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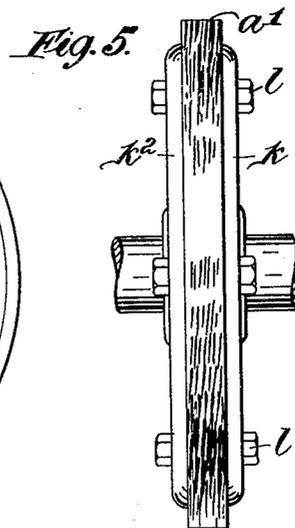
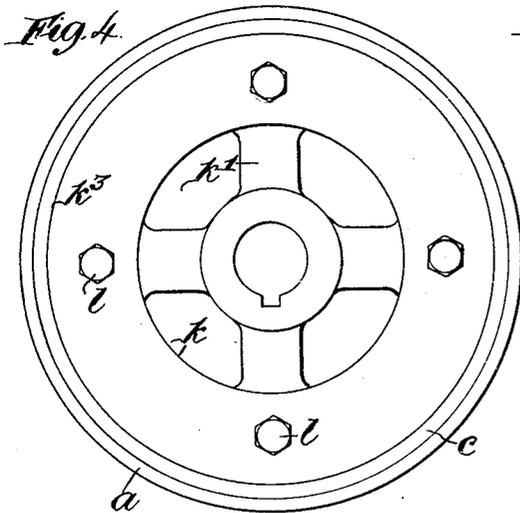
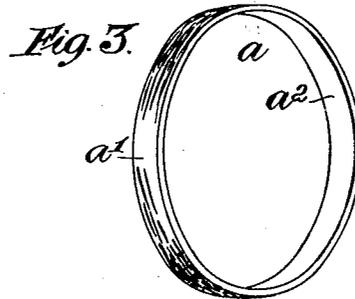
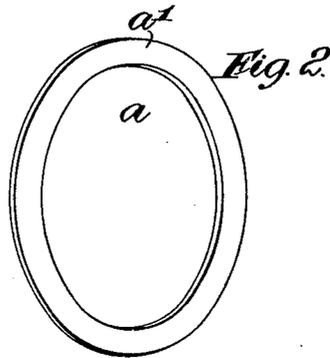
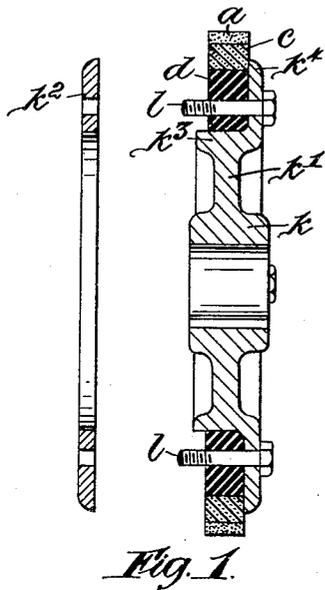
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ROLLER PARTICULARLY FOR USE IN TEXTILE MACHINERY

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2 Sheets-Sheet 1



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# UNITED STATES PATENT OFFICE

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## ROLLER PARTICULARLY FOR USE IN TEXTILE MACHINERY

Application filed November 8, 1930, Serial No. 494,423, and in Great Britain November 26, 1929.

This invention relates to improvements in and connected with rollers and is concerned more particularly with rollers for use in machinery for spinning, drawing, pressing or twisting textiles, such as jute. The invention has for its object the provision of rollers which can be cheaply produced and yet have a long life associated with a reliable and efficient operation during service.

According to the invention the bearing, carrying or rolling surface of a roller is constituted by a sleeve or ring of leather which is attached to an inner sleeve or sleeves of rubber by a vulcanization process. This process is conveniently carried out in a mould which comprises suitable cooling means for preventing the high temperature involved in the vulcanization from injuring the leather. The rubber sleeve, which may be suitably of soft rubber, is conveniently united during the vulcanization process to an inner lining of hard material, such as fibre, ebonite or hard rubber and to an outer ring or rim of leather forming the wearing surface. The hard rubber lining provides a desirable bearing for the mounting of the composite band on the roller, whilst the soft rubber forms a cushion and ensures a resilient pressure on the textile material as it is fed or drawn or carried over the leather rim. The composite annular band thus formed is adapted to be removably mounted on the periphery of a supporting member, so that renewal of the band may be readily effected when required.

In order to enable the invention to be readily understood and carried into effect reference will be made to the accompanying drawings in which:—

Figure 1 is a sectional elevation showing a roller in accordance with these improvements with the flange plate detached.

Figures 2 and 3 show diagrammatically the production of the leather rim.

Figure 4 is an end elevation of Figure 1.

Figure 5 is a side elevation of Figure 4 with the roller mounted on a shaft or spindle.

Figure 6 is a section on the line VI—VI, Figure 7 and showing a mould for use in

the production of the composite band and Figure 7 is a plan view of Figure 6, the left half being shown with parts removed.

Referring to the drawings the leather rim *a* is circularly cut out of a flat piece of leather, Figure 2. This annulus of leather is then given a half turn inwardly so that the then uppermost side face *a'* and undermost side face *a''* of the annulus become the outer and inner surfaces respectively of the leather rim as seen in Figure 3. In this way the latter is integrally produced without the necessity for stitching or connecting the ends of a leather strip. The absence of stitching increases the life of the ring as there is no danger of the chafing of a sewn connection whilst the production is cheapened by the elimination of the stitching operation. The leather ring *a* may be rubberized or impregnated with a rubber solution and is compressed. Owing to the latter operation, a cheap kind of leather may be employed as the pressure produces a desirably smooth outer surface, on the leather as is necessary for the efficient spinning, drawing, twisting or pressing of the textile threads. Consequently the use of expensive varieties of leather is avoided and an important economy is effected.

The leather ring or band *a* is placed in a suitable mould *b*, Figures 6 and 7, together with a suitable quantity of soft rubber to form an inner sleeve *c* and finally an ebonite or hard rubber lining *d* is placed inside the ring of soft rubber *c*. The various members *a*, *c* and *d* having been treated with suitable solutions containing curing, vulcanizing, accelerating and other ingredients, heat is applied to the mould *b*, in any suitable manner so that attachment of the parts is effected by vulcanization. The mould *b* suitably comprises circumferential cooling means such as an iron or steel ring *e* for the leather ring *a*, so that the latter is maintained at a low temperature and is not deleteriously affected by the heat of the treatment.

In the construction of mould shown, the base *f* of the mould *b* is recessed at *f'* on its upper surface to provide a matrix for

receiving the cooling ring *e* and the elements *a*, *c* and *d* to be vulcanized. The matrix is closed by an intermediate member *g* and a central core *h*, the rim *h'* of which  
 5 overhangs or extends over the intermediate member *g*. The latter and the core *h* are formed with recesses *i* on their under surfaces so as to form a complementary part of the matrix. The core member *h* may be  
 10 formed with a central hole *h<sup>2</sup>* so that heat may be conveyed radially from the centre of mould when the parts have been connected together. This connection may be effected by short screw bolts *j* connecting  
 15 the intermediate member *g* to the base *f* and by long screw bolts *j'*, extending from the base *b* through the intermediate member *g* and the rim *h'* of the core *h*, so that by screwing up the bolts *j* and tightening up  
 20 nuts *j<sup>2</sup>* on the bolts *j'* pressure is exerted on the material in the matrix or mould. Naturally however any suitable power or other means may be utilized for imparting the required pressure.

25 In operation the mould parts are detached and one or more steel cooling rings *e* are inserted in the mould. The leather ring *a* treated with any suitable solution for ensuring effective vulcanization is then inserted  
 30 within the steel ring or rings *e*. This is followed by the application to the inner surface of the leather ring *a* of uncured soft rubber *c*, for example in the form of a dough treated with a vulcanizing solution. Finally, the hard rubber ebonite, or  
 35 fibre ring *d* is placed within the soft rubber mass *c*. The mould *b* is thereupon closed by the application and connection of the intermediate member *g* and the core *h* to the base *f* and a downward pressure is applied  
 40 to the mould whilst heat is applied to the mould for effecting all necessary curing of the ingredients and the attachment of the parts by vulcanization. The heat may be  
 45 applied from above or below by any suitable means such as by steam or electrically heated plates. Or the heat may be applied from the central hole *h<sup>2</sup>*, so that heat is transmitted radially. The duration of the treatment is conveniently such that the leather *a*  
 50 is not overheated by the heat conveyed radially from beneath and/or the centre of the mould and in any case the leather is maintained at a low temperature by the surrounding steel ring or rings *e* so that injury  
 55 to the leather due to overheating is prevented. There is suitably a slight excess of ebonite, hard rubber or fibre *d* in the mould and the downward pressure on the mould at the same time causes a radial pressure to be  
 60 exerted outwardly on the material by the core *h*. In this way the plastic bodies are cured and intimately united and a perfect adhesion is ensured. After the completion  
 65 of the press cure in this way the mould is

detached and the composite band composed of the rim *a*, soft rubber sleeve *c* and hard lining *d* is removed.

The band is mounted upon the periphery of a supporting member or wheel device *k*  
 70 Figure 1 formed with spokes *k'*, and composed wholly or partly of any suitable material, such as wood, metal or hard rubber. One flange plate *k<sup>2</sup>* of the rim *k<sup>3</sup>* of this  
 75 member *k* may be detachable so that the band may be readily attached and removed. Consequently when a band *a*, *c*, *d* becomes worn it is necessary to discard only this worn band and to replace a fresh band on the supporting member *k*. The band may be  
 80 attached to the latter in any convenient manner. Thus as in the construction shown the detachable plate *k<sup>2</sup>* and the band may be held in position by screw bolts *l* secured to the fixed flange *k<sup>4</sup>* of the supporting member  
 85 *k* and passing through holes in the ebonite, hard rubber, or fibre lining *d* of the band.

Naturally various modifications may be made in the process of manufacture whilst the construction of the supporting member  
 90 *k* may be varied without departing from the spirit of the invention.

I claim:—

1. A roller for textile machinery comprising a continuous stitchless leather rim,  
 95 an inner sleeve of soft rubber, and a lining of hard rubber, said parts being united by vulcanizing under heat and pressure.
2. A roller for textile machinery comprising a continuous annular leather rim cut  
 100 and half-turned from a flat piece of leather, and an inner sleeve of soft rubber, said rim and sleeve being united by vulcanizing under heat and pressure.
3. A roller for textile machinery comprising  
 105 a composite band composed of a leather rim, an inner sleeve of soft rubber and a lining of hard material, said parts being intimately united by a vulcanization process, a wheel device, said band being mountable on the periphery of said wheel, and a detachable flange attachable to said wheel for holding said band in position.
4. A roller for textile machinery comprising  
 115 a composite band composed of a continuous stitchless leather rim, an inner sleeve of soft rubber and a lining of hard material, said parts being intimately united by a vulcanizing process carried out under heat and pressure, a wheel device comprising a fixed flange plate and a detachable flange plate on the periphery of said wheel, said band being detachably mounted between said flange plates.
5. A roller for textile machinery comprising  
 125 a continuous jointless leather rim, an inner sleeve of soft rubber, and a lining of hard material, said parts being intimately united by a vulcanization process under heat and pressure.

6. A roller for textile machinery comprising a continuous jointless cylindrical leather rim, the outer surface of the leather from which the said rim is made comprising one  
5 of the cylindrical surfaces, an inner sleeve of soft rubber, said rim and sleeve being united by vulcanizing under heat and pressure.

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