May 18, 1954 R. K. BUTLER 2,678,473

TOP ROLL FOR TEXTILE DRAWING MECHANISMS

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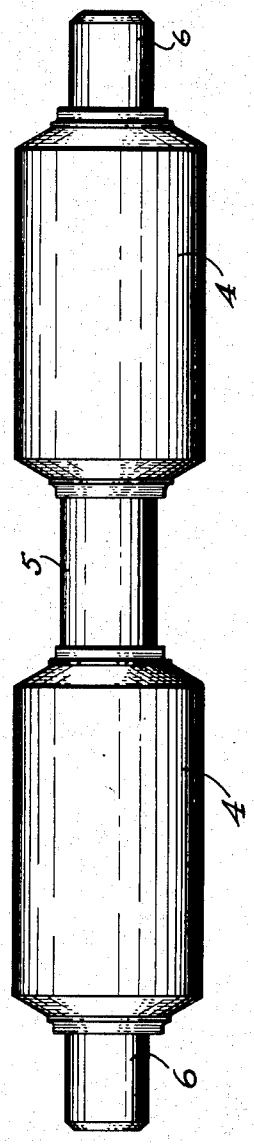

Fig. 1

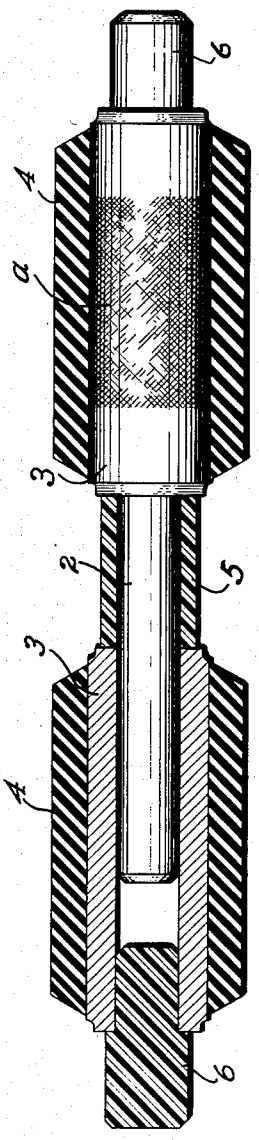

Fig. 2

Inventor:
Richard K. Butler,
by: J. H. McCready,
Attorney.

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TOP ROLL FOR TEXTILE DRAWING MECHANISMS

Richard K. Butler, Whitman, Mass., assignor, by mesne assignments, to Textile Engineering Corporation, Whitman, Mass., a corporation of Massachusetts

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1 Claim. (Cl. 19—142)

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The so-called "solid top rolls" used in textile drawing mechanisms usually comprise a cast-iron or steel body provided with two enlargements or bosses connected by a reduced or neck portion and also with journals or gudgeons projecting from the outer ends of the bosses. When such a roll is in use the bosses are covered with cots which may be made of leather, synthetics, or other non-metallic materials usually having a substantial degree of resiliency. These cots ride on the lower fluted roll with which the top roll cooperates where they press the strands of roving or sliver against the bottom roll as the drawing operation proceeds, and the weight required for this purpose is applied through a saddle which bears on the neck of the roll. In order to hold the roll against travel either backward or forward, the gudgeons are positioned in slots formed in cap bars located at opposite sides of each set of top rolls. The foregoing is an arrangement used almost universally in spinning and roving frames.

One of the objectionable features of rolls of this character is the fact that the bearing or friction surfaces of the roll body, namely the gudgeons and the necks, soon become worn to such a degree that the entire roll must be discarded. While this has always been regarded as a necessary incident to manufacturing procedure, it is a serious factor in view of the expense of production of these bodies.

Another troublesome feature of such constructions is the further fact that frequent cleaning is necessary to remove the lint and fly which collects on the roll necks and gudgeons and in the slots of the cap bars. Usually, also, the neck portions, and often the gudgeons as well, must be lubricated, although care should be taken to use the lubricant sparingly, both because it makes cleaning more difficult and also for the reason that any spot or film of oil on the cots or on the fibrous material being drafted is highly objectionable.

The present invention aims to devise a top roll construction in which these objectionable features will be eliminated.

The nature of the invention will be readily understood from the following description when read in connection with the accompanying drawings, and the novel features will be particularly pointed out in the appended claim.

In the drawing,

Fig. 1 is a front elevation of a roll constructed in accordance with this invention; and

Fig. 2 is a vertical, sectional view of the roll

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shown in Fig. 1 with some parts illustrated in elevation.

In the construction shown the roll body consists of a shaft 2, usually made of steel, and two metal bosses 3, 3 pressed on to it and spaced apart by the customary distance. Preferably the peripheral surfaces of these bosses are knurled or roughened, as indicated at *a* in Fig. 2, in order to provide a better frictional engagement with the cots 4, 4. The shaft need not extend through the bosses but, as better shown in Fig. 2, may be forced into them for only about three-quarters of the length of each boss.

According to the present invention the gudgeons 6—6 are produced independently of the other parts and are connected to the body of the roll simply by a pressed fit. Consequently, they can be removed and replaced whenever they become worn sufficiently to warrant their renewal. Also, the neck portion of the shaft between the two bosses is encircled by a sleeve 5 which may be of metal and may have either a pressed or a loose fit with the shaft. In either event, when it becomes worn the shaft 2 can be withdrawn from one of the bosses, thus permitting the sleeve to be removed and replaced by a new one. The remaining part of the body then can be reassembled with those just mentioned. In this manner a worn out roll body can be restored to useable form at a relatively slight expense.

A further feature of this invention resides in making the gudgeons 6—6 and the sleeve 5, if desired, of some material having a coefficient of friction so low that the application of external lubrication to it will not be required. This material may be one having such characteristics that it requires no lubricant. Such materials, as certain of the synthetic plastics, including nylon, Teflon, the polyvinyl series of resins, ethyl cellulose, cellulose acetate, and others, satisfy these requirements. Or the parts just mentioned may be made of one of the self-lubricating materials, such as the oil impregnated sintered metals, or even oil impregnated hard woods, if the pressures are not too great.

For these purposes one of the synthetic polyamide compositions, such as that sold by the Du Pont Company under the commercial name of "nylon" is highly satisfactory. This is a long chain synthetic polymeric amide having recurring amide groups as an integral part of the main polymer chain. The formula is understood to be —NH(CH_{2M})—NH—CO(CH_{2N})—CO— where the sub. N and M may be 6 to 12 and equal or not. It

is available in both tubular and solid rod forms and can either be molded or machined to the desired shape and dimensions. Compositions having a high tensile strength ample for the purposes of this invention are obtainable from the concern above mentioned.

Another synthetic composition which may be substituted for nylon with satisfactory results, although more expensive and somewhat more difficult to obtain, is that known as "Teflon." This is defined chemically as a polytetrafluorethylene polymer and is also obtainable from the DuPont Company. This material is the equivalent of nylon for the purposes of this invention.

The other synthetic thermoplastics above mentioned can also be substituted for the nylon and Teflon just described, and used without the addition of lubricants. This is also true of the self-lubricating materials above referred to, one example of which is obtainable commercially under the name of "Oilite." All of these materials have the important operating advantage afforded by their extremely low coefficient of friction.

It has been common to run cast-iron rolls of the character above described with cast-iron saddles and in cast-iron bearings, or cap-bars. Once a glaze is established on the friction surfaces the parts operate quite satisfactorily. The coefficient of cast-iron running on cast-iron slightly lubricated is given in Machinery's Handbook as .15. All of the materials above mentioned which applicant proposes to use in the construction of his roll body have a very much lower coefficient of friction which translates itself into a saving in power and a consequent reduction in overhead costs. Moreover, because no lubricant is required, both the labor and expense for applying it and the work involved in cleaning is reduced very materially. While some of the materials mentioned are not suited to high speed operation, others do not have this limitation.

The invention thus provides a top roll of the solid type which is far superior to those in common use, not only because it requires no lubrication, but also due to the fact that less power

is required to drive it and the expenses of operation and renewal are reduced.

Having thus described my invention, what I desire to claim as new is:

A top roll for the textile drawing mechanisms of spinning and roving frames, comprising a shaft, two bosses supported on said shaft and adapted for the application thereto of the customary cots, said bosses having a pressed fit upon said shaft and being spaced apart, and gudgeons pressed into the outer ends of said bosses beyond the ends of the shaft.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
54,732	Hussey	May 15, 1866
215,464	Kelly	May 20, 1879
347,910	Young et al.	Aug. 24, 1886
475,929	Carroll	May 31, 1892
628,521	Campbell	July 11, 1899
628,522	Campbell	July 11, 1899
1,246,841	Bache	Nov. 20, 1917
1,286,936	Campbell	Dec. 10, 1918
1,678,039	Garey	July 24, 1928
2,170,545	Burton	Aug. 22, 1939
2,200,129	Whiteford	May 7, 1940
2,246,086	Austin	June 17, 1941
2,246,092	Gilman	June 17, 1941
2,247,995	Gilbert	July 1, 1941
2,256,193	Cobb	Sept. 16, 1941
2,263,780	Kettley	Nov. 25, 1941
2,275,538	Marvin et al.	Mar. 10, 1942
2,355,510	Cobb	Aug. 8, 1944
2,367,088	Benson	Jan. 9, 1945
2,459,596	Stott	Jan. 18, 1949
2,582,516	Williams	Jan. 15, 1952

FOREIGN PATENTS

Number	Country	Date
1,427	Great Britain	of 1893
214,291	Great Britain	Apr. 14, 1924
518,465	Great Britain	Feb. 28, 1940
374,325	Italy	Aug. 23, 1939