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COMPOSITE TINSEL STRAND

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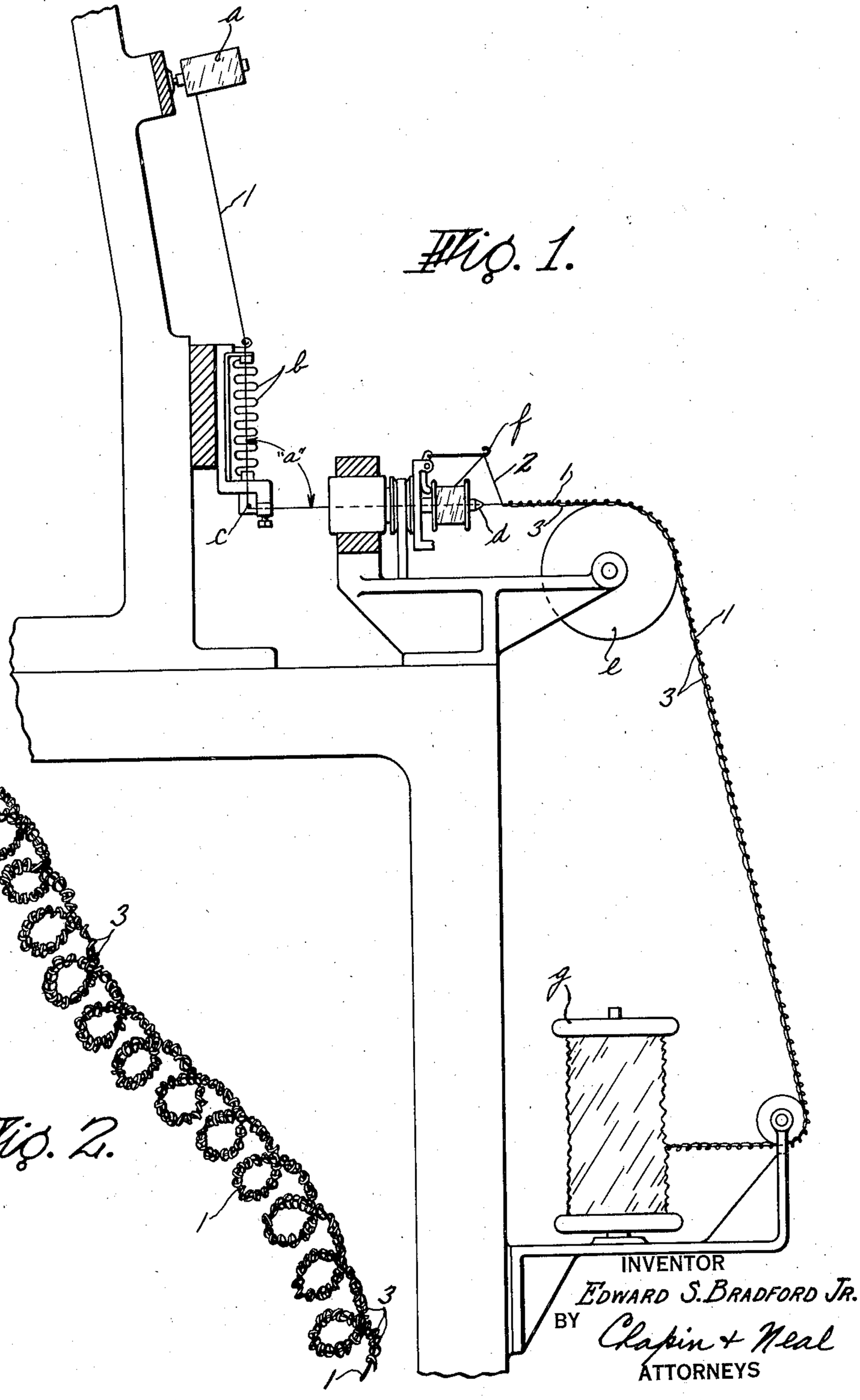


Fig. 1.




Fig. 2.

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## COMPOSITE TINSEL STRAND

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9 Claims. (Cl. 117—52)

This invention consists in an improved species of composite all-metal strand made of tinsel wire. The particular species herein described has certain advantages over other forms of composite strands when used for tinsel decorative purposes, for scouring utensils and other commercial purposes, as will be pointed out.

The improved strand can be made economically on an ordinary tinsel covering machine well known in the tinsel art, by a simple addition to such machine. For an understanding of the invention reference may be had to the accompanying drawing.

Fig. 1 is a diagrammatic view, partly in section, through a tinsel covering machine, showing a well known type of machine except for the addition of a curling edge operable on the core wire and to which reference will be made; and

Fig. 2 is a view of the composite strand made on the machine of Fig. 1 but released from all tension.

In making my product, the covering machine operates as follows: Flattened tinsel wire 1 (which is the core wire) is drawn from supply spool *a* through tension fingers *b*, over the stationary curling edge (small wire or knife blade) *c*, where it is given a tendency to spring into a helical coil when released from tension. But it is kept under tension in the machine as it passes through the hollow spindle *d* to the rotating capstan *e*. The latter acts to maintain the tension, and draw the core wire from the supply spool through the machine. As the wire 1 passes beyond the spindle *d* the rotating flyer *f* serves a second flattened tinsel wire 2 about the wire 1. This second wire is applied in the shape of loose coils, which is a well understood operating step. The composite strand consisting of tensioned core 1 covered with closely spaced but loosely riding or suspended coils 3 (the diameter of which is greater than any cross-dimension of the core) is passed once or twice around rotating capstan *e* and then to spool *g* which is the wind-up spool. The latter winds up the strand with a wind-up tension in the ordinary way. Such tension is sufficient to keep the tension on the core wire from being released enough to permit coils in the core.

The operation of the covering machine is just the same as ordinarily carried on in the tinsel business except for the action of the curling edge on the core wire. Such action on a flattened wire (but not on a core wire as a preparation step for applying covering coils) is well known and fully described for example in the patent to Wolle No. 1,689,093, October 23, 1928. It is to give the wire an inherent tendency to spring into a helical coil when released from tension. But in combining this operation in my covering machine, I spool the composite strand so that such spring action in forming coils does not take place until the spooling tension is released.

When the spooling tension is released and the core left free of tension the composite strand takes the general form of Fig. 2. It will be noted that in this figure the core forms a helical coil of larger diameter than the coil loosely wound or suspended on the core. Each helical coil of the core has suspended along its length a plurality of coils of the loose covering wire. The latter are arranged on the core that is coiled, somewhat differently than they would be on the same core if not coiled. The covering coils are loose on their core but not loose enough to escape taking the coiled form of the core. That is to say, the loose covering filament has two forms of coil. One series of coils about the core as a covering material and the covering material as a coiled strand is again coiled on a longer pitch about the imaginary axis of the core coils. This fact is particularly useful when, as here, the covering coils are loose, because being loose their interaction with the core is such as to throw their scraping edges out in a greater variety of positions than is customary with a composite strand having an uncoiled core and this variety gives a better abrasive effect.

In my use of the product I find it an advantage in manufacture to take the composite strand in spooled (core tensioned form) to machines for making up scouring utensils. For example, the spool is used to feed a skein winding machine. Handfuls of the material are wound from the spool in skein form. Then the strand is released and the skein takes a puffy, springy, tangled form in which both the core and the coils of the covering wire help to retain the utensil form when pulled out and released in use. With the particular species herein described having a definite helical curl in the composite strand over each inch of its length, the material is much easier to handle without too much tangling, since such curls bring the strand back to its original form after stretching. A common utensil made of this material is a ball or wad of coils for abrasive purposes. Such utensils have been made of coreless coils, as for example from the product of the Wolle patented machine. They have been made of coils with

textile cores, and I have before made them of coils with metal core threads.

The particular species herein described has the advantage of a long pitch in the core and a relatively short pitch in the loose covering wire so that many coils of the latter are carried by each single coil of the core. It is desirable to distinguish between a core that is coiled merely for winding into skein form, for example, and one that is coiled for my purpose of making this species of coiled composite strand. My strand has an inherent tendency to lie in helically coiled form due to the character of the core, regardless of whether it is wound in skein form or merely jumbled together and the loosely suspended coils are thus carried or have the tendency to be carried by the core into an arrangement that follows the core in its helical form. The composite strand has a definite curl of helical form in each of its length. Such material has a better tendency to return to its original form after stretching and use than other forms which may tangle too much and not maintain enough composite strand spring in the uses to which they are put.

In determining the pitch of the core coils there are the following factors to consider in the manufacture: the angle "*a*" (see Fig. 1) at which the core wire is drawn over the curling edge in part determines the pitch (the sharper the angle the smaller the pitch), the degree of tension (the more tension the smaller the pitch); the character and thickness of the metal used are also factors. These things being known, it is easy to get a setting for angle "*a*" that will give the pitch desired for the core.

In the species of composite strand I have described, the pitch of the core strand should be long enough for carrying in each turn of the core many covering turns of the loosely wound covering coils.

The composite tinsel strand of this invention is usually used in making up bunches, for example such as shown in my previous Patent 1,864,579, dated June 28, 1932. In such use it will be apparent that the tinsel material of the composite strand cannot maintain the shape as shown in Fig. 2. But the functions planned in making the composite strand in such shape originally are to a very substantial extent retained in the bunched form of the article. It is true that the tinsel material will be distorted when the strands are bunched in the article, but the inherent tendency to the original form of composite strand will still be there acting to give the puffy, springy resiliency to the bunch to a marked degree. The long curls in the composite strand when bunched may be pushed into wavy form rather than true helical form. This wavy form of the composite strand will give the effect in the bunch. In other words, the form of the composite strand curled as I have described, and then placed in bunched or skeined form as a final product, will keep the ball puffed out and resilient for the use of the tinsel in an improved manner. The curls of the strand in the bunch are more nearly in helical form on account of their original condition and tendency to spring back to such condition than in any other form that can be readily understood. The description of the strand in its original form is intended to include the same strand as distorted in bunched condition as equivalents. Of course my composite strand when used for draping and decorative purposes will not be distorted to the same extent as when bunched. And the strand claimed is used both as shown in Fig. 2 and in the bunched condition that I have described in connection with my scouring utensil patent. And it can be used in other advantageous ways with improved results where a puffy, curly, tinsel strand is wanted for the functions I have pointed out.

I claim:

1. A composite all-metal strand of tinsel material comprising a flattened tinsel wire made with many small coils per inch of length, a core filament of springy metal lying inside said coils and having an inherent tendency to assume a helically coiled form when free of tension, the diameter of said helical form being too large to lie inside the diameter of the core covering coils but being small enough to impose a distinct helical curl in each inch of length for the composite wire.

2. A composite all-metal strand of tinsel material comprising in combination a core wire and a covering wire wound loosely around the core, the composite strand as a whole having a tendency to curl into helical form whenever released from tension, the diameter and pitch of said helical form each being small enough to impose a curly nature to the composite strand as a whole over each inch or two of its length.

3. A composite all-metal strand of tinsel wire comprising in combination a core wire and a covering wire wrapped in loose formation about the core, said core being of springy metal and arranged in helically coiled form of considerably larger diameter than its wrapping but of short enough pitch to make distinct curls in the whole composite strand over each short distance of its length.

4. A composite strand made up of a spring metal core filament, a loose wrapping of flattened tinsel serving as an openwork covering for the core, said wrapping and core in composite strand form being arranged with substantial curls in said form throughout its length, said curls being close enough together to insure a substantial recoiling action for each inch of the composite strand in its use.

5. A composite tinsel strand arranged as a whole in curls throughout its length, said curls being close enough together to give a substantial stretching and recoiling action in each inch of the length, said strand comprising a spring metal filament core and a flattened wire tinsel wrapping about the core of much less diameter than the curls of the composite strand, said wrapping being mounted so loosely on the core that its successive and adjacent turns may present a great variety in the arrangement of flat tinsel curls suspended on the core, whereby the core gives the functions of strength, stretching and recoiling actions to the composite strand and the loose wrapping gives the functions of flattened tinsel curls to the composite strand when used in the ways described.

6. A composite metallic material, comprising a carrier member of springy metal adapted to form a plurality of comparatively large, irregular, and elastically connected convolute loops, a strand of comparatively inelastic metallic material helically gimped about and along the carrier member loops, the helices of said gimped material being relatively small, whereby a multiplicity thereof extend along the circuit of and cover each comparatively large convolute loop of said carrier member.

7. A composite metallic material, comprising a carrier member of springy metal adapted to form a plurality of comparatively large, irregular and elastically connected convolute loops, and a strand of flat ribbon-like relatively soft metallic wire helically gimped about and along the carrier member loops, the helices of said gimped ribbon-like wire being relatively small, whereby a multiplicity thereof extend along the circuit of and cover each comparatively large convolute loop of said carrier member.

8. A composite metallic material, comprising a carrier member of springy metal adapted to form a mass of comparatively large convolute loops contracted by their inherent elasticity into a coherent mass of more or less interlaced and compacted convolutions, and a strand of comparatively inelastic metallic material helically wound about and along the carrier member loops, the helices of said gimped material being relatively very small as compared with said carrier member loops, whereby a multiplicity of the former extend along the circuits of and cover the latter.

9. A composite metallic material as defined in claim 8, wherein the inelastic metallic material comprises flat ribbon-like comparatively soft copper wire.

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