A. M. PIGEON.

NEEDLE CARRIER FOR KNITTING MACHINES.

APPLICATION FILED JUNE 6, 1916.

1,230,322.

Patented June 19, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

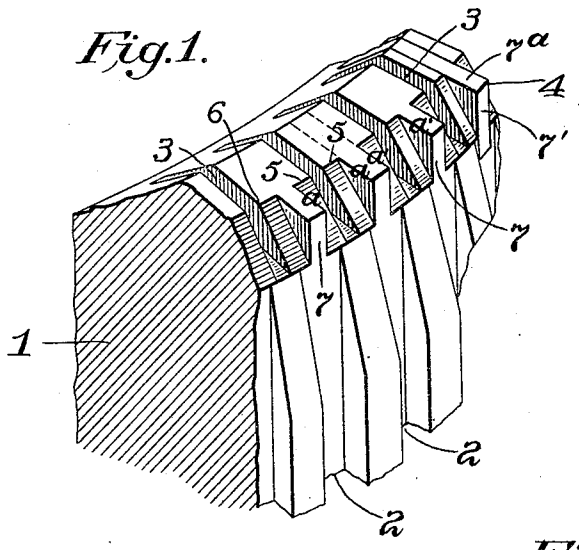


Fig. 2.

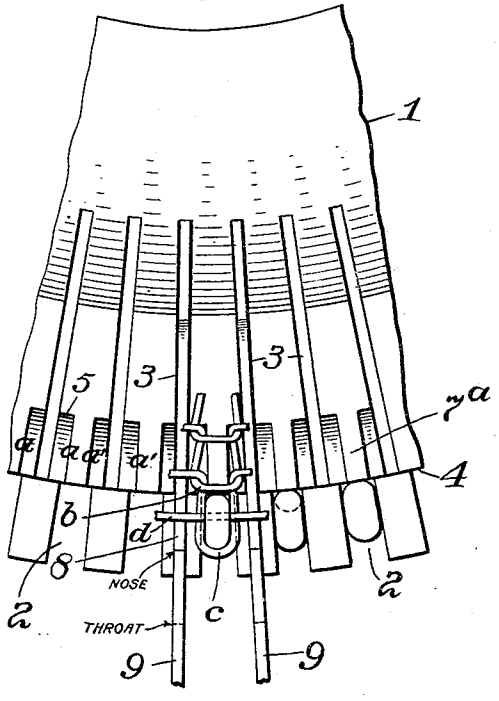
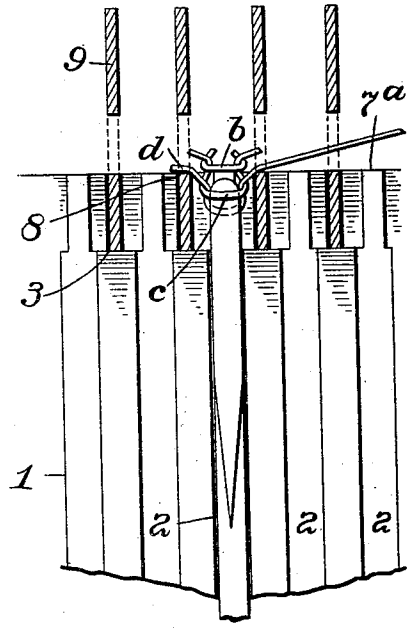


Fig. 3.



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2 SHEETS—SHEET 2.

Fig.4.

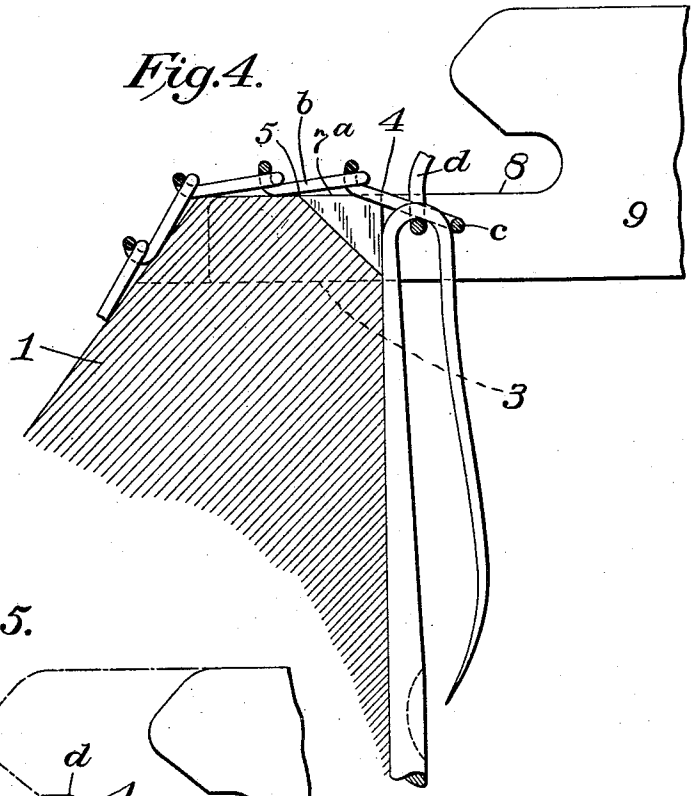


Fig.5.

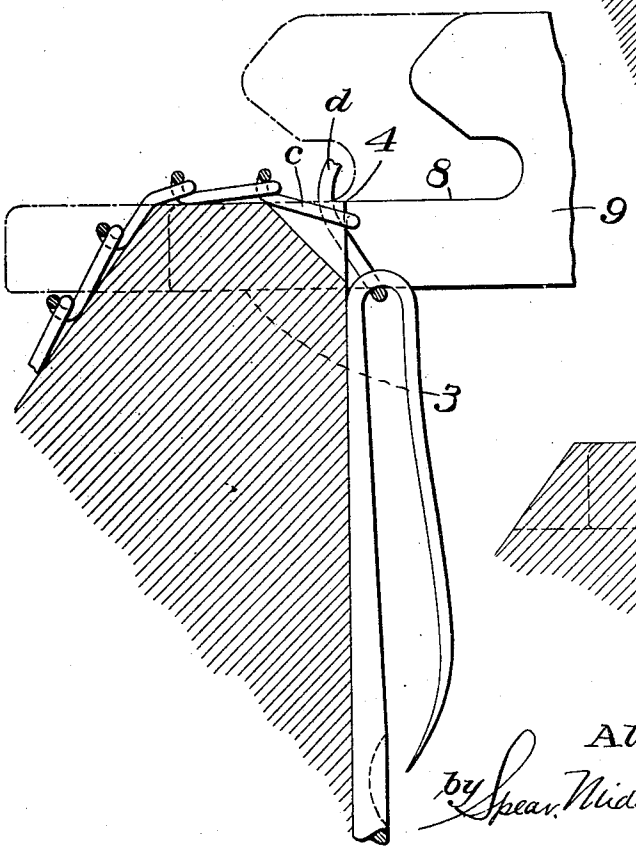
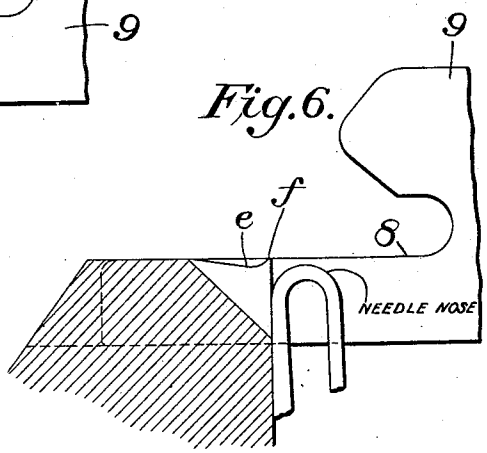


Fig.6.



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UNITED STATES PATENT OFFICE.

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NEEDLE-CARRIER FOR KNITTING-MACHINES.

1,230,322. Specification of Letters Patent. **Patented June 19, 1917.**

Application filed June 6, 1916. Serial No. 101,984.

To all whom it may concern:

Be it known that I, ALBERT M. PIGEON, a citizen of the United States, residing at Norristown, Pennsylvania, have invented certain new and useful Improvements in Needle-Carriers for Knitting-Machines, of which the following is a specification.

The purpose of my invention is to provide a needle carrier with means to facilitate casting off needle loops in knitting operations. The invention can be used in all classes of knitting machines, having spring beard or latch needles, circular or straight bar machines with a single row or double row of needles for knitting rib fabrics and it is applicable to sinker fed knitting machines or direct feed equally well.

For convenience of description I will refer in the following specification to needle cylinders and will also use the broader term needle carrier but in any event I do not wish to be understood as limiting the scope of the invention to any particular form of needle carrier.

Needle carriers or cylinders as is well known are provided with vertical grooves in which the needles slide and the tops of the cylinders, where web holders are employed, are provided with grooves in line with the spaces between the needle grooves and these top grooves receive the web holders to guide them in their movements.

It has been found that in the case of fine gage machines the yarn being fed to the needles sometimes falls or is dragged into the web holder groove and the needle as it retracts because of the restraining influence of the trapped new yarn fails to fully shed the old loop and a tuck stitch in due course will be formed by the needle passing upward and taking thread for forming another stitch without first having cast off the old loop.

The needle cylinder construction of the present invention effectually prevents the yarn from becoming trapped in the web holder groove.

A further feature of the invention concerns the provision of a support for the fabric loop which greatly assists in drawing the new loop through the old loop without relying on the web holder to assist in the knocking off action.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a perspective view of a portion of the top of a needle cylinder which is representative of any needle carrier or bed to which the invention is applicable.

Fig. 2 is a plan view of Fig. 1 of a diagrammatic character showing needles, web holders and a part of the knitting.

Fig. 3 is a front view of Fig. 2.

Fig. 4 is a sectional view of the needle carrier with the needle, web holder and a part of the knitting, the position of the parts being that assumed by them when the old loop is about to be cast off.

Fig. 5 is a view like Fig. 4 with the needle at the limit of its downward stroke having drawn the new stitch and cast off the old loop.

Fig. 6 is a view similar to Fig. 5 showing a slight modification.

The needle carrier or cylinder 1 has vertical needle grooves 2 of substantially ordinary form and transverse slots 3 in planes between the needle grooves for the reception of the web holders, as in ordinary practice.

The top of the cylinder has the usual abrupt angle at its verge 4 but instead of this verge or edge reaching clear up to the web holder groove or slot the verge of the cylinder is cut away, leaving wide spaces between the edges, a, a, a', a', these recesses having inclined bottoms reaching up from the cylinder verge to a point considerably back thereof at 5. The web holder slots open into these wide spaces, and therefore the mouth or end of the web holder slot or groove at its top is also considerably in rear of the verge of the cylinder and the plane of the needles, that is to say the point 6 is some distance back from the verge of the needle carrier and therefore when the web holder is in the groove the end of the crevice between the upper part of the web holder and its guiding wall will be located so far back from the verge where the needles are located that the new yarn in running to the needles cannot catch in the mouth or end of this crevice. The slots are widened as just stated at the verge of the cylinder, leaving a standing wall 7 back of the needle of

a thickness equal to or considerably less than that of the needle. This wall may be made a part of the cylinder or it may be provided by inserted tempered steel bits 7′ as desired. The purpose of this standing wall is to support on its upper surface 7ª the fabric loops as at *b*, Figs. 2 and 4, or to hold up the loop *c* which has just been cast off as shown in Fig. 5.

The newly supplied yarn *d* which is intended to be drawn through the old needle loop *c* is free from any support afforded by the cylinder verge, it being supported solely by the fabric supporting surface 8 of the web holder 9 and the old loop on the needle. The web holder is not required to exert any knocking over action whatever, and the new yarn can be freely drawn through the old loop.

In order to draw the new loop through the old loops a weight or takeup is required to pull the fabric away from the needles. Briefly stated in the new structure the needle carrier verge at points lying between the needles is cut away back to a depth sufficient to avoid any support by the cylinder for the new yarn and a wall or tooth 7 stands behind the needle to support the fabric loop.

The bottoms of the spaces *a*, *a*, *a′*, *a′* are made inclined for convenience. These recesses or spaces however, may be made of rectangular form as well.

The support 7ª serves to sustain the loop which has just been cast off as in Fig. 5 against undue downward deflection, while the new yarn is being drawn therethrough and therefore this new yarn as it goes through the old loop is bent downwardly from a substantially horizontal plane at a sharp angle, approximately a right angle. Without this fabric supporting surface the downward movement of the needle in drawing the new yarn through the old loop would drag the old loop downward, and this downward drag would occur in varying degree, more, for instance, in the case of a needle not quite as smooth as another. The old loop which is dragged down the lowest will allow the new yarn to reach the needle along a path inclining downward and as this path would be shorter than the right angular path above mentioned, this new loop on being drawn through the old loop of extreme downward deflection would be much shorter than a new loop drawn through an old one sustained at a higher level against downward deflection. With the fabric supports 7ª back of the needle the fabric loops have a uniform and minimum deflection and as the needles all go down to a definite level the new loops will all be of a uniform length. From the above, it will be seen that the specific means which I employ for preventing the supply yarn from being trapped in the crevice between the web holder and its guiding wall consists, in the particular example of my invention illustrated, of the recess as *a*—*a* which locates the mouth of this crevice sufficiently far away from the needle cylinder verge and the point where the new yarn is fed, to avoid this new yarn being caught but it will be understood that means other than the recess may be used to prevent the trapping of the new yarn in the web holder groove.

In Fig. 6 a depression is formed in the cylinder top near the verge thereof at *e* and this provides a shoulder at *f* to hold the fabric loop against displacement, due to the drawing of the new stitch. Heretofore the new yarn has been prevented from being trapped in the web holder grooves by locating the lower surfaces 8 of the web holders in a plane above the top of the needle cylinder in which the web holder grooves are made, but this is objectional because of the extra wide sinker wales which are thereby produced. By my invention the lower surfaces 8 of the web holders can be in the same plane with the top of the cylinder and the objection just noted will be avoided, and at the same time the new yarn will not be trapped.

What I claim is:—

1. A needle carrier having grooves for needles and grooves for web holders, with means forming a part of the needle carrier structure adjacent the verge for preventing the new yarn becoming caught in the web holder grooves, substantially as described.

2. A needle carrier having needle grooves with supports at the verge of the same for the needle backs and the old fabric loops, with spaces between said supports extending rearwardly of the plane of the verge and web holder grooves opening into said spaces, substantially as described.

3. A needle carrier having grooves for the needles and grooves for instruments and recesses at the verge of the carrier into which the last mentioned grooves open, said recesses being in the carrier in rear of the plane of the needle backs, substantially as described.

4. In combination a needle carrier having guide grooves for needles and guide grooves for web holders, the lower fabric supporting surfaces of the web holders being no higher than the top of the carrier, and means forming a part of the needle carrier structure to prevent the yarn catching in the grooves of the web holders, substantially as described.

5. In combination a needle carrier having guide grooves for needles and guide grooves for web holders, the lower fabric supporting surfaces of the web holders being no higher than the top of the carrier, and means to prevent the yarn catching in the grooves of the web holders, said means consisting of

the recesses at the verge of the carrier into which the web holder grooves open, substantially as described.

6. A needle carrier having grooves for needles and grooves for web holders, with recesses at the verge of the carrier into which the web holder grooves open and projections between the recesses, of substantially right angular form the vertical faces of said projections furnishing supports for the needle backs and the horizontal face affording supports for the fabric loops.

7. A needle carrier having grooves for needles and grooves for web holders with recesses at the verge of the carrier into which the web holder grooves open and projections between the recesses, said projections furnishing supports for the needle backs and also affording supports on their upper sides for the fabric loops, the upper sides of said projections having each a stop or shoulder adjacent the verge to resist outward movement of the old fabric loops under the draft of the yarn in forming a new loop.

8. A needle carrier having needle grooves and a carrier verge having needle and fabric supporting walls at the back of the needle of approximately the needle width and spaces for the relief of the new yarn alongside said walls, said spaces being in rear of the plane in which the needles operate.

9. A needle carrier having grooves for needles and grooves for web holders with recesses at the verge of the carrier into which the web holder grooves open and projections between the recesses, said projections furnishing supports for the needle backs and also affording supports for the fabric loops, substantially as described.

In testimony whereof, I affix my signature.

ALBERT M. PIGEON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."