

# UNITED STATES PATENT OFFICE.

THOMAS J. MAYALL, OF ROXBURY, MASSACHUSETTS.

## IMPROVEMENT IN TREATMENT OF VULCANIZED RUBBER.

Specification forming part of Letters Patent No. 23,773, dated April 26, 1859.

*To all whom it may concern:*

Be it known that I, THOMAS J. MAYALL, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Compositions of Soft Vulcanized India-Rubber and Gutta-Percha and in Compositions of India-Rubber and Gutta-Percha not Vulcanized; and I do hereby declare that the following description is a true, full, and exact specification of the same, wherein I have set forth the nature and principles of my said improvements, by which my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

My invention consists in the use of olive-oil in compositions of soft vulcanized india-rubber and gutta-percha and in compositions of india-rubber and gutta-percha not vulcanized.

It is well known that india-rubber and gutta-percha are compounded with various earths—such as magnesia, chalk, and other similar earths—and with the oxides of many metals, such as zinc, lead, &c. These compositions are used sometimes with no further preparation than drying in the sun, or they are combined with sulphur and submitted to the well-known process of vulcanization. It has been a very desirable object to mix fluids with the rubber and gutta-percha in these compositions, not only to facilitate the mixture, which is ordinarily done by grinding, but to give greater consistency to the composition and to produce a smooth and perfect surface upon the finished goods. These attempts, however, have been unsuccessful. I have tried various combinations of vegetable oils and of many other fluids, but all had injurious effects upon the rubber and did not effect the desired object, with the exception of olive-oil, which I have found to possess remarkable affinities for india-rubber and gutta-percha and to produce the desired result. It combines with these substances and their various compounds when vulcanized and not vulcanized, and enables the workmen to mix the compounds thoroughly, and gives a smooth surface to the goods, while the composition is rendered very flexible and remarkably perfect and useful. The difference can be easily perceived by comparing the goods manufactured with olive-oil and those made in

the ordinary manner, although it is impossible to describe it fully.

The compositions of gutta-percha and india-rubber are so infinite in number that it is impossible to detail all the proportions in which oil should be used. As a general rule, it is best to mix the oil in French clay, forming a composition like soft putty, and this is gradually ground into the rubber or gutta-percha composition in the ordinary mode of preparing such goods. As a general rule, more oil can be used when the proportions of foreign substances are larger. I give the proportions which can be used in a few ordinary cases, and any workman of ordinary skill can from these examples decide the proportions in other cases.

To make an ordinary composition of india-rubber or gutta-percha sheet which is not to be vulcanized, I take, for a batch of thirty pounds of rubber or gutta-percha composition, one quarter of a pound of olive-oil. The use of oil enables me to use a larger proportion of cheap foreign substances, which can be incorporated with the rubber, and thus the cost of the goods is very much reduced. When making the ordinary compositions of gutta-percha or india-rubber which are intended to be vulcanized I use two ounces of olive-oil to twelve pounds of the composition. The compositions used by different workmen at the different factories vary so much that it is impossible to prescribe any exact rules, as the proportions of oil must vary with the kind and quantity of foreign matter used, and as it is very easy for a workman of ordinary skill to vary the proportions properly I do not limit myself to any proportions of the oil, having given those which are best for common purposes. I use olive-oil also in the same manner in compositions of de-vulcanized or restored rubber, and it is found to be as useful in these compositions as in compositions of native rubber or gutta-percha. It must be understood that the olive-oil in all these compositions has very valuable effects upon the goods, and it is not as a solvent or as assisting mechanically in the manipulation of the rubber that it is of value only. The oil combines with the gums used and improves their qualities to a remarkable degree.

I do not claim the use of olive-oil in the compositions of what is commonly called "hard rubber," as the oil in that composition is used

for a different purpose and has different effects from that which it has in soft or flexible compositions, and is the subject of separate Letters Patent issued to me already; nor do I claim its use in compositions of which emery forms a part, as that is a distinct subject and requires a different treatment, and is a distinct invention of my own. I have also invented a peculiar composition for forming gas-tubing, in which I use olive-oil, and I do not claim that use in this specification; but

What I do claim, and desire to secure by Letters Patent, is--

The use of olive-oil in compositions of gutta-percha and india-rubber, substantially in the manner and for the purposes above described.

THOS. J. MAYALL.

Witnesses:

JOSEPH GAVETT,  
ALBERT W. BROWN.