United States Patent [19]

Bennett

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[45] **July 10, 1973**

[54] **POWER TAPE UNITS AND LOCKING AND RELEASING DEVICE THEREFOR**

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[52] **U.S. Cl.** **242/107.3**, 242/107.6

[51] **Int. Cl.** **B65h 75/48**

[58] **Field of Search** ..... 242/84.53, 84.8, 242/99, 107 R, 107.2, 107.3, 107.4, 107.6, 156; 33/138

[56] **References Cited**

UNITED STATES PATENTS

3,482,798	12/1969	Kawaguchi	242/107.3
3,610,548	10/1971	Quenot	242/107.3
3,289,969	12/1966	Purbaugh	242/107.3

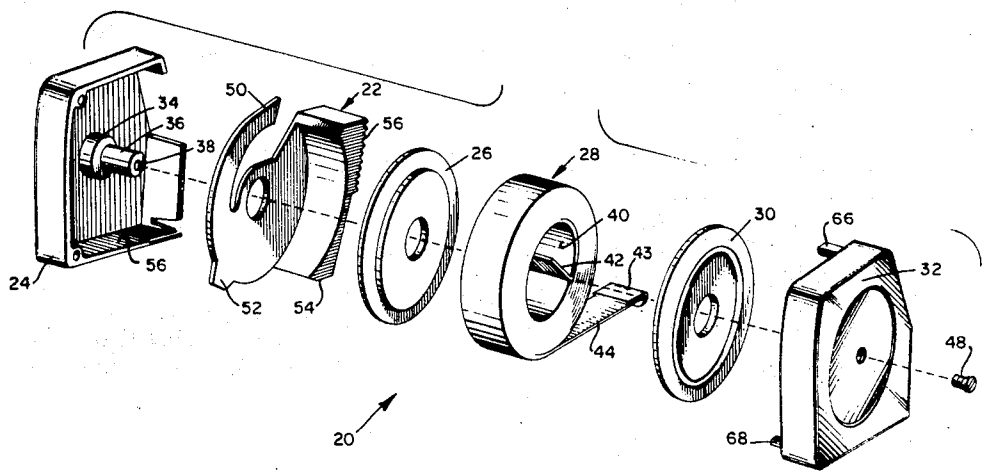
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[57] **ABSTRACT**

A unitary plastic piece performing as a biasing spring, lock and finger-controllable button is installed in a conventional power tape case and maintains the powered measuring tape locked in any extended or non-extended position. The measuring tape is released by pushing the incorporated button to compress the biasing spring portion and release the brake.

8 Claims, 7 Drawing Figures



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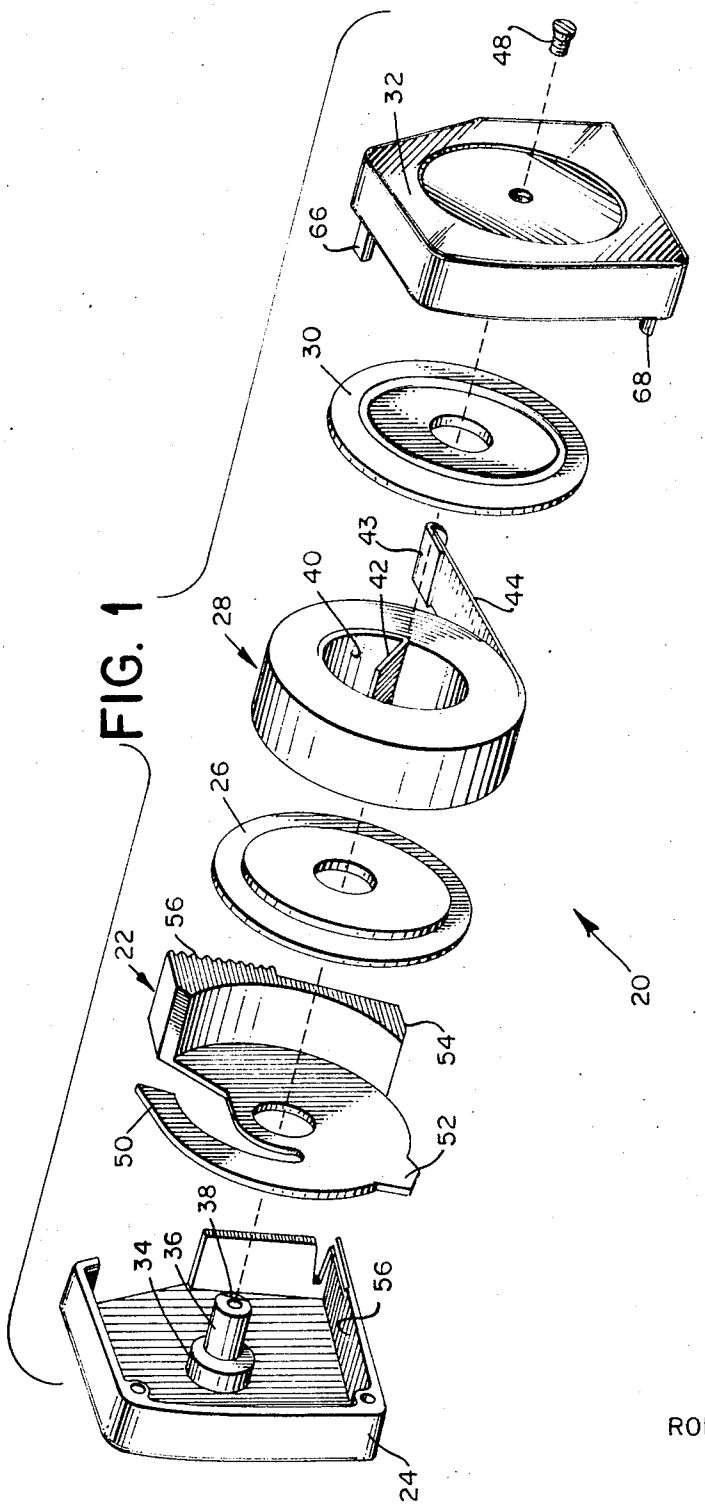


FIG. 1

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FIG. 2

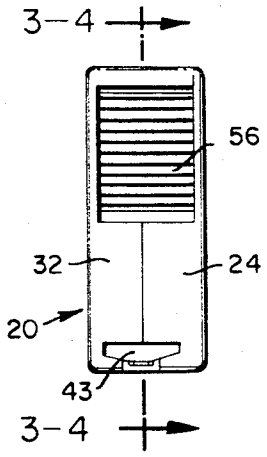


FIG. 3

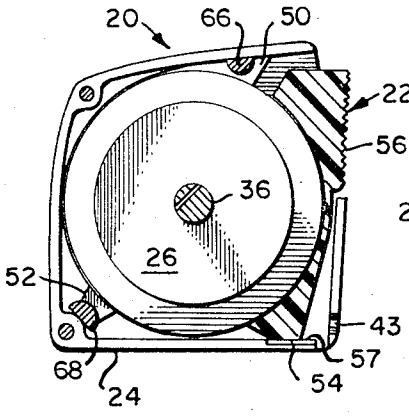


FIG. 4

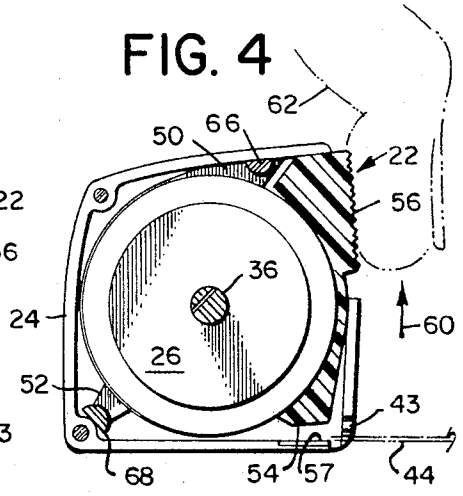


FIG. 5

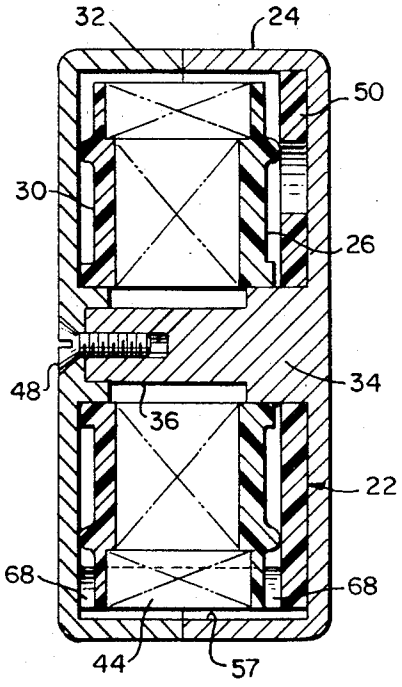
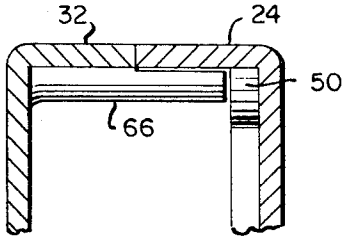


FIG. 6



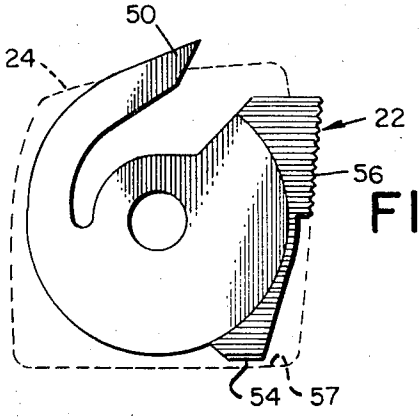


FIG. 7

POWER TAPE UNITS AND LOCKING AND RELEASING DEVICE THEREFOR

SUMMARY OF THE INVENTION

Presently existing power tape locking and releasing devices generally incorporate side or front mounted cam actuated buttons. These buttons are difficult to engage and are normally biased in an unlocked position. This requires the operator to extend the measuring tape to its desired length and then engage the locking mechanism. Also, these devices are prone to binding and jamming. Furthermore, prior art devices comprise many parts and are therefore only used in high priced power tapes.

Therefore, an object of this invention is to provide a power tape locking and releasing device of the above character which is inexpensive and easily constructed.

A further object of this invention is to provide a power tape locking and releasing device of the above character which is a unitary plastic piece.

Another object of this invention is to provide a power tape locking and releasing device of the above character which will not bind or jam.

Another object of this invention is to provide a power tape locking and releasing device of the above character which is reliable.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The power tape locking and releasing device of this invention incorporates a single piece of nylon material which is arcuately slotted so as to comprise a finger-like portion which performs as a spring. This finger-like portion must be compressed to be installed in the power tape case, thereby causing the diametrically opposed locking surface to be in frictional engagement with the measuring tape. This biasing spring force can be overcome by moving the exposed button, which simultaneously compresses the spring and removes the locking surface from engagement with the measuring tape.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described. The scope of the invention is indicated in the claims.

THE DRAWINGS

FIG. 1 is an exploded perspective view of a power tape incorporating the locking and releasing device of this invention;

FIG. 2 is a front view of the assembled power tape of FIG. 1;

FIG. 3 is a cross sectional side view taken along line 3—3 of FIG. 2 showing the power tape locking and releasing device in its normally locked position;

FIG. 4 is a cross sectional side view taken along line 4—4 of FIG. 2 showing the power tape locking and releasing device in its unlocked position;

FIG. 5 is a cross sectional front view of the power tape assembly of FIG. 1;

FIG. 6 is a fragmentary cross sectional front view showing only the assembled power tape locking and releasing device within the surrounding case; and

FIG. 7 is a side view of the power tape locking and releasing mechanism of this invention with the shape of the power tape case shown in broken lines.

The same reference numbers refer to the same elements throughout the several views of the drawings.

DETAILED DESCRIPTION

Referring first to FIG. 1, locking and releasing mechanism **22** is shown in position ready for assembly in power tape unit **20.** Power tape unit **20** also comprises rear case section **24,** drum **26,** measuring tape and spring assembly **28,** drum **30,** and front case section **32.** Locking and releasing mechanism **22** and drum **26** both are positioned on a large diameter shaft **34** of rear case section **24.** Shaft **34** provides a cylindrical bearing surface about which drum **26** can rotate. Smaller diameter shaft **36** incorporates slot **38** into which end **42** of spring **40** is securely positioned. As best seen in FIG. **5,** drum **30** is positioned on shaft **48** of front case section **32.** When assembled, screw **48** is threaded into shaft **36** to maintain power tape unit **20** in the assembled condition.

The one piece power tape locking and releasing device **22** incorporates a finger-like portion **50,** positioning tab **52,** locking surface **54,** and push button **56.** Finger-like portion **50** is formed by cutting an arcuate slot in locking and releasing device **22.** This causes finger-like portion **50** to be relatively independent of device **22,** and to act as a biasing spring forcing locking surface **54** to normally be in frictional engagement with measuring tape **44** in the assembled power tape unit **20.** As best seen in FIG. **7,** finger-like portion **50** of locking and releasing device **22** would normally extend beyond the retaining surface of rear case section **24.** The finger-like portion **50** of locking and releasing device **22** is compressed when the tape unit **20** is assembled. Finger-like portion **50** is then in firm frictional contact with rear case section **24** while also diametrically opposed locking surface **54** is in firm frictional contact with its bounding surface **57.** Since measuring tape **44** slides between locking surface **54** and surface **57** of case sections **24** and **32,** the normal condition is for locking surface **54** to be in frictional contact with measuring tape **44.** This normally locked position is shown in FIG. **3.** Push button **56** is best seen in FIG. **2,** along with the enlarged end **43** of measuring tape **44.** End **43** is larger than the tape slot of unit **20** and thereby prevents measuring tape **44** from entering unit **20** so as to be impossible to withdraw from case section **24** and **32.**

The power tape can be quickly and easily manually released from the normally locked position by simply pushing button **56** vertically upward in the direction shown by arrow **60** in FIG. **4.** The power tape releasing device is easily actuated by one finger. The movement of finger **62,** shown in phantom in FIG. **4,** causes finger-like portion **50** of locking and releasing device **22** to be subjected to a further compression force. Simultaneously, locking surface **54** is removed from frictional contact with power tape **44** and surface **57.** This allows coil spring **40,** which is in tension when power tape **44** is extended, to automatically wind the power tape **44** back into power tape unit **20.** Once the power tape **44** has been completely wound into its case or another desired position has been obtained, the holding force provided by the operator is removed. This allows finger-like portion **50** to perform as a biasing spring in its compressed state and force locking surface **54** into frictional contact with measuring tape **44** and surface **57.** The locking pressure exerted on measuring tape **44** by locking device **22** is sufficient to hold measuring tape

44 at any extended position, while still capable of being easily overcome by the normal force required to withdraw measuring tape 44 from its case. This allows measuring tape 44 to be extended to a desired length and automatically lock in that position.

Jamming and binding of locking and releasing device 22 is prevented by position holding arms 66 and 68, best seen in FIGS. 1 and 6. When power tape unit 20 is completely assembled, position arm 66 is located adjacent to and in close proximity with the side of finger-like portion 50. Position arm 68 is located next to and in close proximity with the side of tab 52 of locking and releasing device 22. Position arms 66 and 68 assure that locking and releasing device 22 will not be able to twist or move in any other manner out of its desired position, thereby assuring that locking and releasing device 22 will always be in its normal locked position ready for easy releasing without fear of binding or jamming.

In the preferred embodiment, locking and releasing device 22 is manufactured from a single piece of nylon. Nylon is preferred for its low friction properties, thereby allowing the spring-tape assembly to freely rotate.

It will thus be seen that the objects set forth above, among those made apparent from the preceding description, are efficiently attained and, since certain changes may be made in the above article without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by letters patent is:

1. A tape measuring device comprising:
A. a housing;
B. a flexible, coilable measuring tape rule disposed within said housing for uncoiling withdrawal therefrom and recoiling retraction therein through a portal zone;
C. automatic take-up means connected with said measuring tape rule to produce recoiling retraction thereof; and
D. a tape locking and releasing device comprising
a. a substantially flat disc shaped portion,
b. a releasable locking surface portion extending substantially perpendicularly to said disc portion and acting directly on one face portion of the measuring tape rule at an acute angle to said face portion as it is traveling through said portal zone during its withdrawal from the housing, wedging the measuring tape against a portion of the housing,
c. said disc portion being arcuately slotted to form an integral spring portion resiliently biasing the locking surface portion into contact with the measuring tape rule, and
d. a finger operable button portion extending substantially perpendicularly to said disc portion and positioned for manually counter-acting the resilient biasing force produced by said spring portion disengaging said locking surface
whereby the measuring tape is automatically locked in an extended position and freely recoiled into the housing by manual counteraction of the lock biasing force.

2. A tape measuring device as defined in claim 1, wherein said biasing spring portion maintains said locking surface portion in intimate frictional contact with the measuring tape in its normal position.

3. A tape measuring device as defined in claim 1, wherein said finger operable button requires a releasing force to counteract said biasing spring force and remove said locking surface portion from intimate contact with the measuring tape.

4. A tape measuring device as defined in claim 1, wherein said biasing spring portion comprises a finger-like portion of said locking and releasing device formed by cutting an arcuate slot in a unitary piece of resilient material.

5. A tape measuring device as defined in claim 1, further comprising a positioning tab to aid in maintaining said locking and releasing device in the desired position.

6. A measuring tape unit comprising:
A. a surrounding case having a front and rear section;
B. rotating drums positioned within said case;
C. a measuring tape rule and automatic take-up assembly positioned between said drums within said case; and
D. a power tape locking and releasing device positioned within said case and comprising:
a. a substantially flat disc shaped portion,
b. an axial bearing portion formed in said disc portion, substantially concentric with the axis of said rotating drums,
c. a tape-engaging portion extending substantially perpendicularly to said disc portion,
d. a button portion extending substantially perpendicularly to said disc portion and attached to said tape-engaging portion and adapted to rotate said tape-engaging portion about said bearing portion when said button is pushed, and
e. a spring portion formed from said disc portion by arcuately slotting said disc portion and adapted to bias said button portion and said tape-engaging portion such that said tape-engaging portion will be in locking contact with the measuring tape.

7. A measuring tape unit as defined in claim 6, wherein said locking and releasing device substantially comprises a flat disc comprising an arcuate slot forming said spring portion, a hole forming said axial bearing portion, and an upstanding portion, a section of which forms said tape-engaging portion and another section of which forms said button portion.

8. A measuring tape unit as defined in claim 7, wherein one of said case sections comprises positioning pins for contacting the surface of said flat disc of said locking and releasing device for maintaining said device in the desired plane.

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