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Chick

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[54] **FABRIC MEASURING DEVICE**

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[52] **U.S. Cl.** ..... **33/134 R,** 226/90, 226/187

[51] **Int. Cl.** **G01b 3/12,** G01b 5/04

[58] **Field of Search** ..... 33/129, 132, 133, 134 R, 33/141 R, 141 B; 226/90, 187

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Assistant Examiner—Charles E. Phillips

[57] **ABSTRACT**

A fabric measuring device adapted for use on a fabric supporting table; said device having a frame on which a first fabric engaging roller is rotatably mounted; said first fabric engaging roller coupled to a counting device for driving said counting device; a second fabric engaging roller rotatably mounted on a roller mounting means said rollers having rotary axis substantially parallel to each other; holding means tending to hold said roller mounting means in first and second positions wherein said rollers are drivably engaged at opposite sides of fabric or held in space to park position and drivably disengaged from said fabric; the roller mounting means having a first bearing axis portion pivotally mounted on said frame and a second bearing axis portion laterally offset from the first bearing axis portion; said second fabric engaging roller rotatably mounted about said second bearing axis portion.

11 Claims, 9 Drawing Figures

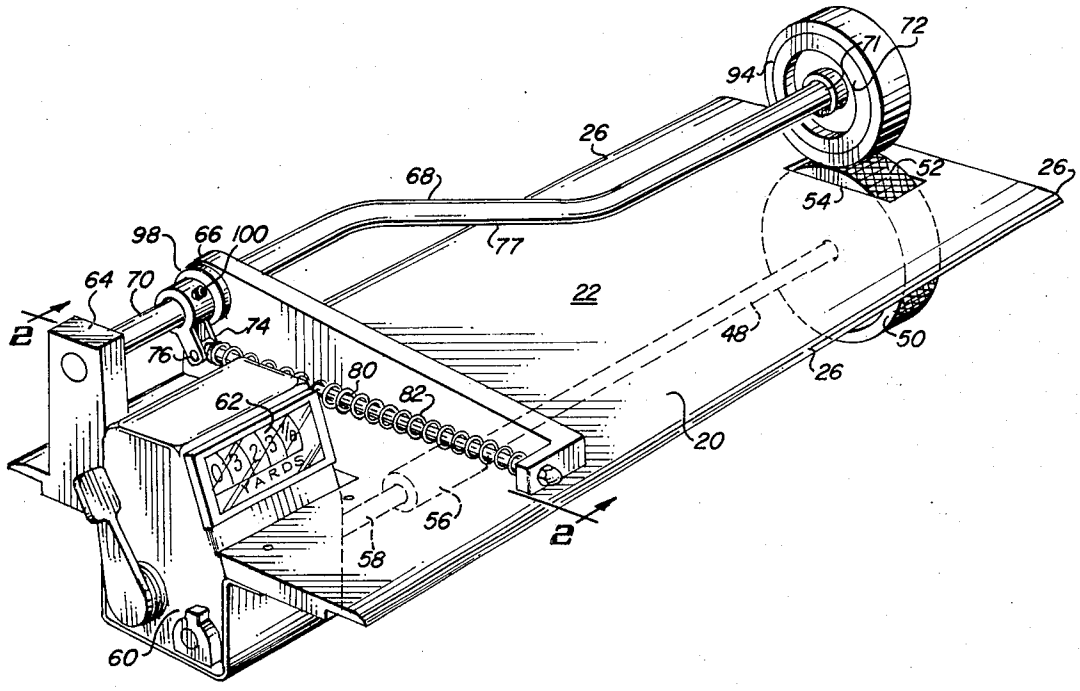
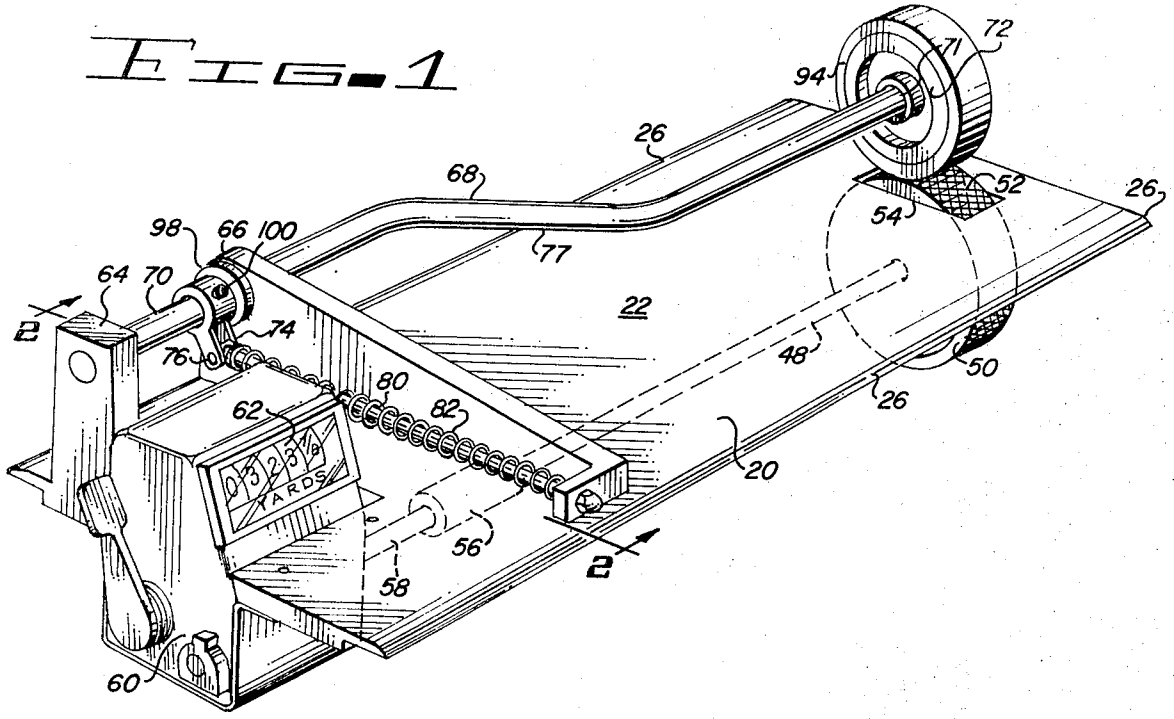


Fig-1


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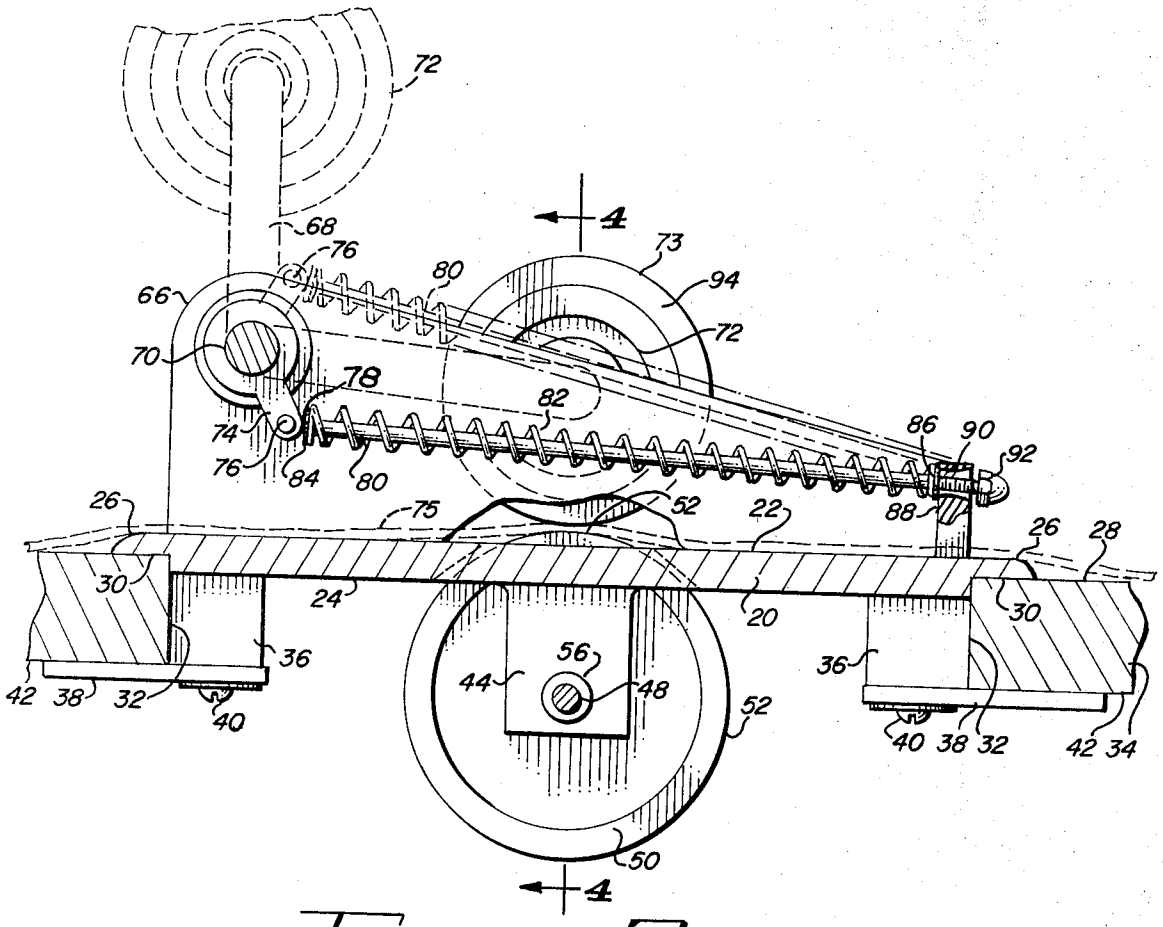

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Fig-2

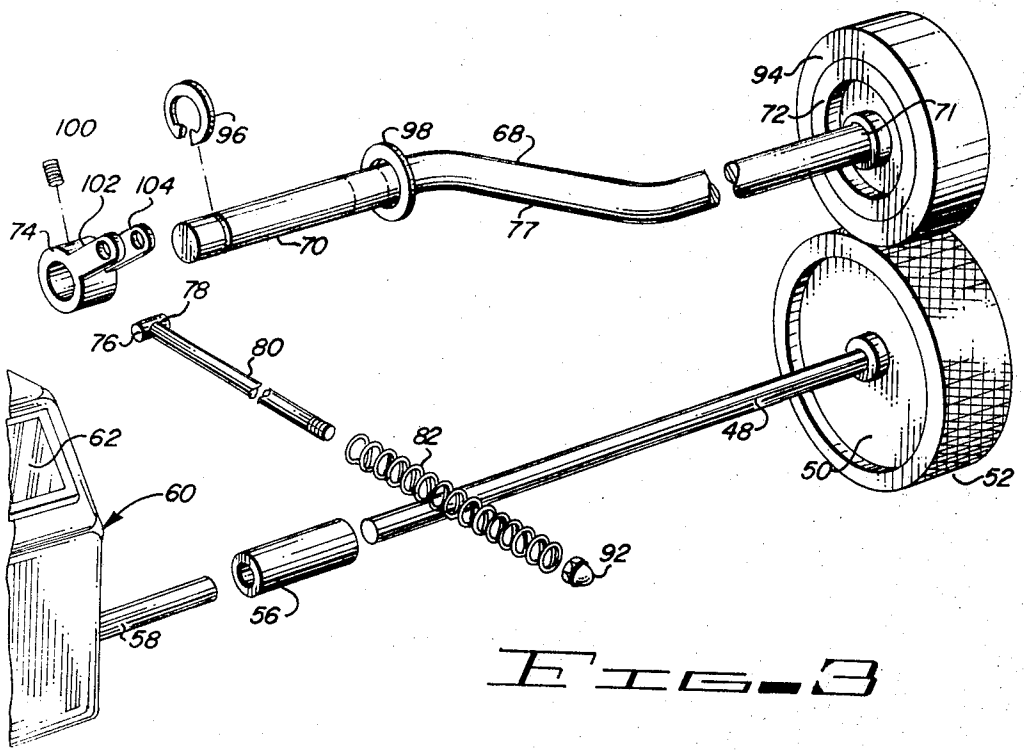

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Fig-3

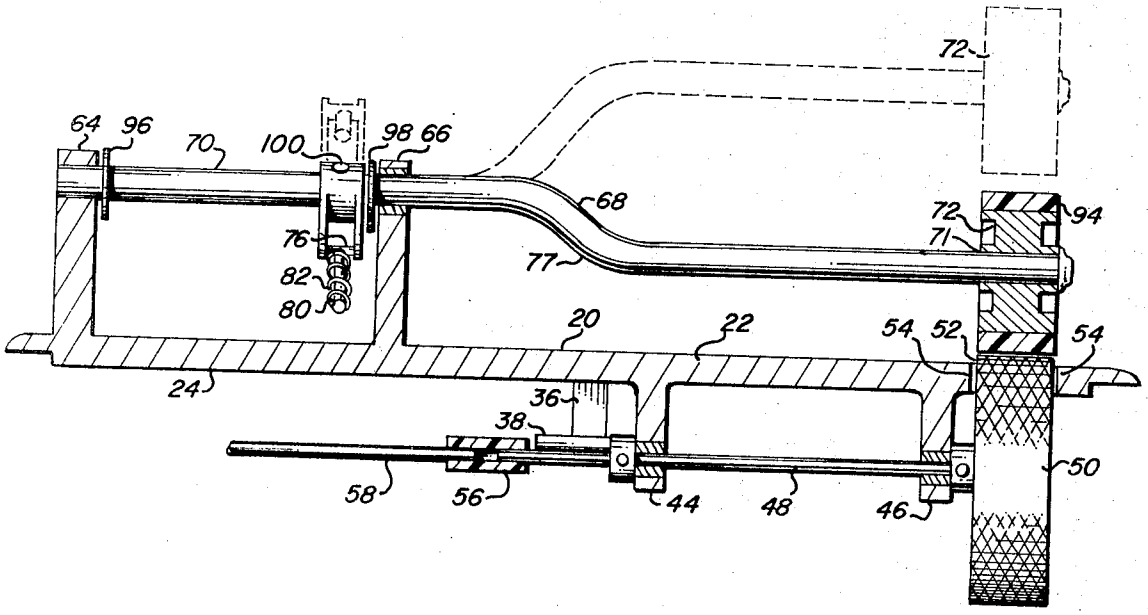

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Fig-4

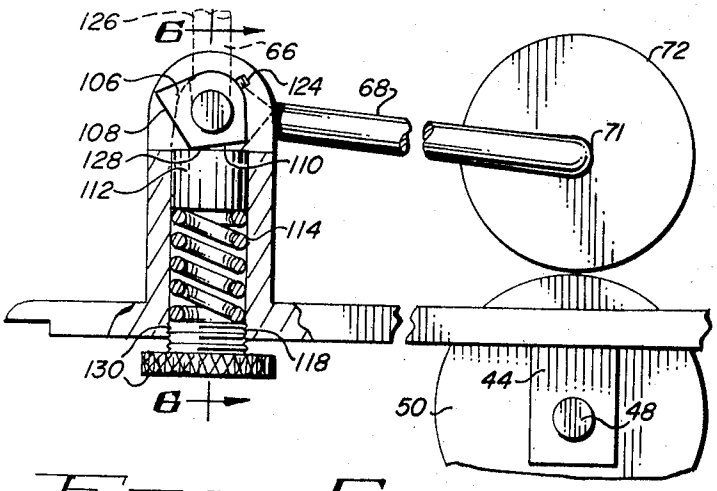


Fig-5

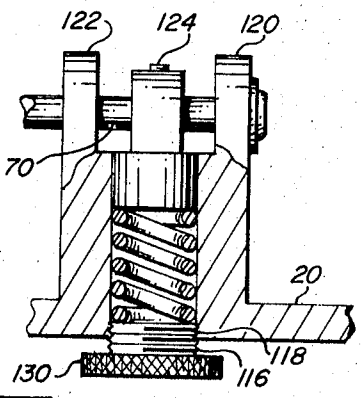


Fig-6

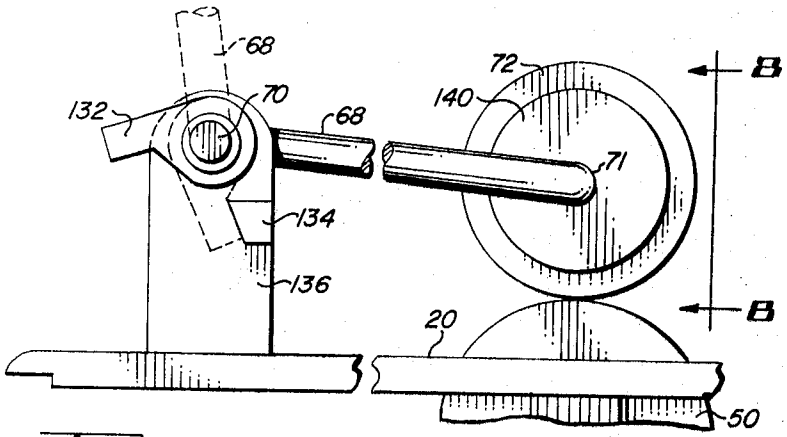


Fig-7

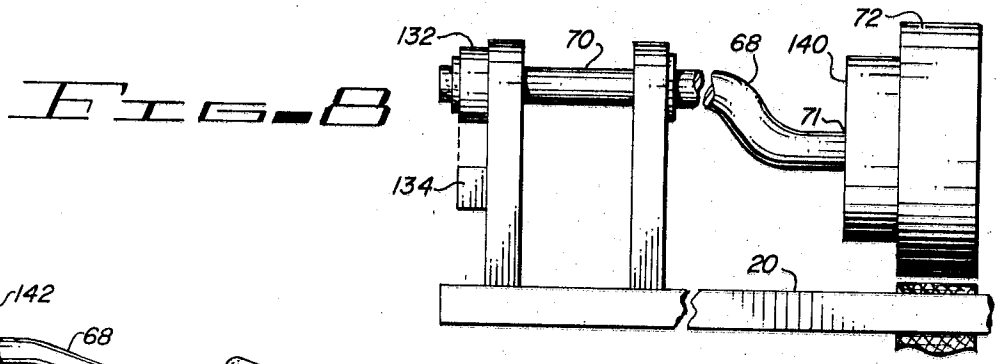


Fig-8

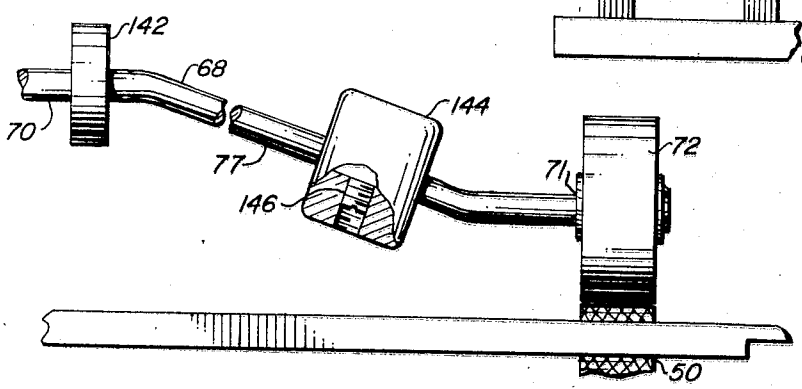


Fig-9

FABRIC MEASURING DEVICE

BACKGROUND OF THE INVENTION

Various fabric measuring devices have been used on fabric supporting tables especially in emporiums where fabric is sold by the yard and dispensed from large rolls of fabrics. The tables usually have a means for holding a roll of fabric such that the fabric may be pulled from the roll as it rotates and the fabric is pulled across a table between fabric engaging rollers which are loaded toward each other such that one fabric engaging roller forces the material to frictionally engage the other fabric engaging roller and said other fabric engaging roller operates a counter which regards the amount of fabric material which is pulled across the table between the rollers. And accordingly this means of measuring greatly facilitates and speeds up the removal of the fabric from the roll and in measurement thereof which is especially important in emporiums where the sale of fabrics and similar materials is specialized in.

Prior art fabric measuring devices have been very expensive and quite complicated. Some of them have utilized parallelagram linkages for holding the respective fabric engaging rollers axially parallel and allowing one of the roller to move relative to the other one so that the fabric may be placed between the rollers and so that the rollers may be loaded toward each other in order to attain frictional engagement of the fabric on the rollers to operate a counting device in accordance with the movement of the fabric between the rollers.

The expensive and complicated fabric measuring devices of the prior art have been initially costly and subsequently relatively complicated to operate and maintain.

SUMMARY OF THE INVENTION

The present invention comprises a fabric measuring device of very simple mechanical arrangement which is very reliable and economical to produce and maintain.

The fabric measuring device of the present invention is provided with a frame adapted to be supported on a fabric holding table and the frame carries a roller mounting means having laterally offset axes one of which is pivotably mounted on the frame of the other which rotatably supports a fabric engaging roller which cooperates with another fabric engaging roller held by the frame with its periphery near the upper surface of the fabric supporting table and the mentioned roller rotatably operates a counting device. The simple roller mounting means of the invention carries a fabric engaging roller and this mounting means is disposed to move in a direction to move said fabric engaging roller toward a counter driving fabric engaging roller by way of separesilient means, cam operated means or gravity operated means, and the roller mounting means in the invention may be moved manually from an engaging position to a disengaged position by simply moving the roller mounting means upwardly away from the counter driving fabric engaging roller, and when the roller mounting means is moved upwardly it is passed to a position in which it is held automatically in elevated position until it is again needed whereupon it may be moved downwardly into engagement with fabric overlying the fabric engaging roller which drives the counter of the invention. The invention comprising the simple fabric engaging roller mounting means having offset axes for mounting the mounting means and the fabric enging roller provides a mechanism which may be economically reproduced and maintained and a mechanism which is very reliable and simple to operate, and one which is capable of affording great convenience to the operator since the movable fabric engaging roller moves upward out of the way of fabric being placed over the periphery of the counter driving fabric engaging roller.

Accordingly, it is an object of the present invention to provide a very simple, economical and reliable fabric measuring device for use on fabric supporting tables, especially in emporiums where fabric is sold by the yard.

Another object of the invention is to provide a novel fabric measuring device having a novel roller mounting means provided with offset axes, one of which provides for pivotal mounting of the roller mounting means on the frame of the invention and the other of which provides for a rotary axis for a fabric engaging roller which is movable toward and away from another fabric engaging roller operating a rotatable counter which measures the yardage of the fabric which is pulled between the two rollers when in engaged position.

Another object of the invention is to provide very simple holding means for holding one fabric engaging roller of the invention in engagement with the counter operating fabric engaging roller.

Another object of the invention is to provide a simple holding means for holding the movable fabric engaging roller of the invention in an engaged position or a disengaged position either by way of a simple over center spring or a simple spring loaded cam mechanism or a simple gravity operated weight means which may provide for adjustable tension of the fabric engaging roller which is movably engagable with the counter driving fabric engaging roller.

Another object of the invention is to provide various means for adjusting the holding force of the movable fabric engaging roller relative to the counter driving fabric engaging roller of the invention.

Further objects and advantages of the invention may be apparent from the following specification, appended claims and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the fabric measuring device of the invention;

FIG. **2** is an enlarged section view taken from the line **2—2** of FIG. **1**;

FIG. **3** is a fragmentary exploded view of the mechanism of the invention;

FIG. **4** is a section view taken from the line **4—4** of FIG. **2**;

FIG. **5** is a view similar to FIG. **2** showing a modification of the invention;

FIG. **6** is a sectional view taken from the line **6—6** of FIG. **5**;

FIG. **7** is another view similar to FIGS. **2** and **5** but showing a further modification of the invention;

FIG. **8** is a fragmentary sectional view taken from the line **8—8** of FIG. **7**; and

FIG. **9** is a top or plan view of the roller mounting means of the invention showing a modification thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

As shown in FIG. 1 of the drawings, the fabric measuring appartus of the invention is provided with a frame plate **20** having an upper surface **22** and a lower surface **24** and having beveled edges **26** which are beveled from the upper surface **22** to the upper surface **24** so as to provide for smooth passage of fabric from the upper surface of a table top **28** as shown in FIG. **2** of the drawings over the frame plate **20.**

The frame plate **20** at its beveled edges **26** is provided with stepped portions **30** adapted to overly the upper surface **28** of a table top as shown in FIG. **2** of the drawings, and the stepped portions **30** are adapted to be fitted into an opening **32** of a table top **34** as shown in FIG. **2** of the drawings. The frame plate **20** at its lower surface **24** is provided with projecting bosses **36** to which clamp plates **38** are secured by means of screws **40** which are screw threaded in the bosses **36.** The clamp plates **38** being adapted to engage the lower surface **42** of the table top **34** for holding the frame plate **20** securely against the upper surface **24** of the table top **34** and for holding the stepped portions **30** of the frame plate **20** in juxtaposition in the opening **32** of the table top **34.**

The frame plate **20** at its lower surface **24** is provided with projecting bearing portions **44** and **46** in which a counter drive shaft **48** is journaled. Mounted on the shaft **48** is a first fabric engaging roller **50** adding its peripheral portion **52** projecting through a slided portion **54** in the frame plate **22** and such that the periphery **52** projects above the upper surface **22** of the frame plate **20** all shown best in FIGS. **2** and **4** of the drawings.

The drive shaft **48** is provided with a coupling **56** which connects a second portion **58** of the drive shaft **48** with a counting device **60** which is a conventional counting device having a digital display **62** adapted to indicate measurements in yards. This display portion **62** of the counter **60** is viewable from the upper side of the frame plate **20.**

The frame plate **20** is provided with a pair of upwardly extending bearing mount portions **64** and **66** as shown best in FIGS. **1, 2** and **4** of the drawings. Pivotably mounted in these bearing portions **64** and **66** is a roller mounting means **68** having a bearing axis portion **70** pivotably mounted in the bearing portion **64** and **66** of the frame plate **20.** This roller mounting means **68** is also provided with a bearing axis portion **71** on which a second fabric engaging roller **72** is rotatably mounted.

The bearing axis portion **70** of the roller mounting means **68** is generally parallel with the axis of the shaft **48** and the bearing axis portion **71** of the roller mounting means **68** is so disposed that it holds the periphery of the fabric engaging roller **72** against the periphery **52** of the fabric engaging roller **50** when in the position shown in FIG. **1** of the drawings. The roller mounting means **68** is provided with an offset portion **77** between the bearing axis portion **70** and the bearing axis portion **71** and this offset portion **74** is relatively closer to the bearing axis portion **70** than it is to the bearing axis portion **71** so that when the roller mounting means **68** and the fabric engaging roller **72** are in the broken line position shown in FIG. **2** of the drawings, the roller mounting means **68** as well as the roller **72** are well above the upper surface **22** of the frame plate **20** so as to provide operating clearance for the placement of fabric over the periphery **52** of the roller **50** so that it may be engaged by the periphery of the roller **72** as will be hereafter described in detail.

Mounted on the bearing axis portion **70** of the roller mounting means is a clevis **74** having a clevis pin **76** pivotally mounting one end **78** of a spring guide shaft **80** which is surrounded by a compression spring **82** such that one end **84** thereof is abutted to the clevis **74** and the opposite end **86** of the spring **80** is abutted to an upstanding rod guide **88** which is integral with the upper surface **22** of the frame plate **20.** This rod guide **88** has an opening therethrough, this opening being designated **90** and the spring guide rod is slidably extendable and retractable therethrough and secured to the guide rod **80** is a nut **92** which is maintained in slight spaced relation with the guide **88** so as to permit the compression spring to exert force of the clevis **74** and to force the roller mounting means into the position as shown in FIG. **2** by solid lines such that the periphery **73** of the roller **72** is compressably engagable with fabric **75** engaged over the periphery **52** of the roller **50** as shown best in FIG. **2** of the drawings.

In this position the fabric **75** may be pulled across the table top **28** generally in the direction of arrow A in FIG. **2** of the drawings which frictionally causes the roller **50** to be rotated by rotating the shaft **48** together with the shaft **58** and operating the counter **60** to provide a digital indication on the display **62** as to the number of yards that has been pulled between the fabric engaging rollers **50** and **72.** It will be understood that compression of the spring **82** provides sufficient hold down force for the fabric engaging roller **72** so that it firmly holds the fabric **75** in frictional engagement with the periphery **52** of the roller **50.** This roller **50** at its peripheral surface **52** may be serrated or may have a high coefficient of friction material on the surface thereof, and the roller **72** may be provided with a resilient tire **94** as shown best in FIG. **3** of the drawings. The roller mounting means **68** is provided with a pair of snap rings **96** and **98** as shown in FIG. **3** of the drawings, and these snap rings are disposed adjacent the bearing portions **64** and **66** of the frame **20** for limiting end play of the bearing axis portion **70** of the roller mounting means **68.**

As shown in FIG. **3** the clevis **74** is provided with a set screw **100,** screw threaded therein and engagable with the bearing axis portion **70** of the roller mounting means **68** to secure the clevis **74** thereon. Also shown in FIG. **3** the clevis **74** is bifurcated and provided with a pair of arms **102** and **104** between which the clevis pin **76** of the spring guard shaft **80** is pivotably mounted. It being noted that the clevis **74** is provided with openings and opposite ends of the clevis pin are pivoted in the openings, the arms **102** and **104** being deflectable and compressable over the end **76** during assembly.

In operation the spring **82** acts over center of the bearing axis portion **70** tending to hold the fabric engaging roller **72** downward in engagement with the periphery of the fabric engaging roller **50** and when the fabric engaging roller **72** together with the roller mounting means **68** moves upwardly to the broken line positions shown in FIGS. **2** and **4** of the drawings, the spring **82** acts over center relative to the bearing axis portion **70** to hold the roller **72** and roller mounting means **68** in the broken line position spaced above the

upper surface of the frame plate **20** and the upper surface **28** of the table **34.** It being noted that the clevis **74** as shown best in FIG. **2** of the drawings pivots to over center positions at opposite sides of the bearing axis portion **70** for alternately holding the fabric engaging roller **72** either engaged or disengaged relative to the fabric engaging roller **50.**

In the modification as shown in FIGS. **5** and **6** of the drawings, the roller mounting means **68** is similar to that shown in FIGS. **1–4** of the drawings and secured to the bearing axis portion **70** is a cam **106** having a pair of flat portions **108** and **110** engaged by a plunger **112** having a compression spring **114** tending to force the plunger **112** against the cam surface **110** or **108,** depending upon the disposition of the roller mounting means **68.**

The spring **114** is adjustably compressed by a screw threaded plug **116** screw threaded in a ball **118** of the frame plate **20** between bearing portions **120** and **122** similar to the herein before described bearing portions **64** and **66** shown in FIG. **1** of the drawings. A set screw **124** holds the cam **106** securely fixed on the bearing axis portion **70** of the roller mounting means **68.**

When the roller mounting means **68** is forced upward to a broken line position **126** the flat portion **108** of the cam **106** is engaged by the plunger **112** and thus the roller mounting means is held upward in the broken line position **126.** Conversely, when the flat portion **110** of the cam **106** is engaged with the plunger **112,** a corner portion **128** of the cam is engaged by the plunger **112** and thus tends to act over center above the shaft **78** transmitting the force of the spring **114** to hold the fabric engaging roller **72** downward against the fabric engaging roller **50.** The spring **114** and plunger **112** are movably mounted in the ball **118** and the screw threaded plug **116** is provided with a serrated peripheral portion **130** manually engagable to screw threadably adjust the plug **116** in the screw threaded ball **118** and to thereby adjust the compression of the spring **114** to adjust the tension of the fabric engaging roller **72** relative to the fabric engaging roller **50.** In the modification as shown in FIG. **7** of the drawings, the roller mounting means **68** is similar to that shown in FIGS. **1–4** of the drawings, and secured to its bearing axis portion **70** is a stop member **132** adapted to engage a stop portion **134** on a bearing portion **136** which is similar to the bearing portion **66** hereinbefore described. This stop portion **134** limits the movement of the roller mounting means to a broken line position shown best in FIG. **7** of the drawings and secured to the fabric engaging roller **72** is a disc weight **140** which gravitationally acts to hold the fabric engaging roller **72** downward against the fabric engaging roller **50** or to hold the fabric engaging roller as well as the roller mounting means **68** in the broken line position **138.** It being noted that the weight acts over center of the bearing axis portion **70.**

In the modification as shown in FIG. **9** of the drawings, the bearing axis portion **70** of the roller mounting means **68** is mounted in a bearing **142** similar to the bearings **66** and **64** herein before described and a weight **144** is adjustably mounted on the offset portion **77** of the roller mounting means, this weight **144** being fixed thereon in various positions by means of a set screw **146** and thus the weight **144** acts in a similar manner to the weight **140** tending to hold the fabric engaging roller **72** downward against the fabric engaging roller **50** in a manner similar to that herein before described.

Secured to the bearing axis portion **70** of the roller mounting means **68** as shown in FIG. **9** is a stop member **132** not shown, but similar to that shown in FIG. **7** and FIG. **8** of the drawings.

The spring **82** as shown in FIG. **2** as well as the plunger **112** and spring **114** and cam **108** shown in FIG. **5** and the weight means **140** and **144** shown in FIGS. **7** and **9** respectively, constitute holding means acting over center relative to the bearing axis portion **70** and are all equivalent devices for alternately holding the fabric engaging roller **72** either engaged with the fabric engaging roller **50** or in an upward broken line position such as the position shown in FIG. **2** by broken lines or the positions shown by **126** and **138** in broken lines in FIGS. **5** and **7** of the drawings.

The same position also applies to the structure shown in FIG. **9** of the drawings since it employs the stop means **132** and **134** shown in FIG. **7** of the drawings.

Accordingly, the invention is generic to these modifications when a roller mounting means such as the roller mounting means **68** is employed, and pivoted at its bearing axis means **70** on the frame and having its bearing axis means **71** parallel thereto and laterally offset therefrom so as to carry the fabric engaging roller **72** into and out of engagement with the periphery of the roller **50** and so as to hold it axially parallel therewith for frictionally engaging fabric between the rollers so that roller **50** will be properly and accurately rotatably driven to operate the counter **60** and indicate at its display **62** the exact yardage of material which is passed between the fabric engaging rollers **50** and **72.**

It will be obvious to those skilled in the art that various modifications may be resoted to without departing from the spirit of the invention.

I claim:

1. In a fabric measuring apparatus; a frame adapted to be secured to a table top; a counting device carried by said frame; a first fabric engaging roller having an axis of rotation and rotatably mounted in connection with said frame; said first fabric engaging roller coupled to said counting device for rotatably driving said counting device; a roller mounting means pivotally mounted on said frame and having a first bearing axis portion; said roller mounting means having a second bearing axis portion laterally offset and parallel with said first bearing axis portion; a second fabric engaging roller rotatably mounted on said second bearing axis portion; said first bearing axis portion being disposed to pivot said roller mounting means and said second bearing axis portion thereof toward said first fabric engaging roller whereby said second fabric engaging roller may be brought into a first position in which it is in contact with said first fabric engaging roller and in which position said second bearing axis portion of said roller mounting means is generally parallel with said axis of rotation of said first fabric engaging roller; and holding means coupled to said roller mounting means and acting over center relative to said first bearing axis portion alternately tending to hold said second fabric engaging roller in said first position in engagement with said first fabric engaging roller and alternately tending to hold said second fabric engaging roller in a second position spaced from said first fabric engaging roller; the respective position depending on manual pivotal movement

of said roller mounting means from one of said positions to the other about the axis of said first bearing axis portion.

2. The invention as defined in claim **1,** wherein: said frame is provided with a normally horizontal plate portion adapted to rest upon the upper surface of a fabric supporting table and adapted to overly an opening in said table; said plate portion having an upper surface.

3. The invention as defined in claim **2,** wherein: said first fabric engaging roller having a drive shaft coupled thereto; said drive shaft rotatably mounted on said frame below said plate; said first fabric engaging roller having a peripheral portion extending above said upper surface of said plate portion, said plate portion is provided with a slot through which said peripheral portion of said first fabric engaging roller extends.

4. The invention as defined in claim **3,** wherein: said drive shaft is coupled to said counting device for driving the same.

5. The invention as defined in claim **4,** wherein: said counting device is provided with a digital display means visible from above said upper surface of said plate portion.

6. The invention as defined in claim **2,** wherein: said plate portion is provided with an end portion adapted to be mounted near an edge of a fabric supporting table; said frame having bearing means disposed near said end portion thereof; said first bearing axis portion of said roller mounting pivoted in said bearing means; said roller mounting means having an offset portion disposed between said first and second bearing axis portions.

7. The invention as defined in claim **6,** wherein: said offset portion being disposed so as to provide manual operating clearance for placing fabric in a position to be engaged between said first and second fabric engaging rollers.

8. The invention as defined in claim **1,** wherein: said holding means having a resilient member acting over center about said first bearing axis portion.

9. The invention as defined in claim **1,** wherein: said holding means is provided with a spring loaded cam and plunger means operably coupled to said roller mounting means.

10. The invention as defined in claim **1,** wherein: said holding means comprising a gravity responsive means on said roller mounting means for holding it in said first position; and stop means on said frame for holding said roller mounting means in said second position.

11. The invention as defined in claim **1,** wherein: said roller mounting means having an arm portion between said first and second bearing axis means; said holding means comprising a weight means adjustably mounted on said arm portion to adjust the position of said weight means for varying the loading of said second fabric engaging roller toward said first fabric engaging roller.

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