Feb. 13, 1940. L. DRITZ 2,190,597

MEASURING DEVICE

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Fig. 1.

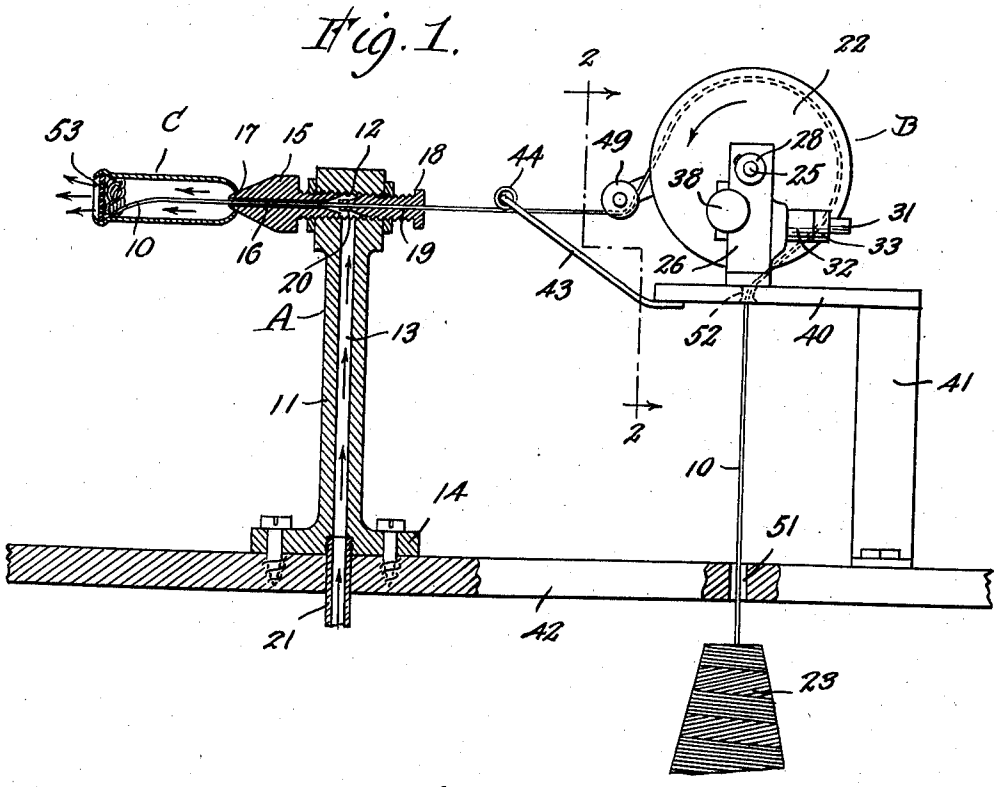
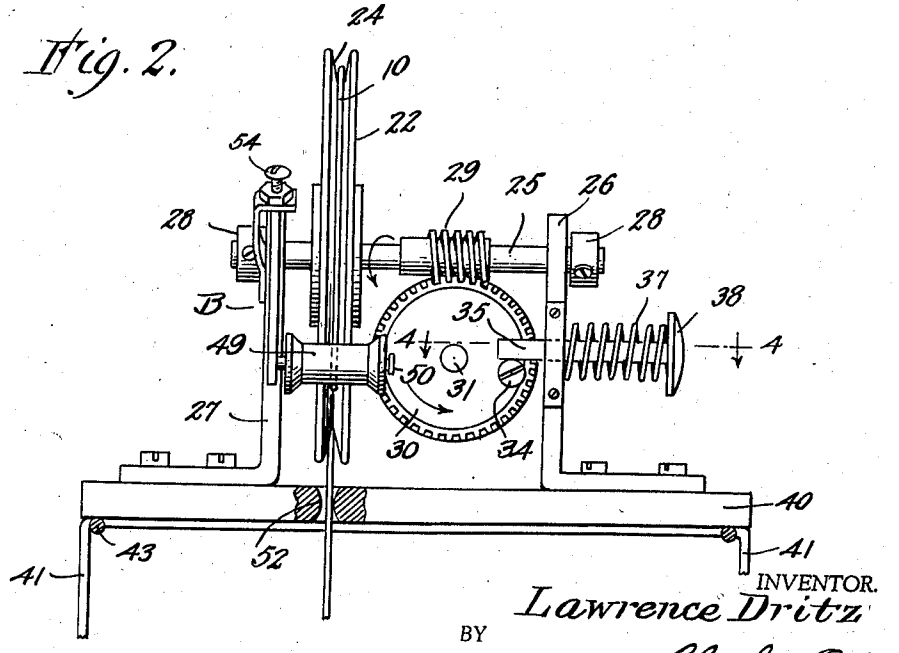


Fig. 2.



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Fig. 3.

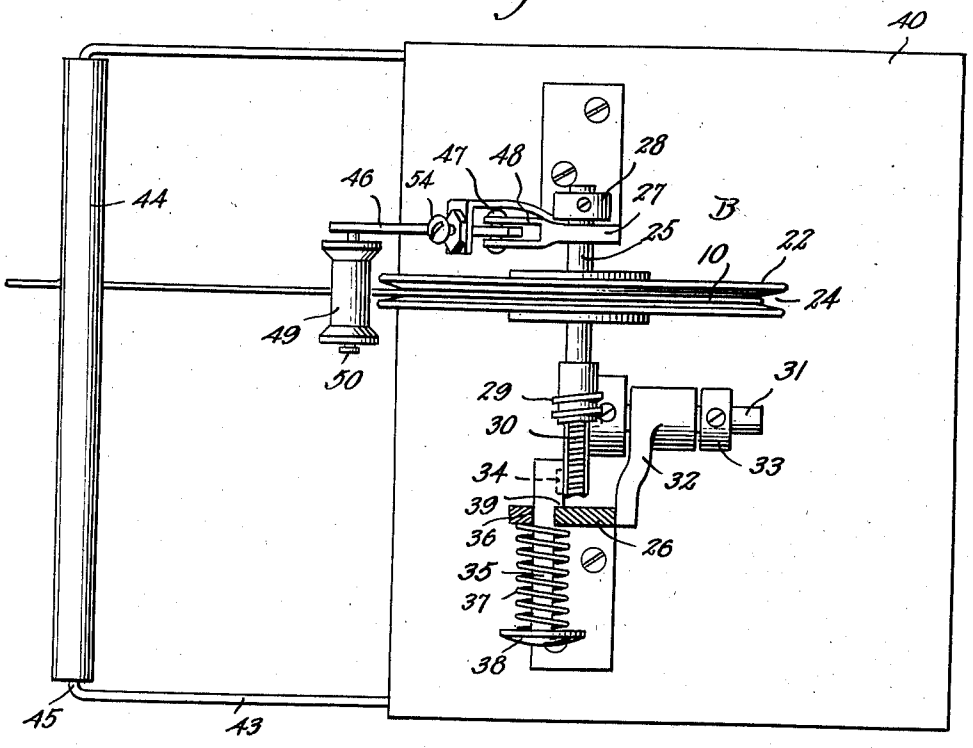
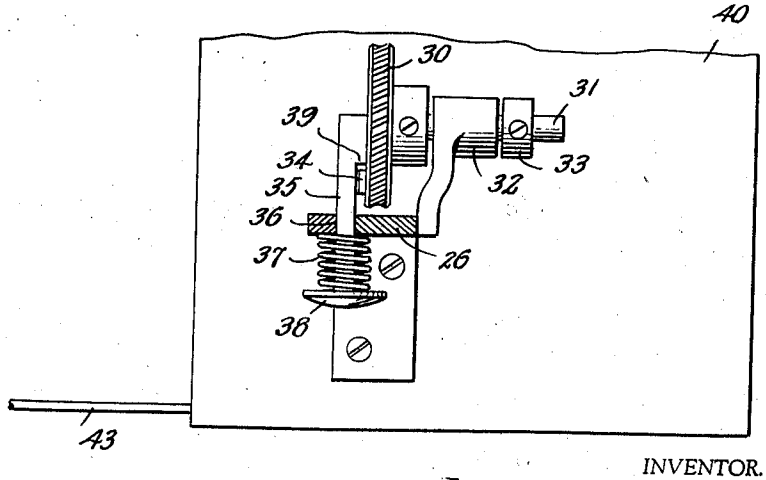


Fig. 4.



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UNITED STATES PATENT OFFICE

2,190,597

MEASURING DEVICE

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Application October 19, 1938, Serial No. 235,765

4 Claims. (Cl. 33—132)

This invention relates to measuring devices particularly designed for measuring elastic thread and to the combination of said measuring device with pneumatic means for feeding the thread into dispensing containers.

The invention has in view an elastic thread measuring device and pneumatic means for feeding the thread which includes a fluid stream acting directly upon the thread to cause the same to be drawn from a spool or other source of supply and over the thread measuring device which is actuated by the feeding movement of the thread and which thread measuring device functions to discontinue the feeding of the thread when a predetermined length has been fed thereover.

The invention further comprehends a thread measuring device provided with manually controlled means for permitting actuation thereof by the feeding of the thread thereover and which means automatically functions to arrest the movement of the measuring device and the feeding of the thread thereover after a predetermined length has been fed through the measuring device.

The invention further provides a measuring device for elastic thread which includes a rotatable measuring element and a swingably mounted guide rotatable on an axis parallel to the axis of the measuring element and under and against which guide the thread is trained and which engages against the measuring element to act as a break when the thread becomes slack so as to avoid overrunning of the thread on the measuring element.

With the foregoing and other objects in view, reference is now made to the following specification and the accompanying drawings, in which:

Fig. 1 is a view in side elevation of a pneumatic means and a thread measuring device constructed in accordance with the invention, with parts broken away and shown in section to illustrate the underlying structure.

Fig. 2 is an enlarged fragmentary vertical sectional view taken approximately on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged top plan view of the measuring device with parts broken away and shown in section.

Fig. 4 is an enlarged fragmentary horizontal sectional view taken approximately on the line 4—4 of Fig. 2.

Referring to the drawings by characters of reference, A designates generally a pneumatic means for drawing elastic thread 10 from a source of supply and over a measuring device indicated generally by the reference character B and for ejecting the thread into a packaging container indicated by the reference character C.

The pneumatic means A includes a standard 11 provided with a horizontally extending threaded aperture 12 adjacent the upper end thereof and which communicates substantially centrally thereof with a vertical fluid duct 13 opening through the flanged lower end 14 of the standard 11. A nozzle 15 is threaded into the forward end of the aperture 12 and is provided with a longitudinally extending bore 16 defining an air vent and a thread dispensing opening, the forward end portion of the nozzle being of conical formation so as to engage within the apertured end 17 of the packaging container C for ejecting the thread thereinto and piling the same in indiscriminate and untensioned condition therein.

The opposite end of the aperture 12 has threaded therein a screw stud 18 provided with a longitudinally extending bore 19 which aligns with the bore 16 and which stud is longitudinally adjustable in the aperture 12 so as to vary the spacing of the reduced forward end 20 thereof from the inner end of the bore 16 in the nozzle 15. The bore 16 is of slightly larger diameter than the bore 19 so that the fluid entering the standard 11 through the conduit 21 will enter the aperture 12 through the fluid duct 13 and thence be emitted through the bore 16 in surrounding relationship with the thread 10 which is drawn through the bore 19 in the plug 18 and ejected by the fluid stream into the packaging container C.

The measuring device B includes a rotatable disk 22 defining a thread measuring element which is disposed between a source of supply such as a cone 23 and the pneumatic means A and which is provided with a peripheral V-shaped groove 24 in which the thread is trained. The disk 22 is secured on a shaft 25 journaled for rotation in bearing openings in spaced standards 26 and 27 through which openings the shaft 25 protrudes and has collars 28 secured on the protruding ends thereof to retain the shaft 25 against endwise movement.

In order to provide means for arresting the rotation of the disk 22 upon completion of a predetermined number of revolutions thereof, the shaft 25 is provided with a worm 29 which meshes with a worm wheel 30 secured on the forward end of a shaft 31 for rotation therewith, which shaft is journaled in a right angularly disposed bracket 32 carried by the standard 26, the shaft 31 protruding through the bearing opening in the said bracket and being provided with a collar

33 for retaining the shaft against endwise movement. The shaft 31 is disposed below the shaft 25 with the worm wheel 30 rotating in a counterclockwise direction, as indicated by the arrow thereon, in a plane at right angles to the plane of rotation of the disk 22.

The worm wheel 30 is provided on its forward face adjacent the periphery thereof with a stop pin 34 which once during each revolution of the worm wheel engages against the underside of a detent bar 35 to stop the rotation of the worm wheel 30, the disk 22 and the feeding of the thread over the disk 22 to the pneumatic means A. The detent bar 35 is of rectangular shape in cross sectional configuration and is slidable in a rectangular opening 36 in the standard 26 and has a coiled expansion spring 37 arranged thereon between the headed outer end 38 and the outer face of the standard 26 to normally maintain the inner end of the bar 35 in the path of movement of the stop pin 34. By manually pressing the headed end 38 of the detent bar inwardly against the action of the spring 37, the inner end of the said bar is moved out of engagement with the stop pin 34 to again permit rotation of the worm wheel 30, the stop pin 34 passing outwardly around the offset inner end 39 of the bar 35 as shown in Fig. 4. Upon releasing the detent bar, the spring 37 functions to retract the said bar to again dispose the inner end thereof in the path of movement of the stop pin 34.

The standards 26 and 27 are mounted on a base 40 which is supported by means of the legs 41 upon a table or other supporting means 42 upon which supporting means 42 the flanged end 14 of the pneumatic means A is also supported. The base 40 is provided with a forwardly and upwardly directed wire bail 43 having an elongated tube 44 rotatably mounted on the bight portion 45 thereof under and against which tube the thread is trained and guided prior to being drawn into the bore 19 of the pneumatic means A.

In order to avoid overrunning of the thread on the disk 22 when the thread becomes slack, between the pneumatic means A and the measuring device B, an arm 46 is swingably mounted on a pin 47 in a slot 48 in the forward edge of the standard 27, and which arm 46 has a rotatable spool 49 mounted for free turning movement on a spindle 50 secured adjacent the outer end thereof. The spindle 50 is disposed in parallel alignment with the shaft 25 and with the spool 49 arranged on the spindle 50 in front of the disk 22 and under and against which spool the thread 10 is trained and guided as the same is drawn towards the pneumatic means A. The drawing of the thread by the pneumatic means A places the thread 10 under tension to swing the arm 46 and the spool 49 upwardly, as shown in Fig. 1, while lessening of the tension in the thread which would cause a slack to occur between the disk 22 and the pneumatic means A will cause the spool 49 to gravitationally swing against the periphery of the disk 22 to act as a brake to thereby arrest the rotation thereof. The thread 10 is fed from the cone 23 through aligned openings 51 and 52 in the table 42 and base 40 respectively and thence around the disk 22 within the grooved margin 24 thereof, the same being trained under the spool 49 and the guide 44 after which it is drawn through the bore 19 and thence ejected through the bore 16 of the nozzle 15 into the packaging container C, the packaging container C having a plurality of outlet openings 53 for venting the fluid stream of the pneumatic feeding means. It will be understood that the ratio of the diameter of the measuring disk 22 with reference to the worm 29 and worm wheel 30 is such that when the worm wheel makes one complete revolution as controlled by the stop pin, a predetermined length of thread will be fed through the measuring device. In order to provide means for limiting the upward movement of the brake spool 49, an adjustable stop screw 54 is provided on the standard 27 and which is adjustable towards and away from the arm 46.

What is claimed is:

1. In a device for measuring a predetermined length of elastic thread, a pair of spaced supports, a marginally grooved measuring element mounted on a shaft journaled for rotation in said supports and about which element the thread is trained, a worm carried by said shaft, a rotatable worm wheel meshing with said worm, a stop stud carried by and projecting axially from the worm wheel, a detent normally disposed in the path of movement of said stop stud for automatically arresting the movement of said measuring element and the feeding of said thread upon completion of a single revolution of said worm wheel, said detent being manually shiftable to a position out of the path of said stop stud to permit of rotation of said measuring element, and brake means controlled by the slack in the thread and engageable with the measuring element for preventing overrunning of the thread.

2. In a device for measuring a predetermined length of elastic thread, a pair of spaced supports, a marginally grooved measuring element mounted on a shaft journaled for rotation in said supports and about which element the thread is trained, a worm carried by said shaft, a worm wheel rotatably carried by one of said supports and meshing with said worm, a stop stud carried by and projecting axially from the worm wheel, a spring urged detent bar mounted for sliding movement in an opening in one of said supports and normally disposed in the path of movement of said stop stud for automatically arresting the movement of said grooved member and the feeding of the thread about the same upon completion of a predetermined number of revolutions thereof, said detent bar being manually shiftable against the action of said spring to a position to permit of the rotation of said measuring element, and a swingably mounted brake having a roller rotatable on an axis parallel to the axis of the measuring element and under and against which roller the thread is trained and which roller engages with the measuring element to act as a brake when the thread becomes slack so as to avoid overrunning of the thread on the measuring element.

3. In a device for measuring elastic thread, a marginally grooved measuring element, suction means for drawing the thread over said grooved measuring element, a pair of spaced standards, a shaft journaled for rotation in said standards and on which shaft the marginally grooved measuring element is mounted and rotated therewith by the drawing of the thread thereover, a worm carried by said shaft, a rotatable worm wheel meshing with said worm, and an interchangeable stop and detent means carried respectively by said worm wheel and one of said standards for automatically arresting the movement of said grooved measuring element and the drawing of the thread thereover upon the completion of a revolution of said worm wheel, said detent means

being manually shiftable to a position out-of-the-way of said stop to permit the rotation of said grooved measuring element by the drawing of the thread thereover.

4. In a device for measuring elastic thread, a marginally grooved measuring element, suction means for drawing the thread over said grooved measuring element, a shaft journaled for rotation on which said measuring element is mounted to turn therewith by the drawing of the thread thereover, a worm carried by said shaft, a rotatable worm wheel meshing with said worm, a stop stud secured to and projecting axially from the worm wheel, a detent normally disposed in the path of movement of said stop for automatically arresting the movement of said grooved measuring element and the drawing of the thread thereover upon completion of a predetermined number of revolutions of said grooved measuring element, said detent means being shiftable to a position out-of-the-way of said stop stud to permit of rotation of said measuring element, and a swingably mounted brake including a roller rotatable on an axis parallel to the axis of the said measuring element and under and against which roller the thread is drawn, and which engages with the said measuring element to act as a brake when the thread becomes slack so as to avoid overrunning of the thread on the said measuring element.

LAWRENCE DRITZ.