June 3, 1958 C. ZELNICK 2,837,296

ANTI-FRICTION TAPE MEASURING CASE

Filed Oct. 19, 1953

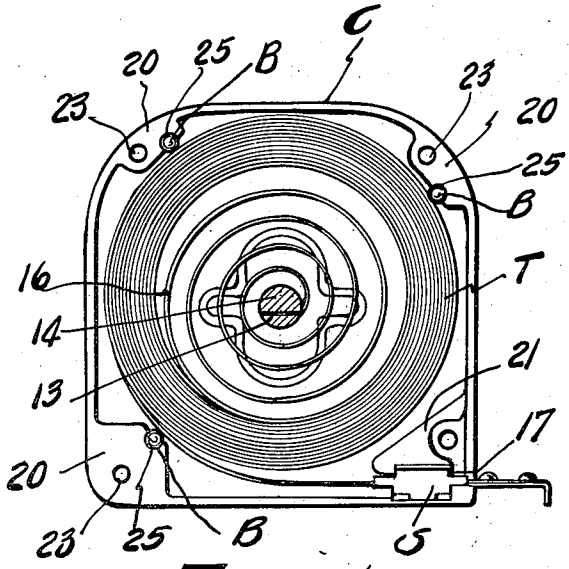


Fig. 1

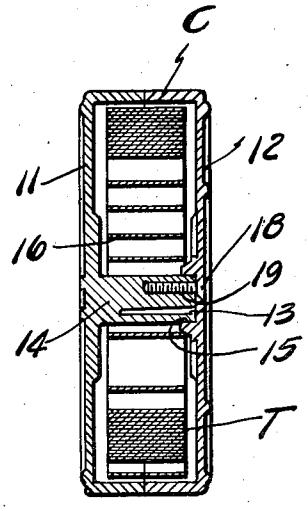


Fig. 2

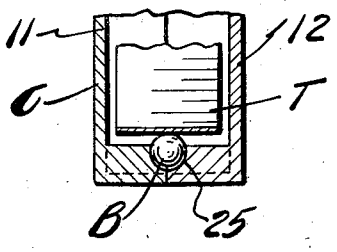


Fig. 3

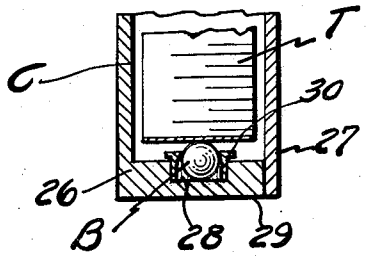


Fig. 4

INVENTOR.
Charles Zelnick.
BY
Fearman & Fearman.

United States Patent Office 2,837,296 Patented June 3, 1958

2,837,296

ANTI-FRICTION TAPE MEASURE CASE

Charles Zelnick, Saginaw, Mich., assignor to The Lufkin Rule Company, Saginaw, Mich.

Application October 19, 1953, Serial No. 386,957

7 Claims. (Cl. 242—84.8)

This invention relates to tape measures and more particularly to a new and improved tape casing provided with anti-friction means which permits the tape to be drawn from and restored to the casing with a minimum of frictional contact with the surface of the tape.

Heretofore, rollers and guide surfaces of various kinds have been provided within tape casings to influence or control the coiling and uncoiling of the tape as it is withdrawn from or restored to coiled position. These rollers and guide surfaces engage substantially the entire undersurface of the tape with the result that this contacted face is often scratched or otherwise marred so that the indicia and graduations are partially obliterated, making it difficult to read and use.

One of the prime objects of my invention is to provide freely revolvable, anti-friction, spherical guide means in the casing, which means has a minimum of contact such as a fine hair line engagement with the undersurface of the tape as it is coiled and uncoiled, so that there is no appreciable wear thereon, and graduations or indicia provided on the undersurface of the tape, as well as the upper surface thereof, are unaffected by engagement with said spherical means and remain clearly legible throughout the life of the tape.

A further object of the invention is to provide centrally disposed guide means of the type described, which has very limited contact only with the linear center of the tape, thus eliminating completely wear on the graduated edge portions of the tape.

Another object of the invention is to provide spaced, freely revolvable spherical members of the type described, which minimize operational friction and therefore greatly reduce the effort required to withdraw the tape from or restore it to its casing, resulting in smoother, easier operating tape.

A still further object of the invention is to design a casing having the aforementioned advantages, which is of simple and durable construction, and which can be very economically manufactured and assembled.

With the above and other objects in view, the present invention consists in the combination and arrangement of parts, hereinafter more fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims, it being understood that changes may be made in the form, size, proportion, and minor details of construction, without departing from the spirit, or sacrificing any of the advantages of the invention.

In the drawing:

Fig. 1 is a side elevational view of a tape casing, one section of the case being omitted and the tape shown coiled in position.

Fig. 2 is a vertical, sectional view through the tape casing.

Fig. 3 is an enlarged, fragmentary, sectional view showing the case, one of the anti-friction balls, and the tape in engagement therewith.

Fig. 4 is a view similar to Fig. 3 showing a modified construction.

Referring now more particularly to the accompanying drawing wherein I have shown the preferred embodiment of my invention, a letter C generally indicates my substantially hollow tape casing which includes individual sections or halves **11** and **12** adapted to be joined so as to form a tape receiving chamber, the section **12** having a socket **13** formed in the inner central portion thereof for accommodating the projecting post **14** of the section **11**. The post **14** is slotted as at **15** to provide anchorage for the coil spring **16** as usual, and the coiled tape T is shown mounted on the end of the spring **16** with its free end extending out the tape opening **17** of the casing in the conventional manner. A screw **18** is mounted in the section **12** and has threaded engagement in a threaded opening **19** provided in the post **14** to secure the case sections in assembled relation.

Mating tape guide projections **20** are formed in the corners of the case sections **11** and **12** as shown, and the outer surfaces thereof have heretofore been engaged by the tape and have served to maintain it in coiled condition. Substantially triangular, inwardly projecting, mating portions or shoulders **21** are provided in each case section adjacent the tape opening **17** and these projections **21** are spaced from the lower wall of the case as shown to form the tape passage **17** therebetween. The projections **21** are arranged on the arc of a circle having a diameter substantially equal to the diameter of the coil assumed by the tape when the latter is within the casing. A generally U-shaped, creep-resisting spring S straddles the tape T and resiliently engages the edges thereof, but this member will not be described in detail inasmuch as it forms the subject matter of my co-pending application Serial No. 295,898, now Patent No. 2,727,701. The case section **11** is formed with a plurality of dowel projections **23**, and the case section **12** with a corresponding plurality of sockets to receive them as usual.

The mechanism thus far described, with the exception of the creep-resisting means, is conventional, and forms no part of the instant invention. As the tape is withdrawn or returned to the casing C, it will be obvious that the side thereof which engages the projections **20** mars and wears rapidly so that indicia provided on that side of the tape soon blurs and becomes indistinct. I have found that if freely rotatable balls or rollers B are provided in the casing at certain predetermined locations such as the projections **20**, very little wear occurs, and the indicia is not scratched or worn off since the ball-contact with the moving tape represents only a very fine hair line and that contact is always in substantially the same path. The location of the rollers B is such that all are in the same plane, i. e., each roller is circumferentially in line with the other rollers so that each contacts the tape at a point in line with the point of contact of the remaining rollers with the tape. Preferably the line of contact between the balls and the tape lies substantially on the center line of the latter.

Formed in the projections **20** are recesses which, when the case sections are assembled, form central sockets **25** which accommodate anti-friction balls or rollers B, and it will be noted that when each ball is in position, the horizontal centerline of the ball is below each upper edge of the socket in which the balls are mounted, so that when the balls are placed in one section of the case and the other section placed in mating relation, the balls will be retained in position, and it will be observed that slightly less than one half of each ball projects above the upper face of the sockets with only the extreme curvature thereof being engaged by the tape. With this arrangement, the centrally disposed balls have only tangen-

tial contact with the central surface of the tape at their extreme curvatures and would tend to define only a very fine hair line along the under surface of the tape. The graduated edges of the tape at no time come into contact with any bearing surface.

In Fig. 4 of the drawing, I have shown a slightly modified construction in which the rim and one wall of the case is formed as a unit **26** with a cover **27** forming a closure as usual. A socket **28** is formed in the rim **29** of the unit, and a retainer cup **30**, of conventional design, is mounted therein with the ball held in the cup **30**. Tape contact etc. is exactly the same as described previously.

While the invention possibly is most advantageously employed with concavo-convex tapes wherein the tape curves away from the rollers so that the point of contact is extremely fine, it will be readily apparent that the casing can also be very successfully employed with planar type tapes.

From the foregoing, it will be obvious that I have designed a tape casing and means wherein the tape can be drawn from and restored to its casing with a minimum of frictional contact, and obviously, the casing can be advantageously employed with push-pull type tapes, spring-retracting tapes and manual re-wind tapes alike.

What I claim is:

1. In combination, a casing having walls defining a substantially hollow chamber; a coiled tape having measuring indicia on at least one face received in said chamber, said tape having one of its ends secured within said chamber and having its other end extending through an opening formed in said casing in communication with said chamber so as to enable said tape to be uncoiled when it is to be used for measuring purposes; and means for guiding said tape during its movements from and to coiled position, said guiding means comprising projections carried by said walls extending into said chamber and being arranged on an arc of a circle having a diameter corresponding substantially to the diameter of the coil assumed by said tape, and spherical roller members carried by said projections and arranged so as to contact said one face of said tape tangentially during its said movements to minimize frictional resistance to said movements of said tape, all of said roller members being arranged circumferentially substantially in line so that each contacts said tape at a point substantially in line with the point of contact of the remaining roller members with the tape thereby avoiding obliteration of said measuring indicia by said guiding means.

2. The combination set forth in claim 1 in which said casing comprises a pair of mating halves and means securing said halves together, each of said halves including a half of each of said projections and each of said projections including a portion of a socket of such diameter as to accommodate and retain one of said spherical roller members therein when said mating halves are secured together.

3. The combination set forth in claim 2 in which said

socket portions are so arranged that when said mating halves and roller members are in assembled relation the latter are so positioned relatively to said tape as to engage the latter along a line corresponding substantially to the center line of said tape.

4. The combination set forth in claim 1 in which said casing comprises a wall having an integral rim with a free edge, a cover, and means securing the cover to said wall at the free edge of the rim, and in which said rim carries cup sockets in which said spherical roller members are received and retained.

5. The combination set forth in claim 4 in which each of said cup sockets is so arranged relatively to said tape that each of said roller members engages said tape along a line corresponding substantially to the center line of said tape.

6. In combination, a casing having walls defining a substantially hollow chamber; a coiled tape having measuring indicia on at least one face received in said chamber, said indicia extending to at least one edge of said face, said tape having one of its ends secured within said chamber and having its other end extending through an opening formed in said casing in communication with said chamber so as to enable said tape to be uncoiled when it is to be used for measuring purposes; and means for guiding said tape during its movements from and to coiled position, said guiding means comprising projections carried by said walls extending into said chamber and being arranged on an arc of a circle having a diameter corresponding substantially to the diameter of the coil assumed by said tape, and spherical roller members carried by said projections and arranged so as to contact said one face of said tape tangentially during its said movement to minimize frictional resistance to said movements of said tape, all of said roller members being arranged so that each contacts said tape intermediate the edges of said tape, said tape thereby avoiding obliteration of said measuring indicia at said one edge by said guiding means.

7. The combination defined in claim 6 in which said projections from the walls of the casing and the spherical roller members carried thereby are fixed against movement in a radial direction relative to the axis of the coiled tape, with the spherical rollers disposed substantially in an arc in which their peripheral surface at contact corresponds to the periphery of the coiled tape.

References Cited in the file of this patent

UNITED STATES PATENTS

1,138,483	Johnston	May 4, 1915
1,730,199	Ferrand	Oct. 1, 1929
1,761,592	Seidel	June 3, 1930
2,110,210	Evans	Mar. 8, 1938
2,132,202	Carlson	Oct. 4, 1938
2,510,939	Carlson (A)	June 6, 1950
2,563,542	Mackelduff	Aug. 7, 1951