Jan. 2, 1923. 1,441,123

R. W. SCOTT.

TIMING CONNECTION FOR DIAL AND CYLINDER KNITTING MACHINES.

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Fig. 4.

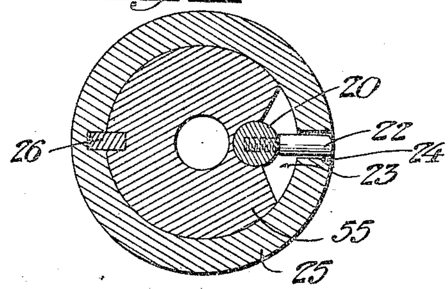

Fig. 3.

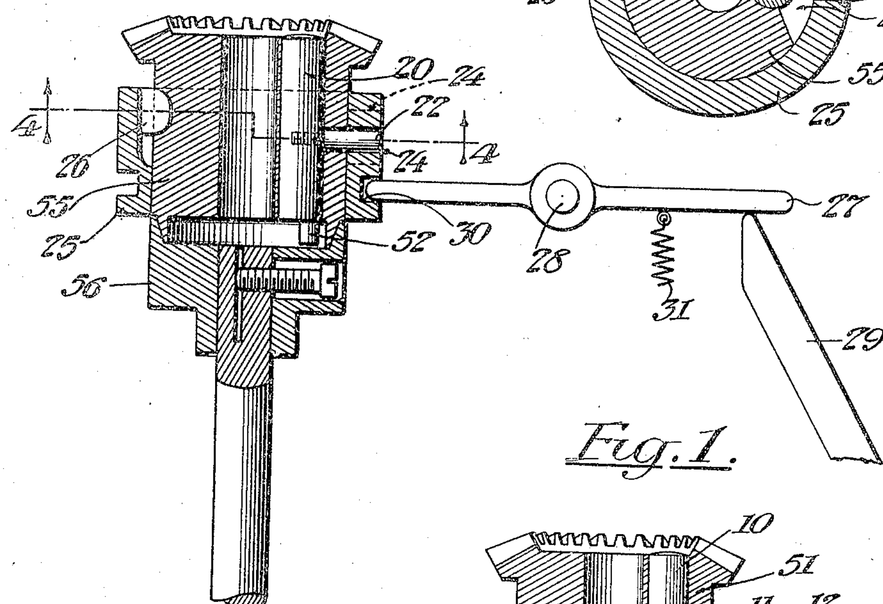

Fig. 1.

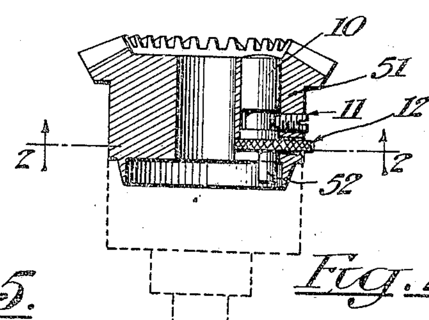

Fig. 5.

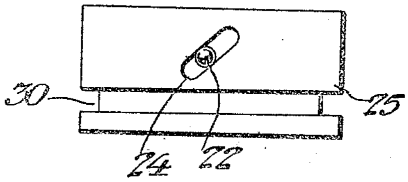

Fig. 2.

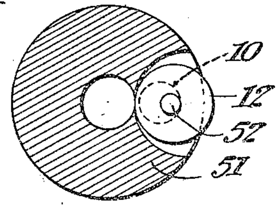

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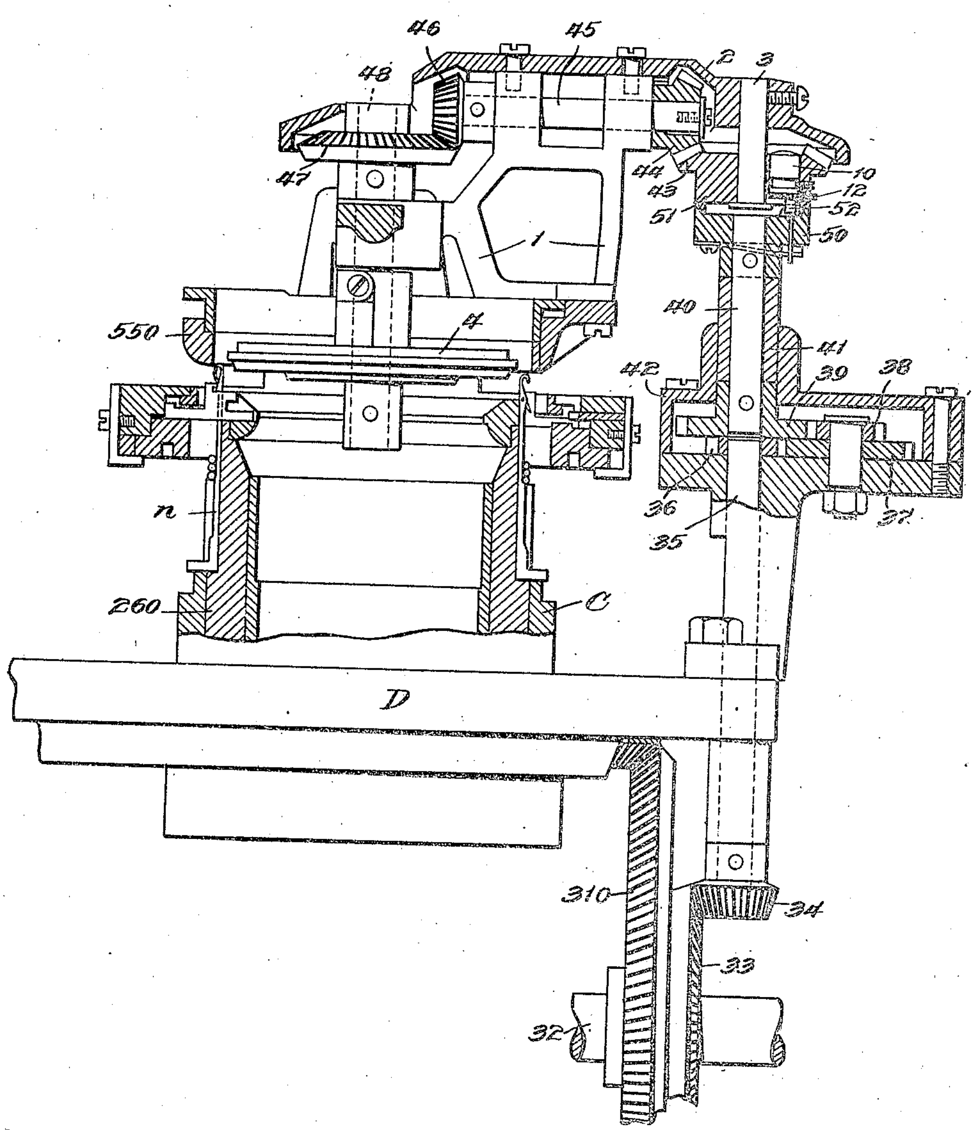
Fig. 5.



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Patented Jan. 2, 1923. **1,441,123**

UNITED STATES PATENT OFFICE.

ROBERT W. SCOTT, OF BABYLON, NEW YORK, ASSIGNOR TO SCOTT AND WILLIAMS, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF MASSACHUSETTS.

TIMING CONNECTION FOR DIAL AND CYLINDER KNITTING MACHINES.

Application filed March 4, 1920. Serial No. 363,135.

To all whom it may concern:

Be it known that I, Robert W. Scott, a citizen of the United States of America, residing in Babylon, in the county of Suffolk, in the State of New York, have invented certain new and useful Improvements in Timing Connections for Dial and Cylinder Knitting Machines, of which the following is a specification.

My invention relates more particularly to knitting machines of that class in which cylinders and dials both carrying knitting instruments are used, and in which it is important to secure a desired cooperative relation of the instruments in the dial to the instruments in the cylinder.

My invention provides means whereby the relative positions of the knitting instruments in the dial and cylinder may be readily adjusted. And first I will describe how this adjustment may be effected by hand in connection with the invention which forms the subject of my Patent 1,356,092, dated October 19, 1920. In the machine illustrated and described in that patent the dial is carried by a hinged frame, so that the dial may be lifted from its working position in relation to the cylinder whenever desired. The invention of my said patent relates to means for insuring the proper relation of the knitting instruments in the dial to the instruments in the cylinder on the return of the dial to its working position, and that was accomplished through the use of a two-part clutch in the gearing which operated the cylinder and dial, one part of the clutch being provided with a clutch to cooperate with a pin or pair of pins on the other part.

In the accompanying drawings—

Fig. 1 is a vertical section, showing one part of the mentioned clutch, but embracing means for carrying out my present invention;

Fig. 2 is a sectional view on the line 2—2, Fig. 1;

Fig. 3 is a vertical section of a construction in which the adjustment is effected automatically;

Fig. 4 is a sectional view on the line 4—4, Fig. 3; and

Fig. 5 is a side elevation of a part.

Fig. 6 is a view corresponding with Fig. 1 of my said patent, the same letters of reference being used for the like parts.

Referring to Figs. 1, 2 and 6, the two parts of the clutch are marked 50 and 51, interposed in the train of gearing between the needle cylinder 260 and the dial 4 of the knitting machine of my above mentioned patent. As seen in Fig. 6, this train of gearing includes a bevel wheel 310, which drives the needle cylinder 260 turning within the stationary cams C on the bed plate, and on this shaft 32 is another bevel gear 33 engaging a bevel pinion 34 on a spindle 35, which carries at its upper end a pinion 36. The train of gearing is continued through pinions 37, 38 and 39, in box 42, spindle 40 in bearing 41, to clutch parts 50 and 51. The upper clutch part 51 is mounted on spindle 3 in bearing plate 2 and carries a bevel pinion 43 gearing into a bevel pinion 44 on horizontal shaft 45 in bracket 1, which also carries the bearing plate 2. This shaft 45 has bevel pinion 46 meshing into bevel pinion 47 on the upper end of spindle 48, which carries the dial 4. The bracket 1 also carries the usual latch ring 550. These parts are as described in my above mentioned patent.

On the lower face of the clutch part 51 is a pin 52 which co-acts with a pin on the part 50. According to my present invention I secure adjustment of the relation of the knitting instruments of the dial to those of the cylinder by the simple expedient of making this clutch pin adjustable about the axis of the clutch. For this purpose, instead of mounting this pin 52 fixedly on or making it part of the clutch part 51, I mount it eccentrically on the end of a stud 10 set in a longitudinal bore in the clutch part 51. The stud may be held in position longitudinally of the bore in the clutch part by a lateral set screw 11 threaded into a tapped hole in the clutch part 51, and with its inner end entering a reduced part of the stud. The same set screw may be used to secure the stud in the position to which it may be rotarily adjusted, the screw being in that case turned to bring its forward end into firm contact with the stud, after the latter has been adjusted. The stud may have a flange or collar 12 with knurled edge projecting beyond the clutch part 51 so as to provide a convenient means of turning the stud 10 when freed from the hold of the set screw.

Accordingly if the knitting instruments of the dial do not mesh exactly, or as desired, between the needles of the cylinder, the proper correction can be made by loosening the screw 11 and with thumb upon the knurled portion 12, the stud 10 can be turned slightly with the result that the eccentrically mounted pin 52 is caused to traverse to a slight extent, and by thus changing the relations of the two clutch parts to each other, to that extent, the instruments in the dial and cylinder are brought into the desired relation to each other.

In certain cases I may make this adjustment automatic. For example, in Figs. 3, 4 and 5 I have shown means for automatically adjusting the pin 52 which is carried by the clutch part 55, and in Fig. 3 I have shown the other clutch part 56 as mounted in a special way upon the upper end of the spindle. In this connection, the stud 20, which carries the clutch pin 52 eccentrically mounted at its lower end, has threaded into its side a pin 22 which passes freely through a horizontal slot 23 in the wall of the clutch part 55 and into a diagonal slot 24, (Fig. 5) in a sleeve 25 on the exterior of said clutch part. This sleeve 25 can only move vertically on the clutch part because of a key 26 on the clutch working in a key-seat in the inner face of the sleeve (Figs. 3 and 4). Normally this sleeve may be held towards the upper part of the clutch part 55, as by spring means 3, and by depressing this sleeve, the stud 20 can be turned to a distance corresponding with the traverse given to the pin 22 by the inclined slot 24, and the clutch pin 52 adjusted accordingly to cause a change of position of the knitting machine dial rotarily in relation to the cylinder. The movement of the sleeve 25 may be effected automatically from the pattern drum of the machine, as through the medium of a lever 27 pivoted at 28 and acting at one end in an annular groove 30 in the ring 25 and acted on at the other end by a thrust bar 29, such as used in the well known Scott and Williams machines.

Such an automatic mechanism as I have described is especially useful in effecting a change of relation of dial to cylinder rotarily, when that change has to be made at certain intervals in knitting and not merely to get the instruments into permanent relationship. Thus in certain forms of knitting machines, especially for producing ribbed fabric, it is desirable that means be provided for shogging the needles of one carrier, usually those needles carried by the dial, so that said needles may be caused to ply between pairs of needles immediately adjacent to those between which they work to produce the ordinary ribbed fabric. This is done at times to produce ornamental courses of shogged stitches and at other times to make the stitches of certain courses of a ribbed fabric overlie each other, to the end that said stitches may more readily be placed upon the impaling points of a transfer point ring when said stitches are about to be applied to a separate machine for knitting the foot of a stocking. Reference may be had to patent to W. H. Childrey, No. 1,306,523, June 10, 1919 as an illustration of the practice in this connection. In the said patent to Childrey, provision is made for changing the relative positions of the cylinder and dial needles by imparting to the dial an intermittent movement always in the same direction, and while this arrangement has functioned well in practice, it is desirable in certain forms of machines that this shogging or racking should take place first in one direction and then in the opposite direction for the space of one needle.

The construction of automatic adjustment which I have above described in connection with Figs. 3, 4 and 5 is useful for this purpose. When it is desired to change the dial needles from one knitting position to the other, the said dial needles are withdrawn into the dial so that the hooks of all of them are inside the ring of cylinder needles. When in this position the thrust bar 29 is raised to depress the forward end of the lever 27 and consequently the sleeve 25. As described, the stud 20 will be partially turned on its axis and the clutch pin 52 will have its position so far changed as to turn the dial a distance equal to one needle space. Thereupon knitting is resumed with the dial needles in the new position, until it is desired to return them to their first position. Then the pattern drum acts to let the thrust bar 29 return and a spring 31 causes the sleeve to rise and the parts are returned to the first position.

I claim as my invention—

1. A knitting machine having cylinder and dial, both carrying knitting instruments in combination with connecting gearing for driving the two and including a clutch and means for adjusting the clutch, to change the relation of the dial to the cylinder rotarily.

2. A knitting machine having cylinder and dial, both carrying knitting instruments, in combination with connecting gearing for driving the two and including a clutch, one part of said clutch being provided with a rotarily adjustable stub carrying a clutch pin eccentrically mounted thereon.

In testimony whereof I have signed my name to this specification.

ROBERT W. SCOTT.