R. S. BEAVERS.

CIRCULAR KNITTING MACHINE.

APPLICATION FILED JUNE 18, 1915.

1,255,851. Patented Feb. 12, 1918.

Fig. 1.

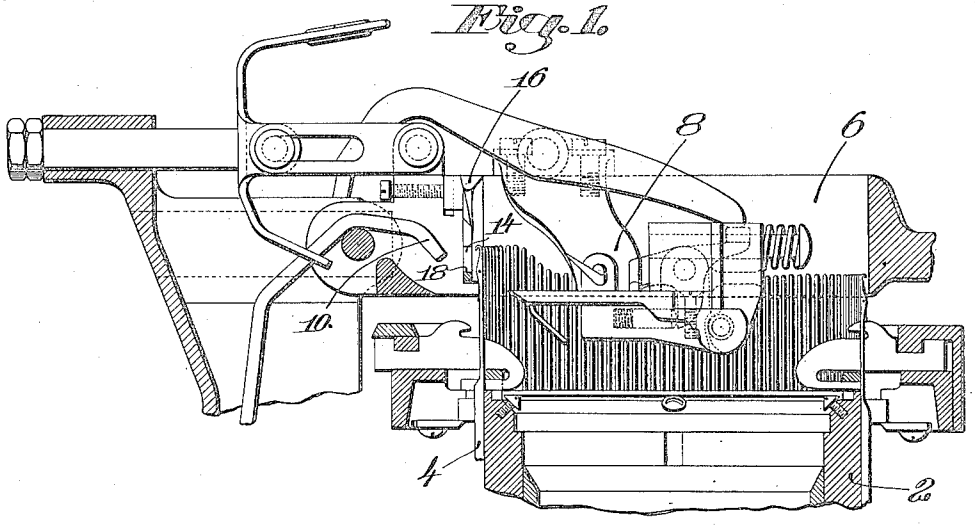


Fig. 4.

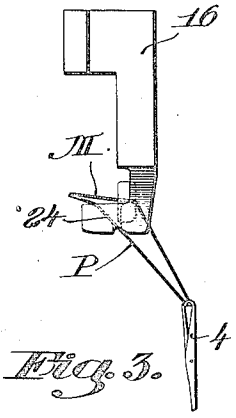


Fig. 2.

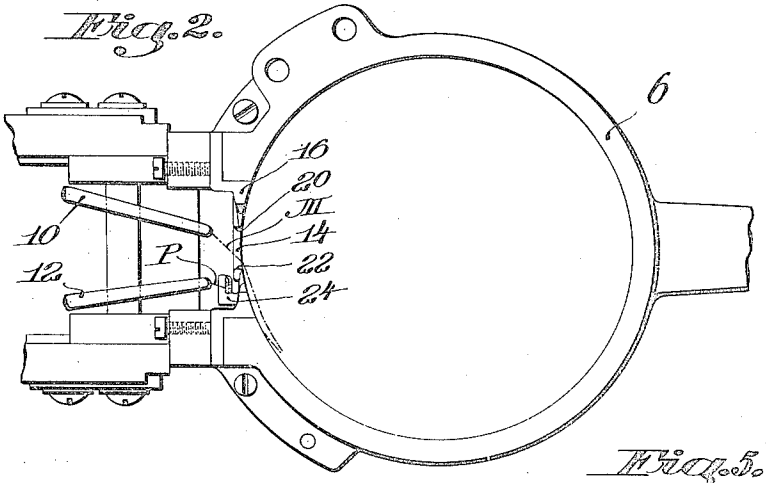


Fig. 3.

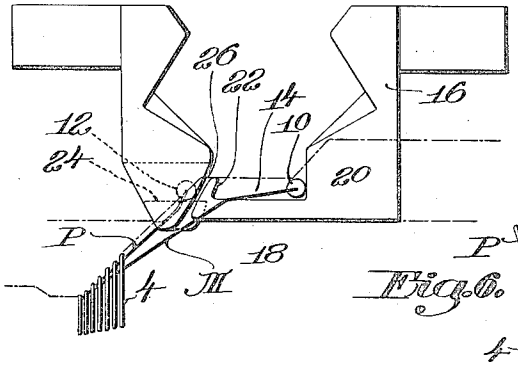


Fig. 5.

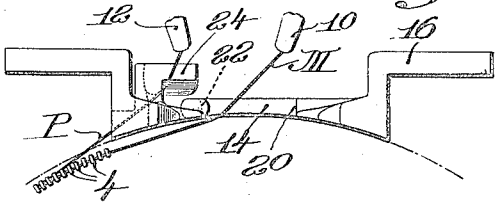


Fig. 7.



Fig. 6.

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CIRCULAR-KNITTING MACHINE.

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Application filed June 18, 1915. Serial No. 34,847.

To all whom it may concern:

Be it known that I, ROBERT S. BEAVERS, a citizen of the United States, residing at Pawtucket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Circular-Knitting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to circular knitting machines such as are used in knitting seamless hosiery, and more particularly to yarn feeding mechanism for such machines.

In doing certain classes of work upon these machines a yarn which should appear on the face of the finished fabric is fed to the needles with the other yarn or yarns and it is the object of the present invention to provide novel and improved means for feeding the yarns in such manner that the uniform location of the yarns in the fabric will be insured.

To this end the invention contemplates the provision in a circular latch needle machine of a novel and improved yarn feeding means constructed and arranged to maintain a radial separation of the yarns until they enter the hooks of the needles. By thus arranging the yarn feeding means the uniform relation between the yarns as they are drawn through the loops of the preceding course requisite for accurate and successful plating is insured. It is preferred to so arrange the guides that the yarns from the guides will pass into the needle hooks from the shank and latch sides, respectively, and will thus invariably assume their proper relative positions in the hooks without danger of interference or disarrangement.

In embodying the broader invention in a machine provided with a plurality of yarn carriers by which the various yarns now usually used in knitting stockings may be inserted and withdrawn, certain further features of invention have been employed which will be hereinafter described and set forth in the claims.

Various features of the invention will be understood from an inspection of the accompanying drawings and the following detailed description of the mechanism illustrated therein.

In the drawings: Figure 1 is a sectional elevation showing so much of a circular knitting machine as is necessary to illustrate the application of the present invention thereto; Fig. 2 is a detail plan view showing the latch ring throat plate and yarn carriers; Fig. 3 is a front view showing the throat plate and the lead of two of the yarns; Fig. 4 is a similar side view of the throat plate; Fig. 5 is a similar plan view; and Figs. 6 and 7 are diagrammatic views indicating the manner in which the yarns enter the needle hooks.

In the drawings the invention is shown as embodied in a rotary needle cylinder machine adapted for knitting fashioned seamless stockings or half hose. The needle cylinder which is indicated at 2 is provided with the usual radial slots in which the latch needles 4 are mounted. The needle cylinder is rotated and reciprocated and the needles are operated and controlled by cams and pickers in the usual manner. The upper ends of the needles are surrounded by a latch ring 6 within which is mounted a yarn holding and cutting mechanism indicated at 8 which coöperates with the yarn carriers in introducing and withdrawing the various yarns during the knitting. Only two of the yarn carriers are shown, the yarn carrier 10 being intended to illustrate one of the carriers for delivering yarn to the main feed throat, while the carrier 12 illustrates a carrier for delivering yarn to the auxiliary feed throat. The carriers are raised and lowered to withdraw or insert the yarns carried thereby by suitable mechanism not shown.

The yarn M is led to the needles through a main feed throat 14 formed in a throat plate 16 which is secured in fixed position in the latch ring. The feed throat 14 is provided with a yarn guiding surface 18 over which the knitting yarn or yarns lead directly to the needles and is also provided with the end walls 20 and 22 which confine the yarns to the guiding and supporting surface 18 and form shoulders at the opposite ends of the guiding surface across which the knitting yarn may lead during the knitting, either rotary or reciprocatory. A yarn P leads from a yarn carrier 12 through an auxiliary feed throat 24 directly to the needles. The feed throat 24, in the construction shown, is formed by a yarn guiding finger or projection on the outer side of the

throat plate shaped to form a yarn retaining notch through which the yarn passes directly to the needles. The throat plate is provided with a slot 26 leading to the auxiliary feed throat 24 from a point directly above the end wall 22 of the main feed throat 14. The yarn P passes through this slot when the yarn carrier 12 is raised or lowered to withdraw or insert the yarn.

The auxiliary feed throat which forms the yarn guide from which the yarn P leads directly to the needles is arranged to the rear of the main feed throat 14 and is also arranged at a greater radial distance from the needles so that the yarn P leads to the knitting point at a steeper inclination than the yarn M and is also separated radially from the yarn M until the yarns are substantially at the knitting point and are within the hook of the needle which is about to draw the yarns through the loop of the previous course. By reason of the arrangement of the feed throats which form the yarn guides from which the yarns lead directly to the needles, the yarn M draws against the shanks of the needles while the yarn P is free of the needle shanks and is in position to lie against the latches of the needles when they have been closed, as indicated in Figs. 6 and 7. In passing into the needle hooks, therefore, the yarn P passes up the latch and into the hook from the latch side, while the yarn M passes up the shank of the needle and into the hook from the shank side. The proper relation of the yarns within the needle hooks when the needles draw the new loops through the loops of the previous course is thus insured with a resulting accuracy and uniformity in the relative positions of the yarns in the fabric.

While it is preferred to employ the specific construction and arrangement of parts shown and described, it will be understood that this construction and arrangement is not essential to the broader features of the invention and may be varied and modified as found desirable or best suited to the construction of the machine in which the invention is to be embodied.

Having explained the nature and object of the invention and specifically described one construction in which it may be embodied, what is claimed is;—

1. A circular knitting machine, having, in combination, a needle cylinder, vertically movable yarn carriers, a throat plate having a main feed throat provided with a guiding surface over which yarn leads directly to the needles, and having an auxiliary feed throat through which yarn leads from a carrier directly to the needles arranged to the rear of the main throat and a greater radial distance from the needles, and a slot through which yarn may be introduced or withdrawn from the auxiliary throat by the vertical movement of a carrier.

2. A throat plate for circular knitting machines having a main feed throat provided with a yarn guiding surface and shoulders at the end of the surface, an auxiliary feed throat radially outside the main throat, and a slot through which yarn may pass to and from the auxiliary throat.

3. A throat plate for circular knitting machines provided with a main feed throat 14 having a yarn guiding surface 18 from which the yarn passes directly to the needles and end walls 20 and 22, an auxiliary feed throat 24 on the outer side of the throat plate, and a slot 26 leading to the auxiliary feed throat from above the end wall 22.

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