J. LACROIX.

SPINDLE.

APPLICATION FILED DEC. 29, 1914.

1,283,812.

Patented Nov. 5, 1918.

2 SHEETS—SHEET 1.

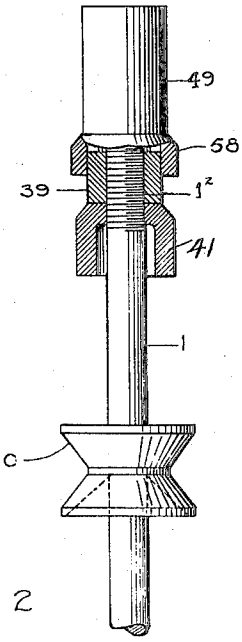


FIG. 2

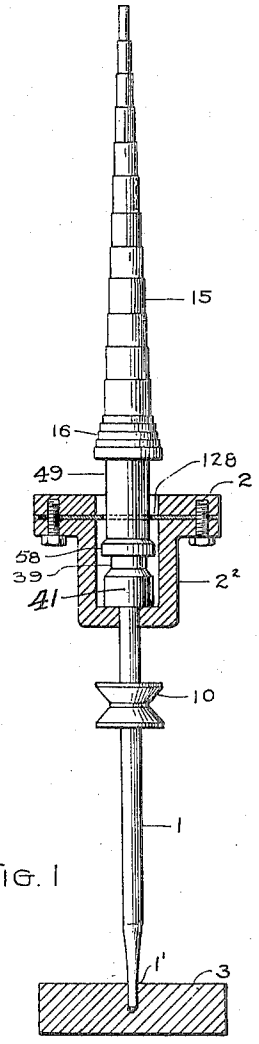


FIG. 1

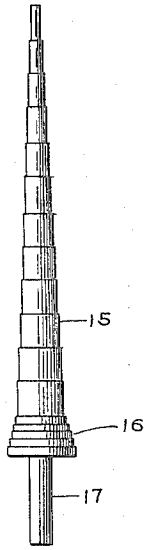


FIG. 3

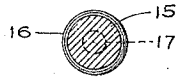


FIG. 4

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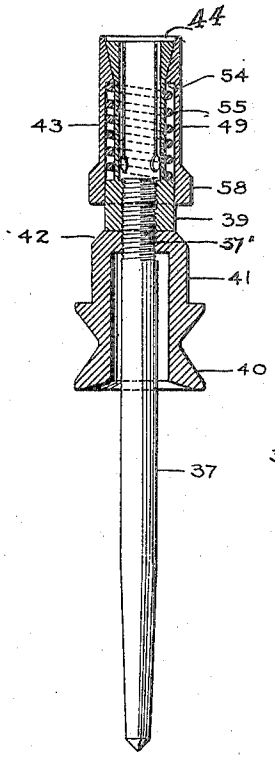
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2 SHEETS—SHEET 2.

Fig. 6.



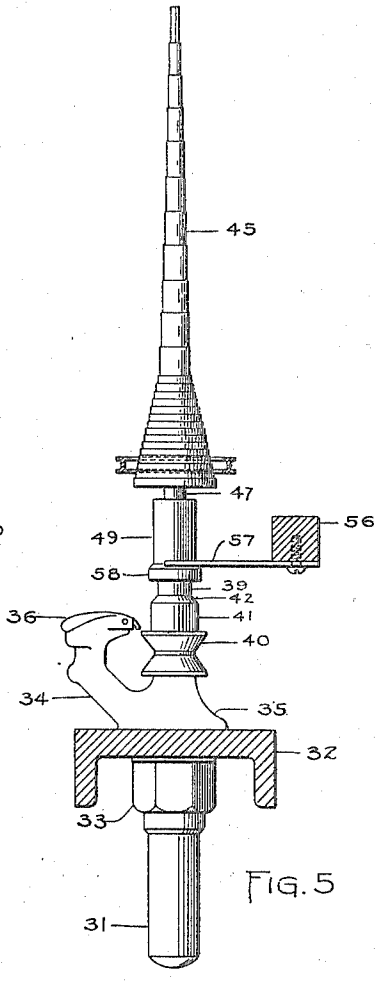
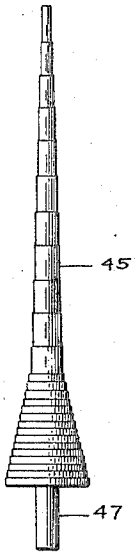


Fig. 5

Fig. 7.



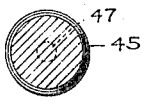


Fig. 8

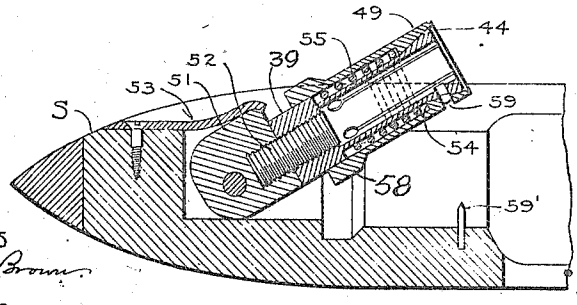


Fig. 9

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SPINDLE.

1,283,812. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed December 29, 1914. Serial No. 879,563.

To all whom it may concern:

Be it known that I, JOSEPH LACROIX, a citizen of the United States, residing at Fall River, county of Bristol, Commonwealth of Massachusetts, have invented certain new and useful Improvements in Spindles, of which the following is a specification.

This invention relates to textile apparatus involving particularly spinning mechanism and weaving mechanism, and the invention consists in the construction, management, and organization of apparatus of this class with the object of generally simplifying and standardizing the parts, thereby to lessen their cost, reduce their number, and to effect a saving in the time ordinarily requisite to perform the several functions and entailed in change of relative position of the thread or yarn carriers. Particularly the invention aims to eliminate the use of bobbins, cop-tubes, etc., and to provide the spindles of spinning mechanism and the shuttles of looms with efficient and practicable connectors for firmly and accurately connecting thread carriers interchangeably to said spindles or to said shuttles.

These and other objects which will appear more particularly hereinafter are secured in the present invention, the construction and operation of which is fully disclosed in the following specification and clearly illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, showing the invention as applied to a mule spindle spinning machine,

Fig. 2 is an enlarged detail elevation, partly in section, showing the manner of attaching the connector to the mule spindle,

Fig. 3 is a side elevation of one type of thread or yarn carrier applicable for mule spindles,

Fig. 4 is a cross section thereof,

Fig. 5 is an elevation of a form of ring spindle spinning machine to which the invention is applied,

Fig. 6 is an enlarged detail sectional view of the connector as attached to the ring spindle,

Fig. 7 is a side elevation of a form of thread or yarn carrier applicable to the ring spindle,

Fig. 8 is a cross section thereof, and

Fig. 9 shows in longitudinal section a part of a shuttle provided with the connector, which is shown in section and tilted upward from the thread chamber.

Textile apparatus to which this invention relates comprises spinning means and weaving means of which latter only a part of a shuttle S is shown in Fig. 9. The invention comprehends in its scope either mule spindle or ring spinning mechanism. A form of mule spindle mechanism is shown in Fig. 1 and comprises a spindle 1 resting in a bearing 1^1 on a support 3, the spindle being provided intermediate its length with a whirl or pulley 10 and projecting at its upper end into a rail 2 adapted for vertical movement and having a depending bearing 2^2 in which the spindle rotates. In the practice of this invention thread or yarn of the character used in mule spinners is wound upon a thread-receiver 15 which as here shown has an enlarged stepped cone 16 below which is provided a concentric stem 17 interchangeably fitting means, to be later described, for securely connecting the carrier 15 either to a spinning spindle, as 1, or to a shuttle.

In Fig. 5 a form of ring spindle is illustrated in which a spindle 37, Fig. 6, is supported in a barrel 31 secured to a rail 32 by a nut 33. The barrel 31 has a head 35 provided with an oil tube 34 to permit filling the barrel 31 with oil. The tube is closed by a pivoted cover 36 having a short nib normally overhanging the whirl 40 of a tubular hub 41 screwed on to the upper end of the spindle 37; the nib of the cover 36 acting as a stop to prevent undue upward movement of the spindle during operation. The upper end of the hub 41 may be beveled off as at 42. In Figs. 5, 7, and 8, a slightly modified form of interchangeable thread or yarn carrier 45 is shown which has a concentric shank or stem 47 for detachably fitting connecting means of either the spinning or weaving mechanisms.

The foregoing description pertains to well known spinning mechanisms and weaving shuttles, and my present invention contemplates improvements in these mechanisms and weaving shuttles for facilitating the connection therewith of interchangeable carriers forming a part of the coördinate, standardized textile apparatus and which invention eliminates bobbins, cop-tubes and their usual respective receiving spindles in the spinning mechanism and in the shuttles, by providing in lieu thereof a thread receiving spindle

which is interchangeably usable by direct connection with either a spinning shaft or a shuttle, thus entirely replacing the usual spindle provided to receive the usual bobbin or cap-tube. The yarn or thread is spun directly on the interchangeable spindle and this then is connected to the shuttle connector.

To standardize the equipment of the correlative spinning and weaving apparatus, I have combined therewith connectors of a type which are self-closing in action and which will accurately position and firmly clamp the inserted stem of thread carriers when adjusted upon either the spinning mechanism or in a loom shuttle.

The connectors which are substantially duplicate in structure to permit interchange or renewal and use in either the mule or ring spinner or the shuttle each comprise a body part or receiver 39, one end of which is threaded for detachable engagement with either the threaded parts 1^2 or 37^1 of the spindles 1 or 37 or the threaded part 52 of a support 51 pivotally mounted in the shuttle S and which is yieldingly maintained in a position to hold an attached thread carrier longitudinally in the thread chamber by a spring 53.

The receiver 39 is provided with a tubular longitudinally split wall, preferably of a resilient material, forming a socket 44, the perimeter of which is turned down to form a recess for an expansion spring 55 reacting at one end against a shoulder of the receiver 39 and at its opposite end acting against an internal shoulder 54 of a sleeve 49. The sleeve 49 is slidably fitted upon the receiver 39 and has its bore beyond the shoulder tapered or flared to react upon a complementary surface on the outer end of the socket 44, whereby under the impulse of the spring 55 the split walls of the socket are automatically contracted and will firmly grip and truly line up an inserted stem of a thread carrier 15 or 45. To permit the insertion or doffing or release of a carrier from its connection with a shuttle or spinning spindle, it is only necessary to press the closer or sleeve 49 against the spring and along the body part or receiver 39 sufficiently to enable the resilient split wall 44 forming the socket to expand automatically to a diameter to permit free insertion or withdrawal of the complementary stem of a thread carrier.

The opening of the connector socket may be accomplished manually at will or by any suitable device according to the particular use of the connector. The sleeve 49 is adapted for operative engagement, when disposed in mule spinning mechanism, by a member 128, Fig. 1, mounted on the downwardly movable support 2.

In doffing the carriers 47 shown in Fig. 5 the sleeves 49 are simultaneously depressed by means of a rock bar 56 having a forked arm 57 adapted to bear against external annular shoulders 58 on the sleeves whereby to slide said sleeves downwardly against the action of the springs 55, thus releasing the carriers.

When a thread carrier 15 or 45 is arranged in and connected to the shuttle S the accidental loosening or release of the carrier is prevented by provision for locking the connector elements. This may be accomplished in different manners in practice, and one simple arrangement consists in providing the sleeve 49 for locking engagement with a part of or on the shuttle, thereby preventing relative movement of the sleeve and eliminating possibility of accidental loosening of the detachably fitted thread carrier. The sleeve is provided with an aperture 59 to receive a locking stud or pin 59^1 positioned in the shuttle S in the path of the tiltable connector.

From the foregoing it will be clear that my invention accomplishes the standardization of connecting means of spinning and weaving equipment and not only eliminates the usual bobbins, etc., which are interchangeable from the fixed spindles of the spinning mechanism but also eliminates the bobbin receiving spindles or parts themselves and provides in their place interchangeable thread carriers connectible to the spindle proper or to the shuttle.

Various modifications in the form and construction of my invention may obviously be resorted to if within the limits of the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. The improved yarn-carrier connector adapted for interchangeable, detachable connection to respective elements of spinning or weaving machines, etc., comprising a split, resilient self-opening socket having a central bore to detachably receive, center, and firmly retain the complementary portion of a yarn-carrier, and a covering, yielding means, which when moved in one direction along the socket permits the same to expand and allow the insertion of the carrier, and when moved outwardly thereon causes the socket to close upon the inserted portion of the carrier.

2. A connector for detachably retaining a yarn-carrying spindle, the connector having a body part adapted for ready attachment to a complementary structure and a plurality of resilient jaws, a sleeve slidably mounted upon said part and when moving in one direction causing the jaws to close and clamp upon an inserted spindle, and a spring inclosed by said sleeve and reacting at opposite ends upon seats on the said sleeve and said body part.

3. The improved connector for yarn spinning or weaving mechanism, comprising a tubular body piece provided for detachable connection to a supporting element of said mechanism and having a plurality of self-opening contractible spindle-clamping jaws longitudinally disposed and circumferentially grooved to form a seat having outwardly flaring faces at one end, an annular shoulder on the body piece, a sleeve longitudinally mounted slidably on said piece, and an expansion spring arranged in the seat between the body piece and sleeve, and effective to cause the sleeve to automatically act upon said faces and contract the jaws.

4. A connector adapted for connection detachably to a support in yarn spinning or weaving mechanism, comprising a tubular split socket with self-opening jaws for closing upon and detachably and firmly retaining an inserted yarn carrying spindle, and means for controlling the opening or closing of the jaws, comprising an exterior elongated sleeve movable in one direction on the socket to permit the jaws to open and a spring concealed by the sleeve and automatically acting on the latter to cause the jaws to contract and for holding the jaws against movement firmly upon the inserted spindle.

5. A connector having a self-opening socket arranged for detachable connection to a support and adapted to close upon an inserted end of a thread or yarn spindle, a device substantially inclosing the socket, and means within and concealed by said device for effecting the automatic movement thereof to close the socket and yieldingly supporting the device.

6. In textile apparatus, an operating support, a detachable connector rigidly attached thereto for temporarily and firmly retaining an inserted thread-receiving spindle, comprising a body part having longitudinal, resilient jaws, a spring seated upon the said body part and re-acting against a shoulder at one end thereof, and a sleeve inclosing said part and being slidable thereupon at each end, the sleeve having an interior shoulder in opposition to the shoulder on said part and against which the spring reacts with a tendency to cause the closing of the jaws, movement of the sleeve in one direction permitting the jaws to close.

7. In combination in textile apparatus, an operating part to which a yarn-spindle is applicable, and the connector comprising an integral, tubular split socket detachably engaged by threads to said part, a jacket surrounding and sliding upon the socket and forming therewith a spring-inclosing chamber, and a spring in the chamber.

8. In textile apparatus, a connector adaptable for detachable, rigid connection to a complementary part of the apparatus and for detachably connecting thereto a thread carrying spindle having a part designed for insertion in said connector, which comprises a detachable body having a yielding socket to receive and center said part, and yieldable, self-acting means on the socket for automatically and firmly closing the socket upon an inserted spindle.

9. In combination, a divided spindle, comprising a supporting member adapted to be revolubly mounted in the spinning machine and to receive the drive, and a thread receiving member having a solid concentric butt portion of reduced diameter at its base adapted to be detachably clamped in balanced axially symmetrical engagement upon said revoluble supporting member in spinning to receive the load directly upon its surface above said butt portion and to be removed and detachably clamped in a shuttle to deliver the load directly therefrom in weaving, and duplicate connectors rigidly mounted upon said supporting member and shuttle, respectively, and each comprising a contractile socket constructed and arranged to receive, center and firmly clamp the inserted butt portion of said thread-receiving member, and automatic means for closing said socket, the base of the thread-receiving member above said concentric butt portion constituting a limiting stop to determine the amount of entrance of said butt portion into the socket.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH LACROIX.

Witnesses:

VICTORIA LOWDEN,

MARION C. HOBBS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."