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DRAG ARRANGEMENT FOR SPINNING AND OTHER TEXTILE FRAMES

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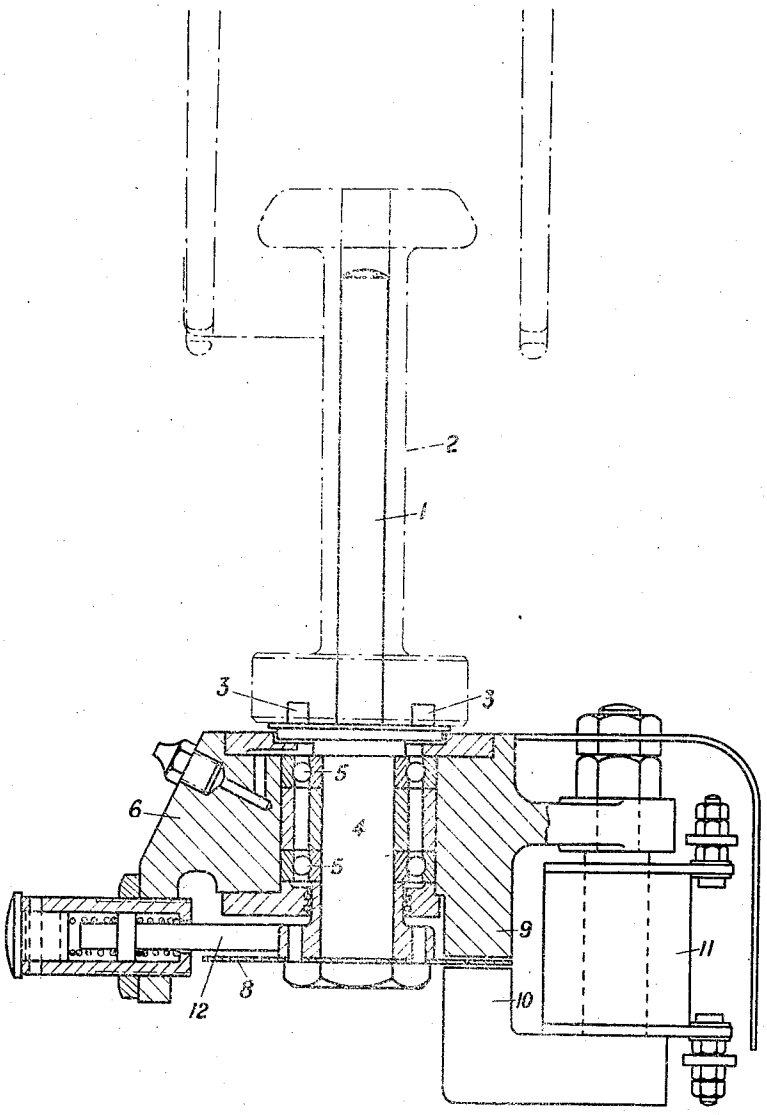

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DRAG ARRANGEMENT FOR SPINNING AND OTHER TEXTILE FRAMES

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This invention relates to an improved drag arrangement applicable to spinning, twisting and other textile frames in which a bobbin is rotated by the pull of yarn.

In connection with spinning and other textile frames in which the bobbin is driven frictionally by the spindle it has been proposed to apply a controllable drag to the bobbin by means of an eddy-current brake, comprising, say, a disc of copper rotating between the poles of an electro-magnet. As the friction between the bobbin and the spindle is an indeterminate quantity, the same variation of the current supplied to a set of electro-magnets will not produce like drag effects on a set of bobbins.

Again, in those spinning or like frames in which the bobbin is rotated by the pull of yarn it has been the practice to employ a bobbin spindle of either one of two types, namely a stationary spindle on which the bobbin rotates, or a spindle rotating at the same speed as the flyer. In both cases friction is set up between the bobbin and the spindle. Where a stationary or dead spindle is employed, the bobbin must travel at a high speed relatively to the spindle, so that there is marked friction between the spindle and the bobbin which varies according to the condition of the spindle and the bobbin. Where a live spindle is employed, the bobbin does not rotate at the same high speed as the spindle, so that in this case also, owing to the difference of speed between the bobbin and the spindle, there is to be overcome frictional resistance which varies according to the condition of the bobbin and the spindle.

The conditions above indicated are, to say the least, not the optimum conditions for spinning, twisting, winding or the like, owing to the indeterminate and varying friction between the bobbin and the spindle.

In these cases also drag arrangements cannot be expected to produce uniform effects under such variable conditions.

With a view to eliminating irregularities in operation, I effect positive mechanical interconnection of the bobbin with a bobbin-centering spindle as by means of pins on a flange on the spindle engaging apertures in the base of the bobbin so that the bobbin and the spindle rotate at exactly the same speed, and I mount the spindle in anti-friction bearings, so that, apart from the drag produced by an eddy current brake, the only resistance to rotation is that set up by the anti-friction bearings.

In a set of ball or roller bearings of similar type the friction is approximately the same for each so that the conditions are practically uniform for all the spindles of a group and regularity of operation rendered practicable.

The rotor of the eddy-current brake is fixed to the spindle and as the bobbin is positively connected with the spindle, and thus with said rotor, there is no relative slip between the bobbin and the rotor of the brake; i. e., the spindle, bobbin and rotor rotate as a unit.

The figure of the accompanying drawing is a vertical section showing a construction according to one embodiment of the invention.

As shown in the drawing the spindle 1 on which the bobbin 2 is impaled or centered is provided with a bobbin-seating flange formed with upstanding pins 3 engaging sockets formed in the base of the bobbin.

The lower extension 4 of the spindle is mounted in ball bearings 5 in the rail 6.

Secured on the lower end of the spindle extension 4 is a disc 8 of non-ferrous metal having a portion rotatable in the gap between the opposed poles 9, 10 of an electro-magnet excited by a winding 11, or it might be of a permanent magnet, and acting as a Foucault or eddy-current brake.

To vary the flux across the air gap in order to vary the order of the drag the air-gap may be varied or the pole pieces adjusted. Again, if an electro-magnet is used, the drag effect may be varied by varying the flow of current through the coil by inserting a resistance in the coil circuit or changing the voltage of the supply, or by changing the number of turns of the coil, that is exchanging one coil for another, or by using

tappings on the coil whereby the number of effective turns of the coil may be varied.

It will be understood that the drag effect is produced with a minimum of friction and without wear of the bobbin, and that with the disc and pole pieces in given positions at a constant speed a uniform resistance torque is set up. Obviously, since the drag is not affected detrimentally by speed, any desired spindle speed may be selected.

In a spinning, twisting or like frame it may be arranged that, at the start of a spinning or like operation, all the magnets are in like positions of adjustment and that, during spinning, individual adjustment of the magnets can be effected to suit conditions.

12 denotes a mechanical brake for effecting positive arrest of the spindle when required.

It is important to note that the brake disc 8 is fixed to the lower end of the spindle extension 4 below the rail 6, so that the bobbin may be brought close to the spindle bearing as distinguished from prior arrangements in which the brake occupies space above the rail, interfering with the attendance and being liable to be damaged, and as distinguished from arrangements in which the brake is located in the rail so as not to be readily accessible.

What I claim is:—

A drag arrangement for textile frames in which the bobbin is rotated by the pull of yarn comprising, in combination with a fixed spindle rail, an upright spindle journalled for free rotation in said rail, the lower end of said spindle being exposed below said rail, said spindle having a flange formed with pins engageable with sockets in a bobbin impaled on the upper portion of said spindle above said rail, a magnet having opposed poles, one of said poles being unitary with said rail, and the other of said poles being below said rail, and a disc of non-ferrous metal fixed to the lower end of said spindle below said rail and rotatable in the gap between said poles.

In testimony whereof I have signed my name to this specification.

JOHN HARGROVE.