# E. VERMILYEA & C. E. NORRIS.

## Knitting Machine Burr.

**No. 229,651.** **Patented July 6, 1880.**

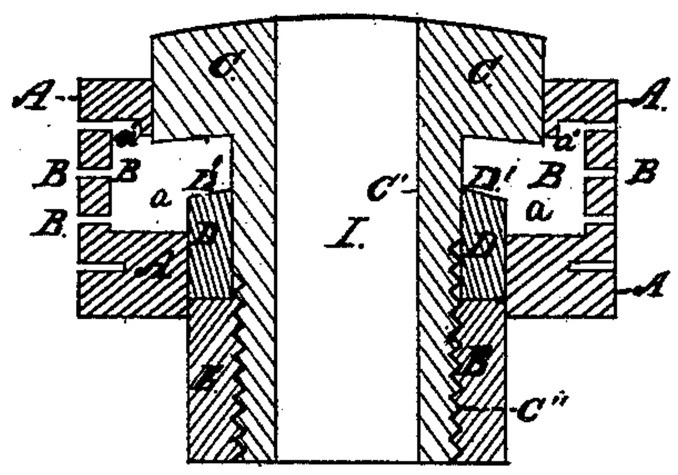


FIG. 1

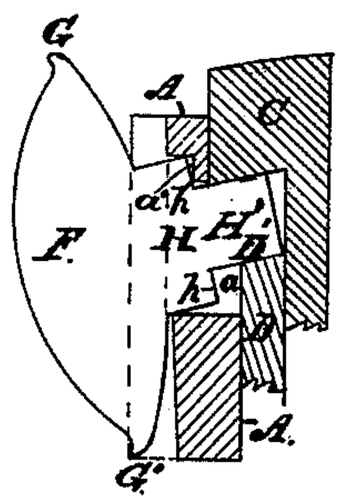


FIG. 2

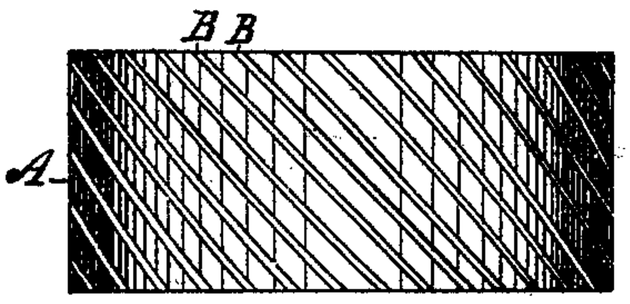


FIG. 3

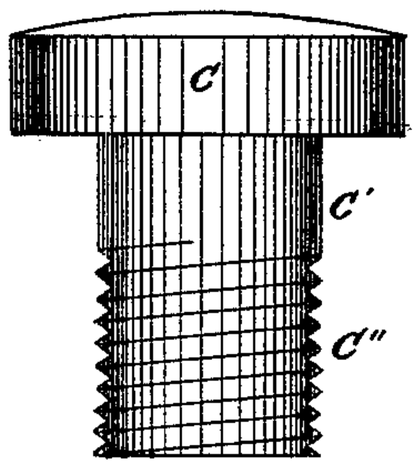


FIG. 4

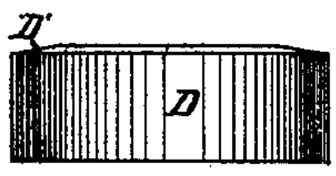


FIG. 5

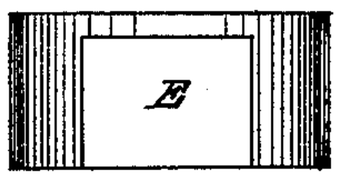


FIG. 6

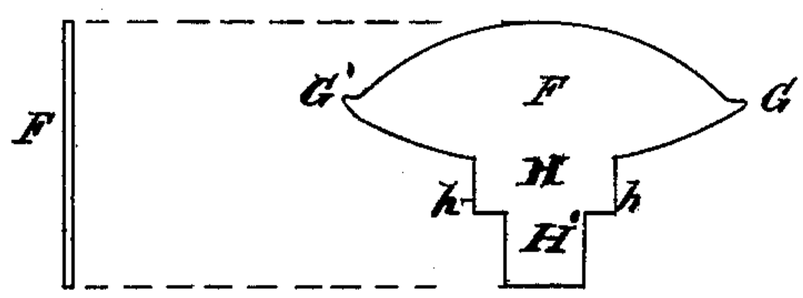


FIG. 7

FIG. 8.

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# UNITED STATES PATENT OFFICE.

EUGENE VERMILYEA AND CHARLES E. NORRIS, OF MILLBURY, ASSIGNORS OF ONE-THIRD OF THEIR RIGHT TO JONATHAN LUTHER, OF WORCESTER, MASSACHUSETTS.

## KNITTING-MACHINE BURR.

SPECIFICATION forming part of Letters Patent No. 229,651, dated July 6, 1880.

Application filed March 31, 1879.

*To all whom it may concern:*

Be it known that we, EUGENE VERMILYEA and CHAS. E. NORRIS, of Millbury, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Knitting-Machine Burrs; and we 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

Our invention relates to an improvement in the burrs for rotary knitting-machines, its object being to reduce the expense of repair when a hook is broken off or worn out and to give the blade a firm seat in the hub.

Knitting-machine burrs have heretofore been provided with blades formed with one end hooked, and when the hook is broken off or worn out the blade is of no further use, and must be replaced by a new one.

In our improved burr each blade has a knitting-hook at both ends and a shank projecting from midway its back edge, the front edge being of such shape that when the back edge is placed in its slit in the hub and snugly upon its seat one of the hooks will stand in proper position for work and the other will be embraced and protected by the slit.

The hub is provided with the usual oblique slits in its outer periphery, and these slits are intersected by an interior groove, through which pass the shanks of the blades, said shanks being clamped edgewise between a flange of the bushing which fits in the hub and the edge of a washer fitting upon the shank of said bushing, and held in place by a clamp-nut fitting upon a screw-threaded portion of said shank. The shanks of the blades have shoulders at opposite edges, intermediate of their lengths, and the slits in the hub are deepened at one side of the intersecting groove to form seats for those shoulders, so that when the blade is in place its back edge rests upon the bottom of the slit on the inner side of the groove and one of the shoulders of its shank rests upon the seat formed for it on the other side of the groove, thus causing the outer end of the blade to project with its hook in a working position, as will be hereinafter more fully described with reference to the drawings illustrating our invention.

Should one of the hooks be broken off or worn out in use, it is only necessary to reverse the endwise position of the blade, when a new hook will be presented for use. So it will be observed that one blade of our improved construction is equal in utility to two of the old form, and by having a central shank with a seat on both sides of it the blade is more steadily and firmly held in the hub than are blades seated on a straight edge, or a seat on one side only of a shank.

Our invention consists, first, in a knitting-machine burr-blade tapering both ways from the middle and having a knitting-hook formed at each end and a central shank projecting from its back edge, so that when placed in the hub with one hook projecting in a working position the other will be embraced by the blade-slit of the hub, and said blade will have a seat on opposite sides of its shank, as hereinafter more particularly described.

It consists, further, in the combination of a series of such blades having properly-shouldered shanks with an obliquely-slitted hub provided with suitable seats for the back edges of the blades and for the shoulders of their shanks, and clamping devices for engaging the shanks and holding the blades in place, all as more fully hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 represents a longitudinal section of a burr-cylinder. Fig. 2 is a section of the same on the line of one of the oblique blade-slits, the blade being shown in working position. Fig. 3 is a peripheral view of the hub provided with the oblique slits which form the blade-seats. Fig. 4 is a side elevation of the bushing, which is an element of the clamping device. Fig. 5 is a side elevation of the washer, which is also an element of the clamping device. Fig. 6 is an edge view of the clamping-nut. Fig. 7 is an edge view, and Fig. 8 a side view, of one of the blades detached.

A denotes the hub, having slits B B cut ob-

liquely across the periphery and extending in and through an inner narrow annular groove, *a*, which is just wide enough to admit the narrower portion H′ of the shank of the blade and one of the shoulders *h* of said shank, the other shoulder being intercepted by the seat *a′*, formed at one side of the groove by deepening the slit. The said narrower portion H′ of the shank is thus caused to extend obliquely inward through the hub in position to be clamped edgewise between the bearing D′ of the washer D and the flange C of the bushing. The washer D is held to place by the nut E on the screw C″ at the end of the bushing.

G and G′ denote the knitting-hooks, one at each end of our blade F, which is adapted to be used either end to the work in the knitting-burr, so that when one hook is worn out or defective the blade can be turned so as to present the new or perfect hook.

While one hook is in position for work, as shown at G in Fig. 2, the other, as at G′, is embraced by the slit and protected from accidental breakage and prevented from catching the yarn.

Another advantage of this form of blade is, that it gives a firmer and better bearing in the hub, on account of having a seat on both sides of its shank.

Blades are struck out with a die under a press and finished by simply rattling; hence it costs no more to make our blade with a double hook than to make a blade with only one hook.

What we claim is—

1. A knitting-machine burr-blade tapering both ways from the middle, and having a knitting-hook formed at each end and a central shank projecting from its back edge, said blade being adapted for use substantially as set forth.

2. The combination, with a series of reversible blades, F, having knitting-hooks at each end and central shanks provided with shoulders *h*, of the hub A, having the oblique slits B, interior groove, *a*, and seat *a′*, the bushing having the flange C, the washer D, and clamp-nut E, substantially as described.

In testimony that we claim the foregoing we have hereunto set our hands and seals this 25th day of March, 1879.

EUGENE VERMILYEA. [L. S.]
CHARLES E. NORRIS. [L. S.]

Witnesses:
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R. C. CUNNINGHAM.