

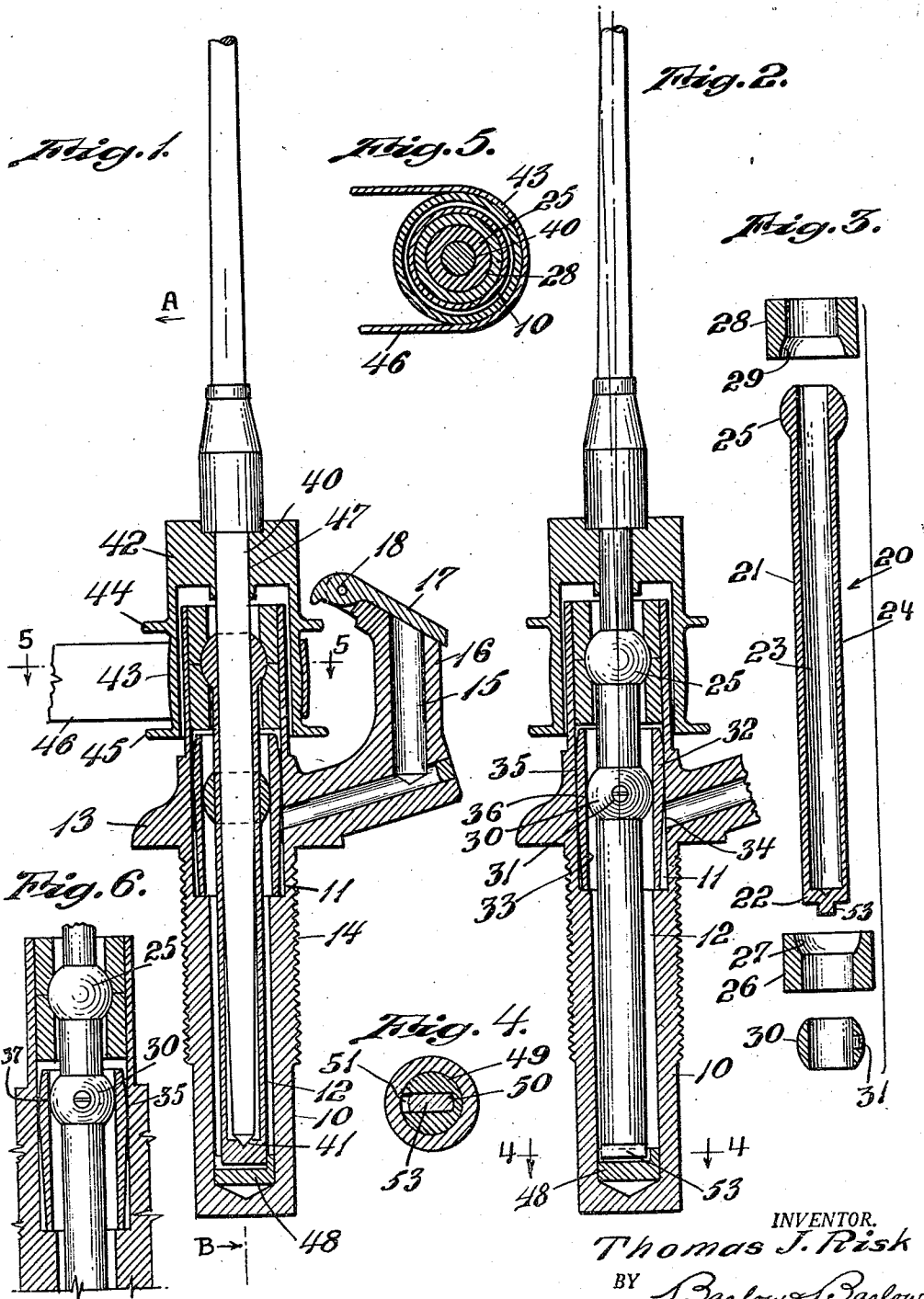
Dec. 30, 1947.

T. J. RISK

2,433,579

SPINDLE

Filed Feb. 9, 1946



INVENTOR.
Thomas J. Risk
BY Barlow & Barlow
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,433,579

SPINDLE

Thomas J. Risk, Central Falls, R. I.

Application February 9, 1946, Serial No. 646,649

7 Claims. (Cl. 57—135)

1

This invention relates to a spindle of the type more particularly used for packaging yarn or thread in the textile industry.

A spindle operates at very high speeds and because of the high speeds of operation the spindle must be accurately centered and dynamically balanced, otherwise excessive vibration will cause faults and excessive wear. It is at times known that because of the mounting of the spindle certain breakages in the yarn occur.

One of the objects of this invention is to provide a spindle which will have some resilient movement should excessive tension momentarily exist in the yarn so that a broken end might be avoided and yet a construction which will return to dynamic balance and centering of the package instantly that the excessive tension has been relieved.

Another object of this invention is to provide a bolster for the spindle which will be rockable but held in the desired balanced relation by means of the driving belt on the whorl.

Another object of this invention is to movably mount the bolster by providing a mechanical dampening for the movement which may occur.

Another object of the invention is to so movably mount the bolster that lubricant will be prevented from excessively rising along the spindle.

Another object of this invention is to provide a movable mounting of the bolster by relative movement of spherical and plane surfaces.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a sectional view of the spindle mounting;

Fig. 2 is a view similar to Fig. 1 but illustrating the spindle as being moved from its dynamically balanced and centered relation, showing the relative position of the parts;

Fig. 3 is an exploded sectional view of the bolster and its mounting;

Fig. 4 is a section through the bottom of the case and bolster illustrating the stop against which the bolster is moved;

Fig. 5 is a section on line 5—5 of Fig. 1, showing the driving belt; and

Fig. 6 is a fragmental section of a modified arrangement.

In proceeding with this invention, I have provided a spherical portion on the bolster which is utilized for rockably mounting the bolster in the case. In addition, a spherical portion is provided

2

at another location on the bolster which is embraced by a rockable thimble having a generally barrel-shaped outer surface. This second spherical surface is located at some point other than at the greatest diameter of the thimble so that movement of the bolster will also rock this thimble. The direction of rocking will depend upon whether the spherical portion is above or below the largest diameter of the thimble and the tension necessary to cause the movement will depend upon how much leverage it is desired should be exerted upon the thimble for rocking the same. This spherical portion may be adjustable if desired for varying the results which occur in the mounting. The mounting for the upper spherical end of the bolster is also such as to limit the movement of oil from the casing. The belt engagement of the whorl is also located at substantially the center of the spherical rockable mounting of the bolster.

With reference to the drawings, 10 designates the case for the spindle mounting which is provided with two different sized bores 11 and 12. This case is provided with an outer flange 13 for engagement with the spindle rail and is threaded as at 14 to receive a nut to hold the flange 13 against the spindle rail. An oil entrance conduit 15 is provided in the oil receiver 16 and is provided with a cover 17 hinged as at 18.

A bolster 20 shown by itself in Fig. 3 consists of a cylindrical member 21 having a solid bottom 22 and a cylindrical bore 23 defining a rather thin but rigid wall 24 for the bolster. At the upper end and formed as one piece with the bolster is a spherical portion 25 which serves to rockably mount the bolster in the case. This rockable mounting is provided by means of a section 26 having a cup formation 27 to receive the lower part of the spherical portion 25 and a section 28 having an inverted cup portion 29 to receive the upper part of the spherical portion 25. These two sections 26 and 28 are brought together about the spherical portion 25 and are, together with the bolster, forced into the upper end of the casing 10 to have a firm fit with the inner bore 11 of this casing. This will rockably mount the bolster in the case around its bearing in the cups 27 and 29 and will also prevent oil from being discharged upwardly which is located in the casing.

In order to control and dampen the rockable movement of the bolster in the casing, I also provide a second spherical portion 30 which is slidable over the outer cylindrical surface 21 of the bolster. This portion 30 may be held in any ad-

justed position along the bolster by reason of a set screw 31 which is sunk thereto. A thimble 32 has an inner cylindrical surface 33 which engages the spherical portion 30 and has an outer barrel-like surface 34 which engages the bore 11. This thimble may rock around its portion of greatest diameter which will be intermediate its length, and usually just above the center thereof, as pressure is applied upon it either above, as shown in Fig. 6, or below, as shown in Fig. 2, this portion of larger diameter at the point of contact of the spherical surface 30 therewith. As shown in the drawing, the portion of largest diameter of this thimble is approximately at 35 above the center thereof and the point of contact of the spherical portion 30 with the cylindrical surface 33 is below this portion of largest diameter as at 36 in Fig. 2 or above this portion of largest diameter as at 37 in Fig. 6.

The spindle 40 is mounted on the bolster to engage as at 41 with the step at the bottom thereof. Upon this spindle a whorl 42 is mounted having a portion 43 between flanges 44 and 45 to be engaged and driven by a belt or tape 46 in the usual manner. The tape will extend substantially as shown at 46 in Fig. 5 and by reason of this arrangement pull will be exerted at substantially the point of mounting of the whorl on the spindle or at 47 and will tend to swing the spindle and its bolster in the direction of the arrow A shown in Fig. 1. This will cause the lower end of the bolster to tend to move as shown by direction of the arrow B in Fig. 1 and movement in this direction is limited by a stop 48 positioned in the lower part of the case. This stop consists of a bottom wall with a U-shaped flange 49 for the reception of the tongue end 53 of the bolster and providing an inner abutment wall 50 for the lower end of the bolster to contact and properly align the spindle in a vertical dynamically balanced position.

Should excessive tension on the yarn exist at the upper end of the spindle and in a direction opposite to the arrow A and in an amount greater than the pull of the belt on the spindle due to the longer leverage through which it acts, the spindle and its bolster would give by reason of the rocking of the bolster in its mounting and swing the lower end of the bolster from its stop and into the space 51 away from the stop wall 50, thus easing this excessive tension on the yarn which in many instances will prevent breaking of the end.

It will be understood that the case is filled with oil and oil exists between the outer surface of the thimble 32 and the case. Rocking of the bolster as above indicated would cause the bolster to swing from the step as illustrated in Fig. 2 at which time pressure would exist on the thimble at point 36 and which being below point 35 in Fig. 2 would rock the thimble about this point 35 in the same direction tending to compress the liquid which existed on one side of the thimble and urging it over to the other side of the thimble. This movement would thus be dampened by reason of the necessary flow of the liquid from one point to another. Rocking of the thimble would be the reverse in Fig. 6. As soon as the

pressure or tension was relieved, the pull of the belt would swing the bolster back to its upright position and pressure at the diametrically opposite side of the spherical portion would move the thimble back about its diameter 35 as a pivot point to the position shown in Fig. 1.

It will be readily apparent that the spherical portion 30 may be adjusted to a lower position to increase its leverage upon the thimble and this would be desirable in some instances.

I claim:

1. A spindle comprising a case, a bolster having a spherical portion adjacent its upper end rockably mounted in said case, a spindle rotatably mounted in said bolster, a whorl on said spindle for a belt drive, and a recessed member in the lower end of said case for movably receiving the end of said bolster providing a stop against which said belt will swing said bolster about said spherical portion.

2. A spindle comprising a case, a bolster having a spherical portion adjacent its upper end rockably mounted in said case, a spindle rotatably mounted in said bolster, a whorl on said spindle for a belt drive, and a stop in the lower end of said case against which said belt will swing said bolster about said spherical portion, a second spherical portion below said first spherical portion and a rockable thimble embracing said second spherical portion and rocked by movement of the bolster about its rockable mounting.

3. A spindle as set forth in claim 1 wherein said whorl is at about opposite said spherical rockable mounting.

4. A spindle as set forth in claim 2 wherein said thimble has a barrel shape outer surface engaging the cylindrical base of said case to rock thereon.

5. A spindle as set forth in claim 2 wherein said second spherical portion is at one side of the largest diameter of said thimble.

6. A spindle as set forth in claim 2 wherein said second spherical portion is adjustable lengthwise of said bolster.

7. A spindle comprising a case, a bolster having a spherical portion adjacent its upper end, a pair of members each cupped to receive said spherical portion to rockably mount the same in said case, a spindle rotatably mounted in said bolster, a whorl on said spindle for a belt drive, and a stop at the lower end of said case against which said belt will swing said bolster about said spherical portion.

THOMAS J. RISK.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
264,297	Jaquith	Sept. 12, 1882
2,051,641	Magrath	Aug. 18, 1936
2,207,896	Rothschild	July 16, 1940

FOREIGN PATENTS

Number	Country	Date
518,600	Germany	Feb. 18, 1931