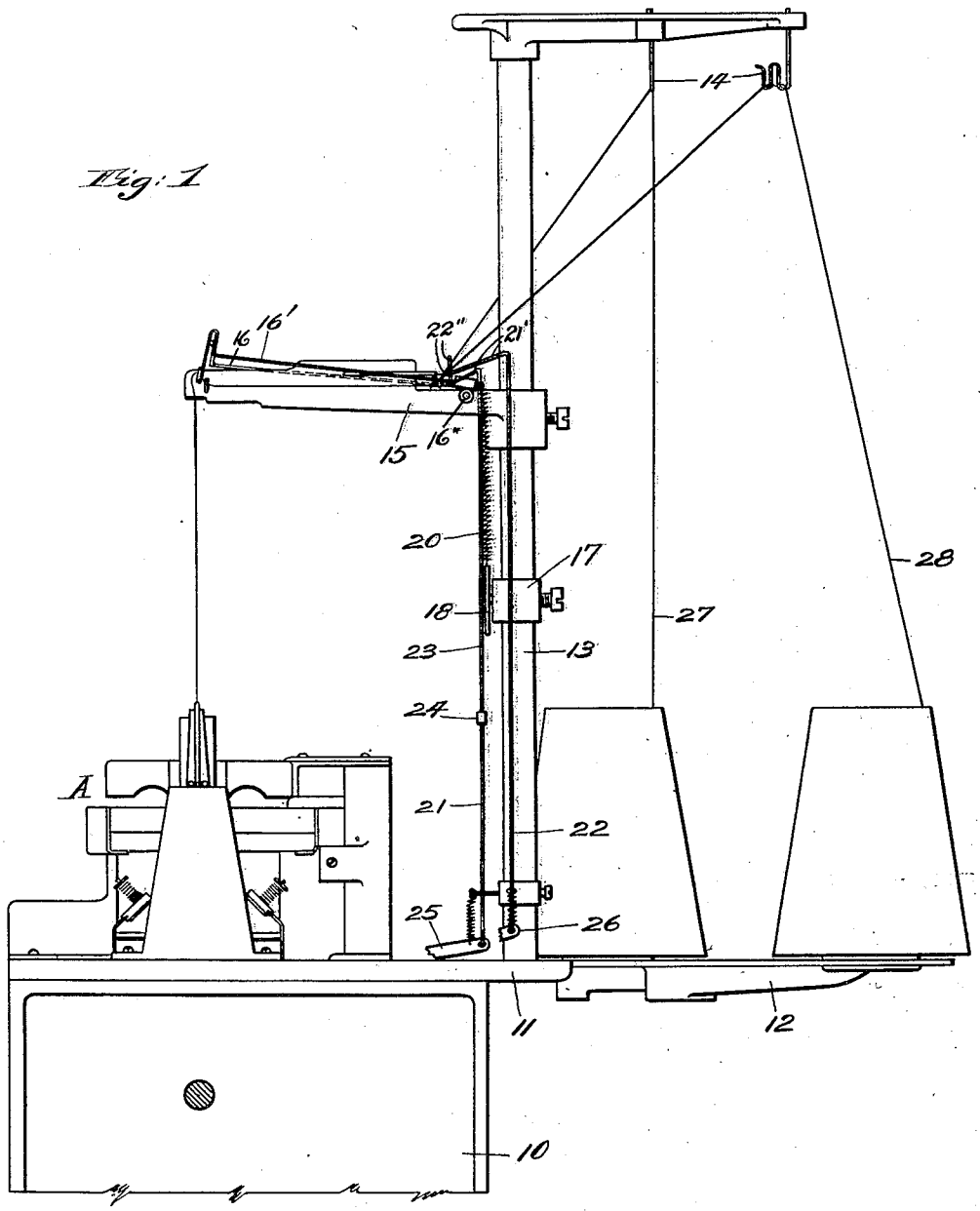
Aug. 28, 1923. 1,465,934

W. B. DUGAN

TENSION DEVICE FOR KNITTING MACHINES

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Fig. 1



INVENTOR.
Walter B. Dugan.
BY William J. Gaston
ATTORNEY.

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W. B. DUGAN

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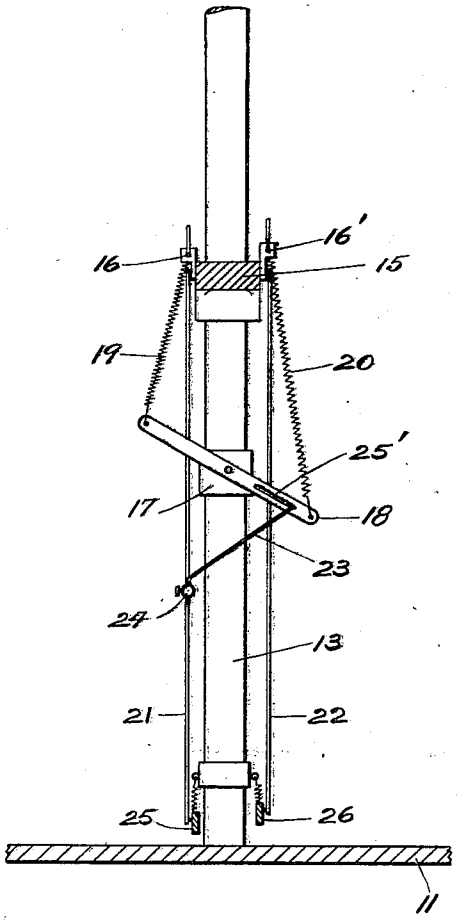


Fig. 2

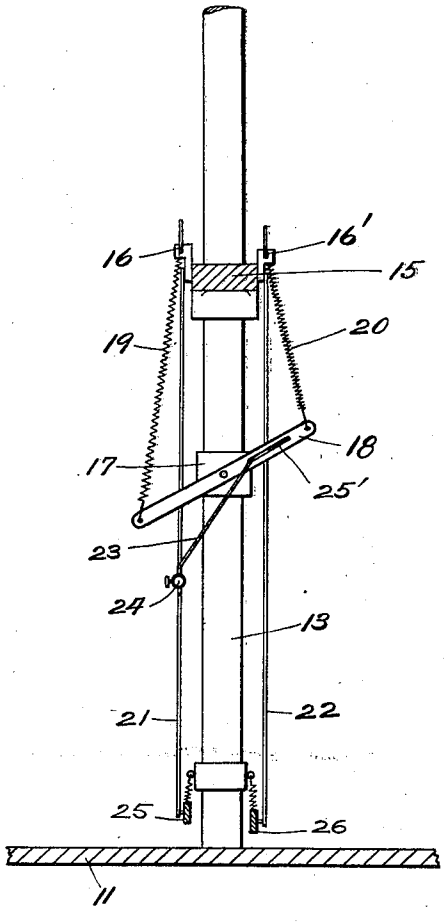


Fig. 3

INVENTOR.
Walter B. Dugan.
BY William J. Jackson
ATTORNEY

Patented Aug. 28, 1923. 1,465,934

UNITED STATES PATENT OFFICE.

WALTER B. DUGAN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO VENANGO KNITTING MILLS, INCORPORATED, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

TENSION DEVICE FOR KNITTING MACHINES.

Application filed October 13, 1921. Serial No. 507,458.

To all whom it may concern:

Be it known that I, WALTER B. DUGAN, a citizen of the United States, residing at the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a certain new and useful Improved Tension Device for Knitting Machines, of which the following is a specification.

This invention has relation to the yarn "take-ups" of circular knitting machines and has more especial relation to a tension device for use in conjunction therewith. The invention further relates to a tension device applicable to the so-called Banner circular knitting machine such for example as is shown and described in Letters Patent of the United States, Number 933,443. The present invention is a development of and an improvement upon the tension for the yarn "take-ups" as employed upon the Banner machine and the device of the present invention is designed to promote tension efficiency and to prevent "pulling out" of the yarn from the yarn binder.

The invention consists of the improvements hereinafter described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which:

Fig. 1, is a fragmentary view, in side elevation, of a circular knitting machine having applied thereto a tension device embodying features of the invention.

Fig. 2, is a view in front elevation illustrating in detail one working position of the tension device, and,

Fig. 3, is a similar view of another position of said device.

For the purpose of illustrating my invention I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Upon a circular knitting machine of the character under discussion it is frequently desirable to knit into the article being fabricated, yarn of contrasting colors. As an example take hosiery in which the leg and foot portions are formed of yarn of one color and the heel and toe portions are formed of yarn of another. For this purpose the take-up bracket of the machine is provided with a pair of yielding "take-ups," under tension, operable at predetermined periods by a "left" pull-down take-up wire and by a "right" pull-down take-up wire. These wires are connected with respect to and operable through the action of the pattern-chain of the Banner machine as is well understood in the art. According to such machine when one "take-up" is out of action tension is still present upon that particular "take-up" thus presenting the possibility of the yarn "pulling out" from the yarn binder. According to the present invention tension is relieved upon the particular "take-up" thrown out of action so that said "pulling out" of yarn is eliminated. A description of the device of the invention will now be given in detail. In the drawings 10 designates the frame of the machine which supports the table 11 and bobbin stand 12. Rising from the table 11 is a take-up post 13 carrying at its top an arm provided with fixed yarn-guides 14. Below said arm is a take-up bracket 15 fixed to post 13. Such bracket carries the conventional, yielding "take-ups," of which there are two, for yarns of contrasting color being fed to the knitting mechanism indicated at A and which is substantially the same form as that used upon the machine shown and described in the patent aforesaid. The operating mechanism including the pattern-chain being of conventional Banner construction and forming no part of the present invention have not been illustrated.

A description will now be given of the improved tension device as used in conjunction with the yielding "take-ups" which are designated 16 and 16′ each of which has pivotal relation, as at 16″ with take-up bracket 15, as is best seen in Fig. 1. Secured to take-up post 13 below take-up bracket 15 is a collar 17 which can be adjusted vertically of the post when desirable. Having pivotal

relation with said collar is a horizontally disposed arm 18 the pivot point being located centrally of the arm. Connecting one of the yielding "take-ups" 16—16′ and one end of arm 18 is a coiled spring 19. A similar spring 20 connects the other "take-up" with the other end of said arm. As the "take-ups" are thrown into or out of action by the "pull-down" take-up wires 21—22 the arm is moved around its pivot point and tension placed upon or removed from said "take-ups" as clearly shown in Figs. 2 and 3. It is to be noted that the "pull-down" take-up wires 21—22 are not connected or attached to the take-up 16—16′. The upper portion of each of said wires 21—22 is bent first outwardly and downwardly at an angle as at 22′ and thereafter upwardly in a vertical manner as 22″. This in effect forms a finger which overlies the pivot point of a take-up arm, as best seen in Fig. 1. When "pull-down" take-up wire 22 is in raised position it is free of arm 16′, as clearly shown in Fig. 1. When said wire is lowered the finger part thereof above described impinges against the upper surface of arm 16′ and causes the latter to move around its pivot point 16. The arm 18 is connected with respect to one of said "pull-down" take-up wires, in the drawings that designated 21, by means of a rod 23. In practice this rod is fixed as at 24 to wire 21 and the free end engages in a slot 25′ formed at one end of arm 18. Thus as wire 21 is raised and lowered arm 18 is caused to move around its pivot point so as to place tension upon spring 19 and remove tension from spring 20 or vice-versa as clearly illustrated in Figs. 2 and 3. The raising and lowering of wires 21—22 is accomplished by means of levers 25—26 which are operatively connected with respect to and operate at predetermined periods of time by reason of the pattern-chain as is well understood in the art.

In operation and for illustrative purposes assume that an article, as hosiery, is being fabricated of white yarn 27 with heels and toes of blue yarn 28. Let it further be assumed that the machine is engaged in knitting with white yarn. In such case "take-up" 16 is under tension of spring 19 and "take-up" 16′ is free of tension of spring 20. This position is clearly shown in Figs. 1 and 2. As properly timed by the pattern-chain, lever 25 raises wire 21 including rod 23 causing the latter to move to the left in Fig. 2, through slot 25′ in arm 18 thus causing said arm to move around its pivot point to the position shown in Fig. 3. Such movement causes tension to be removed from "take-up" 16 and applied to "take-up" 16′ whereupon blue yarn 28 is caused to be fabricated. It will be understood that with the movement of arm 18 "pull-down" wire 22 has functioned to properly position "take-up" 16′. From the above description it is apparent that the "take-ups" when out of action, being free of tension, prevent the "pulling out" of yarn from under the yarn binder as is now customary in Banner knitting machines.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

What I claim is:—

1. In a device of the character stated a pair of take-ups, tension means operatively connected with each take-up and means for rendering said take-ups alternately inactive and for removing tension from that take-up rendered inactive.

2. In a device of the character stated a pair of take-ups, means for rendering said take-ups alternately inactive, a movable member, a spring connecting each take-up with an end of said member and means connecting said member with said take-up operating means whereby in the movement of said member that take-up rendered inactive is relieved of tension.

3. In a device of the character stated a take-up post including a take-up bracket, take-ups operatively arranged with respect to said bracket, means for rendering said take-ups alternatively inactive, an arm pivoted to said post, a spring connecting each take-up with an arm end and means connecting said arms with said take-up operating means whereby that take-up rendered inactive is free of tension.

4. In a device of the character stated a take-up post including a take-up bracket, take-ups operatively arranged with respect to said bracket, an arm pivoted to said post, a spring connecting each take-up with an arm end, pull-down wires for operating said take-ups and means connecting one of said wires with said arm whereby in the movement of said arm tension is afforded or removed from a take-up.

In testimony whereof, I have hereunto signed my name.

WALTER B. DUGAN.