Sept. 29, 1964 C. POOL 3,150,845

MAGAZINE CREEL

Filed Nov. 17, 1960 2 Sheets-Sheet 1

fig _1_

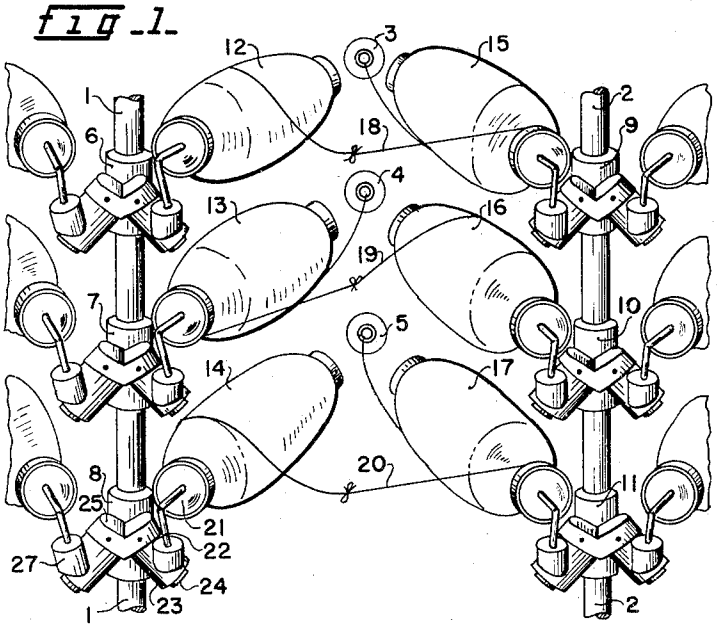


fig _2_

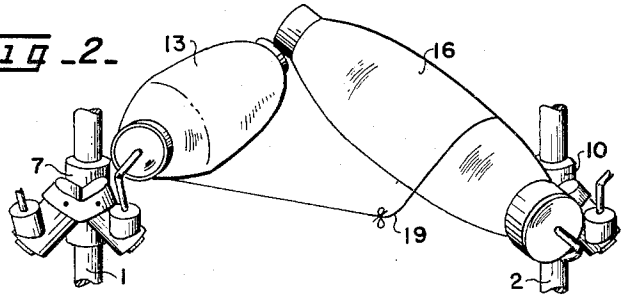
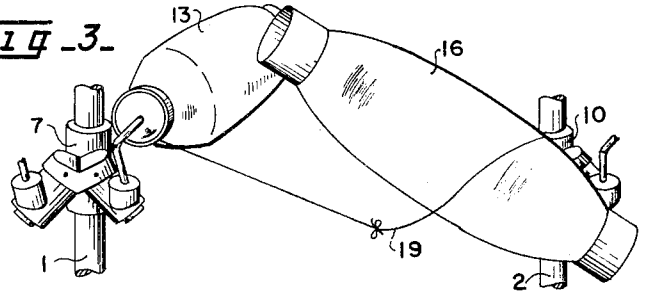


fig _3_



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MAGAZINE CREEL

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fig -4-

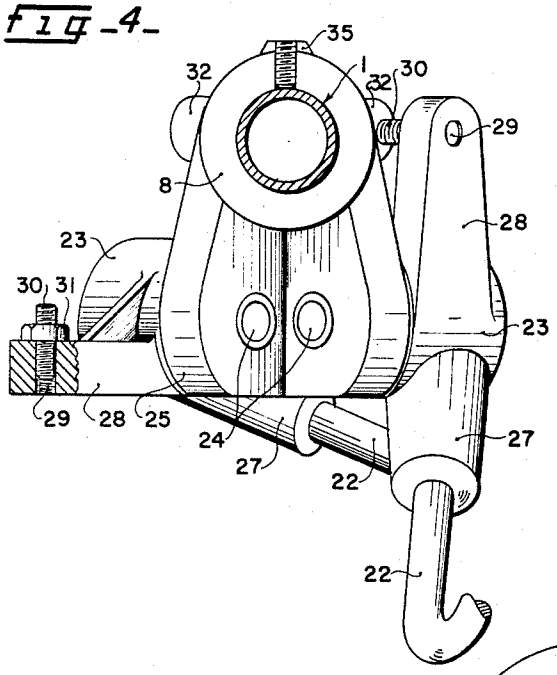
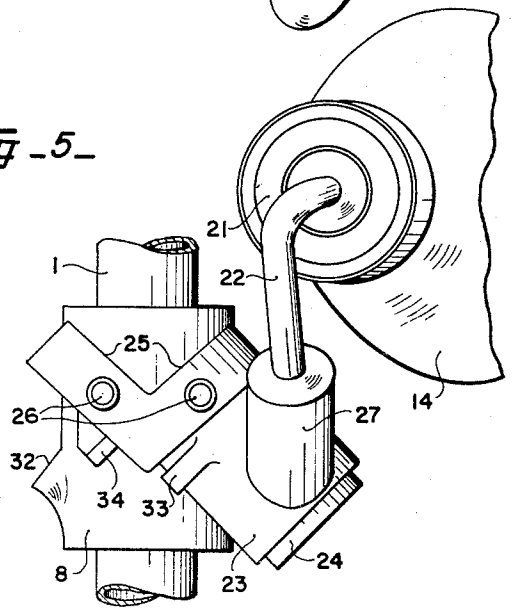


fig -5-



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MAGAZINE CREEL

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6 Claims. (Cl. 242—131)

This invention relates to the continuous removal of yarn from yarn packages grouped on a magazine creel.

It is an object of this invention to provide an improved method of continuously warping yarn from yarn packages supported on a vertical magazine creel.

Another object of this invention is an improved arrangement for supporting yarn packages on a vertical magazine creel.

Other objects of this invention will appear from the following detailed description.

In warping, beaming or similar textile operations, hereinafter referred to as warping, wherein yarns are unwound from a plurality of yarn supply packages and are led in the form of a warp to a beam to be taken up thereon, or to a weaving or knitting machine for processing into a fabric or fabric article, there are employed yarn package supporting creels, e.g., vertical type magazine creels. This type of magazine creel comprises a plurality of vertical standards or columns on which are mounted, in spaced relation, supports or holders for the yarn packages such as bobbins, cops, pirns, cones, and the like.

To insure a continuous supply of yarn to the beam, knitting machine or weaving machine, the yarn packages are grouped in pairs with the transfer tail of the yarn of one package, i.e., the package being drawn off, tied or otherwise connected to the leading end of a second, or reserve package. In this manner, as soon as the yarn on the first package is exhausted, the yarn on the second package begins to unwind. The operator then replaces the exhausted package by a full one and joins the leading end of the yarn on the latter to the transfer tail of said second package.

By the use of a magazine creel with associated pairs of package supports carrying tied-in yarn packages, warping may proceed unhampered upon the exhaustion of yarn from one of the packages. For this purpose only the yarn from one yarn package on each pair of associated package supports is directed to a single yarn guiding member. A second yarn package may then be placed on the other package support, the free yarn end of said second yarn package being tied onto the transfer tail of the package being unwound. On the exhaustion of the yarn package being unwound, the yarn jumps via said transfer tail over on to the full package, which in turn may then be tied to the transfer tail of a new yarn package which has replaced the empty yarn package.

In order to facilitate doffing of empty bobbins and donning of full packages, the package supports are normally pivotably mounted on the magazine creels and are adapted to be swung out of the field of the yarn packages being unwound. The exchange of empty packages for full ones and the tying of transfer tails may in this manner be done rapidly and in a simple way.

A usual requirement of magazine creels is that they be as compact as possible. As is well known the space occupied by magazine creels currently in use is in general very large, resulting in uneconomical use of factory space and of conditioning equipment. To be able to swing the package supports in magazine creels necessitates an increase in the free distance between adjacent yarn packages. This is especially true where the warping is done from long twine cops. Heretofore, providing for swingability of package supports added considerably to the size of the magazine creel. In order to remove this disadvantage, constructions have been proposed in which the package supports are coupled to the columns by means of connections with several pivots, or in which the connections consisted of a combination of pivots and slides. These constructions proved not very satisfactory in practice, and merely resulted in an undesirably complicated magazine creel structure.

More serious, however, is a second disadvantage, i.e., it is almost impossible to adjust accurately the connections having several pivots and/or slides, and even when adjusted they rapidly become misadjusted.

Obviously, an accurate adjustment of the package supports is very important. Thus, where the package support in the unwinding position is not accurately aligned with its axis towards the yarn guiding member no satisfactory running off of yarn from a yarn package on the package support is obtained. The yarn balloon of the yarn running off is then non-symmetrical and is accompanied by strong tension jerks and yarn ruptures often result.

In accordance with this invention there is provided a magazine creel construction wherein, for an unhampered exchange of yarn packages, the package supports carrying the yarn packages are pivotally mounted to have a simple swinging movement around a pivot so that the empty yarn package is easily moved to doffing position. The pivot is inclined relative to the vertical and lies in a plane parallel to the vertical plane of the magazine creel, and may be swung into the unwinding position with a new full yarn package placed thereon, or swung into the doffing and donning positions where the exhausted yarn package is replaced by a full yarn package. The pivots of the package supports cross the columns under acute, downwardly opening angles of about 35 to 50°. While these crossing angles give desirable results, it has been found that optimum results are obtained when the crossing angle between the pivots of the package supports and the columns of the magazine creel is on the order of 42°. The smallest dimensions of the magazine creel may then be realized with yarn packages of different sizes.

In prior magazine creels the pivots on which the package supports are mounted are parallel to the columns. Accordingly, the package supports pivot in the same horizontal plane. The minimum pitch at which the package supports may be positioned from each other is thereby determined by the requirement that a package support with a full yarn package, on swinging in a horizontal plane, will not hinder the yarn balloon of an adjacent running-off yarn package. This requirement is obviated by this invention wherein the swinging package support does not move in a horizontal plane.

It has now been found possible to have the package support positioned in such a manner that the path of the yarn to its guiding member runs partly above the adjacent yarn packages. As a result thereof, the columns of the magazine creel may be placed nearer to each other without hindering the action of adjacent yarn packages.

An additional and special advantage of this invention consists in that the reduction of the dimensions of the magazine creel is obtained without the necessity of having more than one pivot for each package support and without the necessity of having to slip the package holders in and out of the running-off position. Moreover, the stability and the accuracy of adjustment of said magazine creel is exceptionally satisfactory.

In prior magazine creels the pivots of the package supports are parallel to the axes of the columns. In accordance with this invention the plane of the pivots in the magazine creel are parallel to the vertical plane of the columns.

In order for the package supports to remain free from the columns of the magazine creel during the swinging movement of the said package supports, the package supports must be positioned at a substantial distance from said columns. In the magazine creel of this invention this disadvantage is overcome by positioning the pivots in a plane spaced from and parallel to the columns of the magazine creel, the spacing being in a direction away from the yarn guiding member.

To prevent the yarn packages during swinging of the package support from coming into contact with the means for connecting the package supports to the column and at the same time to keep the path of said yarn packages within narrow limits, a certain positioning of the package supports relative to the pivots has been found to be desirable. Thus, in accordance with this invention, the preferred positioning is such that the back end of each package support in the unwinding position lies at a higher point than the shortest connecting line between the corresponding pivot and column, and is on that side of the plane through the pivots away from the column. By placing the back end of the package support farther and farther from the column, point will be reached at which a still further narrowing of the path of the swinging yarn package does not lead to a decrease of the pitch of the magazine creel. With such an arrangement of the package support it is essential to provide special clamping or blocking devices to keep the package support in the unwinding position with or without a yarn package thereon. It has been found that minimal dimensions of the magazine creel are possible if the center of gravity of the package support, either with or without a yarn package thereon, in the unwinding position lies on that side of the plane passing through the pivots which faces the column. In this position it is possible to keep the package support by its own weight in the unwinding position, as well as in the position where it is turned away from this position.

In one aspect of this invention, the back end of the package support is adjustably connected to a hub which may rotate around a journal attached to a slidable collar which collar may be mounted at any desired position on the column. Two abutments are provided on the hub, which abutments limit rotation of the hub around the journal, on the one hand in the unwinding position of the package support, and on the other hand in the position where the package support is swung to the outside.

In the magazine creels in which the pivots are vertical, the package supports are normally fixed in the unwinding position by means of a cam and an adjusting ring. The cam is connected to the package support, whereas the adjusting ring is coaxially mounted on the column. To place the package support into the unwinding position the cam falls into a notch in the adjusting ring and is held therein by the weight of the package support and yarn package thereon, and/or by an additional pressure of a spring. It has been found, however, that in practice this construction is not satisfactory since the package support cannot be maintained for any length of time in the desired position. This is due to the occurrence of wear of the cam or of the notch, or of both. Moreover, a sudden braking of the package support on bringing the same in the unwinding position may cause the adjusting ring to jump out of its correct position. The magazine creel of the instant invention is free from these disadvantages since the abutments do not drop into a notch but rest crossways on a limiting means. As a result there is practically no wear on the limiting means.

Because of the fact that the hub on the package support rotates around an inclined pin, the force exercised around the column by the package support falling into the unwinding position is small. Thus, danger for misaligning of the elements of the magazine creel as a result of any jarring force or jerks is therefore slight.

The unwinding position of the package support of this invention may be varied by making the abutment limiting the swinging into the unwinding position adjustable.

The sliding collar is symmetrical and is provided with two pivots to carry rotatably thereon two package supports. These package supports are arranged so that there is one on each side of the column on which the collar is attached.

Referring now to the drawings wherein a preferred embodiment of this invention is shown,

FIGURE 1 is a perspective view of a portion of the magazine creel, including package supports, of this invention, showing the package supports in unwinding position,

FIGURE 2 is a detail view of the structure in FIGURE 1 with one of the package supports shown half-way in its path of swinging out of unwinding position,

FIGURE 3 is also a detail view of the structure in FIGURE 1 with the package support shown in the full swing-out position,

FIGURE 4 is a detail view, on an enlarged scale and partly in section, of the means for attaching the package support to the column of a magazine creel, and

FIGURE 5 is another view of the detail shown in FIGURE 4.

Like reference numerals indicate like parts throughout the several views of the drawings.

In FIGURE 1 reference numerals **1** and **2** indicate two arbitrarily chosen, successive columns of a magazine creel. Only part of these columns is shown and it should be understood that they are prolonged upwardly, downwardly, and that other columns are arranged on the left and one the right of these columns.

Yarn guiding eyelets **3**, **4** and **5** are provided and are spaced equal distances apart on a rod (not shown), which rod is positioned parallel to the columns **1** and **2**. The yarn guiding eyelets lie behind the vertical plane extending through the columns **1** and **2**.

Collars **6**, **7**, **8**, and **9**, **10** and **11** are slidably mounted on the columns **1** and **2**, respectively, the collars being spaced at distances equal to those between the yarn guiding eyelets **3**, **4** and **5**. Any suitable means, such as screw bolts **35** (FIGURE 4), may be provided to hold said collars in desired position on the columns.

To hold the yarn packages forming the supply of warp yarns there are pivotally mounted on each collar two package supports. Within the area shown between columns **1** and **2**, there are yarn packages **12** through **17**, which are all shown in FIGURE 1 in the unwinding position. The yarn packages **12** and **15** on columns **1** and **2**, respectively, lie in the same horizontal plane as the yarn guiding eyelet **3**, with axes of said yarn packages extending in the direction of said guiding eyelet **3**. The same is the case with the packages **13** and **16** relative to yarn guiding eyelet **4**, and the packages **14** and **17** relative to the yarn guiding eyelet **5**.

The free yarn ends run from the packages **15**, **13** and

17 through the yarn guiding eyelets 3, 4 and 5, respectively to a device forming a warp (not shown). The transfer tails 18, 19 and 20 of said packages are tied to the free yarn ends of the packages 12, 16 and 14, respectively. By replacing the empty bobbins of the packages 15, 13 and 17 by full packages and again tying the transfer tails in a corresponding manner, it is possible to warp without interruption.

The yarn packages are placed on package supports 21, particularly shown in the FIGURE 5 for the package 14. The back end of package support 21 comprises a bent rod 22 which is fixedly attached to a hub 23. The hub is adapted to rotate around a journal 24 rigidly fixed to the collar. The journal 24 is positioned on the collar at an angle α of 42° to the vertical. All journals 24 lie in a single plane parallel to the plane passing through columns 1 and 2.

In FIGURE 2 only the yarn packages 13 and 16 are shown, the yarn package 16 being shown in a position half-way of the full swinging movement. It can be seen from this figure that the top of the yarn package 16 has ascended and thus follows a path between the yarn packages 12 and 13. In this manner the yarn balloon formed as the yarn package 13 unwinds is not disturbed by movement of yarn package 16. Since the back end of the package support lie before the plane through the columns 1 and 2, the yarn package 16 is at the same time pulled somewhat backward so that it is free not only from contact with packages 12 and 13, but from contact with column 2.

The yarn package 16 is shown in FIGURE 3 in its extreme swung-out position. In this position it is a little to the front of yarn package 13 so that the donning and doffing of packages can take place without difficulty.

Referring now to FIGURES 4 and 5 for a description of the details of the swinging mechanism of the package supports, the package support on the right side of column 1 is shown in the unwinding position and the package support on the left side of the column is shown in the swing out, or doffing and donning position. In FIGURE 5 the right half of the figure is a front view of that which is shown in plan view at the right half of FIGURE 4. Also in FIGURE 5, the hub 23 and the journal 24 in the left half thereof are omitted in the interest of clarity.

The journal 24 passes through the hub 23 and its forward end is received in an L-shaped member 25 where it is held by a screw or bolt 26. In this manner the hub is operatively fastened to the collar 8. The L-shaped member may, if desired, be integral with collar 8. A boss 27 is secured to the hub 23 and the bent rod 22 is fixed in said boss in any suitable manner, after the rod is adjusted to desired position. By this construction the package support 21 carried on bent rod 22 may readily be swung relative to column 1.

In order to limit the swinging movement of the package support in the unwinding position, a fixed abutment 28 is provided on the hub 23. At the left in FIGURE 4, the abutment 28 is shown partially in section and provided with a threaded bore 29 for the reception of a threaded pin 30. This pin is adapted to be adjustably carried in said bore, and is held in adjusted position by locknut 31. In the unwinding position of the package support, the pin 30 rests on the shoulder or limiting cam 32 formed on collar 8. By this construction it is possible to rapidly and accurately adjust the position of the package support relative to the yarn guiding eyelet so that the yarn may be properly drawn off the yarn package. As the center of gravity of the package support, with the yarn package in the unwinding position, lies behind the plane through the journals 24, the pin 30 is pressed against the limiting cam 32 by the own weight of the package support and the yarn package. Moreover, this means for adjusting the position of the package support makes it virtually impossible for the package support to be jarred out of position.

In order to limit swinging movement of the bobbin holder into the doffing and donning position, an abutment 33 is also formed on the hub 23. In the outermost position of the bobbin holder 21, said abutment 33 engages with and is limited by a cam 34 projecting from L-shaped member 25. Although a limiting cam 34 is provided for each abutment 33, only one appears in FIGURE 5.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of this invention.

What is claimed is:

1. A magazine creel for use in warping yarn, comprising vertical columns, collars mounted for adjustment along said columns, package supports and means for pivotally mounting said package supports on said collars, said means including a journal operatively connected to said collar, a hub rotatably carried by said journal, and means adjustably connecting the back end of the package support to said hub.

2. A magazine creel according to claim 1 wherein abutments are provided on said hub for limiting the rotation of said hub around said journal.

3. A magazine creel according to claim 2 wherein one of the abutments is adjustable.

4. A magazine creel according to claim 1 wherein the collars are each provided with two pivots, each pivot being mounted on a package support in such a manner that there is a package support on both sides of the column on which the collar is carried.

5. A magazine creel for use in warping yarn comprising at least first and second columns extending vertically in spaced parallel relationship, at least a first collar mounted on said first column, at least a second collar mounted on said second column in a horizontal plane with said first collar, first means on said first collar mounting first and second package supports for pivotal movement one relative to the other from winding to doffing positions with the second package support in winding position extending generally into the area between said spaced columns, second means on said second collar mounting third and fourth package supports for pivotal movement one relative to the other between winding and doffing positions with the third package support in winding position extending generally into the area between said spaced columns in horizontal alignment with and in cooperating proximity to said second package support, the pivotal axes of said first and second pivotal mounting means intersecting the vertical axes of respective columns at a downwardly opening angle of between 35° and 50°, whereby movement of either said second or said third package support from winding position to doffing position will occur in a path upwardly and over the cooperating package support, and at least one thread guide mounted on the opposite side of said columns from said pivotal mounting means for receiving yarn alternately from packages held on said second and third package supports.

6. A magazine creel for use in warping yarn comprising at least first and second columns extending vertically in spaced parallel relationship, at least a first collar mounted on said first column, at least a second collar mounted on said second column in a horizontal plane with said first collar, first means on said first collar mounting first and second package supports for pivotal movement one relative to the other from winding to doffing positions with the second package support in winding position extending generally into the area between said spaced columns, second means on said second collar mounting third and fourth package supports for pivotal movement one relative to the other between winding and doffing positions with the third package support in winding position extending generally into the area between said spaced columns in horizontal alignment with and in cooperating proximity to said second package support, the pivotal axes

of said first and second pivotal mounting means intersecting the vertical axes of respective columns at a downwardly opening angle of between 35° and 50°, whereby movement of either said second or said third package support from winding position to doffing position will occur in a path upwardly and over the cooperating package support, and said first and second pivotal mounting means are angularly disposed to permit retention of said package supports in winding and doffing positions through the effect of gravity.

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