R. B. PRICE.

TREATMENT OF MATERIALS AND ARTICLES PRODUCED THEREBY.

APPLICATION FILED FEB. 7, 1913.

1,287,095. Patented Dec. 10, 1918.

Fig. 1

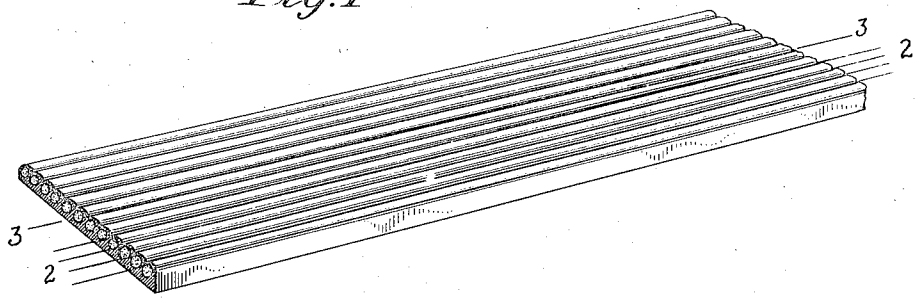


Fig. 2

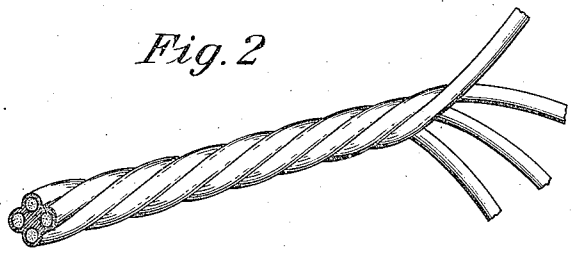


Fig. 3

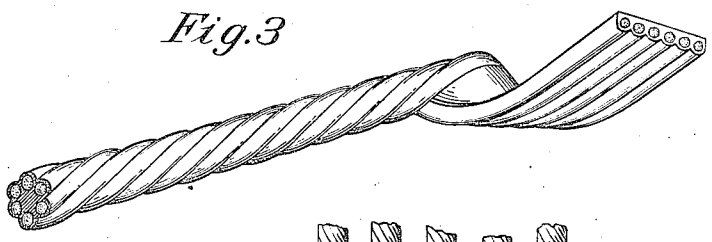
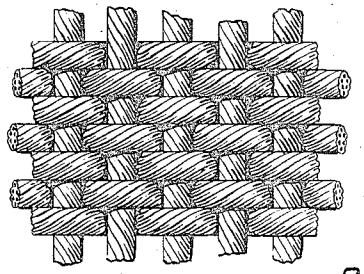


Fig. 4



Witnesses:
Veronica Braun
Francis Boyle

Inventor
R. B. PRICE.
By his Attorney
Ernest Hopkinson,

UNITED STATES PATENT OFFICE.

RAYMOND B. PRICE, OF NEW YORK, N. Y., ASSIGNOR TO RUBBER REGENERATING COMPANY, A CORPORATION OF INDIANA.

TREATMENT OF MATERIALS AND ARTICLES PRODUCED THEREBY.

1,287,095. Specification of Letters Patent. Patented Dec. 10, 1918.

Application filed February 7, 1913. Serial No. 746,853.

To all whom it may concern:

Be it known that I, RAYMOND B. PRICE, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented new and useful Improvements in the Treatment of Materials and Articles Produced Thereby, of which the following is a specification.

My invention relates to the treatment of fiber, strands, threads, cords or cables and the like, and has for its main object to provide an improved method of coating and treating the same whereby they will more perfectly retain said coating when utilized to be twisted into larger elements or woven into fabric.

My invention also embodies certain modifications of the above recited idea, as will be hereinafter more definitely pointed out and claimed.

In the treatment of fiber, strands, threads, cords, cables and the like wherein they are coated with rubber or similar substances for the purpose of strengthening as well as waterproofing the same it has been found that, when so coated, and afterward twisted into elements of larger dimension and then cured, by reason of their shrinkage and tendency to untwist, particularly under the vulcanizing heat, the coating on the adjacent surfaces of the coated elements becomes forced out, leaving their adjacent surfaces contacting, as is the case when they are coated or otherwise treated subsequent to being twisted.

My present invention is intended to effectually prevent this forcing out of the coating, which I accomplish by either partially or completely curing the elements so coated before they are twisted into larger elements. And said cure may be any one of the well known cures, such as cold cure, mold cure, hot air cure, and the like.

I have also found that when the strands, threads or cords so coated and cured are woven into fabric they are similarly benefited by reason of the fact that, even under strain, the fabric will as to its component elements retain the coatings intact thereon.

It will be obvious that the fiber, strands, threads, cords or cables may be filled with a lubricant, such as oil, wax, tar and the like, before the coating is applied. And it will also be apparent that any anti-sticking substance may be applied to the coated elements before being further utilized, if desired. Furthermore, the coating may be of any desired shape, such as round, oblong or the like.

In the accompanying drawing, Figure 1 is a perspective view of a strip of coated elements;

Fig. 2 is a perspective view of separate sections severed on the line 2—2, Fig. 1, and twisted;

Fig. 3 is a perspective view showing a section severed on the line 3—3, Fig. 1, and twisted;

Fig. 4 is a fragmentary view of a fabric embodying my improvements.

My present invention contemplates embedding fiber, strands, threads, cords or cables in parallel relation in a plastic base, such as rubber, which may be as thin or as thick as desired, as shown in Fig. 1, and then twisting sections of said base cut parallel with the line of the material embedded therein into strands, threads, cords or cables, as shown in Figs. 2 and 3, the same being either partially or wholly cured, as by subjecting the same preferably to heat at or above the temperature of the melting point of sulfur, that is, 238° F., and below the temperature of the extreme fluidity of sulfur, that is, 248° F. Between these temperatures vulcanization takes place in the rubber. However, the temperature may be carried up as high as 290°, which is the highest that can ordinarily be used for vulcanizing without burning or carbonizing the rubber. This heating treatment is continued for a period sufficient to produce the desired degree of vulcanization in the rubber, and to produce the best results, it is essential that this heating step be performed prior to said twisting. And it will be obvious that from such elements so formed larger elements may be built up by twisting a plurality of the same together to a size suitable to form as a single layer the fabric of a tire shoe, as shown in Fig. 4, or to even greater size.

Furthermore, I may take a plurality of sections as above and twist the same into a larger element, or I may twist one or more of said sections around a rubber core itself either raw or partially or wholly precured but ordinarily, twisting a section in a slight spiral, as shown in Fig. 3, causes the rubber coating on the inner faces to cohere and form a rubber core. It will be obvious that

in twisting any of the elements hereinbefore enumerated to form larger elements the latter may in turn be coated and then either partially or wholly cured before being used to form still larger elements. While I prefer to use as the coating a solution or paste of rubber, it will be understood that not only may any form of rubber be used for this purpose, but that such substances as gutta percha, balata and the like may be used.

Obviously, the flexibility and extensibility of the articles produced can be regulated and proportioned by the amount of coating as well as by the weave, knit, braid or twist of the same.

I also contemplate combining fibers, strands, threads, cords or cables and the like so treated with other fibers, strands, threads, cords or cables and the like that are uncoated. Or I may coat and cure, either partially or wholly, certain fibers, strands, threads, cords or cables and the like, and then combine the same with other fibers, strands, threads, cords, cables and the like that are coated but uncured, and then cure the same. And in this connection I contemplate combining different characters of materials, such as rubber threads and the like, or metal threads, with fibers either uncoated or coated as hereinbefore described and cured either before or after being so combined. In fact, a wide variety of combinations is obviously possible, involving materials of various characters with fibers so coated.

In an application for Letters Patent filed by me January 19, 1912, Serial No. 672,261, I have disclosed certain processes of treating fibers, strands, threads and the like, the same involving, among others, the use of a vacuum to cause a more thorough permeation of the material being treated by the strengthening and waterproofing medium, as well as the use of pressure rolls, either with or without the vacuum, and it will be understood that I contemplate the use of any or all of the processes described in said application in connection with my hereinbefore described novel treatment.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

The process which comprises arranging a plurality of elements such as fibers, strands, threads, cords, or the like in substantial parallelism with intervening spaces, coating said elements with vulcanizable plastic whereby said spaces are filled with the plastic, partially curing the rubber treated elements, twisting said elements to produce an element of larger dimension, building said element into an article of manufacture, and finally curing said element.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RAYMOND B. PRICE.

Witnesses:
MAY V. SMITH,
CHARLOTTE M. SCHULE.