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MEASURING MACHINE ATTACHMENT FOR CLOTH WINDING MACHINES.

APPLICATION FILED AUG. 11, 1919.

1,391,431.

Patented Sept. 20, 1921.

2 SHEETS—SHEET 1.

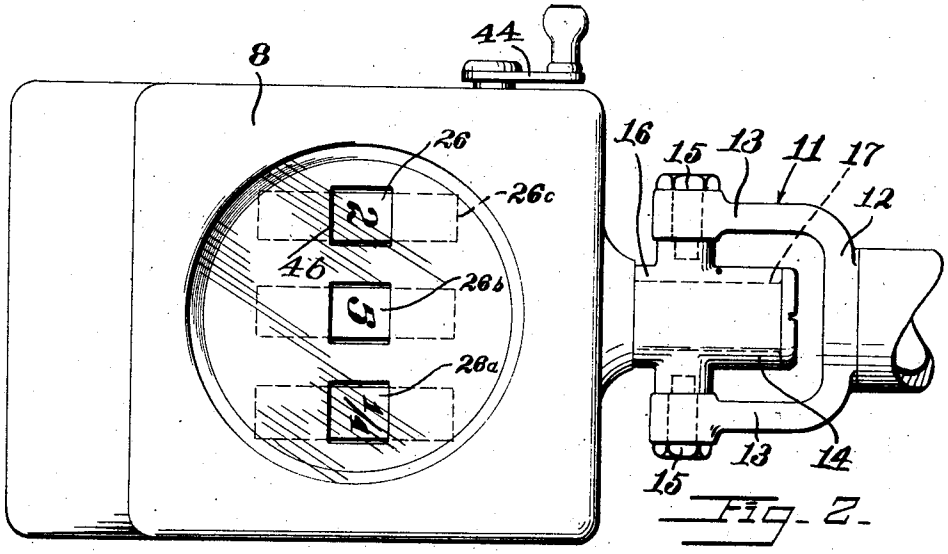


Fig. 2.

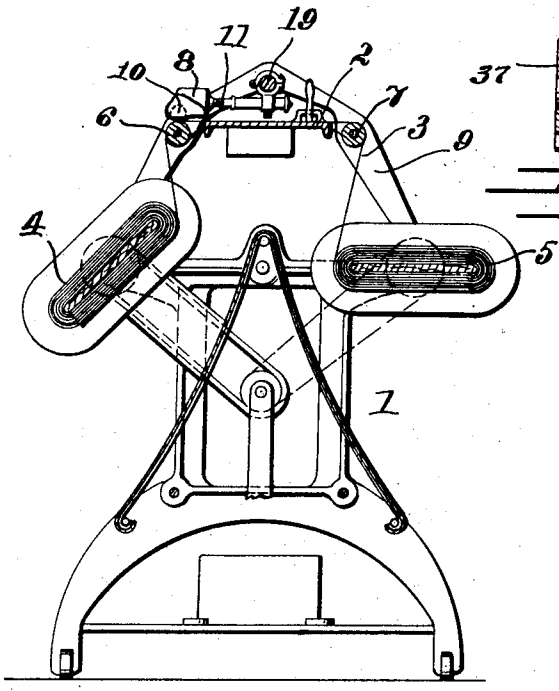


Fig. 1.

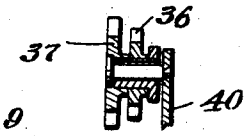


Fig. 7.

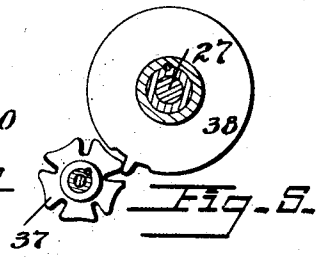


Fig. 5.

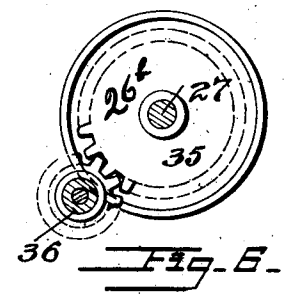


Fig. 6.

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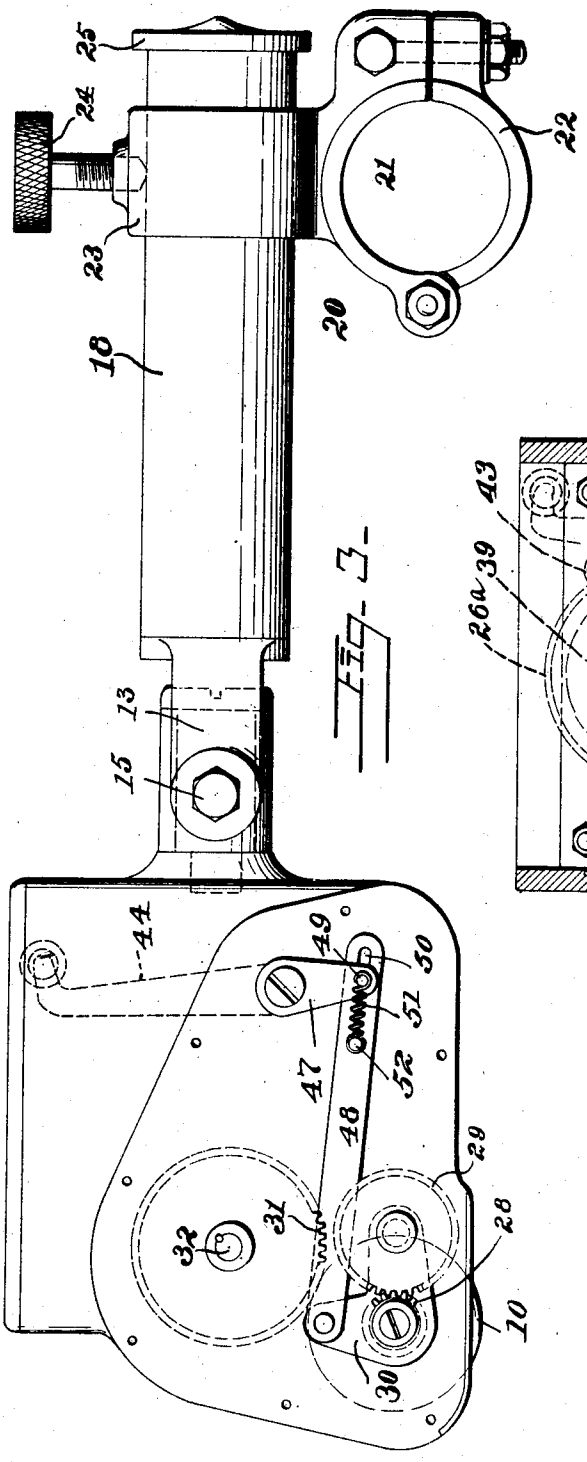


FIG. 3.

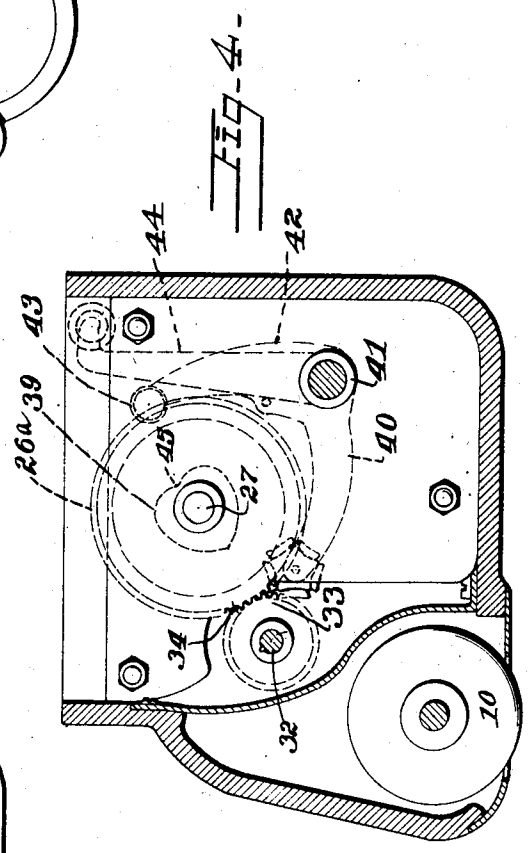


FIG. 4.

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UNITED STATES PATENT OFFICE.

DOUGLAS TURNER, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE MEASUREGRAPH COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

MEASURING-MACHINE ATTACHMENT FOR CLOTH-WINDING MACHINES.

1,391,431. Specification of Letters Patent. Patented Sept. 20, 1921.

Application filed August 11, 1919. Serial No. 316,542.

To all whom it may concern:

Be it known that I, DOUGLAS TURNER, a citizen of the United States, residing in the city of St. Louis and State of Missouri, have invented new and useful Improvements in Measuring-Machine Attachments for Cloth-Winding Machines, of which the following is a specification.

This invention relates to cloth winding machines, and particularly to an attachment or accessory for measuring the length of the cloth wound by the machine. These winding machines are largely used for winding off bolts of cloth to be sold by wholesale, and carrying a given length of cloth.

In the operation of these winding machines, the cloth is usually pulled over or past a guide roller, and when a measuring machine is used for measuring the length of cloth, it is usually held directly over this roller so that the measuring roller or driving roller of the measuring machine rests upon the cloth lying on the face of the guide roller.

The general object of the invention is to provide improved means for supporting the measuring machine to insure a uniform distribution of the weight of the measuring machine upon the guide roller, thereby insuring efficiency and accuracy in driving the indicating mechanism of the instrument; it has also been my object to provide improved means for setting the indicating mechanism back to zero after the measurement has been taken.

The invention consists in the novel features, and in the general combination of parts to be particularly described hereinafter, all of which contribute to produce a simple and efficient measuring machine attachment for cloth-winding machines. A preferred embodiment of my invention will be particularly described in the following specification, while the broad scope of my invention will be pointed out in the appended claims.

In the drawing,

Figure 1 is a vertical cross-section through a winding machine illustrating the practical application of my invention;

Fig. 2 is a plan of the measuring machine and its supporting means, upon an enlarged scale;

Fig. 3 is a side elevation of the measuring machine and illustrating the means for supporting it on the frame, and for setting the mechanism back to zero.

Fig. 4 is a vertical cross-section further illustrating the means for setting the indicating mechanism back to zero;

Fig. 5 is a cross-section showing details of the carrying mechanism;

Fig. 6 is an elevation further illustrating details of the carrying mechanism; and

Fig. 7 is a longitudinal section through the carrying mechanism corresponding to either the unit or tens wheel.

Before proceeding to describe a specific application of this invention, I desire to say that the device affords means for supporting the measuring machine in such a way that the weight of the measuring machine will be most effectively imparted through the measuring roller to the cloth which is passing under the measuring roller, and in order to effect this result, I provide means for supporting the measuring machine on the frame in such a way that the measuring machine can rotate bodily, so as to enable the face of the measuring roller to adapt itself to the face of the roller over which the cloth passes and with which the measuring roller cooperates.

In accomplishing this, I prefer to support the measuring machine so that it is capable of rotating about two different axes, one of which is disposed transversely to the axis of the measuring roller and preferably lies substantially in the middle plane of the measuring roller. I also provide suitable means for adjusting the measuring machine bodily with respect to the guide roller over which the cloth passes. The mechanism for driving the indicating mechanism of the measuring machine includes a clutch device, or its equivalent, and I provide hand-operated means which is capable of opening this clutch at will, and simultaneously resetting the indicating mechanism to the zero position.

The winding machine 1 of a common type may include an elevated table 2 across which the web 3 of cloth is drawn in winding it from one of the bolts 4 to the opposite bolt 5.

The measuring machine is mounted in any suitable manner so that as the cloth passes it will advance the indicating mechanism. In order to do this most effectively, it is preferable to mount the measuring machine

so that its measuring roller will coöperate with another roller on the winding machine, for example, a guide roller 6 which is disposed opposite a similar guide roller 7 with which it coöperates to guide the cloth across the upper face of the table 2.

The measuring machine 8 is supported in any suitable manner from the frame 9 of the winding machine 1, and in such a way that the measuring roller 10, carried by the measuring machine, presses against the cloth on the guide roller 6.

According to my invention I provide supporting means 11 for supporting the measuring machine in such a way as to permit of the bodily rotation of the measuring machine on different axes. This enables the measuring roller to establish effective contact with the roller 6 throughout the length of the measuring roller. This supporting means preferably consists of a head 12 having two forks 13 between which a knuckle 14 is pivotally mounted on gudgeons formed by the ends of oppositely disposed bolts 15, the axes of which form a horizontal axis of rotation for the measuring machine.

In order to enable the measuring roller 10 to adapt itself to the alinement of the axis of the roller 6, I prefer to provide a second axis of rotation in the form of a swivel joint 16 which connects the measuring machine to the knuckle 14. This involves the use of a swivel pin 17, the axis of which is located midway between the forks 13 and also preferably lies in the middle plane of the measuring roller 10.

The supporting means 11 for the measuring machine is provided with suitable means for attaching it to the frame of the machine, and the construction of this part of my invention will depend somewhat on the peculiar design of the winding machine to which the device is applied.

In adapting the device to the winding machine illustrated, I provide an arm 18, the outer end of which carries a head 12, and I provide means for attaching this arm to the frame 9 of the winding machine. In the present instance, the frame of the winding machine includes a longitudinal bar 19 disposed above the table 2, and I utilize this bar to support the arm 18; to do this I provide a bracket 20 having a socket 21 with a hinged cap 22 which enables the bracket to be readily attached to the bar 19. The bracket 20 also includes a guide ring 23 which may be integral with the socket, and through this guide ring 23 the arm 18 is passed. At one side the guide 23 is provided with a set-screw 24, the end of which engages the side of the arm 18 and clamps it in any one of a plurality of possible adjusted positions. At its inner end the arm 18 is provided with a head 25 which limits the outward movement of the arm.

The indicating mechanism of the measuring machine includes a plurality of number-wheels or counters indicated collectively by the number 26, (see Fig. 2), mounted upon a shaft, and including a fraction-wheel 26^a which indicates fractions of a unit of measure, such as a yard. The fraction-wheel is driven from the measuring roller 10 through a clutch or clutch device. This is preferably accomplished by means of a pinion 28 which is rigidly mounted on the shaft of the measuring roller 10, (see Fig. 3). This pinion meshes with a gear-wheel 29 which is carried upon a rocking plate 30, capable of holding the gear wheel 29 elevated or depressed. In Fig. 3 the gear wheel 29 is shown in its depressed position corresponding to the "open clutch" relation of the parts.

In its elevated position the gear-wheel 29 meshes with a gear-wheel 31 which is carried on a stub shaft 32, and this stub shaft carries a pinion 33, (see Fig. 4), which meshes with a gear-wheel 34 rigid with the fraction-wheel 26^a. At the end of each revolution the fraction-wheel carries over to a units wheel 26^b, and at the end of each revolution of the units wheel 26^b it carries over in a similar manner to the tens wheel 26^c. Any suitable carrying mechanism may be provided, for example, the well known mechanism shown in Figs. 5, 6 and 7. In Fig. 6, 26^b indicates that the units wheel carries a rigid gear wheel 35, that meshes with a pinion 36 rigid with a Geneva stop wheel 37, see Figs. 5 and 7, in which 38 represents a single-tooth wheel carried by the fraction wheel 26^a. At each revolution of the fraction-wheel 26^a, the single-tooth wheel 38 turns the Geneva stop wheel 37 through a partial turn, and thereby rotates the pinion 36 far enough to rotate the gear wheel 35 and the unit wheel 26^b through one number space.

Any suitable returning means may be provided for returning the indicating mechanism. The means which I have illustrated comprises parts on the wheels and coöperating parts controlled by hand.

In order to understand the returning of the indicating mechanism consisting of the number wheels 26 to their zero position, it should be understood that these number-wheels are all loose on the shaft 27, and each number-wheel is provided with returning means such as a heart-shaped cam 39. The carrying mechanism for each wheel of higher denomination, (see Fig. 7), is mounted on an arm 40 corresponding to that wheel, and these arms 40 are all mounted on a rock-shaft 41. The rock shaft 41 also carries a returning means in the form of a returning arm 42 corresponding to each heart-shaped cam 39, the upper end of which is provided with a roller 43 to engage the edge of the cam. A hand-operated member such as a lever 44 is attached to the rock shaft.

Now, by moving this lever toward the left, as viewed in Fig. 4, the arms 40 will swing down so as to disconnect the carrying mechanisms from the number wheels, thereby permitting them to rotate freely and independently of each other. The further movement of the lever 44 will bring the rollers 43 up against their corresponding heart-shaped cams 39, and this contact will rotate each cam and its corresponding number wheel until each roller 43 arrives at the notch or most depressed point 45 of the cam. When in this position the number wheels will all be returned to zero so that the number zero will show in each of the windows 46 on the upper side of the measuring machine.

In order to open the clutch, (consisting of the gear wheels 29 and 31), the rock plate 30 is rocked so as to separate these gears. This is accomplished through the actuation of the lever 44. For this purpose, the end of the rock shaft 41 carries a rigid arm 47 which is connected by a link 48 with an arm of the rock plate 30. I prefer to provide a flexible or yielding connection between the arm 47 and the link 48 which includes a pin 49, running in a slot 50 in the link, and I provide a spring 51 connecting the pin 49 with a pin 52 on the link 48. With this organization of parts, it is evident that the force is applied yieldingly to the rock plate.

The actuating member or lever 44 is mounted on the measuring machine in such a way that the application of the actuating force to it by one's hand tends to maintain contact of the measuring roller 10 with the roller 6; that is to say, it is mounted so that it does not tend to swing the measuring machine away from the roller 6 when it is set back to zero.

I prefer to provide the yielding connection described above for the reason that if the gear wheel 29 should strike an obstruction in its path when swinging down to its depressed position, no harm will be done, as the spring 51 will simply be extended after the downward movement of the gear wheel 29 is arrested.

I shall now briefly describe the mode of operation of the measuring machine.

As the web 3 of the cloth passes over the roller 6, it rotates the measuring roller 10 which actuates the pinion 28 to rotate the gear wheels 29 and 31, the latter of which rotates the pinion 33, (see Fig. 4), and this drives the large gear 34 which is carried by the fraction-wheel 26^a. Through the carrying mechanism indicated in Figs. 5 to 7, this wheel 26^a carries to wheels 26^b and 26^c in succession so that the wheels coöperate to measure the length of cloth which has passed the measuring roller, it being understood that the measuring roller 10 is of a predetermined diameter, and the number wheels 26 will indicate the amount of peripheral movement of the measuring roller which has been caused by the passing of the cloth.

After a measurement has been made, a movement of the lever 44 toward the left, (see Figs. 2 and 4), operates through the rock-shaft 41 and link 48 to open the clutch by separating the gear wheels 29 and 31; and through the swinging movement of the arms 40, the carrying mechanism including the pinions 36 are disconnected from the number-wheels 26 so as to permit them to rotate independently; a further movement of the lever 44 toward the left brings the rollers 43 of the arms 42 against the cams 39 carried by the number-wheels, thereby returning them to zero.

The swivel joint at 16 permits the measuring machine 8 to swivel bodily on an axis substantially at right angles to the axes of the measuring roller 10 and the guide roller 6. This enables the measuring roller 10 to adapt itself to the alinement of the axis of the roller 6, and insures that the measuring roller will press itself uniformly against the cloth on the roller 6. This action is also facilitated by the presence of the pivot bolts 15 operating as gudgeons, which permit the rotation of the measuring machine bodily on their axes as another axis of rotation.

The position of the measuring machine with respect to the guide roller 6 may be nicely adjusted by means of the arm 18 and the set-screw 24. The bracket 20 may be applied so that the arm 18 is held above the bar 19 if it should happen that the bar 19 is relatively low down, with respect to the table 2, (see Fig. 3), but in Fig. 1 I have illustrated the bracket 20 as applied in an opposite position, with the arm located below the bar 19. While I have shown the arm 18 in a horizontal position in Figs. 1 and 3, it should be understood that, if desired, it could be held in an inclined position. This depends entirely on what position the cap 22 of the socket 21 is secured in.

It is understood that the embodiment of the invention described herein is only one of the many embodiments my invention may take, and I do not wish to be limited in the practice of my invention nor in my claims, to the particular embodiment set forth.

What I claim and desire to secure by Letters Patent is:

1. In a cloth winding machine, the combination of a frame, a roller supported by said frame, means for drawing the cloth past the said roller, a measuring machine having indicating mechanism and having a measuring roller lying adjacent to the face of the first named roller and transmitting a part of the weight of the machine to said first named roller, said driving roller operating to actuate the indicating mechanism when the cloth is pulled between the said rollers,

a head having two forks supported on said frame, a knuckle pivotally supported between said forks, and a swivel connection between said knuckle and said machine.

2. In a cloth winding machine, the combination of a frame, a roller supported by said frame, means for drawing the cloth past the said roller, a measuring machine having indicating mechanism and having a measuring roller lying above and adjacent to the face of the first named roller and transmitting a part of the weight of the machine to said first named roller, means for supporting said measuring machine on said frame at another point, a clutch for driving said indicating mechanism from said measuring roller and a hand actuated member for opening said clutch and for returning said indicating mechanism to the zero position, and mounted to be operated by a movement exerting a downward pressure on the measuring machine.

3. In a cloth winding machine, the combination of a frame, a roller supported by said frame, means for drawing the cloth past the said roller, a measuring machine having indicating mechanism and having a measuring roller lying adjacent to the face of the first named roller and transmitting a part of the weight of the machine to said first named roller, means for supporting said measuring machine on said frame at another point, a pinion rigid with said measuring roller, a rock plate mounted to rock on the axis of the measuring roller, a gear wheel carried by said rock plate and meshing with said pinion, a gear wheel for driving the indicating mechanism from said last named gear wheel, a lever carried by said measuring machine, means actuated by said lever for actuating said rock plate to separate said gear wheels and thereby disconnect the measuring roller from the indicating mechanism and means also actuated by said lever for returning the indicating mechanism to the zero position.

4. In a cloth winding machine, the combination of a frame, a roller supported by said frame, means for drawing the cloth past the said roller, a measuring machine having indicating mechanism and having a measuring roller lying adjacent to the face of the first named roller and transmitting a part of the weight of the machine to said first named roller, means for supporting said measuring machine on said frame at another point, a pinion rigid with said measuring roller, a rock plate mounted to rock on the axis of the measuring roller, a gear wheel carried by said rock plate and meshing with said pinion, a gear wheel for driving the indicating mechanism from said last named gear wheel, a hand operated lever carried by the measuring machine and mounted so that the application of the operating force is in the direction to press the measuring machine downwardly upon the first named roller, means actuated by said lever for actuating said rock plate to separate said gear wheels and thereby disconnect the measuring roller from the indicating mechanism and means also actuated by said lever for returning the indicating mechanism to the zero position.

In testimony whereof, I have hereunto set my hand.

DOUGLAS TURNER.