Dec. 2, 1969 G. TIGGES 3,481,165

CLOSING SLEEVE FOR DYEING SPINDLES

Filed March 21, 1968

Fig. 2

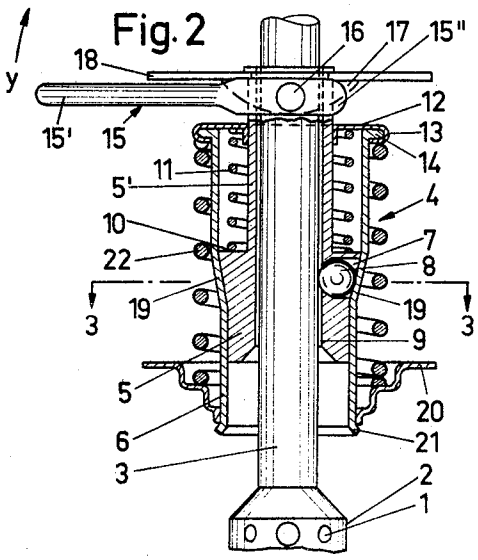


Fig. 4

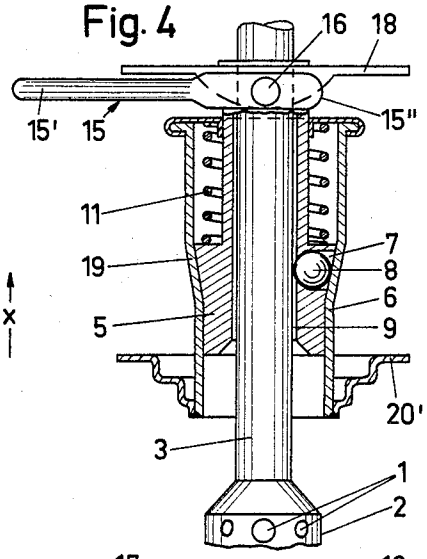


Fig. 3

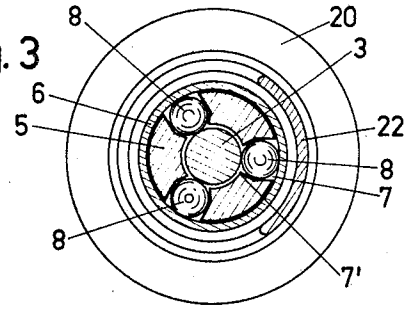


Fig. 5

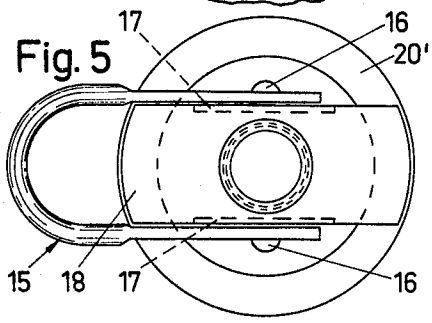
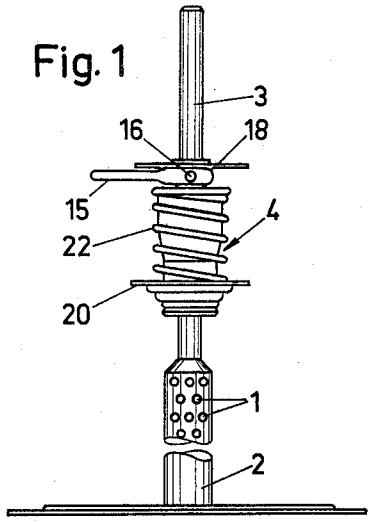


Fig. 1



INVENTOR.
Gerhard Tigges
BY
James E. Montague
Attorney

United States Patent Office 3,481,165
Patented Dec. 2, 1969

3,481,165

CLOSING SLEEVE FOR DYEING SPINDLES

Gerhard Tigges, Wuppertal-Cronenberg, Germany, assignor to Lebrecht Tigges Wuppertal-Cronenberg, Germany, a corporation of Germany

Filed Mar. 21, 1968, Ser. No. 715,037
Claims priority, application Germany, July 10, 1967, T 22,760
Int. Cl. D06f *17/00;* B65h *49/20*
U.S. Cl. 68—198 5 Claims

ABSTRACT OF THE DISCLOSURE

A closing sleeve for dyeing spindles comprising two hollow coaxial slidably arranged spring-biased bushings defining clamping ball receiving spaces therebetween. An opening is provided in the ball receiving spaces towards the inner bushing communicating with the longitudinal axial opening in the inner bushing through which the dyeing spindle extends. Clamping balls are disposed in the ball receiving spaces and are pressed clampingly through the opening against the spindle by spring-biasing means by means of inclined faces on the outer bushing opposite the ball receiving spaces. A releasing lever is provided to shift the bushings against the spring-biasing means for releasing the balls and thereby releasing the clamping position between the spindle and the outer bushing.

The present invention relates to dyeing spindles, in general, and to closing sleeves for dyeing spindles, in particular.

Closing sleeves for dyeing spindles are already known, in which an inner thread in screwed onto an outer thread on the bolt formed end of the dyeing spindle. After the alignment of yarn spools to be dyed on the dyeing spindle, the closing sleeve is screwed, in a nut-like manner, onto the upper end of the dyeing spindle, the upper end of the closing sleeve being formed preferably narrowed down, and which end of the dyeing spindle is provided with an outer thread.

A pressure plate, which is disposed on the closing sleeve, and under circumstances, is spring-biased, sits on the uppermost yarn roll and is secured in its axial alignment, under circumstances, by light compressing the yarn rolls. The manipulation of such closing sleeves is time-consuming. For a possible time saving, complicated auxiliary devices are required, which make possible, under circumstances, a mechanical motor driven rotary mounting of the closing sleeve.

The production of the threads is an unfavorable working step, since the closing sleeve, as the dyeing spindle, must be made of high-grade rust-proof steel, due to the permanent influence of the dye bath.

It is one object of the present invention to provide a closing sleeve for dyeing spindles, wherein by means of the rapid closing, the sleeve has to be slid on the smooth end of the dyeing spindle merely up to the abutment of the pressure plate on the uppermost yarn roll, whereby also a release should be possible by a simple pulling.

It is another object of the present invention to provide a closing sleeve for dyeing spindles comprising two coaxial bushings arranged coaxially relative to each other, and spring-biased to each other, one of the bushings being equipped with receiving chambers for clamping balls, which receiving chambers are open for a concentric passage hollow. On the back side of the bushing are arranged one-sided inclined pressing faces of the outer bushing, opposite which the inner bushing is displaceable against the spring effect by means of a releasing lever, such that the clamping balls enter into the releasing position rendered possible by the inclination of the pressure faces.

It is another object of the present invention to provide a closing sleeve for a dyeing spindle in accordance with the above-mentioned objectives, wherein the outer bushing is closed by a cover, and the releasing lever disposed on the inner bushing supports itself on the cover.

It is another object of the present invention to provide a closing sleeve for a dyeing spindle in accordance with the previously mentioned objectives, wherein the outer bushing carries a pressure plate slidably disposed thereon and a compression spring charging the pressure plate.

It is still another object of the present invention to provide a closing sleeve for a dyeing spindle in accordance with the above-mentioned objects, wherein the pressure plate forms an abutment on the lower outwardly directed edge of the outer bushing, and the spring supports itself on the upper outwardly directed edge of the pressure plate.

Due to this arrangement, a quick-closing sleeve for dyeing spindles is created, which after alignment of the yarn rolls on the dyeing spindle must be merely slid on the upper, smooth, cylindrical end of the dyeing spindle. The closing sleeve is automatically secured in the slid end position against any reverse movement, and in particular by the clamping balls, which are always pressed under the spring operation into its pressing position. For the removal of the closing sleeve, the releasing lever must be operated. By the axial displacement of the outer bushing towards the inner bushing, the balls enter the releasing position. The entire closing sleeve can then be removed. An automatic opening is also prevented, such that by shifting the releasing lever, a downward displacing of the outer bushing against the force charging the outer bushing must be exerted.

The construction form is largely closed on itself. If the pressure plate is slidably arranged longitudinally, relative the outer bushing, and charged by the pressure spring provided there, the closing sleeve can be brought into a clamped end position, in which this pressure spring is more or less compressed, so that upon shrinking of the goods charged by the pressure plate during the dyeing process, the pressure plate can follow about for a corresponding measure.

With these and other objects in view which will become apparent in the following detailed description, the present invention will be clearly understood in connection with the accompanying drawing, in which:

FIGURE 1 is an elevation of one embodiment of the present invention disclosing a dyeing spindle with closing sleeve;

FIG. 2 is an axial section of the dyeing spindle with quick-closing sleeve disclosed in FIG. 1;

FIG. 3 is a section along the lines 3—3 of FIG. 2;

FIG. 4 is an axial section of another embodiment of the present invention disclosing a dyeing spindle with a quick-closing sleeve; and

FIG. 5 is a top plan view of the embodiment disclosed in FIG. 4.

Referring now to the drawing, and in particular to FIGS. 1–3, there is illustrated a dyeing spindle **2**, equipped with perforations **1** for passage of the dye fluid, comprises an upper smooth cylindrical section **3**. Individual yarn rolls are aligned on top of each other on the dyeing spindle **2**.

For securing these aligned yarn rolls, a closing sleeve **4** is provided.

The closing sleeve **4** includes bushings **5** and **6** disposed coaxially relative to each other, namely an inner bushing **5** and an outer bushing **6**.

The inner bushing **5** has received chambers **7** for clamp-

ing balls 8. The receiving chambers 7 comprise a bottom engaging surface 7*a* upon which the clamping balls 8 rest, and a top engaging face 7*b* which is disposed underneath a shoulder 10, the clamping balls 8 being disposed in the receiving chambers 7 between the bottom face 7*a* and the top face 7*b*. The receiving chambers 7 are open, due to opening cross-section 7', communicating with an inner passing through hollow 9 for the smooth cylindrical section 3.

The cross-sections 7' are radially inwardly reduced relative to the diameter of the clamping balls 8, so that the clamping balls 8 cannot fall through inwardly into the passing through hollow 9.

The inner bushing 5 is formed with an annular shoulder 10, defining an annular cylindrical space 5*a* between the inner bushing 5 and the outer bushing 6, in which space 5*a* a spring 11 is disposed, supported on the shoulder 10, at one end. The spring 11 is positioned in the annular cylindrical space 5*a* and about the upper cylindrical portion 5' of the inner bushing 5.

The inner bushing 5 is formed of a thicker lower wall portion 5'', compared to its upper portion 5', which lower wall portion 5'' is complementary to the lower cylindrical wall portion of the outer bushing 6.

The spring 11 supports itself at its other end against a cover plate 12, the latter closing the upper end of the annular space 5*a* and the cover plate 12 has a beaded edg 13, which, in combination with an outwardly directed flange 14 of the outer bushing 6, is secured to the latter.

For optimum positioning the cover plate 12 is formed with a short cylindrical section 12*b* complementary to and surrounding the upper cylindrical section 5' of the inner bushing 5.

The reduced cylindrical section 5' of the inner bushing 5 extends through the central opening 12*a* of the covering plate 12 and thereabove. A releasing lever 15 swingably mounted about hinge pivots 16 is carried by the cylindrical section 5', and the hinge pivots 16 are secured to opposed parallel downwardly depending angled wings 17 of a plate 18, respectively, which plate 18 is arranged on the upper front end of the cylindrical section 5' of the inner bushing 5.

In this manner the engaging and disengaging lever 15 is secured operatively to the inner bushing 5 by means of the plate 18, connected thereto.

The releasing lever 15 is formed and has an operational end 15' and a controlling end 15''.

The clamping balls 8 are coordinated against inclined inner faces 19 formed at a suitable height on the wall of the outer bushing 6. The inclined faces 19 run downwardly reducing to a narrowing in a frustro-conical shape. The clamping balls 8 are positioned, in the cross-sections 7', between the inner and outer bushings 5 and 6, i.e., between the cross-sections 7' of the inner bushing 5 and the inclined frustro-conical faces 19 of the outer bushing 6.

Due to this arrangement, upon mounting the closing sleeve 4 onto the cylindrical section 3 of the dyeing spindle 2, in each slidably mounted end positioning, clamping force is exterted by the clamping balls 8, such that a reverse movement of the closing sleeve in the direction indicated by the arrow X is made impossible.

The compression spring 11 presses the clamping balls 8, continuously in the pressing position, against the cylindrical portion of the dyeing spindle 2. This is accomplished by the compression spring 11, pushing the inner bushing 5 downwardly, relative the outer bushing 6. In order to remove the closing sleeve 4, the releasing lever 15 is turned in the direction indicated by the arrow Y into the vertical position. The controlling end 15'' of the lever 15, accordingly, presses the cover plate 12 and thereby the outer bushing 6 downwardly relative to the inner bushing 5. The clamping balls 8 now move into the release position, and in paricular, due to the inclined pressing faces 19. The sleeve 4 may then be freely removed and pulled off.

According to the embodiment disclosed in FIGS. 1–3 a pressure plate 20 is provided slidably positioned, displaceably, on the outer surface of the outer bushing 6, and is located at the lower extreme edge 21 thereof, which is outwardly bent and formed as an abutment stop. A spring 22 is concentrically arranged, about the outer bushing 6 and pressure-loads the pressure plate 20 by engaging the latter at one end. The spring 22 supports itself at the other end at the beaded end 13 of the cover plate 12 under the outwardly directed flange 14 of the outer bushing 6.

This arrangement causes the pressure plate 20 to be pushed by the spring 22 against the lower abutment stop 21 of the outer bushing 6.

Referring now again to the drawings, and in particular to FIGS. 4 and 5, for another embodiment of the present invention, wherein like numerals are used for like parts. A pressure plate 20' is arranged which is rigidly secured to the outer bushing 6 at the lower end thereof, and the spring 22 of FIGS. 1–3, about the outer bushing is omitted.

In accordance with the present invention, a relatively large upper plate 18 disposed about the closing sleeve 4, serves the purpose of pressing the closing sleeve 4 with great manual forces into the intended tension-end position onto the yarn rolls.

While I have disclosed several embodiments of the present invention, it is to be understood that these embodiments are given by example only and not in a limiting sense, the scope of the present invention being determined by the objects and the claims.

I claim:

1. A closing sleeve for dyeing spindles, comprising
two bushings concentrically disposed relative to each other, one of said bushings constituting an inner bushing having a radial opening and adapted to be slidably positioned on a dyeing spindle,
an outer bushing coaxially movable relative to said inner bushing,
said inner bushing defining at least one cross-section leading into said radial opening,
a clamping ball disposed in said cross-section,
said outer bushing including inclined pressing wall faces opposite said inner bushing opening and adjacent said clamping balls and slanting in axial direction relative the axis of said outer bushing,
spring means urging said inner and outer bushing axially relative to each other for pressing said inclined wall faces against said clamping balls, thereby causing the latter to press through said inner bushing opening against said dyeing spindle, thereby clamping said bushing to said dyeing spindle, and
a releasing lever means for being actuated to move said bushings axially in a direction opposite to that urged by said spring means, for removing the pressing of said inclined wall faces against said clamping balls, thereby releasing the latter from clamping the bushings to said dyeing spindle into a slidably free position.

2. The closing sleeve for dyeing spindles, as set forth in claim 1, which includes
a cover plate secured to said outer bushing, and
said releasing and lever means supports itself at one end on said cover plate.

3. The closing sleeve for dyeing spindles, as set forth in claim 2, wherein
said cover plate includes a beaded circumferential rim formed about said upper outer edge of said outer bushing.

4. The closing sleeve for dyeing spindles, as set forth in claim 1, which includes
a pressure plate axially slidably disposed about said outer bushing, and

a compression spring about said outer bushing and charging said pressure plate.

5. The closing sleeve for dyeing spindles, as set forth in claim 4, wherein

said outer bushing is formed with a lower outwardly directed edge forming an abutment, and an upper outer flange, and

said compression spring is supported between said lower outwardly directed edge and said upper outer flange.

References Cited

UNITED STATES PATENTS

2,721,468	10/1955	Pole	68—198

FOREIGN PATENTS

279,225	10/1927	Great Britain.
356,433	10/1961	Switzerland.

ROBERT L. BLEUTGE, Primary Examiner

U.S. Cl. X.R.

68—212; 242—129.7