

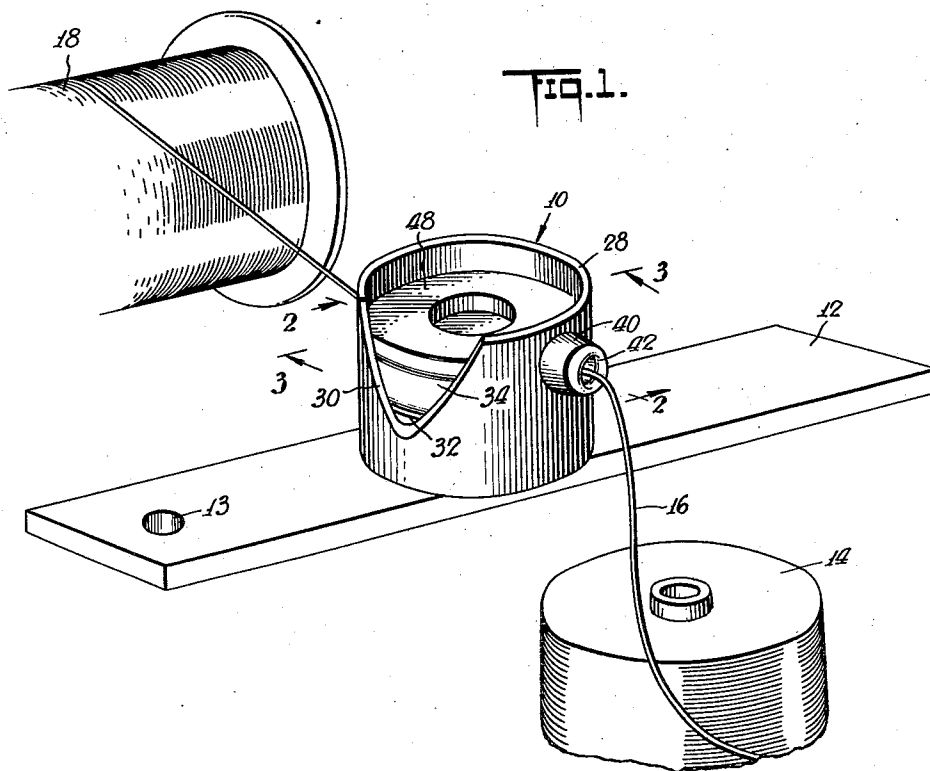
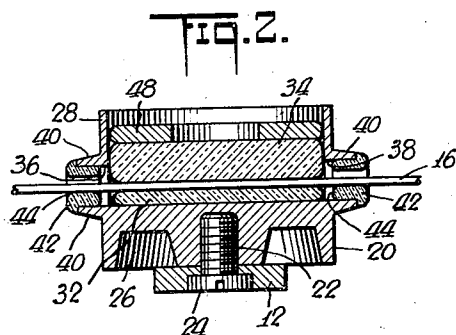
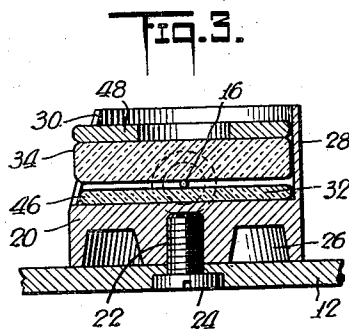
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FLOATING FRICTION YARN TENSION

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FLOATING FRICTION YARN TENSION

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The present invention relates to thread tensioning devices, and it has specific relation to a "floating friction" yarn tension device that may be attached readily to any conventional winding or quilling machine.

Heretofore, it has been customary to use yarn tensioning devices on winding or quilling machines, but such devices generally employed a spring tensioning means or had an axially mounted shaft or stud-like projection for receiving and holding a plurality of tensioning weights in their proper positions against a fixed base plate or member. It has been discovered, however, that such devices slow up the movement of the yarn or thread, and have a tendency to become jerky at high speeds, producing an uneven tension especially when knots, twists and "slugs" (the latter being the trade term for rough spots in yarn) are being passed therethrough.

An object of the present invention is the provision of a yarn tensioning device that is simple and inexpensive to manufacture, and economical and efficient to operate.

A further object of the invention is to provide a yarn tensioning device having a freely movable or "floating friction" base that may be easily and quickly assembled and attached to a conventional yarn winding or quilling machine.

Another object of the invention is the provision of a yarn tensioning device that not only has a "floating friction" base, but permits the shortest unobstructed passage of a yarn or thread therethrough, which short and unobstructed passage permits higher speeds of operation than those formerly employed with conventional yarn tensioning devices of the character above described, thereby permitting greater production on identical winding or quilling machines.

A further object of the invention is the provision of a simple, compact and efficient "floating friction" yarn tension device that gives a steady even tension to the yarn or thread at high speeds, and which permits knots, twists and "slugs" to pass therethrough while maintaining an even tension at such high speeds.

Other and further objects and advantages of the invention reside in the detailed construction of the device, which result in simplicity, economy and efficiency, and which will be apparent from the following description, wherein a preferred form of embodiment is shown, reference being had to the accompanying drawing, forming a part hereof, wherein like numerals indicate like parts, in which:

Fig. 1 is a perspective view of a yarn tensioning device constructed in accordance with my invention, which is shown suitably mounted upon a supporting bar by which the same may be attached to a conventional winding or quilling machine, and illustrating diagrammatically the operation of the device in a conventional winding operation.

Fig. 2 is a cross-sectional view of the device shown in Fig. 1, the same being taken substantially along the line 2—2 thereof, looking in the direction of the arrows; and

Fig. 3 is another cross-sectional view of the device shown in Fig. 1, the same being taken substantially along the line 3—3 thereof, looking in the direction of the arrows.

Referring now to the drawing, there is shown in Fig. 1 a yarn tensioning device 10 mounted upon a suitable supporting bar 12, and illustrating diagrammatically its use in connection with a conventional spool or yarn spindle 14, from which a yarn or thread 16 is being drawn for any suitable purpose under a constant and even tension, such as, for example, rewinding onto a larger spool or warp beam, which is diagrammatically indicated at 18. When the yarn or thread 16 is being moved in the direction of the arrows, it is obvious that it would have a tendency to unwind loosely from the spool or spindle 14 if no tensioning means were employed, and that the slack so created would prevent an even and tight rewinding onto the larger spool or warp beam 18. In order to prevent slack in the yarn or thread 16 and to insure that the same will be wound upon the spool 18 with a uniform tension, the "floating friction" yarn tension device 10 is mounted between the spindle 14 and spool or warp beam 18.

It will be understood that the arrangement illustrated diagrammatically in Fig. 1 is merely for the purpose of depicting an embodiment of one use to which the tensioning device may be employed, and that many other uses may be found wherein it is desirable to place a moving thread under an even tension without departing from the spirit of the invention.

The "floating friction" yarn tension device 10 consists of a base member 20 of cylindrical shape, which may be made of any suitable metallic material, desirably non-rusting. The base member 20 in the modification depicted is made of substantial thickness to provide a suitable attaching means on the underside thereof, such as, for example, a threaded aperture 22 for receiving a threaded machine attaching bolt 24 by

which it is suitably fastened removably to the supporting bar 12. The supporting bar 12 is provided with an aperture 13 for facilitating attachment to a conventional winding or quilling machine. In the construction shown, the base member 20 is provided with an annular groove 26, which serves no useful purpose other than to reduce the weight thereof.

The base member 20 has mounted circumferentially thereabove a cylindrically shaped sleeve member 28, forming an open-top cup-like receptacle. The sleeve member 28 may be welded, soldered or otherwise permanently secured thereto, and may be integrally formed therewith if desired. The sleeve member 28 projects above the base member 20 for a substantial distance, which distance may be predetermined by the thickness of the "floating friction" disc and the thickness and number of gravity weight members to be used in connection therewith to produce the amount of tension desired. A portion of the sidewall of the sleeve member 28 is suitably notched or cut-away, as indicated at 30, to facilitate insertion and removal of the "floating friction" disc 32 and the gravity weight members 34, hereinafter to be described in greater detail.

A pair of diametrically opposed apertures 36 and 38 are provided in the sidewall of the cup-like receptacle or sleeve member 28 in spaced relation to the notched or cut-away portion 30. The apertures 36 and 38 are disposed intermediate the bottom and top of the receptacle or sleeve member 28, and have integral external projecting flanges 40 extending circumferentially thereof. The apertures 36 and 38 and their respective projecting flanges 40 are provided internally with porcelain sleeves or eyelets 42, which are suitably secured therein in any conventional manner, such as being glued thereto, etc. These porcelain eyelets 42 have rounded edges, as indicated at 44, and provide a smooth substantially frictionless surface for guiding the yarn or thread 16 into and out of the device 10, thereby facilitating passage of the yarn therethrough without danger of cutting or otherwise damaging the same.

The "floating friction" disc 32, which provides substantially a floating frictionless base for the yarn or thread 16, is desirably made of glass. While plastic or other composition substances might be used satisfactorily for a short time, it will be found that they are too soft in texture to provide a durable disc. Consequently, if such types of discs are utilized, they must be frequently replaced as they become worn by the high speed movement of the yarn or thread 16 thereover. A worn disc presents a roughened surface which has a tendency to damage the yarn or catch the knots, twists or "slugs" causing jerks in the winding operation. The disc 32 is shown curved or beveled on its opposite edges to present a smooth curved surface to the yarn or thread, thereby eliminating any sharp corners which might have a tendency to cut the thread at times. While I have shown both edges of the disc 32 curved or beveled, it will be obvious that only the upper edge, which contacts the yarn or thread, need be curved or beveled. I have found, however, that if both edges are curved when the disc is made no special care need be taken in assembling the device 10 to make sure that the curved edge is up against the yarn 16 as would be the case where only one edge had been curved or beveled.

The conventional gravity weight member 34 may be made of any suitable material, but I have found that if the weight member to be deposited directly on the yarn or thread 16 is made of glass, better results are obtained. If additional tension is desired, additional weights may be employed, as indicated at 48, wherein the additional weight is shown in the form of a conventional washer. It is, of course, to be understood that if such weights are made of materials having different specific gravities or having different thicknesses, it is possible to increase or decrease the amount of tension imposed upon the yarn or thread 16 passing thereunder to any desirable degree.

In assembling the tensioning device 10 for operation, the "floating friction" disc 32 is deposited in the cup-like receptacle 28 over the base plate 20, and the free end of the yarn or thread 16, as it unwinds from the spindle 14, is passed through the eyelet 42 mounted in the aperture 38 over the "floating friction" disc 32 and out through the opposite eyelet 42 of the aperture 36 from which it is threaded to its starting position on the spool 18. One or more gravity weights 34 and/or 48 are thereupon deposited into the cup-like receptacle or sleeve 28 over the top of the yarn or thread 16 passing over the disc 32. The number of gravity weights 34 to be positioned in the cup-like receptacle 28 depending entirely upon the amount of tension desired to be placed upon the yarn or thread 16. The tensioning device 10 is now ready for operation. By providing a freely movable or rotatable "floating friction" bottom disc 32 for the yarn or thread 16 to pass thereover while passing under the gravity weight 34, I have found that the yarn or thread 16 may be rewound at a much more rapid rate of speed than was heretofore possible with the conventional tensioning devices above described, and that knots, twists and "slugs" will be passed therethrough uninterruptedly without causing any unevenness or jerkiness in the movement of the yarn or thread 16 or tension. The tension remains steady and even under all conditions of operation. In operations where a stop motion is frequently imparted and the yarn is subjected to violent movement due to the operation of the stop motion, I have found that my "floating friction" yarn tension device 10 prevents a hammering action to be set up, which, upon conventional types of tensioning devices above described, is sometimes sufficient to cut the yarn or thread 16. It will be noted that the yarn or thread 16 passes directly through the device 10 in the shortest possible path, and is not subjected to a devious course around a shaft or stud such as encountered in conventional tensioning devices having an axial shaft for positioning and retaining the weights thereon. This feature, plus the unobstructed passageway for the yarn, is believed to facilitate the passing of the yarn or thread therethrough evenly at greater speeds than heretofore practiced, which increases the production of the machines equipped with my devices.

By use of the term "cup-like receptacle" in the specification and claims, I do not mean to limit the invention to an open-top receptacle having closed sides, but it is to be understood that the term shall be construed generically and to include any kind of a receptacle capable of retaining the disc and weights therein, such as, for example, a base member having a series of upstanding circumferentially spaced pegs, or a

lattice-like sidewall construction, which is capable of retaining the members in their respective positions of operation.

Although I have only described in detail one modification which the invention may assume, it will be apparent to those skilled in the art that the same is not so limited, but that various other modifications may be made therein without departing from the spirit thereof or from the scope of the appended claims.

What I claim is:

1. A tension device of the character described comprising a cup-like receptacle having an inlet and outlet port extending through its side thereof in diametrically spaced relation, said ports having a non-metallic sleeve, a non-metallic disc member mounted freely within said receptacle, and a non-metallic gravity weight member mounted freely within said receptacle and adapted to apply pressure on the yarn passing there-through.

2. A tension device of the character described comprising a cup-like receptacle, a disc member mounted freely within said receptacle over which the yarn to be tensioned is adapted to be passed in the shortest possible path, and a gravity weight member mounted freely within said receptacle and adapted to apply pressure on the yarn passing therethrough.

3. A tension device of the character described comprising a cup-like receptacle having means for fastening the same to a supporting bar, diametrically spaced inlet and outlet ports mounted in its sides, a disc member mounted freely within said receptacle over which the yarn passing through said device is adapted to be moved diametrically in the shortest possible path, and a weight member mounted freely within said receptacle to apply pressure on the yarn as it is passed over said disc member.

4. A tension device of the character described comprising a metallic cup-like receptacle having oppositely positioned inlet and outlet ports mounted in its sidewalls thereof, a glass disc member mounted freely within said receptacle over which the yarn passing through said device is adapted to be moved, and a glass gravity weight member mounted freely within said receptacle to apply pressure on the yarn as it is passed over said disc member.

5. A tension device of the character described comprising a cup-like receptacle having closed upwardly extending sides, a portion of one side being cut-away to afford access to said receptacle, oppositely spaced ports extending through said closed sides, said ports being lined with non-metallic sleeves, a non-metallic disc member mounted freely within said receptacle and below said ports over which the yarn passing through said device is adapted to be moved, and a gravity weight member mounted freely within said receptacle for applying pressure on the yarn as it is passed over said glass disc member.

6. A tension device of the character described comprising a metallic cup-like receptacle having and open-top and closed upwardly extending sides, one side having a portion thereof cut-away to afford access to said receptacle, diametrically spaced inlet and outlet ports extending through said closed sides and lined with non-metallic sleeves, a glass disc member mounted freely within said receptacle and below said ports over which the yarn passing through said device is adapted to be moved, a gravity weight member mounted freely within said receptacle for applying pressure on the yarn as it is passed over said glass disc member, and fastening means mounted on the underside of said receptacle for securing the same to a supporting bar.

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