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(54) TRAVERSING DEVICE

(71) We, BARMAG BARMER MASCHINENFABRIK AKTIENGESELLSCHAFT, a body corporate organised under the laws of the Federal Republic of Germany, of Remscheid-Lennep, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a traversing device for use in a threaded winding machine.

A traversing device is described in German Auslegesschrift No. 20 31 245 in which a plurality of traversing thread guides are fixed to common drive rod. This drive rod is mounted in a support which is reciprocable in a straight guide. The support is driven via a cam with an intermediate roller acting as a cam follower.

The thread guide rod is mounted in resilient elements to prevent impacts and vibrations occurring at the points where the threaded guide changes direction referred herein as the reversing points from being transmitted to other moving members and to prevent the stress on the cam and the cam follower from becoming excessive.

However, it has been found that the stress on the cam follower and the cam is high even with this type of mounting since the resilient mounting does not prevent the roller from tilting in the groove when impacts occur at the reversing points. This phenomenon occurs not only when a combination of cam follower and cam is used but also occurs generally in traversing thread guides with integral drive regardless of whether they have a cam or a grooved roller, cylindrical cam, cam disc or other device to provide the drive.

An object of the invention is therefore to provide a traversing device which is reliable and prevents the cam follower from tilting in the driving guide body and thus making the entire apparatus unusable.

According to the invention there is provided a traversing device for use in thread winding machines, comprising a rotatably drivable grooved cam body, a support mounted for movement along a straight guide, at least one traversing thread guide connected to one side of the said support, and a cam follower carried by a journal on a second side of the said support and engaging with the cam body, the cam follower being mounted resiliently and rotatably in relation to the support, wherein the journal enters the groove in the cam body and bears the cam follower on its free end with the interposition of a resilient element arranged concentrically to the axis of the journal on the said free end thereof.

This enables the traversing thread guide to still be able to tilt in the cam follower without tipping the cam follower in the process and thus damaging the cam surface of the cam body. This advantage is obtained in any cam follower whether it is formed as a roller, shuttle or the like. A further advantage of the invention lies in the fact that the resulting high mass forces obtained when driving several thread guides collectively do not act on the cam body.

By using O-rings as damping bodies the damping effect may be regulated simply and reliably.

The damping effect may be increased and thus the damping elements on the cam followers relieved by also providing damping elements on the support on which the traversing thread guides are fixed or guide is fixed.

A roller is suitable as a cam follower in the context of the invention, when using a cylindrical cam, this roller being mounted in turn in bearings, for example needle bearings, on the support.

In the accompanying drawings:

Figure 1 shows a diagrammatic view of a traversing device according to the invention;

Figure 2 shows a detail from Figure 1 in which the mounting of the support in the cylindrical body is visible;

Figure 3 shows an alternative form of mounting to that shown in Figure 2;

Figure 3*a* shows a modification of the mounting shown in Figure 2; and

Figure 4 shows another embodiment of

the mounting using a shuttle as a cam follower.

Figure 1 shows diagrammatically part of a traversing device for use, for example, in a two-for-one twister. A plurality of thread guides (not shown) are rigidly fixed to a thread guide rod 1. The thread guide rod 1 is fixed in the support 2 which is guided along a straight path by a straight guide 3. The guide 3 is rigidly fixed in the machine frame. The front faces 21 of the support 2 may be formed as pistons which enter respective cylinders 22 in at reversing points and are thus braked. The support 2 has a journal 23 which extends into a groove 4 of a revolving cylindrical cam 5, whereby the support 2 is driven by the cam 5.

Figure 2 is an enlarged view of the groove 4 and the support 2 driven therein. The support 2 is mounted in resilient damping elements 6. The damping elements consist of O-rings which are journalled on the end of the journal 23. A needle bearing 7 with an internal cage is placed coaxially to the O-rings. The outer ring of the cage of the needle bearing 7 is formed by a cam follower 8. In this example the cam follower is in the form of a roller. However, it is also feasible to use other forms of cam follower. The O-rings 6 and the needle bearing 7 are protected from axial displacement by a closure disc 9.

When the traversing thread guide reaches a reversing point, the support 2 may be deflected owing to the mass forces of the support 2. This manifests itself in a tilting movement of the support 2 on the cam follower 8. In contrast to what is the case in known traversing devices, this tilting movement is not harmful since it is taken up completely by the damping element 6 without the cam follower 8 tipping on its bearing surface. Alternatively, the cam follower 8 may be adapted to any change in the guide path immediately since it is not obstructed by the support 2. The formation of grooves and excessive wear of the guides are thus avoided.

Figure 3 shows another possible embodiment of the support mounting. In this case, the journal 23 itself forms the inner cage for the needle bearing 7. The outer cage is formed by a bush, upon whose outer circumference resilient damping elements 6^1 are arranged. The latter are connected to the cam follower 8 which, as in Figure 2, is in the form of a roller.

Figure 3*a* shows a variation of the cam follower 8. The cam follower 8 in Figure 3*a* is a roller constructed in the form of a spoked wheel in whose hub the lower end of the support is rotatably journalled. The spokes are resilient and act as damping elements. Tilting of the support 2 is rendered harmless in this case by means of the resilient spokes, so that the cam follower 8 cannot tip in its guide. The needle bearing 7 is similarly unharmed since it can effect the tilting movement of the support 2 with its inner and outer cage.

Figure 4 shows another advantageous embodiment of the invention. Here, a shuttle 8^1 is used as the cam follower and this shuttle is driven by a reversing thread roller 5^1. A rubber bush is used as a resilient damping element 6^{11} and is mounted in a bore hole at the centre of gravity of the shuttle 8^1. A journal 10 is fixed in this bush and its free end is mounted rotatably in the support 2^1. Tilting of the support 2^1 or of the shuttle 8^1 owing to an irregularity in the guide path is also harmless here and the cam follower or the slide path cannot be damaged.

WHAT WE CLAIM IS:—

1. A traversing device for use in thread winding machines, comprising a rotatably drivable grooved cam body, a support mounted for movement along a straight guide, at least one traversing thread guide connected to one side of the said support, and a cam follower carried by a journal on a second side of the said support and engaging with the cam body, the cam follower being mounted resiliently and rotatably in relation to the support, wherein the journal enters the groove in the cam body and bears the cam follower on its free end with the interposition of a resilient element arranged concentrically to the axis of the journal on the said free end thereof.

2. A device according to Claim 1 wherein the resilient element comprises a plurality of coaxially arranged O-rings.

3. A device according to any preceding claim, wherein damping members are provided for acting on the end faces of the support.

4. A device according to any preceding claim, wherein the cam follower is in the form of a rotatably mounted roller.

5. A traversing device substantially as herein described with reference to any one of the embodiments shown in the accompanying drawings.

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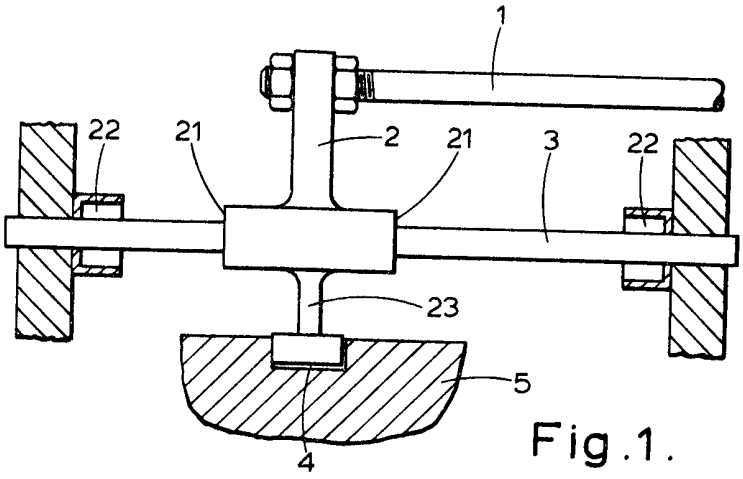

Fig.1.

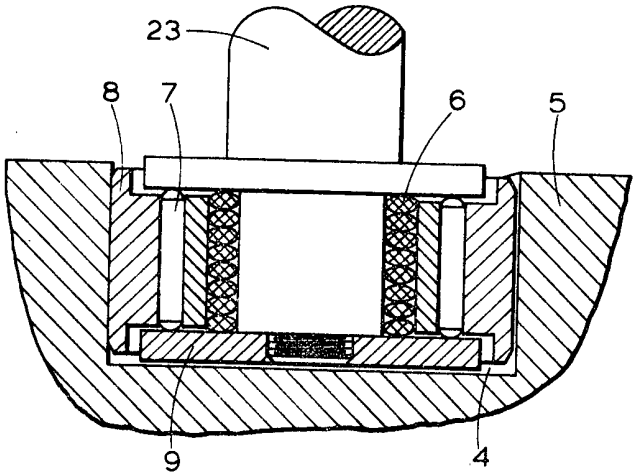

Fig.2.

1585289 COMPLETE SPECIFICATION
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Sheet 2

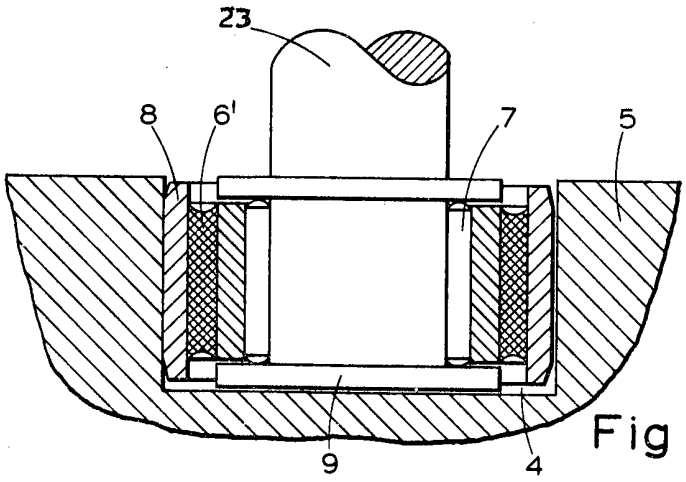

Fig.3.

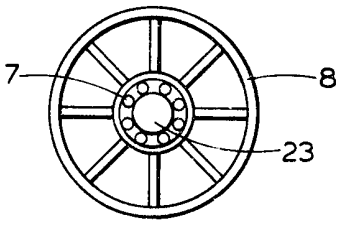

Fig.3a.

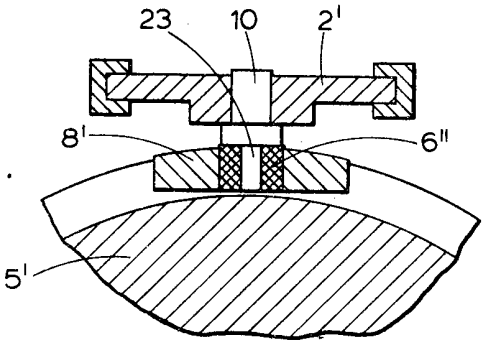

Fig.4.