UNITED STATES PATENT OFFICE.

C. H. HAYWARD, OF STONEHAM, AND DANIEL E. HAYWARD, OF MELROSE, MASSACHUSETTS.

IMPROVEMENT IN TREATING WASTE RUBBER.

Specification forming part of Letters Patent No. **40,407**, dated October 27, 1863.

To all whom it may concern:

Be it known that we, CHARLES H. HAYWARD, of Stoneham, in the county of Middlesex and State of Massachusetts, and DANIEL E. HAYWARD, of Melrose, in the county and State aforesaid, have invented a new and improved process of employing rags and other fibrous articles coated with india-rubber, of which the following is a full, clear, and exact description.

Various attempts have been made to employ the waste rags of india-rubber manufactories, which consist of scraps of cotton and other cloth covered with unvulcanized rubber, by grinding them upon the ordinary heated rolls and mixing them with fresh or crude rubber; but the tenacity of the fibers made it exceedingly difficult to grind the material to a uniform consistence, and their presence invariably caused the gum to blister during the process of vulcanization, so that it has not been found practicable to employ them in the manufacture of any but the cheapest and coarsest articles—as, for example, the packing for steam-engines.

Our invention, which has for its object to remedy the above objections to the employment of these articles, consists in destroying the tenacity of the fibers previous to grinding the rags by boiling the waste rags in an acid or alkali to destroy the cotton or other fiber, so that they may be easily and speedily ground upon the hot rolls, and so that the material will not blister when run upon cloth and subsequently vulcanized.

That others skilled in the art may understand our invention, we will proceed to describe the method by which we have carried it out in practice.

One thousand pounds of the rags or other fibrous india-rubber articles are boiled for a space of ten to twelve hours in a mixture of eight hogsheads of water and seventy-five pounds sulphuric acid, the boiling being effected by means of copper steam-pipes arranged in the bottom of a wooden tank. The acid is now removed by thorough washing, and this part of the process we prefer to effect by submitting the rags for the space of three to six hours to the action of steam under a pressure of seventy-five to one hundred and twenty-five pounds. After being dried the rags are ground upon the heated rolls, the tenacity of the fibrous portion being so effectually destroyed as to crumble to powder in a short space of time and become thoroughly incorporated with the rubber. Twelve pounds of the ground rags are then ground with three pounds of fresh or crude rubber, mixed with suitable proportions of mineral or other ingredients, and the compound thus produced may be employed in the manufacture of various articles, and may be vulcanized without blistering or swelling.

There are other materials which may be employed for the purpose of destroying the tenacity of the fibers besides the one above indicated—as, for example, caustic alkalies; but these require a greater length of time, unless they are made very strong, in which case they become too expensive for use in practice, and we therefore give the preference to the sulphuric acid as the most economical, effectual, and expeditious.

In lieu of grinding the fibrous portions of the rags and the india-rubber together, as above indicated, the two may be easily separated from each other after the cloth has been destroyed, as above, leaving the india-rubber to be used alone, if desired.

What we claim as our invention, and desire to secure by Letters Patent, is—

Boiling waste rags of fibrous material and rubber in an acid or alkali for the purpose of destroying the tenacity of the fibers of the rags, so that the rubber may be reground, and so that the material will not blister when reused, as described.

C. H. HAYWARD.
D. E. HAYWARD.

Witnesses:
WM. H. HILL,
GEORGE T. BAILEY.