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CUT STEEL REINFORCING WIRE

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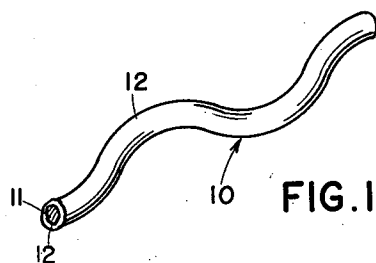


FIG. 1

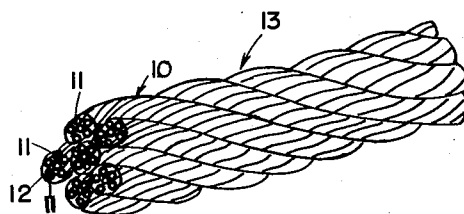


FIG. 2

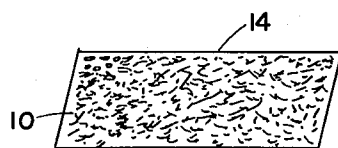


FIG. 3

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CUT STEEL REINFORCING WIRE

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4 Claims. (Cl. 28—80)

This invention relates to articles of manufacture for reinforcing rubber, plastics, paper and the like in order to give this base material more strength or more resistance to wear. More particularly, this invention relates to cut steel wire for being imbedded in the aforementioned base materials in order to improve their strength.

Objects and advantages of the invention will be set forth in part hereafter and in part will be obvious herefrom or may be learned by practising the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

Heretofore, synthetic fibers, glass fibers and metal fibers or filaments were used as reinforcement of plastic, rubber, paper and like base materials.

Metal fibers, especially steel fibers, have been used to reinforce products or materials to give them certain improved characteristics, such as electric, magnetic or heat conductivity, or increased bending or tensile strength. The steel wire heretofore used for these purposes had a relatively low tensile strength in the range between 60,000 and 210,000 p.s.i., corresponding to the method of spinning or drawing. The surface of these wires was left as rolled or spun or drawn, that is, without special further treatment, and the wire itself was left straight.

The general object of this invention is to provide for improved reinforcement for rubber, plastics, paper or the like base materials.

Another object of the invention is to utilize steel wires cut at various staple lengths for reinforcing the aforementioned materials.

Another object of the invention is to provide as a reinforcement for rubber, plastics, paper and like base materials cut steel wires having sinusoidal or helicoidal form.

Yet another object of the invention is to provide a reinforcement for base materials, cut steel reinforcing wires having substantially very high tensile strength.

Furthermore, it is an object of the invention to provide a reinforcement for base materials, cut sinusoidal or helicoidal shaped steel wires having a surface treatment improving the bonding characteristics of the wires.

Yet another object of the present invention is to provide a reinforcement for rubber, plastic, paper and like base materials, comprising a plurality of short staple length steel wires, each of said wires being of relatively high carbon content, preferably plated with a non-ferrous metal and being sinusoidal or helicoidal in form.

A still further object of the present invention is to provide as an article of manufacture a base material and means for reinforcing the same, said means comprising entangled short length high tensile strength non-ferrous metal-plated helicoidal shaped steel wires imbedded in the base material.

A further object of the present invention resides in providing a method of reinforcing rubber, plastic, paper and like base materials which comprises imbedding there-

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in entangled short length very high tensile strength non-ferrous metal-plated steel wires helicoidal or sinusoidal in form.

Various further and more specific purposes, features and advantages will clearly appear from the detailed description given below taken in connection with the accompanying drawing which forms part of this specification and illustrates merely by way of example one embodiment of the device of the invention.

The invention consists in such novel features, arrangements and combinations of parts as may be shown and described in connection with the article herein disclosed by way of example only and as illustrative of a preferred embodiment.

In the following description and in the claims, parts will be identified by specific names for convenience, but such names are intended to be as generic in their application to similar parts as the art will permit. Like reference characters denote like parts in the several figures of the drawing.

FIG. 1 shows an enlarged single piece of a sinusoidal or helicoidal coated cut steel wire;

FIG. 2 shows a stranded cable, partly broken away, from which the reinforcing steel wire staples are cut;

FIG. 3 shows a cross section of a piece of material reinforced by sinusoidal or helicoidal cut steel wire.

Referring now in more detail to the drawing illustrating a preferred embodiment by which the invention may be realized, there is shown in FIG. 1 a cut steel wire or strand, having a sinusoidal or helicoidal form or shape generally indicated by the numeral 10, consisting of a steel core 11, made of a high carbon steel wire having a carbon content of preferably and substantially 0.65% to 0.70% (more or less), and a tensile strength of preferably and substantially 300,000 to 400,000 p.s.i. (more or less), wire or strand 10 may be plated or coated with a non-ferrous metal 12, such as for example, brass, of about substantially 0.64 to 1.28 ounces per 100 pounds (more or less). The cut length of said steel wire 10 may vary from substantially 0.0197 to 1.50 inch (more or less). The sinusoidal or helicoidal form of the cut steel wire is obtained by cutting the staple in predetermined or desired lengths from a stranded cable 13 (FIG. 2) comprising a plurality of individually brass-plated filaments (or wires) varying, say between 7 and 343 wires, according to the wire gauge.

It has been found that the brass plating or coating on wires or strands 10 will assure very good adhesion between the wire 10 and rubber or plastic base material. Thus, the cut steel wire, according to the invention, may be specially adapted as a reinforcement of rubber or plastic products.

As shown in FIG. 3, the cut steel wire, by virtue of the springiness of the high tensile steel and of the sinusoidal or helicoidal form, becomes entangled in an irregular or criss-cross pattern when imbedded in the rubber, plastic or paper base material or product 14, thus giving the desired reinforcement of said base materials, whereby the brass plating provides for an improved bonding between the base material and cut wires.

It is quite apparent that the invention is applicable as a reinforcement for plastic sheets or laminates, or to give to the same other characteristics, such as electrical, magnetic or heat conductivity.

While the invention has been described and illustrated

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with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the principle of the invention, that various other changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

I claim:

1. A reinforcement for rubber, plastic, paper and like base materials, comprising a short staple length steel wire, said wire being plated with a non-ferrous metal and being substantially helicoidal in form. 10

2. A reinforcement for rubber, plastic, paper and like base materials, comprising a short staple length steel wire of substantially very high tensile strength, said wire having a non-ferrous metal plating and being substantially helicoidal in form. 15

3. A reinforcement for base materials comprising a short staple length steel wire, said wire having a relatively high carbon content and a tensile strength of substantially 300,000 and 400,000 p.s.i., covered with a non-ferrous metal plating, and being helicoidal in form. 20

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4. A reinforcement for base materials comprising a short staple length steel wire, said wire having a carbon content of substantially 0.65% to 0.70%, and a tensile strength of substantially 300,000 and 400,000 p.s.i., covered with a non-ferrous metal plating, and being helicoidal in form. 5

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