United States Patent

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[54] WIRE BRAKE

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[52] **U.S. Cl.** **242/149**

[51] **Int. Cl.** **B65h 59/22**

[58] **Field of Search** ..... 242/147 R, 149; 226/195; 57/106

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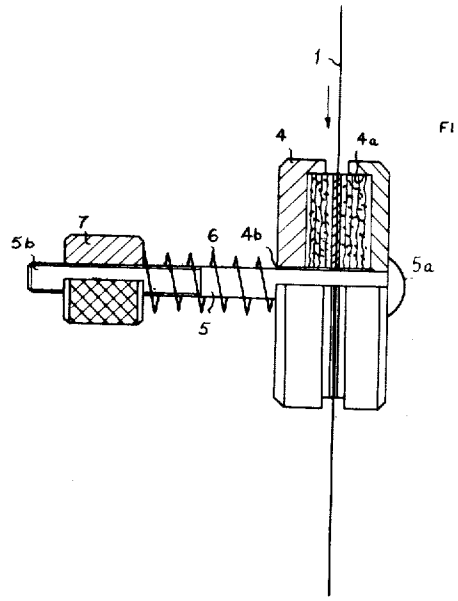
[57] **ABSTRACT**

A device for braking a traveling wire in order to apply a drag force to the wire is constituted by a pair of juxtaposed brake members between which the wire is passed. Each brake member is constituted by a pad of glass fabric adapted to press against the wire, and each glass fabric pad is adhered to an underlying relatively soft supporting base such as felt.

Each brake member is seated in a correspondingly configured recess in a rigid support member, and the two support members are mounted on a support bolt which passes through central openings provided therein and in the brake members. A compression spring adjusted by a nut on the bolt is used to apply an adjustable axial pressure against the two support members urging them towards each other which causes the glass fabric pads to be pressed against the wire.

3 Claims, 2 Drawing Figures



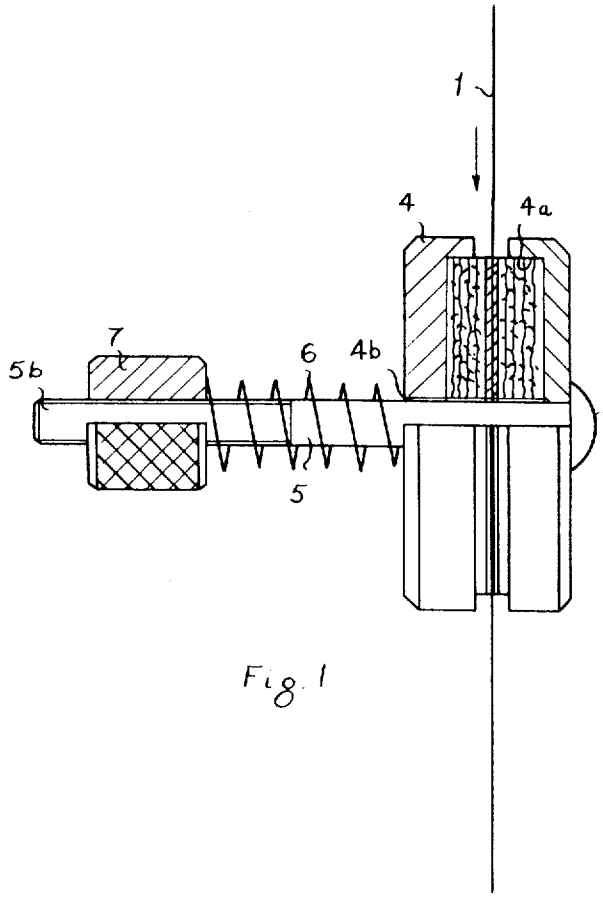


Fig. 1

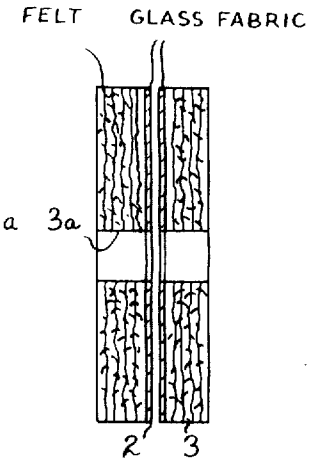


Fig. 2

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WIRE BRAKE

The present invention relates to an improvement in the structure of wire brakes, or fore-brakes, which are utilized primarily in conjunction with wire tension regulators which are, in turn, used in conjunction with machines for winding electric coils and where it is desired to maintain a certain tension on the wire as it is being wound into coil form.

Wire brakes usually comprise a pair of brake pads between which the wire runs, and these pads are usually made of felt, leather or ceramic. The brake pads are pressed by a compression spring arrangement towards each other so as to press against and brake the wire which is being pulled through between the pads, the braking effect being of course dependent upon the degree of pressure which is applied by the spring. An increase in braking increases the tension in the wire, and conversely a decrease in braking reduces the tension.

When the brake is used as a fore-brake for a wire tension regulator, it serves the function of allowing the wire to run pretensioned on the brake roller (about 10 to 20 percent of the total wire tension), which in turn regulates over a brake system about 80 to 90 percent of the total wire tension.

Whether a uniform and constant wire tension can be maintained over a long period of time depends upon the type and quality of the brake lining. When using already known brake lining materials such as felt or leather, the wire tends to dig into the surface of the lining so that the wire tension is reduced. This has the undesirable effect that, on the one hand, the brake rollers on the wire tension regulator are no longer entrained so that the regulator system becomes inoperative. On the other hand, as the coil is wound on the core, its circumference increases, so that the desired filling-factor of the coil is not achieved.

If brake pads of a ceramic material are used, these being likewise known, the wire cannot of course dig into the ceramic surface because of its hardness. However due to the resulting line support, the specific pressure must be relatively high so that the customary lacquer coating applied to the wire to insulate it electrically is subject to being scraped off at the pressure points between the ceramic brake pads, and thus impairs the electrical insulating quality of the wire as it is being wound into coil form. Moreover, any lacquer which is scraped off the wire accumulates between, and is deposited upon, the surfaces of the ceramic pads and establishes a lubricating effect which contributes to a variation or reduction in wire tension.

The object of the present invention is to provide an improved form of brake pad which does not suffer from the disadvantages attributable to the pad constructions mentioned above. This objective is realized by providing a brake pad structure comprising a relatively soft base, such as felt, to which is applied a wire braking surface in the form of a glass fabric.

One suitable embodiment of the invention will now be described and is illustrated in the accompanying drawings wherein:

FIG. 1 is a view partly in elevation and partly in section of the improved brake pads when assembled with their related supporting structure; and

FIG. 2 is a view of the two brake pads which go into the assembly structure of FIG. 1.

With reference to the drawings, the wire to be braked is indicated at 1 and is arranged to be passed through and in pressure contact between the working faces of juxtaposed pads of glass fabric 2 which are secured, such as by gluing, to a relatively soft supporting base 3 such as felt. As seen in FIG. 2, the bases 3 with the glass fabric pads 2 thereon are provided with axially aligned openings 3*a*, each base 3 and its glass fabric pad 2 is seated in a recess 4*a* of corresponding configuration provided in a rigid mounting member 4 of metal which also includes an opening 4*b* in alignment with openings 3*a*, and a mounting bolt 5 having a head 5*a* on one end is passed through the openings in mounting members 4 and the brake pads 2–3. The other end 5*b* of bolt 5 is threaded to receive a knurled tension-regulating nut 7 which bears at one end face against one end of a tension-regulating spring 6, the opposite end of this spring bearing against the face of one of the mounting members 4. The tension on wire 1 is increased by increasing the pressure applied by spring 6 which increases the pressure between pads 2 and wire 1 and is decreased by decreasing the spring pressure.

In order to simplify the drawings, the associated winding machine structure has not been included since it is not considered essential to a disclosure of the invention itself which is directed to the structure of the wire brake itself.

The glass fabric pads between which the wire is pulled through with a drag effect has the desirable quality of being highly resistant to abrasion from the wire. Because of the relatively soft base to which the glass fabric pad is attached, the glass pad tends to partially wrap around the wire, thus reducing the unit area pressure on the wire and minimizing the chances for scraping off any lacquer insulation coating on the wire. In this manner, a considerable braking effect can be achieved with a low surface pressure. In all events any dirt particles which arrive at the glass fabric brake pads will not give rise to any wire lubricating effect since such particles will find their way into the interstices in the glass fabric. The glass fabric brake pads are suitable for use as a fore-brake in conjunction with a wire tension regulator, or as a wire brake cooperating with such a regulator, or assembled with it.

The fabric pads 2 are woven from fiberglass and the wire passes between them to one side of the bolt 5.

I claim:

1. In a device for braking a traveling wire in order to apply a drag force to the wire, the combination comprising a pair of juxtaposed brake members between which the wire is passed, each said brake member being constituted by a pad of glass fabric adapted to press against the wire and which is adhered to a soft supporting base material.

2. A braking device as defined in claim 1 wherein the soft supporting base material for the glass fabric pad is felt.

3. A wire braking device as defined in claim 2 wherein the glass fabric pad is glued to the underlying felt supporting base.

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