

No. 681,451

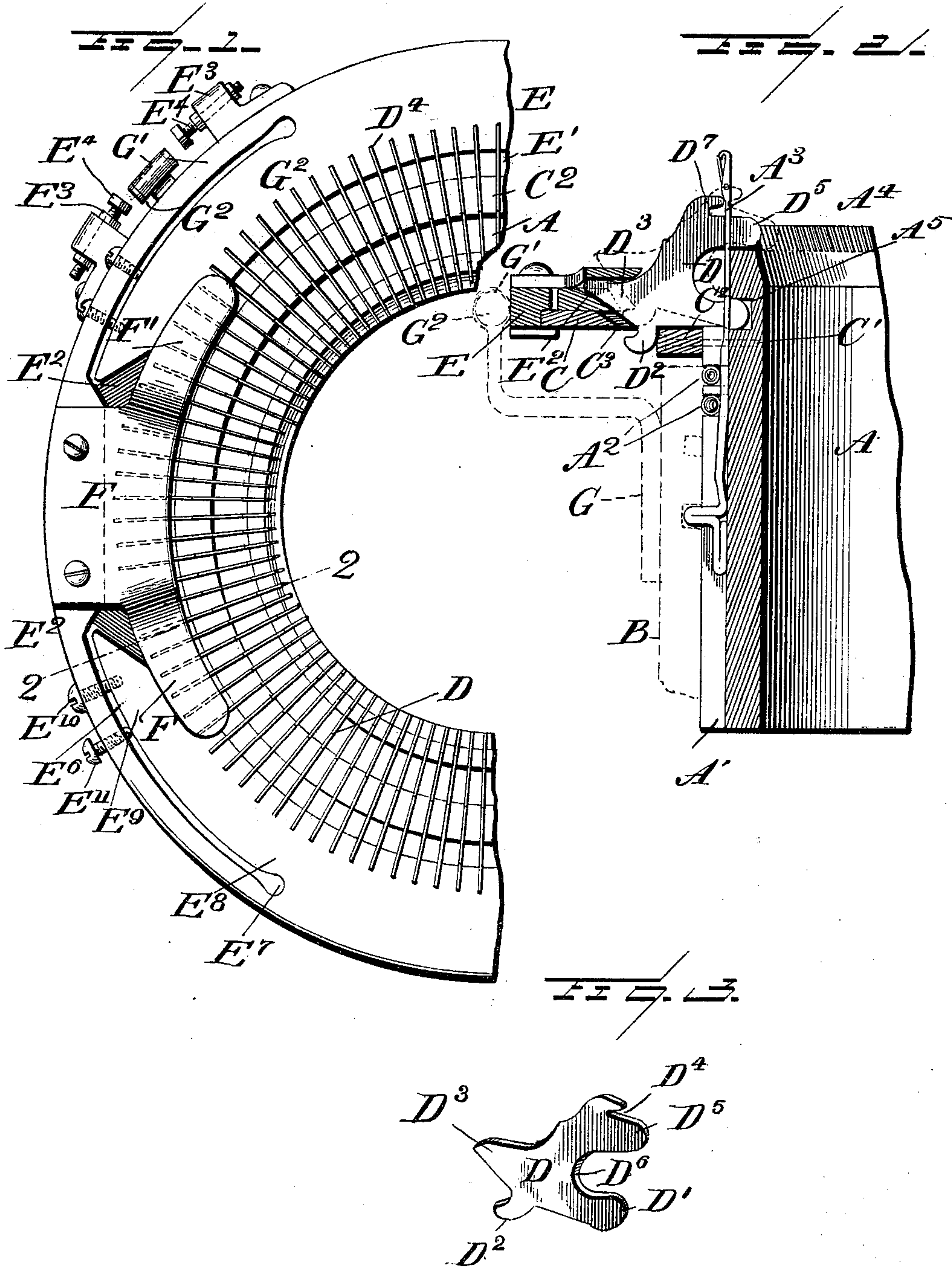
Patented Aug. 27, 1901.

E. A. HIRNER.

PRESSER BIT FOR KNITTING MACHINES.

(Application filed Dec. 22, 1960.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

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KNITTING MACHINE MANUFACTURING COMPANY, OF SAME PLACE.

PRESSER-BIT FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 681,451, dated August 27, 1901.

Original application filed August 29, 1895, Serial No. 560,925. Divided and this application filed December 22, 1900. Serial
No. 40,801. (No model.)

To all whom it may concern:

Be it known that I, EMIL A. HIRNER, a citizen of the United States, residing at Allentown, in the county of Lehigh, State of Pennsylvania, have invented certain new and useful Improvements in Presser-Bits for Knitting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has relation to an improved sinker or presser-bit for knitting-machines and to the manner of mounting and operating the same, so as to cooperate with adjacent elements of the knitting-machine. A material portion of the subject-matter of this invention is taken from my application for patent for a knitting-machine filed August 29, 1895, and serially numbered 560,925 as a division thereof.

20 Among the objects of the invention are to provide a presser-bit which has its support in a direct line opposite the strain or pull of the loop when it is being drawn, whereby less wear occurs and greater accuracy is secured in the operation of the sinker.

25 Another object is to provide an efficient and simple means for adjusting the throw of the sinker to adapt it to differing kinds of work, such as close or loose knit fabrics, and to yarns of different numbers, weights, fineness, or strength.

30 Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

Referring to the drawings, Figure 1 is a partial plan of a knitting-machine provided with my improvements. Fig. 2 is a central vertical section on the line 2 2 of Fig. 1, and Fig. 3 is a perspective of one presser-bit or sinker detached.

45 Like letters of reference indicate like parts throughout the several figures of the drawings.

A represents the needle-cylinder, provided with the usual needle-grooves A', needle-retaining spring-bands A², and needles A³.

50 B represents in dotted lines the usual cam-cylinder.

C represents a presser-bit-supporting ring secured by screws C' or in any other suitable manner to the needle-cylinder A. An annular rib C² is formed upon the ring C and is slotted radially in a series which agrees with the slots A' of the needle-cylinder, but occur intermediate thereof. These radial slots are shown best by line C³, Fig. 2, and have their outer end walls inclined upwardly, as there shown. A similar series of slots A⁴ is formed in the upper edge of the needle-cylinder, so that the slots in the top of the needle-cylinder and in the annular ring serve as guides for the presser-bits.

By referring to Fig. 3 it will be seen that the presser-bit D is made of a thin plate of suitable material. It has a rounded heel D', which serves as the fulcrum of the bit. This fulcrum is pivotally seated in an external annular groove A⁵ in the needle-cylinder, so that the pull or strain on the sinker of a loop when it is drawn comes directly on the heel or fulcrum D'. A depending hook D² and a tail or operating extension D³ are provided, the lower surface of said tail being inclined upwardly for a purpose hereinafter described. The upper outline of the bit comprises a throat D⁴ and a finger D⁵, between which is a recess D⁶, separating the finger from the pivot, so that the finger may move inwardly between the needles. There are required in each knitting-machine as many presser-bits as there are needles, said bits being arranged to project between the needles, as shown.

As thus far described, it will be seen that with the fulcrum D' seated in the annular groove A⁵ of the knitting-cylinder the hook D² rests and will take under the beveled edge of the annular inwardly and downwardly inclined depression E', Fig. 2, and thus serve the function of retaining the bit in operative position without the employment of extraneous bit-retaining devices. In this position it will be seen that the finger D⁵ rests in one of the grooves A⁴ in the top of the needle-cylinder, while the throat D⁴ and the finger will be in position at the side of a needle to perform their intended functions, which are that at the inward movement of the sinker the inner end of the throat pushes the stitch off

from the needle, while the edge of the upper wall of the throat prevents the fabric from rising. (See full and dotted lines in Fig. 2.)

Mounted upon the ring C is a second ring 5 E, having an annular inwardly and downwardly inclined depression E', which is broadened into a cam-like depression E². Over the depression E² there is mounted a plate F, having upwardly-curved arms F' at opposite 10 ends of the plate, which arms and plate project over the extensions D³ of the presser-bits. The outer ring E has upon its periphery abutments E³, each provided with adjustable bolts E⁴, having the usual set-nuts to 15 retain the bolts in an adjusted position in the abutment. A bracket G (see dotted lines in Fig. 2) is secured in any suitable manner to the cam-cylinder B and projected upwardly between the abutments B³ and their bolts and 20 carrying a pad or core G², of leather, rubber, or other suitable material, in the head G' of the bracket G. By this construction as the cam-cylinder is revolved the head of the bracket G contacts with one or the other of 25 the bolts E⁴ and communicates a rotary, or it may be reciprocatory, movement to the outer ring E.

The means for adjusting the extent of the movement of the presser-bit which I have 30 provided consists in forming either integrally or separate from the annular ring E a part adjacent to the cam-like depression E², which part may be moved inwardly or outwardly to increase or decrease the inward movement of 35 the sinker. When formed integral with the ring E, I cut a slot E⁶, terminating in an eye or enlargement E⁷, thereby leaving a connecting portion E⁸, which has sufficient resiliency to permit movement of the portion E⁹ inside 40 of the slot toward and away from the inclined operating extension D³ of the sinker, and I provide adjusting-screws E¹⁰ and E¹¹, the former threaded only in the part E⁹ and the latter threaded only in the adjacent outer por- 45 tion of the ring. Now by loosening the screw E¹⁰ the portion E⁹ may be forced inwardly by the screw E¹¹ and secured in such position by tightening the screw E¹⁰. In this manner any desired adjustment may be secured. When 50 made separately from the ring E, which is desirable to permanently hardening the cam-like extension, a joint of a desired form is provided instead of the eye E⁷. The fulcrum or pivotal point of the presser-bit being lo- 55 cated in the outer surface of the needle-cylinder and the operating extension of the bit being in operative contact with the ring E it will be seen that the pressure-bits are thrown in and out in a very slightly-curved line or 60 arc between the needles as the outer ring is rotated, bringing arms F' of the plate F to bear upon the operating extensions D³, depressing the same into the cam-like depres- 65 sion E², which, being located adjacent and opposite to the needle-cams of the cam-cylinder, produces an action of the presser-bits in time

properly related to the reciprocations of the needles in the operation of forming stitches. As the stitch is drawn the presser-bit moves forward toward the center of the cylinder, and 70 in so doing the resistance to the pull of the loop is at the heel D', as heretofore stated, and the end of the throat D⁴ forces the work from the hook, and as the needle rises in the loop or stitch the upper wall of the throat 75 prevents the fabric from rising, and thus holds the work down, it being understood that the presser-bits are at first held back while the needles are descending by the plate F and the cam-depression E². At other times 80 during the revolution of the ring E the operating extension D³ rides upon the inclined annular depression E' of the ring E, which maintains the finger D⁵ extended inwardly.

While I have shown one manner of mount- 85 ing, connecting, arranging, and operating the improved presser-bit herein shown and described, I do not limit my invention to exact details in such features, as it is apparent that one skilled in the art may devise ma- 90 terially different means for operating said presser-bits, and yet retain material advantages accruing from their form and from the particular means herein shown of mounting and connecting the same. Alterations in other 95 details within the skill of the mechanic are also possible without a material departure from the novel features of my invention.

What I claim is—

1. A presser-bit having its heel below and 100 in the same vertical line with its throated finger and a hook-shaped bit-retaining tail below and outside of the heel; substantially as specified.

2. A presser-bit having its heel and throated 105 finger substantially in vertical line with each other and having an operating extension and a hook-shaped guiding and bit-retaining tail below said extension; substantially as specified. 110

3. The combination with a needle-cylinder having a slotted presser-bit-supporting ring, of a presser-bit having its fulcrum located within the outer surface of said cylinder, and provided with an operating extension and an 115 intermediate tail resting in a slot of the ring and serving to guide the bit; substantially as specified.

4. The combination with a needle-cylinder having a slotted presser-bit-supporting ring 120 and an exterior annular groove, of a presser-bit having its pivotal point of support in said groove and having an operating extension with an intermediate hook-shaped tail resting in a slot in the ring; substantially as specified. 125

5. The combination with a needle-cylinder having a slotted bit-supporting ring and an exterior annular groove, of a presser-bit hav- 130 ing a rounded heel located in said groove, an operating extension and an intermediate hook-shaped tail projecting into a slot in said ring, whereby the heel is retained in the

groove of the cylinder; substantially as specified.

6. The combination with a needle-cylinder having an exterior annular groove, and a slot-
5 ted bit-supporting ring secured to the cylinder, of a series of presser-bits each having a bit-retaining tail and each mounted in a slot of the ring, a bit-operating ring mounted on the bit-supporting ring and having a depression and a covering-plate therefor, and means
10 for rotating said bit-operating ring, whereby the bits are retained in the supporting-ring without the use of extraneous devices and are positively operated by the passing covering-plate and depression and positively held
15 at other times in a radially-immovable position; substantially as specified.

7. The combination with a needle-cylinder having an annular groove, of a presser-bit
20 pivotally mounted in said groove and having an operating extension and a guiding-tail, a slotted bed through which the tail of the bit plays, and a ring supported on said slotted bed and having a recess, and means for de-
25 pressing the operating extension of the bit therein; substantially as specified.

8. The combination with a needle-cylinder having an annular groove, of a presser-bit pivotally mounted in said groove and having
30 an operating extension, a slotted bed through which the tail of the bit plays, a ring supported on said slotted bed and having a depressed portion or recess, and a plate on said ring having inclined arms riding over the ex-
35 tension of the presser-bit; substantially as specified.

9. The combination with a needle-cylinder having an annular groove and a cam-cylinder, of a slotted bed mounted on said needle-
40 cylinder, a bit-operating ring supported on said bed, a connection between the cam cylinder and ring, a presser-bit having a rounded heel mounted in said groove, an extension, a tail between said extension and heel working
45 in the slot of said bed, and a plate mounted on said ring and having inclined arms bear-

ing on the extension of the presser-bit; substantially as specified.

10. The combination of a needle-cylinder, a presser-bit-supporting ring secured thereto, 50
a series of presser-bits each having an operating extension, a bit-operating ring having a cam-like depression, one wall of which is adjustable, and a covering-plate, said operating extension being arranged to pass between 55
the operating-ring and the covering-plate substantially as specified.

11. The combination of a needle-cylinder, a presser-bit-supporting ring secured thereto, a series of presser-bits, each having an oper- 60
ating extension a bit-operating ring having a cam-like depression one wall of which is adjustable, a covering-plate, means for adjusting said wall, and means for securing it in an adjusted position, said operating extension 65
being located above said operating-ring and arranged to pass below said covering-plate substantially as specified.

12. The combination with a series of presser-bits and supporting means therefor, of a bit- 70
operating ring having a cam-like depression and covering-plate, an operating extension projecting from each bit and between said operating-ring and covering-plate, and means for moving said ring, substantially as speci- 75
fied.

13. The combination with a series of presser-bits each having an operating extension and supporting means for said bits, of a bit-oper- 80
ating ring having a cam-like depression, and a surface for holding the operating extensions of the presser-bits in relatively immovable position, and a covering-plate for moving said extensions into the cam-like depression, sub- 85
stantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

EMIL A. HIRNER.

Witnesses:

EDWARD RUHE,
REUBEN J. BUTZ.