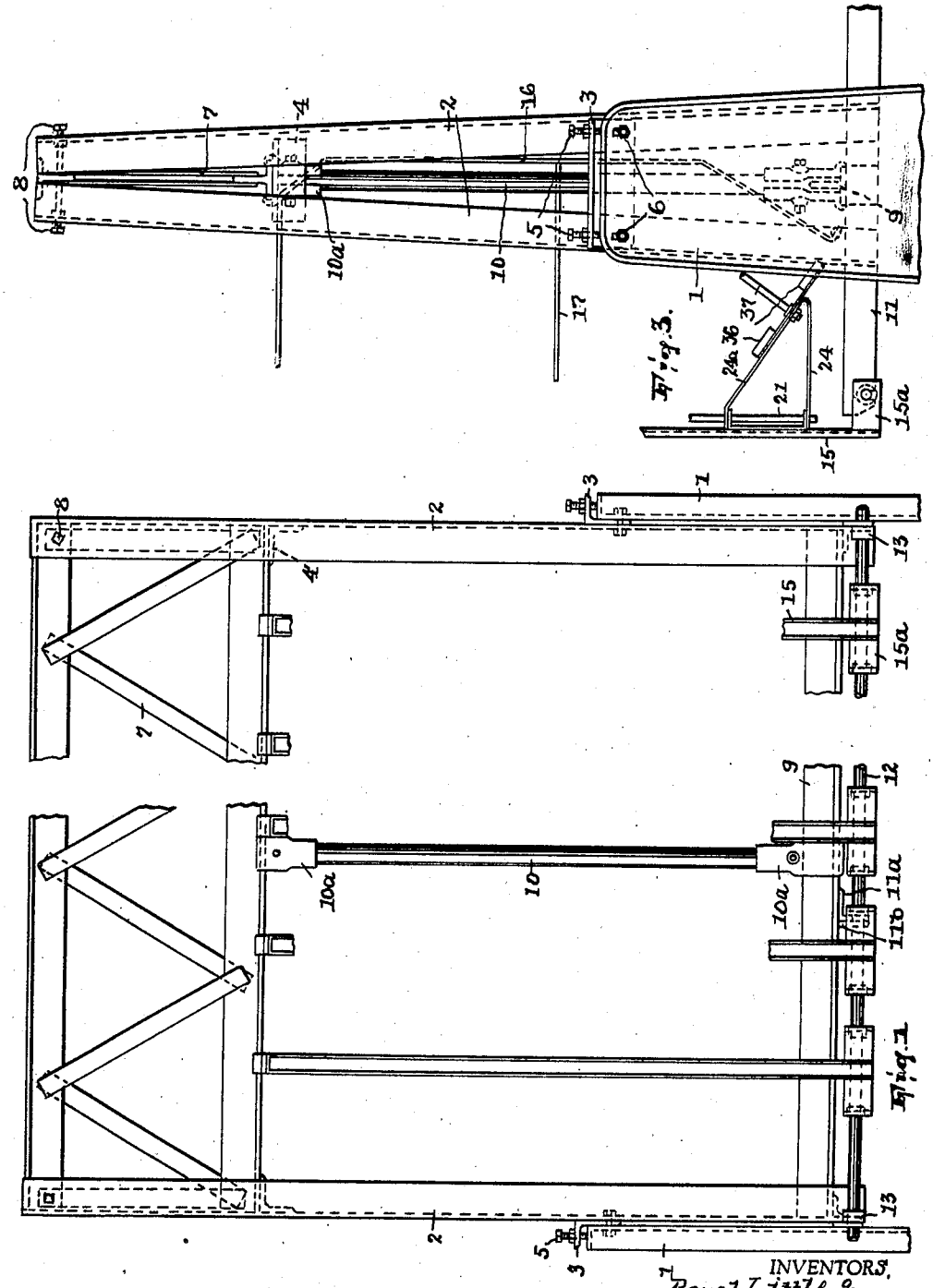
Dec. 28, 1943. R. LITTLE ET AL 2,337,904

CREEL

Filed Oct. 15, 1941 4 Sheets-Sheet 1



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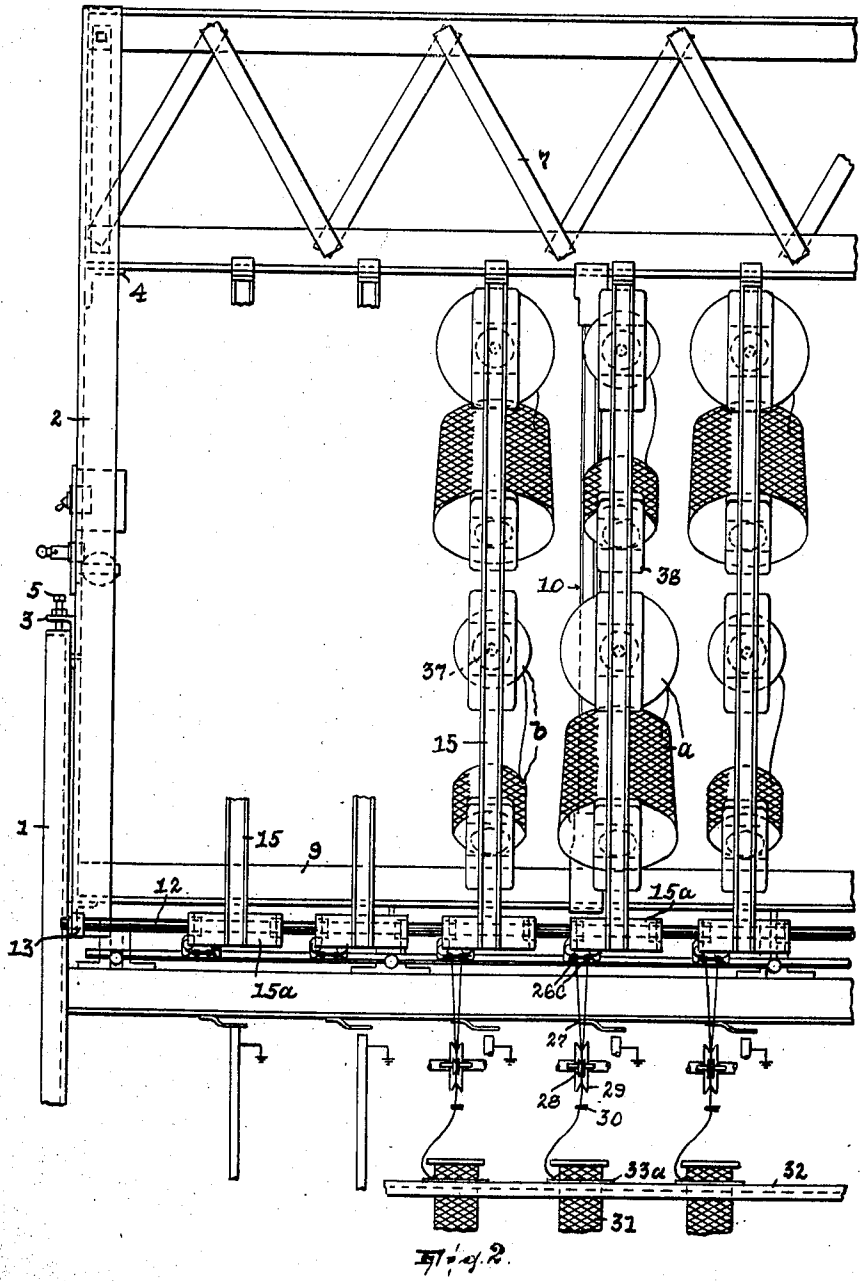


Fig. 2.

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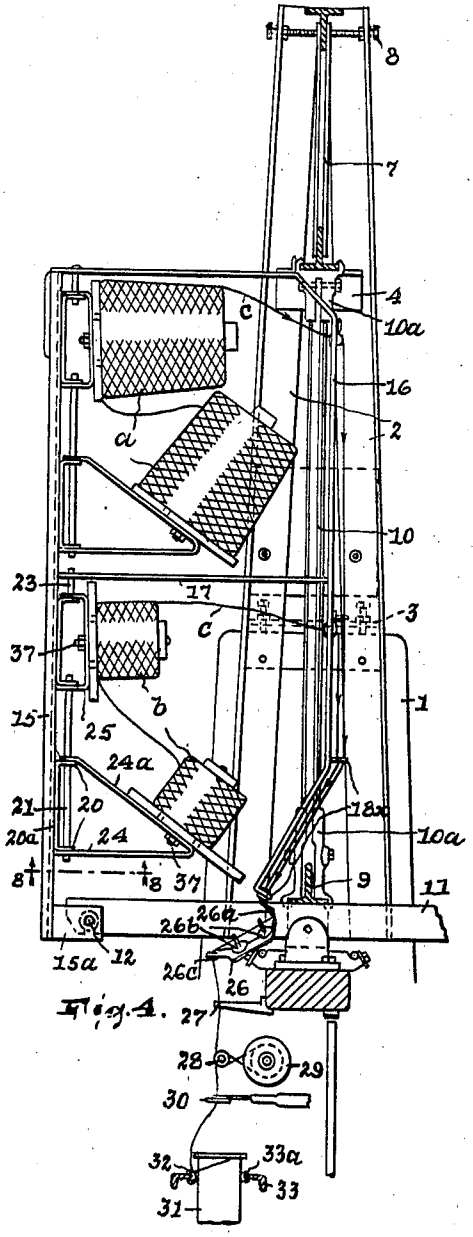


Fig. 4.

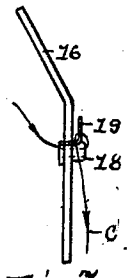


Fig. 7.

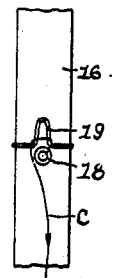


Fig. 6.



Fig. 6a

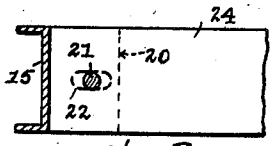


Fig. 8.

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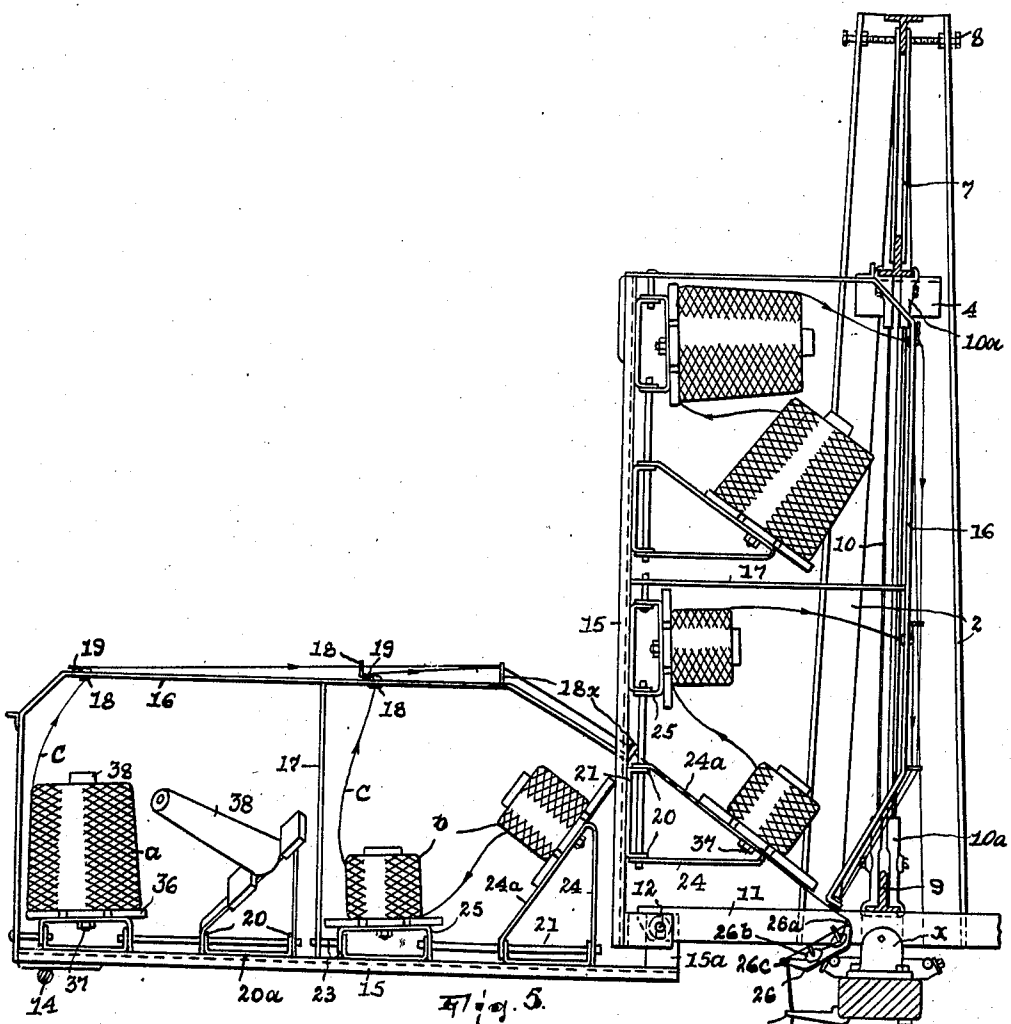


Fig. 5.

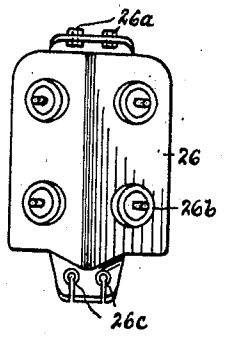


Fig. 9.

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UNITED STATES PATENT OFFICE

2,337,904

CREEL

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Application October 15, 1941, Serial No. 415,029

6 Claims. (Cl. 242—131)

This invention relates to means for supplying yarn to yarn-receiving packages which receive the yarn from above them. It is herein shown and described with reference to a so-called down-twisting machine but it is not necessarily limited in that or other respects not included in the appended claims.

Given a horizontal row of yarn-receiving packages and a horizontal row of yarn-guiding means above them, the invention contemplates yarn-supply-including units each pivoted in the supporting structure to turn on a horizontal axis lateral of the vertical plane of said row of yarn-guiding means and normally upstanding from said axis and supported by said structure in upstanding position but pivotally movable therefrom independently of each other in a direction from said plane past the vertical plane of said axis, each unit having a yarn-delivery guide arranged, in said position of such unit, to deliver downwardly and generally toward one of said yarn-guiding means. Thereby, in the upstanding or normal positions of all the units there is a compact and space-saving state thereof but each may be moved from its said position, as to project laterally, for doffing and other operations affecting the yarn. Incidentally the arrangement and construction are such that the flow of the yarn may continue whatever the position of a given unit at any time.

Included in each unit there is a carrier, pivoted as stated, and there is means on each carrier to support at least one yarn supply projecting in the direction opposite to that in which the carrier moves from its upstanding position.

Another feature of the invention consists in providing on the carrier, pivoted as stated, a yarn-supply support or holder pivotally movable into and out of the plane of pivotal movement of the carrier whereby the maximum state of compactness in the system as a whole may be attained when the carriers are in their upstanding positions but when any one is moved therefrom its holder may be shifted into convenient reach of the attendant.

Usually there will be means on each carrier to support at least two supplies with their axes converging to a common point and there will be a yarn-guiding means on the carrier substantially at said point. Thereby, one (or the active) supply having its tail end tied by the attendant to the leading end of the other (or the reserve) supply, the flow of the yarn may continue in the known way when the former supply is exhausted. In such case said means will preferably comprise separate holders for the two supplies each pivoted to move into and out of the plane of movement of the carrier.

In the example shown two yarns are in each instance to undergo twisting together to form a single yarn. If the supplies for such two yarns (both such supplies being on the same carrier) may differ in bulk, as where one yarn is plain rayon and the other creped rayon, then in any two adjoining units a supply of larger bulk is positioned laterally of a supply of smaller bulk, thus further to economize space.

In the drawings,

Fig. 1 is a front elevation, partly broken away, of the frame or fixed structure of the mechanism of this invention;

Fig. 2 is a front elevation of one end portion of the mechanism, the units shown being all in upstanding position;

Fig. 3 is a side elevation, with parts of the carrier shown appearing broken away;

Fig. 4 is a vertical sectional view, showing a unit in upstanding position;

Fig. 5 is a similar view, showing one unit upstanding and another depressed and one of the supply holders on the latter turned from normal position;

Figs. 6 and 7 are, respectively, a plan and side elevation of a yarn-guide-including portion of a unit;

Fig. 6*a* is a transverse sectional view of the carrier strip 16 of a unit;

Fig. 8 is a section on line 8—8, Fig. 4; and

Fig. 9 is a plan of the tension device 26.

In the drawings let 1 be the end standards of a down-twisting machine which support the following superstructure: Inward of each standard is a pair of upwardly converging angle-iron uprights 2 held in rigid relation to each other by angle-brackets 3 and 4 welded thereto. The brackets 3 have set-screws 5 stepped on the respective standards and the uprights have bolt-and-slot connections 6 with and securing them in fixed relation to the standards. A horizontal truss 7 having upper and lower T-rails has its lower such rail seated at its ends on the brackets 4 and it exists clamped by screws 8, at its upper portion, between the uprights. 9 is a T-rail below and parallel with the truss, from which latter it is suspended by hangers 10 consisting of bars having clamps 10*a* engaged as shown with the lower rail of the truss and with rail 9. Crossbars, generally designated 11 in Figs. 3 and 4 but in Fig. 1 shown as comprising angle-iron bars 11*a*, welded to rail 9, and strips 11*b*, welded to

bars 11*a*, are penetrated at each end thereof, or at each side of the vertical central plane of the machine, by a shaft 12 parallel with rail 9 and confined against endwise displacement by collars 13. At its lower portion said superstructure may be held fast to the twisting machine frame in any way against displacement laterally as viewed in Figs. 3, 4 and 5, as at *x*, Fig. 5. The superstructure may have other form than that shown and described. Outward of and parallel with each shaft is a rod 14 (Fig. 5) which may be a part of the twisting machine frame proper and affords a rest, as will appear. The parts so far described, including such frame proper, form the fixed structure or frame of the mechanism of this invention, in effect a superposed creel.

The carriers of the mentioned units are pivoted on shaft 12 to move in vertical transverse planes, each of which here consists of a channel-bar 15 having welded and in angular relation to one end thereof a generally U-shaped hinge-member 15*a* journaled on said shaft. The shaft is lateral of the vertical plane occupied by the row of yarn-guiding means (26*a*) for the yarn-receiving packages, as will appear. With regard to a supply or yarn package, or, according to the example, four of them, to be borne by each carrier, the following is to be considered: The carrier, pivotally supported as by shaft 12, is to assume either of two positions, i. e., the depressed position of Fig. 5 where it is supported by rod 14 or an upstanding position where it abuts the truss, as in Figs. 4 and 5, its center of gravity being then to the right of its axis at 12; that side of the carrier which, when the carrier is moved to upstanding position, faces the direction in which it so moves will be hereinafter treated as its inner side. A holder for any supply is to be arranged at said inner side, being pivoted thereto on an axis crossing the carrier's axis of pivotal movement (shaft 12) and supporting the supply with the latter's axis crossing that of the holder's axis and normally in the plane of movement of the carrier, whereby when the carrier is in upstanding position the axis of the supply will project inwardly, and when the carrier is depressed the holder may be swung to a position in which the axis of the supply projects laterally from said plane for doffing. Again, according to the actual example the tail of a strand of yarn at any time being served by one supply is to be connected to the leading end of a strand to be served by a reserve supply, and in this case the holders (arranged on a common carrier) for these two supplies so support the latter when in their normal positions that the axes of such supplies converge at least approximately to the same point, where a guide for the yarn, in effect one with the carrier, may exist. Again according further to the actual example, where two strands are to undergo twisting together, there will be on each carrier two pairs of supplies, each pair characterized as last described. Still again, it being assumed that, according to the example, the four holders in the latter case are arranged in alinement lengthwise of their carrier, the two holders for the supplies of larger bulk on one carrier will be arranged in lateral registry or beside the two for the supplies of smaller bulk on the next adjoining carrier, to the end that the maximum number of supplies can be accommodated in the machine. The carrier in each instance is, as indicated, preferably itself equipped with appropriate means to guide and deliver the yarn, especially to the end that the running of any strand may continue whether the carrier be upright, or in normal position, or depressed, as when doffing.

With these ends in view the construction as shown is as follows:

Having an end affixed to the free end of the carrier is a strip 16 which extends first inwardly from the carrier and then parallel with it and generally toward its axis, and finally has its free end portion converging toward the carrier; the strip throughout its length lies in the plane of movement of the carrier. About midway the length of the carrier there may be a brace 17 connecting it and the strip.

The strip has two longitudinally offset eyelets 18 in pairs arranged on the part thereof which parallels the carrier and close to each eyelet at the side thereof remote from the carrier's axis a wire hook 19 (Figs. 6 and 7), each such eyelet and hook forming a tensioning yarn-guide. It also has other guides 18*x* in pairs, one at its free end (see Fig. 6*a*) arranged to deliver downward and generally toward the aforesaid yarn-guiding means (26*a*) when the carrier is in upstanding position.

Extending from the inner side of each carrier are four pairs of alined projections 20, each pair here forming the bent-off ends of a strip 20*a* which may be welded to and in effect is one with the carrier; there are two pairs each side of brace 17. A flexible elastic rod 21 penetrates the three projections next adjacent the fulcrum of the carrier and a similar bearing rod penetrates the three projections beyond and next adjacent brace 17; in each group the rod fits the hole by which it penetrates the middle projection and so is fast therein but the other two projections in each group have slots 22 (Fig. 8) extending inward from the carrier and permitting the end of the rod to yield from the carrier. Short rods 23 are fast in the remaining projections and in the strip 16 and brace 17, as shown. The rods 21 and 23 all extend in a line parallel with the carrier and afford bearings.

Straddling the first and third pairs of projections are the holders 24 and straddling the second and fourth pairs are the holders 25. Each holder is a strip having its extremities bent off. Each holder 25 is generally U-shaped, or has both extremities of the same length. Each holder 24 has one extremity appreciably longer than the other so that its intermediate or body portion 24*a* is in bias relation to the axis of the holder. Each holder 24 or 25 has its extremities penetrated by the corresponding rod or rods and so is pivoted thereon. That extremity of each holder which adjoins the yielding end of the rod is cut off square so as normally to be held by the corresponding rod 21 in face-to-face relation to the inner face of the carrier, whereby the holder is normally held in the plane of movement of the carrier but may be sprung out of such position; the other end of each holder extends short of the carrier to permit the holder to turn on its axis. On the body portion of each holder is a pad or seat 36 and a projecting spindle 37 for the core 38 of the corresponding yarn supply. In the normal position of either holder 25 the spindle thereof is in the line, perpendicular to the carrier, occupied by the corresponding yarn guide; the bias state of the body portion 24*a* of each holder 24 is such that its spindle converges with that of the related holder 25 toward the corresponding yarn guide.

Each pair of holders thus adapted to cooperate

with a given yarn guide is to receive a pair of yarn packages or supplies one of which at any time has its yarn extending directly to the corresponding yarn guide and the other of which, then serving as a reserve, is to have the leading end of its yarn tied to the tail end of the yarn from the thus active supply. There are two classes of yarn supplies shown, large, *a*, and small, *b*. One pair of holders 24—25 on each carrier is to receive the supplies *a* and the other the supplies *b*. But, to economize space in the machine, the pair of supplies *a* on any carrier is laterally adjacent the pair *b* on the next adjoining carrier on either hand.

In the present case, where two yarns are to be intertwisted, such two yarns *c* from the then active supplies on any carrier extend through the respective guides of each pair 13*x* on strip 16 of the carrier and so are delivered thereby, to wit, to the hereinbefore mentioned guiding means with respect to whose vertical plane the axis of each of the aforesaid units is laterally positioned. This guiding means here consists of two guides 26*a* of a tension device 26 between whose freely revoluble disks 26*b* the yarns pass and, after penetrating guides 26*c* on this device, pass to a guide 27. Thereafter they extend together around a pulley 28 and a suitably driven drive wheel 29, then back over the pulley and down through a common guide 30 to the receiving package 31, assumed to be mounted on a rotated spindle and with which is associated the usual yarn-guide 32 arranged on the ring 33*a* of a reciprocated ring-rail 33.

While it will usually be preferred that the movement of each unit from its upstanding position should be approximately through 90° it may be less or more, but in the latter case it should be less than approximately 180° if contact of the yarn with the shaft 12 is to be avoided where such a shaft and the guiding means 26 have the relation here shown by way of example.

In any position of any unit in the example each supply has its free end so projecting that gravity is not active on the yarn of such supply to encourage sloughing off of such yarn. Further, each guide, as 18, is so arranged as to insure the free over-end delivery of the yarn from the corresponding supply.

Having thus fully described our invention, what we claim is:

1. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, means to support on each carrier a wound yarn-supply with its delivery end facing generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery end of the thus supported yarn-supply, each of said means being movable on the corresponding carrier into and out of the path of pivotal movement of such carrier.

2. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, means to support on each carrier a wound yarn-supply with its delivery end facing generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery end of the thus supported yarn-supply, each of said means being pivotally movable on the corresponding carrier into and out of the path of pivotal movement of such carrier.

3. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, means to support on each carrier a wound yarn-supply with its delivery end facing generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery end of the thus supported yarn-supply, each of said means being pivotally movable on the corresponding carrier into and out of the path of pivotal movement of such carrier and around an axis adjacent the other end of such yarn-supply.

4. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, a pair of means on each carrier respectively to support wound yarn-supplies with their axes of winding converging generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery ends of the thus-supported yarn-supplies, each of said means being movable independently of the other on the corresponding carrier into and out of the path of pivotal movement of such carrier.

5. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, a pair of means on each carrier respectively to support wound yarn-supplies with their axes of winding converging generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery ends of the thus-supported yarn-supplies, each of said means being pivotally movable independently of the other on the corresponding carrier into and out of the path of pivotal movement of such carrier.

6. In combination, with fixed structure, a row of carriers pivoted therein to turn independently of each other around approximately the same horizontal axis and each to and from a relatively upstanding position in which it is gravity-held bearing against said structure, a pair of means on each carrier respectively to support wound yarn-supplies with their axes of winding converging generally in the direction in which such carrier is movable to said position, and a yarn-guide arranged on each carrier to be approximately opposite the delivery ends of the thus-supported yarn-supplies, each of said means being pivotally movable independently of the other on the corresponding carrier into and out of the path of pivotal movement of such carrier and around an axis adjacent the other end of such yarn-supply.

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