F. STONE.

MACHINE AND PROCESS FOR TREATING FABRIC BELTS.

APPLICATION FILED JULY 31, 1908.

937,726.

Patented Oct. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1

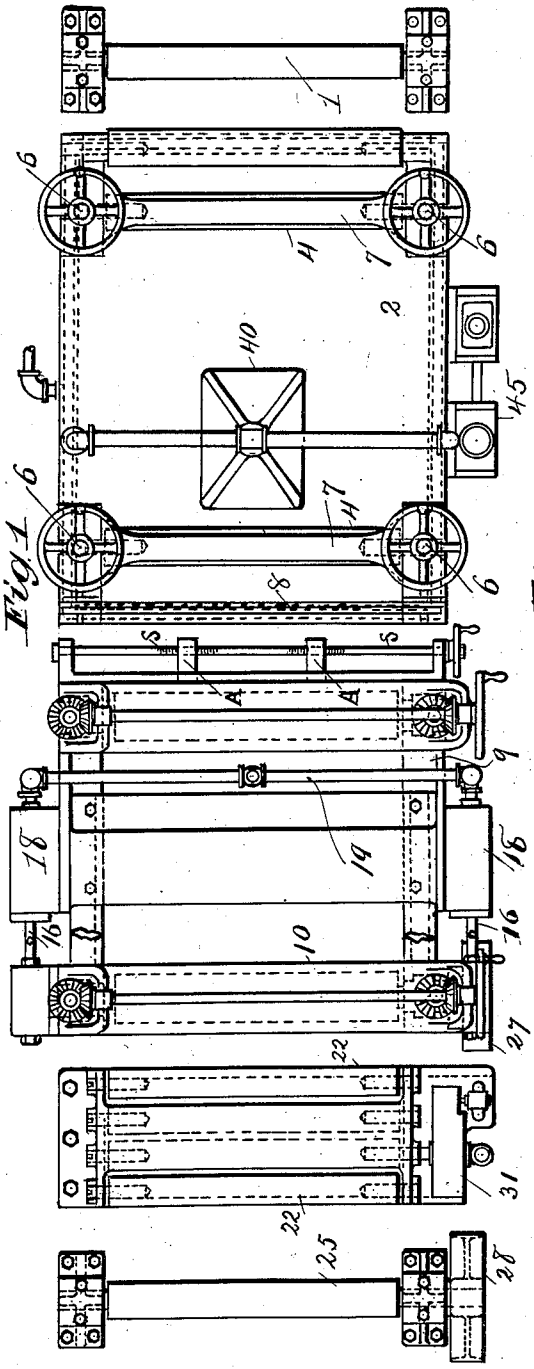
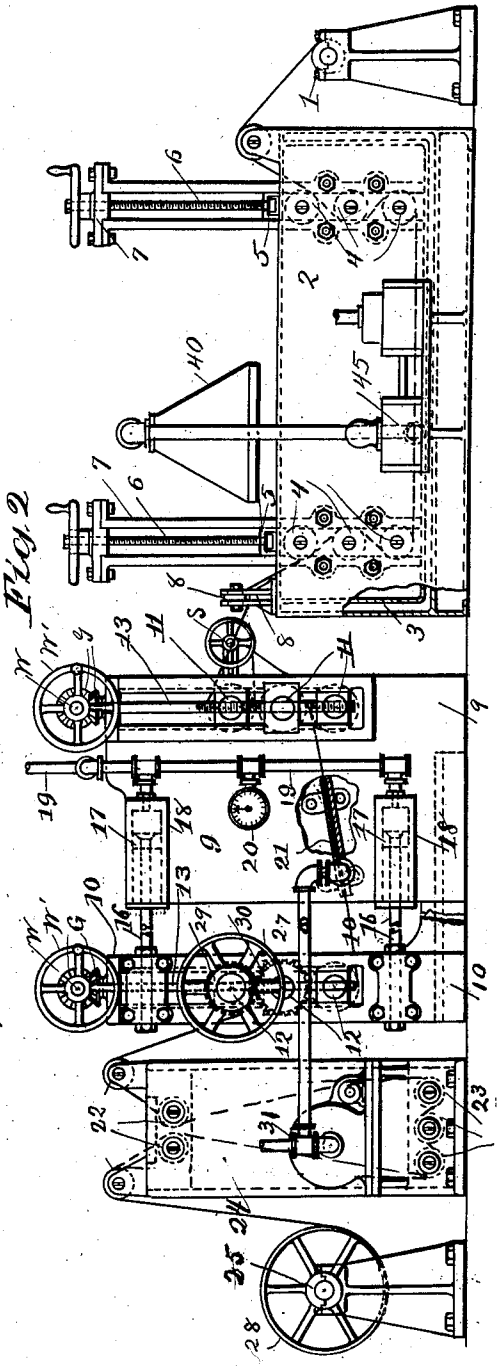


Fig. 2



Witnesses
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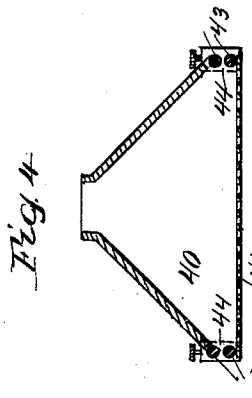

Fig. 4

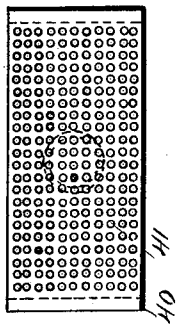

Fig. 5

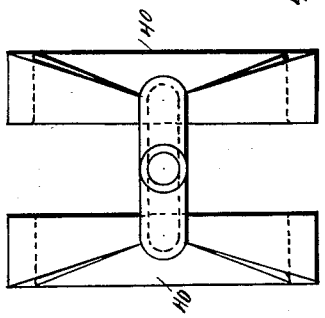

Fig. 7

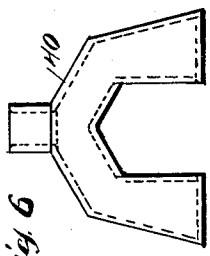

Fig. 6

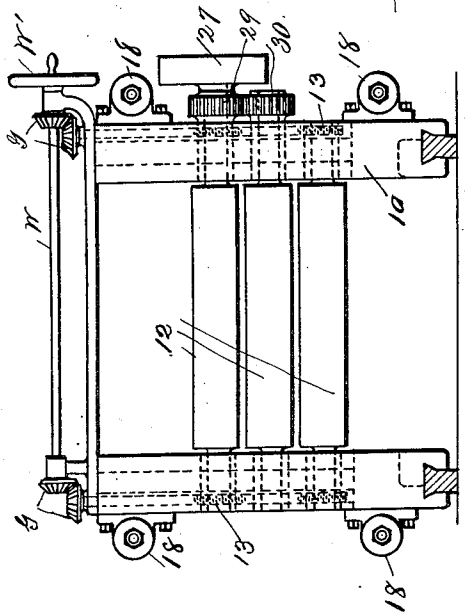

Fig. 3

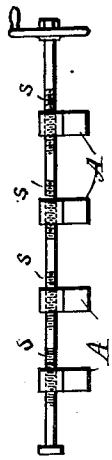

Fig. 8.

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UNITED STATES PATENT OFFICE

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MACHINE AND PROCESS FOR TREATING FABRIC BELTS.

937,726. Specification of Letters Patent. Patented Oct. 19, 1909.

Application filed July 31, 1908. Serial No. 446,242.

To all whom it may concern:

Be it known that I, FRANK STONE, a citizen of the United States, and resident of Lakewood, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines and Processes for Treating Fabric Belts, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide mechanism and a process for treating a fabric belt with a composition which will give life and flexibility thereto and will add greatly to the gripping power thereof upon the pulley over which it passes, and thus enable the belt to make better contact with the pulleys and to utilize its full pulling strength thereon. To accomplish these objects a gelatinous composition is applied to the belt, the gelatinous composition being first heated to reduce it to a fluid condition and hence capable of absorption by the fibrous belt, and after being thoroughly incorporated with the belt so as to fill the interstices thereof is chilled and approximately dried, so as to be permanently retained therein.

A further object of the invention is to stretch the treated belt while still heated and while the belt is still moist and to immediately set and harden the composition in the belt so that very little if any stretching of the belt will occur while it is in use.

The constant stretching of treated belts and the loss of time required in shortening them has heretofore occasioned much annoyance.

To carry out the required treatment and to obtain the desired results I employ the method of treatment and the forms of apparatus as hereinafter described, exemplified in the accompanying drawings and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a plan view of the complete apparatus employed; Fig. 2 is a side elevation; Fig. 3 is a side elevation of the stretching rolls showing the sliding frame for the stretching rolls; Fig. 4 is a longitudinal section of the applicator for a shorter treatment shown in Figs. 1 and 2 and Fig. 5 is a plan view of the bottom thereof; Fig. 6 is an elevation of a double form of applicator; and Fig. 7 is a plan view thereof; Fig. 8 is an elevation of a rod bearing four guides for belts.

In these views 1 is the roll or drum upon which the belt is wound before treatment, 2 is a tank provided with hollow walls 3 through which steam is circulated to provide heat for the bath. This bath comprises the gelatinous composition in which the belt is immersed and which is reduced to a fluid state by means of the application of heat so that it is in condition to permeate every part of the fabric, 4, 4 are rolls journaled in the blocks 5, 5 which are secured at each end of the tank. Over these rolls the belt passes from one end of the tank to the other so as to become permeated with the fluid composition.

The frames in which the rolls are journaled are vertically movable by means of screws 6, 6, passing through the frames 7, 7, so that when the machine is stopped the rolls and belt thereon can be lifted out of the tank.

After passing through the bath the belt is passed between the edges of preferably wooden scrapers 8, 8, which remove superfluous material therefrom, and thence the belt passes between guides A adjustable by means of screws S, and through a stretching frame formed in opposite sections, 9 and 10, one of which is slidingly movable in relation to the other. Journaled in each section are the rolls 11, 11, and 12, 12, over which the belt passes and which hold it tightly and compress it between them while the process of stretching the belt is being carried on. The rolls in each section are relatively adjustable toward and from each other, by means of the screws 13, 13. which pass through the projecting lugs or brackets 14, 14 upon the journal boxes 15, 15. These rolls also assist in compressing and solidifying the composition and in incorporating it in the belt. The screw threads are shown alternately reversed to obtain the desired movement of the boxes. A common operating rod and wheel W and W′ and bevel gears G are employed to turn these screws.

The movable section is provided with piston rods 16, 16 and pistons 17, 17, which are forced outwardly in their respective cylinders 18, 18, by means of hydraulic or other power, the inlet pipes being shown at 19, 19, and a gage 20 is employed to indicate the

required pressure. Oil or other fluid can be used in the cylinders if desired. This system of piping supplies fluid under pressure to all the cylinders alike. While being stretched between the sections of this portion of the device the belt is subjected to a blast of air, which exerts a drying influence so as to consolidate and partially dry the composition thereon. This blast is shown to pass through the flattened conduit or tube 21, and after passing therethrough, the action of the compressing rollers 12, 12 serves to further set and consolidate the coating and to finish the surface of the belt, and after the belt has been in this manner set and partially dried it is then subjected to a cold air blast for a longer period to place the treated belt in condition for industrial use.

To accomplish the final cooling and drying of the belt it is passed over two sets of rollers 22, 22 and 23, 23 separated to expose the belt to a blast of air passing through the blast chamber 24. As soon as completed the belt is wound upon a drum 25. Power can be applied through the band wheels 27 and 28 and gears 29 and 30 upon the roller journals and in this manner the belt is drawn through the machine, 31 is a blower which can be powerful enough to supply the air blast required. When a less prolonged treatment is required a different device for applying the hot composition is employed and is shown in the figures. In this device 40 is an elevated chamber located above the tank and having a horizontal bottom 41 perforated with openings 42. At each end of this chamber are journaled the rolls 43, 43 arranged one above and one below each opening 44, through which the belt can be passed for treatment. The composition is pumped up from the tank by any suitable means such as a pump 45 and is showered down upon the belt and finally escapes through the perforated bottom. In Figs. 6 and 7 a double form is shown of this device separating the chambers to provide for treatment of two belts simultaneously.

A very simple and efficient method of treating the belt and preparing it for use is obtained by means of the above described machinery and process and a finished article is produced thereby, having the qualities of flexibility and durability and it is thoroughly stretched before it is dried.

Having described the invention what I claim as new and desire to secure by Letters Patent is:—

1. In a device for the purpose of treating a belt as described in combination a tank containing a fluid composition, means for heating said tank, a series of rolls at each end of the tank, over which said belt is extended through said tank, means for elevating said rolls above said tank, means for removing superfluous material from said belt, a guide rod over which said belt passes, a stretching device for said belt, and a cooling and drying device therefor.

2. In a device for the purpose of coating and impregnating a belt with a hot solution and stretching the same, the combination with a tank for heated composition, of a steam heating device therefor, horizontal rolls arranged vertically over each other in each end of the tank over which the belt is suspended and by means of which the belt is passed through the heated composition, a pair of blades having scraping edges between which the belt passes to remove superfluous material, a series of pressure rolls through which said belt is drawn, and a similar series of rolls opposed thereto over which said belt passes, one of said series of rolls being movable relatively to the other series of rolls, means for applying pressure to one series of rolls, a blowing device and a passage through which said belt passes and through which the current of air from the blower passes, a blast chamber, a series of rolls therein, an opposed series of rolls therein over which said belt passes, and a winding drum for the belt.

3. In a device for the purpose of treating a belt with a heated composition and for stretching the same, a tank adapted to hold the composition, a scraping device, a series of gripping rolls and an opposed series of gripping rolls, over which rolls said belt passes, one series of rolls being movable relatively to the other, a stationary support for one series of rolls, a movable support for the other series of rolls, a set of cylinders upon the stationary support, pistons therefor operatively connected with said movable support, means for supplying fluid under pressure to said cylinders and means for cooling and drying said belt.

4. A device for treating a fabric belt with a coating of heated composition, adapted to be solidified by a blast of cold air, in combination, a tank adapted to contain the hot composition rolls in said tank, arranged at each end to support the belt therein, wooden scrapers at one end of the tank between which the belt travels, guide rod and guides adjustable thereon, between which said belt is passed, a series of gripping rolls over which the belt passes, a similar series of gripping rolls opposed thereto, a device for exerting a pressure upon one series of rolls to separate them from the other series, while the belt is wound thereon to stretch the same, means for indicating the degree of pressure employed, means for partially drying and solidifying the coating upon the belt, simultaneously with stretching the same.

5. The heretofore described process of treating a fibrous belt with a composition adapted to provide flexibility and durability

thereto consisting of first heating the composition to enable it to enter the interstices of the belt and immersing the belt therein until coated, scraping off the superfluous coating, stretching the heated belt and simultaneously cooling and drying the same to set and partially solidify the coating and surface the same and completing the treatment by subjecting the belt to the influence of a cooling blast.

In testimony whereof I hereunto set my hand this 19th day of July 1908.

FRANK STONE.

In presence of—

GEO. S. COLE,

WM. M. MONROE.