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METHOD OF PROTECTING, SILENCING, AND RIGIDIZING FABRICATED SPRING STRUCTURES

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FIG. 1

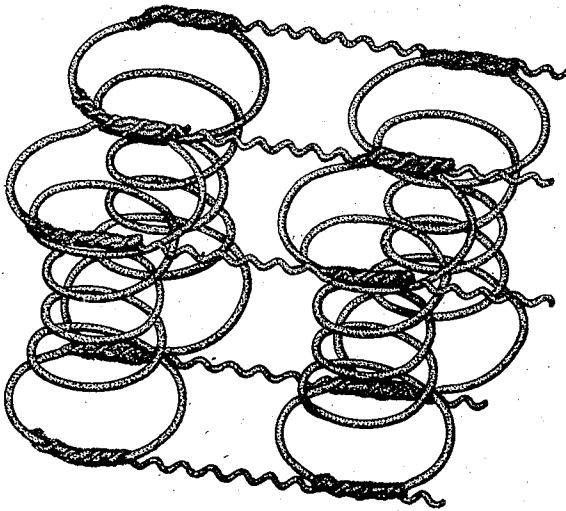
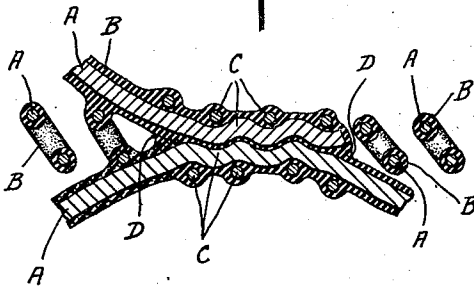


FIG. 2



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METHOD OF PROTECTING, SILENCING, AND RIGIDIZING FABRICATED SPRING STRUCTURES

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3 Claims. (Cl. 91-68)

This invention relates to a method of forming silenced, rust-proof and relatively stiffened fabricated spring structures of the general character illustrated in the following Letters Patent, Hager and McCoy, No. 1,913,353 and No. 1,977,476; Karr No. 1,257,610; No. 1,337,320; No. 1,596,273; No. 1,744,389; No. 1,798,885; No. 1,887,058; No. 1,895,429 and No. 1,938,489; Eonnell No. 405,821 and No. 630,967; Jeffrey No. 426,022; Mellon No. 1,103,526; Coopermuth No. 1,382,344; Rhinevault No. 1,732,859; Marquardt No. 1,839,325; Stackhouse No. 1,846,370; Gail No. 1,819,172; Karpen No. 1,882,649 and Suekoff No. 1,934,153.

Since the fabricated spring structure may be any one of those before mentioned or any other equivalent thereto, the drawing is to be considered solely an illustration of the invention applied to one example of fabricated spring structure and is illustrative of its application to any one of the aforesaid patent disclosures, and the invention hereinafter set forth is to be considered as being applicable to any one of the patented structures or any other fabricated spring structure in which there is a plurality of rows, each containing a plurality of cushion coils, said coils and/or rows being hingedly connected together.

It has been determined that if the end turns of the coils of the several disclosures were formed as closed elements, such as circles and the like, and connected together in spring unit arrangement, each end turn being formed with offset sinuositities, and the like, the resulting structure will readily collapse row upon row. However, if these same representative sample devices be processed, as hereinafter set forth, the unit tends to maintain a coplanar relationship and does not collapse and if deformed, as for row folding, upon release from the constraining force, the constrained positioned parts of the unit immediately tend to resume their coplanar relationships.

The chief object of the invention is to produce a fabricated spring structure of the general character before mentioned, such that the same is not only rust-proof but is silenced—that is, clicking noises due to relative movement between parts is substantially eliminated—and in addition thereto, the method of production produces such a structure which is inherently stiffened as before set forth.

In the drawing, Fig. 1 is a perspective view of a portion of a spring structure embodying the invention and Fig. 2 is an enlarged sectional view of a portion thereof.

The chief feature of the invention consists in coating a spring structure A of the general char-

acter indicated by reference to the several patents first mentioned and the instant example only illustrated in the drawing, with a rubber like covering B which covers with a film to the desired thickness substantially the entire structure and which by reason of the several interlocking relationships at the hinge connections C, traps additional rubber or rubber like material so that the latter constitutes a reenforcement D for the hinge structure and in effect constitutes the equivalent of a spring normally constraining the entire end portions of the spring structure into coplanar relationship.

Briefly, the method of production is as follows:

Any one of the spring units hereinbefore mentioned, or the equivalent thereof, such as the example illustrated in the drawing, after fabrication, is dipped into or sprayed with rubber like material which completely covers all of the exposed surfaces and as stated, accumulates in relatively heavier masses at the joints or hinge connections, or wherever two or more wires are associated together, either operatively or in juxtaposition.

The resulting structure has the inherent stiffening, silencing and rust-proofing characteristics before mentioned.

The spring unit is fabricated and almost invariably from untempered wire. The untempered wire is coated by either dipping, spraying, or the like, with a rubber like solution and then the resultant product is subjected to a tempering temperature which also semi-cures or partially vulcanizes or in some instances, may more than semi-cure the rubber simultaneously with the tempering. It has been determined, for example, that the tempering requires a temperature of from 350° to 450° F.

The rubber stock, bath or spray material may be so constituted that it will require a temperature of about the same for vulcanizing or partial vulcanization. It is to be understood, even if the rubber is vulcanized, it still retains its resilient characteristics so that the so-called constraining or spring action of the addition thereof to the fabricated spring structure, does insure in the completed product the tendency of all of the parts lying in one plane to remain in that plane until forcibly deformed therefrom and to return to that plane upon release from the constraining force.

In the spring art, heretofore, dipping into japan and other similar materials has coated the spring structure. However, it has been coated with a rigid covering. The material, however, does not

have the resulting inherent resiliences which the present process produces in the final structure. It is to be pointed out that if the initial application of the rubber, or rubber-like material, produces a relatively thin coat or covering and a heavier one is desired, the unit may be repeatedly dipped or sprayed until the desired thickness of covering has been applied thereto.

Rubber or rubber like solutions or liquid materials preferably are pigmented so that each unit, when completed, will have the desired color and the color perforce, is the result of the pigmented rubber or rubber like material; thus, black, blue, green, yellow, red and other shades and colors may be applied as desired by the ultimate consumer.

Also, if desired, whenever the material is capable of withstanding the tempering temperature if simultaneously tempered and vulcanized, the rubber or rubber like material may have incorporated in it certain other ingredients, for example, asbestos or cork. The asbestos or cork gives greater body to the coating. The size of the particles of the asbestos or cork is such it preferably will pass a screen having a mesh of anywhere from 140 to 200 to the inch.

The resultant product in any one of these instances is that the hinge joint is rubber coated and reenforced. The structure is noiseless. It rustproofs the metallic surfaces of the structure. It also gives a more finished "feel" to the surfaces of the several parts of the structure. The rubber-like material may be of any desired type. For example, rubber in the form of "smoke sheets" is reduced to liquid state by cutting it generally with benzoin, benzine or gasoline. This results in a rubber solution.

There is available, however, rubber in liquid form which looks white and milky. This is known as latex. To either of these may be added the desired pigment and to the pigmented or uncolored rubber solution or latex may be added pulverized cork, leather, asbestos and/or wood flour as set forth.

While the invention has been described in considerable detail in the foregoing specification, the same is to be considered as illustrative and not restrictive in character. Several modifications

have been set forth, which modifications are directed (1) to the different forms of spring structures, (2) to the different forms of rubber or rubber-like material utilized, and (3) the rubber or rubber-like material pigmented and/or augmented by pulverized additions, and all of these, as well as others which will readily suggest themselves to persons skilled in this art are considered to be within the scope of this invention, reference being had to the appended claims.

The invention claimed is:—

1. The method of forming a relatively stiffened fabricated spring structure, including taking the structure of untempered wire, the structure including a plurality of coil springs arranged in rows and a plurality of hinge-like connections between rows, coating the structure at the hinge connections with vulcanizable rubber-like material for relatively stiffening each hinge-like connection and then heating the coated untempered structure to the tempering temperature for simultaneously tempering the structure and sufficiently vulcanizing the coating for relatively permanent adherence to the structure.

2. The method of forming a suitably colored silenced and relatively stiffened fabricated spring structure, including taking the structure which includes a plurality of coil springs arranged in rows and a plurality of silenced like connections between rows, and then applying to the entire structure suitable pigmented rubber-like material for relatively stiffening each hinge-like connection and simultaneously coloring the entire structure correspondingly.

3. The method of forming a rust-proof, silenced and relatively stiffened fabricated spring structure, including taking the structure of untempered wire, the structure including a plurality of coil springs arranged in rows and a plurality of hinge-like connections between rows, then covering the entire structure with vulcanizable rubber-like material for relatively stiffening each hinge-like connection, and then heating the covered untempered structure to the tempering temperature for simultaneously tempering the structure and sufficiently vulcanizing the covering for relatively permanent adherence to the structure.

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