(No Model.) 2 Sheets—Sheet 1.

F. BUCKHALTER.

CIRCULAR KNITTING MACHINE.

No. 510,401. Patented Dec. 12, 1893.

Fig. 1.

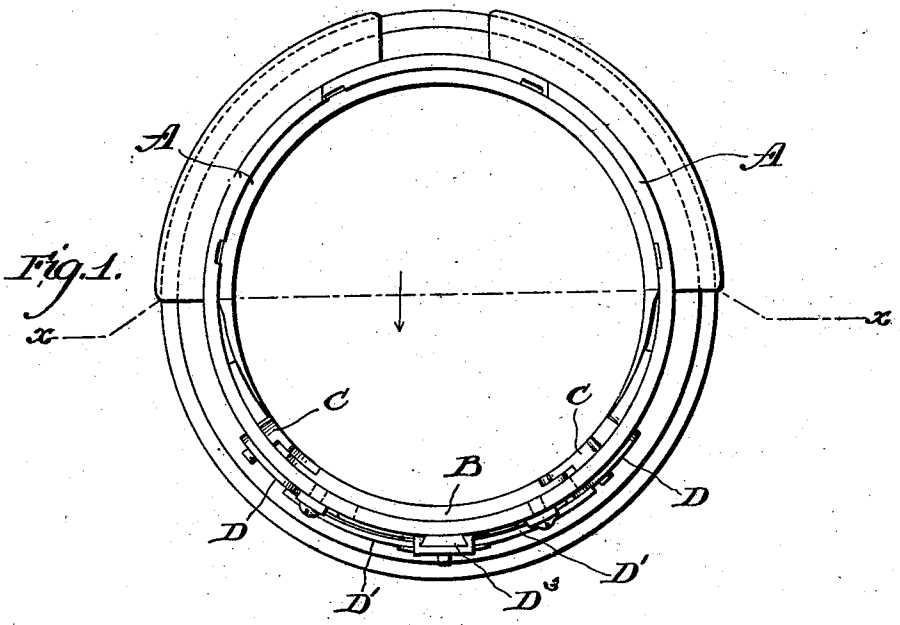


Fig. 2.

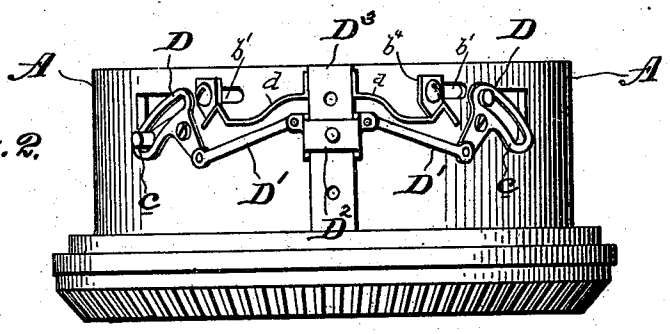
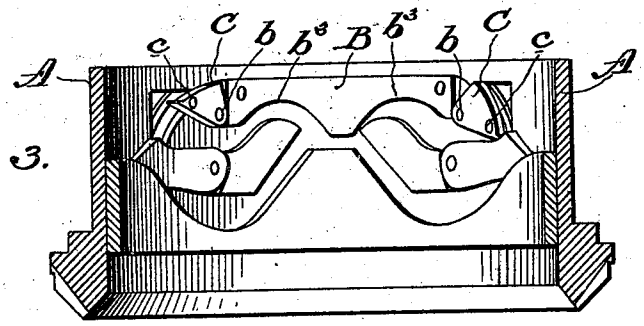


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

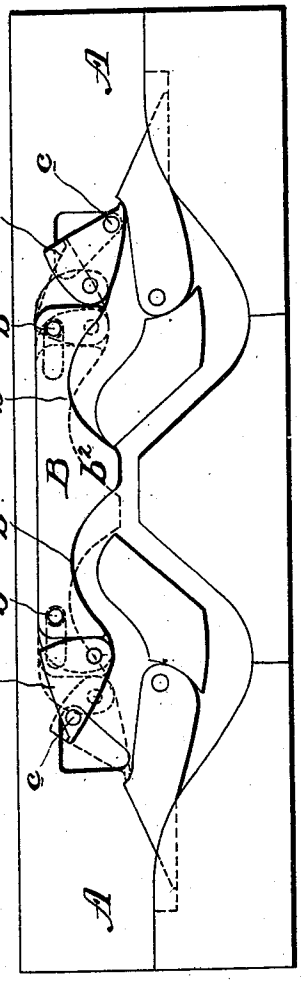
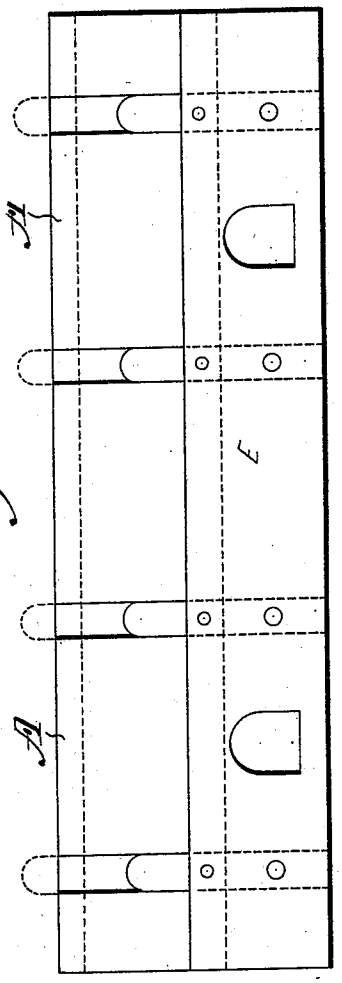


Fig. 5.



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FREDERICK BUCKHALTER, OF ASHBOURNE, PENNSYLVANIA.

CIRCULAR-KNITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 510,401, dated December 12, 1893.

Application filed February 21, 1893. Serial No. 463,205. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK BUCKHALTER, a citizen of the United States, residing at Ashbourne, county of Montgomery, and State of Pennsylvania, have invented a new and useful Improvement in Circular-Knitting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to certain mechanism in connection with the knitting or cam cylinder for use when the goods are to be narrowed down, as, for instance, when the heel or toe of the stocking is to be formed.

It consists in certain mechanism connected to the knitting or cam cylinder to accomplish this result, which will hereinafter be fully described.

In the drawings: Figure 1 is a plan view of the cam cylinder. Fig. 2 is a front elevation of the same. Fig. 3 is a section on the line *x*—*x*, Fig. 1, looking in the direction of the arrow. Fig. 4 is a diagram of the knitting cams on a flat surface. Fig. 5 is a diagram of the semi-circular plate for moving certain needles out of action.

A is the knitting or cam cylinder. Within the cam cylinder is the plate B, secured to said cylinder by pins *b*, which pass through the slots *b'*, the pins *b* having V-shaped heads b^4 which secure them in the slots. Secured to the post D^3 are the springs *d*, which, at the points where they come in contact with the heads are in the shape of an inverted V. The plate B has its central portion, b^2, downwardly extending, and on each side of said central portion is the cut-out portion, b^3, so that from one side to the other is, first, a gradual upward incline, next a gradual downward incline—the same from the other side. Pivoted to said plate B on each end are the cams C, which are controlled by pins *c* passing through slots in the cylinder. Said pins also pass through the slotted links D on the exterior of the cylinder. Rods D' connect the links with the plate D^2, sleeved upon the post D^3. When said plate D^2 is pushed down, said links are pushed up, thus lifting the cams C out of operation. When the plate D^2 is pushed up, the links are depressed, thus permitting the cams C to assume either of the two positions shown in Fig. 4. It will be observed that when the links D are in the position shown in Fig. 2, the movement of the plate B to the left will move the cams C on the left hand side to the left; the pin *c* will travel obliquely downward in the slot of the link D, and give the cam C, in addition to its horizontal movement, a downward movement on its pivot, the slot of the link D thus acting as a guide for its corresponding needle-picking cam C to bring the latter into a position to be acted upon by one of the needles, as I will now describe. When the cylinder is reciprocated, as is the case when narrowing the knitting, the needle strikes one of the cams C, and while riding over it, moves it upward on its pivot point and moves the plate B in the direction of the travel of the needle, causing the cam C at the other end of the plate B to move down (by virtue of the pin *c* and slot in the link D) into a position to be acted upon; the remaining needles pass under the plate B. The heads b^4, while the plate B is moving, depress the springs *d*, which quickly spring back into place after the heads override the points of the "V," thus preventing the displacement of the plate B and the cams C from the new position, which, as just described, they are caused to assume. On the movement of the cylinder in the other direction, the first needle on the other side strikes the cam which has been brought into a position to be acted upon as above described, riding over it, and moving the plate B in a direction opposite to that in which the first movement caused it to move, and bringing the other cam once more in a position to be acted upon; the remaining needles, as before, passing under plate B. When the desired number of needles are thrown out of action, the plate D^2 is pushed down, throwing both cams C out of operation.

In Fig. 5 I show the semicircular needle lifting cam E for moving half the needles out of action, which is done just before commencing to knit the heel of a stocking. This cam is fully described in the patent to Diebel, No. 483,954, dated October 4, 1892, and forms no part of my invention.

I claim—

1. The combination with the cam-cylinder

of a plate adapted to move upon the cam cylinder, and a needle picking cam pivoted to each end of said plate.

2. The combination with the cam cylinder of a plate adapted to move upon the cam cylinder, a needle picking cam pivoted to each end of said plate and means substantially as described to throw said cams out of action.

3. The combination with the cam cylinder of a plate movable thereupon, a needle picking cam pivoted to each end of said plate, one of which is adapted to be in line of movement of the needles and guides for said cams, substantially as and for the purpose described.

4. The combination with the cam cylinder of a plate movable thereupon, a needle picking cam pivoted to each end of said plate, one of which is adapted to be in line of movement of the needles, guides for said cams, and means to throw said cams out of action, substantially as and for the purpose described.

5. The combination with the cam cylinder of a plate secured to said cam cylinder by pins passing through slots in said cylinder, and a needle picking cam pivoted to each end of said plate.

6. The combination with the cam cylinder of a plate secured to said cam cylinder by pins passing through slots in said cylinder, a needle picking cam pivoted to each end of said plate, and means substantially as described to throw said cams out of action.

7. The combination with the cam cylinder of a plate, said plate being adapted to move upon the cam cylinder and a needle picking cam pivoted to each end of said plate, a post, a plate sleeved on said post, and links connected with said plate, said cams being guided by pins passing through slots in said links.

8. The combination with the cam cylinder of a plate movable thereupon, a needle picking cam pivoted to each end of said plate, one of which is adapted to be in line of movement of the needles, and means to retain said plate in position when not acted upon by the needles substantially as described.

In testimony of which invention I have hereunto set my hand.

FREDERICK BUCKHALTER.

Witnesses:

FRANK S. BUSSER,

HERBERT A. HALL.