

No. 866,364.

PATENTED SEPT. 17, 1907.

F. HUTCHINS.
SPINNING ROLLER.
APPLICATION FILED OCT. 30, 1906.

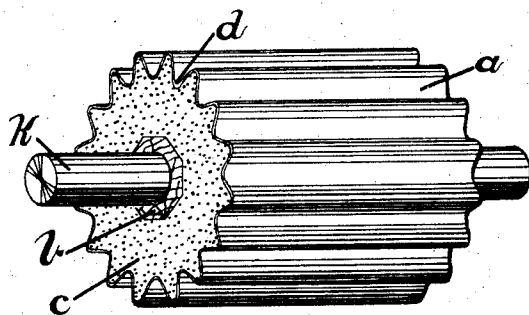


Fig 1.

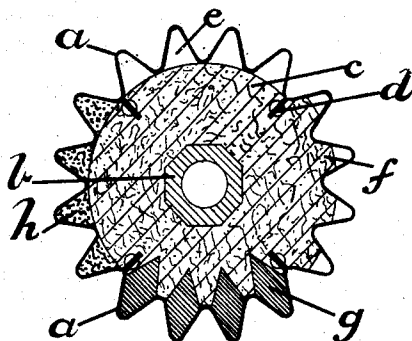


Fig 2.

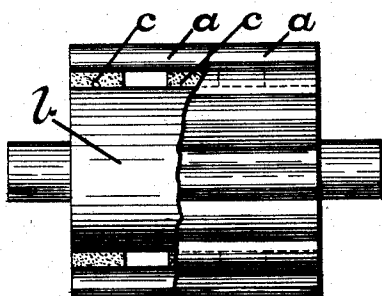


Fig 3.

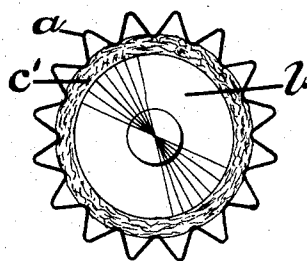


Fig 4.

Witnesses

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UNITED STATES PATENT OFFICE.

FREDERICK HUTCHINS, OF HARLESDEN, ENGLAND.

SPINNING-ROLLER.

No. 866,364.

Specification of Letters Patent.

Patented Sept. 17, 1907.

Application filed October 30, 1905. Serial No. 285,173.

To all whom it may concern:

Be it known that I, FREDERICK HUTCHINS, a subject of the King of Great Britain, residing at Crescent Works, Harlesden, in the county of Middlesex, England, electrical engineer, have invented certain new and useful Improvements in Spinning-Rollers, of which the following is a specification.

My invention relates to spinning rollers. I have used this designation simply for convenience; a roller of this character, however, can be used for drawing rollers and feeding rollers in preparing, combining, spinning; doubling, twisting and other machinery for the treatment of fibrous materials.

My improved roller consists primarily of a ring, or tube, corrugated or fluted transversely so as to form teeth of suitable pitch and shape, mounted upon rubber or other flexible material. I prefer to make the fluted ring by passing a strip of thin sheet steel through a pair of rollers which flute it transversely of its length, a suitable length of the corrugated sheet strip so made having its ends then joined together, thus forming a fluted or corrugated tube having the external outline of an ordinary fluted roller. The ends of the strip may be joined together by brazing, electric welding or by other means. If desired, the ring or tube may be hardened and tempered. Instead of making the fluted tube from a strip of fluted metal, I may take a tube already formed and flute it, by drawing it through dies, or by stamping the flutes or teeth one or more at a time. The fluted ring or sheathing I mount upon a suitable hub or spindle, interposing, between the sheathing and the hub or spindle, a ring, tube, or disk, or more than one of these, or other suitable support, made of rubber, cloth, leather, cork, paper or other more or less yielding or flexible material. If the frictional grip of the corrugated ring or tube upon its support is not sufficient to prevent its slipping, the support may have projections, or other means may be employed, to give a positive drive. A convenient method of manufacture is to make the corrugated ring or tube as described above and fill it, with or without pressure, with a suitable material in a plastic state, such for instance as paper pulp, or powdered cork mixed with a suitable binding agent. If a non-metallic surface be required, this can be attained either by covering a fluted metal ring or tube, made as described above, with skin, leather, parchment, paper, or other material suitably cemented to the base, or the metal may be omitted altogether and the fluted ring or tube itself may be made of vulcanized fiber, ebonite or other non-metallic material.

It is obvious that the amount of resilience of the roller may be adjusted to almost any extent by altering the thickness and kind of material employed for the sheathing and for its support. When the rollers are to

be subjected to rough usage, and it is necessary to make the teeth exceptionally strong to resist damage, this may be accomplished by filling in the tooth with a suitable material, as compressed wood pulp, thus producing what is practically a solid tooth, or the additional support may be obtained from a wire or rod of circular or other section, held in place by suitable means.

In some kinds of machinery it is found advantageous to employ fluted rollers in which the flutes are not parallel with the axis, but are helical or inclined to the axial line. It is clear that my improvements are applicable to the manufacture of such, and of other kinds of rollers, and moreover that the ribs or teeth may be of any required pitch or shape.

In the drawings: Figure 1 is a perspective view in elevation of the invention; Fig. 2 is a sectional view of a roller showing a slightly modified construction; Fig. 3 is a plan view of a further modification; and Fig. 4 is a sectional view thereof.

A strip of steel is corrugated transversely either by passing it between corrugating rollers, or by stamping the corrugations one or more at a time. The two ends of this sheathing, *a*, may conveniently be joined together, as at *d*, by brazing or electric welding. Mounted on the spindle, *k*, is shown an octagonal wooden boss, *b*, which, however, may be omitted. The intervening space, *c*, between the central boss and the corrugated cylinder, is filled with a resilient or elastic substance, such, for instance, as a mixture of paper pulp and cork, with glue or casein as a binding material.

In all the figures *a* indicates the corrugated strip and *c* the flexible supporting material.

Fig. 2 shows a roller in which the corrugated sheathing, *a*, is made in four sections, the ends of the sections being joined by rivets, *d*. The teeth of the roller may be empty, as at *e*, or the flexible core, *c*, may have projections, *f*, partially filling them. Or the teeth may be strengthened with rigid material, *g*, such as metal strip (here shown keyed into the flexible support, *c*), or the teeth may be filled with a material such as paper pulp, *h*, applied in a plastic or semiplastic condition.

Figs. 3 & 4 show a roller in which the corrugated sheathing, *a*, is mounted upon rings, *c'*, made of cloth or other resilient material. Three rings are shown, the number being adjusted to circumstances.

In textile machinery for the treatment of fibrous materials, drawing and feeding rollers of various kinds are very largely used, and among these varieties leather-covered rollers are the most important. These leather-covered rollers are a constant source of trouble and expense, and many attempts have been made to substitute what are known in the textile trade as "metallic" drawing rollers, where a pair of rigid fluted metal roll-

ers mesh together, with or without means to prevent the teeth of one roller touching the bottoms of the grooves of the other roller. If the teeth are allowed to bottom, it is found that the fibers are crushed, and even when provided with means to prevent the bottoming, such rollers have considerable disadvantages; they are unsatisfactory for drawing fine rovings and are in all cases very expensive to manufacture, as obviously unless made with very great accuracy the fibers passing between the rollers will not be evenly gripped by the teeth.

My improved roller has the great advantage possessed by a leather covered roller in that it is flexible, gripping the fibers firmly without damaging them, and it is suitable for fine drawing as well as coarse. It also has the advantages of a solid metallic roller, in that it does not require frequent attention and renewal, like leather; it has a positive action, not dependent merely on rolling friction (as in the case of leather rollers), moreover it is not attended by electrical troubles and is little influenced by atmospheric conditions.

Besides combining the good points of both of what I may term the "leather" and "metallic" systems, my roller has further advantages, in that it is less expensive than either in first cost and maintenance, it requires less power to drive (on account of the comparatively small pressure needed), the working surface can be readily renewed in the event of damage, and, lastly, the difficulties of starting a machine, which has been standing idle and has become cold, are greatly lessened, as the thin metal operative surface or rim of my roller (as ordinarily constructed for drawing) very quickly attains the temperature of the surrounding air, while the rest of the machine may yet be compara-

tively cold. For working fibrous materials in the wet state, the roller may conveniently be made of phosphor-bronze or other incorrodible substance.

The rollers herein described may be used in pairs—two rollers meshing together—for either feeding or drawing, or they may be used singly as feed rollers, or in conjunction with traveling bands, feeding aprons and other known appliances employed in the various kinds of machines used for working fibrous materials.

I have found flexible corrugated rollers such as herein described valuable in machines for spinning cotton and other fibers, and in machines for covering wire or other cores with fibrous materials, of the kind described in the specifications of the patents granted to me and to W. A. Phillips, numbered 778,603 and 778,604 dated 27 December 1904 and 800,012 and 800,013 dated 19 September 1905.

I claim:—

1. A roller, for use in the treatment of fibrous materials, provided with a rigid axial core, a thin outer covering of fluted material, and an intervening filling of elastic material within, the said flutes constituting the teeth of the roller supported internally with rigid material secured to the elastic body, substantially as described and shown by the drawings.

2. A roller involving a rigid axial core, an outer covering corrugated to form a fluted surface, and an elastic material arranged between the core and the covering, said elastic material forming a yieldable support for the fluted portion of the covering.

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

FREDERICK HUTCHINS.

Witnesses:

ALFRED GEORGE BROOKES,
ERNEST JOHN HILL.