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GUIDE-MOUNTING ARRANGEMENT

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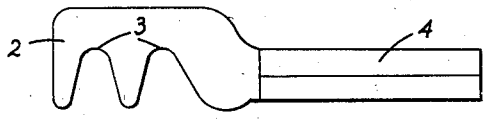


Fig. 1

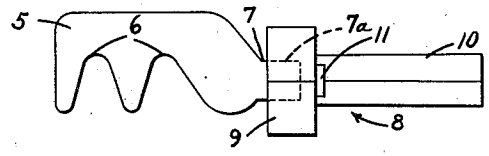


Fig. 2

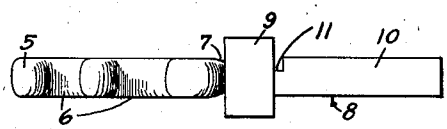


Fig. 3

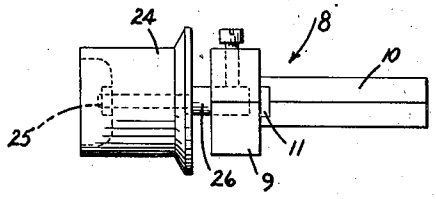


Fig. 6

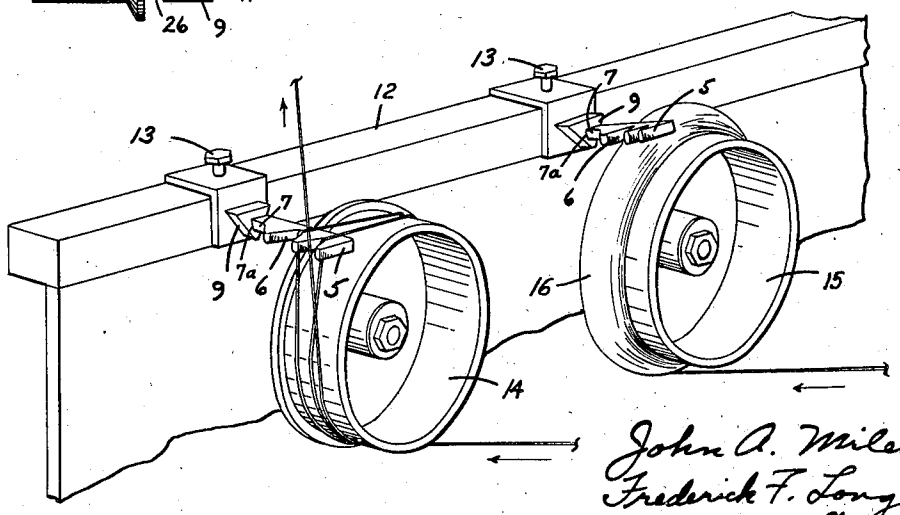


Fig. 4

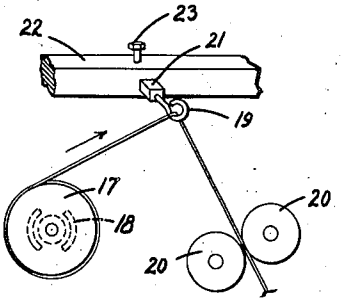


Fig. 5

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GUIDE-MOUNTING ARRANGEMENT

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9 Claims. (Cl. 242—157)

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This invention relates to guide-mounting means, and is particularly concerned with the reduction of breakage of guides.

The present invention is useful wherever thread guides may become subject at times to stresses exceeding that for which they are normally designed. The high stress may be that developed by the thread bundle being controlled by the guide itself and it may be desirable to avoid breakage or severe damage to the thread bundle while relieving the stress without damaging or breaking the guide itself. Again, the stresses may be developed by improper operation or negligent servicing of adjacent or associated mechanisms. An example of this occurs in connection with the type of thread-drawing mechanism comprising as a unit a rotating wheel or godet and an associated guide for causing and controlling the lateral displacement of a thread wrapped one or more times thereabout. Such a mechanism is of use in numerous situations, such as in artificial filament spinning machines, and may take various forms. It may comprise a smooth-faced roller on an axis inclined to that of the wheel, or it may be of a peripherally grooved roll or a pronged non-rotary guide in which the grooves or prongs control the displacement of the thread. These guides, whether rotary or non-rotary, are fixed in place on stationary bearings if rotary, or on a stationary support if non-rotary, as close as possible to the wheel. The proximity of the guide to the wheel is of importance. If placed too far from the wheel or godet, less traction is obtained between the thread and the wheel, so that slippage thereon may occur. Again, if the guide is displaced unnecessarily far from the wheel, the thread makes too sharp an angle about the guide and the increased wear and tear upon the thread gives rise to breakage of the filaments in the thread, particularly when the thread being passed about the wheel and guide mechanism is not completely set up, as is often the case where such mechanisms are frequently used, for example, in an artificial filament spinning machine. It has been found in the past that for any one of various reasons the thread may at times be allowed to wind upon the wheel until a sufficient mass is built up thereon to force the guide, whether rotary or non-rotary, to be deflected away from the wheel. Such guides, rotary or non-rotary, are generally made of a brittle material, such as porcelain, glass or phenolic resins, which are incapable of bending to any great extent with the result that breakage of the guides occurs as the result of such deflection. In the case of guides of

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the rotary type, they are frequently supported upon shafts made of such brittle material and liable to the same excessive breakage during use. The accumulation of the thread about the wheel may result from accidental breakage of the thread in passing from the wheel to the next thread-handling device, or as the result of an operator's carelessness or forgetfulness when doffing the machine, during which operation he may purposely allow the thread to gather upon the wheel.

It is the principal object of the invention to provide a guide-mounting capable of being distorted plastically and, if necessary, of even being broken, so that severe damage or breakage to the guide is avoided, in order to relieve any excessive stress applied to the guide. This has the advantage of breaking a relatively inexpensive and easily replaceable mounting part while avoiding breakage of the guide itself or of the bearing associated with a guide of the rotary type, which parts are generally made of expensive materials in order to meet the specific requirements of smoothness, hardness, and freedom from abrasion and wear caused either by contact with the thread itself in the case of the guide material or with the complementary bearing mechanism in the case of the bearing of a rotary guide. Other objects and advantages will be apparent from the drawing and description thereof.

In the drawing which is illustrative of the invention—

Figure 1 is a view of a lap-displacing guide of the prior art;

Figure 2 is a side view of one embodiment of the invention as applied to a lap-displacing guide;

Figure 3 is a side view of the guide of Figure 2, taken in a plane at right angles to that of Figure 2;

Figure 4 is a perspective view showing the operation of the lap-displacing guide of Figures 2 and 3 in association with a wheel;

Figure 5 is a view illustrating the application of the invention to a more common type of guide; and

Figure 6 shows the application of the invention to a rotary type of guide.

Figure 1 shows a lap-displacing guide, such as may be made of porcelain. The effective guiding body 2 has two grooves 3 and a shank 4. As shown, the long shank 4 is of triangular cross-section, though, of course, it could be of any desired shape, and it serves for mounting the guide simply by being placed within a complementary socket in which it may be held by a set screw. When such a guide is broken by virtue of the

pressures exerted thereon by the thread guided thereabout or by that carried on the adjacent wheel, it is no longer of use.

In accordance with the present invention as shown in Figures 2 and 3, the guide body 5 having grooves 6 is provided with a short shank 7 which fits within a socket 7a provided in one end of an adapter or mounting member 8. In the specific example shown, the end 9 of the member 8 provided with the socket 7a is considerably enlarged with respect to the shank 10 of the adapter, though this is not an essential feature of the construction in accordance with the present invention, but rather the result of the fact that the shank 7 of the guide is approximately of the same size as the complementary socket intended to receive the shank 10 of the adapter. An essential feature of the invention, however, is to provide at least one point of weakness in the mounting member at a position therealong beyond the point therein to which the guide shank extends. When the mounting member is of the construction shown, i. e., the shank 10 of the member is smaller than the socket end 9, the shank 10 may be of sufficient weakness to assure that any bending or breakage occurs at some point of its length. However, if the difference in cross-sectional shape of the shank 10 and socket end 9 is insufficient to assure breakage along the shank 10, a transverse cut 11 may be made at any desired position along the shank 10 beyond the portion thereof which is received within the supporting socket for holding the guide mounting. A transverse cut may be made of such a depth as to provide for either bending or breakage under a predetermined moment of force exerted upon the guide. Instead of a single cut, a plurality of cuts may be provided and if desired, a single cut may be extended completely around the shank 10.

Whether the mounting member is merely bent under the stress or is broken depends upon the material of which it is made. It may for example, be made of a fairly hard, brittle, easily breakable material, such as molded phenolic resin or similar resins, in which case, breakage would occur before any appreciable bending takes place. On the other hand, the mounting member may be made of lead or other ductile material, either metallic or of a synthetic resin plastic. In the latter case, the guide mounting may undergo considerable bending plastically to relieve the stress before breakage occurs, and such a material consequently has the advantage that it can be bent back to its original position after the proper thread-guiding conditions are restored and such re-bending can be repeated a number of times before the material ruptures. Any of the materials from which the mounting member is to be made, can readily be formed about the shank of the guide by casting or other simple molding operations, and when lead or other metallic materials, as well as some of the thermoplastic resins are used in making the mounting member, the broken parts can be re-melted and molded to re-form the adapter.

The shape of the shank of the mounting member is immaterial, since it can be either cylindrical or non-cylindrical, such as of triangular or rectangular cross-sectional shapes, the former of which is shown in the drawing.

Figure 4 illustrates the operation of the lap-displacing guide of Figures 2 and 3. As there shown, a plurality of guides 5 are mounted at spaced intervals upon a rail 12 by means of set screws 13 extending to sockets in the rail for receiving the shanks 10 of the guide adapters. Each guide is associated with one of the wheels 14 and 15 shown, that associated with wheel 14 being shown in normal operation with the thread bundle proceeding first through the back groove 6 and then around the wheel, again through the guide but this time through the front groove 6 and again around a wheel, thereby displacing the laps of thread above the wheel laterally of the periphery thereof. A large accumulation of thread 16 is shown upon the wheel 15, so that it has exerted a pressure under the guide 5 and bent it upwardly. Figure 2 shows the under side of the guide 5 as mounted in Figure 4, so that the weakening cut 11 is beneath the adapter as shown. When an operator arrives at the scene and removes the excess accumulation of threads 16, he may then bend the guide mounting back into proper position, assuming that it is made of lead and that it has not been bent to such an extent as to cause rupture.

In Figure 5, a guide constructed in accordance with this invention is shown in a modified thread-handling arrangement. As shown, a thread proceeds from a source 17 which may be subject to a drag or brake 18, through a guide 19 of pigtail form and thence to the nip between feeding rollers 20. The guide 19 is secured in a mounting member 21 constructed in accordance with the invention and secured in a supporting rail 22 by means of a set screw 23. The mounting member 21 is so constructed that it will bend when tension in the thread between supply 17 and the rolls 20 exceeds a predetermined amount, so that it will give in that event, thereby avoiding breakage and damage of both the thread and the guide. The strength of the point of weakness in the guide-mounting member is predetermined in accordance with the character of thread being handled. Thus, if the thread happens to be a heavy cord, it will stand considerable tension and consequently the mounting member may be designed to resist a much greater bending moment than would be the case with a lighter yarn and especially when such yarn is of incompletely set artificially produced filaments.

Any form of guide may be mounted in accordance with the invention, such as a pot-eye, pigtail, and the like.

Figure 6 illustrates the invention as applied to supporting a rotary guide comprising a roller 24 having a thread-carrying surface mounted rotatably upon a shaft 25. The shank portion 26 of the shaft 25 projecting axially with respect to the guide is received in a socket within a mounting member or adapter 8, which is here shown as of the same construction as that in Figures 2 and 3.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

We claim:

1. In combination, a guide having a shank projecting therefrom and a mounting member having the guide secured to one end thereof, said mounting member having a shank extending from the portion to which the guide is secured and adapted to be secured to a supporting structure, the mounting member having at least one transverse plane of weakness therethrough which is more susceptible to yield under the stress of a predetermined bending moment than the guide.

2. In combination, a guide having a shank pro-

jecting therefrom and a mounting member having the guide secured to one end thereof, said mounting member having a socketed portion to which the guide is secured and a shank extending from the socketed portion and adapted to be secured to a supporting structure, the shank portion of the mounting member having at least one point thereof which is weaker than the socketed portion of the mounting member and weaker than the guide.

3. In combination, a guide having a shank projecting therefrom and a mounting member having the guide secured to one end thereof, said mounting member having a socketed portion to which the guide is secured and a shank extending from the socketed portion and adapted to be secured to a supporting structure, the shank portion of the mounting member having at least one point thereof which is weaker than the socketed portion of the mounting member and weaker than the guide, said mounting member being made of a deformable material.

4. In combination, a guide having a shank projecting therefrom and a mounting member made of lead having the guide secured to one end thereof, said mounting member having a socketed portion to which the guide is secured and a shank extending from the socketed portion and adapted to be secured to a supporting structure, the shank portion of the mounting member having at least one point thereof which is weaker than the socketed portion of the mounting member and weaker than the guide.

5. In combination, a guide having a shank extending therefrom and a mounting member having a socket in one end adapted to receive the guide shank, said mounting member having a shank portion extending from the socketed portion and the transverse cross-section through the shank of the mounting member being sufficiently reduced at a portion thereof adjacent the socketed portion of the member to render the reduced section more susceptible to yield under the stress of a predetermined bending moment than the guide.

6. In combination, a guide having a shank extending therefrom and a mounting member made of deformable material having a socket in one end adapted to receive the guide shank, said mounting member having a shank portion extending from the socketed portion and the transverse cross-section through the shank of the mounting member being sufficiently reduced at a portion thereof adjacent the socketed portion of the member to render the reduced section more susceptible to yield under the stress of a predetermined bending moment than the guide.

7. In combination, a guide having a shank extending therefrom and a mounting member made of a ductile material having a socket in one end adapted to receive the guide shank, said mounting member having a shank portion extending from the socketed portion and the transverse cross-section through the shank of the mounting member being sufficiently reduced at a portion thereof adjacent the socketed portion of the member to render the reduced section more susceptible to yield under the stress of a predetermined bending moment than the guide.

8. In combination, a guide having a shank extending therefrom and a mounting member made of lead having a socket in one end adapted to receive the guide shank, said mounting member having a shank portion extending from the socketed portion and the transverse cross-section through the shank of the mounting member being sufficiently reduced at a portion thereof adjacent the socketed portion of the member to render the reduced section more susceptible to yield under the stress of a predetermined bending moment than the guide.

9. In combination, a guide having a shank projecting therefrom and a mounting member having the guide secured to one end thereof, said mounting member having a socketed portion to which the guide is secured and a shank extending from the socketed portion and adapted to be secured to a supporting structure, the shank portion of the mounting member having at least one point thereof near the juncture of its shank with its socketed portion which is weaker than the socketed portion of the mounting member and weaker than the guide.

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