Sept. 6, 1938. J. UYTENBOGAART 2,129,283

MOUNTING APPARATUS

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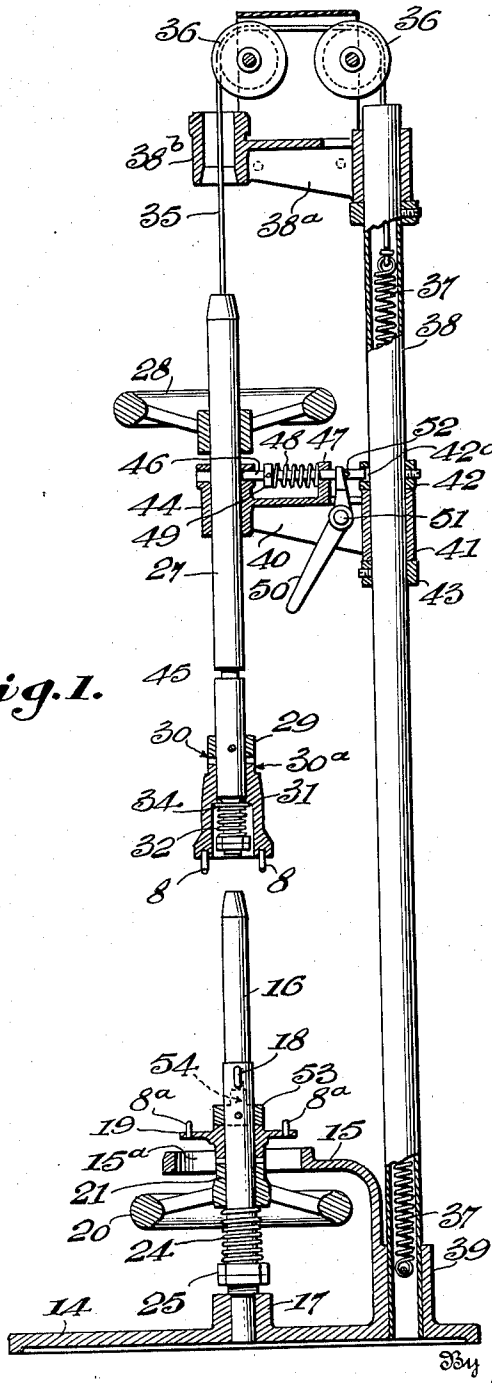


Fig. 1.

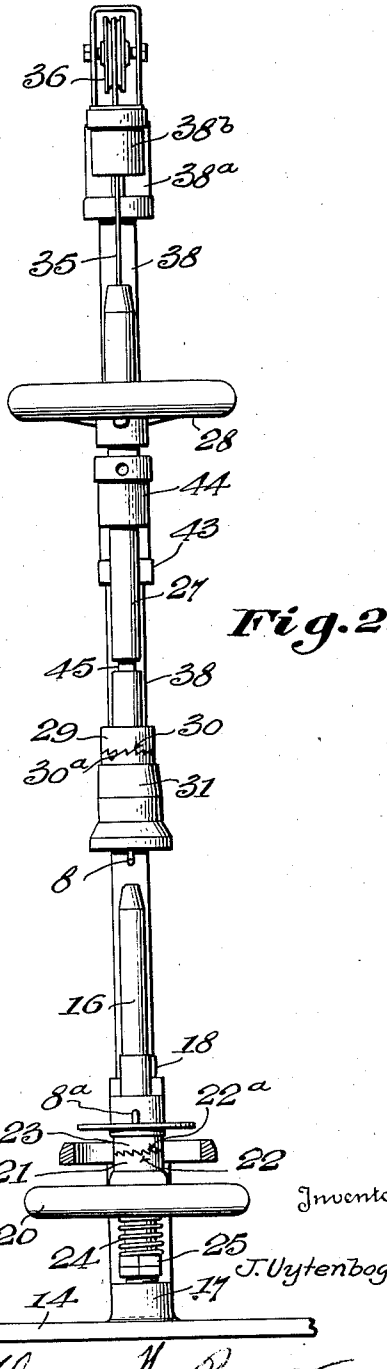


Fig. 2.

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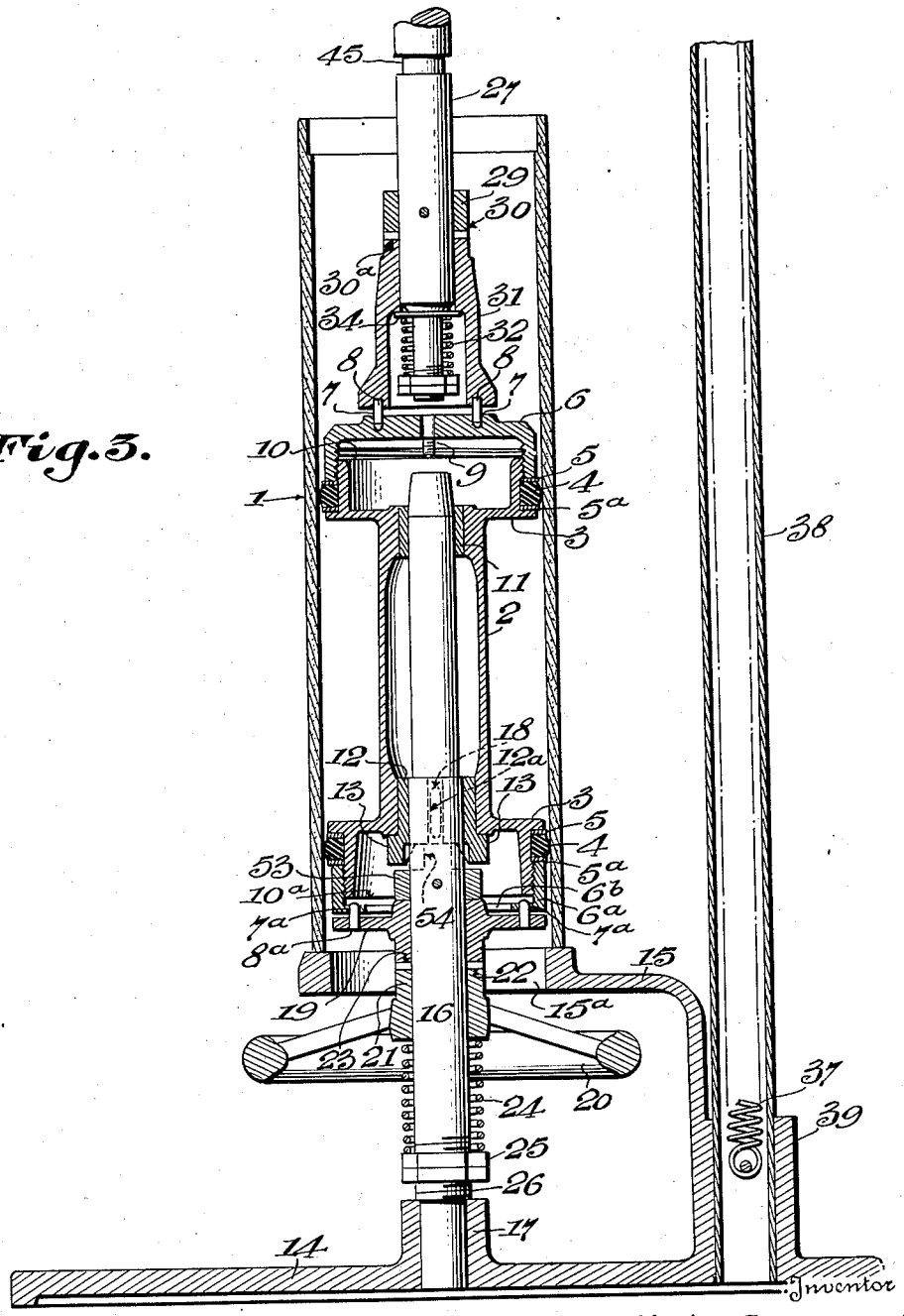
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Fig. 3.



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2,129,283

MOUNTING APPARATUS

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Application January 7, 1937, Serial No. 119,532

5 Claims. (Cl. 279—1)

This invention relates to an apparatus for applying a mounting member to the member to be supported by it. It is particularly adapted for applying a mounting member such as that described in copending application Serial No. 119,533, filed January 7, 1937, entitled "Mounting member."

In the continuous treatment of artificial cellulosic filaments as described in copending application Serial No. 131,942, filed March 19, 1937, entitled "Continuous spinning," the filaments are wet-treated, washed and dried while passing them over a generally spiral path on spaced, hollow, rotatable cylinders, the wet-treatment and washing being applied at one end of one of the rollers and heat, for example, from a gas burner or electric heater, being applied to the other end of that roller. In such an apparatus, it is desirable to use rollers of low heat conductivity and having an even and very accurately shaped surface. It has been found that porcelain or quartz cylinders are particularly adapted for this use. Such cylinders, however, are relatively friable and must be supported carefully and accurately. It is also desirable to have them supported in such a way that the rollers may be removed from or replaced upon the driving shaft of the spinning apparatus without stopping the latter.

In the above copending application for "Mounting member" there is described a means for supporting such a roller. The present application is concerned with means for applying and removing such a mounting member.

It is an object of the present invention to provide an apparatus or tool whereby the mounting member may be expeditiously applied to and removed from the member to be supported by it. It is also an object to provide a mechanism whereby the application of excessive pressure through the mounting member may be avoided. Other objects will become apparent.

Referring to the drawings, Figure 1 is a side elevation of an apparatus embodying the present invention, portions of the apparatus being illustrated in section. Figure 2 is an elevation of the apparatus shown in Figure 1, taken from the left hand side of Figure 1. Figure 3 is a sectional view of a portion of the apparatus showing the mounting member within the hollow roller.

In the drawings the numeral 1 indicates the hollow cylindrical roller which may be of porcelain, quartz or other suitable material. The numeral 2 designates the mounting member which includes enlarged portions 3 at each end carrying ring-like gaskets 4 of rubber or other suitable material. Annular washers 5 and 5a are positioned on opposite sides of the gaskets 4. The caps 6 and 6a screw onto the enlarged portion of the mounting member and are provided with annular surfaces which bear upon the washers 5, 5. As the caps 6 and 6a are advanced on the threads the pressures on the gaskets 4, 4 are increased, forcing the gaskets radially into contact with the inner surface of the roller 1. The pressure applied should be sufficient to securely hold the hollow cylinder but should be insufficient to seriously deform or break the friable cylinder.

The cap 6 is provided with holes 7, 7 adapted to receive the pins 8, 8 fixed to the upper head 31 of the tool for tightening and loosening the cap. The cap 6a is provided with similar holes 7a, 7a, adapted to receive the pins 8a, 8a fixed to the lower head 19 of the tool for tightening and loosening this cap. This cap 6a is also provided with a hole 6b to receive the shaft of the mounting apparatus. Each cap is also provided with a set screw 9 adapted to bear upon the surfaces 10 and 10a of the enlarged portion of the member 2 whereby the caps may be retained in place when tightened to the desired extent.

Bushing members 11 and 12, held in the interior of the cylindrical member 2 by means of set screws (not shown), provide bearing surfaces for properly positioning the mounting member upon the shaft of the spinning apparatus. The bearing 12 is provided with tapered projections 13, 13 which fit into corresponding recesses on a collar carried by the drive shaft of the spinning machine.

The apparatus for applying the mounting member includes a base 14 carrying a standard 15, adapted to receive and position the lower end of the cylinder 1. The standard 15 is provided with a hole 15a of sufficient size to permit passage of the cap 6a and head 19 therethrough. A shaft 16 is mounted in a collar 17 extending from the base plate 14.

The shaft 16 is of the same size and shape as the shaft of the spinning apparatus so that it fits within the bushings 11 and 12 in the same manner as the shaft of the spinning apparatus. A lug 18 on the shaft 16, cooperates with a slot 12a in the bushing 12 to position and retain the mounting member against turning on the shaft 16 while the caps are being applied.

The pins 8a are carried in the head or collar plate 19 rotatably mounted on the shaft 16. Immediately below this collar plate is a wheel 20 having a collar 21 adapted to rotate about the

shaft 16. The collar 21 is provided with ratchet shaped teeth 22 extending upwardly from the upper surface of the collar, which teeth cooperate with similar teeth 22a extending downwardly from the surface 23 of the collar 19. The wheel 20 is supported by the spring 24 resting on the collar 25, which collar may be adjusted to give the desired degree of tension by rotation on screw threads 26 on shaft 16. The teeth 22 and 22a have their surfaces so shaped that the inclined surfaces are pressing against each other when the cap is being tightened and the vertical surfaces are pressing against each other when the cap is being unscrewed. With this arrangement the wheel 20 will turn the collar 19 to tighten the cap 6a only so long as the pressure is less than that required to slip the slanting surfaces of the teeth 22 and 22a over each other. The amount of this pressure may be regulated by increasing or decreasing the tension of the spring 24 by turning the screw collar 25. A greater pressure may be applied to unloosen the cap 6a since the surfaces of the teeth then in contact are vertical and will not slip over each other.

A similar arrangement for tightening the cap 6 is suspended above the shaft 16. This arrangement includes a shaft 27 having a wheel 28 fixed against rotation relative to the shaft. A collar 29 is pinned to the shaft 27. This collar is provided with ratchet teeth 30 similar to the teeth 22 and 22a. A head or collar 31 having teeth 30a adapted to cooperate with the teeth 30 is rotatably carried at the end of the shaft 27. A spring 32 bearing against the collar 31, adjustably positioned on the end of the shaft 27 by means of screw threads, bears at its upper end against the washer 34, which in turn bears upon an annular surface within the hollow cupped end of the collar 31. The adjustable collar 31 is positioned so as to force the teeth 30a of the collar 31 against the teeth 30 on the collar 29 fixed to the shaft 27. The ratchet teeth 30 and 30a are reversed as compared with the teeth 22 and 22a so that the unlimited pressure is applied to the cap 6 in a clockwise direction (looking down) and the limited pressure in a counterclockwise direction. The direction of either or both of the surfaces of the sets of teeth may be varied depending upon the threads of the caps, the important feature being to have the limited pressure applied in tightening the caps and the unlimited pressure applied in loosening them.

The shaft 27 is suspended by a flexible cable 35 which passes over the pulleys 36, 36 and is connected to a spring 37 within the hollow cylindrical shaft 38. The shaft 38 is supported in an elongated collar 39 extending from the base plate 14. The bracket 38a has an apertured bearing portion 38b which serves as a guide for the cable 35 and the upper end of the shaft 27. A bracket 40 has a collar portion 41 rotatably mounted on the shaft 38 and is held in position longitudinally on that shaft by the collars 42 and 43, fixed to the shaft 38 by means of cap screws. The outer end of the bracket 40 is provided with a collar 44 adapted to slidably receive the shaft 27. A slot 45 is provided in the shaft 27 and a pin 46, slidably mounted in the collar 44 and in the projection 47, is carried by the bracket 40. This pin 46 is within a compressed coil spring 48 bearing against a collar 49 and the projection 47 whereby the resilient pressure tends to force the pin 46 toward the shaft 27. When the shaft 27 is raised until the slot 45 is opposite the pin 46, the end of the pin 46 will slip into the slot 45 and retain the shaft in its raised position. When it is desired to lower the shaft 27, the trigger 50, which is pivoted on the bracket 40 at 51 and has a bifurcated arm bearing against the pin 52 on the shaft 46, is moved to withdraw the pin 46 from the slot 45. When the end of the pin 46 is withdrawn from the slot 45 the other end of that pin extends into a hole 42a in the fixed collar 42 so as to prevent rotation of the bracket 40 about the shaft 38. But when the pin 46 is advanced into the slot 45 the other end of that pin is withdrawn from the hole 42a. With this arrangement the bracket and shaft 27 may be swung around the shaft 38 when the shaft 27 is in its raised position, thus facilitating the placing or removal of a roller 1 on the standard 15. At all times, except when the shaft 27 is fully raised so that the pin 46 slips into the slot 45, the bracket is held against rotation about the shaft 38 by the collar 42. Also the shaft 27 can only be lowered when the bracket 40 is swung into position to permit the pin 46 to enter the hole 42a.

With this arrangement deformation or breakage of the edges of the cylinder to be mounted is prevented since the shaft 27 and bracket 40 cannot pivot around the support 38 except in fully raised position above the cylinder 1. Furthermore raising and lowering of the shaft 27 is only possible when the said shaft 27 is in perfect axial alinement with the cylinder 1 and the lower shaft 16.

A collar 53 fixed to the shaft 16 by a set screw is provided with two bearing surfaces 54 on opposite sides of the shaft 16. The surfaces of the bushing 12 between the projections 13 rest upon the bearing surfaces 54 to support the mounting member the desired distance from the surface of the standard 15 upon which the roller 1 rests. This distance may be varied if desired by changing the position of the collar 53.

The operation of the mounting apparatus is as follows:

The shaft 27 is raised and swung to one side and the roller 1 is positioned on the standard 15 as illustrated in Figure 3. The mounting member with the caps 6 and 6a unscrewed to release the pressure on the gaskets 4, 4 is placed over the shaft 16 as illustrated in Figure 3, the lug 18 registering with the slot 12a in the bushing 12 and the opposite surfaces of the bushing 12 resting upon the stops 53. The roller 1 is then positioned over the mounting member. The shaft 27 is swung back to the position shown in Figure 1 and the trigger 50 is moved to the left to withdraw the pin 46 from the slot 45 and into the hole 42a, thus to allow the shaft 27 to be lowered until the pins 8 may be fitted within the holes 7 in the cap 6. The nut 25 is adjusted on the screw threads 26 to regulate the maximum amount of pressure to be exerted on the gasket 4 by the contact between the ratched teeth 22 and 22a. The cap 19 passes on the washer 5, expanding the gasket 4 into contact with the inner surface of the roller 1. When the pressure applied to the gasket 4 is equal to the maximum according to the adjustment of the nut 25, the teeth 22 will slip over the teeth 22a against the pressure exerted by the spring 24.

The nut 33 will have already been adjusted to give the desired pressure between the ratchet teeth 30 and 30a. By turning the wheel 28 the collar 31 is rotated, through the ratchet teeth 30 and 30a, with the result that the cap 6 is screwed toward the gasket 4, applying pressure thereto through the washer 5. When the pressure applied to the gasket 4 reaches the desired

maximum value, the teeth **30***a* will raise the collar **29** against the pressure of the spring **32**, thus avoiding the application of excessive pressure to the gasket **4**.

The shaft **27** may now be raised until the pin **46** fits into the slot **45**, whereupon the shaft **27** may be swung out of the way and the roller **1** and mounting **2** may be removed as a unit from the shaft **16** and the support **15**. The cap screws in the collars **6** and **6***a* may be tightened to prevent unintentional rotation and loosening of the caps. The roller may then be applied to the spinning machine by slipping the member **2** over the driving shaft of the spinning machine until the lugs **13**, **13** fit into the corresponding recesses in the collar on the said driving shaft.

When it is desired to remove the mounting member from the roller, the procedure described above may be reversed; that is, the roller may be removed from the spinning machine and the cap screws in the caps **6** and **6***a* loosened. The roller and mounting member may then be placed over the shaft **16**, the shaft **27** may be lowered and the wheels **20** and **28** rotated to release the pressure applied by the collars **6** and **6***a*. Since the contacting surfaces of the ratchet teeth **22** and **22***a* and **30** and **30***a* are vertical when pressure is being applied to loosen the caps, additional pressure may be applied, if necessary, to overcome any tendency of the caps to stick.

It is obvious that many variations may be made in utilizing the above invention and it is not intended to limit it to the particular embodiment shown and described as illustrative of a single application of it. The terms used in describing the invention have been used in their descriptive sense and not as terms of limitation and it is intended that all equivalents thereof be included within the scope of the appended claims.

What is claimed is:

1. A device for mounting a mounting member within a hollow roller comprising a pair of spaced mounting devices having their shafts in aligned relationship, each of said mounting devices having a collar rotatable on said shafts and adapted to actuate said members to exert pressure upon an expansible gasket, said collars having surfaces with an annular row of inclined teeth extending about said shafts, a wheel for each mounting device having the collar carrying an annular row of inclined teeth adapted to cooperate with the teeth of said collars to rotate said collars with said wheels when the teeth are held together, resilient means for forcing said teeth toward each other, and means for moving said mounting member relative to each other longitudinally of the axes of the shafts.

2. A mounting device comprising an annular supporting surface, a shaft extending therethrough, a collar rotatably mounted on said shaft and adapted to actuate a rotatable member to exert a pressure against an expansible gasket bearing on the inner surface of a hollow cylindrical member positioned on said supporting surface, and resilient means for regulating the maximum pressure to be exerted upon said expansible gasket by rotation of said rotatable member, a second mounting member positioned axially in line with said shaft and provided with an adjustable resilient means for rotating a compression member against an expansible gasket and means for separating said shafts relative to each other and longitudinally of the shafts.

3. A mounting device as defined in claim 2 in which one shaft is positioned above the other and may be swung out of alignment with the other.

4. A mounting device comprising an annular supporting surface, a shaft extending therethrough, a collar rotatably mounted on said shaft and adapted to actuate a rotatable member to exert a pressure against an expansible gasket bearing on the inner surface of a hollow cylindrical member positioned on said supporting surface, and resilient means for regulating the maximum pressure to be exerted upon said expansible gasket by rotation of said rotatable member, a second mounting member mounted on a second shaft which is positioned axially in line with said first mentioned shaft and provided with an adjustable resilient means for rotating a compression member against an expansible gasket, means for separating said shafts relative to each other and longitudinally of the shafts and means to move one of said mounting members laterally with respect to the second of said mounting members.

5. A mounting device comprising an annular supporting surface, a shaft extending therethrough, a collar rotatably mounted on said shaft and adapted to actuate a rotatable member to exert a pressure against an expansible gasket bearing on the inner surface of a hollow cylindrical member positioned on said supporting surface, and resilient means for regulating the maximum pressure to be exerted upon said expansible gasket by rotation of said rotatable member, a second mounting member mounted on a second shaft which is positioned axially in line with said first mentioned shaft and provided with an adjustable resilient means for rotating a compression member against an expansible gasket, means for moving said shafts longitudinally and laterally relative to each other, and means for retaining said means against lateral movement except when said means have been moved apart longitudinally.

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