Dec. 2, 1924. 1,517,840

E. KOELLA

BRAIDER CARRIER

Original Filed Aug. 1, 1922 2 Sheets-Sheet 1

Fig. 1.

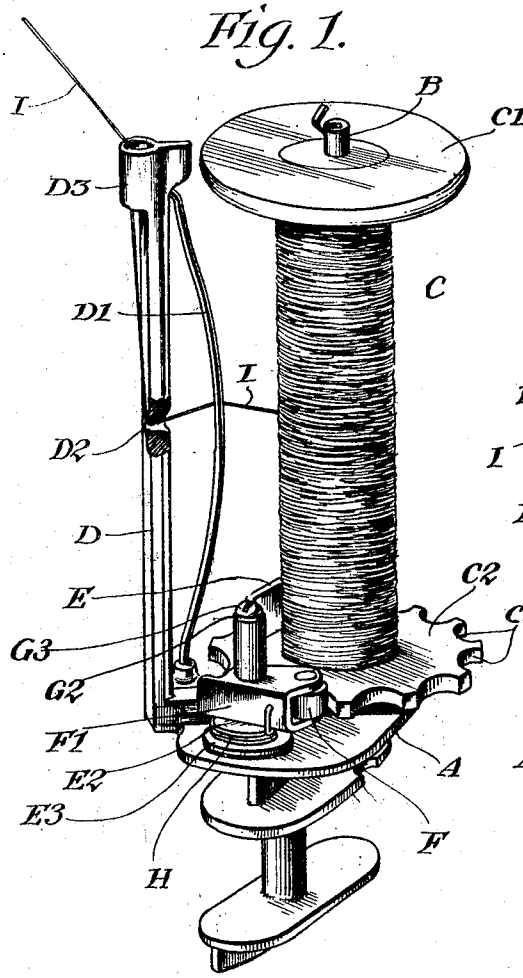


Fig. 2.

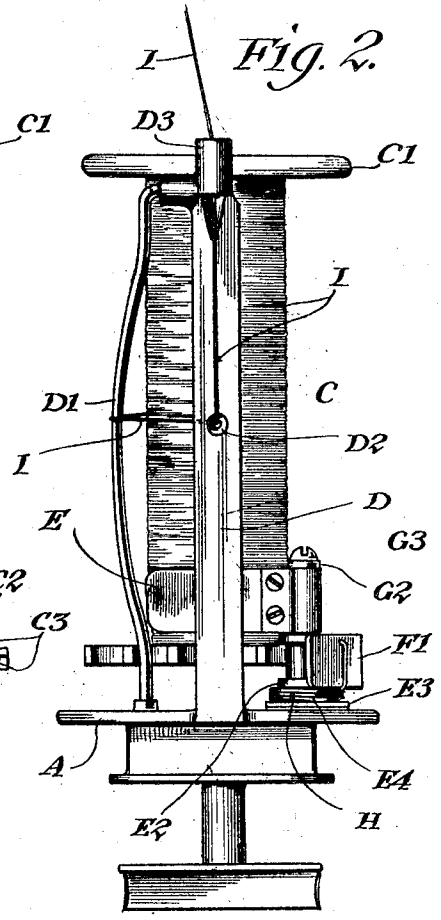
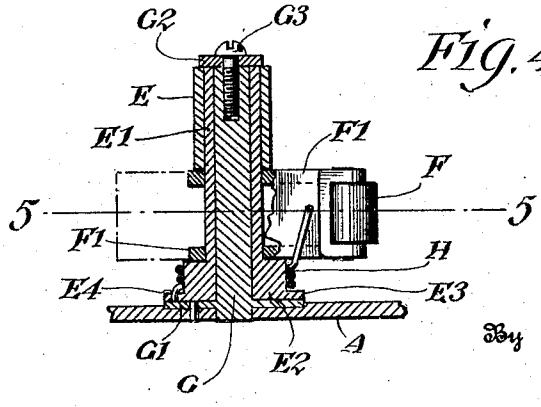


Fig. 4.



Inventor

Ernest Koella

By Cyrus Keller

Attorney

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Fig. 3.

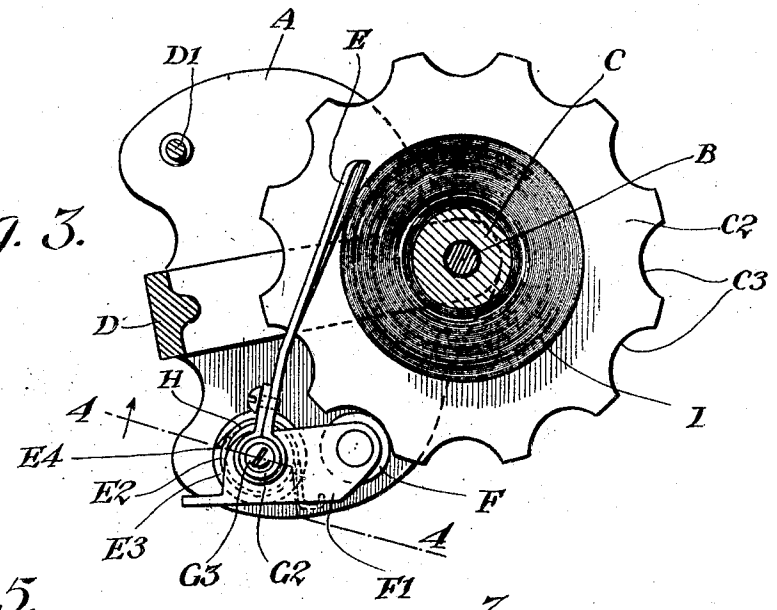


Fig. 5.

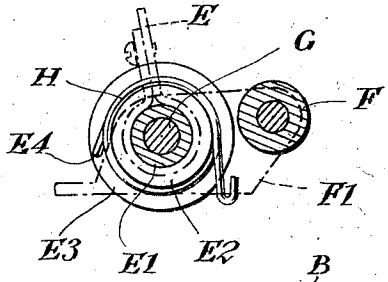
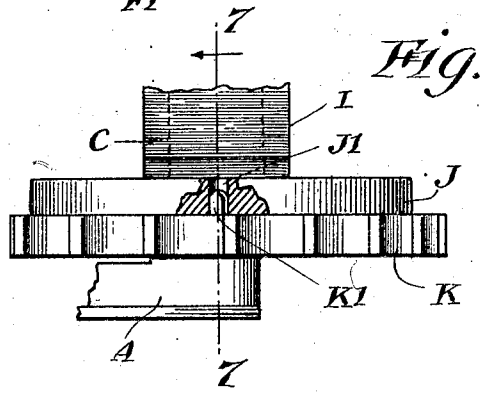


Fig. 6.



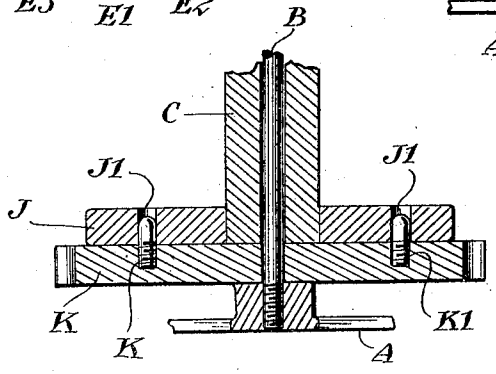


Fig. 7.

Inventor

Ernest Koella

By Cyrus Keller

Attorney

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UNITED STATES PATENT OFFICE.

ERNEST KOELLA, OF ROCKFORD, TENNESSEE.

BRAIDER CARRIER.

Application filed August 1, 1922, Serial No. 578,880. Renewed October 3, 1924.

To all whom it may concern:

Be it known that I, ERNEST KOELLA, a citizen of the United States, residing at Rockford, in the county of Blount and State of Tennessee, have invented a new and useful Improvement in Braider Carriers, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates particularly to means for controlling the rotation of spools in braider carriers.

The object of the invention is to provide mechanism whereby the spool is made to offer substantially uniform resistance to the unwinding of the cord throughout the unwinding, whether the quantity of cord on the spool is large or small.

In the accompanying drawings,

Fig. 1 is a perspective of a carrier embodying my improvement;

Fig. 2 is an elevation looking at the carrier from the left as shown in Fig. 1;

Fig. 3 is a transverse section of the structure shown by Figs. 1 and 2;

Fig. 4 is an upright section on the line, 4—4, of Fig. 3;

Fig. 5 is a horizontal section on the line, 5—5, of Fig. 3;

Figs. 6 and 7 show modifications, wherein the resistance disc is separable from the spool.

Referring first to Figs. 1 to 5, inclusive, A is a base from which rises the stationary upright spool axle, B, which is loosely surrounded by the spool, C, having a plain upper disc, C^1, and a lower disc, C^2, which serves as a resistance disc. Said disc is preferably notched, as shown by the drawings, to form a ratchet let-off. From the base, A, there rises a cord guiding column, D, which stands parallel to the axle, B. Near said column is a wire cord guide, D^1, having its lower end rigidly secured to the base, A, and having its upper end turned laterally and secured rigidly to the column, D. Near its middle, the column, D, has an aperture, D^2, which forms a guide for the cord, I. At its upper end, said column has an upright passage or eye, D^3, for guiding the cord, I.

The cord passes from the spool across the guide, D^1, and through the aperture, D^2, and thence upward through the upper aperture or eye, D^3, as shown by the drawings.

In addition to serving the function of guiding, the bar or guide, D^1, and the apertures, D^2 and D^3, offer frictional resistance to the moving of the cord. Further resistance to the moving of the cord is offered by restraining the rotation of the spool. This is accomplished by two members, one being a presser blade, E, and the other being a presser roller, F. Said members are located at opposite sides of an upright plane cutting the column, D, and the spool axle, B. The presser blade presses yieldingly upon the mass of cord on the spool. The presser roller presses yieldingly against the periphery of the lower disc or ratchet let-off, C^2. To increase the resistance offered by the roller and to make such resistance variable or spasmodic, the periphery of the lower disc, C^2, is preferably provided with notches, C^3, whereby said disc is made a ratchet let-off.

The presser roller is carried on a support, F^1, which loosely surrounds a sleeve, E^1, which loosely surrounds a post, G, which rises from and is rigid on the base, A. Said post has a base, G^1, resting on the base, A. On the lower part of the sleeve, E^1, is a hub, E^2, which forms a rest for the presser roller support, F^1. Said hub rests on the base, A. At the lower part of the hub is a flange, E^3, in which is a socket, E^4, at the side of said plane opposite the presser roller. A spring, H, is coiled around the hub, E^2, so as to make the ends of the spring tend to move toward the space between the post, G, and the spool. One end of the spring rests in the socket, E^4, and tends to turn the hub clockwise. The other end of the spring is turned upward and extends over the outer face of the roller support, F^1, between the sleeve, E^1, and the roller, F, and tends to turn the roller support, F^1, contraclockwise, whereby the roller, F, is pressed against the disc or ratchet let-off, C^2.

Above the roller support, F^1, the sleeve, E^1, supports the presser blade, E, one end of said blade surrounding said sleeve while the other end of the blade is in position to bear against the mass of cord on the lower part of the spool. The blade is folded

around the sleeve, E^1, and two binding screws, E^5, extend through the end and the body of the blade beside the sleeve and serve to bind the folded part of the blade immovably to the sleeve.

On the upper end of the post, G, is a washer, G^2, large enough to extend across the sleeve, E^1. A screw, G^3, extends downward through said washer into the post, G, to hold the washer in place.

From the foregoing it will be seen that the resistance offered to the passing of the edge of the disc or ratchet let-off, C^2, over the presser roller, F, depends upon the distance at which the free end of the presser blade is held from the spool axle, B. The farther the presser blade is held from said axle, the harder the presser roller will bear against the resistance disc, and the more resistance the presser roller will offer to the turning of the disc, C^2; for then the spring, H, is under greater tension.

In connection with the foregoing it must be noted that as the unwinding of the cord proceeds, the point at which the cord pulls on the spool moves closer and closer to the spool axis. From that point to the axis is a diminishing arm of a lever, the other arm of which extends from said axis to the edge of the disc. The diminishing of said arm reduces the effectiveness of the strain on the cord for turning the spool. This diminution in effectiveness of said cord strain must be taken into account while making provision for diminishing the pressure of the roller on the edge of the ratchet let-off.

To allow the unwinding of the cord, I, from the spool by movement of the cord through the aperture, D^1, and the eye, D^3, at uniform speed, the rotation of the spool, including the ratchet let-off, C^2, must be allowed to increase as the mass of cord on the spool is made of smaller diameter. Hence it is desirable that the aggregate resistance to the turning of the spool be diminished simultaneously with and proportional to the reduction of diameter of the cord mass on the spool, in order that the force needed to pull the cord through the eye, D^3, may be substantially uniform during the operation of the braiding machine. The roller support and the presser blade are made of such relative dimensions as to allow the changing of the presser roller pressure toward the resistance disc at such rate as will require the same pull on the cord during the unwinding of all of the cord from the spool.

Furthermore, in providing for changing the presser roller pressure toward the ratchet let-off, the fact must be taken into account that the resistance afforded by the roller, under a given pressure, to the turning of the ratchet let-off depends in part upon the velocity of rotation of the let-off, the engagement between the let-off and the roller being increased by increase in velocity of the let-off. For when the velocity of the let-off increases, the impact between the teeth of the let-off and the roller increases in force. It is also to be noted that such impact varies with the size and inclination of said teeth.

In Figs. 6 and 7, two discs, J and K, are applied to the lower end of the spool, the disc, J, being in plain form like the upper disc, C^1, and the disc, K, being below the disc, J, and detachably engaged with the disc, J, and having notches similar to the notches on the disc, E^2, of Figs. 1, 2 and 3. The disc, K, loosely surrounds the spool axle, B. On the disc, K, are studs, K^1, which rise loosely into sockets, J^1, formed in the disc, J. Thus engagement is made between these two discs which compels the rotation of these discs in unison. Hence the turning of the spool by pulling on the cord for unwinding causes the rotation of both these discs. The presser roller, F, in this case bears against the notched resistance disc, K. When all the cord has been unwound from the spool, that spool is to be lifted out of position on the spool axle, the disc, K, being detached and then put into engagement with the next spool placed on the spool axle.

I claim as my invention,

1. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord from the spool, presser mechanism having one part located to bear against the mass of cord on the spool and having another part located to bear against the ratchet let-off, and elastic means tending to press the first part of said presser mechanism against the cord mass on the spool and tending to press the other part of said mechanism against the ratchet let-off, substantially as described.

2. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord from the spool, two presser members, the first located to bear against the mass of cord on the spool and the second located to bear against the resistance disc, and elastic means intervening said presser members and tending to press the first of said members against the cord mass on the spool and tending to press the second of said members against said ratchet let-off, substantially as described.

3. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, two hinged presser structures each turnable independently of the other and the first being adapted to bear against the cord mass on the spool and the second being adapted to

bear upon the ratchet let-off, and elastic means intervening the two presser structures and tending to press the first of said structures against the cord mass on the spool and tending to press the second presser structure against the ratchet let-off substantially as described.

4. In a mechanism of the kind described, the combination with a base, of spool mechanism comprising a ratchet let-off, means for guiding cord passing from the spool, two hinged presser structures each turnable independently of the other and the first being adapted to bear against the cord mass on the spool at one side of an upright plane cutting the spool axis and the second being adapted to bear upon the ratchet let-off at the other side of said plane, and elastic means intervening the two presser structures and tending to press the first of said structures against the cord mass on the spool and tending to press the second presser structure against the ratchet let-off, substantially as described.

5. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, two presser structures hinged on a common axial line and turnable independently of each other and the first being adapted to bear against the cord mass on the spool and the second being adapted to bear upon the ratchet let-off, and elastic means intervening the two presser structures and tending to press the first of said structures against the cord mass on the spool and tending to press the second presser structure against the ratchet let-off, substantially as described.

6. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, two presser structures hinged on a common upright axial line and turnable independently of each other and the first being adapted to bear against the cord mass on the spool and the second being adapted to bear upon the ratchet let-off, and elastic means intervening the two presser structures and tending to press the first of said structures against the cord mass on the spool and tending to press the second presser structure against the ratchet let-off, substantially as described.

7. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, a post, a sleeve rotatably surrounding the post, two presser members, one of which is turnable with and the other turnable on the sleeve, and one being adapted to bear against the cord mass on the spool and the other being adapted to bear against the ratchet let-off, and elastic means tending to press one of the presser structures against the cord mass on the spool and the other tending to press the other presser structure against the ratchet let-off, substantially as described.

8. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, a post, a sleeve rotatably surrounding the post, two presser members, one of which is turnable with and the other turnable on the sleeve, and one being adapted to bear against the cord mass on the spool and the other being adapted to bear against the ratchet let-off, and a spring supported by the sleeve and tending to press one of the presser structures against the cord mass on the spool and the other tending to press the other presser structure against the ratchet let-off, substantially as described.

9. In a mechanism of the kind described, the combination with a base, of spool mechanism including a ratchet let-off, means for guiding cord passing from the spool, a post, a sleeve rotatably surrounding the post, two presser members, one of which is turnable with and the other turnable on the sleeve, and one being adapted to bear against the cord mass on the spool and the other being adapted to bear against the ratchet let-off, and a spring coiled around the sleeve and tending to press one of the presser structures against the cord mass on the spool and the other tending to press the other presser structure against the ratchet let-off, substantially as described.

In testimony whereof I have signed my name this 28th day of July, in the year one thousand nine hundred and twenty-two.

ERNEST KOELLA.