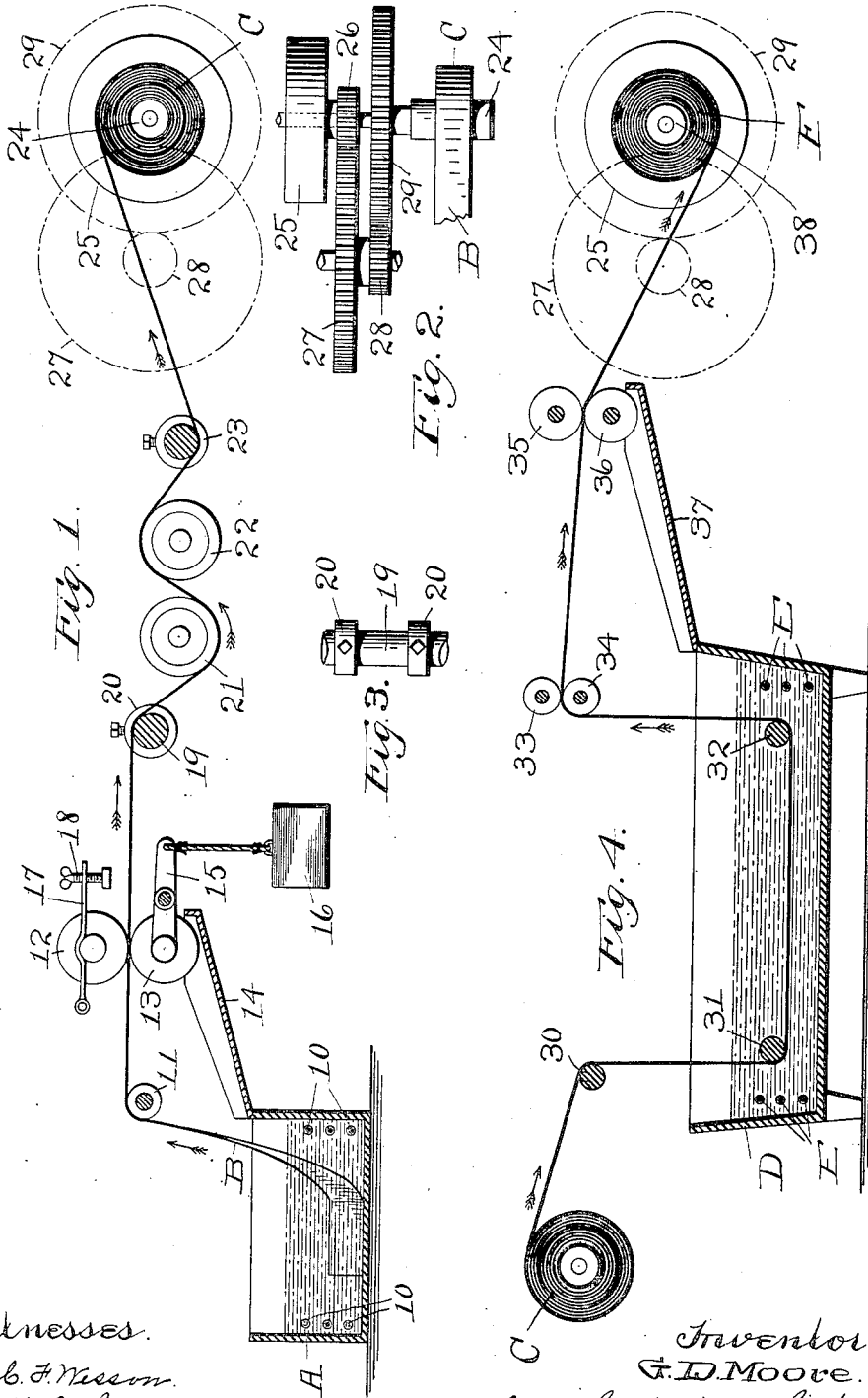


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TEXTILE BELTING AND METHOD OF PREPARING AND TREATING THE SAME.

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Witnesses.

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UNITED STATES PATENT OFFICE.

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TEXTILE BELTING AND METHOD OF PREPARING AND TREATING THE SAME.

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To all whom it may concern:

Be it known that I, GEORGE D. MOORE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Textile Belting and Method of Preparing and Treating the Same, of which the following is a specification.

My invention consists of a novel form of belting and of an improved method of making the same.

My improved method may be divided into two operations—first, stretching and softening the textile material preparatory to chemical treatment, and, second, the treatment thereof with particular chemicals, as hereinafter specified. The first or stretching process consists in taking any of the ordinary forms of textile material suitable for use as belting, such as a plurality of layers of duck or canvas folded on top of each other and stitched together longitudinally or lengthwise or such as canvas in the bolt or fabric woven in a single piece in various thicknesses and widths by use of several warps and fillings; in wetting such material in water, preferably hot; in stretching the same while wet, and then drying the same under tension. This process is so carried out that all tensile stretch is removed, and this process, while stretching the belting longitudinally, will not appreciably diminish its width and will only affect the thickness. This preliminary process will render the belting very flexible and will stretch or set the fibers in such condition that they will very readily absorb the chemicals, as hereinafter described, the principal ingredient of which is rosin-oil, a product usually obtained by the destructive distillation of resin.

Generally in practice the rosin-oil is mixed with a certain proportion of a drying or oxidizing oil, such as linseed-oil, to facilitate drying and to impart a firm hard surface to the material. A proportion of about fifty per cent. of linseed-oil is generally used, and the boiled linseed-oil is preferred. When it is desired to color the belting, a sufficient quantity of suitable coloring-matter is added to the mixture. The belting, which has been previously stretched and dried, is passed through a tank containing the above-described mixture. The mixture in the tank,

which originally is a thick oily mass, is heated until it becomes a very thin liquid. As the belting passes through the tank it is thoroughly saturated and impregnated with the mixture, the fibers being in such condition that the mixture will penetrate or saturate every thread thereof. From the tank the belting is drawn out between suitable wringing-rolls and is wound into a coil. It is then unwound and hung in suitable loops and allowed to remain so for several days or until thoroughly dry.

Many different forms of apparatus may be devised for putting the previously-described method into practice.

I have shown in the accompanying drawings in diagram one convenient form of apparatus which may be used in order to convey a clear understanding of my invention.

Referring to said drawings, Figure 1 is a sectional elevation in diagram of the apparatus used in the stretching process. Fig. 2 is a detail of the gearing used to drive the winding-drum. Fig. 3 is a detail of one of the guiding-rollers, and Fig. 4 is a section in diagram illustrating the apparatus used in the chemical treatment.

The belting B, preferably in the form of a roll or coil, is placed in a tank A, which contains water, which is heated by suitable means, as by a coil of steam-pipe 10. This thoroughly-wetted belting is then passed over a guide-roller 11 between a pair of heavy tension-rollers 12 and 13. A trough 14 is used to carry the drippings back to the tank A. The roll 13 is mounted on pivoted arms 15 and is forced under pressure against the roll 12 by any suitable means, as weights 16. If desired, the roll 12 may have a friction-strap 17 applied thereto, which is adjustable by means of screw 18. From these rolls the belting passes over a guiding-roll 19 and is held in place axially thereon by means of collars 20 20, which may be set thereon to accommodate different widths of belting. The belting then passes around rotary steam-drums 21 and 22, which are arranged to dry both faces of the belting. The belting then passes around another guiding-roller 23, which has adjustable collars, and is coiled upon a drum 24. The drum 24 is driven by powerful gearing—as, for example, by pulley 25, carrying pinion 26, the pulley 25 and

pinion 26 being cast on a sleeve which revolves loosely on the shaft of the drum 24. The pinion 26 meshes with a large gear 27, which carries a small pinion 28, which drives a large gear 29, keyed fast on the shaft of the drum 24. The pulley 25 may be driven by any suitable means, and the speed thereof may be reduced as the coil C gradually increases in size. By this arrangement a heavy tension will be put upon the belting between the rolls 12 and 13 and the coil C. By this apparatus the belting will be wet, put under a heavy tension while wet, and dried and stretched and set the fibers, as previously described. The coil or roll C of belting thus prepared is then taken, and the end of the belting is led over a guiding-roller 30, down around other guiding-rollers 31 and 32, submerged in a tank D, in which is placed the chemical mixture before described. The mixture is heated by a coil of steam-pipes, as E, within the tank or by a series of gas-jets beneath the same. The belting thoroughly saturated with the chemicals then passes between a pair of wringing-rolls 33 and 34, which wring out any surplus of the mixture, then between a pair of heavier wringing-rolls 35 and 36. A trough 37 conducts any surplus of the mixture back to the tank D. The belting is then coiled up into a coil F on a drum 38. The belting is then taken and allowed to thoroughly dry, as before described, and is then ready for use. Many other forms of mechanism may be devised for practicing the invention.

Power is applied to the drum 38 by means of an arrangement of gears similar to that shown in Fig. 2. By this means the belting is saturated and coiled up hot under heavy tension, thus insuring perfect and complete stretching.

The advantages of my improved belting and the method of making the same are as follows: Canvas belting is generally made by soaking the stitched canvas in linseed-oil, there being no care taken to insure penetration of the oil into the fibers further than to leave the belting in the oil for several hours, or even several days, provided there is no immediate hurry for the goods. From the oil-tanks the belting is passed between wringing-rolls and is then immersed in a bath of thick paint, which will coat only the surface of the belting. In some cases fine sand or other material is added to the paint, with the idea of increasing its frictional quality. The belting then passes between a pair of rollers, which squeeze out the excess of the paint, and is then dried. This process will merely give a final surface treatment to the belting.

The principal feature of my process over those now generally in use is that every fiber or thread of the belting is treated and reached by the chemicals, so that the finished belting

is homogeneous or of the same composition and consistency throughout as distinguished from belting which depends for its efficiency upon a thick surface-coating of dried paint.

One of the disadvantages of painted belts is the tendency of the painted surface to crack, peel, and wear off, thus rendering the belting unfit for use and exposing its unprotected inner layers to the friction of the pulleys and the deteriorating effect of atmospheric influences. This objection is entirely overcome by my invention. My treatment is one which reaches every fiber of the belting, so that as the belting wears the facing and frictional qualities thereof remain practically constant. Furthermore, my chemical treatment insures a quick and perfect penetration throughout the entire belting. There is no part not thoroughly saturated. The inside is exactly like the outside, while in the ordinary "paint-and-oil" belting the inside (especially in thick heavy belting) is frequently not affected at all. In these painted belts, moreover, the outside is harder and more brittle than the inside. This causes the outside to crack and peel off, thus exposing the unprotected inner layers or plies.

In my improved belting the rosin-oil and drying-oil penetrate every thread, and therefore every thread, in effect, has the proper friction-surface for driving the pulleys and is flexible and permanently set in the proper condition for all kinds of use. There are no hard spots. This insures better wearing qualities, particularly in places where belting is exposed to dampness or acid fumes. Where belts prepared by the surface treatment are used in these places, as the surfaces become worn or cracked off the belting will deteriorate rapidly, owing to the penetration of the dampness or fumes into the unprotected inner layers or plies. In short, belting prepared by my method has the advantage of perfect homogeneity, flexibility, and a perfect and continuous friction-surface which will last and remain so long as the belting itself can be used. The rosin-oil gives a surface to the fibers which I have found in practice effects a very superior and lasting bite or friction on iron or wooden pulleys.

The specific mechanism and steps for carrying out the broad idea of my invention may be varied without departing from the scope of the claims.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. As an article of manufacture, a material for belting or other purposes having a textile body consisting of a number of superimposed plies permeated throughout with rosin-oil.

2. As an article of manufacture, a material for belting or other purposes comprising a textile body permeated throughout with rosin-oil and an oxidizing or drying oil.

3. As an article of manufacture, a material for belting or other purposes having a textile body consisting of a number of superimposed plies, the fibers of which are stretched and permeated throughout with rosin-oil.

4. As an article of manufacture, a material for belting or other purposes having a textile body, the fibers of which are stretched and permeated throughout with rosin-oil and an oxidizing or drying oil.

5. The method of preparing textile belting which consists in permeating the same throughout with rosin-oil and an oxidizing or drying oil.

6. The method of preparing textile belting which consists in wetting the same, stretching the same while wet, drying the same under tension to stretch and set the fibers and then permeating the same throughout with a dressing for increasing its adhesive properties.

7. The method of preparing textile belting which consists in wetting the same, stretching the same while wet, drying the same under tension and stretching and setting the fibers and then permeating the same throughout with rosin-oil.

8. The method of preparing textile belting which consists in wetting the same, stretching the same while wet, drying the same under tension and stretching and setting the fibers and then permeating the same throughout with rosin-oil and an oxidizing or drying oil.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE D. MOORE.

Witnesses:

LOUIS W. SOUTHGATE,
PAUL B. MORGAN.