Feb. 26, 1924. 1,484,866

S. BOROVOY

KNEE BRAKE

Filed Oct. 28, 1921

Fig. 1.

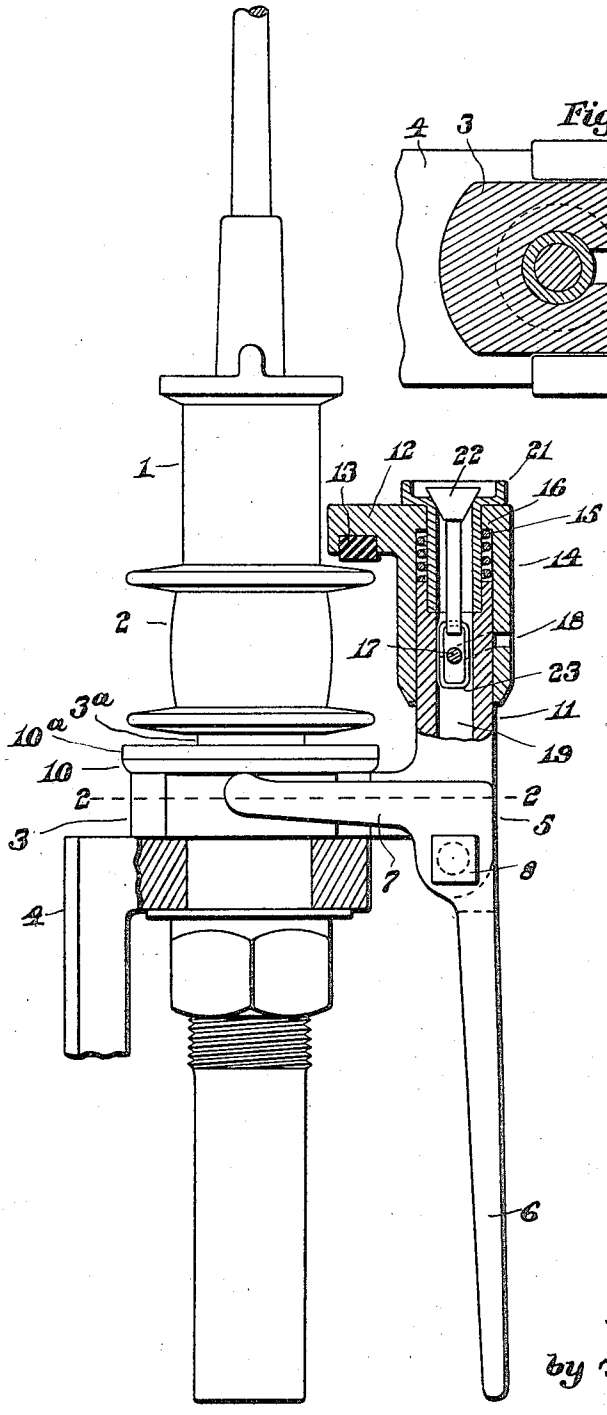
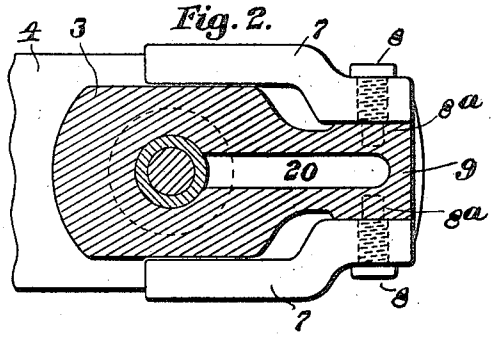


Fig. 2.



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UNITED STATES PATENT OFFICE.

SAMUEL BOROVOY, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO SACO-LOWELL SHOPS, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

KNEE BRAKE.

Application filed October 28, 1921. Serial No. 511,066.

To all whom it may concern:

Be it known that I, SAMUEL BOROVOY, a citizen of the United States, and a resident of Lowell, Massachusetts, have invented certain new and useful Improvements in Knee Brakes, of which the following is a specification.

This invention relates to knee brakes such as are used on spindles for spinning and twisting yarn, and its object is to provide a construction which shall be efficient and free from the defects which characterize the knee brakes now commonly in use. The invention consists in the particular construction and arrangement of the mechanism hereinafter set forth.

The knee brakes commonly in use have the fault that the force applied to the spindle to produce the braking action is not applied in a direction parallel to the axis of the spindle, with the result that the spindle is liable to become bent, especially if the knee brake is roughly used. Bent spindles are a cause of waste of power and of bad work in the mill.

It it also desirable to have a simple and effective means of oiling the spindle. This is provided for in my construction.

In accordance with my invention, the spindle is stopped by simultaneous frictional contact on the upper and lower sides of the whirl; and in contrast to other knee brakes of this general type now in use, in which the braking force is applied only or mainly at one edge of the whirl and so tends to bend the spindle, in my invention the parts are so arranged that there is an evenly distributed frictional contact over the entire area of the bottom of the whirl, and the force is exerted in a direction parallel to the axis of the spindle. This gives a large friction surface and also prevents any tendency to bend the spindle.

In the accompanying drawings, in which like numerals denote like parts, Fig. 1 is a side elevation, partly in section, of a knee brake embodying my invention applied to a spindle. Fig. 2 is a sectional view on the line 2, 2 of Fig. 1.

Referring to the drawings, 1 is a spindle having the whirl 2, which spindle is mounted in customary manner on the base 3, with its upwardly projecting cylindrical portion 3^a, which base in turn is mounted in usual manner upon the frame 4. 5 is a knee brake lever which consists of the depending arm 6 adapted to be pressed by the knee of the machine operator, and a yoke or pair of arms 7, 7 projecting therefrom at substantially a right angle. This knee brake lever is pivotally mounted by means of the aligned cap screws 8, 8 having their ends seated in aligned bores 8^a, 8^a, in a lug 9 projecting downwardly from the base 3, the knee brake lever thus being prevented from any lateral play or motion and allowed to move only in a plane at right angles to the fulcrum line on which it is pivoted.

Below the spindle whirl and resting loosely on the base 3 is a metallic washer 10, loosely surrounding the upwardly projecting portion 3^a, and above the washer 10 is a friction washer 10^a of leather or other friction material, which likewise loosely surrounds the portion 3^a of the base and rests loosely upon the metallic washer 10.

11 is a post carried by the spindle base 3, which has the double function of providing an oil inlet and channel for oiling the spindle bearings (as described below), and of carrying the upper friction finger 12 adapted to engage the upper flange of the whirl frictionally when the knee brake is operated to apply braking pressure to the spindle. It will be seen that when the arm 6 of the knee brake is pressed inwardly by the knee of the operator, the arms 7, 7, which extend along opposite sides of the base 3, will engage against and raise the metal washer 10 and the friction washer 10^a until the latter contacts with the lower flange of the whirl 2, and will then raise the spindle until the upper flange of the whirl comes in contact with the leather friction segment 13 carried by the friction finger 12, whereupon the rotation of the spindle will cease.

The arms 7, 7 of the knee brake lever are of such length that when the washers 10 and 10^a and the spindle have been raised to the extent necessary to cause the top flange of the whirl to contact with the friction segment 13, the points of engagement of the arms 7, 7 with the washer 10 will be substantially at diametrically opposite points with respect to the spindle axis. The result of this arrangement is that the braking pressure is exerted in a direction parallel to the axis of the spindle, and with substantial

uniformity throughout the area of the friction washer 10^a upon the whole area of the lower face of the whirl.

When the pressure of the operator's knee on the arm 6 is released, the arms 7, 7 drop under the influence of gravity to the position indicated in Fig. 1, and the washers 10 and 10^a likewise drop until they rest on the base 3, and the spindle then is allowed to rotate freely.

The friction finger 12 is carried by a hollow member 14 rotatably mounted upon the post 11 so as to enable the friction finger to be turned aside when it is desired to remove the spindle from its base. A spring 15 seated upon the top of post 11 and bearing against an inwardly projecting flange 16 of the member 14 tends to raise the member 14 from the post 11, but this lifting action is controlled by a pin 17 carried by the post 11 and projecting through its wall into a slanting slot 18 in the wall of the member 14, which extends for about a quarter of a circumference. When the finger 12 is in position to engage the whirl, the pin 17 is at the lowest part of the groove 18, so that it is necessary to compress the spring in order to rotate the member 14 into non-engaging position.

The post 11 contains a central bore or oil channel 19 which communicates with a channel 20 in the base 3, to afford a passage for oil to the spindle bearings from the oil inlet 21 seated in the member 14. 22 is a closure for this oil inlet which carries at its end a link 23, loosely surrounding the pin 17. The spindle bearings may be oiled by raising the closure 22 by the spout of an oil can and inserting oil thereunder, the engagement of the link 23 with the pin 17 retaining the closure 22 in position to fall back by gravity into closing position after the oil can is removed.

What I claim as new is:—

1. In a device of the character described, a spindle having a whirl, a friction disk beneath said whirl, a metallic disk beneath said friction disk, a knee brake lever having a pair of arms adapted to engage said metallic disk at points substantially opposite diametrically with relation to the spindle axis, and a friction element located above said whirl in position to engage the upper surface of said whirl when the knee brake lever is operated.

2. In a device of the character described, a spindle having a whirl, a friction disk beneath said whirl, a metallic disk beneath said friction disk, a knee brake lever having a pair of arms adapted to engage said metallic disk at points substantially opposite diametrically with relation to the spindle axis, and a post carrying a friction finger adapted to engage the upper surface of said whirl when the knee brake is operated, said post being provided also with an oil inlet and a channel for carrying oil therefrom to the spindle bearing.

3. In a device of the character described, a spindle having a whirl, a friction disk beneath said whirl, a metallic disk beneath said friction disk, a knee brake lever having a pair of arms adapted to engage said metallic disk at points substantially opposite diametrically with relation to the spindle axis, a post carrying a friction finger adapted to engage the upper surface of said whirl when the knee brake is operated, said post being provided also with an oil inlet and a channel for carrying oil therefrom to the spindle bearing, and a closure for said oil inlet normally seated on the top thereof and adapted to be lifted to afford access to the inlet.

In witness whereof, I have hereunto set my hand in the presence of two subscribing witnesses.

SAMUEL BOROVOY.

Witnesses:
ROBERT E. NAUMBURG,
WILLIAM A. OTIS.