

A. PETERSEN.
 THREAD CARRIER.
 APPLICATION FILED JAN. 5, 1912.

1,043,788.

Patented Nov. 5, 1912.
 2 SHEETS—SHEET 1.

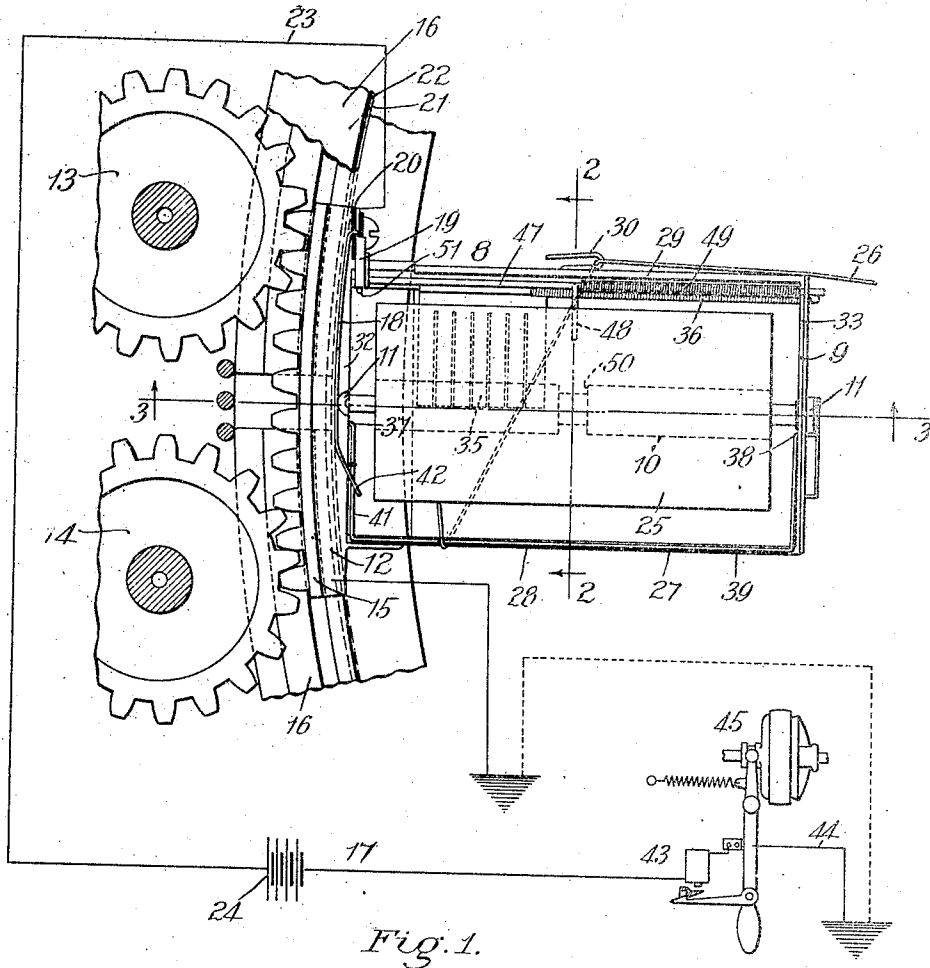


Fig. 1.

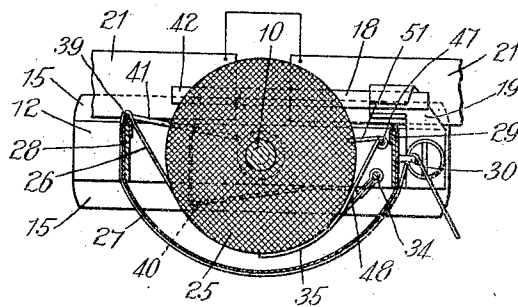


Fig. 2.

Witnesses.
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 Leonard A. Powell

Inventor:
 Aulis Petersen
 By his attorney Charles S. Goring

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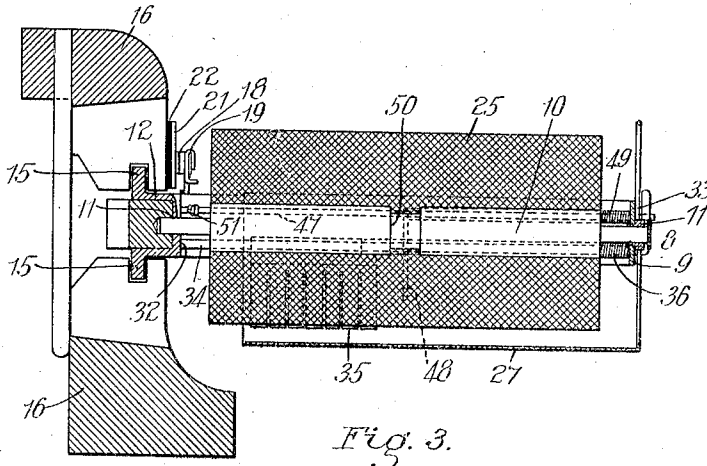


Fig. 3.

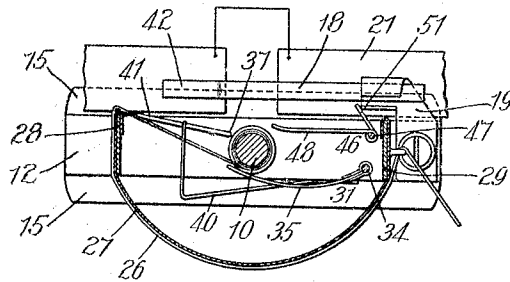


Fig. 4.

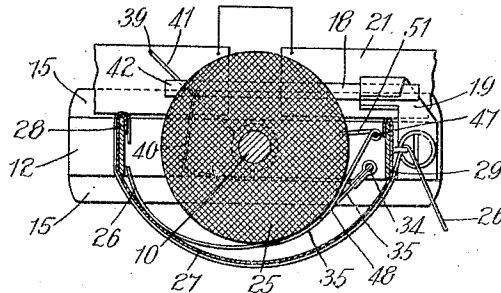


Fig. 5.

Witnesses.
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 Leonard A. Powell.

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UNITED STATES PATENT OFFICE.

ANKER PETERSEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO BOSTON MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

THREAD-CARRIER.

1,043,788.

Specification of Letters Patent.

Patented Nov. 5, 1912.

Application filed January 5, 1912. Serial No. 669,548.

To all whom it may concern:

Be it known that I, ANKER PETERSEN, a subject of the King of Denmark, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Thread-Carriers, of which the following is a specification.

This invention relates to improvements in thread carriers particularly suitable for use in connection with braiding machines and looms.

The object of the invention is to provide a device which is adapted to detect a thread breakage and to close an electric circuit by means of said detecting device, whereby said machine may be stopped or whereby the condition of said thread may be indicated.

The object of the invention is further to provide a device adapted to cooperate with the thread-mass carried thereby in completing an electric circuit just prior to the spending of the thread constituting said thread-mass, but at a sufficient length of time in advance thereof to allow thread enough to remain thereon to supply the machine until the same has come to a dead stop, or until sufficient warning has been given to the operator thereof to stop said machine.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a plan view of a device embodying my invention with pinions shown in connection therewith constituting one of the many forms of driving means which may be used in connection with a carrier of this character, and an electric circuit shown in diagrammatic form connected therewith. Fig. 2 is a section taken on line 2-2 of Fig. 1 illustrating the parts therein in their normal operative relation to each other. Fig. 3 is a longitudinal section, partly in elevation, taken on line 3-3 of Fig. 1. Fig. 4 is a section similar to Fig. 2 with the parts shown in their relative positions as they would appear just prior to the spending of

the thread carried thereby. Fig. 5 is a section similar to Fig. 2 illustrating the manner in which connection is made between the electric circuit terminals when the thread breaks.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, referring particularly to Figs. 1, 2 and 3, 8 is a thread carrier preferably consisting of a rectangular support 9 having a spindle 10 journaled to rotate thereon in bearings 11, 11. For the purpose of illustrating one form of support and the electric circuit connections for the carrier, I have illustrated said carrier as having a segmental end 12 having teeth thereon engaging pinions 13 and 14, adapted to be rotated by any suitable means not shown in the drawings. The segmental end is also provided with flanges 15, 15 which engage a support 16, and constitutes one of the terminals of an electric circuit 17 which is grounded in the frame of the machine and has direct connections with said segment.

A spring 18 is mounted upon a bracket 19 which in turn is mounted upon the carrier 9 and insulated therefrom by means of the insulating material 20, said spring and bracket constituting a second terminal for said electric circuit 17, said spring having engagement with a stationary conductor 21 mounted upon the stationary part of the machine and insulated therefrom by the insulation 22. Said conductor is in turn connected to the wire 23 leading to any suitable source of supply such as a battery 24 as herein shown. The spindle 10 is adapted to carry a thread-mass 25 having a thread 26 leading outwardly therefrom to the work which is being formed by the machine to which said carrier is connected.

A shield 27 is preferably provided to protect the thread-mass 25 upon the under side thereof and is secured to the sides 28 and 29 of the rectangular support 9. A thread-guide 30 is secured to one of the sides of said support, preferably 29, and adapted to guide the thread 26, which extends from beneath the thread-mass 25 upwardly to the upper edge of the side 28,

thence around beneath said shield 27 through said guide 30 and thence to the work being formed by said machine. A thread tensioning device 31 is pivotally mounted upon the ends 32 and 33 of the support 9 and preferably consists of a rod 34 to which is secured a feeler 35 which is adapted to engage said thread-mass upon or adjacent to its under side and is yieldingly held thereagainst by a torsional spring 36.

In a braiding machine or a loom, where a large number of carriers are employed, it is often difficult to know when the thread leading from the thread-masses, carried by said thread carriers, breaks and owing to this difficulty the work being formed on said machines might be ruined before the breakage becomes known. To obviate this and to insure the stopping of the machine, when a thread breaks or to signal the operator that a thread has been broken, I have provided a detector, which is preferably U-shaped and is pivoted at 37 and 38 in the ends 32 and 33 respectively of said support and is provided with a feeler 39 extending longitudinally of said support substantially parallel with the axis of said spindle and is adapted to engage the thread 26 at a point adjacent to the upper edge of one of the sides of said support preferably 28. A spring 40 secured in the support 9 is adapted to engage said detector and yieldingly urge the same upwardly against said thread. The pressure exerted by the spring 40 is less than the pressure exerted upon the thread mass 25 by the tensioning device 31, and it will therefore be seen that owing to this variation in pressure between said tensioning device and said detector that the thread 26 extending from said thread-mass over said feeler 39 and the upper edge of the side 28 would be drawn in a comparatively straight line, but upon the breakage of said thread said feeler would be allowed to fly upwardly to the position shown in Fig. 5 at which time the arm 41 of said detector would engage the opposite end 42 of the spring 18 and thereby connect the terminal; and being of a suitable current conducting material and pivotally mounted in the segment 12, which is also a current conductor, said terminal 12 will be connected with the terminal 18 and thus permit the current to pass therethrough, through the wire 23 connecting the battery 24, thence through the windings of the electro-magnet 43, thence through the conductor 44 which is grounded in the frame and conducted therethrough to the terminal 12.

In connection with the electro-magnet 43 I have illustrated, in diagrammatic form, a power transmission device 45 which may be controlled by said magnet in any suitable manner, whereby the machine to which the same is connected may be stopped.

In addition to the trouble sometimes caused by the breaking of the thread, there is often a great deal of trouble caused by the thread on some of the carriers being spent, whereupon if not detected immediately, a defect will appear in the work being formed on the machine of which said carrier is a part. To overcome this difficulty a second detector 46 is provided consisting of a rod 47 which is pivoted in the ends 32 and 33 of the support 9 and is also provided with a feeler 48 which is adapted to engage the outer surface of said thread-mass and is yieldingly pressed thereagainst by a torsional spring 49 which encircles the rod 47. The feeler 48 is preferably slightly longer than the distance between the outer surface of the spindle 10 and the axis of the rod 47. Thus it will be seen that said feeler will be prevented from being swung upwardly and beyond the plane connecting the axis of said rod and the axis of said spindle. But in order to permit said feeler to pass by said spindle and across said plane, an annular groove 50 is formed in the spindle 10 of sufficient depth to permit a plurality of coils of thread to be wound therein and still permit said feeler to swing upwardly therethrough. Secured to the end of the rod 47, adjacent to the end 32 of said support is a pin 51 which is adapted to engage the bracket 19 upon which the spring 18 is supported. In the operation of said carrier, the pin 51 will be normally held out of engagement with said bracket 19 by the thread-mass carried by said spindle preventing the upward movement of the feeler 48, but when said thread is spent, with the exception of a plurality of courses contained in said annular groove, said feeler is allowed to swing upwardly until said pin engages said bracket, when the terminal 12 will be connected therethrough with the terminal 18 and the electric circuit 17 closed, whereby said machine may be stopped or the state of said thread-mass indicated by any suitable device, and on account of the thread contained in said annular groove, said machine may continue to operate for a short time without making a defect in the work being formed therein.

The general operation of the device is as follows: The spindle 10 having a suitable amount of thread wound thereon is placed upon the support 9 in the bearing 11, the tension feeler 35 and detector feeler 46 being forced downwardly against the actions of their respective springs and the pin 51 moved away from the bracket 19 thereby disconnecting the terminals 18 and 21. The end of the thread from the thread-mass 25 is then drawn out from the under side of said thread-mass, thence upwardly and over the feeler 39, thence around beneath the shield 27 through the thread-guide 30 to the

point where the work is formed and upon drawing said thread taut, said feeler 39 is swung downwardly against the action of the spring 40 whereby the connection between the end 42 of the terminal 18 and the terminal 20 is broken, thereby opening the electric circuit 17 and deenergizing the magnet 43. When this operation has been performed upon each of the carriers contained in the machine, said machine is ready to be started which may be done by any suitable device controlled by the electro-magnet 43 when it is desired that a thread breakage or a spent thread is to stop the machine.

If during the operation of said machine the thread 26 should break, the feeler 39 on the detector is released whereupon said detector is forced upwardly to the position illustrated in Fig. 5, when the arm 41 will engage the terminal 18 thereby connecting said terminal with the terminal 12 upon which said arm is pivoted, and close the electric circuit 17 and energizing the magnet 43.

When the thread on the spindle 10 is nearly spent, that is, with the exception of several courses of thread which are contained in the annular groove 50, the feeler 46 is released and allowed to swing upwardly upon its pivots until the pin 51 engages the bracket 19 whereupon the terminal 12 is connected with the terminal 18 and thus the electric circuit 17 will be closed, whereby the result hereinbefore stated will be accomplished.

It will be obvious that this invention may be adapted to any device or machine employing thread carriers or thread-masses, and furthermore the specific construction of the device would not necessarily have to be carried out as herein shown and described, as many variations and changes might be made without departing from the spirit of the invention or sacrificing the advantages obtained thereby.

Having thus described my invention what I claim and desire by Letters Patent to secure is:

1. A thread carrier having, in combination, a support, a spindle mounted in said support, adapted to carry a thread-mass having a thread tensioning device, electric circuit terminals, a U-shaped detector pivoted at each end thereof to said support adapted to connect said terminals, the portion of said detector connecting the legs thereof constituting a feeler extending substantially parallel with the axis of said spindle, and adapted to engage a thread leading outwardly from said thread-mass, means adapted to yieldingly urge said detector into connecting relation with said terminals, and thread tensioning means adapted to overcome the pressure exerted on said thread by said yielding means, whereby said detector

is held in disconnected relation to said terminals.

2. A thread carrier having, in combination, a support, a spindle mounted in said support adapted to carry a thread-mass, electric circuit terminals, a detector pivotally mounted upon said support having a feeler tangentially disposed relatively to said thread mass and adapted to engage the periphery thereof adapted to connect said terminals and to be normally retained in disconnected relation therewith by said thread-mass.

3. A thread carrier having, in combination, a support, a spindle mounted in said support adapted to carry a thread-mass, and provided with an annular groove adapted to contain a plurality of coils of thread, electric circuit terminals, and a detector adapted to connect said terminals and to be normally held in disconnected relation thereto by the thread contained in said thread-mass exclusive of the thread in said annular groove.

4. A thread carrier having, in combination, a support, a spindle rotatably mounted in said support, provided with an annular groove adapted to contain a plurality of coils of thread, said spindle being adapted to carry a thread-mass having a plurality of coils of thread extending into said groove, and a detector having engagement with said thread-mass adjacent to said groove, adapted to connect said terminals and to be normally held in disconnected relation thereto by the thread contained in said thread-mass exclusive of the thread in said annular groove.

5. A thread carrier having, in combination, a support, a spindle rotatably mounted in said support, provided with an annular groove adapted to contain a plurality of coils of thread, said spindle being adapted to carry a thread-mass having a plurality of coils of thread extending into said groove, and a pivotally mounted detector having yielding engagement with said thread-mass, adjacent to said groove, adapted to connect said terminals and to be normally held in disconnected relation thereto by the thread contained in said thread-mass exclusive of the thread in said annular groove.

6. In combination, an electric circuit, a thread carrier embodying in its construction a support constituting one of the terminals of said circuit, adapted to carry a thread-mass having a thread leading outwardly therefrom, a second terminal for said circuit carried by said support and insulated therefrom, a detector adapted to connect said terminals and provided with a feeler extending longitudinally of said thread-mass, substantially parallel with the axis thereof, said feeler also being adapted to engage said thread and to be normally

held in disconnected relation to said terminals, and a second detector adapted to connect said terminals, to engage said thread-mass and to be normally held in disconnected relation to said terminals by said thread-mass.

5 In testimony whereof I have hereunto set

my hand in presence of two subscribing witnesses.

ANKER PETERSEN.

Witnesses:

CHARLES S. GOODING,
SYDNEY E. TAFT.