Oct. 2, 1962 G. SCHÖLLKOPF ET AL 3,056,252

RELEASABLE LOCK DEVICES FOR SPINNING ASSEMBLIES

Filed March 14, 1961 2 Sheets-Sheet 1

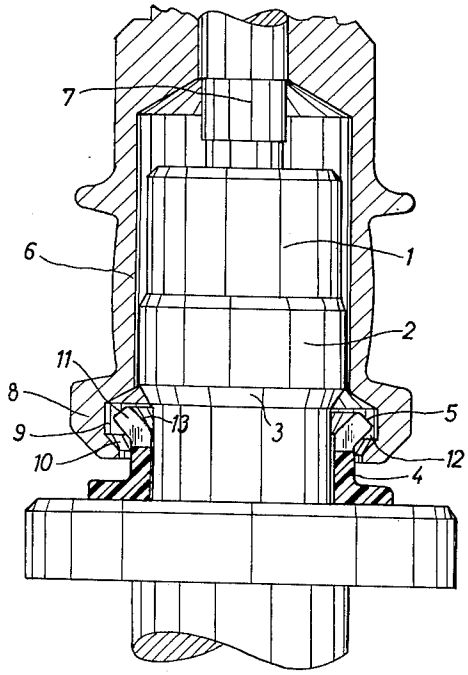



Fig.1

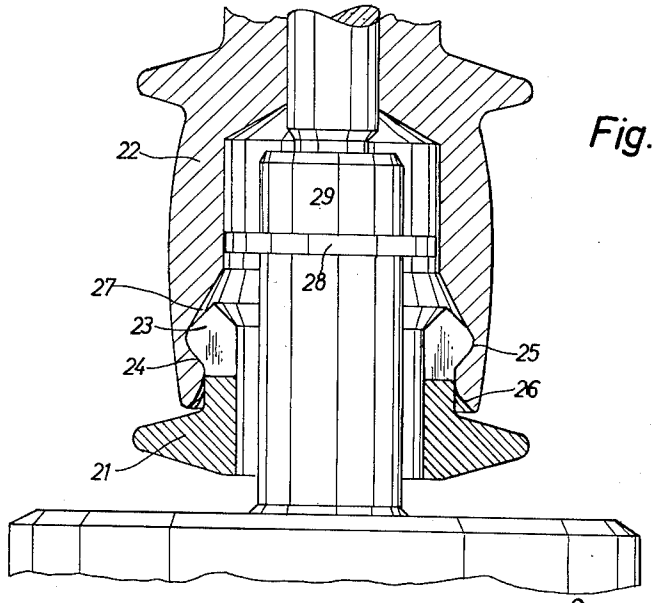



Fig.2

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FIG. 3

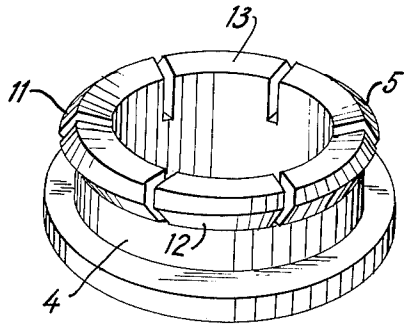
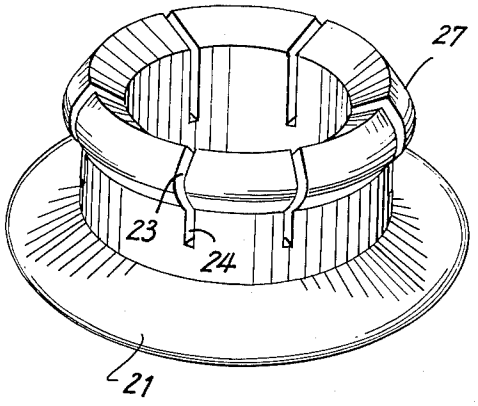



FIG. 4




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3,056,252

# RELEASABLE LOCK DEVICES FOR SPINNING ASSEMBLIES

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The present invention relates to textile machinery.

More particularly, the present invention relates to spinning assemblies where the rovings which come from the drafting assemblies are spun, which is to say twisted and wound into cops.

Such spinning assemblies normally include rotary spindles which are fixedly connected with spinning bells, and the lower ends of the spinning bells form whorls adapted to be engaged by a belt for rotating the spindles together with the spinning bells.

As is well known, the cops are wound on to the spindles and must be periodically removed therefrom. During removal of the cops, because of their frictional engagement with the spindles, there is a tendency to raise the spindles with the cops, and if measures are not taken to retain the spindles on their bearings they will be undesirably removed with the cops. Various devices are known for holding the spindles on their bearings while the cops are removed, but the known devices suffer from various defects. For example lint, fibers, and the like easily accumulate at these known lock devices to prevent them from operating properly, and in some cases because of the frictional rubbing of such lint, fibers, and the like there is a danger of combustion.

One of the objects of the present invention is to provide a spinning assembly of the above type with a releasable lock means which on the one hand will reliably hold the spindle together with the spinning bell against removal when the cops are removed and which on the other hand is capable of being uninfluenced by any lint, fibers, or the like.

Another object of the present invention is to provide a releasable lock means of the above type which can be used either with that type of spindle assembly where the spindle rests on a springy support while supported for rotary movement or where the spindle is supported for rotary movement by a rigid bearing.

An additional object of the present invention is to provide a releasable lock structure of the above type which will automatically become operative when a spindle together with the spinning bell fixed thereto is mounted on the bearing.

It is furthermore an object of the present invention to provide a releasable lock device which will form part of the whorl of the spinning bell and which will as a result simplify the manufacture of the spinning bell. Also, the objects of the present invention include the provision of a releasable lock structure which is simple and inexpensive while at the same time being easy to assemble with the remaining structure and being very reliable in operation.

With the above objects in view, the invention includes, in a spinning assembly, a spindle having a lower portion and a coaxial bearing means cooperating with the lower spindle portion to support the spindle for rotary movement. A hollow whorl is fixed to the spindle and extends downwardly over the bearing means and surrounds the latter. An annular member is carried by the bearing means above the lower end of the whorl in the interior thereof, and the whorl is formed in its interior below this annular member with an annular groove. An annular lock member surrounds the bearing means beneath



the annular member carried thereby ad has an upper portion extending into the hollow whorl. The whorl is formed in its interior below the annular member carried by the bearing means with an annular groove, and the annular lock member has an outwardly directed portion extending into this groove so that when the whorl and the spindle move up the lock member moves upwardly therewith to be engaged by the annular member carried by the bearing means which thus results in preventing removal of the spindle and spinning bell. The annular lock member of the invention is made of a springy material and when held down by the operator will yield during upward movement of the whorl so that the spinning bell and spindle can be removed intentionally.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

FIG. 1 is a fragmentary sectional elevation of one embodiment of the invention showing only the lower portion of the spindle and spinning bell;

FIG. 2 is a fragmentary sectional elevation of a second embodiment of the invention, FIG. 2 also showing only the lower portion of the spindle and spinning bell; and

FIG. 3 is a perspective view of the locking means of FIG. 1; and

FIG. 4 is a perspective view of the locking means of FIG. 2.

Referring to FIG. 1, there is shown therein the bearing means **1** which is substantially cylindrical and which is carried in a well known manner by the spindle rail. The bearing means **1** fixedly carries at its exterior an annular member **2** which may be fixed in any suitable way to the exterior surface of the bearing means **1** as by suitable set screws, for example. The annular member **2** has at its lower end a frustoconical surface **3**.

An annular lock member **4** according to the present invention shown in perspective in FIG 3, surrounds the bearing means **1** beneath the annular member **2** which is carried thereby and normally rests on the spindle rail, as shown in FIG. 1. The annular lock member **4** is slipped down to the position shown in FIG. 1 surrounding the bearing means **1** before the annular member **2** is placed on the bearing means **1**. The lock member **4** is made of a springy material which may be, for example, a polyamide, and it has a substantially L-shaped cross section, as indicated in FIG. 1. Thus, at its lower end the annular lock member **4** has an outwardly directed flange which normally engages the spindle rail, as indicated in FIG. 1. The upper part **5** of the annular lock member **4** flares outwardly and is formed with a suitable, relatively large number of axially extending cutouts so as to form between these cutouts a plurality of springy tongues which are directed outwardly and upwardly, as indicated in FIG. 1.

The spindle **7** is supported at its lower portion by the coaxial bearing means **1** for rotary movement in a well known manner, and, as is also well known, a spinning bell is fixed to the spindle **7** for rotary movement therewith. This spinning bell is provided at its lower portion with the whorl **6**, and this whorl is hollow and extends from the spindle downwardly over and surrounds the bearing means **1**. It will be noted that the annular member **2** is located within the hollow whorl above the lower end thereof. In accordance with the present invention the lower flange **8** of the whorl **6** is thicker than is conventional, and at the elevation of this flange **8** the whorl **6** is formed in its interior, beneath the annular member **2**,

with an annular groove 9. It will be noted that the annular groove 9 has a lower frustoconical surface 10 which is directed upwardly and overlapped by the tongues of the lock member 4. When the spindle 7 and the spinning bell fixed thereto are placed on the bearing means 1, the whorl 6 moves downwardly over the bearing means 1 and the lower edge of the whorl 6 engages the inclined surfaces 11 of the tongues at the upper portion 5 of the lock member 4. As a result these springy tongues can yield inwardly and as soon as the lower edge of the groove 9 moves beyond the outwardly and downwardly directed surfaces 11 of the tongues, these tongues snap into the groove 9, and in this way it is extremely simple to assemble the annular lock member 4 of the present invention with the whorl 6.

If there is any tendency for the spindle 7 and the whorl 6 to move upwardly, as when the operator removes a cop from the spindle 7, the surface 10 of the groove 9 engages the lower surfaces 12 of the tongues so as to move the entire lock member 4 upwardly, and it will be noted that the surface 3 of the member 2 is in the path of movement of the upwardly and outwardly directed surfaces 13 of the tongues so that these tongues are engaged by the surface 3 and pressed outwardly into the groove 9 to prevent movement of the lower part of the flange 8 upwardly beyond the tongues while the latter engage the surface 3, so that in this way the spindle and bell are reliably locked against removal. However, when it is desired to remove the spindle and bell, it is only necessary for the operator to hold the member 4 down at the elevation as shown in FIG. 1, for example, while moving the spindle and bell upwardly, and then the tongues will yield inwardly to release the spindle and bell.

In the embodiment of FIG. 2 the annular lock means of the invention, shown in perspective in FIG. 4, forms the lower flange 21 of the whorl 22. The upper part 23 of the annular lock member 21 of FIG. 2 extends into the hollow whorl 22 and is axially slit or formed with a plurality of cutouts which are distributed about the axis of the lock member 21 so as to form a plurality of springy tongues 24. It will be noted that this upper part 23 is provided with an outer annular bulge which extends into a groove 25 formed at the inner periphery of the hollow whorl 22 beneath the annular member 28 which is carried by the bearing means 29 which supports for rotary movement the spindle at its lower portion as well as the spinning bell fixed thereto, the whorl 22 foming part of the spinning bell, as is well known. Before the parts are assembled as shown in FIG. 2, the annular member 21 is placed around the bearing means 29 and may rest on the spindle rail, and it will be noted that in this embodiment the inner diameter of the member 21 is substantially greater than the outer diameter of the bearing means 29 so that the lock member 21 surrounds the bearing means 29 with substantial clearance. The bearing means 29 may be formed with a groove which receive the member 28 which may take the form of a snap ring. When the whorl 22 is moved downwardly with respect to the bearing means 29 to support the spindle thereon, the outwardly flared inner surface 26 at the bottom of the whorl will engage the inclined downwardly directed surfaces 27 of the tongues 24, and these springy tongues will yield inwardly until they snap into the groove 25 so that in this way the member 21 is assembled with the whorl 22. Because the member 21 at its bottom flange forms the lower flange of the whorl 22, the machining of the whorl 22 is far simpler and less expensive than a conventional whorl.

Assuming that there is a tendency for the spindle and the spinning bell to move upwardly, the lock member 21 will of course move upwardly with the spinning bell, and the member 28 is located in the path of movement of the member 21 and engages the tongues 24 at the upper outwardly inclined surfaces of the tongues 24, these surfaces forming a crest with the surfaces 27, respectively. Thus, such upward movement would only result in a force which urges the tongues 24 outwardly into tighter engagement with the whorl 22 at its groove 25, and in this way the spindle and spinning bell are locked against removal from the bearing means 29. On the other hand, the operator may at any time hold the lock member 21 below the member 28 and raise the spinning bell so as to deflect the tongues 24 inwardly and thus separate the spinning bell and spindle from the bearing means 29. Of course, the parts may be assembled by raising the lock member 21 into the whorl 22 until the tongues 24 snap into the groove 25.

It will be noted that in both embodiments the inner diameter of the annular lock means is smaller than the outer diameter of the annular member 3 or 28 which is carried by the bearing means 1 or 29, respectively. Of course, in the embodiment of FIG. 2 the annular lock means 21 is permanently connected with the whorl 22 so as to form a part thereof, and the whorl assembly of FIG. 2 operates as a single unit.

The annular lock member of either of the embodiments of the invention may be made of any suitable springy material such as metal or plastic, and a suitable polyamide is preferred, such a material having the required elasticity for the tongues.

While in both embodiments of the invention the spindle is supported on a rigid bearing, it is clear that the invention may equally be used with those bearings which provide a springy support for the spindle.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of spinning assemblies differing from the types described above.

While the invention has been illustrated and described as embodied in lock devices for spinning assemblies, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. In a spinning assembly, in combination, a spindle having a lower portion; bearing means cooperating with said lower portion of said spindle to support the latter for rotary movement; a hollow whorl fixed to said spindle and extending therefrom downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof and having an outer surface located adjacent the inner surface of said whorl; and annular lock means surrounding said bearing means beneath said annular member and having a lower portion extending downwardly beyond said whorl and an upper portion extending into said whorl, said annular lock means being engaged by said whorl and raised therewith when said spindle and whorl are raised and said upper portion of said annular lock means cooperating with said annular member upon raising of said whorl to prevent further raising of said whorl and said spindle therewith so as to lock said whorl and spindle on said bearing means, said annular lock means when held at said lower portion thereof against upward movement with said whorl and spindle yielding to release said whorl and spindle therewith for separation from said bearing means.

2. In a spinning assembly, in combination, a spindle having a lower portion; bearing means cooperating with

said lower portion of said spindle to support the latter for rotary movement; a hollow whorl fixed to said spindle and extending therefrom downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof and having an outer surface located adjacent the inner surface of said whorl; and annular lock means surrounding said bearing means beneath said annular member and having a lower portion extending downwardly beyond said whorl and an upper portion extending into said whorl, said annular lock means being engaged by said whorl and raised therewith when said spindle and whorl are raised and said upper portion of said annular lock means cooperating with said annular member upon raising of said whorl to prevent further raising of said whorl and said spindle therewith so as to lock said whorl and spindle on said bearing means, said annular lock means when held at said lower portion thereof against upward movement with said whorl and spindle yielding to release said whorl and spindle therewith for separation from said bearing means, said annular lock means being made of an elastic plastic.

3. In a spinning assembly, in combination, a spindle having a lower portion; bearing means cooperating with said lower portion of said spindle to support the latter for rotary movement; a hollow whorl fixed to said spindle and extending therefrom downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof and having an outer surface located adjacent the inner surface of said whorl; and annular lock means surrounding said bearing means beneath said annular member and having a lower portion extending downwardly beyond said whorl and an upper portion extending into said whorl, said annular lock means being engaged by said whorl and raised therewith when said spindle and whorl are raised and said upper portion of said annular lock means cooperating with said annular member upon raising of said whorl to prevent further raising of said whorl and said spindle therewith so as to lock said whorl and spindle on said bearing means, said annular lock means when held at said lower portion thereof against upward movement with said whorl and spindle yielding to release said whorl and spindle therewith for separation from said bearing means, said annular lock means being made of an elastic polyamide.

4. In a spinning assembly, in combination, a spindle having a lower portion; elongated bearing means coaxial with said spindle and cooperating with said lower portion thereof to support said spindle for rotary movement; a hollow whorl fixed to said spindle and extending therefrom downwardly over said bearing means and surrounding the latter; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an elastic annular lock member surrounding said bearing means beneath said annular member and having a lower portion extending downwardly beyond said whorl and an upper portion extending into said whorl, said upper portion of said annular lock member having an outwardly directed part located in said groove of said whorl so that when the latter is raised together with the spindle the annular lock member will also be raised, said annular member which is carried by said bearing means being located in the path of upward movement of said annular lock member and engaging said upper portion thereof to press said outwardly directed part of said lock member outwardly so as to prevent separation of said lock member from said whorl and thus prevent movement of said whorl, spindle, and annular lock member upwardly beyond the elevation where said annular member engages said upper portion of said lock member, said annular lock member when held at said lower portion thereof against upward movement with said whorl and spindle yielding to release said whorl and spindle therewith for separation from said bearing means.

5. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means.

6. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said

bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said whorl having an outwardly directed flange at its lower end and being formed with said groove at the elevation of said flange.

7. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said whorl having an outwardly directed flange at its lower end and being formed with said groove at the elevation of said flange, and said annular lock member having an outwardly directed flange located beneath said whorl.

8. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member caried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said whorl having an outwardly directed flange at its lower end and being formed with said groove at the elevation of said flange, said lock member remaining out of engagement with said whorl except when the latter moves upwardly.

9. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said whorl having an outwardly directed flange at its lower end and being formed with said groove at the elevation of said flange, said annular member which is carried by said bearing means having a downwardly directed frustoconical surface which engages said surfaces of said tongues to wedge the latter outwardly against said whorl.

10. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said

axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said lock member having a lower end portion formed with an outwardly directed flange which forms the lower flange of said whorl, said tongues being in permanent engagement with said whorl in said groove thereof.

11. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed above the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said tongues having additional upper surfaces which extend downwardly and outwardly from said first-mentioned upper surfaces and which form a crest therewith, said whorl when moving downwardly along said bearing means engaging with its lower end said additional surfaces of said tongues to press the latter inwardly until said tongues snap into said groove.

12. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed above the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said whorl having an outwardly directed flange at its lower end and being formed with said groove at the elevation of said flange, said annular lock member closely surrounding said bearing means.

13. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said lock member having a lower end portion formed with an outwardly directed flange which forms the lower flange of said whorl, said tongues being in permanent engagement with said whorl in said groove

thereof, said annular lock member having an inner diameter substantially larger than the outer diameter of said bearing means so that said lock member surrounds said bearing means with substantial clearance.

14. In a spinning assembly, in combination, an elongated spindle having a lower portion; elongated bearing means coaxial with said spindle and supporting the same at said lower portion thereof for rotary movement; a hollow whorl fixed to said spindle and extending downwardly over and surrounding said bearing means; an annular member carried by said bearing means in the interior of said whorl above the lower end thereof, said whorl being formed in its interior below said annular member with an annular groove; and an annular lock member surrounding said bearing means beneath said annular member carried thereby and having an upper portion extending into said whorl, said upper portion of said annular lock member being formed with a plurality of axial cutouts distributed about the axis of said annular lock member and forming between said cutouts a plurality of springy tongues, said tongues extending outwardly away from said axis into said groove of said whorl so that when the latter moves upwardly said lock member moves upwardly therewith, said tongues having next to the inner surface of said annular lock member surfaces which extend outwardly and upwardly from said inner surface of said lock member, and said annular member which is carried by said bearing means being located in the path of upward movement of said outwardly and upwardly directed surfaces of said tongues to engage the latter surfaces and to urge said tongues outwardly upon upward movement of said lock member with said whorl, whereby said tongues are pressed tightly against said whorl in said groove thereof to prevent movement of said whorl and said spindle therewith upwardly beyond an elevation where said annular member carried by said bearing means engages said annular lock member, said tongues yielding when said lock member is held down below said annular member carried by said bearing means to permit release of said whorl from said lock member when it is desired to separate said spindle and whorl from said bearing means, said lock member having a lower end portion formed with an outwardly directed flange which forms the lower flange of said whorl, said tongues being in permanent engagement with said whorl in said groove thereof, said annular lock member having an inner diameter substantially larger than the outer diameter of said bearing means so that said lock member surrounds said bearing means with substantial clearance, said annular member which is carried by said bearing means being in the form of a snap ring.



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