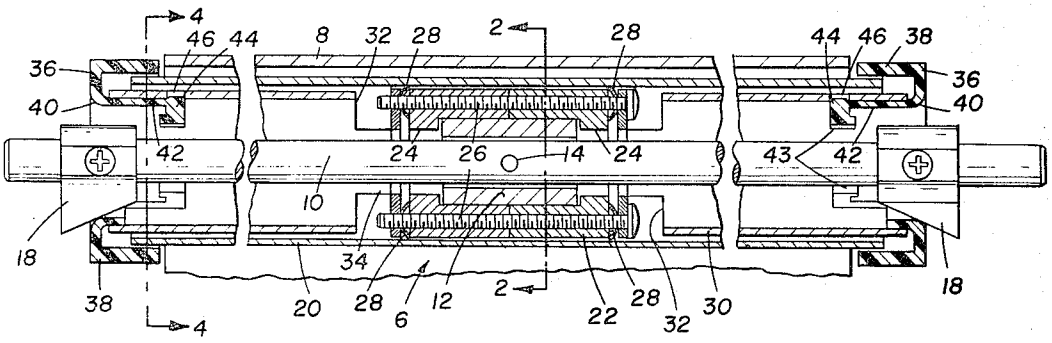
Sept. 19, 1967 R. A. DREXLER 3,342,389

ROLLER TO PROVIDE PROPER TRACKING OF A WEB IN A WEB TRACKING MECHANISM

Filed April 12, 1965

FIG. 1



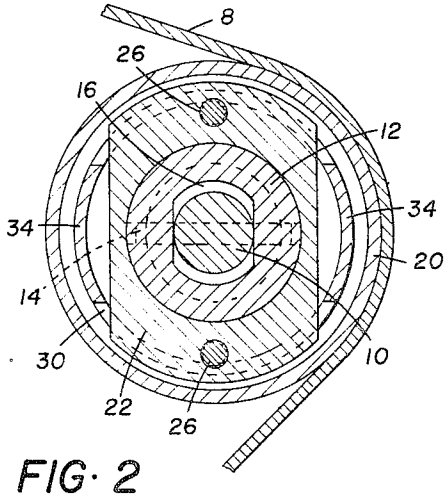




FIG. 2

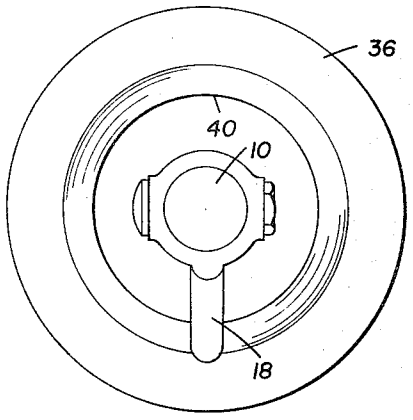



FIG. 3

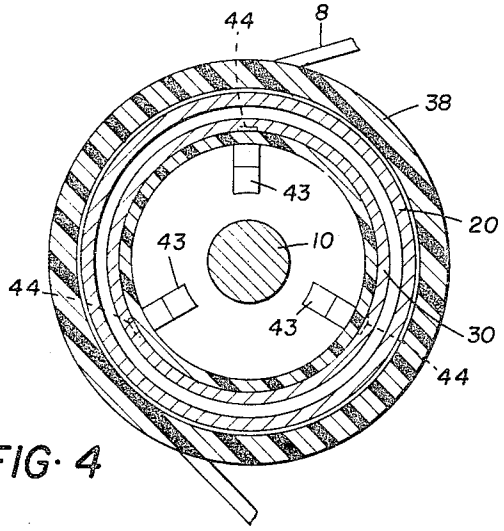



FIG. 4

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# ROLLER TO PROVIDE PROPER TRACKING OF A WEB IN A WEB TRACKING MECHANISM

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4 Claims. (Cl. 226—23)

## ABSTRACT OF THE DISCLOSURE

A tiltable web tracking roller having means for sensing an edge of a web as it mistracks, and in response to the sensing to cooperate with a fixed cam means to tilt the roller in a direction to return the web to its proper tracking position.

This invention relates generally to rollers, and more specifically to an improved roller to provide proper tracking of a web in a web tracking mechanism.

Rollers that are designed to provide proper tracking of a web trained thereover are well known in the art. A web tracking roller of this general type is disclosed in U.S. Patent No. 3,149,497. Although operating successfully, web tracking rollers of this general type have had the disadvantage of being of relatively complicated construction and design. This is particularly so in respect to the mechanism employed in such rollers for sensing the web. Applicant's improved web tracking roller is particularly applicable to web tracking systems of this type, and effectively eliminates the above-mentioned disadvantage and others of such rollers.

This invention includes within its scope an improved tiltable web tracking roller to provide proper tracking of a web in a web tracking mechanism. The web tracking roller comprises fixed means for rotatably supporting a web supporting assembly. The web supporting assembly has an improved web sensing means that cooperates with the fixed means, and is responsive to any lateral mistracking of the web from a normal position to tilt the web supporting assembly in a direction to return the web to its normal position.

Accordingly, one of the objects of the present invention is to provide an improved tiltable roller to provide proper tracking of a web in a web tracking mechanism.

Another object of the invention is to provide a web tracking roller for a web tracking mechanism or the like that is of simple design and construction, thoroughly reliable and efficient in operation, and economical to manufacture.

Another object of the invention is to provide an improved tiltable web tracking roller for a web tracking mechanism or the like that may be assembled with a minimum of effort.

Another object of the invention is to provide an improved and simplified web sensing means for a roller designed to provide proper tracking of a web.

Objects and advantages other than those set forth above will be apparent from the following description when read in connection with the accompanying drawing in which:

FIG. 1 is a front elevation view in section of a tiltable roller designed to provide proper tracking of a web, and constructed in accordance with one embodiment of this invention;

FIG. 2 is a section view taken along line 2—2 of FIG. 1;

FIG. 3 is a right end view of the roller of FIG. 1; and

FIG. 4 is a section view taken along line 4—4 of FIG. 1.

Referring to the drawings, an embodiment of a tiltable roller 6 is disclosed which is designed to provide proper tracking of a web 8 in accordance with the present invention. The roller 6 comprises fixed means for rotatably supporting a web supporting assembly. The fixed support means, as best seen in FIGS. 1 and 2, comprises a shaft 10 secured to a frame, not shown. A cylindrical bearing support 12 is secured to shaft 10 by a pin 14 extending loosely through a corresponding opening in shaft 10. The bearing support 12 has an axial opening 16 of elongated cross section as seen in FIG. 2 in which its smallest width is slightly greater than the diameter of shaft 10, and its largest width exceeds the diameter of shaft 10 to allow pivotal movement of support 12 relative thereto in one plane. Adjacent each end of shaft 10, a ramp 18 inclined with respect to the shaft axis is rigidly secured thereto and disposed in the same plane of movement as bearing support 12 for a purpose to be explained hereinafter.

The web supporting assembly which is rotatably mounted on shaft 10 comprises a cylindrical web supporting drum 20 rotatably mounted on bearing support 12 by means of a bearing 22. The bearing 22 comprises a pair of annular bearing members, each having an axial opening 24 to accommodate shaft 10. A portion of each opening 24 is enlarged and receives the complementary outer periphery of bearing support 12. The bearing members are secured together by bolts 26, and to drum 20 by arcuate washers 28 on bolts 26 which expand radially into engagement with the inner periphery of drum 20 when bolts 26 are tightened. Accordingly, drum 20, bearing 22, and bearing support 12 are pivotal as a unit about pin 14.

The web supporting assembly has web sensing means cooperating with ramps 18 and responsive to web 8 when it mistracks to tilt the assembly in a direction to return the web to its normal tracking position. The web sensing means comprises a tube 30 coaxially mounted within drum 20 for axial movement relative to the web supporting assembly. The tube 30 has opposed peripheral slots 32 through which bearing 22 extends as best seen in FIG. 2. Upon rotation of drum 20, the sides of bearing 22 engage the edges of ribs 34 (see FIG. 2) on tube 30 and rotate the tube. Sensing members, shown as plastic end caps 36, are provided at each end of tube 30 and drum 20. Each cap 36 has an outer peripheral lip 38 overlapping the ends of tube 30 and drum 20, and an inner peripheral shoulder 40 parallel thereto and having a portion thereof in constant slidable engagement with a corresponding ramp 18. Each shoulder 40 further has axially extending resilient fingers 42 with lugs 44 at one end thereof that are urged by the resilience of fingers 42 into corresponding notches 46 in tube 30 forming a detent system for releasably securing end cap 36 thereto. The fingers 42 further have radially inwardly extending lips 43 that are engageable by any suitable tool for withdrawing lugs 44 from notches 46 when it is desirable to remove the end caps 36 from tube 30.

The pivoting of drum 20 to return web 8 to its normal position is achieved by virtue of the interaction between shoulders 40 and ramps 18. The drum 20 is rotated by the tensioned web 8 trained thereover and passing between the peripheral lips 38 of end caps 36 as best seen in FIG. 1. If web 8 should mistrack axially to the left or to the right, an edge thereof will engage one or the other of the lips 38 of end caps 36 and urge the cap and tube 30 axially to the left or right. Since ramps 18 are positioned so that shoulders 40 of end caps 36 are in constant engagement therewith, there occurs a combined axial and transverse movement of end caps 36 and tube 30 as a unit relative to shaft 10. This, in turn, imparts pivotal movement to drum 20 since it is constrained to move with tube 30 by lips 38. Although two ramps 18 are provided, one would be sufficient provided some suitable means is incorporated in roller 6 to urge shoulder 40 into constant engagement with ramp 18. Such means could comprise

a leaf spring, not shown, interposed between tube **30** and shaft **10.**

The invention has been described in detail with particular reference to a preferred embodiment thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove, and as defined in the appended claims.

I claim:

**1.** In an improved web tracking roller for maintaining a web in a normal tracking position, the combination comprising:

support means;

a drum pivotally mounted on said support means for supporting a web trained thereover;

cam means mounted on said support means in inclined relation with the normal axis of said drum when said web is in its normal position;

web edge sensing means encircling each end of said drum and slidably mounted thereon for axial movement in response to lateral movement of said web from its normal position;

a tube mounted coaxially within said drum for interconnecting said web edge sensing means;

said web edge sensing means having cam followers in engagement with said cam means and cooperating therewith for simultaneously moving said web sensing means axially in the same direction, and transversely to said normal axis in opposite directions in response to lateral movement of said web from its normal position, said movement of said web edge sensing means forcing said tube to tilt and said drum to pivot in a direction to return said web to its normal position.



**2.** The invention according to claim **1** wherein each of said web edge sensing means comprises an annular cap having an outer peripheral lip encircling an end of said drum, and an inner peripheral lip parallel and concentric to said outer lip and having a shoulder in engagement with a corresponding one of said cam means.

**3.** The invention according to claim **2** wherein each end of said tube has a plurality of recesses along its inner periphery, and said inner lip of said cap further has a plurality of resilient, axially extending fingers having lugs for engaging said complementary recesses in said tube for releasably securing said cap thereto.

**4.** The invention according to claim **1** wherein said support means comprises a fixed shaft; said cam means comprises a pair of inclined ramps secured to said shaft; each of said web edge sensing means comprises an annular cap having an outer peripheral lip encircling an end of said drum, and an inner peripheral lip parallel and concentric to said outer lip and having a shoulder in engagement with a corresponding one of said ramps; said tube having a plurality of recesses along its inner periphery, and said inner lip of said cap further having a plurality of resilient, axially extending fingers having lugs for engaging said complementary recesses for releasably securing said cap to said tube.

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