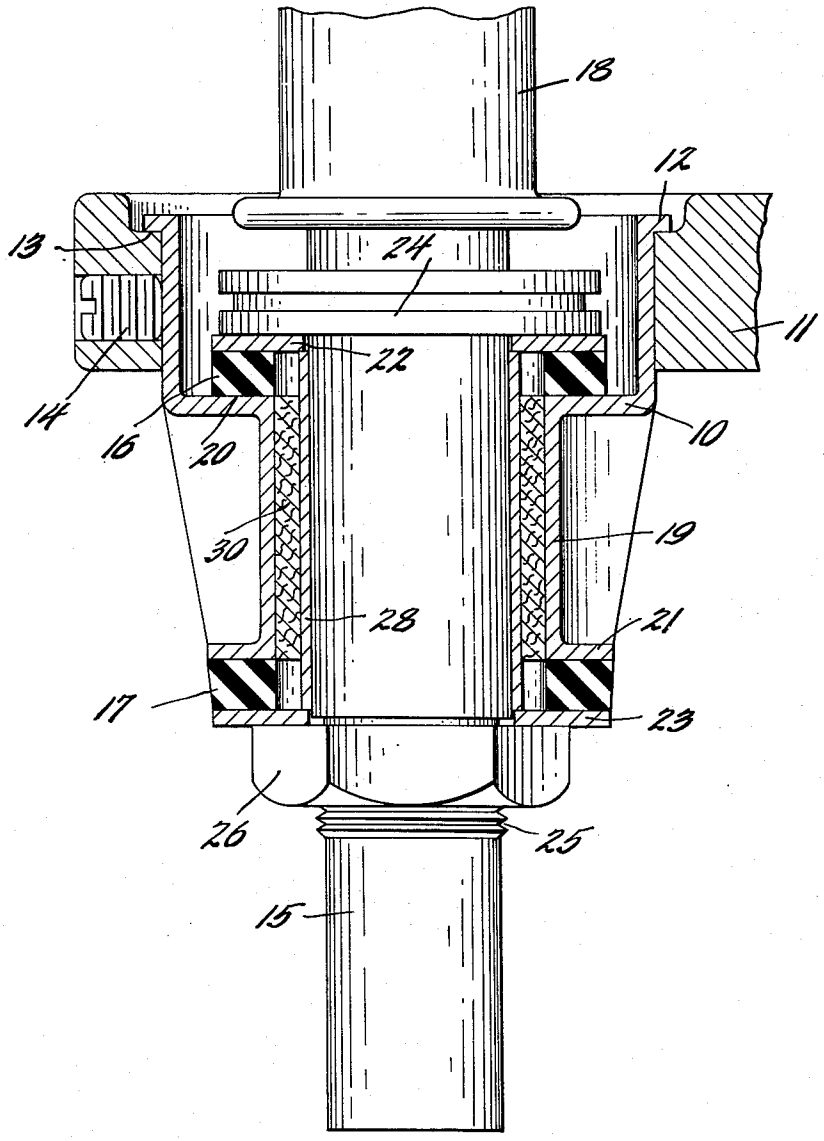
Feb. 2, 1954 D. G. SOUSSLOFF ET AL 2,668,087

SPINDLE MOUNTING

Filed April 25, 1951



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Patented Feb. 2, 1954

2,668,087

UNITED STATES PATENT OFFICE

2,668,087

SPINDLE MOUNTING

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Application April 25, 1951, Serial No. 222,836

3 Claims. (Cl. 308—152)

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This invention relates to a vibration isolating spindle mounting for a twisting machine. More specifically, the invention relates to an improvement in a vibration isolating spindle mounting for a twisting machine which prevents the accumulation of static electricity which may affect the handling characteristics of yarn being processed by the twisting machine.

An upright, rotatably supported spindle is commonly employed as one element of a twisting machine. A spindle thus employed is driven at high speeds, and in the event the yarn package, or the core of the yarn package, carried by the spindle is not balanced about its axis of rotation severe vibrations are set up in the spindle mounting. Such vibrations limit the speed at which the twisting machine may be safely operated, and also cause undue wear of the affected components of the machine.

The transmission to the spindle mounting of vibrations originating in this manner may be reduced to a large extent by elastically supporting the spindle step in which the spindle is journaled. This has been done effectively by bonding to a mounting shell one face of rubber washers which on another face are bonded to metal washers which engagingly support the spindle step. This type of an elastic support for a spindle step is shown in the accompanying drawing. An elastic support of this kind for the spindle step and the spindle electrically isolates these elements from the remainder of the twisting machine with which they may be associated, so that very substantial charges of static electricity are accumulated thereon as a result of the generator-like effect of the spindle and yarn being rotated at high speed. Such an accumulation of static electric charges affects the behavior of the yarn being processed by the twisting machine and often causes irregularities in the operation of the machine.

The purpose of this invention is to provide a vibration isolating spindle mounting which retains all the advantages of an elastically supported spindle step, and which at the same time is constructed and arranged to avoid the accumulation of static electricity which may affect the behavior of the yarn being processed.

One embodiment of the invention is illustrated in the accompanying drawing which shows a diametric vertical sectional view of a vibration damping spindle mounting, and in which drawing the spindle step and the lower portion of the whorl of a spindle supported thereon are shown in elevation.

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In general, the invention consists of providing a compressible conducting means between a spindle step and the element on which it is elastically supported, and from which it is thereby otherwise electrically isolated, so that the conductive means will bleed static electricity from the spindle step while in no manner interfering with the vibration isolating effect of the elastic support. A full understanding of the invention may be had from the following detailed description of the embodiment of the invention which is illustrated in the accompanying drawing.

In the drawing, a mounting element or shell 10 extends into an aperture provided in the member 11, which may be a swing arm, and is supported therein by the radially extending flange 12 on the upper edge of the shell. This flange rests upon the shoulder 13 which is formed in the wall of the aperture in the member 11. The shell 10 is fixedly positioned with respect to the member 11 by the set screw 14 which threadedly engages the member 11 and abuts the outer wall of the portion of the shell which is positioned within the shell receiving aperture.

A spindle step 15 extends through the shell 10 coaxially therewith, and is elastically mounted therein by means which include the rubber rings 16 and 17. The spindle step 15 is adapted at its upper end to rotatably support a spindle (not shown), the whorl 18 of which may be seen in the drawing.

The lower portion 19 of the shell 10 is reduced in diameter to provide an internal shoulder 20 to which one face of rubber ring 16 is bonded. Similarly, the lower edge of the shell 10 is provided with a radially extending flange 21 to the underside of which one face of the rubber ring 17 is bonded. The spindle step 15 is supportably engaged by means which include the metal rings 22, 23 which at their inner circumference closely encircle the spindle step 15. The metal rings 22, 23 are bonded, respectively, to the rubber rings 16, 17. The spindle step comprises a radially extending collar 24 the underside of which rests upon the upper surface of the ring 22. A lower portion of the spindle step is threaded as at 25 to receive a tightening nut 26 which may be turned up into engagement with underside of the ring 23. The nut 26 may be taken up to bring the metal rings 22, 23 into firm frictional engagement with the collar 24 and the nut 26, respectively, so that, in effect, the spindle step 15 is rigidly connected to the rings 22, 23. The inner diameter of the lower portion 19 of the shell is sufficiently larger than the outside diam-

eter of the spindle step to permit the spindle step to freely oscillate within the shell.

It will be understood that the rubber rings 16, 17 will not exhibit the desired characteristic of isolating vibrations if in the course of establishing the frictional connection between the ring 22 and the collar 24, and between the ring 23 and the nut 26, respectively, the rubber rings are placed under heavy compression. In order to thus prevent compressing the rubber rings until they take on the characteristics of a solid material, the means for supportably engaging the spindle step includes a sleeve 28 which closely encircles the spindle step, and which at its ends abuts the most inwardly portions of the mutually facing surfaces of the rings 22, 23. With the sleeve 28 thus interposed between the rings 22, 23, the firm frictional engagement necessary to fasten the spindle step to the rings 22, 23 may be obtained without placing the rubber rings 16, 17 under compression. As a result, the spindle 17 floats more easily on the elastic support, and the maximum vibration isolating effects of the elastic support are obtained.

It will be observed that in the vibration isolating spindle mounting thus far described the spindle step 15, and the means for supportedly engaging the spindle step, are electrically isolated from the shell 10 by the rubber rings and, accordingly, from the remainder of the twisting machine with which the spindle mounting may be associated. This results in the accumulation of static electricity on the spindle and the spindle mounting, and adversely effects the behavior of yarn being processed in the twisting machine, as previously explained. This difficulty is obviated by the present invention by inserting in the space between the sleeve 28 and the lower portion 19 of the shell a mass of steel wool 30 which contacts the sleeve 28 and the shell portion 19 over a large area. The steel wool thus provides a path for the discharge of static electricity accumulating on the spindle or spindle step to the shell 19, without in any manner interfering with the oscillation of the spindle step on its elastic support. It will be apparent that other kinds of shredded conductive material which is easily compressible may be substituted for the steel wool.

It is desired to secure by Letters Patent the claims of invention set forth below:

1. A vibration isolating spindle mounting comprising an annular shell having two spaced, parallel surfaces, two annular rubber rings bonded on one surface, respectively, one to each of said parallel surfaces, two annular members bonded, respectively, one to each of another surface of each said rubber ring, a spindle step positioned to extend through the said shell, rubber rings and annular members, a spacing sleeve closely encircling a portion of said spindle step and abutting at its ends the mutually facing surfaces of said annular members, means supported on said spindle step for releasably securing said spindle step to the oppositely facing surfaces of said annular members, and compressible conductive means interposed between and contacting said spacing sleeve and said shell.

2. A vibration isolating spindle mounting comprising an annular shell having two spaced, parallel surfaces, two annular rubber rings bonded on one surface, respectively, one to each of said parallel surfaces, two annular members bonded, respectively, one to each of another surface of each said rubber ring, a spindle step positioned to extend through the said shell, rubber rings and annular members, a spacing sleeve closely encircling a portion of said spindle step and abutting at its ends the mutually facing surfaces of said annular members, means supported on said spindle step for releasably securing said spindle step to the oppositely facing surfaces of said annular members, and a compressible mass of shredded conductive material interposed between and contacting said spacing sleeve and said shell.

3. A vibration isolating mounting comprising an annular shell having two spaced, parallel surfaces, two annular rubber rings bonded on one surface, respectively, one to each of said parallel surfaces, two annular members bonded, respectively, one to each of another surface of each said rubber ring, a spacing sleeve extending through said shell and rubber rings and abutting at its ends the mutually facing surfaces of said annular members, said spacing sleeve being adapted to encircle an object to be mounted, the oppositely facing surfaces of said annular members being engageable by means carried by said object for securing said object in the mounting, and compressible conductive means interposed between and contacting said spacing sleeve and said shell.

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