

UNITED STATES PATENT OFFICE.

JOHN MURPHY, OF NEW YORK, N. Y.

IMPROVEMENT IN PROCESSES FOR TREATING GUTTA-PERCHA.

Specification forming part of Letters Patent No. **10,977**, dated May 30, 1854.

To all whom it may concern:

Be it known that I, JOHN MURPHY, of the city, county, and State of New York, have invented a new Method of Treating Gutta-Percha—viz., incorporating a small proportion of sulphur or its equivalent therewith, and then subjecting it to such a degree of heat and for such a length of time as to drive off its injurious volatilizable ingredients, by which I produce an article possessing such a degree of compactness, ductility, and tenacity that it can be converted into banding and many other useful articles, and which can be rendered permanently elastic by incorporating another proportion of sulphur or its equivalent therewith and subjecting it to a second heating operation, substantially as described in John Rider's patent of June 1, 1852. It was discovered by John Rider, and secured by his patent of June 1, 1852, that certain volatilizable ingredients incorporated with gutta-percha must first be driven off by a preliminary heating operation before the gutta-percha can be rendered permanently elastic by combining sulphur and other substances therewith and subjecting it to the action of heat.

By repeated practical experiments on a large scale I have discovered that the incorporation of a small proportion of sulphur or its equivalent with the gutta-percha before subjecting it to the said preliminary heating operation produces the happiest results—viz., the injurious volatilizable ingredients incorporated with the gutta-percha are much more perfectly driven off by the said preliminary heating process, which gives to the article thus treated more solidity, ductility, and tenacity than the gutta-percha has when the sulphur is not incorporated therewith prior to the said preliminary heating operation, thereby enabling the article to be spread into much thinner sheets, and also preventing it from blistering and running off from articles of clothing, &c., with which it may be combined after it has been incorporated with the second proportion of sulphur and driers and acted upon by the second or vulcanizing heating process. I have found that the proportion of sulphur that can be judiciously incorporated with the gutta-percha prior to the said preliminary heating process depends somewhat upon the natural condition of the gutta-percha to be operated

upon. It sometimes has more aqueous and other volatilizable ingredients combined with it than it has at others, rendering it necessary that different proportions of sulphur should at different times be combined with the gutta-percha to enable the preliminary heating operation to produce the desired effect upon it. When there is more than the usual proportion of volatilizable ingredients in the natural gutta-percha a little larger proportion of sulphur should be combined with it before exposing it to the said preliminary heating operation. Generally speaking, I find that from two to six ounces, or thereabout, of sulphur or its equivalent, incorporated with ten pounds of gutta-percha, produces the best results after an exposure of the article to the action of a steam bath of the temperature of about 280° of Fahrenheit for the space of about three hours; but I have sometimes incorporated as high as ten ounces of sulphur with ten pounds of gutta-percha and subjected it to the preliminary heating operation without producing an article that had any of the characteristics of vulcanized gutta-percha or india-rubber, and at another time by the same process of treatment I have produced an article which did possess some of the characteristics of vulcanized gutta-percha and india-rubber—that is, the product of said process could sometimes be dissolved in the known solvents of natural gutta-percha and could be worked and kneaded into sheets by the heated rollers, and be rendered permanently elastic by incorporating another proportion of sulphur with it and subjecting it to a second heating operation, and sometimes the said product could not be dissolved in the solvents of natural gutta-percha, and could not be worked over or kneaded into sheets by the heated rollers, and could not be rendered permanently elastic by any known process.

When a less proportion of sulphur is incorporated with gutta-percha a higher degree of heat and a greater length of time are required to produce the desired result; and where a larger proportion of sulphur is incorporated with the gutta-percha a little lower degree of heat and less time are required for the heating operation to produce the desired and best result; but as the proportion of sulphur employed in my said process of treatment, as also

the degree of heat and the length of time occupied in the said preliminary heating process, must depend upon the natural condition of the gutta-percha, the said proportions of sulphur and gutta-percha, the temperature of the heating process, and the length of time required by said process cannot be precisely stated by numbers. They are, however, readily ascertained and determined by anyone familiar with the treatment and manufacture of gutta-percha. Therefore I wish it to be understood that I do not restrict myself to the use of any precise proportion of sulphur in my said process of treating gutta-percha, save that the proportion of sulphur employed must not be so large as to cause a development in the gutta-percha subjected to said process of treatment of any of the aforesaid distinguishing characteristics of vulcanized gutta-percha.

Gutta-percha prepared by my said method

of treatment can be vulcanized or metallothyanized by the process described in John Rider's patent of June 1, 1852, or by the methods usually employed for vulcanizing or metallothyanizing india-rubber.

What I claim as my invention, and desire to secure by Letters Patent, is—

Incorporating with gutta-percha substantially the proportion of sulphur or its equivalent herein specified, and then subjecting it to such a degree of heat and for such a length of time as to expel therefrom its injurious volatilizable ingredients, preparatory to vulcanizing the gutta-percha thus treated or for using it in the condition that my said process of treatment puts it into.

JOHN MURPHY.

Witnesses:

WILLIAM RIDER,
WM. E. RIDER.