United States Patent [19]

Franks et al.

[11] **3,835,797**

[45] **Sept. 17, 1974**

[54] **PATTERN CONTROL FOR TUFTING MACHINES**

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[22] Filed: **Nov. 11, 1971**

[21] Appl. No.: **197,714**

[52] **U.S. Cl.** ..... **112/79 A,** 74/571

[51] **Int. Cl.** **D05c 15/32**

[58] **Field of Search**..... 112/79 R, 79 A, 266, 254, 112/255; 74/571, 568, 117, 390, 393

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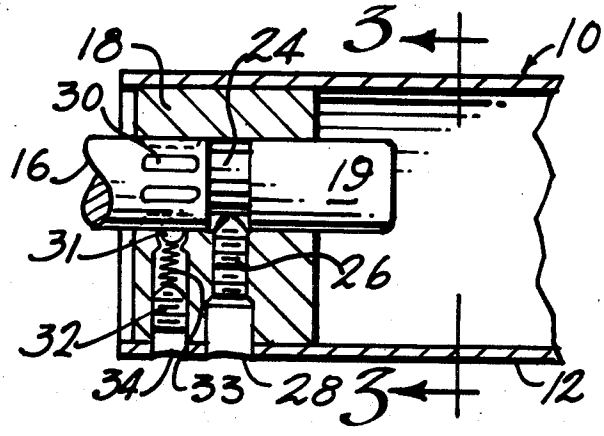
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[57] **ABSTRACT**

A yarn control roller arrangement for varying the amount of yarn supplied to the tufting needles at different times to vary the pattern tufted. A large metal roller is eccentrically supported on opposite ends on respective short end shafts which are concentrically mounted in journal bearings on the frame of the tufting machine and eccentrically attached to the end of the roller by insertion in a metal plug held by set screws in the hollow steel roller. The end of the short shaft in the roller has a series of peripheral grooves each representing a position. The individual yarns are led side-by-side along the length of the roller on opposite sides thereof and the eccentric rotation of the roller on each revolution bends the yarns outwardly from the axis of the shaft thereby delivering more or less yarn depending upon the position.

3 Claims, 8 Drawing Figures



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SHEET 1 OF 2

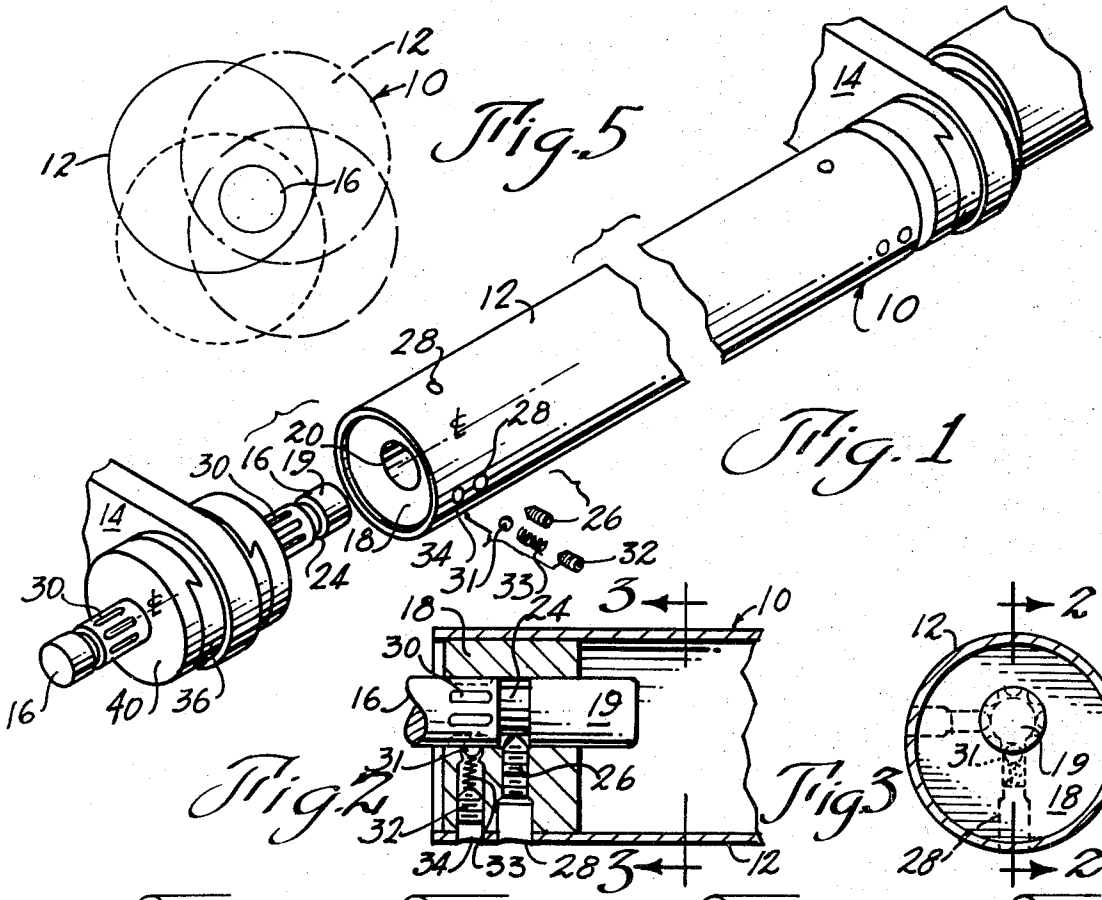


Fig. 5

Fig. 1

Fig. 2

Fig. 3

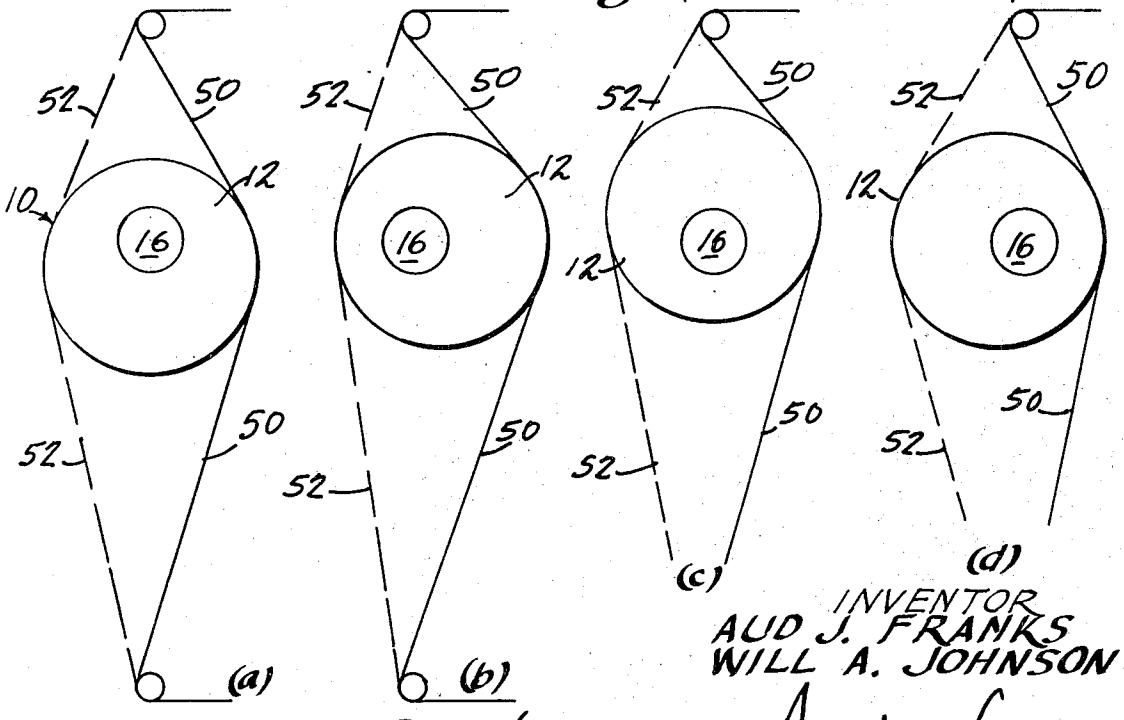


Fig. 4

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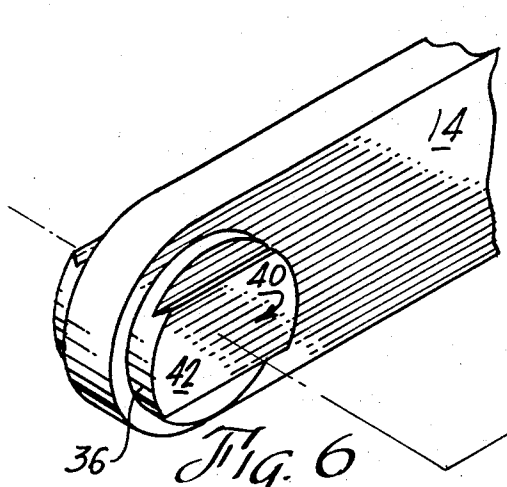
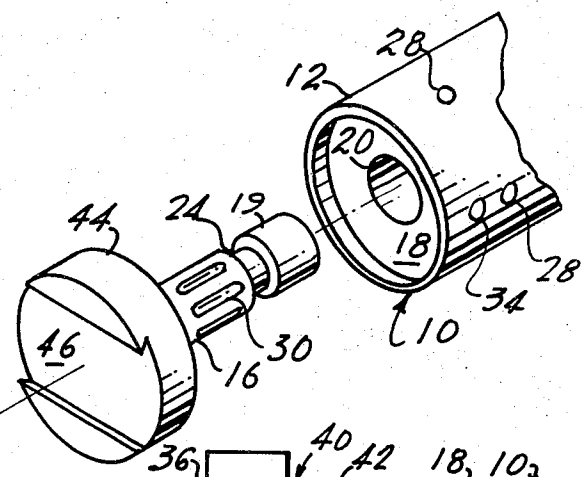


Fig. 6



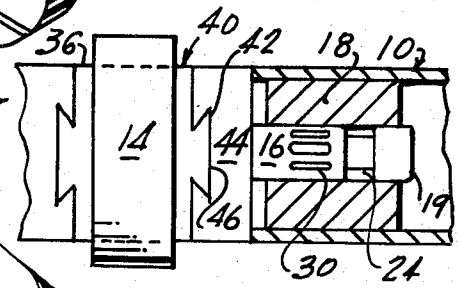


Fig. 7

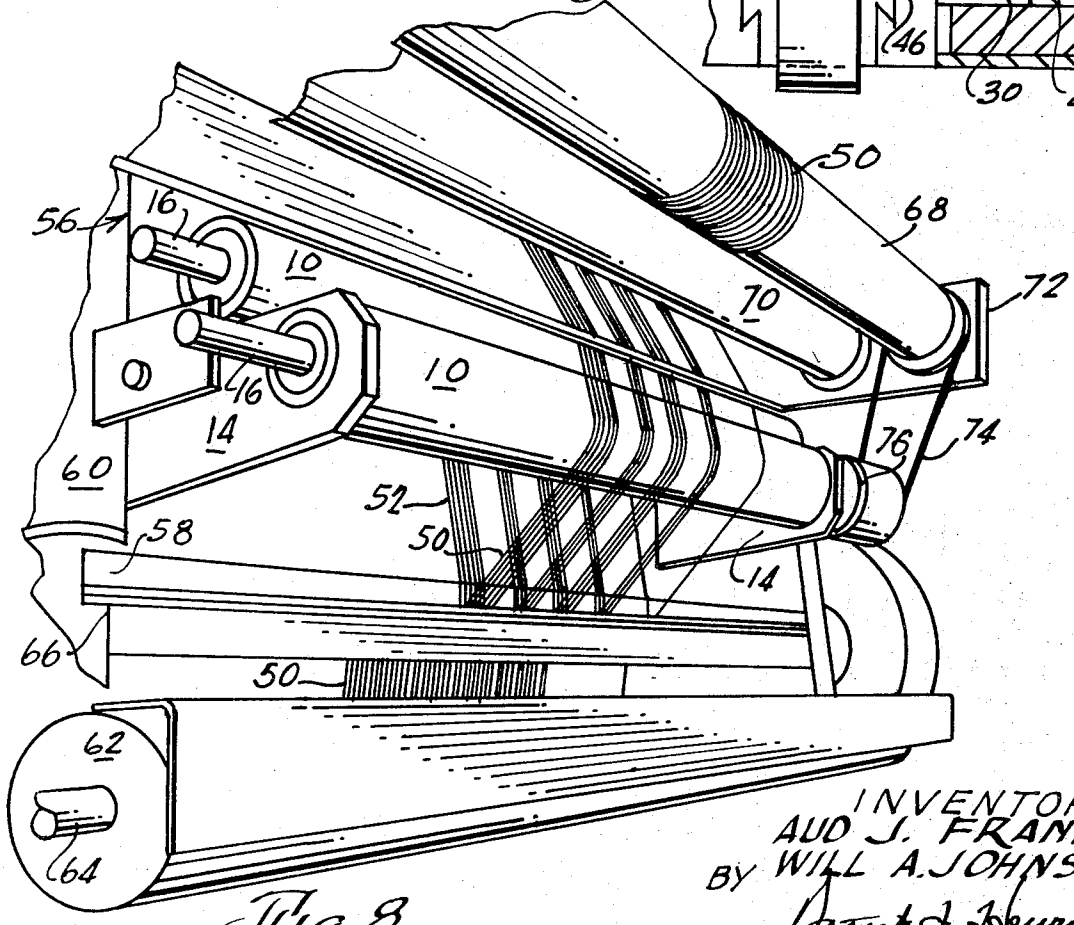


Fig. 8

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PATTERN CONTROL FOR TUFTING MACHINES

BACKGROUND OF THE INVENTION

1. Field of the Invention

Textile machinery and particularly carpet tufting machines and pattern control devices therefor. Pattern control devices which bend the yarn out from normal straight line travel to create a curved path.

2. Description of the Prior Art

Pattern control devices for a plurality of continuous yarn delivered to tufted textile machines for making carpet are well known and generally comprise the slat-type which employs a plurality of notches in a long slack through which the respective yarns travel and the depth of the notch determines the amount of yarn delivered or the gear type which works on the principle of pushing the yarns down into cavities in the gear to govern the amount of yarn which is delivered when released. There is also yarn jerkers which operate to jerk a certain amount of yarn and release it to the tufting needles. All of these pattern control devices are satisfactory for what each is able to do but two major factors in each of them is the cost of the pattern control devices initially and the cost of changing from one pattern to another. It is very costly to change the slat pattern type and also time consuming and costly to change the other types. Some of the prior devices are found in the Crawford U.S. Pat. Nos. 2,853,033; 2,853,034; Short U.S. Pat. No. 3,089,442; Nix U.S. Pat. No. 2,875,714 and the Odenweller U.S. Pat. No. 2,853,032. The present arrangement has advantages over all of these from the standpoint of initial manufacturing costs, installation costs and the number of pattern variations which may be obtained by simple adjustment.

SUMMARY OF THE INVENTION

A plurality of yarns delivered to respective tufted textile needles are controlled by means of an eccentric roller operated against the yarns to vary the path thereof from a straight line to create a curvature which when released results in slack varying the amount of yarn fed. The problem of adjustment has been reduced in the present device by means of a simple repositioning of the roller on the shaft which supports the roller and easy set screw operation to accomplish this. There is no significant disadvantage of wear because there are no readily wearable moving parts and the initial construction and installation cost is relatively moderate.

An advantage of this invention resides in the quick and easy manner of changing the pattern control roller from one position to another to vary the pattern. A principle object of this invention is to provide a pattern control arrangement which can be quickly and easily changed from one position to another to vary the pattern. A beneficial arrangement is found in the construction whereby no machine shop operation is necessary to change from one pattern within the number of settings provided by the particular roller.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a pattern control roller made in accordance with the present invention.

FIG. **2** is a cross-sectional view taken substantially along lines **2—2** in FIG. **3.**

FIG. **3** is a cross-sectional view taken substantially along lines **3—3** in FIG. **2.**

FIGS. **4**(*a*) (*b*), (*c*) and (*d*) is a diagram of a series of movements of the roller set in one position as it moves against the yarn.

FIG. **5** is a diagrammatic view of the different adjustments for eccentric operation of the roller.

FIG. **6** is a perspective view of portions of the device illustrating an assembly.

FIG. **7** is an elevation view of the journal for the roller with a portion of the end of the roller broken away.

FIG. **8** is a perspective view of a portion of a tufted textile machine frame with a pair of the present roller arrangements installed with yarn thereon.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The roller arrangement is shown generally and identified by reference numeral **10** in FIG. **1** and comprises an elongated hollow steel roller **12** supported on bearing support members **14** at spaced locations on a tufted textile machine frame to receive yarns thereagainst. Roller **12** is supported on respective short shafts **16** at each of the respective ends by means of steel plugs **18** fixed in the ends of the hollow portion of the roller **12** and each having a shaft hole **20** therein. Shaft **16** has an elongated smooth portion **19** which is inserted in the plug **18** through the hole **20** and a reduced groove portion **24** which receives two set screws **26** threadedly engaging a threaded bore **28** near the end of the roller **12.** Shafts **16** also include a series of elongated grooves or notches **30** spaced around the circumference of the shaft **16** and receiving therein a ball bearing **31** seated by a set screw **32** which is threaded into a tapped hole **34** near the end of roller **12,** against a coil spring **33.** Shaft **16** can be turned after set screws **26** are backed-off. Grooves **30** are numbered outside tube **12** for selective reference. Hole **20** is eccentrically located with respect to the center line of the roller **12** and the end of shaft **16** at the journal support member **14** is concentrically mounted in a bearing **36** on the frame member **14.** Shaft **16** is attached to the bearing **36** by means of a dovetail locking groove arrangement comprising the plate **40** attached as part of the bearing having a protruding dovetail portion **42** thereon and a plate **44** attached to the end of shaft **16** and having a dovetail groove **46** therein which receives the dovetail protrusion **42** in the manner shown in FIG. **7** thereby connecting the end of shaft **16** to the bearing **36** on the frame member **14.** Other rollers **12** may be added to and on other side of frame members **14** in the manner shown in FIG. **7** it being preferable not to use rollers that are too long due to the manufacturing expense and the deflection from the weight of the roller but rather a series of shorter rollers.

Each of the positions **30** represents a different cyclic motion based upon the cyclic diagram shown in FIG. **5** with the center of the bearing **36** representing the center reference point and the roller surface traveling in the pattern shown.

In FIG. **4** the path of the roller is illustrated diagrammatically from FIG. (*a*) thru FIG. (*d*) wherein the yarns are shown as numbers **50, 52** there being a plurality of yarns on opposite sides of and all along the roller **12** and as the roller **12** is driven by a power means in the counterclockwise direction shown the yarn **50** is moved from shorter length position shown in (*d*) thru the series from the right to left hand side until yarn **50** is in

the longer arc shown in (*a*) and yarn **52** is shortened in a similar manner. Each time the roller **12** revolves the procedure is repeated and the amount of yarn is controlled by the position of the ball bearing **31** in the notch **30** on the short shaft **16** from the maximum position of eccentricity to the minimum position of eccentricity as illustrated in FIG. **5.**

With reference to the illustration in FIG. **8,** a typical tufted textile machine frame is designated generally by reference numeral **56** and comprises longitudinal frame members **58** and vertical frame members **60** on which is mounted the carpet spool **62** on a shaft **64** below the tufting bed **66** which contains the plurality of side-by-side tufting needles receiving respectively a yarn **50** or **52** depending on whether it is on the front side or the back side of the roller **12** which is mounted on the frame members **14** in the manner previously described. The yarn **50** or **52** is delivered from yarn packages on bobbin frames and carried across rollers **68, 70** mounted on journals and frame members **72** and driven by a chain **74** carried by the end of roller **12** which in turn is driven by a chain **76** from a power source not shown. Observing the diagrammatic series in FIG. **4** and FIG. **5** in connection with the machine arrangement shown in FIG. **8** it is seen that as the roller **10** is driven eccentrically yarns **50** are moved from the extended positions shown in FIG. **4**(*a*) to the position shown in FIG. **4**(*d*) during which time yarn is released to the needles and the pattern is varied and the cycle is repeated each revolution of roller **10.**

While I have shown and described a particular embodiment of this invention together with the suggested mode of operation this is by way of illustration only and does not constitute any sort of limitation on the scope of the invention since various alterations, changes, deviations, amendments, revisions, omissions and departures may be made in the embodiment shown without departing from the scope of this invention as defined by proper interpretation of the appended claims.

I claim:

1. In a pattern control device:

a. an eccentrically mounted pattern control member having a plurality of yarns side-by-side in contact therewith,

b. a support member mounted on opposite ends of said pattern control member and in eccentric relation to the center of said pattern control member, said supports being mounted concentrically in bearings stationarily supported whereby eccentric operation of the pattern control member against the yarn varies the path of the yarn to change the amount of yarn delivered to the needle thereby controlling and varying the pattern,

c. said pattern control member being adjustable selectively to change the eccentricity thereof,

d. said pattern control member including an elongated member, such as a cylinder, having an adjustable support on each end, said adjustable support being adjustable to change the eccentricity and comprising a support member connected to said elongated member and offset and offcenter therein, said support member being adjustable on said elongated member to vary the eccentricity thereof and being connected on said elongated member by an adjustable member engaged therebetween, there being a plurality of positions on said support member in which said adjustable member engages said support member,

e. said support member being inserted in the end of said elongated member and connected offcenter therein,

f. grooves on the periphery of said support member in which said adjustable member is engaged and a ball bearing in said groove,

g. a set screw operable against said ball bearing.

2. The device in claim **1**: a second set screw preventing disengagement between said support member and said elongated member.

3. The device in claim **1**: said elongated member being a tube, a plug in said tube, a hole in said plug in which said support member is inserted.

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