

H. SWINGLEHURST.
KNITTING MACHINE.
APPLICATION FILED JUNE 28, 1911.

Patented Apr. 1, 1913.

3 SHEETS—SHEET 1.

1,057,782.

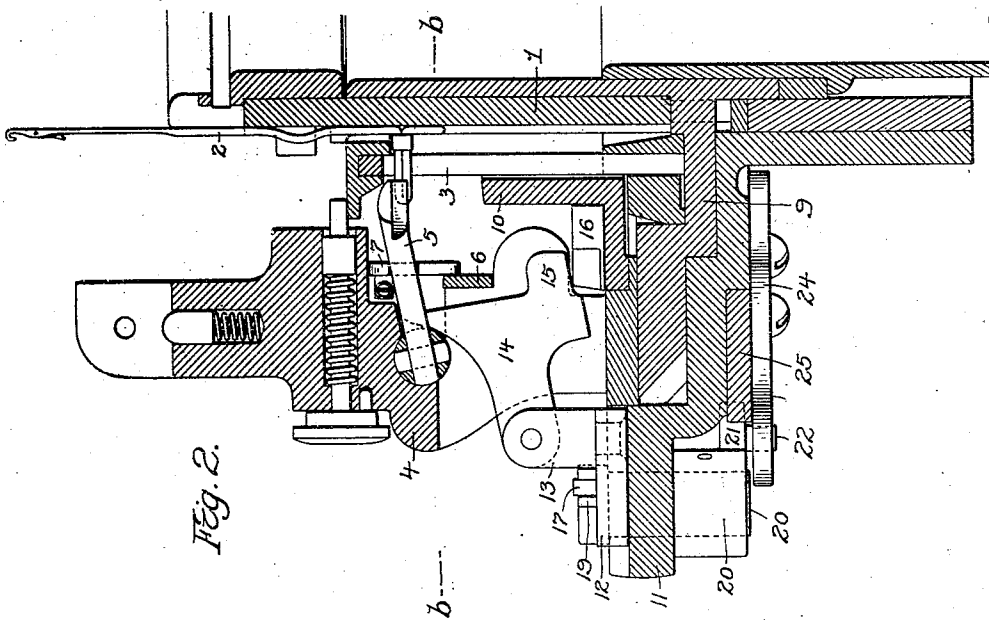


Fig. 2.

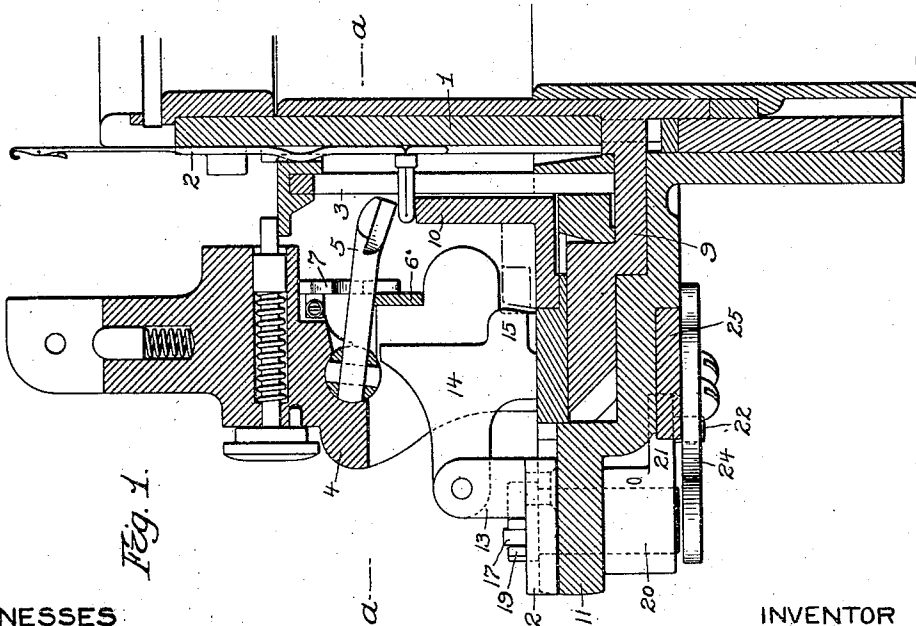


Fig. 1.

WITNESSES

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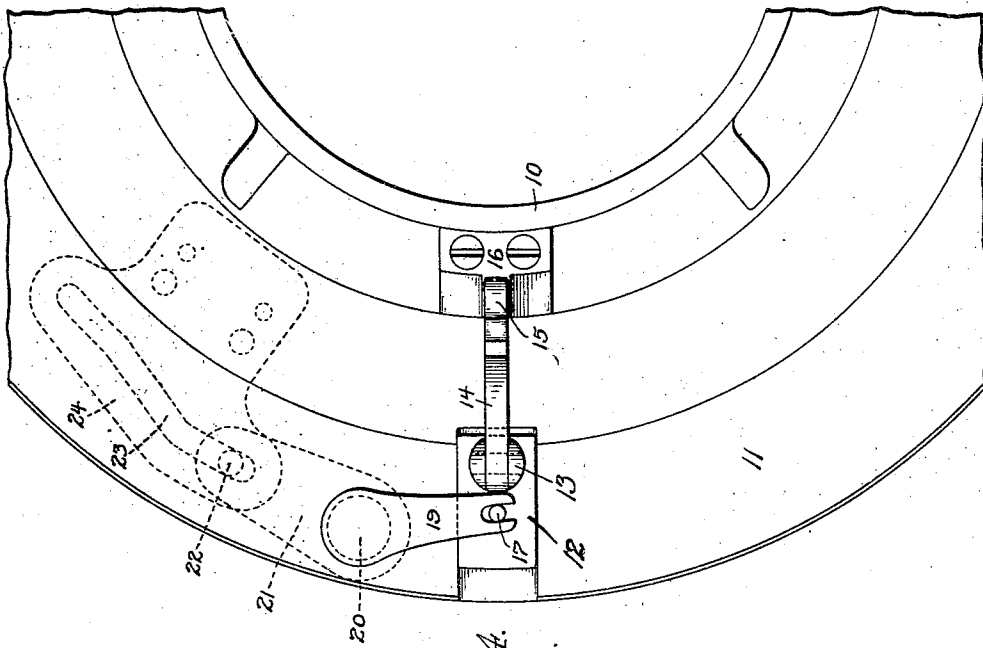


Fig. 4.

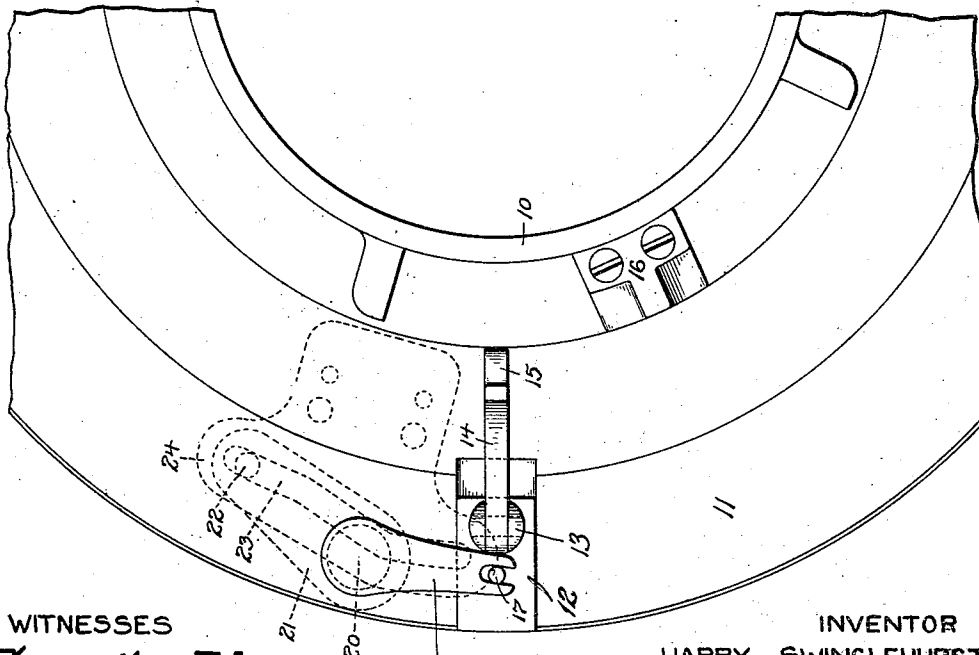


Fig. 3.

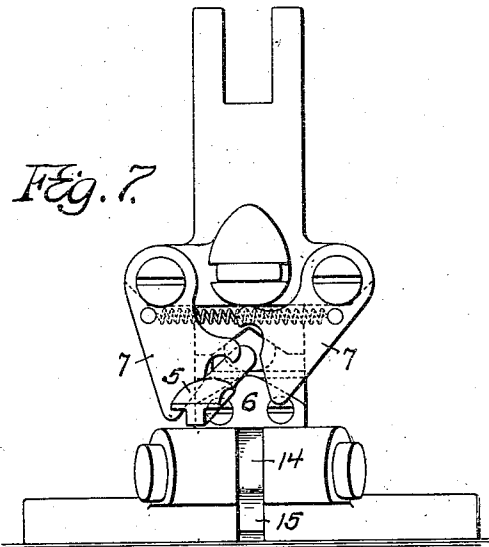
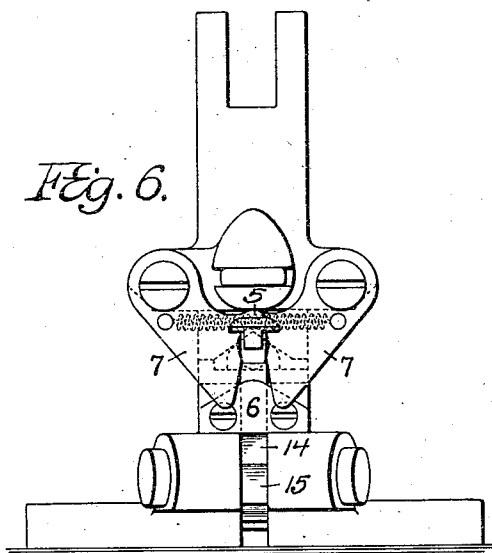
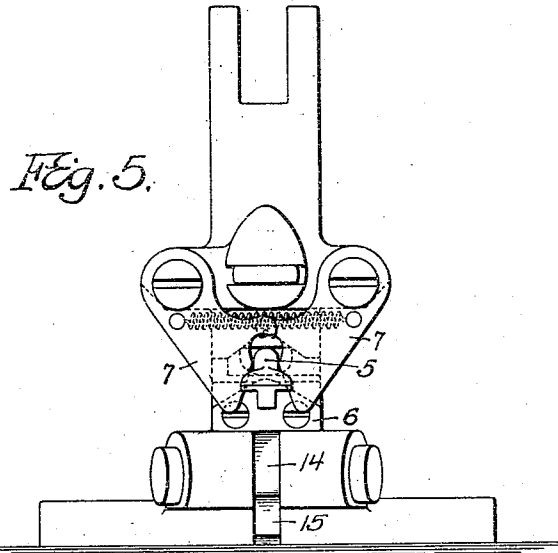
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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KNITTING-MACHINE.

1,057,782.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed June 28, 1911. Serial No. 635,875.

To all whom it may concern:

Be it known that I, HARRY SWINGLEHURST, a citizen of the United States, residing in Boston, Massachusetts, have invented certain Improvements in Knitting-Machines, of which the following is a specification.

My invention relates to circular knitting machines and has for its object the manipulation of the depressing picker bar in that class of machines which are used for the manufacture of seamless hosiery and in which a certain number of needles are first picked out of action and then into action again in forming the heels and toes of such hosiery, and my invention is applicable to a machine of the type shown in the patent of George D. Mayo, No. 726,178, dated April 21, 1903, and especially to a machine of that type in which the cylinder is revoluble and the cam ring stationary, as set forth in the application for patent filed by Harry Swinglehurst on the 18th day of May, 1911, Serial No. 628,055.

In the accompanying drawings—Figure 1 is a sectional view of sufficient of the machine to illustrate my present invention; Fig. 2 is a similar view illustrating some of the parts in different positions from those shown in Fig. 1; Fig. 3 is a sectional plan view of certain parts of the machine taken on the line *a-a*, Fig. 1, Fig. 4 is a similar sectional plan view taken on the line *b-b*, Fig. 2, and Figs. 5, 6 and 7 are face views, in different positions, of those portions of the ordinary machine which act upon the picker and impart to it movements other than those imparted by the mechanism constituting the subject of my invention.

In the drawing, 1 represents part of the needle cylinder of the machine, 2 one of the needles mounted so as to reciprocate vertically therein, 3 a skeleton cylinder surrounding the needle cylinder and serving as a guide for the butts of the needles and 4 a post or standard to which is universally pivoted a depressing picker 5 for engaging the butts of the needles which have been lifted out of operative position during the narrowing operation in the formation of the toe or heel pocket and depressing these needles into active position again for the widening operation, whereby the formation of said heel or toe pocket is completed, this depressing picker operating in connection with a

double cam plate 6 and a pair of spring-actuated plates 7 as in the Mayo machine. In order to engage with the butts of the raised needles the picker 5 must occupy the lifted position shown in Figs. 2 and 6, although its normal position is the partially depressed position shown in Figs. 1 and 5, and my invention relates to mechanism for raising the picker at the proper time from the position shown in Figs. 1 and 5 to the raised position shown in Figs. 2 and 6. Supposing that the picker occupies the raised position shown in the latter figures it will be struck by the butt of a raised needle and carried forwardly with the latter. This will cause the picker to press upon the plate 7 in advance of it, thus causing said plate to swing downwardly on its pivot, with the effect of depressing the picker and carrying down the butt of the raised needle with which said picker engages. By reason partly of the downwardly swinging movement of the plate 7 and partly of the cam-like action of the inner face of said plate upon the picker stem the picker finally reaches the position shown in Fig. 7, and by this time the needle butt is freed from engagement with it because of the arc of a circle in which said needle butt travels. As soon as the picker is thus freed the reaction of the plate 7 causes the picker to move rearwardly and the picker stem rises on the cam 6 until it finally reaches the apex of said cam and is there retained by being engaged between the front and rear plates 7, as shown in Fig. 5, until it is finally again lifted to the position shown in Figs. 2 and 6 by the mechanism which I have devised. The duplex character of the mechanism provides for the proper operation of the picker irrespective of the direction in which the machine is reciprocating.

In the machine of the Mayo patent before referred to the needle cylinder was stationary and the cam ring had the necessary rotating and reciprocating movements imparted to it in order to effect either rotary knitting for the production of the leg and foot of the stocking or to-and-fro knitting for the production of the heel and toe pockets. In the machine of the Swinglehurst application, however, these rotating and reciprocating movements were imparted to the needle cylinder, the latter being carried by the gear ring 9, and the cam ring 10 only

having a limited movement of reciprocation imparted to it when, during reciprocation of the needle cylinder, the direction of movement was changed from right to left, or vice-versa. For this reason the mechanism for effecting the final lift of the depressing picker 5 as employed in the Mayo machine is not applicable to the present machine, and in order to effect, in the latter type of machine, the desired movement of the picker 5 I have devised the mechanism which I will now proceed to describe.

To suitable guides on the fixed bed 11 of the machine is adapted a slide 12 which can be moved radially on said bed, said slide having a post 13 to which is pivoted a lever 14, whose upper end is adapted to act upon the stem or shank of the pivoted picker 5 and raise the same from the intermediate position shown in Fig. 1 to the fully elevated position shown in Fig. 2, said lever 14 having a projecting toe 15 which, at the proper times, is acted upon by a cam 16 mounted upon the base of the cam ring 10. Projecting upwardly from the top of the slide 12 is a pin 17 which is engaged by the forked end of an arm 19 carried by the upper end of a rock shaft 20, the latter being adapted to bearings in the fixed frame 11 of the machine and having, at its lower end, another arm 21 with downwardly projecting pin 22 which enters a cam slot 23 in a plate 24, the latter being carried by a ring or segment 25 which is mounted on the underside of the fixed frame 11 so that it may have reciprocating movement imparted to it at the proper times. Normally, that is to say during round-and-round knitting and during that portion of the to-and-fro knitting when narrowing is being performed, the parts occupy the position shown in Fig. 1, the depressing picker 5 occupying its intermediate position so that it will not act either upon the butts of the depressed or active needles or upon those of the raised or inactive needles. When, however, the narrowing operation has been completed and the widening operation is about to be started, the ring or segment 25 is reciprocated by connection with some available part of the machine so as to cause inward movement of the slide 12 and of the lever 14 carried thereby, thereby bringing the toe 15 of said lever into the path of the cam 16 on the base of the cam ring 10, consequently, on each reciprocation of the latter said cam will act upon the toe 15 and will cause the lever 14 to raise the picker 5 from its intermediate or inoperative position shown in Fig. 1 to its elevated or operative position shown in Fig. 2, the picker being thereby caused to engage first a needle at one end of the active set and then a needle at the other end of said active set to depress the same into operative position in order to effect the desired widening of the web which

is being knitted, or if the lifting pickers are permitted to remain in action during the widening operation the lips of the depressing picker will be wide enough to engage a pair of needles at each operation, the outermost of these needles being raised to the inoperative position again when it comes under the influence of the lifting picker. When the widening operation has been completed and round-and-round knitting is about to be resumed the ring or segment 25 is restored to its former position, thereby effecting retraction of the slide 12 and withdrawal of the lever 14 to the inoperative position shown in Fig. 1. The dropping of the lever 14 after it has passed from under the influence of the cam 16 is effected by its own weight, although, if desired, a suitable spring may be employed to aid in such movement, it being desirable to remove the upper end of said lever 14 from the path of the descending picker 5 when the latter is being depressed.

I claim:

1. The combination, in a knitting machine of the rotary cylinder type, of a depressing picker which normally occupies an inoperative position, a lever for lifting said picker into position to engage with the butts of the elevated needles, a cam for actuating said lever, means for operating said cam, and means for moving the lever into and out of range of said cam.
2. The combination, in a knitting machine of the rotary cylinder type, of a depressing picker which normally occupies an inoperative position, a lever for raising said picker into position to engage the butts of the elevated needles, a ring carrying the stitch cam and also provided with a cam for operating said lever, means for reciprocating said cam ring when the direction of movement of the needle cylinder is changed during reciprocating knitting, and means for moving the lever into and out of range of the lever-operating cam on said ring.
3. The combination, in a knitting machine of the rotary cylinder type, of a depressing picker which normally occupies an inoperative position, a lever for raising said picker into position to engage the butts of the elevated needles, a cam for acting on said lever, means for actuating the cam, a slide guided on the fixed bed of the machine, to which slide said lever is pivoted, and means for imparting inward and outward movement to said slide.
4. The combination, in a knitting machine of the rotary cylinder type, of a depressing picker which normally occupies an inoperative position, a lever for raising said picker into position to engage the butts of the elevated needles, a cam for acting on said lever, means for actuating the cam, a slide guided on the fixed bed of the machine, to which

slide said lever is pivoted, and means for
imparting inward and outward movement
to said slide, said means comprising a slotted
cam plate carried by a movable member of
5 the machine and a rock shaft adapted to
bearings on the fixed bed of the machine and
having two arms, one engaging said cam
plate and the other engaging the slide.

In testimony whereof, I have signed my
name to this specification, in the presence of 10
two subscribing witnesses.

HARRY SWINGLEHURST.

Witnesses:

WALTER LARKIN,
THERESA F. MURPHY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."