March 4, 1941. G. SMITH 2,233,645

TEXTILE TWISTING UNIT

Filed June 17, 1940

Fig. 2

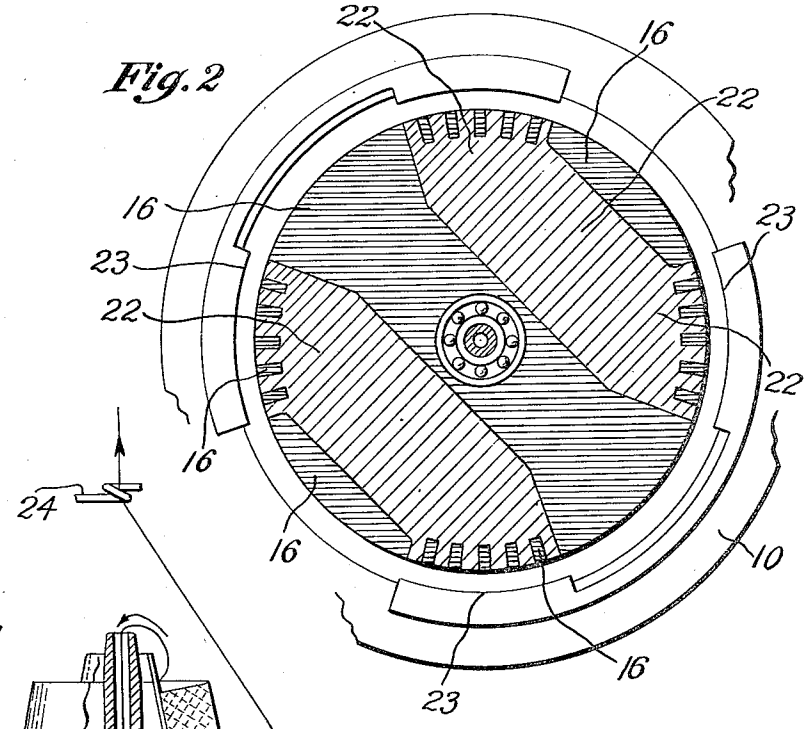


Fig. 1

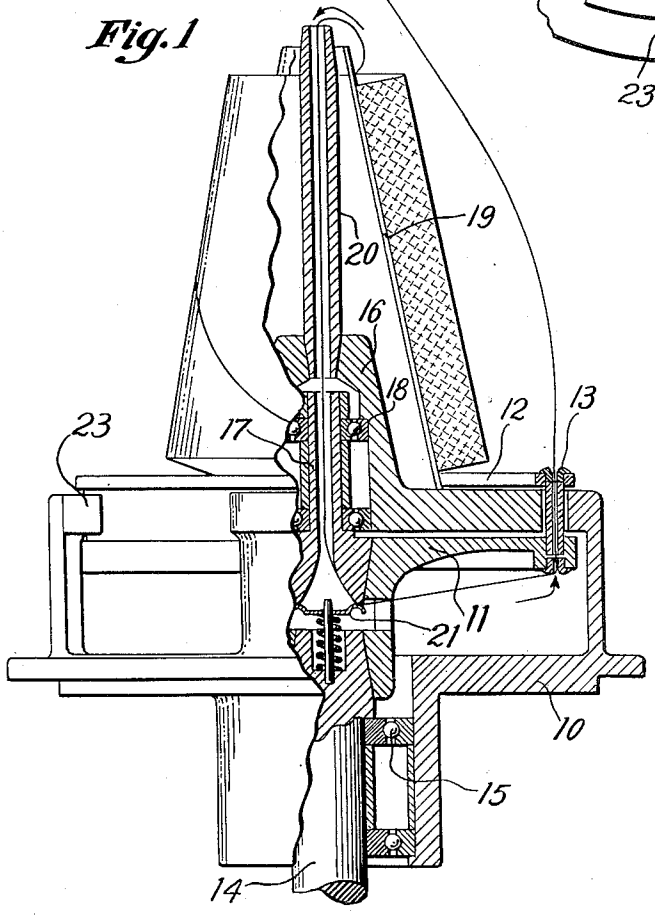
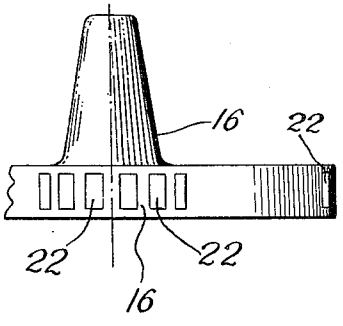


Fig. 3



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TEXTILE TWISTING UNIT

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5 Claims. (Cl. 57—58)

This invention relates to twisting units and particularly to damping means for a magnetic type double twister for silk, rayon, etc., in which the material being twisted is mounted on a cone, or other form of package, and maintained stationary during the twisting operation by damped magnetic means presently to be described.

An object of the present invention is to provide a simple and efficient double twisting unit in which the material being twisted is maintained against rotating with the revolving yarn guide by magnets provided with damping coils, these magnets being on the mounting means for the package and being attracted toward pole pieces on a fixed unit member surrounding the package mounting means, the gap between the pole faces of the magnets and their pole pieces on the fixed member being annular and providing limited but sufficient space for a yarn guide to revolve at high speed within the gap.

Another object of the invention is to provide tensioning means for the material being twisted and including guiding means for the material in the revolving twisting member, there being a light spring pressing a thin disc against a portion of the revolving member for the material being twisted as it advances from the package to the revolving twisting disc and its guide to provide a light tension on the material.

And finally it is an object of the invention to prevent oscillation or hunting of the package supporting member during operation by providing damping means in the form of damping poles on the end faces of the magnets by slotting these faces and filling the spaces with highly conducting and preferably non-magnetic material such as aluminum, brass, copper, etc., of which the package supporting member may be cast or otherwise formed.

With the above and other objects in view the invention includes the features of construction and operation set forth in the following specification and illustrated in the accompanying drawing.

In the accompanying drawing annexed hereto and forming a part of this specification, I have shown the invention embodied in a double twister unit adapted for silk and rayon but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to this specification being relied upon for that purpose.

In the drawing:

Fig. 1 is an elevation of a complete twisting unit made according to the present invention, parts being broken away to more clearly show their construction;

Fig. 2 is a horizontal sectional view taken through the supporting member for the yarn package; and

Fig. 3 is a detail view in elevation of the package supporting member showing the face of one of its magnets and the damping means thereon.

In the above mentioned drawing there has been shown but one embodiment of the invention which is now deemed preferable, but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

Briefly, and in its preferred aspect, the invention is applicable to a twister including the following principle parts: First, a fixed unit support; second, a rotatable member therein on which is mounted a thread guide; third, a package support on which may be mounted the material being twisted; fourth, anti-friction bearings supporting this package supporting member centrally upon the rotatable member; fifth, magnets on said package supporting member having their end faces at spaced portions of the periphery thereof and having damping coils formed therein; sixth, pole pieces on the fixed support and adjacent the end faces respectively of the magnets; seventh, a guiding conduit centrally within the package supporting member; and eighth, a guide for the yarn being twisted on the rotatable member at the periphery thereof and adapted to rotate within the gap between the periphery of the package supporting member and the pole pieces.

Referring more in detail to the figures of the drawing, I provide a fixed assembly supporting or body member 10. A number of these fixed members may be mounted upon any usual form of twisting machine frame to form twisting units therein and may be retained in fixed positions by any desired means not shown. Rotatable centrally within the supporting member 10 is a carefully balanced yarn guiding member in the form of a plate 11 and ring 12 one above the other and held together by tubular members 13 one only of which is shown. To permit rotation of the plate 11 and its associated members within the support 10 at high speeds the plate 11 may be secured to the upper end of a shaft 14. This shaft 14 may be rotated by any means, not shown, and may preferably be mounted on anti-friction bearings 15.

Mounted centrally upon the upper end of the supporting plate 11 is a package or material supporting member 16. As shown in Fig. 1 the plate 11 has a central member 17 extending upward therefrom and provided with anti-friction bearings 18. On member 16 may be placed a package of material to be twisted such as the cone 19. Extending centrally upward from the material supporting member 16 is a tubular member 20 around which the cone 19 is centered.

A continuous guideway is therefore provided

for the material being twisted from the package 19 through the tube 20 and the members 16 and 17 to a position below the plate 11 and thence out through one of the tubular guides 13. Preferably and as shown in Fig. 1 a light tensioning plate or disc 21 is spring pressed upward against a surface of member 17 so that this plate or disc applies a light drag or tension on the material being twisted as it is drawn from the twisting unit.

In order to retain the member 16 against rotation while the plate 11 and assembled parts are rotating at extremely high speed, magnets 22 are formed, preferably by casting, within the member 16 which is of non-magnetic but conducting material such as brass, aluminum, etc. As shown in Fig. 2, two of these magnets 22 are provided each of which has its opposite pole or end face at spaced portion of the periphery of the member 16 which as shown is circular. On the fixed supporting member 10 are formed pole pieces 23 there being one pole piece for each pole face of magnets 22. Preferably the pole pieces may be formed as integral parts of member 10, the magnetic material of which this member is made being increased at these portions. These pole pieces 23 are spaced slightly from the pole faces of magnets 22 so that an annular but narrow opening is formed about which the guide 13 and the material being twisted travels during rotation of the member 11. During this rotation of member 11 the support 16 for the material being twisted is retained against rotation by the magnetic attraction of the magnetic poles to the pole pieces.

As the guide 13 rotates at extremely high speeds and the tension on the material may be irregular there is a tendency for the supporting member 16 to rotate or swing back and forth. The only force preventing this motion is the magnetic attraction between the magnet end faces and the pole pieces 23. When oscillations start effective damping means are required to effectively reduce this swinging and restore the member 16 to rest. Such damping means are provided by the end faces of the magnets 22 being slotted vertically, the spaces provided by these slots being filled with a metal having good conducting qualities. As stated above the member 16 may be cast of brass, aluminum, etc., in a mould into which the magnets 22 have previously been placed. The cast material therefore forms damping coils surrounding the end projections of the magnets 22.

Any tendency of the package supporting member 16 to oscillate or swing back and forth tends to increase and decrease the air gap between the poles and their pole pieces 23. This change in air gap will change the magnetic flux linking the damping coils which in turn will induce currents in the coils. These induced currents absorb energy from the motion of oscillation and thus dampen the swinging movements. The supporting member is therefore maintained in the position in which the magnet end faces are closely adjacent their pole pieces. Any movement away from this position is resisted and the position promptly restored without continued swinging back and forth. The force preventing movement away from this position and restoring the supporting member when displaced is greatly increased by the damping coils in the pole ends of the magnets.

In operation the plate 11 is rotated at high speed and the strand of material passes from the package or supply 19 maintained against rotation by the means above described through guide 13. From the guide 13 the strand of material being twisted passes upward to a centrally mounted eyelet 24 fixed to a part of the machine and thence to a suitable take-up mechanism. With each rotation of the plate 11 and guide 13 the strand receives two twists. By varying the rate of advancing or feeding motion of the strand from the eyelet 24 by the take-up mechanism the number of twists per unit of length can be widely varied while maintaining the rotation of the guide 13 constant.

I claim as my invention:

1. In a twister of the double twister type, a unit member, a centrally mounted member within said unit member rotatably mounted and supporting the material being twisted, a guide member revolvable about said central member, magnetic means to retain said supporting member against rotation during the twisting operation, and damping coils formed within said magnetic means.

2. In a twister of the double twister type having a central rotatably mounted member for supporting the material being twisted and housed centrally within the twisting unit, magnets within said material supporting member having their pole ends at the periphery thereof, pole pieces within said twisting unit, whereby said supporting member is maintained in a predetermined rotative position, and damping coils formed at said pole ends, whereby movements of said supporting member from said position are restrained and said position restored.

3. A textile twisting unit comprising in combination, a unit member, a material supporting member mounted centrally of said unit member, material guiding means rotatable within said unit member and revolvable relative to said material supporting member, means to guide material from said supporting member to said rotatable guiding member, and magnets having damping coils at their pole faces to aid in retaining said supply support against rotation and for preventing oscillation of said support during operation of said guiding member.

4. A double twister unit comprising in combination, a fixed unit member, a material supporting member mounted for rotation therein but normally retained in a predetermined rotative position during the twisting operation, magnets within one of said members, pole pieces formed in the other member, said magnets and pole pieces cooperating to retain said supporting member against rotation, said magnets having their pole ends slotted, and damping coils extending about said slotted ends.

5. A double twister unit comprising in combination, a fixed unit member, a material supporting member of conducting material mounted for rotation therein but normally retained in a predetermined rotative position during the twisting operation, magnets within one of said members, pole pieces formed in the other member, said magnets and pole pieces cooperating to retain said supporting member against rotation, said magnets having their pole ends slotted, and the conducting material of said supporting member extending around said slotted ends to form damping coils thereon.

GRAYDON SMITH.