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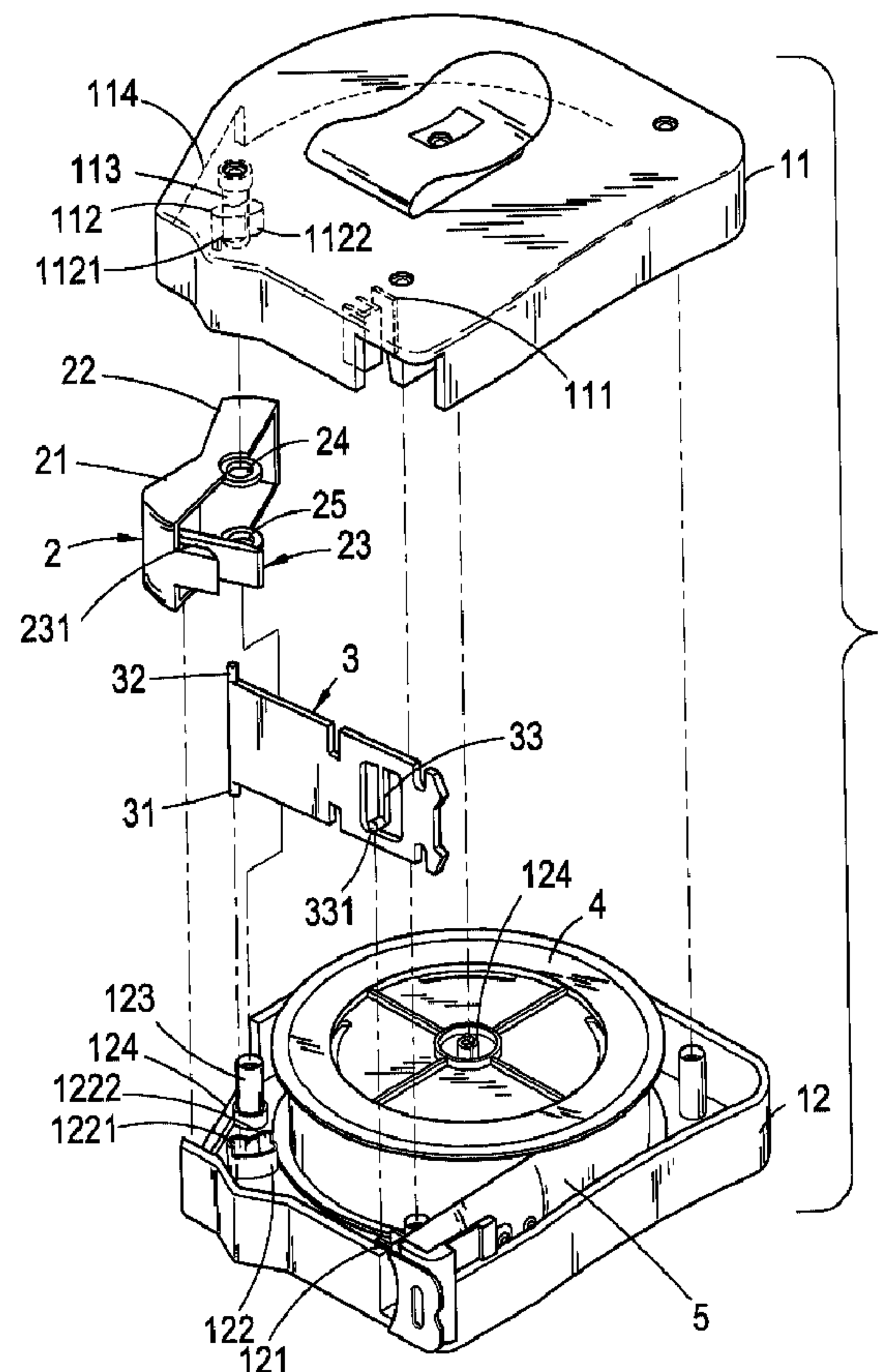
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(54) Title: BRAKE DEVICE FOR A TAPE RULE



(57) Abrégé/Abstract:

A brake device for a tape rule is provided that comprises a housing composed of an upper housing and a lower housing, a control device having a brake button and a release button. A brake strap is displaceable by the control device. The brake strap is guided in

(57) Abrégé(suite)/Abstract(continued):

slide slots formed on the housing such that a protuberance of the spring tongue is mated with the top edge of the slide slot formed on the lower housing. The top end of the brake strap is disposed on a slipway or in a confining slit formed on the brake button, the bottom end thereof is disposed near the surface of the tape. The bottom end of the brake strap is forced against the tape rule to lock it in an extended position when the brake button is depressed. The flexed spring tongue performs the releasing function of the brake.

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ABSTRACT

A brake device for a tape rule is provided that comprises
5 a housing composed of an upper housing and a lower housing, a
control device having a brake button and a release button. A
brake strap is displaceable by the control device. The brake
strap is guided in slide slots formed on the housing such that
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BRAKE DEVICE FOR A TAPE RULE

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention relates to a brake device for a tape rule,
5 and more particularly to an elaborately designed brake device for a
type rule which can definitely control halting the tape in a desired
position when it is pulled out for measurement.

2. Description of the Prior Art

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A tape rule is widely applicable for surveying work both in
domestic and engineering fields such as, interior design, furniture
arrangement, civil engineering and building construction etc.
Incidentally, it is found that a conventional tape rule has inherent
15 shortcomings as follows:

1. Its brake device (a key button) is not easily controllable for
an extended tape, and in the worst case, causing an injury to
the user or a third person standing near the user.
2. Frequent operation of a brake device causes shortening
20 durability of a tape rule, especially in the case the brake
device includes metallic springs or screws, such a high-fault
rate of the brake device increase production cost of a tape
rule.
3. When it is necessary to measure several objects successively,
25 it is inconvenient because a conventional brake device is
not suitable for frequent operation as described above.

4. A conventional tape rule shall be securely kept out of the reach of children as the extended tape will normally retract automatically with a very high speed which may probably cause a danger to the person who tamper with it.

5 There was an improved design for brake device for a tape rule patented by US. Pat. No.4,976,048. In this cited case braking a tape is carried out by a toggle and its shoe. There is a pivot arm provided on the toggle, and the end of the pivot arm is formed into an U shaped pivot recess that hooks on a bearing shaft of the shoe.

10 An aperture is further formed on the lower end of the bearing shaft which makes the pivot arm of the toggle able to revolve around the bearing shaft of the shoe. As soon as the tape has been pulled out and positioned in a desired position thereof, the user may press an off-flat provided on the toggle so as to urge a brake strap

15 against the tape by turning the pivot arm thereby achieving the aim of halting the movement of the tape. On the other hand, when retracting the tape, by pressing an on-flat provided on the toggle, and the pivot arm turns to bring the shoe off the tape so that the tape is released to wind back on the reel and returns to the housing.

20 With this structure, the brake device of the cited case performs the braking function of the tape. However, it should be noticed that in this structure the forces for braking and releasing the tape are concentrated in the hooked portion of the pivot arm and the bearing shaft because the shoe is driven by the pivot arm. After

25 the tape rule has been in use for a certain time, the pivot recess formed at the end of the pivot arm is likely to crack thereby causing the brake device to loose its function. Besides, in the case that the bearing shaft is disengaged with the pivot recess

during braking the tape, the tape is got stuck thereof and fails to be wound back into the housing. In addition, a tape rule with such a brake device is too sophisticated to assemble owing to its complicated structure that leads to increase the production cost and discourage users purchasing desire.

In order to overcome the shortcomings inherent to the conventional technique described above, the present inventor has delved into this matter with a long time efforts and came to realization of the present invention.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a simply constructed, easily operatable brake device for a tape rule thereby upgrading the quality of a tape rule and minimizing its production cost.

To achieve this object, the brake device for a tape rule according to the present invention comprises a housing composed of an upper housing and a lower housing, a control device, a reel and a brake strap. There are a pair of breaches, guide slots, and slide slots respectively formed in the upper and the lower housings, facing each other. Main components of the brake device are the control device and the brake strap. The control device is pivotally coupled to the housing. The control device emerges out of the housing with its brake button and release button extending out of the breaches of the upper and the lower housings. The brake strap is set in the slide slots of the upper and lower housings with its one end received in a

confining slit, while its other end is disposed in a position near the tape. The brake strap is further equipped with a spring tongue having a protuberance formed at its end for positioning the brake strap in the slide slots thereof. When the brake button is pressed, a supporting arm of the brake button pushes the brake strap to urge the tape and halt it thereat, while being clogged by the slides slot at the lower housing, the spring tongue is flexed to produce a resilient force. As soon as the releasing button is pressed, the brake strap restores its initial state with the aid of the resiliency of the spring so that the tape is released from detention and is free to retract.

BRIEF DESCRIPTION OF THE DRAWINGS

The above object and other advantages of the present invention will become more apparent by describing in detail the preferred embodiments of the present invention with reference to the attached drawings in which :

Fig. 1 is an exploded illustrative view of the present invention;

Figs. 2A and 2B are the drawings illustrating the fundamental principle of the present invention;

Figs. 3A and 3B are the drawings illustrating the operational principle of the present invention;

Fig. 4 is an exploded illustrative view of another embodiment of the present invention; and

Figs. 5A and 5B are the drawings illustrating the fundamental

principle of another embodiment of the present invention shown in Fig. 4.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

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As shown in Fig. 1, the brake device for a tape rule of the present invention comprises a housing 1, a reel 4, a control device 2, and a brake strap 3.

The housing 1 is composed of an upper housing 11 and a lower housing 12, wherein a pair of breaches 114, 124, a pair of guide slots 112, 122, a pair of positioning pins 113, 123, and a pair of slide slots 111, 121 are respectively formed on the upper and the lower housings 11, 12 facing to each other. Among them the positioning pins 113, 123 are formed in the breaches 114, 124 respectively.

15

A reel 4 is installed on an axle 124 which is formed on the lower housing 12 for winding a tape 5 thereon, the reel 4 together with the tape 5 is accommodated in the housing 1.

The control device 2 has a brake button 21 and a release button 22 emerged therefrom. The brake button 21 has an extended supporting arm 23 on its end, the supporting arm is provided with a confining slit 212. There are a pair of apertures 24, 25 facing up and down each other formed on the center portion of the control device 2 for inserting the positioning pins 113, 123 installed on the upper and lower housing 11, 12 respectively so as

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to settle the control device 2 on the housing 1 thereby emerging the brake button 21 and the release button 22 respectively from the breaches 114, 124 formed on the upper and the lower housings 11 and 12, and by so, the control device 2 is able to perform forward
5 and backward movement by pressing with respect to the positioning pins 113, 123 as a center axis.

The brake strap 3 has two pivot pins 31, 32 protruded up and down from a side edge which are engaged respectively to the left hand side 1111 of the guide slot 112 and the left hand side 1121 of
10 the guide slot 122. A spring tongue 33 is further provided for the brake strap 3 at a relevant portion with a protuberance 331 formed at its end so as to settle the brake device 3 in the slide slots 111, 121 formed respectively on the upper and the lower housing 11, 12. With this structure, the brake strap 3 is guided
15 in the slide slots 111, 112 such that the protuberance 331 of the spring tongue 33 is mated with the top fringe of the slide slot 121 formed in the lower housing 12. As a result, the top end of the brake strap 3 is accommodated in the confining slit 231 of the supporting arm 23, while its lower end is disposed near the surface
20 of the tape 5.

Referring to Figs. 2A, 2B and 3A, 3B, the drawings illustrate the fundamental principle (Figs. 2A,2B) and the operational principle (Figs. 3A,3B) of the present invention respectively. When the tape 5 is pulled and extended to a designated length, the
25 brake button 21 of the control device 2 is pressed so that the supporting arm 23 pushes the brake strap 3 causing the pivot pins

31, 32 to slide from the left hand sides 1111, 1221 of the guide slots 112, 122 to the right hand sides 1112, 1222 of the guide slots 112, 122, and are positioned thereat. At the same time, the brake strap 3 slides downwards so as to detain the tape 5 by urging it against the housing 1. Meanwhile, the spring tongue 33 is flexed as its end protuberance 331 is clogged in the guide slot 121 formed in the lower housing 12 and produces a resilient force. As soon as the releasing button 22 is pressed, the brake strap 3 restores its initial state with the aid of the resiliency of the spring tongue 33 so that the tape 5 is released from the detention and is free to retract.

Referring to Figs. 4, 5A and 5B, the drawings are an exploded view in another embodiment of the present invention (Fig. 4), and illustrating the fundamental principle of the same (Figs. 5A, 5B).

The brake device for a tape rule in this embodiment comprises a housing 6, a reel 4, a control device 7, and a brake strap 8.

The housing 6 is composed of an upper housing 61 and a lower housing 62, wherein a pair of breaches 611, 621, a pair of slide slots 613, 623, and a pair of positioning pins 612, 622 are respectively formed on the upper and the lower housings 61, 62 facing to each other. Among them the positioning pins 612, 622 are formed in the breaches 611, 621 respectively. The slide slot 623 of the lower housing 62 further has a breach 6231 formed at its one side.

A reel 4 is installed on an axle 63 which is formed on the lower housing 62 for winding a tape 5 thereon.

The control device 7 has a brake portion 71 and a release portion 72 thereon. A slipway 73 is formed at the bottom of the brake portion 71 and having a confining slit 731 at its end terminal thereof. A pair of apertures 74, 75 are provided and
5 aligned coaxially at the center of the control device 7.

The brake strap 8 has an aperture 82 at its center portion thereof, a slender spring tongue 81 is extended from one side of the aperture 82, and a protuberance 811 is formed at the end of the spring tongue 81 vertical to the spring tongue 81.

10 The control device 7 is assembled to the housing 6 by fitting the positioning pins 612, 622 into the apertures 74, 75 and emerging its brake portion 71 and releasing portion 72 out of the breaches 611, 621 respectively. The brake strap 8 is accommodated in the slide slots 613, 623 formed on the upper and
15 the lower housings 61, 62 with its protuberance 811 fitted in the breach 6231 formed at one side of the slide slot 623 such that the top end of the brake strap 8, is inserted into the slipway 73 at the bottom of the brake portion 71.

When the tape 5 is to be halted, by pressing the brake portion
20 71 of the control device 7, the brake strap 8 is forced to slide along the slipway 73 at the bottom of the brake portion 71, and then inlaid in the confining slit 731 of the slipway 73, at this moment the brake strap 8 is forced to move downwards and detain the tape 5 thereat. Meanwhile, the protuberance 811 of the brake
25 strap 8 is clogged by the breach 6231 of the lower housing 62 causing the spring tongue 81 flexed to produce a resilient force.

If the tape 5 is to be wound back to the reel 4, by pressing the release portion 72 of the control device 7, the top end of the brake strap 8 will be released from the confining slit 731 and restores its initial state with the aid of resiliency of the spring tongue 81
5 thereby achieving the retraction of the tape 5 back into the housing 6.

After having finished reading over the above detailed description of the present invention. One may clearly understand that the present invention has several features which are distinctly
10 superior to the cited case, and are as follows:

1. Detention of the tape is carried out by pushing the brake strap to slide along the slide slot until it urges the tape on the housing.
2. Force to detain the tape comes from the resiliency of a
15 spring with the result that the durability of the brake device is greatly upgraded than that of the cited case employing a hook.
3. The structure of the present invention is much simpler, more convenient, and much safer than that of the cited case.

20 Those who are skilled in the art will readily perceive how to modify the invention. Therefore, the appended claims are to be construed to cover all equivalent structures which fall within the true scope and spirit of the invention.

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What is claimed is:

1. A brake device for a tape rule comprising:

5 a housing composed of an upper housing and an lower housing, said upper and lower housings respectively having a pair of breaches defining an opening in said housing, a pair of guide slots, and a pair of slide slots formed therein and disposed in face-to-face relationship;

10 a reel for winding a tape thereon being accommodated in said housing;

15 a control device pivotally coupled to said housing and having a brake button portion and a release button portion respectively disposed in said opening formed by said pair of breaches, said brake button portion having an extended supporting arm formed on an end thereof, said supporting arm having a confining slit formed therein; and

20 a brake strap having a first end disposed in said confining slit and being slidably disposed in said slide slots, two pivot pins respectively extending from opposing side edges thereof and respectively disposed in said pair of guide slots, and a spring tongue disposed at a predetermined portion of said
25 brake strap, said spring tongue having a protuberance formed at a distal end thereof and extending orthogonal said spring tongue and being blocked by an edge of one of said slide slots, wherein a second end of said brake strap is pressed
30 against the tape responsive to depression of the brake button portion of said control device, said

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depression of said brake button portion displacing
said brake strap through said slide slots and
displacing said pivot pins from a first position in
said guide slots to a second position therein, said
5 spring tongue being resiliently displaced by said
displacement of said brake strap to establish a bias
force to reversibly displace said brake strap and
thereby release the tape responsive to depression of
said release button portion of said control device.

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2. The brake device of claim 1, wherein two positioning pins
are installed in said two breaches of said upper and said
lower housing respectively corresponding to each other, and
two apertures coaxially aligned each other are formed at a
15 center portion of said control device for inserting said two
positioning pins so that said control device is settled on
said housing and able to make forward and backward movement on
said housing with respect to said positioning pins as a center
axis when being pressed.

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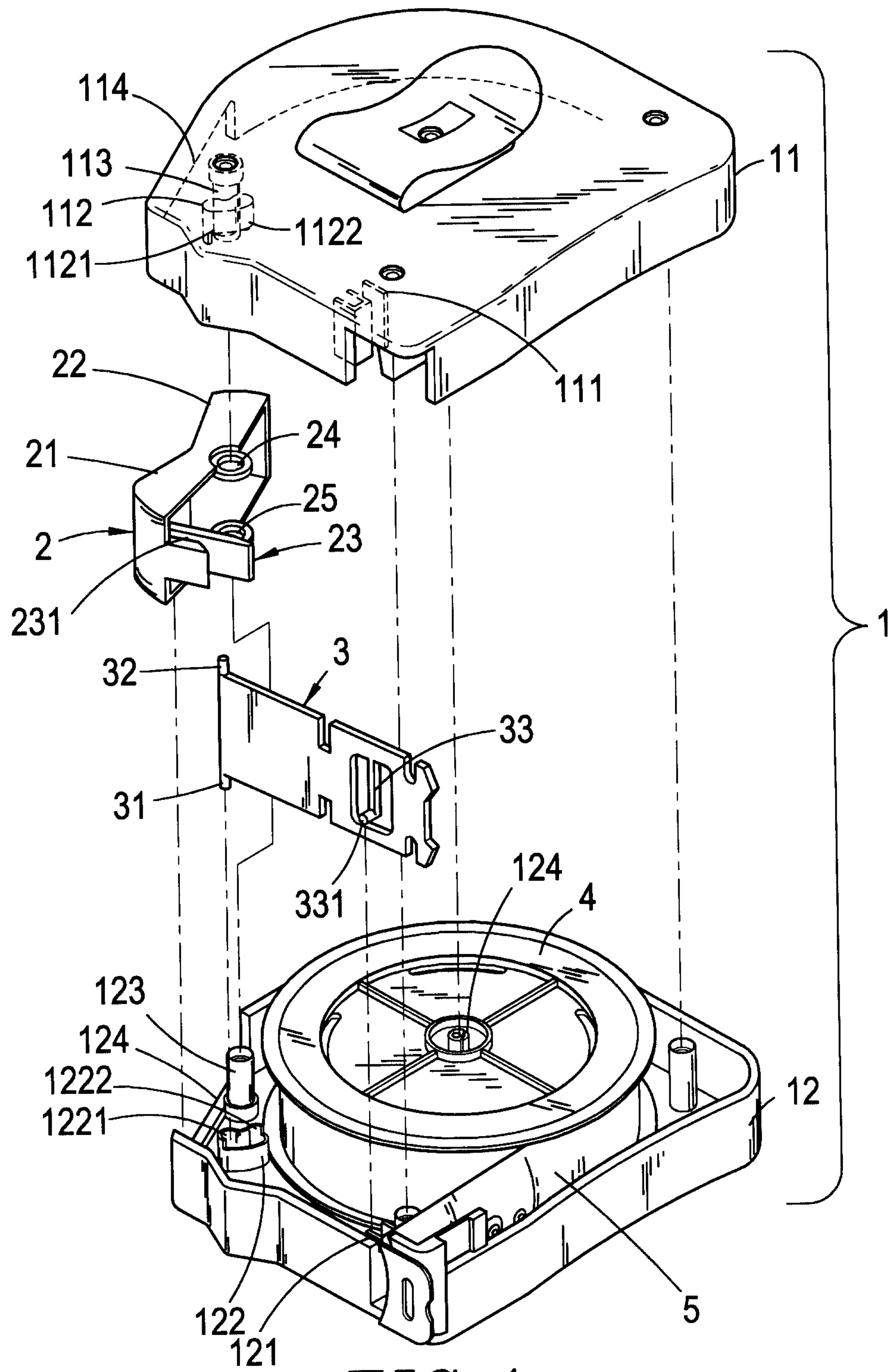
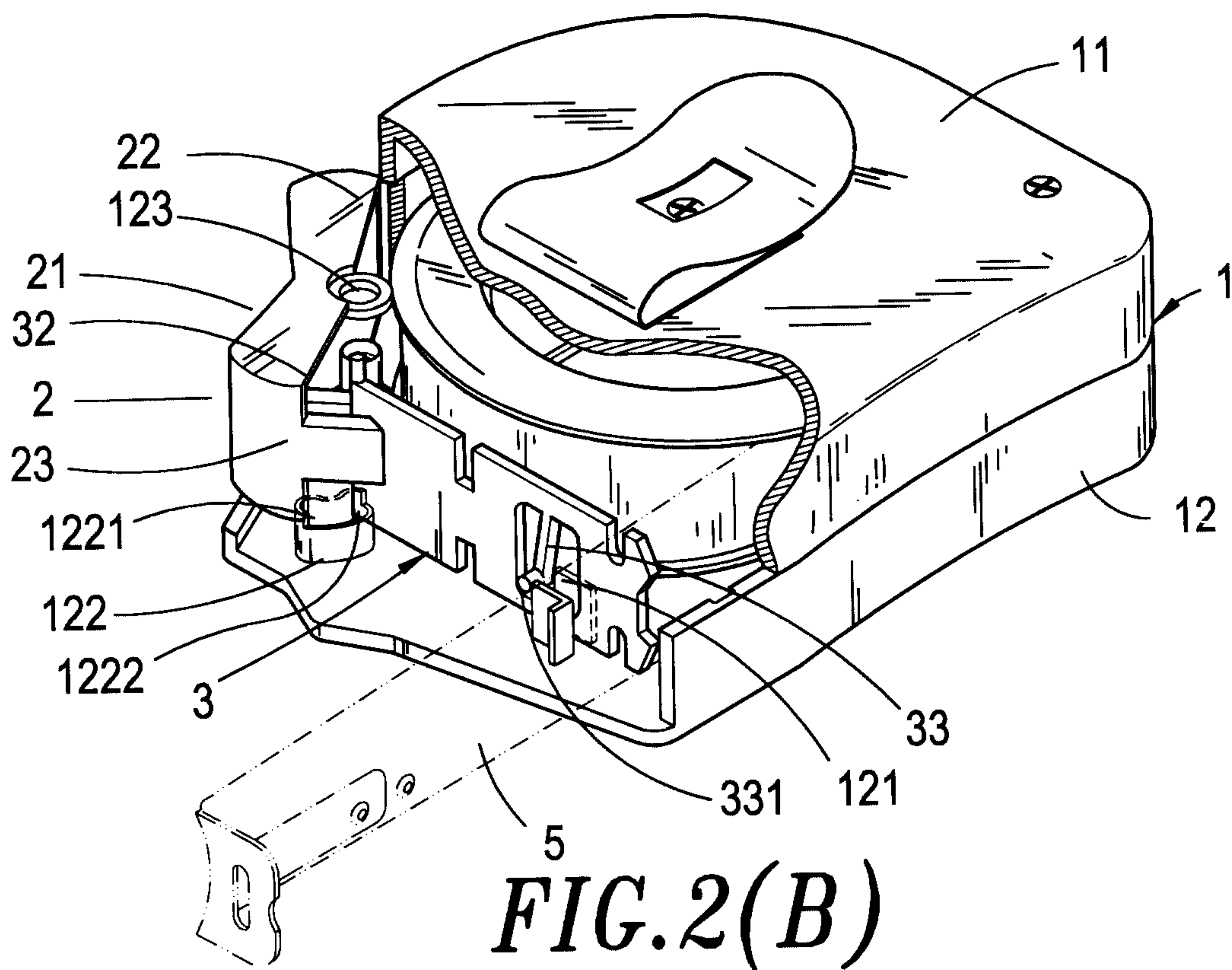
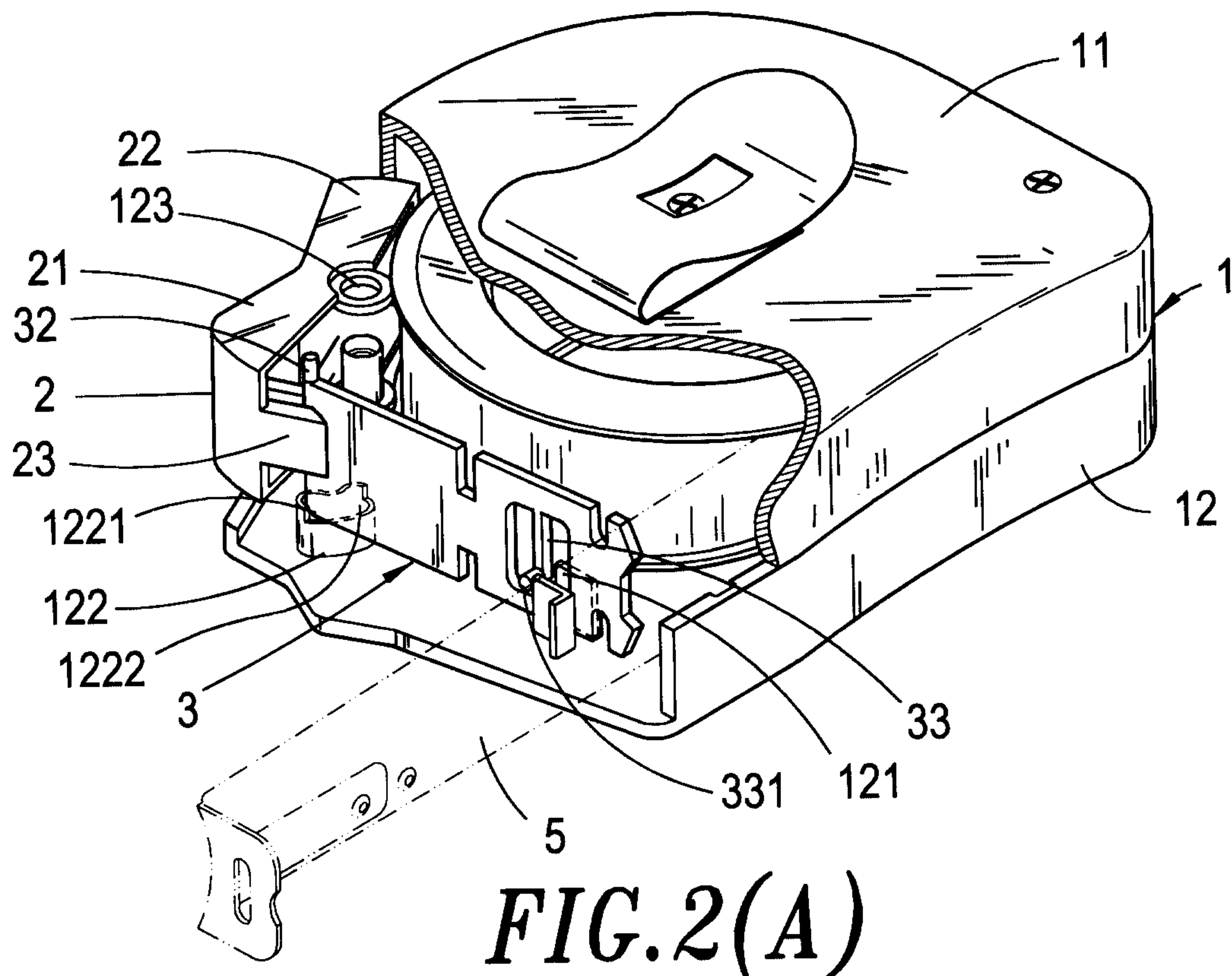


FIG. 1



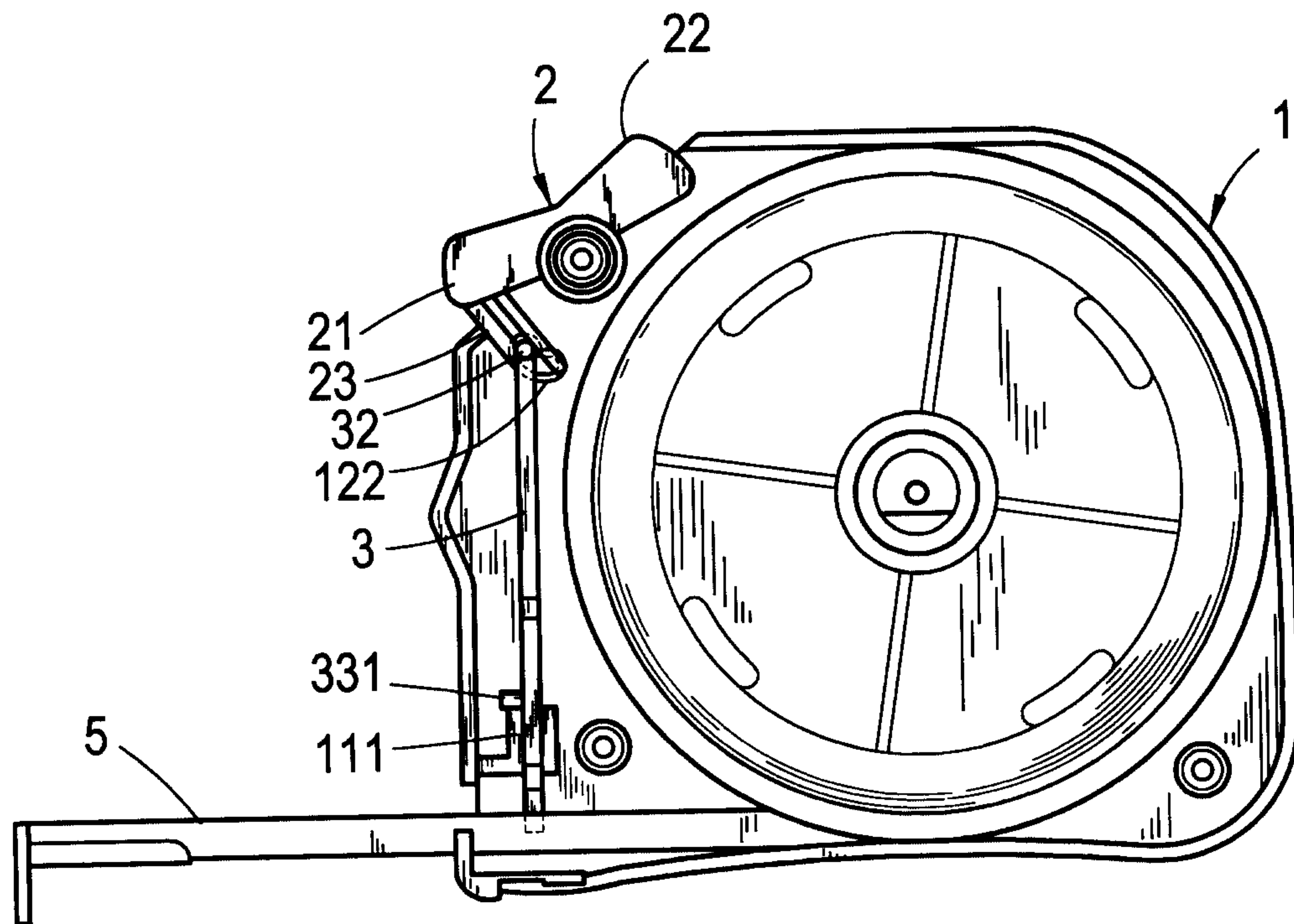


FIG. 3(A)

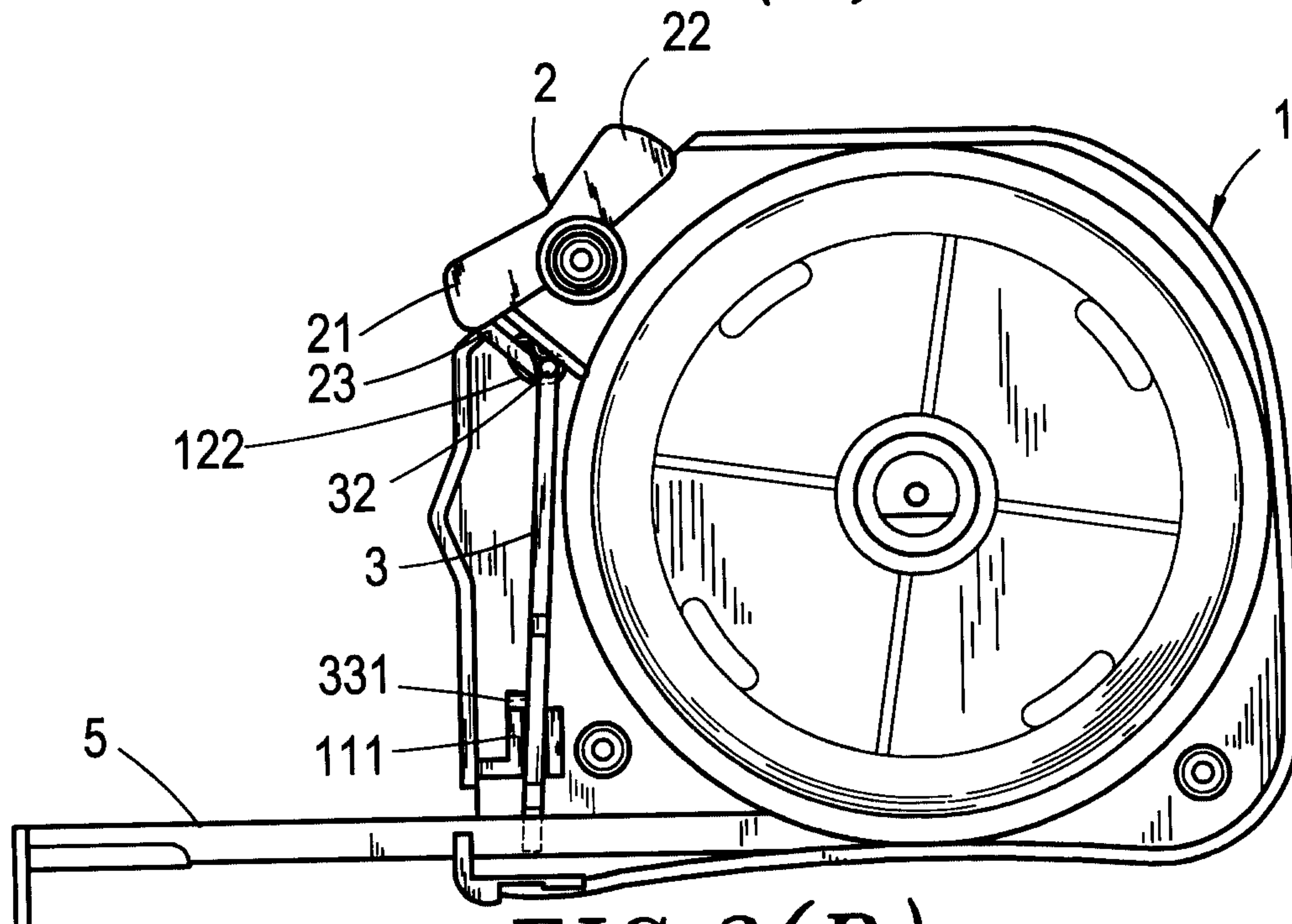


FIG. 3(B)

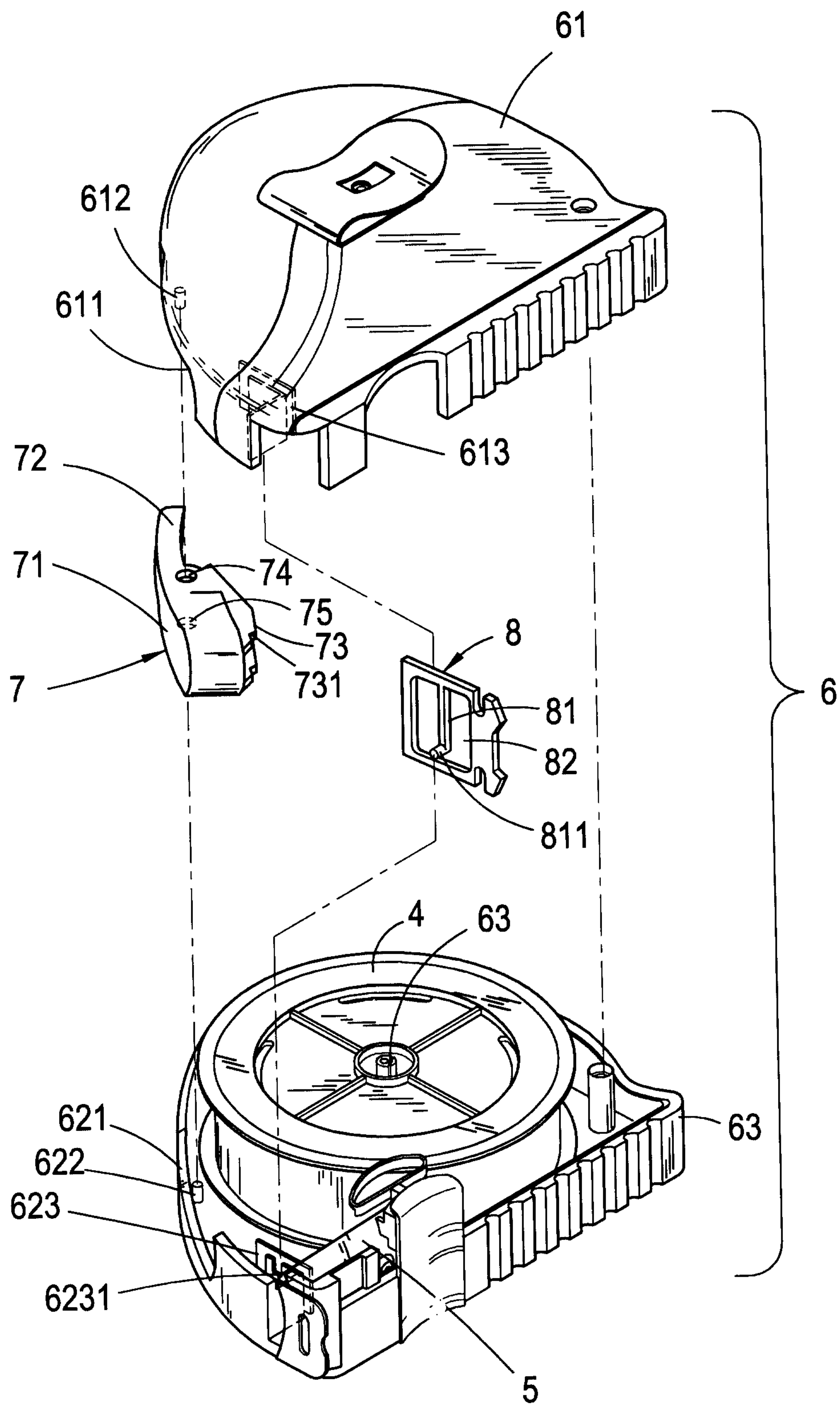


FIG. 4

