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L. BRUEGGEMANN

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TENSION COMPENSATOR FOR WINDING MACHINES

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Fig. 1.

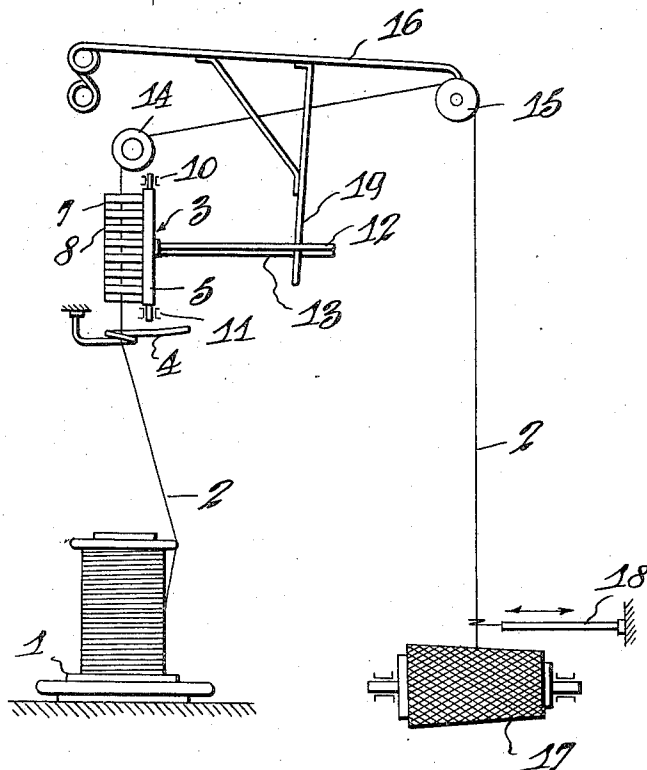


Fig. 2.

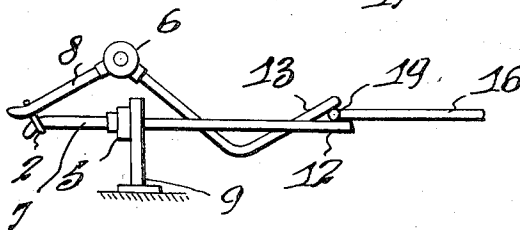
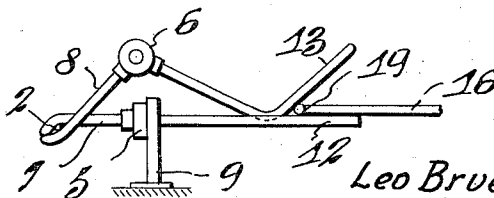


Fig. 3.



Inventor
Leo Brueggemann.

By *James H. Byer*
Attorney

UNITED STATES PATENT OFFICE

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TENSION COMPENSATOR FOR WINDING
MACHINES

Leo Brueggemann, Wuppertal-Oberbarmen, Germany, assignor to American Bemberg Corporation, New York, N. Y., a corporation of Delaware

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4 Claims. (Cl. 242-154)

This invention relates to winding machines, but primarily has for its object to devise a means whereby a yarn body may be built up under a tension which is uniform throughout the winding thereof.

It has heretofore been the practice in order to compensate for variations in tension of winding machines to use flexible hoops over which the thread was guided. These hoops are provided in order to overcome the resistance occurring during winding, for example, catching of the thread which may easily cause injuries thereto and tearing thereof. Although breaking of the thread is thus avoided, it is not possible by this means to prevent variations of tension in the thread during winding, owing to the steadily increasing elasticity of the hoops.

The present invention therefore has for one of its objects to produce, during rewinding of a yarn body, a uniform tension throughout. The invention is further based on the fact that it is not possible to avoid variations of thread tension during winding, by means of the usual methods, because they depend on the quantity of yarn wound upon the support, the accumulated dirt and other matter on the thread cleaners and other parts contacting with the thread, the increasing speed of take-up during the winding, the oil content of the thread and other causes, but that it is possible to obtain a uniform winding tension, if by means of an intermediately positioned adjustable braking device an additional tension is imparted to the thread which may be varied so that the entire tension becomes uniform.

In order to carry out this tension compensation, the tension of the thread itself is used as the regulating medium. By means of a certain mechanical device comprising this invention the tension of the thread causes the thread brake to decrease its braking effect under an increasing tension, while the thread braking tension is increased as the tension on the thread is decreased. For this purpose a guide roller is mounted on a spring tension device having a finger which projects into an angular space formed by projection jaws of a thread brake, for example, a plate or finger brake. It is therefore one object of the present invention to devise an improved tension regulating device for winding machines which operates by the tension on the thread itself.

These and other objects will in part become obvious and will in part be pointed out in the following specification and appended claims when taken in conjunction with the attached drawing, in which, Fig. 1 is a diagrammatic view illustrat-

ing the use of the invention during the rewinding operation, Fig. 2 is a plan view of the invention per se when in the position of greatest braking effect, and Fig. 3 is a view similar to Fig. 2 but showing the device in a position of least braking on the thread.

In the drawing, in which like numerals of reference indicate like parts, 1 indicates the supply spool from which the thread 2 is guided to the brake grill 3 by means of a pig-tail guide 4. The brake grill 3 which is sometimes called a finger tension comprises two opposite plates 5 and 6 which possess a number of fingers 7 and 8 so spaced that the fingers on one plate project into the open space between the fingers of the other plate.

The grill plate 5 is stationarily supported on a bracket 9 while the grill plate 6 is pivotally mounted in bearings 10 and 11.

The grill plate 5 is provided with a projection 12 which extends rearwardly from the finger 7. A member 13 projects rearwardly from the grill plate 7 and is shaped to form a scissors-like jaw arrangement with the projection 12 of the grill plate 5.

The thread 2, as before stated, is led from below by means of the thread guide 4 and passes through the fingers 7 and 8 of the braking device 5 and 6. After leaving the braking device it is led over a stationary guide roller 14 and from there passes over a guide roller 15 mounted on the spring tension device 16 and from there is finally wound upon a collecting spool 17 by means of an oscillating thread guide 18. The spring tension 16 which carries the guide roller 15 also carries a projecting finger 19 which engages the angular space formed by the scissors-like arrangement of the projections 12 and 13 of the grill plates 5 and 6.

The operation of the device is as follows: Should the tension at the take-up side fall below normal, the spring tension member 16 will swing upwardly, owing to its resilient nature, consequently the finger 19 is moved from the position shown in Fig. 3 of the drawing to that of the position shown in Fig. 2. This causes the thread 2 which originally passed through the fingers of the brake in a more or less straight path to take a very crooked path through the said fingers whereby the friction is increased and consequently the thread tension increases. In this manner the desired compensating effect results.

If on the other hand the tension of the thread increases as it passes over the guide roller 15, the projecting finger 19 will be forced in the

angular space between the projections 12 and 13 and opens the braking finger whereby the braking tension is decreased. By this means the sum of the tension on the thread will be a constant one.

From the foregoing description, taken in connection with the accompanying drawing, it is thought the complete, construction, operation, and advantages of my invention will be clear to those skilled in the art to which it relates.

Having thus described my invention as required by the patent statutes, what I claim is:

1. In a device of the class described, in combination, a thread brake comprising opposed grill members, each of said members having a plurality of fingers through which thread passes, each of said grill members having a projection extending in a direction opposite to the said fingers, said projections forming an angular space, a guide roller mounted on a resilient member, a finger element mounted on said resilient member and projecting into the angular space formed by said projecting elements and adapted to thereby vary the braking tension as the resilient member varies in position with the varying tension of the thread.

2. In a device of the class described, in combination, a thread brake comprising opposed grill members, pivotally movable relative to each other, fingers mounted on said grill members and together forming an angular space, a finger ele-

ment projecting into said space moved by the varying tension of a thread and thereby opening and closing said grill members to vary the braking tension.

3. An apparatus for rewinding yarn bodies under uniform tension which includes a thread brake interposed between the thread supply and the winding spool, said brake comprising a pair of intermeshing, opposed grills, one of said grills being pivoted for relative movement with respect to the other of said grills and forming a thread space therebetween, a resilient thread contacting member having a depending offset portion contacting the said pivoted grill member and receiving movement from the thread passing over said offset portion.

4. An apparatus for rewinding yarn bodies under uniform tension which includes a thread supply, a thread braking and tensioning device through which the thread being rewound passes during its travel from the thread supply to the thread take-up, said brake comprising a plurality of alternately stationary and pivoted thread contacting members, a resilient arm carrying a thread contacting member over which the said thread passes, an offset arm secured to and receiving movement from said resilient arm, said arm adapted to communicate its movement to the pivoted thread contacting members of said brake.

LEO BRUEGGEMANN.