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TAPE TENSION PULLEY

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Fig. 1

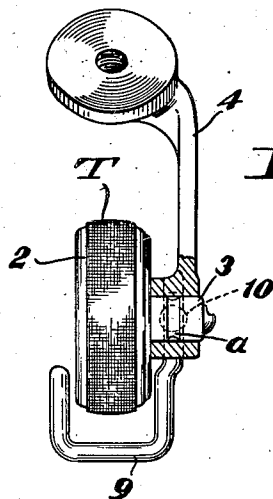
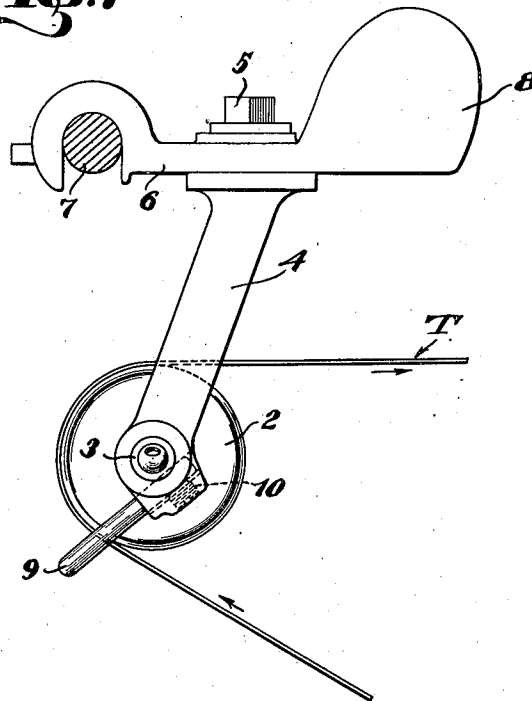


Fig. 2

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TAPE TENSIONING PULLEY

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3 Claims. (Cl. 74-240)

This invention relates to spinning and twister frames (hereinafter included generically in the term "spinning frames") and it is more especially concerned with the spindle driving mechanisms for machines of this type.

It is the usual practice in these machines to mount the spindles in two parallel rows at opposite sides of the frame and to drive the spindles from a common drum or cylinder which extends longitudinally of the frame and is located approximately midway between the two rows of spindles. In a common arrangement an endless belt or tape partly encircles the drum and is driven by it, this tape running from the cylinder around two adjacent spindles at one side of the frame, then across the frame to the opposite side, around two spindles at the latter side, and thence back to the cylinder. These tapes or belts customarily are made of textile fabric, leather, or other suitable materials, a textile tape being most commonly used, and they always stretch more or less, depending upon the running conditions, variations in atmospheric humidity, and the like. It is, therefore, necessary to employ some kind of a takeup or tension mechanism on each tape to maintain it continuously under tension notwithstanding variations in the degree of stretch of the tape.

The common forms of takeup or tensioning mechanisms used with these tape drives consist of a pulley driven idly by the tape and supported for swinging movement under the influence of a weight having sufficient mass to apply the desired degree of tension to the tape.

While tape tensioning pulleys of this type have been in common use for many years, they are open to the objection that occasionally some tape will run off its pulley. When this happens the free tape is likely to wrap around one or more adjacent tapes, causing them to run off and thus producing a snarl. In any event, the machine must be shut down while the tape is replaced or a new one installed.

This difficulty has long been recognized and it has been customary to equip the support for each tape tensioning pulley with a pair of horns projecting laterally and forwardly from the region of the pulley hub where one or the other of them will catch the tape in the event that it runs off and thus will maintain some degree of control over a tape so thrown out of operation. While this expedient reduces the trouble and annoyance caused by a tape slipping its pulley, still it does nothing toward reducing or eliminating such occurrences.

The present invention deals especially with these conditions and it aims to devise a tape tensioning pulley having all of the advantages of the common commercial constructions, together with the added advantage of making it substantially impossible for the tape to run off the pulley.

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

In the drawing,

Figure 1 is a side view of a tape tensioning pulley structure or organization embodying the present invention; and

Fig. 2 is a front elevation of the pulley per se and its arm showing this assembly equipped with a guard constructed in accordance with this invention.

In the arrangement shown, a pulley 2 is mounted on an arbor or spindle 3 which is secured in the lower end portion of an arm 4. This arm is releasably fastened by means of a bolt 5 to a hanger 6 which is hooked over and rocks on a rod 7 extending the entire length of the machine frame. Usually the hanger consists of a casting and it is provided with an enlargement 8 at its end opposite the rod 7, this part 8 being made of such mass as to apply the desired pull or tensioning effort to the tape T.

So far as the parts just described are concerned, they involve no departure from the common form of tape tensioning pulley construction which has long been in use.

According to the present invention, however, a guard 9 is mounted on the pulley support in such a manner that it cooperates with the pulley in almost completely encircling the tape in the region at which it runs on to the pulley. This guard may conveniently be made of a heavy wire bent to approximately a U-shape, as shown in the drawing, and it is supported on the arm 4 by drilling a hole in the lower end of the latter to receive one end of the guard. A set screw 10 locks the guard securely in the arm. Preferably the arbor 3 is grooved circumferentially, as shown at a, Fig. 2, and one leg of the guard passes through this groove at such a point that when the set screw 10 is tightened up it not only secures the guard in place but also locks the arbor 3 in its operative position in the holder 4. The bridge portion of the guard extends transversely across the peripheral edge of the pulley, while the legs of the guard occupy a generally parallel relationship to the planes of the end faces of the pulley.

It will be observed from an inspection of Fig. 2 that the guard has little more than a running clearance with the right-hand face of the pulley. At the opposite side of the pulley the clearance is slightly greater but still is only sufficient for the edgewise passage of the tape T through the clearance space between the free end of the guard and the pulley during the operation of installing the tape and guiding it initially into its running position. Thereafter, if the tape starts to run off either end of the pulley, it is promptly stopped by its engagement with one or the other of the legs of the guard 9. Consequently, with this arrangement, it is practically impossible for the tape to run off the pulley.

It will be evident, therefore, that the invention not only substantially eliminates the difficulty above described, but that it does so in such a manner that the operation of installing the tape or replacing it with a new one is not materially more difficult than in the old constructions.

In this connection it may be pointed out that the tension maintained on the driving tapes regulates, to a large degree, the power required to drive the spindles. A greater tension is commonly used than is necessary merely to drive the spindles at full speed, due to the fact that the proper tension for efficient driving when up to speed is not sufficient to prevent the tapes from running off the pulleys when starting up and overcoming the inertia of the pulleys and the spindles. When a tape runs off, the frame must be stopped to put it back on again, and when the frame is again started up one or more tapes are likely to jump off, so that the operator tends to increase the tape tension to such a point that the liability of the tapes running off is reduced. In other words, the degree of tension customarily used on the tapes is determined primarily with the object of reducing, so far as possible, the danger of the tapes running off the pulleys rather than to the end of maintaining the best running conditions possible. The fact that this high tension involves an increase in power and wear is merely regarded as a necessary evil.

Since this invention substantially eliminates the liability of the pulleys slipping their belts, and does so without reference to the degree of tension maintained on the tapes, the latter factor can be adjusted solely with reference to the requirements of driving the spindles.

While we have herein shown and described a typical embodiment of our invention, it will be understood that the invention may be embodied in other forms without departing from the spirit or scope thereof.

Having thus described our invention, what we desire to claim as new is:

1. In a tape tensioning pulley structure for spinning frames and the like, the combination of a pulley, a support therefor, including an arm and an arbor supported by said arm, the pulley being mounted for rotation on said arbor, a guard provided with a leg extending through a hole in said arm, said arbor having a groove in which a portion of said leg is received, and a set screw threaded through a portion of said arm and securing the guard to the arm.

2. In a tape tensioning pulley structure for spinning frames and the like, the combination of a pulley, a support therefor, including a swinging arm and an arbor supported by said arm, the pulley being mounted for rotation on said arbor, and a U-shaped guard, the bridge portion of which extends transversely across the peripheral edge of said pulley, one leg of said guard being secured to said support at one side of said pulley and the other leg being free and unsupported and being positioned close beside the opposite side of said pulley and so spaced therefrom as to provide a narrow slot through which an endless tape can be passed edgewise into running position on the peripheral surface of the pulley, the portions of said guard at the lateral faces of said pulley adjacent to the peripheral surface thereof being positioned so close to the edges of said surface as to prevent the tape from running off said surface.

3. In a tape tensioning pulley structure for spinning frames and the like, the combination of a pulley, a support therefor including a swinging arm, an arbor on which said pulley is mounted, one end of said arbor being secured to said arm at one side of said pulley but the opposite end of said arbor being free and unsupported, and a U-shaped guard, the bridge portion of which extends transversely across the peripheral edge of said pulley, one leg of said guard being secured to said support at the side of said pulley at which the arbor is supported and the other leg being free and unsupported and being positioned close beside the opposite side of said pulley and so spaced therefrom as to provide a narrow slot through which an endless tape can be passed edgewise into running position on the peripheral surface of the pulley, the portions of said guard at the lateral faces of said pulley adjacent to the peripheral surface thereof being positioned so close to the edges of said surface as to prevent the tape from running off said surface.

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