

Nov. 28, 1950

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2,532,261

BRAKE FOR TEXTILE MILL SPINDLES

Filed June 18, 1949

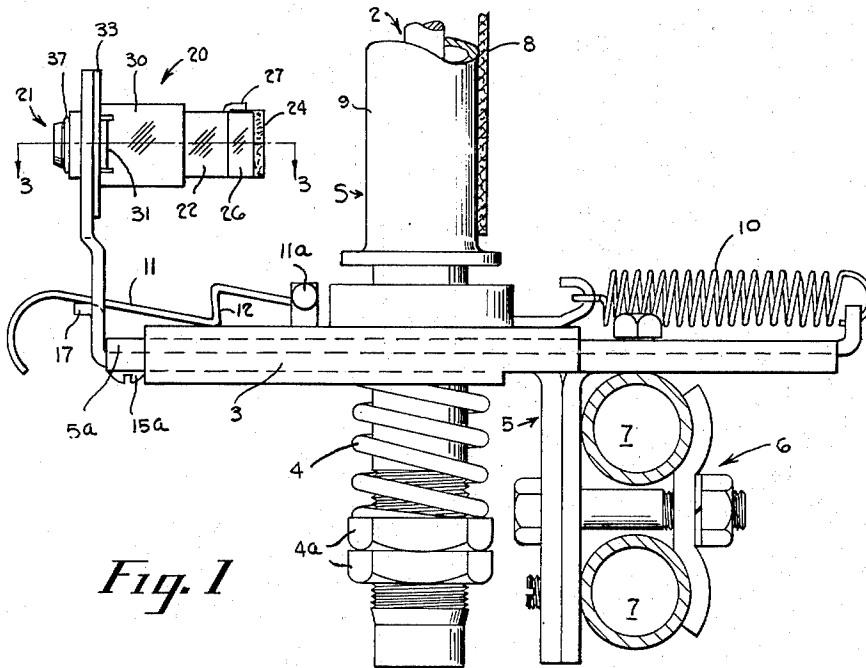


Fig. 1

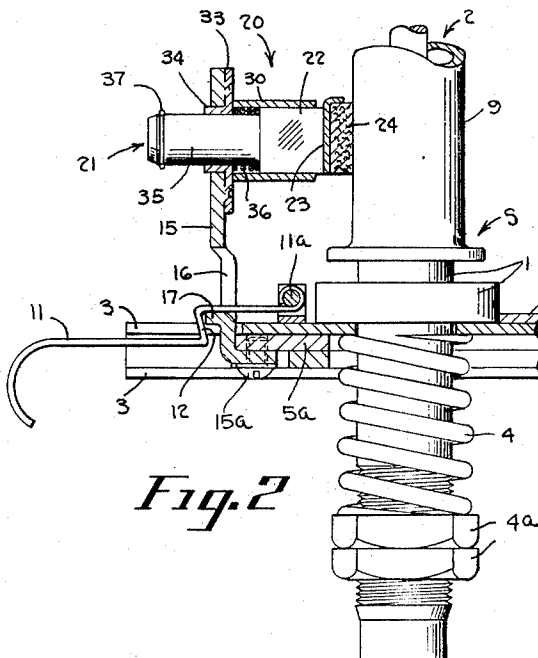


Fig. 2

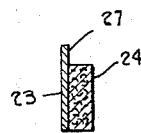


Fig. 4

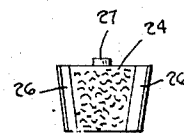


Fig. 5

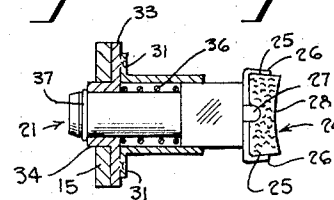


Fig. 3

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2,532,261

BRAKE FOR TEXTILE MILL SPINDLES

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Application June 18, 1949, Serial No. 100,052

4 Claims. (Cl. 57—89)

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The invention relates to an improved brake construction for textile mill spindles, the brake mechanism being of the type which is operated to stop rotation of the spindle, as by frictionally engaging the spindle whorl, consequent upon moving a support for the spindle in a direction to cause disengagement of the whorl and its driving band. Mechanisms of that type are well known. The previously proposed supports for suitable brake shoe material for contact with the spindle whorl have been unsatisfactory for a variety of reasons. When the installations have required provision for yielding movement of the brake shoe support after engagement of the shoe with the whorl the prior arrangements have been either crude and unsatisfactory for their purposes or the expense of production has been disproportionate to the work to be performed.

The principal object hereof is to provide an improved brake mechanism of the type indicated, and particularly one which is not open to the above noted objections of prior constructions.

A specific object is to provide a textile mill spindle brake adapted to be applied as a result of moving the spindle a predetermined distance away from the usual driving band, said brake including a strong sliding but non-rotary support for friction material, a practical and inexpensive means for enabling the friction material to be easily changed when worn or damaged, said brake including an improved spring plunger construction to enable latching of the spindle in idle or non-driven position while friction braking force is being applied to stop rotation of the spindle.

Other objects will be made apparent in the following description of a preferred form.

In the drawing, Fig. 1 is a side elevation of a spindle mounting bracket assembly incorporating the invention and with the brake mechanism idle. Fig. 2 is a fragmentary sectional view showing the spindle stopping operation of the brake. Fig. 3 is a detail sectional view of part of the brake mechanism as indicated at 3—3 on Fig. 1. Fig. 4 is a central vertical sectional view of the brake shoe and a head portion of a supporting plunger therefor prior to locking of the brake shoe in place on the head. Fig. 5 is a front elevation of the brake shoe and its mounting head.

As shown in Figs. 1 and 2 the textile mill spindle S, comprising bolster case 1 and rotary blade and whorl assembly (live spindle unit) 2, is mounted on a supporting saddle 3 of flat C shaped section (not shown). The mounting is preferably non-rigid as by provision of a spring 4

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and securing nuts 4a on and around the bolster case, essentially as in Gleitz et al. Patent 2,433,987 dated January 6, 1948. The saddle is slidably secured to a generally T-shaped supporting or mounting bracket 5 (also essentially according to said patent), the bracket being fastened securely as by clamping device 6 to a portion of the spinning or twisting machine frame (not shown). The common type of spindle mounting rail illustrated includes parallel substantially rigid tubes or pipes 7.

The spindle-driving band 8 (Fig. 1 only) is maintained in an approximately fixed vertical plane of movement generally parallel to the spindle rail by guiding means not shown, so that the spindle whorl 9 is in contact therewith for rotation of the spindle when the saddle 3 and supported spindle S are in the position shown in Fig. 1.

The saddle 3 is biased by a tension spring 10 toward the position in which the spindle is being driven; and to withdraw the saddle and disconnect the spindle whorl and driving band a handle and latch device 11, pivoted to the saddle at 11a, projects horizontally over the portion 5a of the bracket 5. Ordinarily the handle/latch device 11 is designed so that its latching shoulder 12 can be swung downwardly beyond the forward edge of bracket portion 5a to hold the spindle in an idle or non-driven position (Fig. 2). In the illustrated construction an upstanding brake-supporting arm or post 15 for the brake mechanism hereof is made a part of the bracket 5 (attached by screws 15a as shown) has an opening 16 through which the latch/handle device 11 extends, and the latching shoulder 12 engages an outwardly bent lip 17 on the arm 15 to latch and retain the spindle in non-driven position.

The purpose of the brake or brake assembly hereof, indicated at 20, is to quickly stop the spindle and its yarn package (not shown) from rotating; and to do so as a consequence of moving the spindle into the latched position, Fig. 2.

The brake 20 comprises a spring biased plunger assembly 21, the enlarged non-circular head portion 22 of which carries at its free end a sheet metal mounting piece 23 for a suitable brake surface supporting element (block or pad) 24 representing, for instance, a cut piece of leather or a molded section of suitable brake block composition.

The mounting piece 23 for the pad or braking element 24 is made as a metal stamping with paired flanges 26 which form a dove tail recess for

the brake material. The flanges 26 slightly converge forwardly toward the spindle as brought out in Fig. 3 and converge downwardly at a more pronounced angle toward the saddle 3 and its support as shown by Fig. 5. In case the brake material of the pad 24 is leather it is cut generally in the keystone shape similar to the mounting piece as viewed in Fig. 5 but is merely squeezed into the trapezoidal or truncated wedge form shown by Fig. 3 through pressure of the flanges 26. To lock the pad 24 on the stamping 23 a lip 27 thereof is turned downwardly over the brake element as illustrated by Figs. 3 and 5 after said element has been inserted into the dove tail recess. The acting face 28 (Fig. 3) of the braking pad 24 may conform generally to the whorl 9 to increase brake face contact therewith. The mounting piece 23 is secured to the head 22 of the plunger 21 by welding or brazing.

Brake elements serving the above indicated purpose have been designed for support by spring plungers but, at least usually, so as to turn on the plunger axes thus limiting the braking area approximately to line contact with the whorl. The non-circular form of the plunger head 22 in supported sliding contact with a non-circular housing or guide 30 hereof, prevents the brake element from turning out of position and holds it accurately in alignment with the spindle whorl axis.

The housing 30 can be most inexpensively made by forming a flat rectangular strip of sheet metal into a hollow tube (e. g.) of rectangular section. In that case the seam is closed as by brazing. The tube has a suitable number of oppositely outstruck attaching tabs 31, Fig. 3, preferably welded either against the arm or post 15 or, as specifically illustrated, to a mounting stamping 33 made as a circular necked washer (neck at 34). In case of using the stamping 33 the same is welded to the arm 15 as clearly indicated in Fig. 2. The neck portion 34 of the mounting stamping 33 forms a free guide for a reduced circular stem 35 of the plunger 21; and a coiled compression spring 36, normally extended as in Fig. 3, surrounds the stem and forces the plunger and braking pad 24 outwardly toward the spindle whorl in line therewith. To retain the plunger assembly in its housing 30, 33 when the brake is withdrawn from contact with the spindle, by spring 10 acting on saddle 3, a snap ring 37 is preferably applied to the exposed end of the stem 35 as shown.

The operation of the brake 20 in stopping the spindle when the latter is moved by the handle/latch 11 to latching position of the latter will be evident from Fig. 2. During that operation, after initial contact of the braking pad 24 with the whorl 9, the plunger spring 36 gradually increases the braking force and permits the latching shoulder 12 to be hooked over the lip 17 of the brake-supporting post 15. The latch is released by upward movement of its handle portion as will be evident, the shoulder 12 being thereby cammed over the holding lip 17.

It will be evident from the above that the brake can be very inexpensively manufactured and assembled from comparatively inexpensive and simple parts; operates to hold the brake pad ele-

ment 24 securely in position for most effective contact with the whorl; that the spring 36 is fully housed against being blocked by accumulations of dirt or lint, and that the braking pad element 24 may be easily and inexpensively renewed when worn or damaged, either by lifting the lip 27, removing the element and replacing it in its mounting or by removing the entire plunger assembly 21 and replacing said assembly.

We claim:

1. A textile spindle brake for a spindle supported on a slide adapted to be latched to a fixed support in a position wherein the spindle is clear of its driving band, said brake comprising a spring plunger device slidably carried by the fixed support and always presenting the same friction braking face for contact with a circular surface of the spindle, said braking face yieldingly engaging said circular surface when the slide is latched in said position.

2. A brake according to claim 1 wherein the spring plunger device is a tube of non-circular section slidably supporting a complementary portion of a plunger element projecting from the tube and on which the braking face is fixedly mounted so that it cannot turn about the axis of the plunger.

3. A textile spindle brake of the class described, designed for use with a slidably mounted spindle for automatic contact therewith when the spindle is moved on its slide away from its driving band a predetermined distance, said brake including a keystone-shaped pad of friction material and a sheet metal mounting for the pad formed to provide a keystone-shaped recess embracing the pad and having a pair of flanges gripping the converging side edges of the pad, said mounting having a lip tightly engaging the wider end of the pad to hold the same seated firmly in the recess.

4. A textile spindle brake of the class described designed for use with a slidably mounted spindle for automatic contact therewith when the spindle is moved on its slide away from its driving band, said brake including a plunger having means supporting friction braking material for contact with the spindle, a coil spring for the plunger acting thereon at one end and a housing for the plunger and cooperating therewith fully to enclose the spring, said plunger and housing having juxtaposed mutually slidably contacting face portions preventing the braking material from rotating out of position about the axis of the plunger.

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