May 10, 1949. E. J. WITCHGER 2,469,674

TAPE RULE

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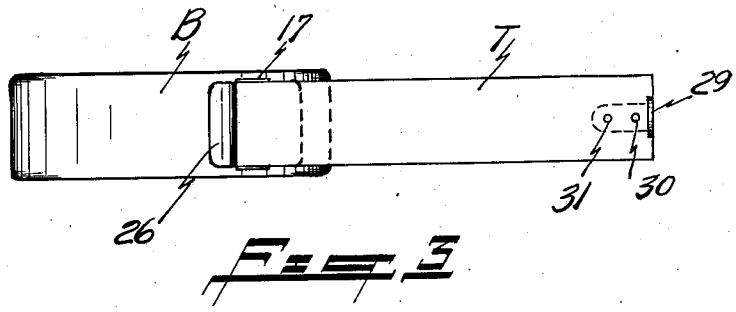


Fig. 3

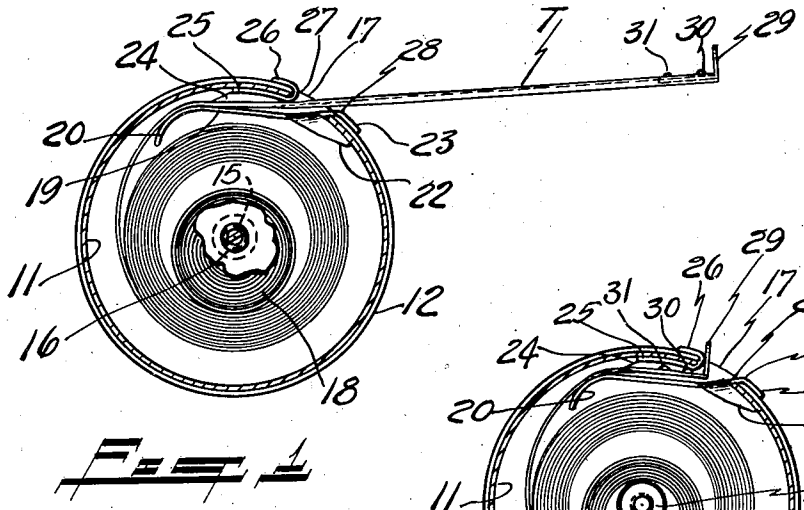


Fig. 1

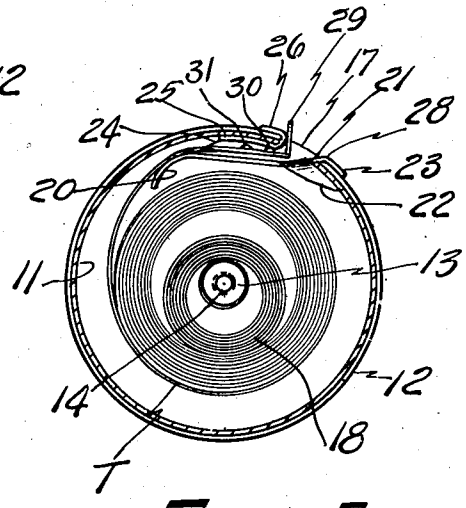


Fig. 2

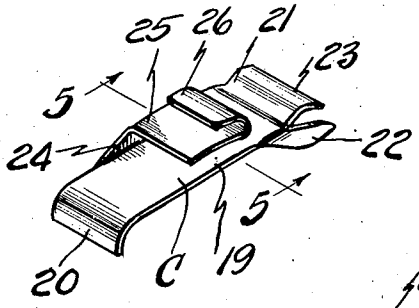


Fig. 4

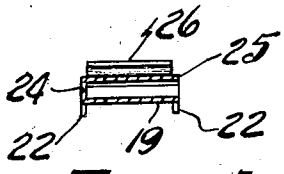


Fig. 5

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TAPE RULE

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This invention relates to coilable concave, convex tape rules of the so-called push-pull type, wherein the tape is mounted in a casing where it is coiled with each successive convolution overlying the preceding convolution, the tape being drawn out from the casing by pulling and restored to the case by pushing.

It is highly desirable in push-pull tape rules of the nature herein referred to that both the withdrawal and the coiling or rewinding be accomplished with a minimum of effort, and that the force required be uniform throughout the entire range of operations, furthermore, there should be no creeping movement of the tape at any point in its operations.

One of the salient features of the invention is to provide means for controlling the action of a concave convex tape rule and to maintain the telescopic case sections in proper position with relation to each other.

Another object is to provide means on the tape and engageable with the case to create a tension on the end section of the tape when it is fully pushed into the case, thereby forming spaced-apart friction catches and preventing it working out of the case when fully wound.

A further object is to provide means for changing the tape rule from a non-planar to a planar section which means also serves to reinforce the case across the tape entrance slot.

A further object still is to provide means to prevent the end hook being drawn or pressed out of reach, and entirely into the case, said means further preventing, in a large measure, the entrance of dust and dirt into the case through the tape entrance.

Concave-convex tape rules have a natural inherent tendency to assume a straight line from the coil in the center out through the casing opening, but by changing the natural course of the tape, which has a natural tendency to straighten, a tension is created at the point of change, which tension acts as a brake on the tape when it is extended, thus preventing "creeping," but in no manner interfering with the rewinding operation.

Another object is to provide means to prevent the coiled tape from working out of the case by creating a tension on the extreme end of the tape when it is fully pushed into the case.

To the accomplishment of the foregoing and related ends, said invention then consists in the means hereinafter described, and particularly pointed out in the claims and annexed drawing, the following description setting forth in detail certain means and one mode of carrying out the

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invention, such disclosed means and mode illustrating, however, but one of various ways in which the principle of the invention may be used.

In the drawing:

Fig. 1 is an enlarged, sectional, side-elevational view of my measuring tape rule.

Fig. 2 is a view similar to Fig. 1 illustrating the tape locked in the casing.

Fig. 3 is a top plan view of the tape rule.

Fig. 4 is an enlarged, isometric view of the snubber clip.

Fig. 5 is a sectional end view taken on the line 5—5 of Fig. 4.

Referring now to the drawing in which I have shown a case B formed of individual sections 11 and 12 respectively, one of said sections telescoping into the other, the section 11 being provided with a post or pintle 13 having a centrally disposed threaded opening 14 therein. A centrally disposed opening 15 is provided in the case section 11, said opening registering with the threaded opening 14, and a screw 16 is provided for firmly securing the sections in assembled relation.

A slitted opening 17 is provided in each of the sections 11 and 12 in aligned relation and forms an entrance slot for the tape rule T in the usual manner.

My improvement is specifically directed to concave-convex tape rules which have a natural inherent tendency to assume a straight line when drawn from the case. In the instant design, the post 13 serves as an anchorage for the one end of the coil spring 18, this spring being coiled on the post with the free end connected to the inner end of the tape rule T, said spring tending to draw the tape into the case and draw it into a coil, the portion within the case being changed from non-planar to a planar cross-section when coiled.

A snubber clip C is mounted on and fits over the opposite edges of the entrance slot 17 and is preferably in the form of a stamping, said clip including a flat wall 19 with its inner end downwardly curved as at 20, the outer end section being bent upwardly as shown at 21, and downwardly turned ears 22 are provided on the edges of the section 21 and serve to accurately space the case sections with relation to each other.

The outer end of the clip C terminates in a curved lip 23 which covers the edges on the one side of the entrance slot 17, said lip being of the same curvature as the outer rim of the case so that a smooth, tight fit is assured.

An upwardly projecting wall 24 is formed integral with the inner edge of the clip, and the metal is bent over to form an overhanging leg section 25, the one end being turned to form a rolled lip 26 which is adapted to cover and snugly fit the opposite edge of the entrance slot 17, this lip being curved to fit the outer periphery of the case. The leg section 25 is spaced a predetermined distance above the main body 19 and is also curved to snugly fit the inner periphery of the case.

The curvature of the leg 25 and the angle of the section 21 form a restricted throat opening through which the tape is drawn or pushed back for recoiling, and I wish to direct particular attention to the fact that the clip serves to keep the case sections in proper location and also covers any sharp jagged edges which might otherwise score the tape metal, and it further reinforces the case by providing support across the tape entrance.

The tape, when wound, is planar in cross-section, and has an inherent tendency to assume a straight line when unwound, consequently, when the tape is drawn from the case, it passes over the curved section 20 and immediately begins to straighten and spring to a non-planar shape, and inasmuch as the abutment 27 formed by the turned lip 26 on the section 25, extends into the normal path of travel of the tape, a tension is created between the curved section 20, the abutment 27, and the coil of tape in the case, this tension creating a brake when the tape is extended and also serves to prevent any creeping action.

When the tape is pushed into the case, it passes over the abutment 28 through the tape entrance 17, the inward push forcing the tape out of contact with the upper face of the member 19 so that it in no manner affects the insertion of the tape in the case, it is as free and easy to insert as though there were no clip.

A hook 29 is provided on the outer end of the tape rule and is secured in position by means of spaced-apart rivets or eyelets 30 and 31 respectively, this hook section reinforcing the end section of the tape for a predetermined distance back from the end, so that when the tape is pushed into the case, it creates a greater tension between the tape opening and the clip, thus serving to frictionally lock the tape in the case.

When the tape is completely wound, the frictional contact will be between the rivet 30 and the bottom face of the overhanging leg 25, but if for any reason, accidental or otherwise, the tape were not completely wound, the second rivet 31 would act in exactly the same manner, it will thus be obvious that each of the rivets serve the same purpose.

It will, of course, be understood that any projection, such as an upset or raised weld, could be substituted for the rivets with exactly the same result.

From the foregoing description, it will be obvious that the rule can be pushed into the casing very easily and without tendency to choke or buckle, it can be easily extended, has adequate holding means to prevent "creeping," the sectional casing will remain in predetermined set relation, and the tape entrance will be amply reinforced.

What I claim is:

1. In a tape measure of the push-pull type having in combination, a casing having a tape entrance therein, a flexible tape rule extending into the casing and through said entrance, and being in its free state rod-like and of non-planar cross-section, means tending to draw the rule into the casing, a one-piece snubber clip mounted in said casing outside the coiled tape and formed with spaced-apart lips engageable with and covering the edges of the tape entrance and between which the tape travels as it is withdrawn or pushed into the casing, one of said lips forming an abutment which extends into the normal srtaight line of travel of the tape to change the natural course of the tape as it is withdrawn from the casing.

2. A construction as described in claim 1 in which both lips form abutments for changing the natural course of the tape as it is drawn from and pushed into the case.

3. The combination as defined in claim 1 in which the clip forms a reinforcement for the case across the tape entrance.

4. In a coilable measuring tape of the character described, a resilient measuring tape of the push-pull type, having a transverse curvature and an inherent tendency to assume a rectilinear state, a casing having a peripheral rim with an entrance slot therein and through which the tape is moved, a winding spring in the casing and secured to the inner end of the tape, a clip mounted in said casing and including a flat body section, an overhanging leg, curved lip sections formed on the body and leg sections respectively and covering and engaging the opposite edges of the entrance slot, said tape traveling over said body section as it is withdrawn or pushed into said casing, the outer end of the leg section extending into the normal path of travel of the tape after it is in its rectilinear state, and tending to change the natural course of the tape.

5. The combination set forth in claim 4 in which the casing comprises individual sections, and means on the clip for accurately spacing said sections with relation to each other.

6. In a coilable measuring device of the class described, a resilient tape rule having a transverse curvature and an inherent tendency to assume a rectilinear state, a casing formed with an entrance slot through which the tape is moved, a snubber clip mounted on said casing and including a flat wall over which the tape rule travels as it is withdrawn and coiled, the front end section of said wall being bent upwardly and terminating in a curved lip section covering one edge of the entrance slot, an overhanging leg formed integral with said clip and spaced a predetermined distance above said wall, said leg terminating in a turned lip engaging the opposite edge of the entrance slot, said wall and turned lip changing the natural course of the tape as it is withdrawn from the casing.

7. In a coilable, concave-convex measuring tape of the push-pull type having an inherent tendency to assume a rectilinear state, a casing having a peripheral rim with an entrance slot therein and through which the tape is moved, a snubber clip mounted in the casing and having a flat wall over which the tape travels, an abutment on the clip above said wall and defining one edge of the entrance slot, said abutment extending into the normal path of travel of the tape after it is in its rectilinear state, and a raised section on the tape adjacent the end thereof for frictionally engaging said abutment to create a tension and form a safety catch to lock the tape in position when it is fully pushed into the case.

8. The combination as defined in claim 7 in

which a hook is secured on the end of the tape with the hook securing means forming said raised section to provide an individual safety catch.

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