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[54] **COILABLE RULE LOCKING MECHANISM**
15 Claims, 5 Drawing Figs.

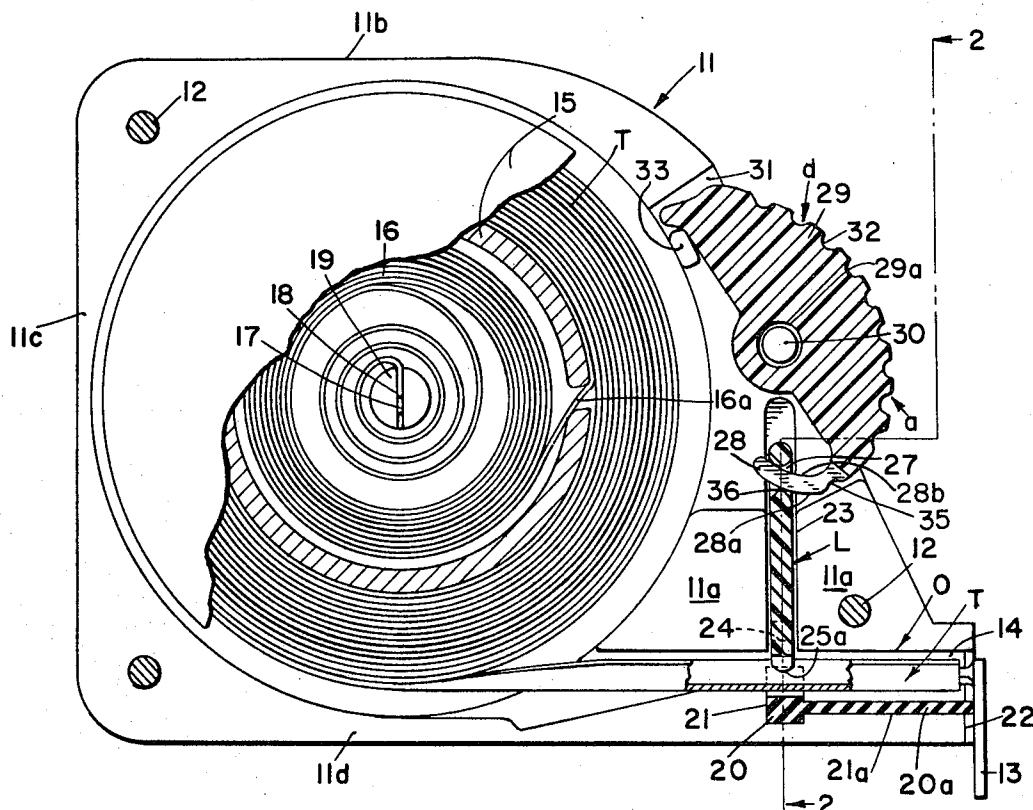
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85, 96, 99, 107, 107.2, 107.3, 107.4, 107.6;
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ABSTRACT: A measuring or like device having a casing with a front wall opening adjacent a bottom wall and a tapeline coilaible in the casing and movable out the opening to various projected positions, and wherein an actuator projecting from the front wall of the casing and journaled for pivotal movement from a first pivoted position to a second pivoted position moves a vertically slideable tapeline lock from a position out of braking engagement with the tapeline down to a position in which it resiliently clamps the tapeline against the bottom wall of the casing and holds it in a particular position of extension, cams interconnecting the lock and actuator being operable to cam the lock down to clamp the tapeline when the actuator is pivoted from the first to the second position and to lift the lock up to release the tapeline when the actuator is returned.



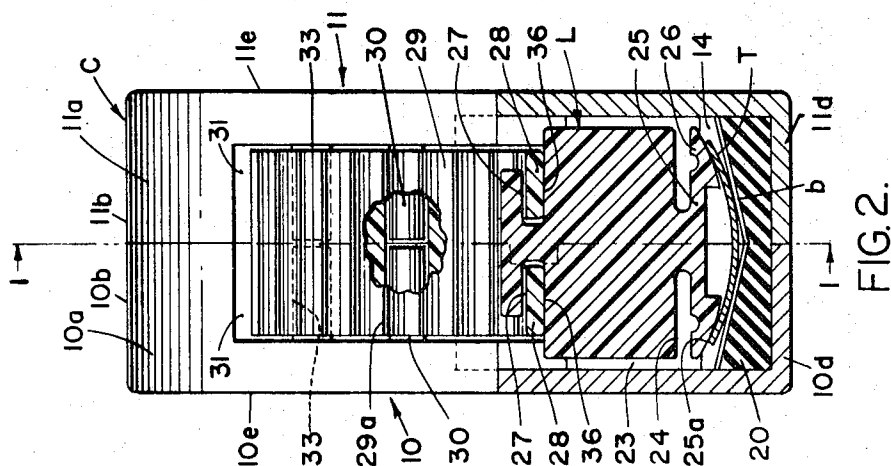


FIG. 2.

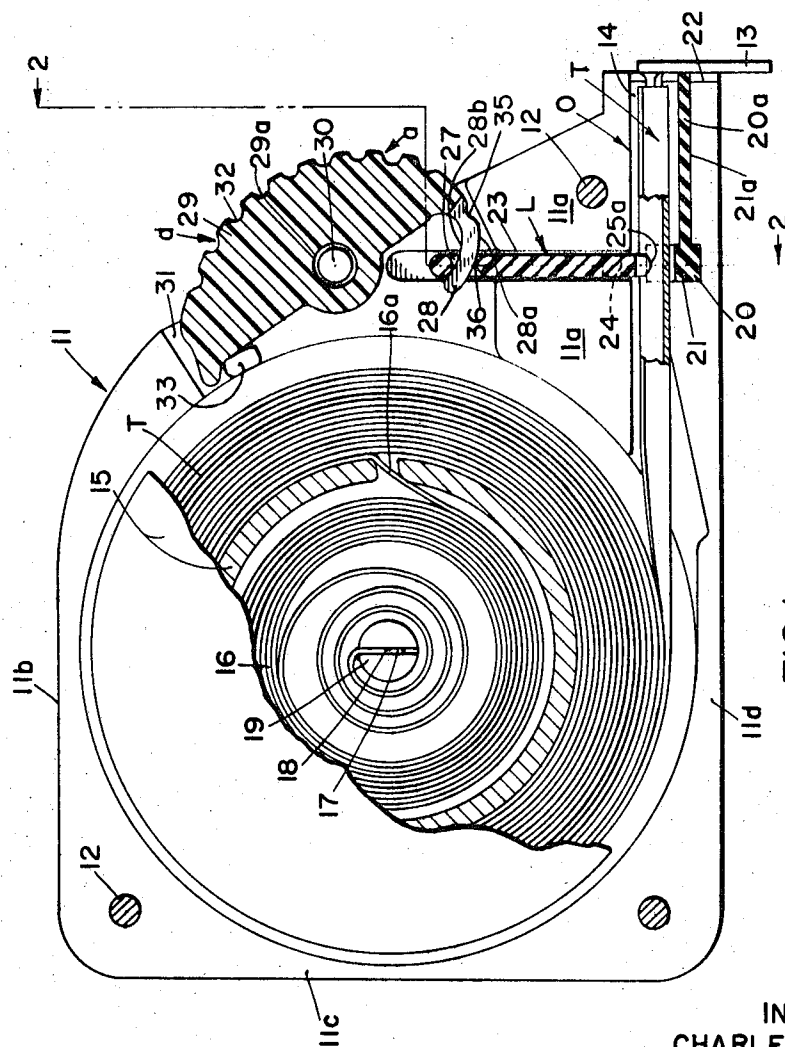


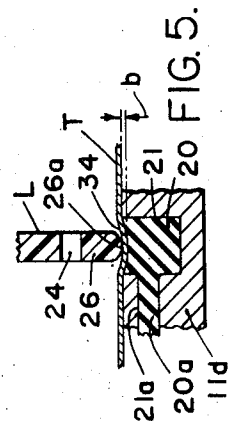
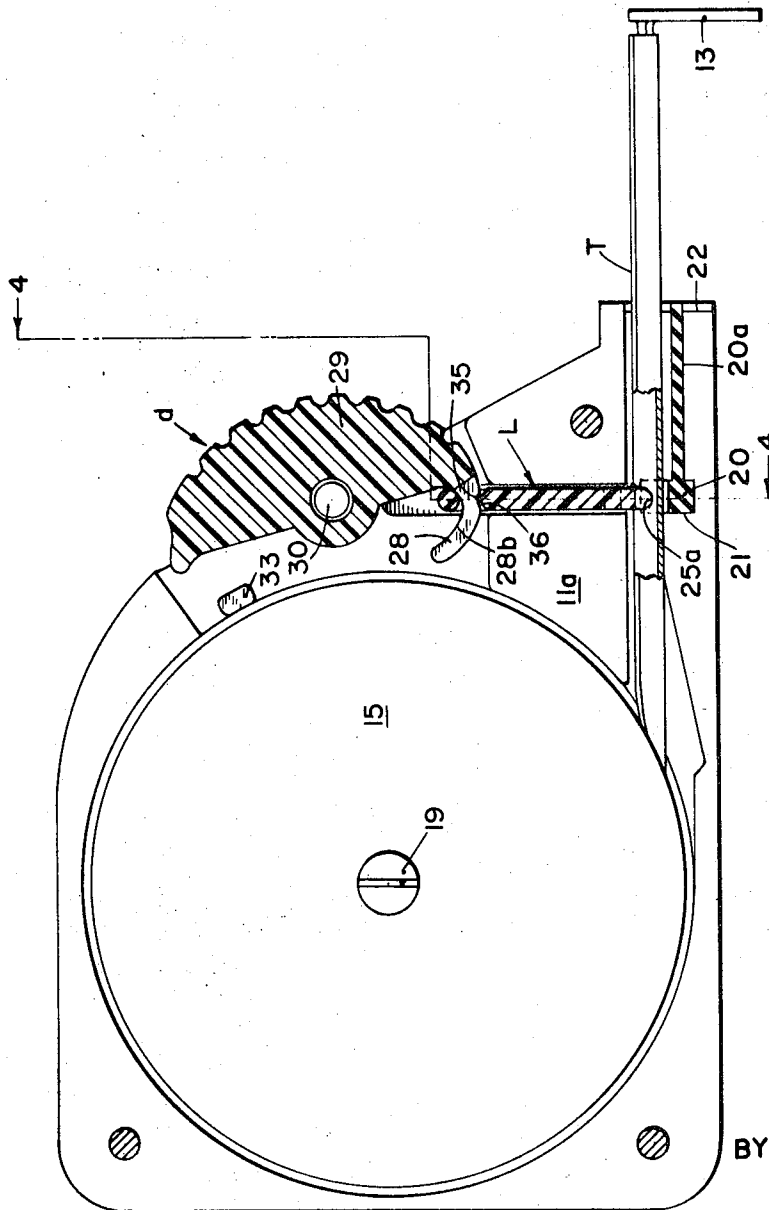
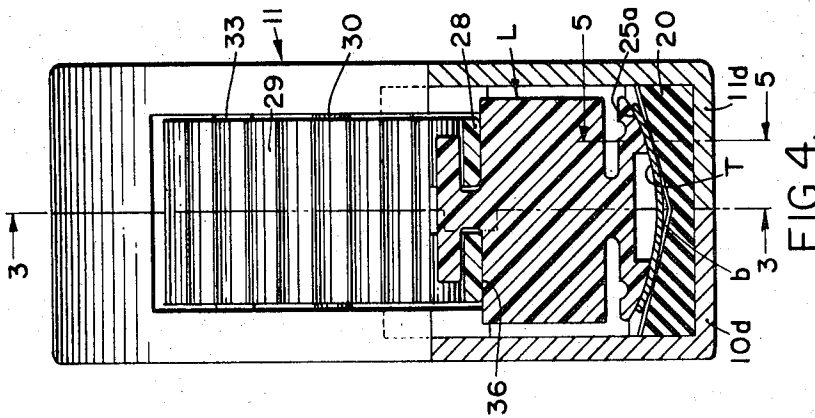
FIG. 1.

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COILABLE RULE LOCKING MECHANISM

One of the prime objects of the invention is to design a coilable rule having a novel lock mechanism wherein an actuator at the front of the casing can be simply pivoted to actuate a vertically reciprocable lock member which, when moved to clamping position, securely and reliably holds the tapeline in a particular position of extension from the tape casing.

A further object of the invention is to provide a coilable rule with a lock mechanism of economical and durable construction which resiliently clamps the tapeline and makes it unnecessary to hold close dimensional tolerances in the manufacture of the various parts.

Still a further object of the invention is to design a measuring tape having a new and improved locking mechanism operable to clamp the tapeline against a resilient pad which has an extending portion functioning as a tape hook bumper for cushioning the retracting force of the spring motor and preventing the gradual deterioration of the tape hook connection.

Other objects and advantages of the invention will be pointed out specifically or will become apparent from the following description when it is considered in conjunction with the appended claims and the accompanying drawings, in which:

FIG. 1 is a side elevational view taken on the line 1-1 of FIG. 2 and with parts broken away to move clearly illustrate the construction of the measuring device, the lock mechanism being shown in a position in which it is inoperative;

FIG. 2 is a transverse sectional view taken on the line 2-2 of FIG. 1;

FIG. 3 is a side elevational view similar to FIG. 1 but showing the lock mechanism in clamping position to hold the tapeline in the extended position in which it is shown;

FIG. 4 is a transverse sectional view taken on the line 4-4 of FIG. 3;

FIG. 5 is a fragmentary, sectional side elevational view taken on the line 5-5 of FIG. 4.

Referring now more particularly to the accompanying drawings, the measuring device of the invention includes a casing C comprising a pair of generally boxlike sections 10 and 11, which may be secured together by screws 12, and which include inclined front wall sections 10a and 11a, top wall sections 10b and 11b rear wall sections 10c and 11c, and bottom wall sections 10d and 11d. A tapeline T is normally coiled in the casing and has a leading end extending out mating slotted openings 14 formed in the casing front wall sections 10a and 11a which together form a tapeline opening O. A tape hook 13 is secured to the front end of the tapeline T in the usual manner and it will be seen that the tapeline T is wound on a winding drum 15 and is adapted to be retracted by a spring motor 16. The spring 16 is secured to the tapeline T at 16a and its inner end 17 is received within a slot 18 provided in the casing center post 19 in the usual manner.

Mounted in the bottom wall sections 10d and 11d of the casing C, and forming a portion of the bottom wall of the casing C, is a transversely extending, resilient rubber pad 20 having a forwardly extending tongue portion 20a. The pad portion 20 is received within mating recess portions 21 formed in the bottom wall sections 10d and 11d, and the extending tongue portion which operates to cushion the tape hook member 13 is received within mating forwardly extending recess portions 21a provided in the wall sections 10d and 11d. It will be observed that the bottom wall sections 10d and 11d are cut away as at 22 and that the tongue portion 20a extends beyond the cut away portions 22 into position to be engaged by the tape hook 13 and to cushion the force with which it slams into the casing under the retracting influence of the spring motor 16.

Provided in vertical alignment with the recess portions 21 are mating recesses 23 in the front wall sections 10a and 11a which accommodate a vertically reciprocating lock plate generally designated L. The lock member L is provided with aligned slots 24 in its lower end, as shown in FIG. 2, which define resilient legs 25 having tapeline engaging pads or feet 26 for engaging only the edge portions of the tapeline T. Also,

provided in the locking plate L are recesses 27 for receiving the curvilinear arms 28 of an actuator member 29 which, it will be observed, projects from the front walls 10a and 11a of the casing in both the positions in which it is shown in FIGS. 1 and 3. The member 29 is mounted for movement from the position shown in FIG. 1 to the position shown in FIG. 3 in mating openings 31 formed in each casing front wall 10a and 11a, the actuator 29 being mounted on pins 30 extending transversely from and mounted in walls 10a and 11a which are accommodated in an opening 29a provided in the actuator 29. As a matter of convenience, the front wall of the actuator 29 is preferably horizontally knurled, as shown at 32. Projecting transversely from the front walls 10a and 11a are stops 33 which, as shown, operate to halt the actuator 29 in the position in which it is shown in FIG. 1.

When the locking plate L is moved to clamping position, as shown in FIG. 5, the pads 26 depress the edges of the tapeline T to form locking hollows 34 therein, the deformable rubber pad portions 20 being disposed a distance b below the level of the bottom wall sections 10d and 11d to permit this to occur. The displaced portions of the pad 20 are able to flow into portions of the recesses 21 not occupied by the pads 26 and tapeline T. It will be observed that the bottom surfaces of the pads 26 are curvilinear as at 26a to facilitate the formation of the recesses 34. The disposition of the plate L in recesses 34 provides a positive mechanical interlock which supplements frictional locking forces.

The arms 28 have lower surfaces 28a functioning as camming surfaces and to lock the locking plate L in lowered clamping position a notch 35 is formed in the surfaces 28a within which beveled surfaces 36 formed on the locking plate L engage. When the locking button 29 is moved from the position shown in FIG. 1 to the position shown in FIG. 3 and the beveled surfaces 36 engage in the notch 35, there is an audible click which tells the user that the lock L is in locked position. When the actuator 29 is pivoted from the position shown in FIG. 3 back to the position shown in FIG. 1, the hollows 34 formed in the tapeline T are restored by the resilience of the rubber pad 20. At the same time, camming surfaces 28b provided on the upper portions of arms 28 positively lift the locking plate L up out of engagement with the tapeline T so that it can be promptly returned to the casing C under the influence of the spring motor 16.

In operation the actuator 29 and lock plate L are normally maintained in the position shown in FIGS. 1 and 2, out of clamping engagement with the tapeline T. However, when the tapeline T has been drawn a predetermined distance out of opening O and it is desired to lock it in position to perform a measuring function, the actuator 29 may be merely pressed at position a to revolve it clockwise about the pivot pins 30 and move the lock plate L sharply down into engagement with the tapeline T. The legs 25 provide a resilience in addition to that provided by the rubber pad 20 to assure that the tapeline T is not injured in any manner by the creation of the mechanical interlock between the pads 26 and tapeline T. When the actuator 29 is pivoted by pressing its upper portion at d in FIG. 3, locking plate L is immediately released to return upwardly and, in fact, is positively drawn upwardly by the actuating arms 28.

It is to be understood that the drawings and descriptive matter are in all cases to be interpreted as merely illustrative of the principles of the invention, rather than as limiting the same in any way, since it is contemplated that various changes may be made in the various elements to achieve like results without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. In a measuring device or the like: casing means having an opening therein through a front wall thereof adjacent a bottom wall thereof; a tape coilable in the casing and being movable out said opening; actuator means at the front wall of the casing and journaled for pivotal movement from a first pivoted position to a second pivoted position; a vertically slideable

lock adjacent the front wall of the casing means mounted for movement from a position in which it is out of engagement with the tape down to a position in which it clamps the tape against the bottom wall of the casing means and holds it in a particular position of extension out the opening; and means interconnecting the lock and actuator operable to cam the lock down to clamp the tape when the actuator is pivoted from the first to the second position and to cam the lock up to release the tape when the actuator is returned.

2. The combination defined in claim 1 in which said tape has an angularly disposed tape hook connected to its front end and a resilient pad under said lock extends forwardly into the path of the tape hook to function as a cushion for the tape hook.

3. The combination defined in claim 1 in which said interconnecting means comprises curvilinear arm means extending inwardly and upwardly from the lower end of the actuator through an opening in said lock.

4. The combination defined in claim 3 in which a locking notch is provided in said actuator which is engaged by the lock with an audible click.

5. The combination defined in claim 1 in which vertical guide surfaces in said casing on either side of the lock assure its vertical movement perpendicular to said tape.

6. The combination defined in claim 1 in which said lock comprises a plate with spaced-apart, resilient feet thereon engaging only the edge portions of the tape.

7. In a measuring device or the like: casing means having an opening therein through a front wall portion thereof; a tapeline with a tape hook on its front end coilaible in the casing and being movable out said opening; actuator means projecting from the front wall portion of the casing and journaled for pivotal movement from a first pivoted position to a second pivoted position; a lock connected with said actuator means for movement from a position in which it is out of engagement with the tapeline when the actuator is in said first position to a position in which it engages the tapeline when the actuator is in said second position; clamp surface means on the casing means cooperating with the lock when the actuator means is pivoted to said second position to hold the tapeline in a particular position of extension out the opening; said actuator means being operative to move the lock away from the said clamp surface means when the actuator means is returned to said first position.

8. The combination defined in claim 7 in which a resilient pad is seated in said bottom wall portion in the path of said lock.

9. The combination defined in claim 7 in which said pad has a forwardly extending portion extending to cushion the tape hook.

10. The combination defined in claim 7 in which the pad is seated in a recess in said bottom wall which it does not fill.

11. In a measuring device or the like: casing means having an opening therein through a front wall thereof adjacent a bottom wall thereof; a tape with a tape hook on its front end

coilaible in the casing and being movable out said opening; a resilient pad incorporated with said bottom wall and having a forwardly extending portion extending into the path of the tape hook to cushion its impact; an actuator mounted for movement from a first position to a second position; and a lock connected with the actuator for movement from a first position in which it is out of locking engagement with the tape down to a second position in which it forces the tape against the pad and holds the tape in a particular position of extension out the opening.

12. The combination defined in claim 7 in which said actuator is pivoted generally intermediate its ends and is swingable to first and second positions by manual pressure applied at opposite ends thereof.

13. The combination defined in claim 1 wherein a part of said interconnecting means underlies said lock so that the lock is moved upwardly upon return movement of the actuator.

14. In a measuring device or the like: casing means having an opening therein through a front wall portion thereof; a tapeline with a tape hook on its front end coilaible in the casing and being movable out said opening; actuator means projecting from the front wall of the casing means and journaled for pivotal movement substantially intermediate its end from a first pivoted position to a second pivoted position; a lock connected with said actuator means for movement in response to movement of said actuator means from first position to second position from a position in which it is out of engagement with the tapeline to a position in which it engages the tapeline; clamp surface means on the casing means cooperating with the lock when the actuator means is pivoted to said second position and the lock is moved by the actuator to engage the tapeline to hold the tapeline in a particular position of extension out the opening; and locking notch means provided in said actuator means for releasably holding the actuator means and lock in said second position in which the lock engages the tapeline.

15. In a measuring device or the like: casing means having an opening therein through a front wall portion thereof; a tapeline with a tape hook on its front end coilaible in the casing and being movable out said opening; swingably mounted actuator means projecting from the casing means and mounted for movement from a first position to a second position; guide means in said casing; a lock mounted for substantially reciprocatory movement in said guide means from a position in which it is out of engagement with the tapeline to a position in which it clamps the tapeline; cam surface means interposed between the actuator means and lock operative when the actuator means is swung from first to second position to cam the lock and move it into clamped engagement with the tapeline; and clamp surface means on the casing means cooperating with the lock, when the actuator means is pivoted too said second position and the lock is moved by the actuator to engage the tapeline, to hold the tapeline in a particular position of extension out the opening.

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