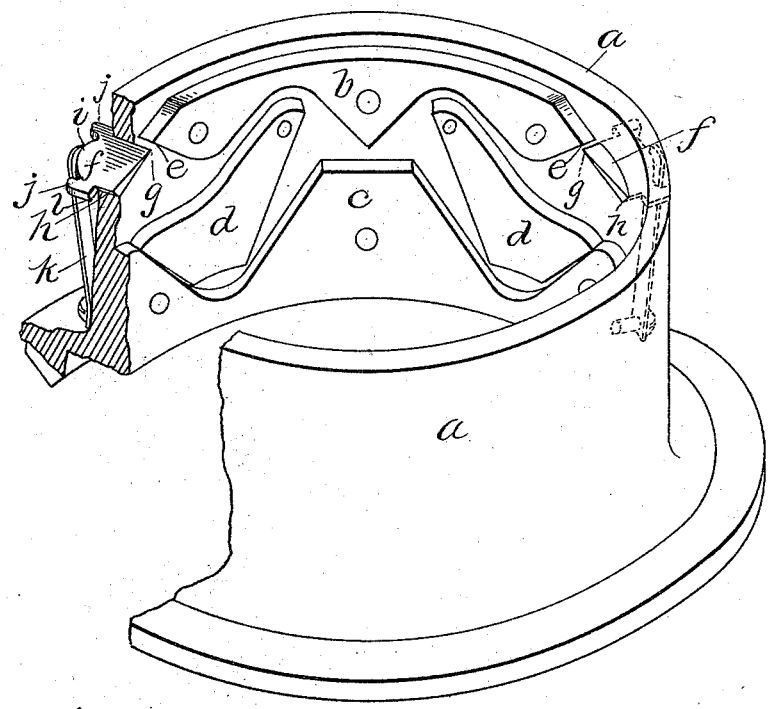
(No Model.)

G. H. COBURN.

CAM GUARD FOR KNITTING MACHINES.

No. 493,909. Patented Mar. 21, 1893.

Fig. 1.



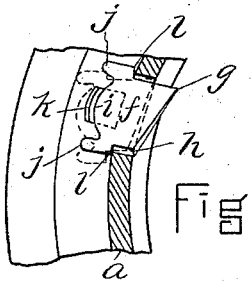


Fig. 2.

Fig. 3.

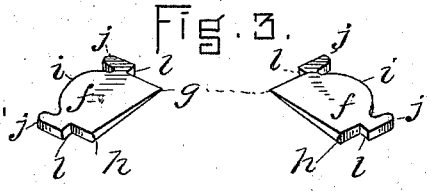
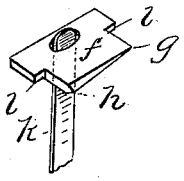


Fig. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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CAM-GUARD FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 493,909, dated March 21, 1893.

Application filed October 3, 1892. Serial No. 447,652. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. COBURN, of Laconia, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in Cam-Guards for Knitting-Machines, of which the following is a specification.

This invention has relation to cam cylinders and cam bars of knitting machines in which the needles are reciprocated in order to form stitches and in which also certain of the needles are at times rendered inoperative by moving the shanks or heels of the needles out of the orbit or path of the needle-actuating cams.

It is the object of the invention to provide efficient and certain means for guarding the stationary cams against being struck by the needle shanks in such manner as to break or damage the cams, the needles, or the fillets of the needle cylinder or bar.

To these ends the invention consists in providing the cam cylinder or bar with guard-cams arranged in proximity to the stationary cams, which guard cams are pivotally arranged and bodily movable in the cam cylinder or bar, all as is hereinafter fully described and distinctly pointed out in the claims.

Reference is to be had to the annexed drawings, and to the letters marked thereon, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings—Figure 1 is a perspective view of the cam cylinder of a knitting machine, part being shown as broken out, illustrating the invention. Fig. 2 is a sectional detail view illustrating the manner of supporting the cam guards and the movement of the same. Fig. 3 represents perspective views of the two cam guards. Fig. 4 illustrates a slightly modified form of the invention.

In the drawings *a* designates the cam cylinder. *b* is the upper and *c* is the lower stationary cam. *d d* are the swinging or wing cams which operate to raise the needles. All of the parts mentioned are of common construction, and may be of the form shown or any other suited to the purpose of actuating the needles so as to form stitches from a yarn fed thereto, and so as to allow the needles to be raised or otherwise moved in order that their shanks or heels may not come within the orbit or path of the said needle-operating cams.

As the cam cylinder shown is equipped it is designed that, in throwing the needles out of action, as when narrowing is being performed in the operation of knitting heel and toe work, the needles shall be raised so that their shanks or heels may pass above the upper stationary cam *b*. It not infrequently happens, however, that the needles are not raised sufficiently high, but just to a point where, in the revolution of the cam cylinder, the point *e* of the cam *b* will strike the shank or heel, and when this occurs a breakage or damage results, and such mishap is often of a serious and expensive character. To avoid accidents of the kind mentioned it has been proposed to equip the cam cylinder or bar with guards which will operate to switch the needles whose shanks are on a line with the point *e* of the upper stationary cam either above or below the latter; but so far as I am aware the said guards are more or less uncertain, and themselves sometimes catch and break the needles, the cams or the fillets of the needle carrier or support. I have ascertained that if guards are arranged or supported in the cam cylinder or bar, in proximity to the ends of the upper stationary cam, in such manner that they may have both a pivotal and backwardly-yielding movement, they will not fail to switch the needles whose shanks or heels may come into contact therewith above the said stationary cam. I have devised several forms of means of the adaptability or character mentioned, among which is that shown in Figs. 1, 2 and 3 of the drawings, in which *f* designates the cam guards consisting of pieces of steel or other suitable material arranged loosely in inclined slots formed in the cam cylinder, so that the upper end *g* of the inner portion may be in close proximity to the end *e* of the cam *b* and the lower end *h* in a lower plane. The inner edge of each cam guard may be beveled from its lower end *h* upward, to the point *g*, as shown in Figs. 2, 3, and 4, or the inner edge of the said guards may be flat, as shown in Fig. 1. I do not, however, limit myself to a guard

having any particular form of face rounded, as at *i*, ears *j* being provided at the ends of such rounded portion.

k is a spring secured at its lower end to the cam cylinder, and arranged to bear at its upper end on the rounded portion *i* of the guard and press the latter inward so that the shoulders *l* of the ears *j* may rest against the outer surface of the cam cylinder, and when the guards are in this position their inner portions will extend beyond the inner surface of the cam cylinder a distance corresponding to the thickness of the needle-operating cams. With this construction and arrangement of parts should the shank or heel of a needle strike the inner edge or face of the guard at any point below and including the parts *h* and *g* the said guard will turn upon its supports as on a pivot and also yield bodily backward so as to positively and certainly prevent the needle-heel from catching upon the said inner edge or face and so switch the said needle-heel above the same and the point *e* of the stationary cam *b*.

The dotted lines in Fig. 2 represent the position the guard may assume when the shank or heel of a needle strikes the guard above its pivotal point.

It is the construction whereby a compound pivotal and bodily backward-yielding movement may be imparted to the guard when struck by a needle shank that constitutes the essential feature of my invention since it is this capability of the guard that renders its functions certain.

The ears *j* are provided in order that the guards may not accidentally be displaced or disengaged from the end of the springs *k*.

Instead of rounding the outer portions of the guards and providing them with ears *j* the upper ends of the springs may be arranged to project through holes or slots formed in the outer portions of the guards, as shown in Fig. 4.

In cases where the needles are drawn back or down out of the path of the needle operating cams, it is obvious that the guards may be inclined in reverse direction and so switch the needles back or down out of the way of the cams.

Having thus explained the nature of my invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of its modes of use, I declare that what I claim is—

1. A cam cylinder for knitting machines provided with needle-operating cams and equipped with cam-guards adapted to have a bodily backward-yielding and pivotal movement in the cam cylinder and arranged in proximity to the points of the upper stationary cam, as set forth.

2. A cam cylinder for knitting machines provided with needle-operating cams and equipped with cam-guards, arranged in inclined slots in the cylinder and adapted to have a bodily backward-yielding and pivotal movement in the said cylinder, and a spring arranged to bear upon the said guards, the upper ends of the latter being arranged in proximity to the ends of the upper stationary cam, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 20th day of September, A. D. 1892.

GEORGE H. COBURN.

Witnesses:
S. S. JEWETT,
G. S. DAVIS.