# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN BANDS FOR MACHINERY.

Specification forming part of Letters Patent No. **28,350**, dated May 22, 1860.

*To all whom it may concern:*

Be it known that I, JOSEPH H. CLIFTON, of New Castle, Lawrence county, State of Pennsylvania, have invented certain new and useful and Improved Banding for Machinery, of which the following is a full, clear, and exact description.

It has long been a desideratum with manufacturers to obtain a substitute for leather banding for driving machinery that can be afforded to the consumer at less cost and possessing all of its essential qualities—such as its great strength and durability, united with pliability.

Many materials have been proposed and used as a substitute for leather—among others, a woven fabric of cotton, flax, or hemp, covered and impregnated with india-rubber, gutta-percha, or some pliable water-proof paint or cement. The rubber bands are generally made of two or more plies of a woven cotton fabric, cemented together with india-rubber and the exterior covered with the same material. The great objection to these bands is that the different layers of the textile material being only united by elastic cement, there is no direct connection between the textile fibers of the different layers. Hence when these bands are subjected to strain and wear, these different layers are liable to split and separate, which materially weakens and destroys the integrity of the band, and, moreover, these bands are liable to slip on the pulley when wet, and the external coating of rubber is softened if the oil from the machinery comes in contact with it, and when run at high speed the heat generated softens the cement on the surface and between the different plies of cloth, causing the cement to peel off and leave the textile material of the band exposed and the different plies to separate.

Bands made of hemp, cotton, or flax are generally woven so as to form a thick heavy fabric, the warps and fillings being well tied. The textile band made of these materials is covered and impregnated with some oil, cement, or pigment, in order to render it water-proof, and protect and give greater smoothness to the surface. The great objection to bands of this description made from vegetable fiber is that they are rendered stiff and rigid by the application of a water-proof cement or paint, and the oil, which is the vehicle used for applying the resinous and earthy compounds to cover the band, is absorbed by the vegetable fiber, causing it in a short time to rot and lose its strength; and also by the absorption of the oil the surface-coating becomes hard and brittle, which causes it to crack off and leave the textile fiber exposed; or it becomes hard and enameled by the friction on the pulleys, which renders it liable to slip. Moreover, all bands made from vegetable fiber are greatly affected by dryness and moisture, which causes them to contract when wet and expand when dry, so that they are almost worthless to drive machinery requiring the bands to be kept at a uniform tension.

The object of my invention is the construction of a band of textile material that will not be liable to the before-mentioned defects; and my invention consists of a woven band the warp of which is of animal fiber, and the woof of either animal or vegetable fiber impregnated and covered with a pliable water-proof cement.

That those skilled in the art may understand my invention, I will proceed to describe the manner in which the band is made.

This band consists of a textile fabric the warps of which are of animal fiber and the weft of either animal or vegetable fiber.

The band may be made of any desired width or thickness, and the different plies of the warp and weft threads are well tied through and through by the warps. The band, after being woven, is sized with any well-known size, and then passed, while damp, through pulverized rosin or any other gum, which is caused by the damp size to adhere to its surface. After that the band is passed between heated rollers for the purpose of melting the adhering rosin or gum and causing it to penetrate the band and give greater smoothness and eveness to its surface. The band is then covered with a water-proof cement or composition composed of boiled linseed-oil and black lead, or any other unctuous earth or mineral, which, mixed with linseed or other oils, will form a water-proof coating or cement, and give an even surface to the band and protect from wearing, while it does not destroy its pliability.

I do not confine myself to impregnating or covering a band with the warps of animal fiber

and the woofs of either vegetable or animal fiber with the material herein described, as any other well-known material may be used for this purpose that will increase the durability and strength of the band without destroying its pliability.

The great superiority of this band over those heretofore constructed is that it possesses a pliability and elasticity almost as great as the leather band, while it is not liable to stretch, as is the leather band, and can be afforded to the public at less cost.

The cement or coating to the woolen band does not harden and become brittle and crack, as it does on those bands made of hemp or flax or other vegetable fiber. Neither does the oil used in these cements rot the animal fiber, so that this band is more durable than those made of these materials, besides being more flexible, and unaffected by dryness or moisture.

Having thus described my improved banding, what I claim as new, and desire to secure by Letters Patent, is—

A band the warps of which are of animal fiber and the wefts of either animal or vegetable fiber impregnated or coated with pliable cement.

In testimony whereof I have subscribed my name.

JOSEPH H. CLIFTON.

Witnesses:

JOHN S. HOLLINGSHEAD,

H. S. SMITH.