UNITED STATES PATENT OFFICE.

FRANCIS D. HAYWARD AND JOHN C. BICKFORD, OF COLCHESTER, CONN.

PROCESS OF ROLLING INDIA-RUBBER CLOTH.

Specification forming part of Letters Patent No. **7,189**, dated March 19, 1850.

To all whom it may concern:

Be it known that we, FRANCIS D. HAYWARD and JOHN C. BICKFORD, of Colchester, in the county of New London and State of Connecticut, have invented a new and useful process of coating cloth or various other materials with caoutchouc or other substance of similar properties, or which, as heretofore applied and fixed to cloth, has been previously entirely or partially dissolved by some solvent or been attached by some cement; and we do hereby declare that the nature of our said process is fully described in the following specification—that is to say:

Our invention or process consists in taking a piece of cloth or any other sheet material (to whose surface it may be desirable to apply and fix caoutchouc, gum-elastic, or india-rubber) and a quantity of ground india-rubber (when in a tacky or adhesive state, in which it is after being ground or reduced by the usual process of grinding crude caoutchouc) and running or passing the same together (the caoutchouc being on one side of the cloth) between two cylinders or rollers, (placed with their axes parallel and their curved surfaces in contact, or nearly so,) and in such manner that while the upper of the said rollers, or that in contact with the caoutchouc, is made to revolve at a greater speed or velocity than the lower one, it (the said upper roller, or that in contact with the caoutchouc) shall spread and grind it, as it were, into the cloth and below, and fix it to that surface of it which is immediately contiguous to said roller—viz., that roller which revolves at the greatest speed.

We are aware that by means of two rollers or cylinders india-rubber has been spread upon cloth or other material and made to adhere to it by simple pressure, the said rollers having been revolved at the same velocity, and they serving only to spread the gum over the surface and press it down thereupon. In such case, in order to give the rubber the power of adhering to the cloth, it requires first to be dissolved or softened by spirits of turpentine or some other equivalent solvent. Our process of moving or revolving one of the rollers faster than the other grinds the rubber into and down upon the cloth and so thoroughly fixes it thereto as to render it impossible to peel it therefrom, whereas by the old process it can readily be peeled off. Besides this, we are enabled to dispense with the use of spirits of turpentine or any chemical solvent such as is generally used to give the rubber the properties required to cause it to adhere to the cloth.

We do not claim the mere spreading of india-rubber on cloth by means of rollers moving at equal velocities; nor do we claim the running of rollers at different velocities, as the same have been operated heretofore and for the purpose of planishing or polishing a hard surface—such as that of a plate of metal—or for grinding or reducing any substance even between them; but

What we do claim is—

The new or improved process of applying and fixing rubber to cloth by means of rollers, the said improved process being a combination of the method of spreading the rubber by the pressure of rollers and the method of grinding and fixing it at the same time against and into the substance of the cloth, all as specified.

In testimony whereof we have hereto set our signatures this 29th day of January, A. D. 1849.

FRANCIS D. HAYWARD.
JOHN C. BICKFORD.

Witnesses:
RALPH GILBERT,
HENRY C. GILBERT.