Aug. 8, 1944. L. D. COBB 2,355,510

TOP ROLL

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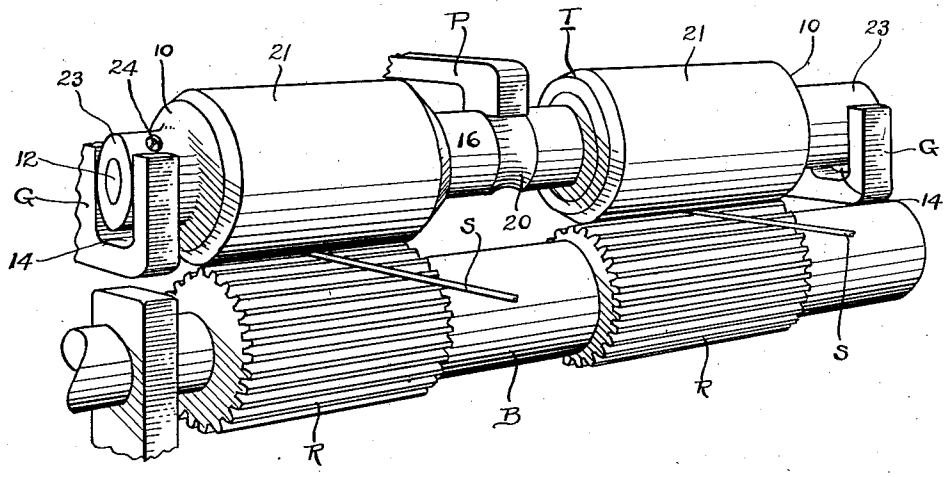


Fig. 1

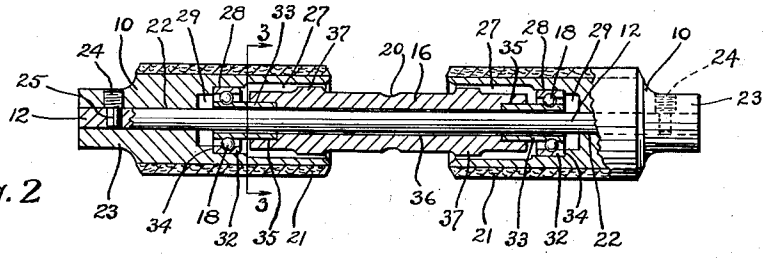


Fig. 2

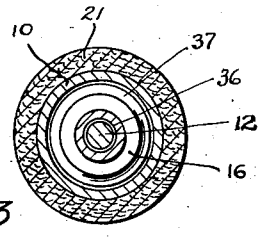


Fig. 3

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TOP ROLL

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8 Claims. (Cl. 19—142)

This invention relates to top rolls for attenuating machinery in the textile industry, and particularly to top rolls for spinning frames, drawing frames and the like wherein a strip of intermingled fibers such as sliver, roving or thread is stretched and reduced in size by feeding it between top and bottom roll members that are urged into peripheral rolling engagement with each other.

An object of this invention is to provide an improved top roll of simplified construction and which has individually demountable roll members that are arranged for unitary rotation. A further object is to provide a unit-handling top roll wherein interchangeable top roll members are supported for coaxial rotation as a unit and wherein a pressure transmitting sleeve between the roll members is supported in relatively rotatable antifrictional relation to the roll members to uniformly urge both roll members downwardly.

To these ends and also to improve generally upon devices of the character indicated, the invention consists in the various matters hereinafter described and claimed.

In the accompanying drawing:

Figure 1 is a perspective view showing an application of this invention;

Figure 2 is a view mainly in longitudinal section through the top roll; and

Figure 3 is an enlarged cross scetion taken along the line 3—3 of Figure 2.

Generally stated, I have provided a unit-handling top roll T that has top roll members 10 demountably fastened in spaced relation on the opposite ends of a shaft 12, and the necked outer ends of these roll members are demountably received in non-bottoming vertically guided relation in slots 14 provided in guide brackets G. A pressure transmitting sleeve 16, extending into and between these roll members 10, surrounds the shaft 12 in annularly spaced relation and is demountably supported at its ends by unit-handling antifriction bearings 18 spaced about the shaft 12 and respectively mounted in the roll members 10. A pressure foot P, suitably urged downwardly into seated relation in a groove 20 in the sleeve 16, presses the roll members 10 into peripherally supported rolling contact with similarly positioned bottom roll members R formed on a suitably driven bottom roll B, so that a strip of intermingled fibers, such as sliver, roving, yarn or thread and generally designated at S will be subjected to a controlled attenuating operation as it is fed between the coacting top and bottom roll members.

Referring in detail to the drawing, the roll members 10 are interchangeable, and each of these roll members is peripherally covered by a cot 21 which may be composed of a suitable yieldable material, such as cork, leather or rubber. These cots are yieldably pressed against the strips S and onto the bottom roll members R under influence of the pressure foot P. The roll members 10 are axially bored at 22 to slidably and closely fit over the ends of the shaft 12, and a reduced cylindrical necked outer end 23 on each roll member, which is guided by one of the slots 14, removably receives the threaded outer end of a stud 24 provided with a reduced portion 25 that removably fits in a transverse bore in the shaft 12, to demountably secure the roll member 10 on the shaft 12. These studs 24 hold my top roll parts in assembled unit-handling relation, and in the event that a machine operator should desire to relubricate the bearings or replace any of the top roll parts, it is only necessary to remove the studs 24 whereupon the various parts may be slidably disassembled. The inner end of each roll member 10 has successively smaller coaxial counterbores 27, 28 and 29, the intermediate counterbore frictionally and demountably receiving an outer race ring 32 of the unit-handling antifriction bearing 18 that has freely rolling elements such as bearing balls rolling in raceways in the outer race ring 32 and in an inner race ring 33.

The outer race rings 32 respectively seat against shoulder 34 at the inner ends of the counterbores 28, and the inner race rings 33 which are centrally bored to be supported in annularly spaced relation about the shaft 12 by the bearing balls, axially extend out of the outer race rings and towards each other into demountably seated relation in the opposite ends of counterbores 35 in the sleeve 16 which is centrally bored at 36 to be annularly spaced about the shaft 12. These inner race rings 33, which co-operatively support the sleeve 16 in spaced relation about the shaft 12, enter into substantially bottoming engagement with the inner ends of the counterbores 35 to axially locate the sleeve 16 relative to the top roll members 10. The innermost counterbores 29 may serve as lubricant wells for the antifriction bearings 18, and a cylindrical flange 37, near each end of the sleeve 16 and lying in closely spaced relation within the outer end of each counterbore 27, acts as a shield which prevents the egress of lubricant from the top roll members and the ingress of dust or other deleterious matter into the bearings.

I claim:

1. In a top roll for textile machinery, a shaft, a pair of roll members having axial bores receiving said shaft, reduced outer ends on said roll members, fastening elements demountably and individually securing said reduced outer ends to the opposite ends of said shaft, a sleeve surrounding said shaft between the roll members, and antifriction bearings respectively mounted in said roll members and co-operatively supporting said sleeve in annular spaced relation about said shaft.

2. In a top roll for textile machinery, a shaft, a pair of spaced roll members demountably secured on the ends of said shaft, a pair of unit-handling antifriction bearings, each bearing having an outer race ring demountably seated in one of said roll members and having an inner race ring surrounding said shaft in spaced relation, a sleeve surrounding said shaft, and said inner race rings having inwardly projecting portions demountably received in the sleeve ends and supporting the sleeve out of contact with said roll members and with said shaft.

3. In a top roll for textile machinery, a pair of spaced roll members having axial bores therethrough, a shaft having its ends respectively seated in said bores, fastening elements detachably securing the roll members to said shaft ends, the inner end of each of said roll members having a counterbore, a sleeve member surrounding said shaft and having ends within said counterbores, a unit-handling antifriction bearing demountably seated in each counterbore, each bearing being supported by one of said roll members in annularly spaced relation to said shaft, and race rings of said bearings demountably seated in the ends of said sleeve and supporting said sleeve in annular spaced relation to said roll members and to said shaft.

4. A top roll for textile machinery and comprising a shaft, a pair of interchangeable roll members having axial bores receiving said shaft, a reduced cylindrical outer end on each roll member, a fastening element detachably secured in each of said reduced outer ends, said fastening elements entering the shaft and demountably securing the roll members to the shaft in predetermined spaced relation, the inner end of each roll member having a counterbore, a sleeve surrounding the shaft and having ends respectively received in said counterbores, an antifriction bearing demountably seated in each counterbore and having a race ring surrounding said shaft in annularly spaced relation, and each of said race rings having an axially projecting portion demountably received in an end of said sleeve to support said sleeve in annularly spaced relation to said shaft and to said roll members.

5. In a top roll for textile machinery, a rotary shaft, a pair of axially spaced roll members mounted on the shaft, each roll member comprising a cot-carrying portion and a reduced end portion to enter a guide slot, the adjacent ends of the roll members being open and spaced from the shaft, and the remaining portions of the roll members being bored for a sliding fit on the shaft, means for detachably securing the bored portion to the shaft, an antifriction bearing mounted within and supported by each roll member, and a non-rotary pressure transmitting sleeve clearing the shaft and supported by said antifriction bearings independently of the shaft, the sleeve extending between the open ends of the roll members from one of the supporting bearings to the other.

6. In a top roll for textile machinery, a rotary shaft, a pair of axially spaced roll members mounted on the shaft, the adjacent ends of the roll members being open and spaced from the shaft and the remaining portions of said roll members being bored for a sliding fit on the shaft, means for detachably securing the bored portions to the shaft, a non-rotary pressure transmitting sleeve entering the open ends of the roll members, and an anti-friction bearing seated in and supported by each roll member in spaced relation to said shaft and supporting the sleeve out of engagement with said shaft for transmitting pressures from the sleeve to the roll members independently of said shaft.

7. In a top roll for textile machinery, a rotary shaft, a pair of axially spaced roll members, each having its outer end portion bored to slide on and off an end of the shaft and the other end of each roll member being open and spaced from the shaft, means for detachably securing the bored end portions of said roll members to the shaft, a non-rotary pressure transmitting sleeve entering the open ends of the roll members, a pair of antifriction bearings surrounding the shaft, each bearing comprising a series of rolling elements and an outer race ring seated in the interior of one of the roll members, and the non-rotary sleeve having raceway means thereon to engage the rolling elements of said bearing for supporting the sleeve in spaced relation to the rotary shaft.

8. In a top roll for textile machinery, a rotary shaft, a pair of axially spaced roll members closed at one end and open at the other, means for securing the closed ends to the ends of the shaft, a non-rotary pressure transmitting sleeve entering the open ends of the roll members, a pair of antifriction bearings each bearing including an inner race ring and an outer race and a series of rolling elements, one of the race rings of each bearing engaging the interior of one roll member and the other race ring engaging the non-rotating sleeve to support said sleeve in spaced relation to the rotary shaft.

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