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(54) Control device of the dial in circular hosiery, knitting and similar machines

(57) This invention concerns a control device of the dial in a circular hosiery and knitting machine that comprises a cylinder powered by a motor contrivance, a drive shaft (11) powered by a motor contrivance, and a dial (12) keyed to a shaft (13) made to turn by the drive shaft (11) by means of a transmission. This transmission comprises a toothed belt (16), that mated with the toothed wheels (14,15) keyed respectively to the drive shaft (11) and the driven shaft (13), and the rollers or guide pulleys (17, 18) associated with the toothed belt (16), which move independently to adjust the tautness of the toothed belt and together to create a movement of the belt involving an angular phase shift between the dial and cylinder.

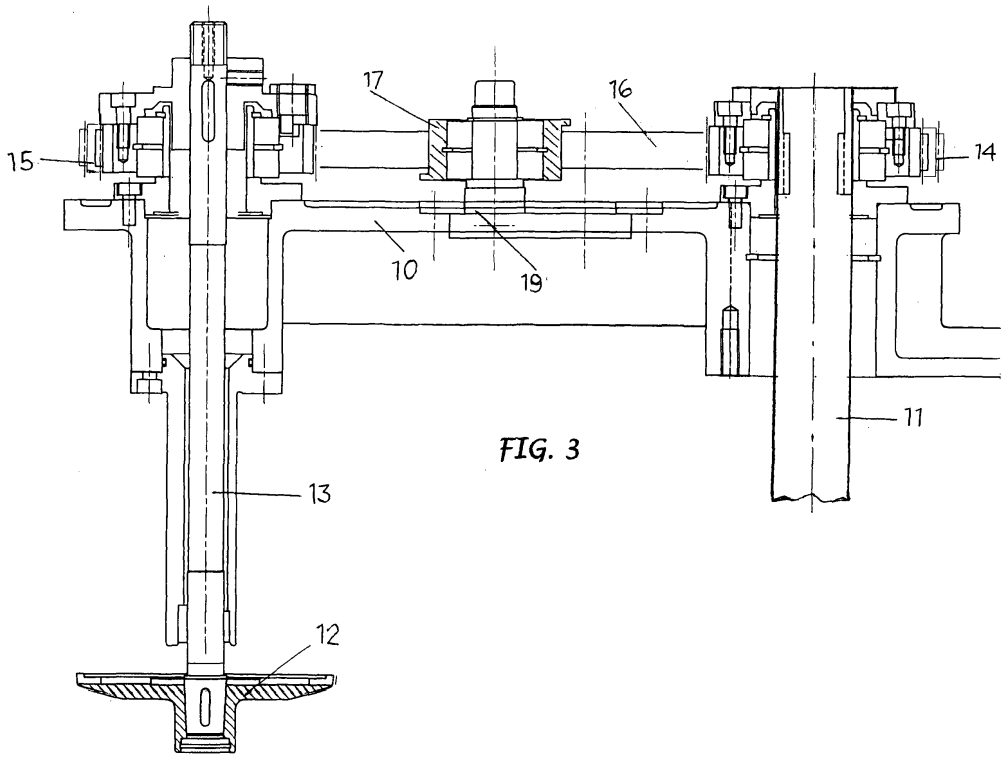

FIG. 3

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Description

Field of the invention

[0001] This invention concerns, in general circular hosiery and knitting machines in the textile machinery sector and in particular, when provided, a dial control device in such machines.

State of the technique

[0002] As is well known circular machines for hosiery comprise:

A cylinder holding the needles to form the stitches, which turns on its axis, driven by a motor by means of a transmission which envisages a shaft; and when provided

A dial, supporting the devices for the formation of the stitch in the shape of needles or sinkers, which is positioned above the cylinder and keyed to the lower part of a shaft which is controlled by a drive connected to the cylinder drive shaft to turn the dial in synchrony with the cylinder itself.

[0003] This drive is usually made up of a number of gears which must match precisely otherwise the rotation of the cylinder and the dial will not be synchronised leading to failure or errors in making the finished article.

[0004] In fact a match between the gears always involves a degree of play which accumulating may compromise the correct function of the machine. Furthermore, for particular work, e.g. the transfer of the stitches from the needles or sinkers of the dial to the cylinder needles, the dial must be turned at a certain angle with regard to the cylinder. To avoid these drawbacks and to endeavour to annul the play, pinions divided into two parts have been made so that their toothing fit with those of the pinions they couple with and the half of the pinion that couples with the dial shaft can turn almost independently from the others to enable the dial to be angularly out of phase with the cylinder. This however leads to a further complication in construction.

[0005] Such a gear drive, besides being complex and noisy is also difficult to calibrate given the high number of gears. Moreover it is further complicated by the addition of the operating elements that allow the independent movement of one of the gears so that the dial can be angularly out of phase with regard to the cylinder when needed.

Objectives and summary of the invention

[0006] A first objective of this invention is to avoid the abovementioned problems using a drive that guarantees greater precision in the synchrony between the cylinder and dial, which is easy to calibrate and which, , when required, enables a certain independent rotation of the dial with regard to the cylinder.

[0007] A second objective of the invention is to propose a drive device that is less noisy, simpler, and more economical to make.

[0008] These objectives are achieved, in a circular hosiery machine with a dial positioned above the cylinder and with a drive that comprises a toothed belt turning on a first toothed wheel, keyed to a drive shaft powered by the motor that controls the machine cylinder, and on a second toothed wheel, keyed to a driven shaft supporting the dial, and two rollers, called guide pulleys, associated with the ends of the toothed belt and moving independently, to keep the belt taut, and together, to cause the belt to move at an angle out of phase between dial and cylinder.

Brief Description of the Drawings

[0009] The invention will however be described in more detail with reference to the enclosed indicative and not limiting drawings, in which:

Fig. 1 shows a view in perspective of the drive device between the cylinder shaft and the dial shaft;
Fig. 2 shows a view from above: and
Fig. 3 shows a lateral cross section.

Detailed Description of the Invention

[0010] Said drawings of a circular hosiery machine show a support 10 and, on said support, a drive shaft 11, that receives its turning motion from a motor contrivance (not shown); the same one that controls the cylinder with needles), and a dial 12 supported by a respective shaft 13, or driven shaft. For the transmission of the rotary motion of the drive shaft 11 to the driven shaft 13 the invention envisages two toothed wheels 14 and 15, keyed respectively to the drive 11 and driven 13 shafts and a toothed belt 16 mated with said toothed wheels. In this way, the motor that activates the machine cylinder sets the drive shaft 11 turning, a motion that is transmitted to the driven shaft 13 and, consequently, to the dial 12 by means of the toothed belt 16.

[0011] Furthermore two guide pulleys 17 and 18 are provided, that is tension rollers, associated with two opposite ends of the toothed belt 16 and each one assembled on a slide 19 and 20 positioned above the support 10 and facing crossways to the ends of the belt. The slides 19 and 20 can move independently to enable tensioning of the toothed belt to be carried out simply and efficiently so as to hold the connection between the drive and driven shaft in position, and also together to cause an angular rotation only of the driven shaft with regard to the drive shaft and consequently the dial with regard to the cylinder for that work which requires the cylinder and dial to be out of phase. The slides 19 and 20 can be moved by hand to tension the belt and controlled and managed by a programme to achieve, when needed dur-

ing knitting, out of phasing between the cylinder and the dial.

[0012] In this way an extremely simple device is achieved whereby the toothed belt replaces a number of gears, it is easy and inexpensive to make given the lower number of components, it is more reliable in that the only coupling envisaged is the one between the toothed belt and wheels with consequent no accumulation of play, and simple calibration given that the belt is tensioned mechanically by moving the guide pulleys.

Claims

1. Control device of the dial in a circular hosiery machine with a cylinder made to turn on its axis driven by a motor contrivance, a drive shaft (11) on board a support (10) and driven by said motor contrivance, and where the dial (12) is positioned above the cylinder and keyed to a shaft (13) made to turn by the drive shaft (11) by means of a transmission, **characterised by** the fact that said transmission comprises a toothed belt (16), which mates with toothed wheels (14, 15) keyed respectively to the drive shaft (11) and driven shaft (13), and some rollers or guide pulleys (17, 18) associated with the toothed belt (16), which move independently to adjust the tautness of the toothed belt and together to create a movement of the belt involving an angular phase shift between the dial and cylinder.

2. Control device of the dial according to claim 1, in which each roller or tensioning guide pulleys (16, 17) is assembled on a relative slide (18, 19) and can move crossways to the opposite ends of the toothed belt on said support.

3. Control device of the dial according to claim 2, in which said slides holding the guide pulleys can be moved by hand to adjust the tautness of the toothed belt.

4. Control device of the dial according to claim 2, in which said slides holding the guide pulleys are fixed to each other for simultaneous movement to create angular phase shift between the dial and cylinder, said simultaneous movement being controlled and managed by a programme.

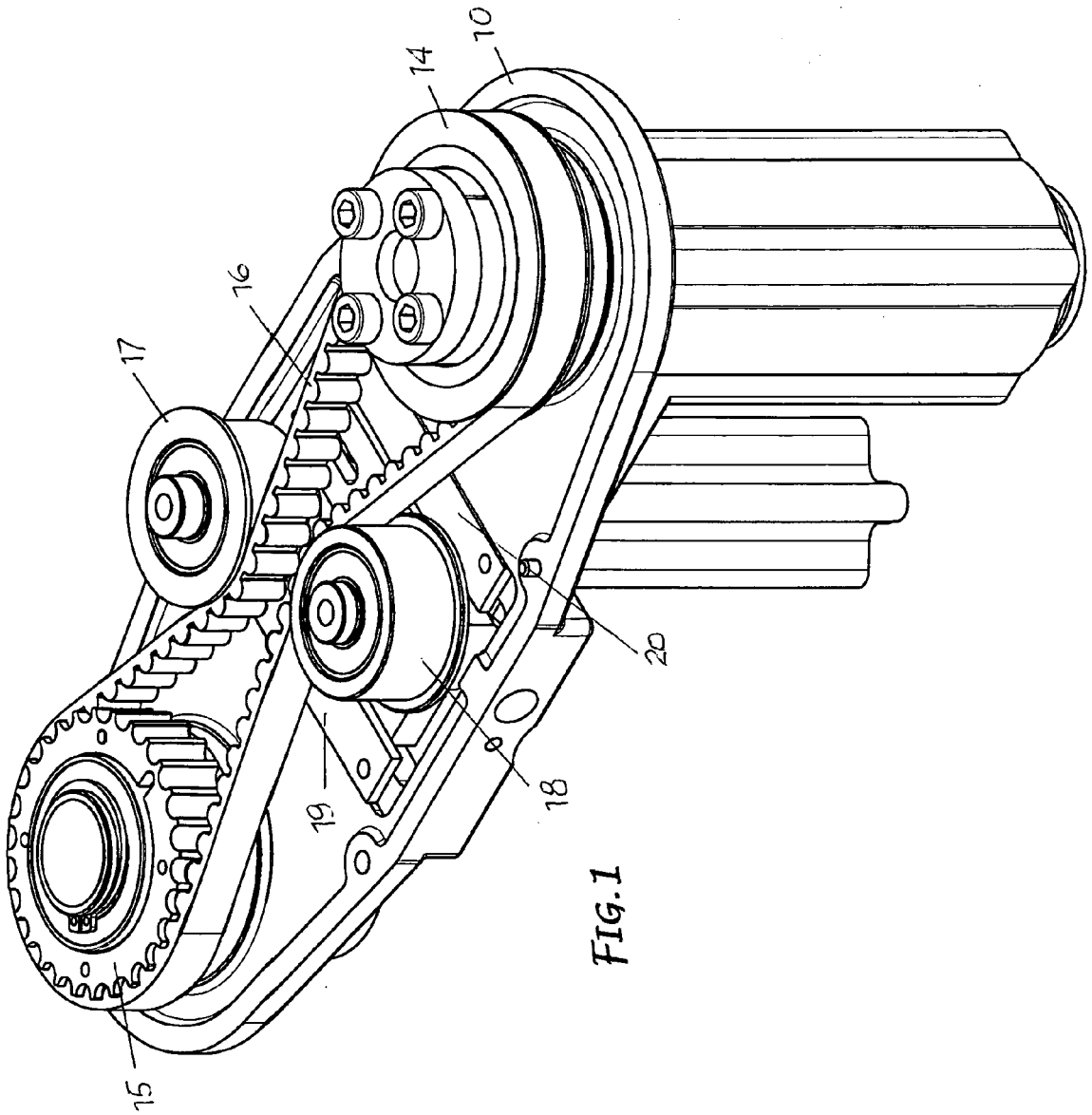

FIG. 1

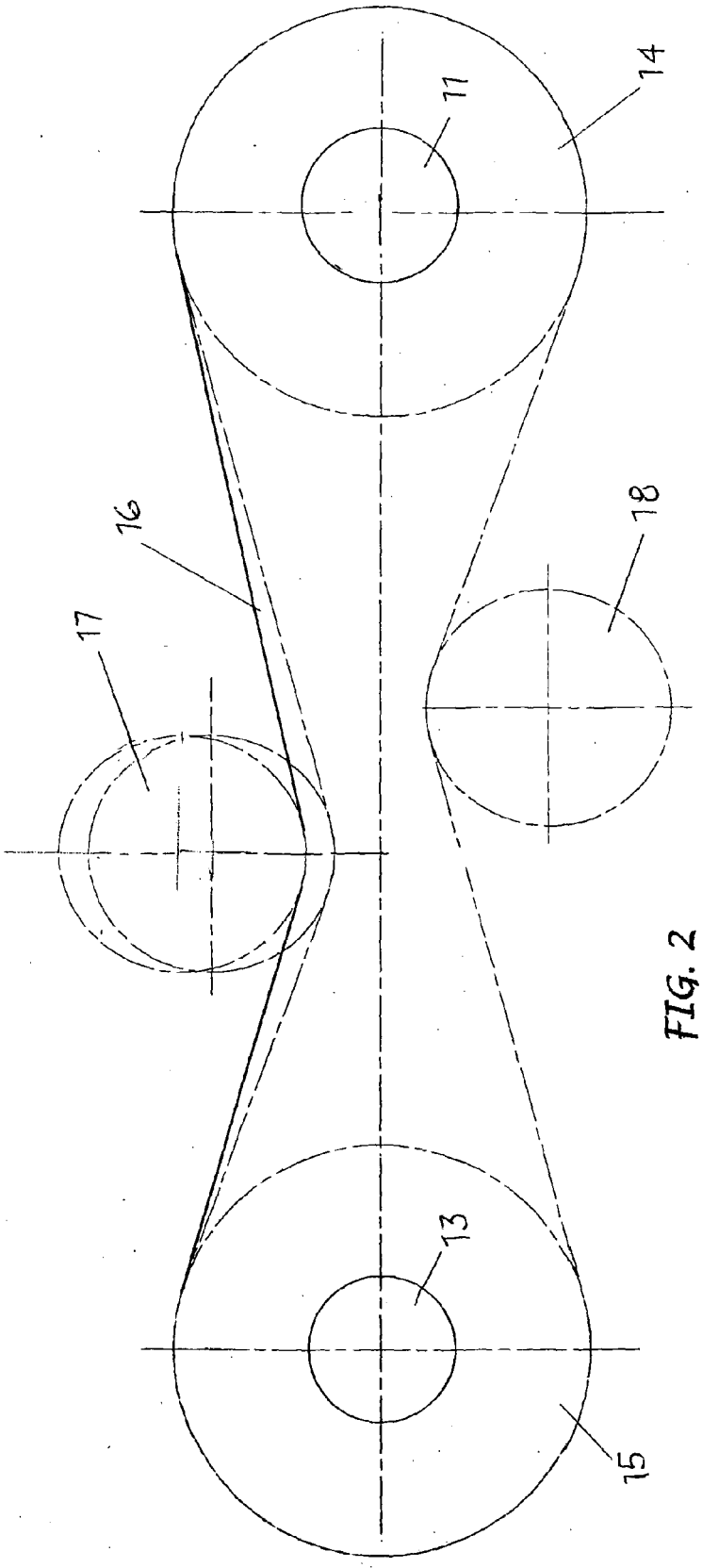

FIG. 2

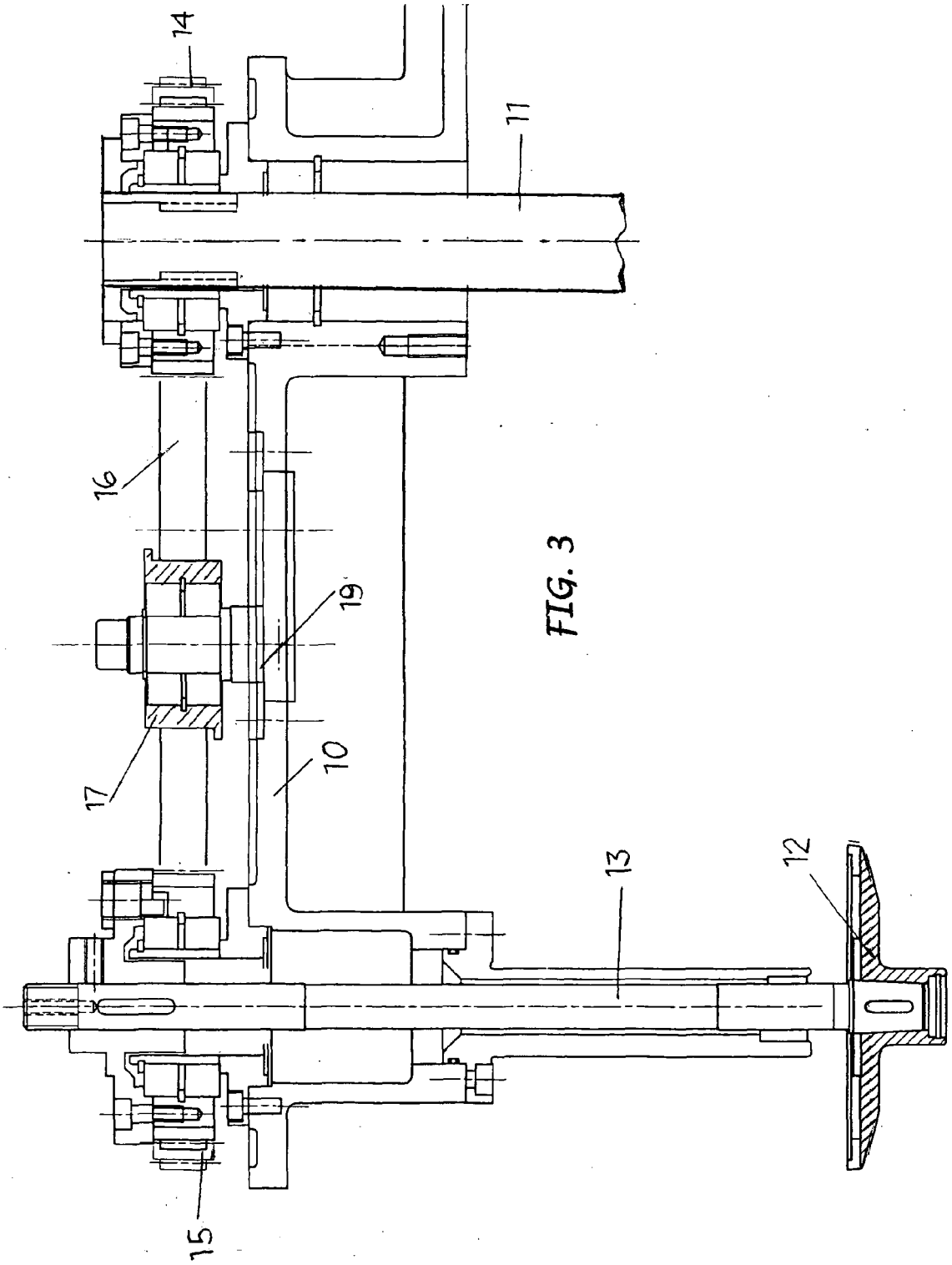

FIG. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5013

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	29 May 2006	Pieracci, A

CATEGORY OF CITED DOCUMENTS

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 42 5013

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