

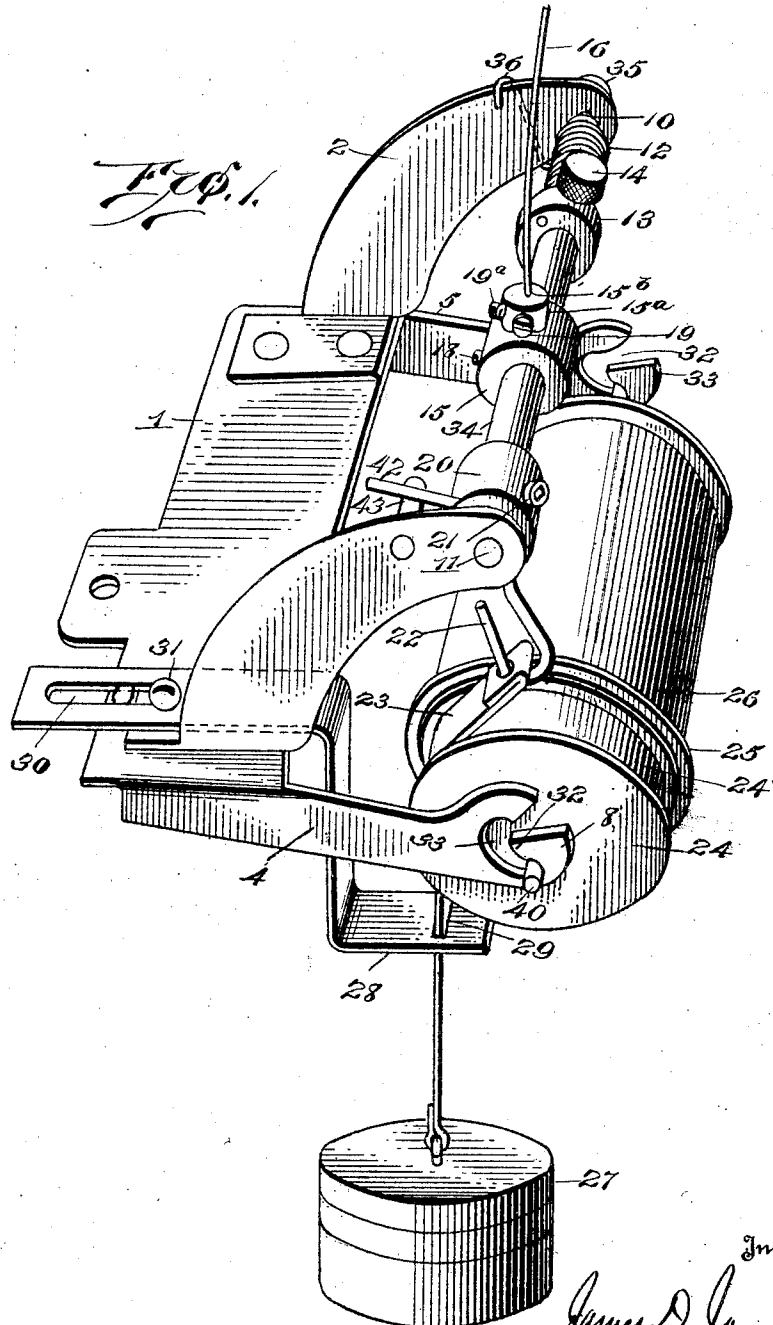
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UNWINDING DEVICE

Original Filed March 22, 1926 2 Sheets-Sheet 1



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By

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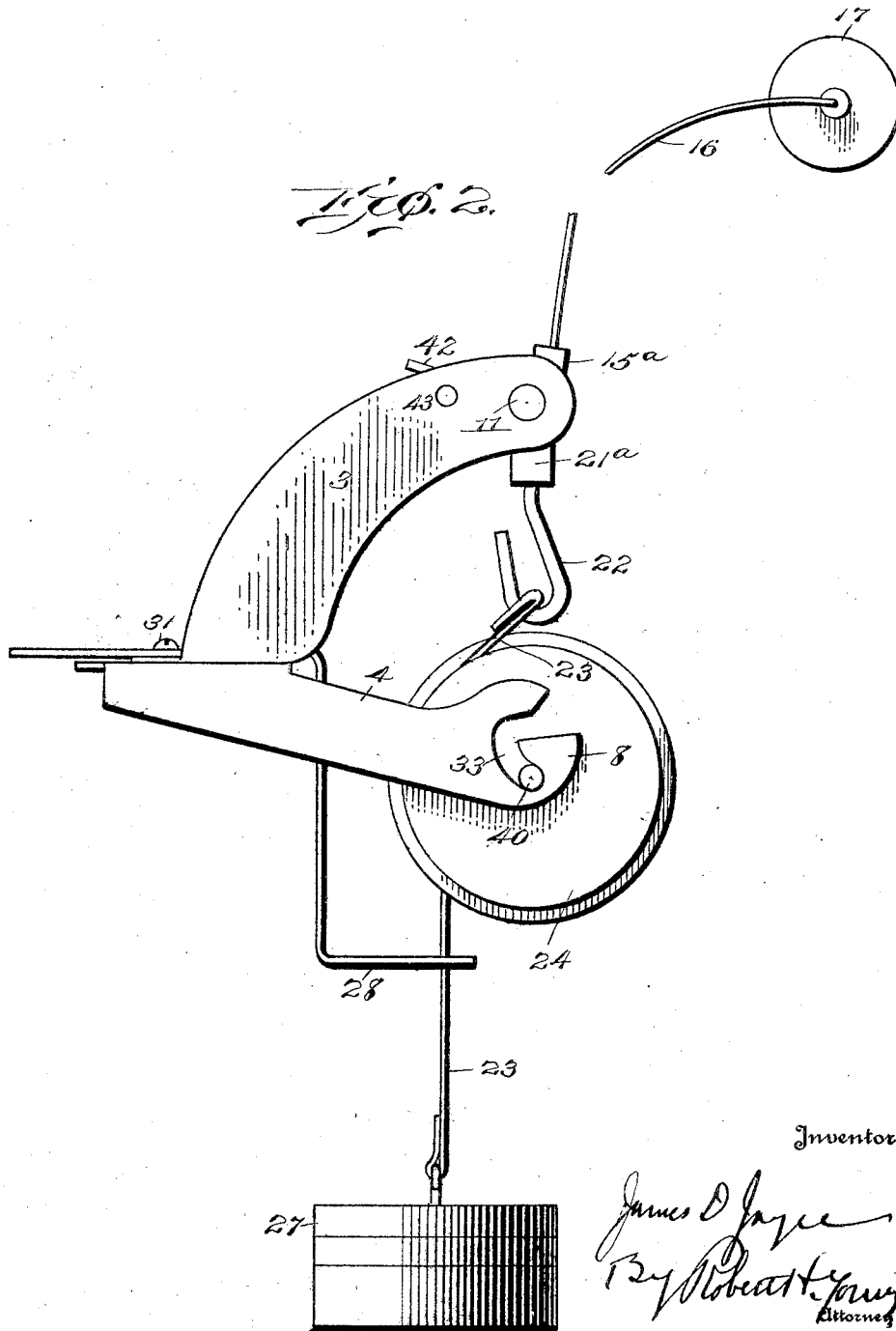
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## UNITED STATES PATENT OFFICE.

JAMES DANIEL JOYCE, OF PHILADELPHIA, PENNSYLVANIA.

## UNWINDING DEVICE.

Application filed March 22, 1926, Serial No. 96,531. Renewed January 27, 1927.

This invention relates in general to unwinding devices for regulating the delivery of yarn, thread and the like from rotating spindles. More particularly my invention relates to improvements over the unwinding device shown in my co-pending application Serial No. 79,741, filed January 7, 1926, on unwinding device.

It is the prime object of my invention to control the rotation of the spool or bobbin in such a manner as to compensate for the starting of the winding operation and for the series of irregular variations in speed of feeding due to the traversing of the thread guide and to the variations in the diameter of the cone of yarn or thread being wound on the bobbin; and to prevent the spool from overrunning when the thread breaks or the tension thereon is relieved for any reason; so that fine or delicate materials can be wound without undue strain or breakage.

To these ends it is my object to employ a flexible compensating arm fixedly secured to a rotatable rod, to which rod there is also secured a brake suspension means for supporting a brake from a point diametrically above the center of and in very close juxtaposition to the periphery of a brake drum on the spool or bobbin holder. Additionally I propose to provide means through which the brake is adapted to pass, said means being adjustable to control the amount of breaking surface initially employed.

Other objects of my invention will be found in the accompanying specification and claims and will be disclosed in the accompanying drawings in which—

Figure 1 is a perspective of my device;

Figure 2 is an end elevation of the same with the movable portions shown in dotted lines.

Referring now with greater particularity to the drawings it will be seen that my device is comprised as follows:

A frame 1, substantially doubly U-shaped, is provided with two pairs of arms 2 and 3, and 4 and 5. The frame 1 has a base plate portion provided with an aperture at 6 for the insertion of suitable means for securing my device to the frame of the winding machine with which it is to be used.

The arms 2 and 3, near their outer extremities, are provided with conically faced (not shown) bearing pins 10 and 11 which are adapted to bear in conical seats (not shown) in the ends of a compensator arm

control 34 to rotatably support said rod in said frame. The bearing pin 10 screw-threadedly engages the arm 2 and is provided with a knurled knob 35 for adjusting said bearing pin during the assembly of the rod in the frame.

A coiled compression spring 12 is mounted on said rod concentrically thereof and has one end thereof bent to form a loop 36 fixedly secured to the arm 2. The other end of said spring passes through an aperture 37 in a collar 13 mounted on rod 34 and adjustably fixed thereon by means of a set screw 14. It will be obvious that rotation of the collar 13 about the rod 14 will vary the compression of spring 12.

Another collar 15 is mounted on the rod 34 and is fixed in position relative thereto by means of a rivet 18 passing through said rod and said collar. The collar 15 has an upstanding portion 15<sup>a</sup>, provided with a bore 15<sup>b</sup>, extending radially of said collar. In this bore one end of a flexible spring wire compensator arm 16 bearing a thread guide pulley 17, is adjustably fixed by means of set screws 19 and 19<sup>a</sup>.

A collar 20 is also mounted on said rod 34 adjacent the arm 3, the collar being adjustably, though fixedly, secured to said rod by means of a set screw 21. The collar 20 has an upstanding portion 20<sup>a</sup> for the reception of a hook-like brake band suspension member 22.

The arms 4 and 5 are notched at their extremities to provide slots 33 curved in configuration and having projections 32 of the arms to prevent the shaft 40 of the retaining means for holding the spool or bobbin 26 from moving out of the slots 33 under the impulses given the thread or yarn.

Secured to the member 22 is a brake band 23 of fabric or other suitable material. It will be noted that the member 22 normally extends to a point in very close proximity to and diametrically above a brake drum 24' of the spool holder 24 secured to the shaft 40. To the other end of the brake band 23 there is secured a weight 27. The brake band 23 intermediate of its ends passes through a slot 29 in a doubly bent arm 28. This arm 28 is adjustably secured to the plate or base 1, by means of a set screw 31 and a longitudinal slot 30 in the arm 28 itself. Movement of the arm 28, with the consequent movement of the slot 27, to the right as viewed in Figure 2 will result in a

greater length of the brake band 23 being forced into engagement with the brake drum 24'. The reverse motion will result in a lessening of the amount of braking surface applied.

An arm 42 secured to rod 34 is adapted to abut an arm 43 secured to arm 3 to limit the motion of the rod 34 under the influence of the spring 12.

From the foregoing it will be seen that my device operates as follows:

The initial setting of the amount of the braking surface of the band 23 is made by means of the arm 28, with its slots 29 and 30 and the set screw 30, in accordance with the character, texture, fineness and strength of the thread or yarn being wound. A change increasing the draft on the thread will result in a flexion of the arm 16 and an immediate partial rotation of the rod 34, the collar 20, and the hook 22 secured to said collar 20 against the action of the spring 12.

The end of the hook-shaped arm 20 has been disclosed as closely adjacent to and diametrically above the brake drum 24'. Hence the slightest degree of rotation of the rod 34 will result in freeing a portion of the brake band 23 from contact with said drum, thus permitting the spool holder and its spool to rotate more freely to feed the additional amount of thread necessary to supply the conditions causing the increased draft. When the draft is decreased the spring 12 will tend to rotate the rod 34 in the opposite direction, increasing the braking surface and preventing overrunning of the spool.

The principal improvements of the present device over the one shown in my co-pending application above referred to are as follows: The compensator arm is secured directly and fixedly to the rod and tends to rotate the same more promptly upon an increase in draft on the thread. In the earlier device no rotation took place until the coiled spring was sufficiently compressed. The brake supporting means is mounted diametrically above and in immediate juxtaposition to the brake drum so that the slightest increase in draft resulting in a rotation of the rod 34 will release a portion of the brake band from engagement with the drum. I have provided the arm 28 provided with means, slot 30 and pin 31, for making an initial adjustment of the amount of braking surface to be applied. The provision of the slot 29 in the arm 28 prevents any appreciable pendulous movement of the weight 27 from being transmitted to the band 23 in such a manner or degree as to result in an appreciable change in the amount of surface thereof engaging the drum 24'.

I claim—

1. In combination, in an unwinding de-

vice, a rotatable spool holder, a brake drum on said spool holder and rotatable therewith, a movable compensator arm operated by the draft of the thread being delivered from said spool, a brake band frictionally engaging said brake drum throughout a portion of the length of said band, means for adjusting the effective length of said brake band to be engaged by said brake drum, and means operable by the movement of the compensator arm to vary the extent of engagement of said band with said drum.

2. In combination, in an unwinding device, a rotatable spool holder, a brake drum on said spool holder and rotatable therewith, a movable compensator arm operated by the draft of the thread being delivered from said spool, a brake band frictionally engaging said brake drum throughout a portion of the length of said band, means for adjusting the effective length of said brake band to be engaged by said brake drum, and means operable by the movement of the compensator arm to vary the pressure of said brake band on said brake drum.

3. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band, a rod rotatably mounted in said frame, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the draft on the thread being wound, and manually adjustable means for adjusting the effective length of band to be in contact with said drum.

4. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material having a weight suspended from one end and being attached at its other end to an arm secured to a rod rotatably mounted in said frame, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the draft on the thread being wound, and manually adjustable means for adjusting the effective length of said band to be in contact with said drum.

5. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material having a weight suspended from one end and being attached at its other end to an arm secured to a rod rotatably mounted in said frame, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the draft on the thread being wound, and manually adjustable means through which

said band passes for adjusting the effective length of said band to be in contact with said drum.

6. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material having a weight suspended from one end and being attached at its other end to an arm secured to a rod rotatably mounted in said frame, the point of attachment of said band to said arm being at a point above and in close proximity to said drum, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the draft on the thread being wound, and manually adjustable means for adjusting the effective length of said band to be in contact with said drum.

7. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material having a weight suspended from one end and being attached at its other end to an arm secured to a rod rotatably mounted in said frame, the point of attachment of said band to said arm being at a point diametrically above and in close proximity to said drum, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the draft on the thread being wound, and manually adjustable means for adjusting the effective length of said band to be in contact with said drum.

8. In combination, in an unwinding device, a frame, a rotatable spool holder mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material having a weight suspended from one end and being attached at its other end to an arm secured to a rod rotatably mounted in said frame, the point of attachment of said band to said arm being at a point diametrically above and in close proximity to said drum, a flexible compensator arm fixedly secured to said rod, means tending to rotate said rod in a direction opposed to the tendency to rotation caused by the

draft on the thread being wound, and manually adjustable means through which said band passes for adjusting the effective length of said band to be in contact with said drum.

9. In combination, in an unwinding device, a frame, a spool holder rotatably mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material suspended from means movably mounted in said frame, the point of suspension being above and in close proximity to said drum, and means below said drum for adjusting the effective length of said band to engage said drum.

10. In combination, in an unwinding device, a frame, a spool holder rotatably mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material suspended from means movably mounted in said frame, the point of suspension being diametrically above and in close proximity to said drum, and means below said drum for adjusting the effective length of said band to engage said drum.

11. In combination, in an unwinding device, a frame, a spool holder rotatably mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material suspended by one end thereof from means movably mounted in said frame, the point of suspension being above and in close proximity to said drum, a weight secured to the other end of said band, and means below said drum for adjusting the effective length of said band to engage said drum.

12. In combination, in an unwinding device, a frame, a spool holder rotatably mounted in said frame and having a brake drum rotatable therewith, a brake band of flexible material suspended by one end thereof from means movably mounted in said frame, the point of suspension being diametrically above and in close proximity to said drum, a weight secured to the other end of said band, and means through which said band passes at a point below said drum for adjusting the effective length of said band to engage said drum.

In testimony whereof I affix my signature.

JAMES DANIEL JOYCE.