Sept. 8, 1959 M. B. STRIAR 2,902,848

KNITTING MACHINE

Original Filed Feb. 24, 1953 3 Sheets-Sheet 1

Fig. 1

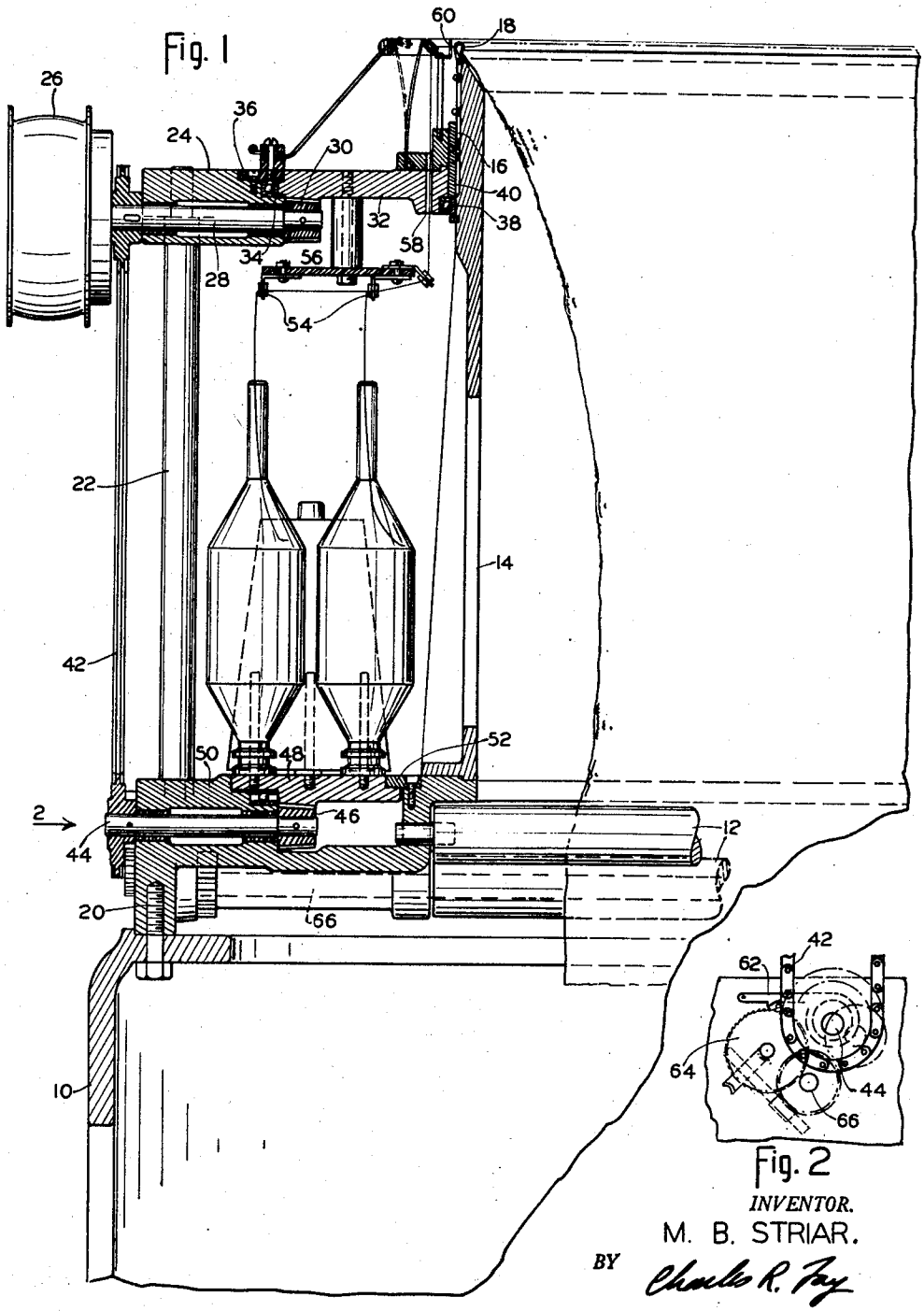

Fig. 2

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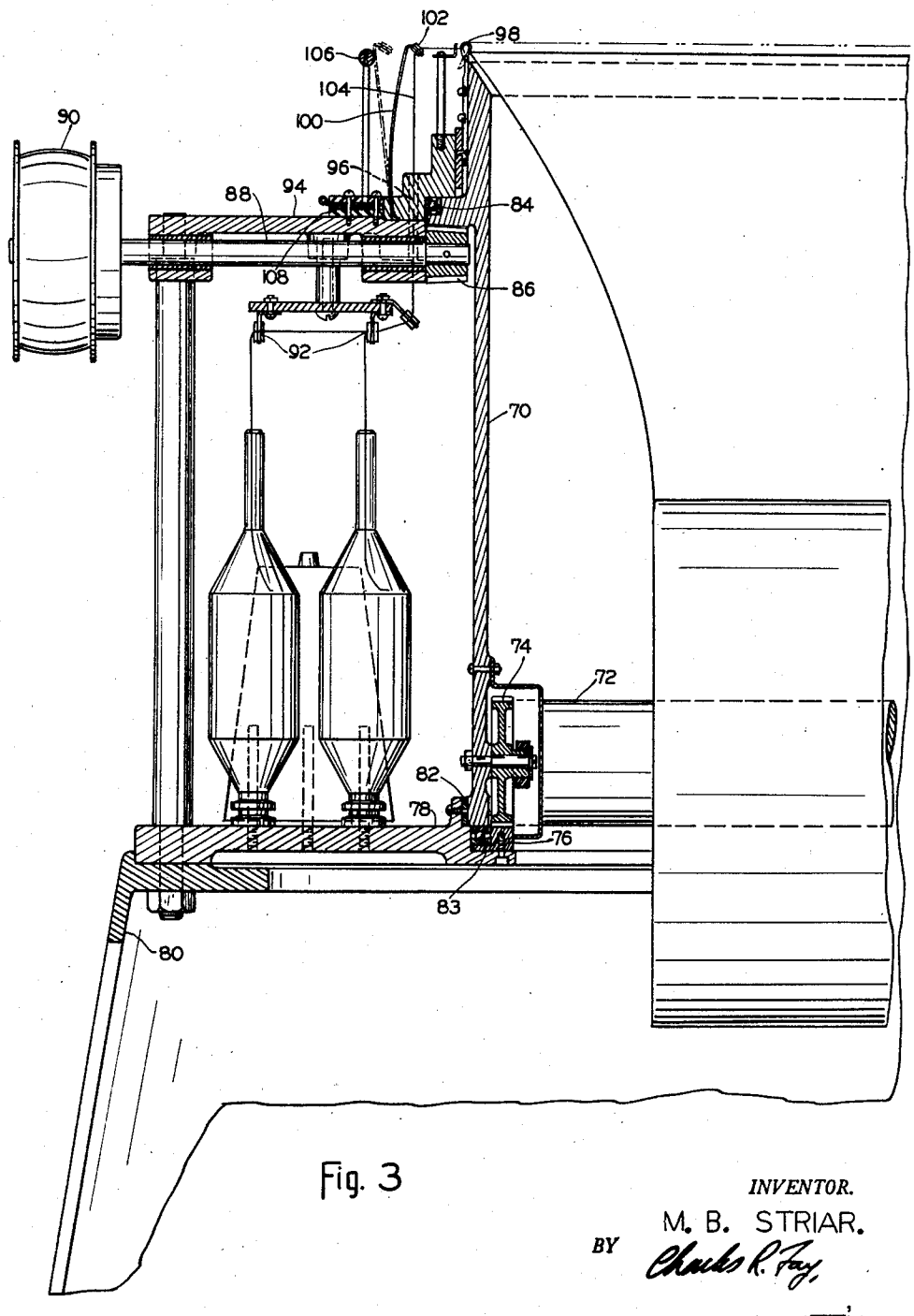

Fig. 3

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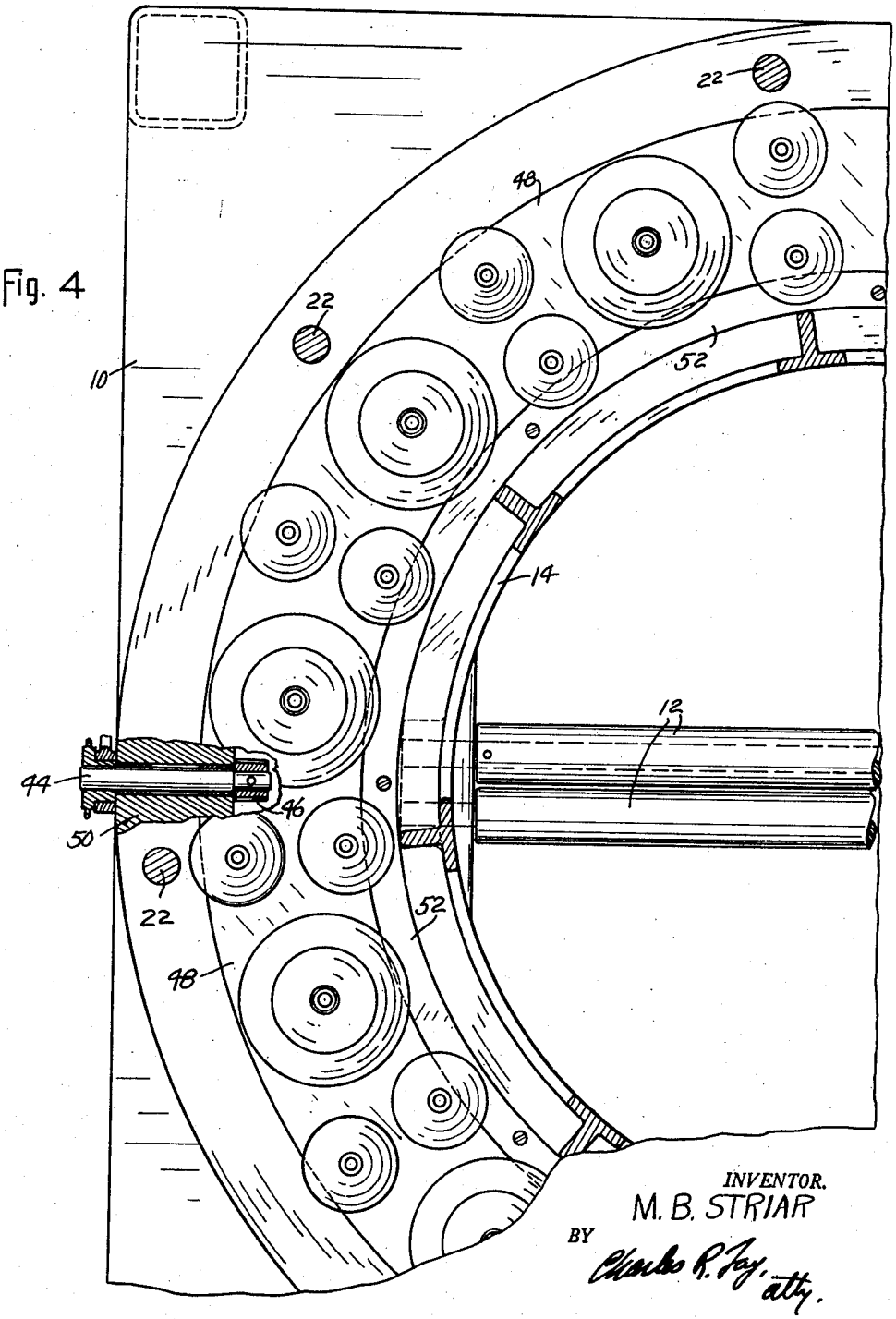
Fig. 4



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2,902,848

KNITTING MACHINE

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Original application February 24, 1953, Serial No. 338,263, now Patent No. 2,810,279, dated October 22, 1957. Divided and this application September 30, 1957, Serial No. 687,205

4 Claims. (Cl. 66—125)

This application is a division of my U.S. Patent No. 2,810,279. The object of the present invention is to provide a new and improved location for the bobbins feeding yarns to a knitting machine of any general known type as well as any machine of like nature, and yarn guides for feeding the yarn up past the cams to the needles, rather than down from above, and the reason for providing the new location resides in greater ease of replenishing the bobbins and also to reduce the height of the machine, so that the same may be completely serviced from the floor, avoiding the necessity for step-ladders, etc.

Another object of the invention resides in the provision of new and improved bobbin-holding means for knitting machines and guide means for the threads, said bobbin-holding means being applied either to a rotating cylinder or a fixed cylinder type of machine and including supporting means for said bobbins and new and improved bearing and driving means as well as stop motions, all to the end that the bobbins may be placed within the reach of the operator and not high overhead as is the conventional manner of applying the threads in prior art machines.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Fig. 1 is a view in elevation, partly in section, showing the invention applied to a fixed cylinder knitting machine;

Fig. 2 is an end view of a detail, looking in the direction of arrow 2 in Fig. 1 and illustrating drive mechanism as well as cloth take-up rolls;

Fig. 3 is a view similar to Fig. 1 but illustrating the invention applied to a rotary cylinder machine; and

Fig. 4 is a plan view with parts in section of the construction shown in Fig. 1.

In the prior art knitting machines, the only possible place for locating the bobbins has always been at the top of the machine and the yarn is always fed downward, and in ordinary knitting machines, this means that the machine must be thirteen to fifteen feet high. The present invention overcomes this difficulty by a new and improved bobbin-holding construction, so that substantially the machine need be no higher than the dial or the needles.

As shown in Fig. 1, the machine is provided with a base 10 as is conventional and this base may consist merely of iron legs or any other kind of frame that may be desired. The knitted cloth is deposited within this frame as for instance by means of a pair of slowly operated rollers 12, the nip of which feeds the cloth downwardly.

The cylinder in the machine is indicated generally at 14 and this cylinder is substantially the same as those of the prior art, providing for the needles which are usually located vertically as at 16, and horizontally if so desired in certain types of machines on top of the cylinder at 18. These needles are provided with the usual cams which

are well known in the art, and the cylinder, needles and cams are all more or less conventional.

Upon frame 10 there is provided an annular frame member generally indicated at 20. This may be provided with uprights 22 supporting another annular frame member 24 at a height adjacent the location of the needles. The frame 20, 22, 24 may support driving means such as a pulley 26 although of course the machine may be individually motorized. Pulley 26 is provided with a shaft 28 extending radially inwardly of the machine and driving a gear 30. This gear in turn drives a circumferential flat annular ring 32 which is supported at its outer edge by frame member 24 on a shoulder 34 and a thrust bearing 36 may be provided. This bearing construction extends all about the periphery of ring 32.

An inner support on the fixed cylinder 14 may be provided by another thrust bearing 38 and it will be understood that the ring 32 rotates on the axis of cylinder 14 and carries with it the needle cam generally indicated at 40 and such other mechanism as may be required to the usual operation of a knitting machine.

The pulley 26 may also drive as by means of a chain or the like 42 a lower shaft 44, the lower shaft being provided with a gear 46 driving another annular ring 48 appropriately supported by a bearing 50 on frame 20 and such other bearings as may be required as for instance a bearing ring or the like at 52. The shafts 28 and 44 of course are rotated in unison and drive rings 48 and 32 together about the cylinder. Of course it is clear that rings 48 and 32 may be connected to make them rigid and this is contemplated within the limits of the invention also.

The ring 48 is provided with bobbin-holders or spindles and there may be as many of these as is required or convenient. In the present case, three different threads are illustrated and these threads are guided in eyes 54 mounted upon a support 56 depending from ring 32. These eyes direct the threads upwardly through passages 58 near the inner circumference of ring 32 and thence through further eyes 60 if needed to the knitting area of the needles.

A pawl 62 may operate a rotary ratchet by means of shaft 44 in order to intermittently operate a reduction gear 64 for slowly rotating a shaft 66 which drives one of the rolls 12, the other roll 12 being idle if desired.

Referring now to Fig. 3, there is shown a revolving cylinder type of machine wherein the cylinder is indicated at 70. Carried with this cylinder are the cloth take-up rolls 72 which may be driven by means of a gear 74 from a fixed gear 76 on a fixed annular frame 78, the latter carrying the bobbin spindles comparable to those shown in Fig. 1. The frame 78 is mounted on the knitting machine frame 80 and annular bearings 82 may be provided for rotatably supporting the rotary cylinder 70.

The rotary cylinder 70 is the same as cylinders of the prior art, and may be supported at its upper end by a thrust bearing 84, and it may have a bearing 83 at its lower end. The cylinder 70 is rotated by a gear 86 driven from a shaft 88 from pulley 90 which is comparable to pulley 26 in Fig. 1.

Guide means are provided at 92 and these may be supported in fixed relation from the fixed frame 94. This frame is provided with passageways 96 for the threads which ascend to the knitting area generally indicated at 98.

It will be seen that therefore the machine comprises a main frame 80, a rotary needle cylinder 70, a fixed ring-like annular frame disposed on the main frame about the cylinder. Said fixed annular frame comprises the spaced annular members 78 and 94, the bearings at 82 and 83 and 84 providing annular tracks mounting the

cylinder and of course the cylinder **70** is provided with the ring gear that is adapted to be actuated by gear **86**.

In both forms of the invention, there is provided suitable stop motions which may press spring fingers **100** having thread guides **102** and being held by the threads as at **104** away from a circular rod or bar **106** insulated from the frame of the machine at **108**. If a thread breaks, the spring **100** will contact the bar **106** and stop the motion. However, if desired, the thread **104** could of course maintain spring fingers **100** into contact with a commutator ring or the like, so that when the thread breaks, the holding finger would move away from the current carrying ring and then merely open the circuit in this fashion.

The invention provides a very convenient bobbin holder and yarn feed means which are always within reach of the operator, making for faster operation, greatly facilitated threading of the yarn, and a simpler and more inexpensive machine in general.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claims, but what I claim is:

1. A knitting machine comprising a main frame, a rotary needle cylinder therein, needles on the cylinder, a fixed ring on the main frame and disposed about the cylinder, said ring including a pair of vertically spaced annular members with vertical means rigidly connecting the members, each member including an annular track, an annular bearing in each track, said bearings being rotatably mounted on the tracks and supporting the cylinder for annular rotation, means to rotate said cylinder on the bearings, bobbin spindles on the ring frame lower member, and yarn guides for the bobbin threads on the upper member of the ring frame, said guides feeding the threads upwardly to the needles, the latter being located wholly above the bobbin spindles.

2. A knitting machine comprising a main frame, a rotary needle cylinder therein, needles on the cylinder, a fixed ring frame on the main frame and disposed about the cylinder, said ring frame including a pair of vertically spaced annular members with vertical means rigidly connecting the members, each member including an annular track, an annular bearing in each track, said bearings being rotatably mounted on the tracks and supporting the cylinder for rotation, means to rotate said cylinder on the bearings, bobbin spindles on the ring frame lower member, and yarn guides for the bobbin threads

on the upper member of the ring frame, said guides feeding the threads upwardly to the needles, a shaft in the ring frame, a gear on the shaft and a ring gear on the cylinder, said shaft rotating the cylinder.

3. A knitting machine comprising a main frame, a rotary needle cylinder therein, needles on the cylinder, a fixed ring frame on the main frame and disposed about the cylinder, said ring frame including a pair of vertically spaced annular members with vertical means rigidly connecting the members, each member including an annular track, an annular bearing in each track, said bearings being rotatably mounted on the tracks and supporting the cylinder for rotation, means to rotate said cylinder on the bearings, bobbin spindles on the ring frame lower member, and yarn guides for the bobbin threads on the upper member of the ring frame, said guides feeding the threads upwardly to the needles, a shaft in the ring frame, a gear on the shaft and a ring gear on the cylinder, said shaft rotating the cylinder, and a pair of cloth take-up rolls in the cylinder, the rolls revolving with the cylinder, and means to rotate the rolls.

4. A knitting machine comprising a main frame, a rotary needle cylinder therein, needles on the cylinder, a fixed ring frame on the main frame and disposed about the cylinder, said ring frame including a pair of vertically spaced annular members with vertical means rigidly connecting the members, each member including an annular track, an annular bearing in each track, said bearings being rotatably mounted on the tracks and supporting the cylinder for rotation, means to rotate said cylinder on the bearings, bobbin spindles on the ring frame lower member, and yarn guides for the bobbin threads on the upper member of the ring frame, said guides feeding the threads upwardly to the needles, a shaft in the ring frame, a gear on the shaft and a ring gear on the cylinder, said shaft rotating the cylinder, and a pair of cloth take-up rolls in the cylinder, the rolls revolving with the cylinder, and means to rotate the rolls, said last-named means including a gear on the cylinder and a fixed ring gear on the ring frame in mesh therewith.

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