

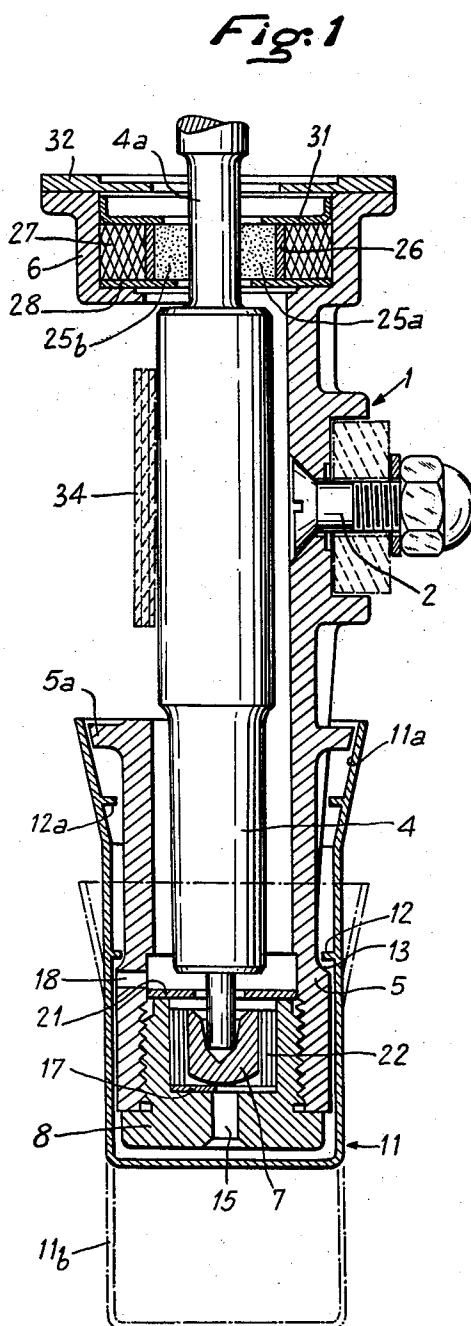
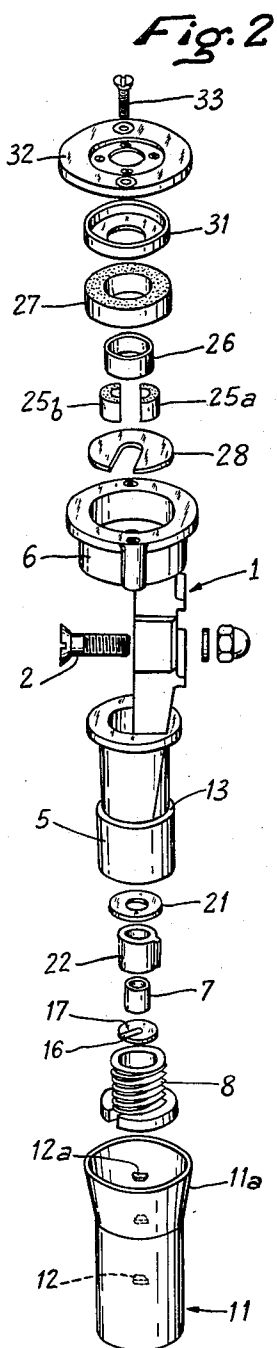
Aug. 13, 1963

P. BOURGEAS

3,100,375

SPINDLE-HOLDER

Filed Sept. 18, 1962



Inventor:
 Pierre Bourgeas
 By:
 Michael S. Striker
 his Attorney

1

3,100,375

SPINDLE-HOLDER

Pierre Bourgeas, 110 Ave. Maurice Faure,
Valence, France

Filed Sept. 18, 1962, Ser. No. 224,428

Claims priority, application Luxembourg Sept. 23, 1961
8 Claims. (Cl. 57-134)

The present invention relates to the spindle-holders of twist-ers and like textile machines, of the type in which the lower end of the spindle, in the form of a pivot, revolves in a foot-step bearing consisting of a bush resting on a foot at the lower end of the spindle-holder.

The object of the invention is to provide a spindle-holder of the kind specified which will be simple and robust in construction, reliable in operation, and convenient to maintain.

With this in end in view the spindle-holder according to the invention is distinguished by the feature that between the bush and the bottom of the foot, pierced axially, is interposed a suitably apertured washer, to permit, under the action of the rotary motion of the spindle, a circulation of oil in the circuit constituted by: the bottom of a cup surrounding the said foot, with clearance, the axial hole in the foot, the aperture of the washer, the periphery of the bush, one or more radial holes in the foot, and, finally, the clearance between the foot and the cup.

The oil set in circulation by the rotary motion of the spindle ensures effective lubrication of the pivot of the spindle in the bush and the bearing surface of the bush on the bottom of the foot.

The invention likewise relates to forms of construction comprising at least one of the following characteristic features:

(a) The aperture of the washer consists of a radial slit;

(b) A further washer rests on the top of the bush, in order to obviate splashes of oil in an upward direction;

(c) The bottom of the foot is constituted by a plug screwed into the said foot;

(d) The cup is of transparent material, preferably of plastic;

(e) The cup is fixed to the foot in such a way as to be able to occupy, upon the latter, either a service position, for which its bottom is in the neighborhood of the foot of the spindle-holder, or an emptying position, for which its bottom is low enough to enable the oil to flow into the said cup;

(f) The means for fixing the cup to the foot are constituted by associated elements, integral with or secured to the cup and the foot respectively, certain of these elements being constituted by projections, whilst the associated elements are constituted by an annular shoulder;

(g) The upper part of the cup is flared;

(h) The foot is provided with a collar, which practically closes the flared upper portion of the cup;

(i) the upper part of the spindle-holder comprises a pierced dish, through which passes a portion, with a reduced diameter, of the spindle, revolving in two half-bearings of porous material, clapsed in a ring of india rubber or like material, forming an absorber of radial vibrations;

2

(j) The half-bearings are covered by a pierced dish for the retention of lubricating oil.

The invention will be better understood upon reading the following description and examining the appended drawings, which show, by way of example but not of limitation, one form of construction of the invention.

In these drawings:

FIGURE 1 represents in axial section one form of construction of a spindle-holder according to the invention; and

FIGURE 2 is an exploded view, on a smaller scale, of the same spindle-holder.

The spindle-holder illustrated in the drawings comprises a body denoted as a whole by 1, and designed to be fixed, by means of a bolt 2, to a supporting bar, called a vault.

The spindle 4 is designed to be supported, at its lower end, in an assembly mounted in a cylindrical portion or foot 5 of the body 1, whilst it is guided, at an intermediate region of its length, in an assembly mounted in a dish 6, integral with the upper portion of the body 1.

The lower end of the spindle 4, in the form of a pivot, turns in a foot-step bearing constituted by a bush 7, the convex under surface of which rests against the bottom or inner end of a concentric recess in a plug 8, screwed into the internally threaded lower end of the foot 5.

The foot 5 is surrounded by a cup 11, preferably of flexible, resilient and transparent material, such as a suitable plastic. This cup is retained on the said foot by two bosses 12 projecting inwards from its cylindrical wall surface, and resting upon an annular shoulder 13 of the foot 5.

The cup 11 contains oil for effecting the splash lubrication of the pivot of the spindle 4, thanks to the establishment of a circuit comprising an axial hole 15 in the plug 8, a radial groove 16 in a washer 17 interposed between the bush 7 and the bottom of the recess in the plug 8, the annular space between the bush 7 and the plug 8, the aperture of a washer 21, one or more radial holes 18 provided in the foot 5, and, finally, the annular gap between the external cylindrical surface of the foot 5 and the internal cylindrical surface of the cup 11.

The circulation of the oil in the aforementioned circuit is effected by the rotary motion of the spindle. The washer 21, loosely surrounding the pivot of the spindle, rests upon the upper edge of the plug 8, with a view to obviating upward splashes of oil, the central bore of the hole in this washer being of a diameter sufficient to allow the oil to circulate freely upwards, through this hole, around the pivot of the spindle.

A spiral spring 22, interposed between the external cylindrical surface of the bush 7 and the bore of the plug 8, resiliently centres the pivot of the spindle in the foot 5 of the spindle-holder, and serves to damp radial vibrations.

The upper part of the cup 11 is flared, as indicated at 11a, so as to facilitate the placing of the said cup upon the lower end of the foot.

In the neighbourhood of the upper edge of the cup 11, the foot 5 of the spindle-holder is provided with a collar 5a, which serves as a baffle, designed to oppose the entry of dust into the said cup.

In order to permit the flow of the oil that is located

in the assembly provided at the lower portion of the device around the foot of the spindle-holder, more particularly when this oil is being renewed, means are provided for maintaining the cup 11 when in its lowest position, indicated by dot-and-dash lines at 11b, the said means consisting, in the example illustrated, of additional internal projections 12a, situated higher up in the cup than the projections 12, but designed also to rest upon the annular shoulder 13 of the foot.

The guiding of the spindle in the upper dish 6 is effected by a split bearing of porous material, the two half-bearings 25a, 25b which bear against a cylindrical portion 4a of the spindle, of reduced thickness. These half-bearings are lodged in a metallic ring 26, which is itself surrounded by a ring 27 of flexible and resilient material, such as india rubber. The half-bearings 25a and 25b, the metallic ring 26 and the india-rubber ring 27 rest upon a washer 28, which is slit radially to facilitate the mounting and positioning of itself upon the pierced bottom of the dish 6.

These members form a sort of centering and guiding bearing for the spindle. They are covered by a dished member 31, which serves as a reserve oil trough for the lubrication of the split porous bearing 25a, 25b. Finally, the upper surface of the dish 6 is covered with a pierced annular plate 32, fixed on to the said dish by means of screws, such as countersunk-headed screws 33.

The bores of the washer 28, the dish 31 and the upper plate 32 are of course larger than the diameter of the upper portion of the spindle, to enable all these parts to be mounted on from above. It is to enable the bearing 25a, 25b to be mounted on the part 4a of the spindle, where the diameter is reduced, that this bearing has been made in two parts, which are lodged in the ring 26, the internal diameter of which must of course be greater than the diameter of the upper end of the spindle, in order that the mounting may be possible.

The driving belt for rotating the spindle has been indicated by dot-and-dash lines at 34.

The mounting and demounting of the spindle, and of the various elements of the spindle-holder, are easy to effect.

In operation, the upper part of the spindle is suitably centered and guided in the split bearing 25a, 25b, and the lower part in the bush 7, upon which it rests, any radial vibration being damped, in the former case by the india-rubber ring 27, and in the latter case by the spiral spring 22.

The circulation of oil through the circuit described above is ensured by the rotary motion of the spindle. For the renewal of the oil, all that is necessary is first to lower the cup 11 into the position 11b, in order that all the used oil may flow into the said cup, so that it can be completely removed under the most favourable conditions of manipulation and cleanliness. Supervision of the lubrication is facilitated by the fact of the cup being made of transparent material.

The invention is not of course limited to the form of construction described and illustrated, which has been given merely by way of example, as numerous modifications may be made therein, according to the application contemplated, without thereby going outside the ambit of the invention.

I claim:

1. A spindle-holder for supporting a rotatable spindle which terminates in a pivot at its lower end, the spindle-holder comprising: a foot at its lower end, closed at the bottom, the foot being formed with a concentric cavity in its upper portion and with a axial duct communicating with this cavity, a bush lodged in this cavity and serving as a foot-step bearing in which the pivot of the spindle revolves and is supported, a washer interposed between the under side of the bush and the bottom of the cavity in the foot, and a cup adapted to contain lubricating oil, enclosing the lower end of the spindle-holder, the washer being formed with a radial slit and the spindle-holder being formed with at least one radial duct in the region of the pivot but above the level of the bush, so that when the spindle is revolving, oil will flow outwards through the radial duct in the spindle-holder down between the foot of the spindle-holder and the sides of the cup, and up again from the bottom of the cup through the axial duct in the foot, the slit in the washer, and the clearance space between the bush and the sides of the cavity in the foot.

2. A spindle-holder as claimed in claim 1, further comprising a washer resting upon the top of the bush, to obviate upward splashes of oil.

3. A spindle-holder as claimed in claim 1, wherein the foot includes a plug screwed into the lower end of the spindle-holder.

4. A spindle-holder as claimed in claim 1, the cup surrounding the foot being made of a transparent plastic.

5. A spindle-holder as claimed in claim 1, further comprising means for retaining the cup in a service position, with the bottom of the cup close to the bottom of the foot, and means for retaining the cup in an emptying position, with the bottom of the cup so far below the bottom of the foot that all the lubricating oil from the oil circuit can flow into the cup.

6. A spindle-holder as claimed in claim 5, the said retaining means comprising projections on one of the members and an annular ledge on the other adapted to engage with these projections.

7. A spindle-holder as claimed in claim 1, the brim of the cup being flared, to facilitate slipping the cup on to the foot of the spindle-holder body, and the spindle-holder further comprising a collar on the foot, adapted to shield the flared upper portion of the cup from the entry of dust.

8. A spindle-holder as claimed in claim 1, further comprising, at its upper end, a dish formed with an axial aperture through which the spindle passes, a split bearing of porous material surrounding the spindle, and a ring of resilient material surrounding the split bearing and holding the halves of the bearing together, this ring being adapted to absorb radial vibrations, and the split bearing and the resilient ring being located in the said dish.

References Cited in the file of this patent

FOREIGN PATENTS

1,127,067	France	Aug. 6, 1956
1,242,136	France	Aug. 16, 1960