Aug. 30, 1938. F. KLEIN 2,128,487

YARN CONTROL MEANS

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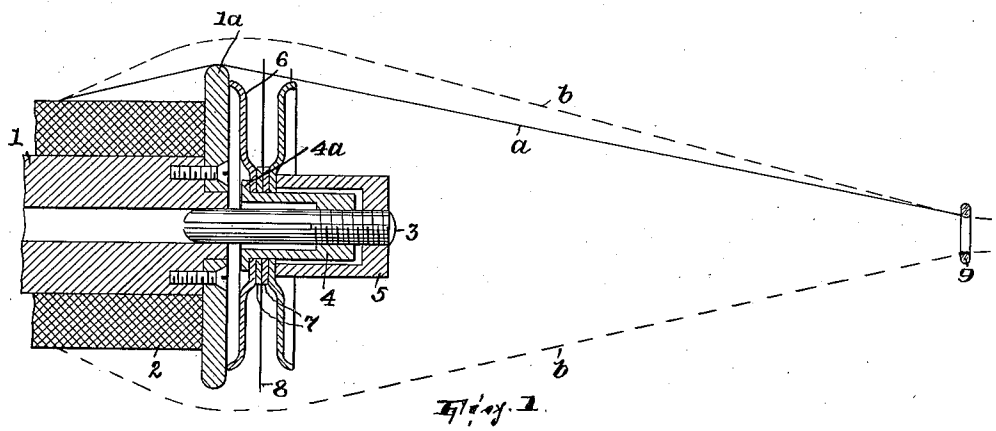


Fig. 1.

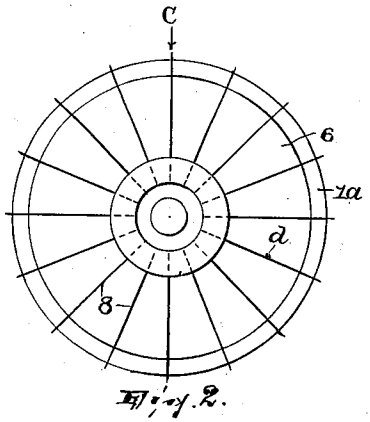


Fig. 2.



Fig. 3.

INVENTOR,
Frederick Klein,

BY Johnston Stewart,

ATTORNEY.

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YARN CONTROL MEANS

Frederick Klein, Glen Rock, N. J., assignor to Sipp-Eastwood Corporation, Paterson, N. J., a corporation of New Jersey

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8 Claims. (Cl. 242—128)

When yarn is drawn from a wound mass whose axis of winding extends more or less toward the direction of draft there is a tendency for the yarn to kink in the length thereof which reaches from the mass, especially if the yarn is of a certain kind, as high-twisted synthetic yarn. This kinking is primarily due to the fact that the withdrawal of the yarn in this manner, or over-end from and so that it moves in a path defining an orbit around the axis of the mass, involves the incorporation of a twist in the yarn for each convolution withdrawn, wherefore if sufficient slackness ensues the twist is permitted to produce the kink. A conspicuous instance in which this kinking is likely to occur is when the axis of the windings is more or less horizontal; at the side of the mass at which the yarn passes up past the package the kinking is not so likely to occur as at the opposite side where the yarn is passing downward and gravity is active to cause it to fall with formation of slack, especially if the draft speed is slowing up. In other words, it is after the yarn in such a case has passed the peak of the package that the slack and consequent formation of the kinks are most likely to occur. It is the object of this invention to provide for controlling the orbital movement of the yarn while being delivered over-end from a wound mass of yarn. To this end the invention contemplates means for supporting the mass and for controlling the orbital movement of the yarn which includes supporting structure and filaments supported thereby and arranged in succession around the axis of the mass and in lines respectively crossing the path of orbital movement of the yarn, such filaments having free ends and there being spaces between the filaments which are wide relatively to the thickness of any filament and in each of which spaces the yarn when received thereby is free of said means to move away from one to the next adjoining filament. As herein set forth the free ends of the filaments are supported inwardly of said orbital path, being actually radial. If the invention is applied to the purpose above indicated (i. e., to prevent the formation of kinks in the yarn when its speed-rate is relatively slow) these filaments project outwardly only a limited distance, or so far as only to be active on such length when the speed-rate is slow but not to reach the balloon in said length when the speed is normal.

The invention may be utilized also for tensioning yarn delivered over-end from a wound body, and I claim accordingly, i. e., whether or not the filaments project outwardly from their points of support.

In the drawing,

Fig. 1 shows a longitudinal section of a wound mass and a device including the filaments and means to support such mass and device, together with a guide for the yarn;

Fig. 2 is a right hand elevation of what is shown in Fig. 1 with the front disk removed; and

Fig. 3 shows said device as it appears in Fig. 1, but detached.

1 is a spool around which yarn has been formed into a wound mass 2, as by the well-known traverse-wind method. The body here including such spool and wound mass in the example supporting a fitting constructed as follows: A pin 3 has one end bifurcated and forming a stud which is jammed into the spool and its other end threaded. A sleeve 4 is screwed on to the threaded end of the pin, having a circumferential flange 4*a* at its inner end. Another sleeve 5, receiving sleeve 4 is screwed on to the threaded end of the pin. Penetrated by sleeve 4 and located between flange 4*a* and sleeve 5 is a pair of disks 6 which are dished and present their dished sides toward each other. When the sleeves are made to clamp the disks the latter as shown clamp a ring which here includes two annuli 7, of leather, glued or otherwise held together. Parts 3 to 7 form what I term a support for resilient flexible filaments 8 (as of or at least having the stiffness and flexibility of horse hair) arranged here in radial relation to the ring formed by said annuli and preferably equally spaced, their inner ends being between such annuli and so affixed to and supported by the ring. The disks are not indispensable, but they are present as guards to protect the filaments against distortion in handling either when the fitting is assembled with or detached from the spool, their dishing allowing the filaments freedom of movement in other directions than strictly in the plane in which they are shown to lie.

At 9 is a guide through which the yarn extends to a rotating receiving spindle, spool or other draft means, not shown.

As shown in Fig. 1 the yarn *a* is assumed to be traveling at slow speed so that as the length thereof between guide 9 and the point of departure of the yarn from the wound mass revolves its path of revolution or orbit more or less approximates, if said length does not actually wipe, the periphery of the flange 1*a* of the spool. The filaments 8 project through this path and they afford yielding tension means, ceasing to act as such, however, if or when the speed of the yarn is such that said length becomes so ballooned that its orbit is beyond the reach of the filaments or the

ballooning attains the dimension indicated by the broken lines *b*—*b*.

Whereas a novel tension means is shown present such means also performs this function especially where as shown the axis of winding, extending more or less toward the direction of the draft, is also more or less horizontal: When the speed of the yarn is slow, and particularly when it is slowing, on the yarn passing the peak of the mass (arrow *c* Fig. 2) the mentioned length tends to fall by gravity, with production of slack, and since the preceding delivery of a convolution involved a twist in the yarn this twist tends to develop a kink or loop in the said length as heretofore explained, which kink becomes troublesome in subsequent manipulation of the yarn. If the filaments 8 are present they act to resist the travel of said length in its orbital movement and instead of such length at the down-moving side of the mass falling to produce slack, with consequent formation of a kink, it is left supported by one of the filaments, as indicated at *d*, for example, in Fig. 2.

Whereas in some of the appended claims I treat the spool or core and the fitting as together constituting supporting structure for the yarn mass and the filaments it is to be understood my invention also contemplates supporting means other than specifically that which is thus constituted.

Having thus fully described my invention what I claim is:

1. A device to be positioned at the delivery end of a wound yarn mass from which the yarn is to be drawn over-end fashion including an arcuate series of resilient flexible filaments arranged to project from within to beyond a given orbit and a support circumscribed by said orbit and comprising members exerting clamping pressure on said filaments lengthwise of the axis of said orbit.

2. In combination, with structure to support a body including a wound yarn mass from which the yarn is to be drawn over-end fashion, said structure having a support to adjoin the delivery end of said body when supported on said structure, resilient flexible filaments supported by said support nearer to the axis of the mass than the periphery of such mass is to said axis and projecting free from their points of support through the orbit in which the yarn in being delivered travels rotatively.

3. The combination set forth in claim 2 characterized by said support including a disk-like portion substantially coaxial with the mass and having a diameter approximating that of said body at its delivery end.

4. A device of the class described including a series of resilient filaments all substantially radial to a common axis and supporting means for the filaments exerting clamping pressure thereon lengthwise of said axis and inwardly of their outer ends.

5. A device of the class described including a series of resilient filaments all substantially radial to a common axis and supporting means for the filaments including disk-like elements of less radial dimension than and exerting clamping pressure on the filaments inwardly of the outer ends thereof and there being a clear space between each said element and such series of filaments around the zone of clamping pressure.

6. Means for supporting a wound yarn mass from which the yarn is to be drawn over-end fashion and for controlling the orbital movement of the yarn including supporting structure and long resilient filaments supported thereby and all arranged in succession around the axis of the mass and in planes respectively crossing the path of orbital movement of the yarn at intervals which are wide relatively to the thickness of any filament and the space between each two adjoining planes being clear to permit the yarn when received therein to move freely from one to the other corresponding filament.

7. The means set forth in claim 6 characterized by said filaments being supported by said structure inwardly of said path.

8. The means set forth in claim 6 characterized by said structure including a disk-like portion substantially coaxial with and arranged at the delivery end of the mass and by said filaments flanking said portion and being supported by said structure inwardly of said path.

FREDERICK KLEIN.