C. J. ULMANN.

DEVICE FOR WINDING YARN AND THE LIKE.

APPLICATION FILED JULY 6, 1915.

1,224,977.

Patented May 8, 1917.

Fig. 1.

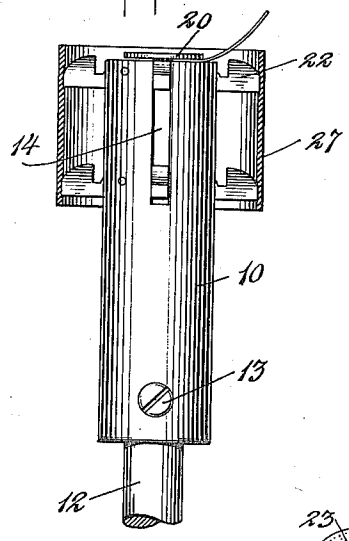


Fig. 2.

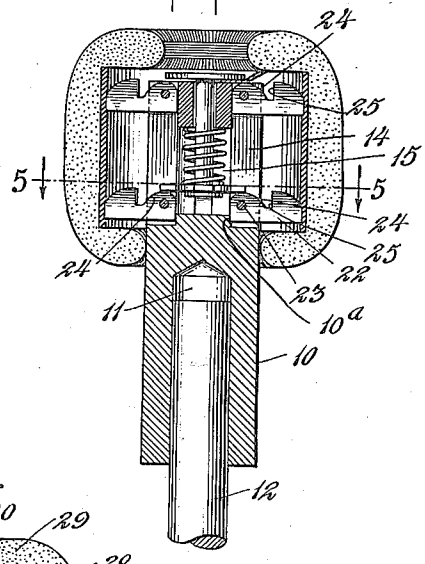


Fig. 3.

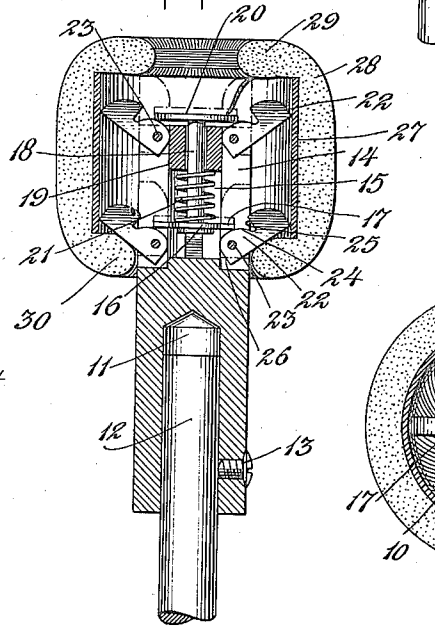


Fig. 4.

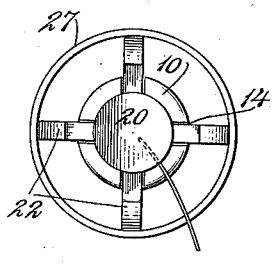
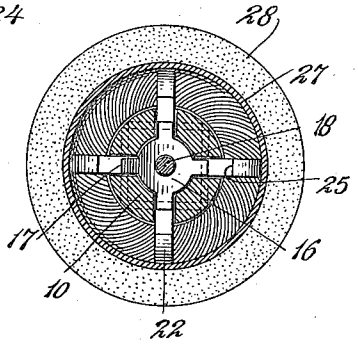


Fig. 5.



WITNESSES

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UNITED STATES PATENT OFFICE.

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DEVICE FOR WINDING YARN AND THE LIKE.

1,224,977. Specification of Letters Patent. Patented May 8, 1917.

Application filed July 6, 1915. Serial No. 38,097.

To all whom it may concern:

Be it known that I, CARL J. ULMANN, a citizen of the United States, and resident of the borough of Manhattan, city, county, and State of New York, have invented a certain new and useful Improvement in Devices for Winding Yarn and the like, of which the following is a specification.

My invention relates to devices for winding yarn and the like and has for its object to provide a simple and efficient carrier upon which the yarn or the like may be wound in the form of a ball in a novel manner. My improvement further contemplates the provision of means whereby the ball of yarn or the like in the process of winding is firmly held against unintentional dislocation and yet is easily removed from the device when completely wound. Other objects of my invention will appear from the description hereinafter and the features of novelty will be pointed out in the appended claims.

An example of my improved arrangement is shown in the accompanying drawings in which Figure 1 is an elevation with the core on which the yarn or the like is wound shown in section; Fig. 2 is a vertical section showing the completed ball of yarn or the like; Fig. 3 is a similar view showing said completed ball in the act of being removed from the device; Fig. 4 is a plan view of Fig. 1; and Fig. 5 is a horizontal section on the line 5—5 of Fig. 2.

As shown in the drawings the device comprises a preferably cylindrical head or carrier 10 having an axial recess 11 at one end for the accommodation of the usual shaft or spindle 12 of the driving mechanism, any suitable means, such as for instance a screw 13, being provided for securing the head 10 upon the shaft 12 so as to rotate therewith. At its other end the holder 10 is provided with longitudinal slots 14 preferably arranged in diametrically opposite pairs and extending radially and inwardly into communication with an axial chamber 15, the said slots 14 and chamber 15 beginning at an intermediate point of the holder 10 and terminating in the free end face thereof as shown in Fig. 2. A member 16 is slidably mounted within the chamber 15 and is preferably provided with peripheral projections 17 which extend into the slots 14, the said member 16 being secured to the inner end of a rod or stem 18 which projects slidably through a bushing 19 secured in the outer end of said chamber 15 and at its outer end carries a clamping plate 20 as shown in Fig. 2. The parts are so arranged and proportioned that in the normal condition of the device the member 16 will be located near the inner end of the chamber 15, while the plate 20 will rest against the free end of the holder 10, said plate 20 projecting over the ends of the slots 14 as also illustrated in Fig. 2. The member 16 and plate 20 are maintained in and returned to this normal position for instance by means of a coil spring 21 which surrounds the rod or stem 18 and bears with its opposite ends respectively against the bushing 19 and the member 16. The arrangement further includes fingers 22 which are pivoted at 23 in the slots 14, each of which contains a pair of fingers located respectively near the inner and outer ends thereof and having cam surfaces 24 extending respectively beneath the plate 20 and the projections 17 and terminating at shoulders 25 formed on said fingers as shown in Fig. 2. These fingers 22 normally occupy a position at substantially right angles to the axis of said device or in other words project radially from the slots 14, the pressure of the projections 17 upon the cam surfaces 24 of the lower fingers 22 under the influence of the spring 21 serving to maintain said lower fingers in this position, excepting when a force sufficient to overcome the tension of said spring is exerted toward the free end of the carrier. The upper fingers 22 are similarly maintained in their extended positions by means of the plate 20 which exerts a pressure upon the cam surfaces 24 thereof through the medium of said spring 21. The said fingers 22 are further provided with angular or squared ends 26 which are arranged to engage the bushing 19 and portions 10^a of the carrier 10 whereby the pivotal movement of said fingers 22 toward their extended position is arrested or said fingers may engage the inner end walls of the slots for the same purpose, it being understood that any other arrangement producing the same result may be substituted if desired. The fingers are

otherwise so shaped as to permit a pivotal movement thereof in the opposite direction toward their folded position.

In using the device a tubular core 27 of any suitable material such as cardboard and preferably having a substantially uniform inner diameter throughout its length is placed over the fingers 22, it being understood that the inner diameter of said core relatively to the distance between the outer ends of each pair of diametrically opposite fingers 22 when the latter are in their horizontal position, is such that a frictional engagement between the inner surface of said core and the ends of said fingers is secured. In this manner the core 27 is firmly secured upon said fingers 22 so as to rotate with the carrier 10 as the shaft or spindle 12 is rotatably actuated by means of any suitable mechanism. It will be seen that the tubular core 27 is of considerably larger diameter than the diameter of the carrier 10 and is a true tube or cylinder of substantially even diameter throughout and without any end flanges or other projections. The yarn or the like 28 which is to be wound upon the core 27 substantially in the form of a ball may have its one end located beneath the plate 20 so that said end is firmly clamped between said plate and the free end of the carrier 10 or said end may be otherwise secured, after which the winding operation is commenced by applying power to the shaft or spindle 12. The winding operation may be carried out in the usual manner excepting that the said yarn or the like is also wound over the opposite ends of the core 27 to form an inwardly extending portion 30 in addition to the portion 29, the lower one engaging the carrier 10 and both inwardly overhanging the ends of the core 27 as shown in Fig. 2. After the desired amount of yarn or the like 28 has been wound on the core 27 to produce a ball of the desired size the winding operation is discontinued and a pressure toward the free end of the carrier 10, sufficient to overcome the tension of the spring 21, is exerted on the completed ball. This will cause the fingers 22 to swing on the pivots 23 as shown in Fig. 3 so that the core 27 is released from frictional engagement therewith, the operation at the same time, through the medium of the cam surfaces 24, acting upon the plate 20 and the projections 17 of the member 16 and moving said plate 20 away from the free end of the carrier 10 and thus releasing the heretofore clamped end of the yarn 28. A continued movement of the completed ball toward the free end of the carrier 10 will finally cause the inwardly extending portion 30 to engage the lower fingers 22 and thereby cause a continued pivotal or folding movement thereof and a continued axial movement of the combined member 16, rod 18 and plate 20 until finally said lower fingers 22 will lie entirely within the slots 14 as shown by dotted lines in Fig. 3. In this condition of the parts the projections 17 of the members 16 are located beneath the shoulders 25 of the lower fingers 22 and the ball of yarn or the like is free to be moved outwardly on said carrier 10 beyond said lower fingers 22. To completely remove said ball of yarn or the like from the carrier 10 the axial movement of said ball toward the free end of said carrier is continued until the upper fingers 22 are likewise swung or folded inwardly by said inwardly extending portion 30 so as to lie entirely within the outer periphery of said carrier 10 whereupon said ball is free to be completely withdrawn from said carrier as will be clearly apparent. As soon as said portion 30 of the ball has passed beyond the fingers 22 the latter will be returned to their outspread, horizontal position by the pressure of the plate 20 and the projections 17 upon the cam surfaces 24 of said fingers, due to the influence of the spring 21. It will be seen that the initial pivotal movement of the fingers 22 as the ball is being removed immediately causes a movement of the plate 20 away from the free end of the carrier so that the end of the yarn which is clamped beneath said plate during the winding operation is quickly released and does not interfere with the removal of the completed ball or cause an unwinding thereof.

With my arrangement the core 27 is firmly held against dislocation throughout the entire winding operation, as the tension exerted by the yarn and possibly tending to pull the core and partly completed ball from the carrier is never sufficient to overcome the tension of the spring 21. The danger of an interruption of the winding operation before the same has been fully completed or an unintentional dislocation of the core and partly completed winding whereby the whole ball structure is destroyed is thus entirely avoided and a loss of yarn owing to the same becoming entangled is done away with. Furthermore a more firmly and securely wound ball is produced with my improved device than has heretofore been possible while the inner end of said yarn is made readily accessible whereby an unwinding of the yarn under the most favorable conditions is possible with the danger of tangling or the like reduced to a minimum. With my improved device it is further possible to produce a ball of yarn having an enlarged hollow interior and two inwardly overhanging end portions forming reduced end openings communicating with said interior. In addition to this the core is more firmly held on the carrier than has

heretofore been possible and yet at the same time is removable therefrom in a simple and efficient manner and with a minimum of effort, so that the possibility of destroying or disarranging the winding during the removal of the ball from the carrier is also obviated.

Various changes in the specific form shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:

1. The combination of a carrier, a tubular core of even internal diameter throughout surrounding said carrier and spaced therefrom, and a plurality of devices normally projecting beyond the periphery of said carrier into frictional contact with the inner surface of said core whereby the latter is supported in spaced relation to said carrier, said devices being movable to positions in which no part thereof projects beyond said periphery of the carrier whereby said core and the ball of yarn or the like wound thereon and over its ends may be removed from said carrier.

2. The combination of a carrier, a tubular core surrounding said carrier and spaced therefrom, a plurality of fingers pivotally connected with said carrier and located in pairs at a distance from each other lengthwise of said carrier, said fingers normally projecting in a radial direction beyond said carrier into contact with the inner surface of said core whereby the latter is supported in spaced relation to said carrier, said fingers being movable to inoperative positions entirely within the periphery of said carrier whereby said core and a ball of yarn or the like wound thereon and over its ends may be removed from said carrier and yielding means for maintaining said fingers in their normal positions and arranged to yield as said fingers are moved to their inoperative positions.

3. The combination of a carrier having radial slots, fingers mounted in said slots and normally projecting radially out of same, said fingers being movable to an inoperative position entirely within the periphery of said carrier, resilient means for maintaining said fingers in their normal position and arranged to yield as said fingers are moved to said inoperative position and yarn clamping means operatively connected with said resilient means.

4. The combination of a carrier having radial slots, fingers mounted in said slots and normally projecting radially out of same, said fingers being movable to an inoperative position entirely within the periphery of said carrier, resilient means for maintaining said fingers in their normal position, and yarn clamping means operatively connected with said resilient means, said fingers being provided with cam surfaces adapted to actuate said resilient means as said fingers are moved to said inoperative position whereby said clamping means is moved to a releasing position.

5. The combination of a carrier having an axial chamber and radial slots communicating therewith, fingers pivotally mounted in said slots and normally projecting out of same, said fingers being movable to an inoperative position entirely within the periphery of said carrier, a member slidably mounted in said chamber, peripheral projections on said member extending into said slots, a yarn clamping plate at the free end of said carrier, a rod connecting said member and said plate, and a spring in said chamber bearing against said member, said fingers being provided with cam surfaces adapted to engage said projections whereby said member, rod and clamping plate are actuated against the tension of said spring as the fingers are moved to said inoperative position.

6. The combination of a carrier having an axial chamber and radial slots communicating therewith, a pair of fingers pivotally mounted in each slot and located respectively near the opposite ends thereof, said fingers being movable to an inoperative position entirely within the periphery of said carrier, a member slidably mounted in said chamber, peripheral projections on said member extending into said slots, a yarn clamping plate at the free end of said carrier, a rod connecting said member and said plate and a spring surrounding said rod and bearing against said plate, said fingers being provided with cam surfaces extending respectively beneath said clamping plate and said projections whereby said member, rod and clamping plate are actuated against the tension of said spring as said fingers are moved to an inoperative position.

7. The combination of a carrier having radial slots, fingers movably mounted in said slots and normally projecting radially out of same, a tubular core surrounding said fingers and having its inner surface in frictional engagement therewith, and adapted to form a support for a ball of yarn wound on said core and inwardly overlapping the ends thereof, said fingers being movable to an inoperative position by an axial movement of said core and ball of yarn to permit a removal thereof from said carrier.

8. The combination of a carrier having radial slots, fingers pivoted in said slots and normally projecting radially out of same, yielding means for maintaining said fingers in their normal position, a tubular core surrounding said fingers and having its inner surface in frictional engagement therewith, and adapted to form a support for a ball of

yarn wound on said core and inwardly overlapping the ends thereof, said fingers being movable to a position entirely within the periphery of said carrier in opposition to said yielding means to release said core and permit a removal thereof with said ball of yarn from said carrier.

9. The combination of a carrier having an axial chamber and radial slots communicating therewith, a pair of fingers pivotally mounted in each slot near the opposite ends thereof, and normally projecting radially out of said slots, a tubular core surrounding said fingers and having its inner surface in frictional engagement therewith and adapted to form a support for a ball of yarn wound upon said core and inwardly overlapping the ends thereof, a member slidably mounted in said chamber, a clamping plate at the free end of said carrier arranged to clamp an end of said yarn, a rod connecting said member and said plate and a spring surrounding said rod and bearing upon said member, said fingers being movable to an inoperative position entirely within the periphery of said carrier and being provided with cam surfaces extending respectively beneath said clamping plate and member whereby said rod and member are actuated against the tension of said spring and said clamping plate is operated to release said yarn end as said fingers are moved to said inoperative position and said ball of yarn and core is free to be removed from said carrier.

In testimony whereof I have hereunto set my hand.

CARL J. ULMANN.