

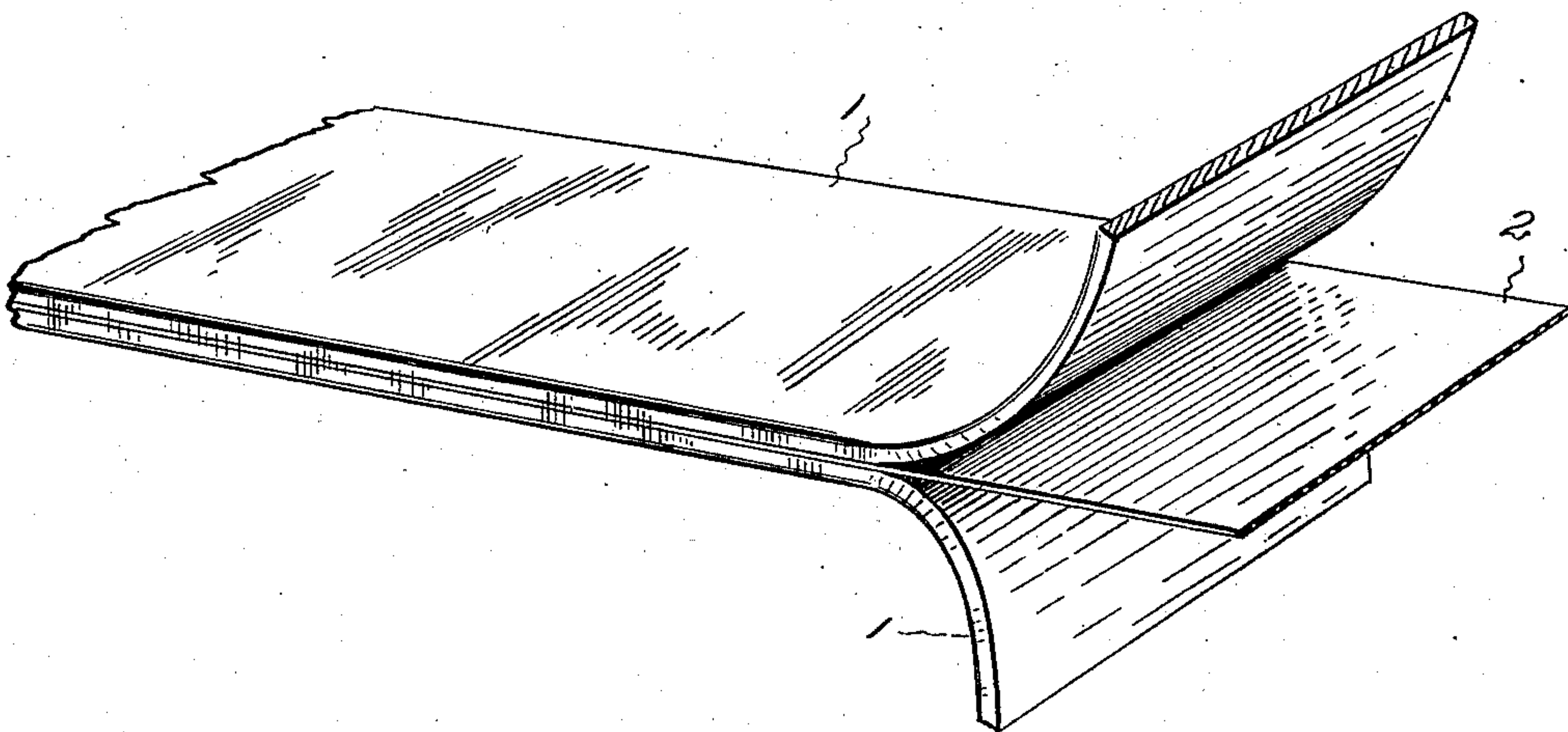
No. 750,299

PATENTED JAN. 26, 1904.

C. E. NEWTON.  
BELTING.

APPLICATION FILED SEPT. 25, 1902.

NO MODEL.



*Witnesses*

*Ethel M. Lowe.*

*B. F. Kilgore.*

*Inventor*

*Charles E. Newton by*  
*Harry P. Williams*

*Attorney*

## UNITED STATES PATENT OFFICE.

CHARLES E. NEWTON, OF HARTFORD, CONNECTICUT.

## BELTING.

SPECIFICATION forming part of Letters Patent No. 750,299, dated January 26, 1904.

Application filed September 25, 1902. Serial No. 124,786. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. NEWTON, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Belting, of which the following is a specification.

This invention relates to a belt which is formed of one or more plies of tawed leather and rubber partially vulcanized.

The belts in most common use are made of one or more plies of bark-tanned leather united by glue or other cement. Such belts are not waterproof. They absorb moisture freely, and thus shrink and stretch considerably under atmospheric changes, sometimes even to straining shafting out of line or slipping loosely about a pulley, and the laps and plies often separate. Bark-tanned-leather belts are damaged by the fatty acids often present in lubricating-grease, and by overheating they become worthless if steamed or if wet and subjected to a temperature of 200° Fahrenheit. Belts are made of cotton and other fabrics; but such stretch easily. They have not the tensile strength of leather belts nor the tractive efficiency. Belts are also made of woven fabric and partially-vulcanized rubber; but such rubber belts are not durable. The rubber is attacked by ingredients of lubricating-grease and is injured by heat. Even the heat due to the slip of a belt upon a pulley will destroy the coating of a rubber belt in a short time.

I have discovered that leather which is so tawed that the gelatin is rendered insoluble in water, and thus is waterproof, may be placed in a vulcanizing-press and subjected to the heat and pressure necessary for vulcanizing rubber and cementing several plies together without deterioration.

The object of this invention is to produce a belt which has pliability, tensile strength, and tractive efficiency and which is acid-proof and waterproof, and therefore will not shrink and run tight or stretch and run loose under the influence of varying atmospheric conditions. This object is accomplished by forming a belt of one or more plies of chrome or mineral tawed leather in which the gelatin is rendered insoluble in water, treated with rubber, and

subjected to considerable heat and pressure to unite and harden the leather and rubber.

The figure of the drawing shows a perspective view of a section of a belt embodying my invention with a portion separated in order to show the formation.

The hides or skins of which the leather plies of this belt are made may be treated by the usual processes of soaking, liming, unhairing, bating, washing, &c., employed for preparing hides or skins for tanning. They may then be placed in a bath and subjected to the action of a solution of water and a common compound of metallic salts and an acid, such as bichromate of potash and muriatic acid, for a longer or a shorter time, depending upon the kind, thickness, and condition of the hide and strength of the solution. After treating the hides in this manner they may be treated in a bath to a solution of water and a soluble sulfid and an acid, as sulfid of potassium or sulfid of soda and hydrochloric or muriatic acid. The second solution may also contain chrome alum, saltpeter, and arsenite salt or arsenite of sodium or potassium. The actions of these solutions may be hastened by slightly heating and agitating them. The action of these solutions produces insoluble chromic oxid, which unites with the fibers and renders the gelatin insoluble in water, but does not injure the fibers of the leather. The proportions of these ingredients and the length of times of treatment are known to those skilled in the art of tawing leather and are not material to this invention. The leather after being treated to the solutions which convert the gelatin into an insoluble condition may be colored, soaked, and greased in the usual manner. The leather made in this manner is then cut into strips of the desired width and length, and the strips 1 are put together and built up in one or more plies, with intervening strips 2 of rubber-gum and sulfur. These plies of rubber and leather in this condition are then placed in a vulcanizing-press or run through vulcanizing-rolls and subjected to high heat and pressure for the purpose of liquefying the gum, cementing the plies and laps together, and hardening the gum. This heat and pressure acting on the contained



moisture in bark-tanned leather would render such leather worthless. Belts formed in this manner will not shrink and stretch as a cotton belt. They are more durable than a rubber belt, and they do not absorb moisture and shrink and stretch as a bark-tanned leather belt. These belts have great tensile strength. They are pliable and have a high tractive efficiency. They are waterproof—in fact, water has no effect upon them—and they are not attacked by the fatty acids of machine-lubricants. By means of this process the laps of a belt may be secured together in a strong and desirable manner. Even hot water will not affect a ply nor a lap in a belt made by the process described. Leather is far superior to cotton for belting, and these belts have the tractive and durable qualities of leather and the waterproof and elastic qualities of rubber combined.

The belting made in the manner above described can be cut up and used for steam, wa-

ter, and gas packings and for electric insulators. Of course for the insulators the vulcanization would be carried to a higher degree than for the packings. It can be formed into hose for conducting water, steam, or gas, or it can be rolled into tubes for use as vehicle-tires, the pliability of the product, its toughness, and durability fitting it for any of these purposes.

I claim as my invention—

A belt consisting of an inner ply of partially-vulcanized rubber-gum and sulfur, and two outer plies of tawed leather having its gelatinous matter rendered insoluble in water and its pores permeated with partially-vulcanized rubber-gum, the plies having been united and solidified by heat and pressure, substantially as specified.

CHARLES E. NEWTON.

Witnesses:

H. R. WILLIAMS,  
ETHEL M. LOWE.