

[54] PATTERN WHEEL WITH PIVOTALLY MOUNTED JACKS

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[58] Field of Search.....66/50 A, 25, 156, 1, 40

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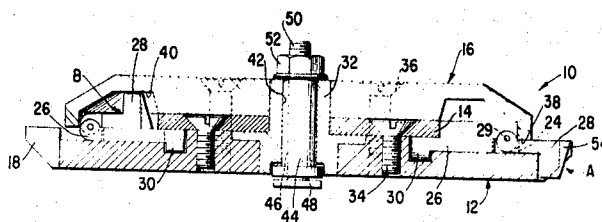
Primary Examiner—Wm. Carter Reynolds

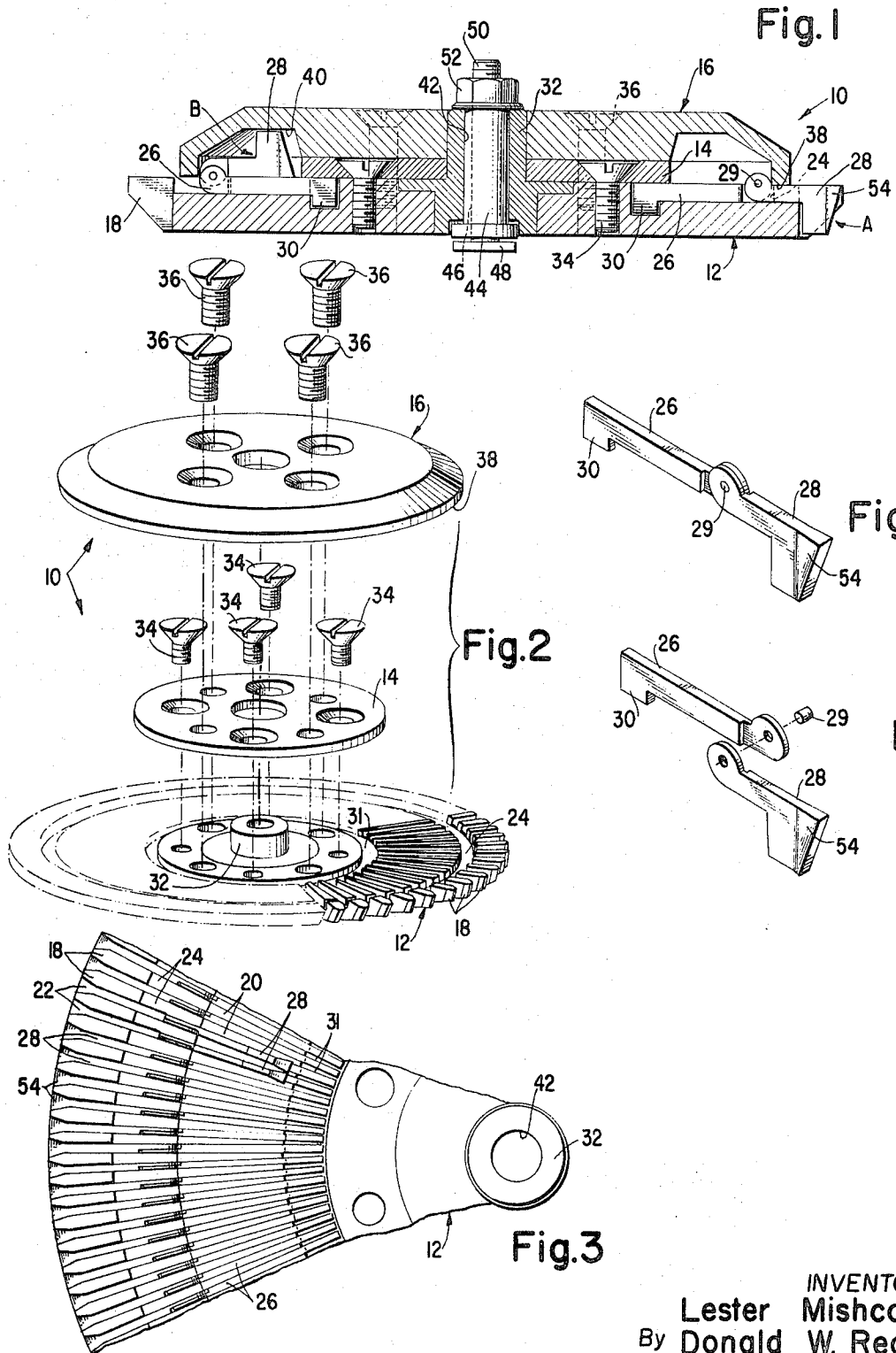
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[57] ABSTRACT

A pattern wheel for a circular knitting machine is provided with pivotally mounted jacks capable of being moved about their pivotal mountings between needle-actuating positions and non-actuating positions, the pattern wheel also being provided with means effective to prevent dislodgement of the jacks from their needle-actuating positions when disposed over the jacks and secured to the wheel.

3 Claims, 5 Drawing Figures





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PATTERN WHEEL WITH PIVOTALLY MOUNTED JACKS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to pattern wheels for circular knitting machines.

2. Description of the Prior Art

The basic elements of a pattern wheel are a jack-retaining ring, needle-raising jacks to act on the butts of knitting needles and a cover to lock the jacks in place in the retaining ring. The most common type of pattern wheel is assembled by manually inserting the jacks in selected slots formed in the retaining ring and then securing the cover to the retaining ring, the jacks being inserted only in those slots to be used in raising a needle and the other slots being left empty. The manual insertion of jacks in a wheel has always been a time-consuming and costly operation, and is becoming even more so because of an increased demand for circular knitting machines having more feeds with a pattern wheel at each feed. One approach to a solution of the problem is to use a pattern wheel as disclosed in U.S. Pat. No. 2,990,702 for "Device for Setting a Pattern Wheel," issued July 4, 1961, to R. Schmidt having slidable jacks which fill the slots of a retaining ring and which can be radially moved by a jack setting device from a needle-actuating position to a non-actuating position. However such pattern wheels are structurally more complex and more costly than the conventional pattern wheels, the jacks are difficult to position, and the pattern wheels operate less efficiently than the conventional wheels.

SUMMARY OF THE INVENTION

The pattern wheel of the invention comprises a jack-supporting ring which includes radially extending slots and jacks in such slots pivotally mounted for movement between needle-actuating positions and non-actuating positions, and means securable over the supporting ring to hold down the jacks when in needle-actuating positions.

It is an object of the invention to provide an improved pattern wheel in which jacks may be easily moved either manually or with a jack setting device between needle-actuating and non-actuating positions.

It is another object of the invention to provide an improved pattern wheel in which jacks are movable between needle-actuating and non-actuating positions and which is both simple in construction and economical to manufacture.

It is still another object of the invention to provide an improved pattern wheel in which jacks are movable between needle-actuating and non-actuating positions and in which the jacks when in needle-actuating positions extend between gear-like teeth located at the outer peripheral margin of the wheel.

Other objects and advantages of the invention will become apparent during a reading of the specification taken in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a sectional view of a pattern wheel constructed according to the invention.

FIG. 2 is an exploded perspective view of the pattern wheel showing a jack retaining ring and covers of the pattern wheel of the invention.

FIG. 3 is an enlarged fragmentary planar view of the retaining ring.

FIG. 4 is a perspective view showing a jack and supporting arm for use in the pattern wheel of the invention.

FIG. 5 is an exploded view of the jack and supporting arm of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, the pattern wheel 10 of the invention may be seen as comprising a jack retaining ring 12 and covers 14 and 16. The jack retaining ring includes a plurality of tapered teeth 18 and a plurality of radial slots 20 extending

into flared-out spaces 22 between the teeth. An annular groove 24 is formed in the ring as shown.

A jack supporting arm 26 is mounted in each of the slots 20 of the jack retaining ring and connects at pin 29 with a jack 28. Each jack 28 is pivotable on pin 29 about the arm 26 with which it connects, being movable between a needle-actuating position (Position A) wherein the trapezoidally free end of the jack occupies a space 22 and a position (Position B) wherein the jack rests on top of the arm. Each of the arms 26 includes a finger 30 which extends into the annular groove 31 to prevent radial movement of the arms and connected jacks.

The covers 14 and 16 fit over a boss 32 formed on the jack retaining ring and are securable to the plate by screws 34 and 36 respectively. The cover 14 when secured to the jack retaining ring is effective to hold down arms 26 and so prevent the fingers 30 from being dislodged from annular groove 31. Cover 16, when secured to the jack retaining ring, holds jacks which are in an open position (Position A) securely in place. As indicated, in the open position, the jacks 28 are engaged by annular surface 38 of the cover 16 and in the folded position (Position B) the jacks are wholly within annular recess 40 formed in the cover 16. The jacks of the pattern wheel are set with only the cover 14 in place, the normal procedure being to start with all jacks in open positions and then flipping over selected jacks either manually or with a suitable indexing device according to the intended use of the wheel, after which the cover 16 is secured to the jack retaining plate 12 to prevent dislodgement of the jacks from their desired positions.

The pattern wheel has a central bore 42 in which there is provided a sleeve 44 having a axial length slightly in excess of that of the bore and a stub shaft 46 having a foot 48 at one end. The other end 50 of the shaft 46 is threaded to receive a nut 52 which may be tightened to affix the position of the foot 48 in a slot on a knitting machine and maintain the sleeve 44 stationary while the wheel is free to rotate on the sleeve.

Because of the tapered teeth 18 and flared-out spaces 22 therebetween, the wheel can readily roll into the butts of cooperating knitting needles of a circular knitting machine and there is little likelihood of any interference between the needles and teeth of the wheel occurring. Also, because the teeth are tapered as shown it is possible to have the roots of the teeth of substantial thickness and yet provide substantial spacing at the periphery of the wheel to accommodate swedged ends 54 on the jacks 28. Such swedged ends 54 offer a wide surface to the butts of needles which are to be lifted by the pattern wheel, the butts are prevented from slipping off the jacks prematurely and defects which would otherwise be produced in the fabric being knitted as well as possible damage to the wheel and needles are avoided.

While the invention has been described in its preferred form, it is to be understood that the words which have been used are words of description rather than of limitation, and that changes within the purview of the appended claims may be made without departing from the true scope and spirit of the invention.

Having thus set forth the nature of this invention, what is claimed herein is:

1. A pattern wheel comprising a jack-supporting ring which includes a plurality of radially extending slots, a jack in each of at least some of said slots, an arm for each of the jacks and each of the jacks being pivotally mounted on its associated arm for movement between a needle-actuating position and a non-actuating position, each jack and associated arm being removable as a unit from a slot, means for holding each arm in a fixed position in the ring, and means for holding down the jacks which are in needle actuating position.

2. A pattern wheel as defined in claim 1 wherein the jack-supporting ring includes an annular groove and the arms each include a finger extending into the annular groove to prevent radial movement of the arms and pivotally connected jacks.

3. A pattern wheel as defined in claim 2 wherein the jacks in the non-actuating positions rest on their pivotally connected arms.

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