edges, either raw or bound, may be turned inwardly to give smooth edges and a finished appearance.

What I claim is:—

1. As a new article of manufacture, a tubular braid of a predetermined cross-sectional shape

comprising interbraided strands of relatively stiff and inelastic material, and unbraided warp threads of elastic material, whereby said cross-sectional shape is substantially maintained.

2. As a new article of manufacture, a tubular braid of a predetermined cross-sectional shape comprising interbraided strands of relatively stiff threads extending helically in opposite directions and crossing over and under one another, and unbraided initially tensioned elastic warp threads extending longitudinally and passing between the oppositely extending braided threads at or near points where the latter cross, whereby said cross-sectional shape is substantially maintained.

3. As a new article of manufacture, a tubular braid of a predetermined cross-sectional shape comprising interbraided strands of relatively stiff threads extending helically in opposite directions and crossing over and under one another, and unbraided initially tensioned elastic warp threads extending longitudinally, said elastic warp threads lying between the oppositely extending braided threads at or near points where the latter cross and being frictionally held between said threads, whereby said cross-sectional shape is substantially maintained.

4. As a new article of manufacture, a tubular braid comprising an open mesh braiding of relatively stiff material including unbraided initially tensioned elastic warp threads, the meshes of the braid being contracted in the direction of the axis of the braid by the elastic warp threads, whereby to provide increased resistance to transverse deformation.

5. As a new article of manufacture, a tubular braid comprising an open mesh braiding including unbraided initially tensioned elastic warp threads, the meshes of the braid being contracted in the direction of the axis of the braid by the elastic warp threads, whereby to provide increased resistance to transverse deformation.

6. As a new article of manufacture, a tubular braid of predetermined cross-sectional shape comprising interbraided threads of relatively stiff material, and unbraided elastic warp threads extending between the interbraided threads in the direction of the axis of the braid and spaced apart substantially uniformly circumferentially of the braid, whereby when the braid is elongated, its predetermined cross-sectional shape is substantially maintained though reduced in area.

7. A tubular braid of predetermined cross-sectional shape comprising relatively stiff braided threads and elastic warp threads having a predetermined maximum stretch, whereby the original cross-sectional shape of the braid is substantially maintained when stretched but with a limited reduction in its cross-sectional area.

8. A tubular braid of substantially circular cross-sectional shape comprising relatively stiff braided threads and elastic warp threads having a predetermined maximum stretch, whereby the original cross-sectional shape of the braid is substantially maintained when stretched but with a limited reduction in its diameter.

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