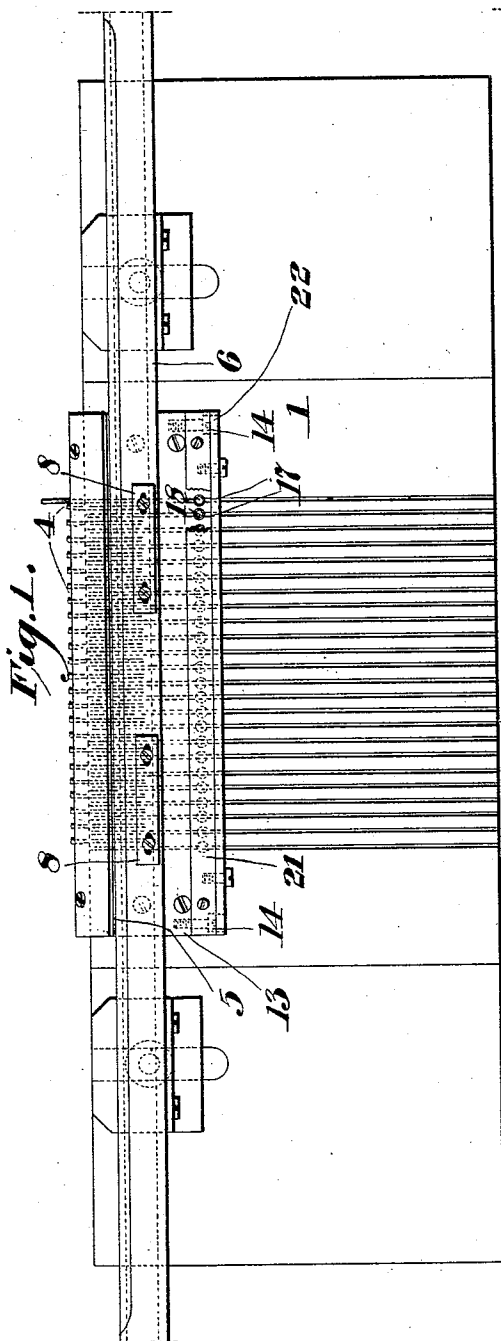


(No Model.)

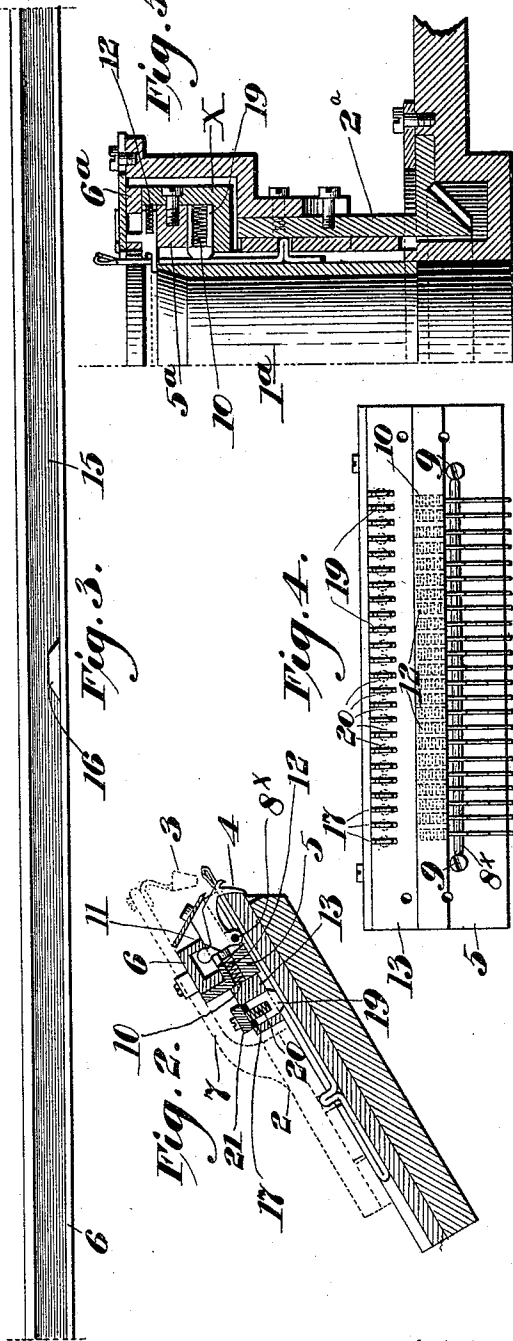
J. BENNOR.
KNITTING MACHINE.

No. 499,648.

Patented June 13, 1893.



Witnesses:
F. Norman Dixon,
Charles Godwin



Inventor:
Joseph Bennor,
per John N. Nolan
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UNITED STATES PATENT OFFICE.

JOSEPH BENNOR, OF PHILADELPHIA, PENNSYLVANIA.

KNITTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 499,648, dated June 13, 1893.

Application filed January 13, 1892. Serial No. 417,909. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BENNOR, a citizen of the United States, residing at the city and county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Knitting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention embodies improvements in that general class of knitting machines wherein reciprocative latch-needles are employed, these improvements relating to a sinker or web-holder construction and to a frictional device for acting upon the needles, whereby advantages are gained as hereinafter described.

The improvements are applicable to any ordinary machine of this class, whether it be of the straight or the circular type, as illustrated in the annexed drawings, in which—

Figure 1 is a plan of the needle-bed of a straight machine equipped with the improvements. Fig. 2 is a partial transverse section through the same, the cam-carrier and thread-guide being indicated by the dotted lines. Fig. 3 is a separate view of the sinker-operating bar, inverted. Fig. 4 is a like view of the sinker-frame and its connections. Fig. 5 is a vertical section through one side of a circular machine to which my improvements are applied.

In the drawings, the numeral 1 represents the needle-bed of an ordinary straight knitting machine, which may be of a single or the double face pattern; 2, the usual reciprocative cam carriage for actuating the needles in said bed, and 3 the yarn-guide which is connected with and conducted by the carriage.

4 represents a series of vibratory sinkers or loop-holders supported in a frame or bar 5 that is fixed to the needle-bed in such manner that the work-engaging portions of the sinkers extend over and beyond the inner edge of the bed and alternate with the needles, as is common in all knitting machines in which sinkers or loop-holders are employed.

6 represents the sliding cam-bar for actuating the sinkers successively at the proper intervals, this bar being impelled by the re-

ciprocating cam carriage as usual; that is to say, by a projecting arm 7 on the carriage co-acting with fixed blocks, 8, on the top of the bar. The sinkers are pivoted in the same horizontal plane, so that normally their up-projecting members are in alignment. They are strung on a rod 8^x so as to be operative independently of each other, and this rod is disposed on the under side of the frame 5, and fastened in place by means of screws 9 that take against the ends of the rod. Thus by loosening the screws, the rod with the entire series of sinkers, may be readily detached from the frame.

It will be observed that the rod is so disposed that the rounded lower corners of the sinkers come in contact with the face of the needle bed and are thus supported by the latter during their vibration. In this instance the inward movement of each sinker is effected by a spring 12 fitted to a hole 10 in the back of the sinker frame, a small head, 11, being interposed between the spring and the sinker. The spring is confined by a back plate 13 fastened to the edge of the frame by screws 14.

As a simple and efficient means whereby the needles may be held in their grooves under spring pressure for the purpose more especially of obviating the otherwise liability of their jumping immediately upon being freed from the knitting cams, I cut in the outer edge of the bar, 13, a series of kerfs 17 coincident with the needle grooves in the bed 1; and I bore in the top of the bar a corresponding series of recesses 18 that intersect the kerfs. I then insert in each of the kerfs a longitudinally-movable bit, 19, which rests upon the needle below the same, and I next insert in each of the recesses 18 a spiral spring 20 which enters a slot in the bit. I cover the kerfs and recesses by a plate 21 that is securely fastened to the bar, the upper ends of the springs bearing against the under side of this plate, and thus pressing the bits down upon the needles to insure the frictional action above referred to. As the movement of the bits is at right angles to that of the needles, this action is most effectual.

In Fig. 5 I have shown my improvements as applied to a circular frame machine. In this

construction the sinkers are not fulcrumed as in the straight frame machine, but are mounted in radial grooves in an annular bed 5^a which surrounds the head of the needle cylinder 1^a, the sinkers thus being reciprocative radially as is common in this type of machines. These sinkers are actuated by a revolvable ring-cam 6^a to which motion is imparted in the usual manner from the rotatable cylindrical cam carrier 2^a. This ring cam acts to throw out the sinkers, their inward movement being accomplished by a series of small spiral springs 12 that are fitted in radial holes in the bed 5^a in a manner to act against the sinkers respectively. A flanged ring X fastened to said bed supports the outer ends of the springs. This bed is slotted at its lower end for the reception of the friction bits 19 that act upon the needles, the action being effected by spiral springs 10 interposed between the bits and the ring. The lower flanged end of the latter prevents the dropping of the bits from their slits or kerfs.

It will be obvious that in either of the constructions above described any or all of the spiral springs may be removed and replaced without disturbance of the bits or the sinkers.

I claim as my invention and desire to secure by Letters Patent—

1. The combination with the supporting frame, of the series of vibratory sinkers and the rod upon which said sinkers are mounted so as to be operative independently of each other, said rod being applied to the under side of the said frame, together with means for securing the rod detachably in place, whereby the said rod equipped with the sinkers may be directly applied to or removed from the

under side of said frame, substantially as described.

2. The combination with the supporting frame, of the series of vibratory sinkers and the rod upon which said sinkers are mounted so as to be operative independently of each other, said rod being applied to the underside of the said frame, together with the set-screws bearing against the ends of the rod to secure it detachably in place, whereby the said rod equipped with the sinkers may be directly applied to or removed from the under side of said frame substantially as described.

3. The combination with the needle-bed and its needles, of a series of bits bearing upon the latter, and a series of springs acting upon said bits individually, together with means for supporting said bits and springs, substantially as described.

4. The combination with the needle-bed and its needles, of the bar, the series of bits therein in line with the needles, and the series of spiral springs acting upon said bits, substantially as described.

5. The combination of the needle bed and its needles, the bit-supporting bar with its slits or kerfs, the series of frictional bits therein, the springs acting upon said bits, and a covering plate confining said springs, substantially as described.

In testimony whereof I have hereunto affixed my signature this 9th day of January, A. D. 1892.

JOSEPH BENNOR.

Witnesses:

J. W. KENWORTHY, Jr.,
JOHN R. NOLAN.