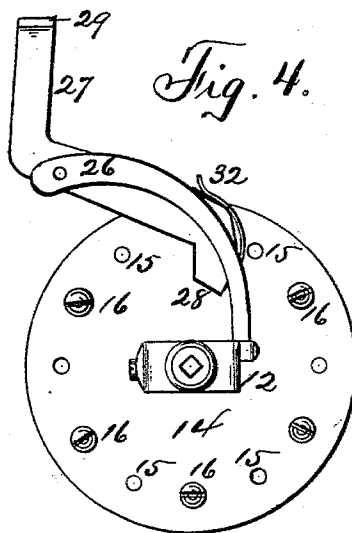
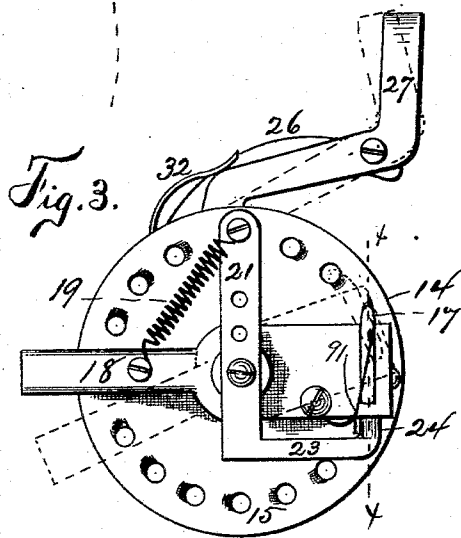
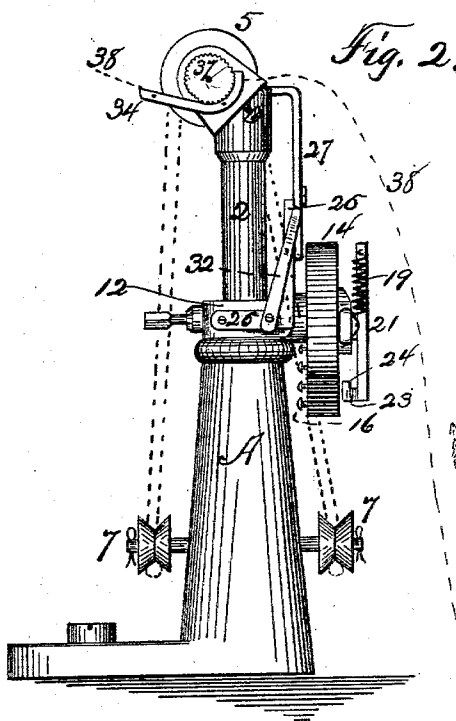
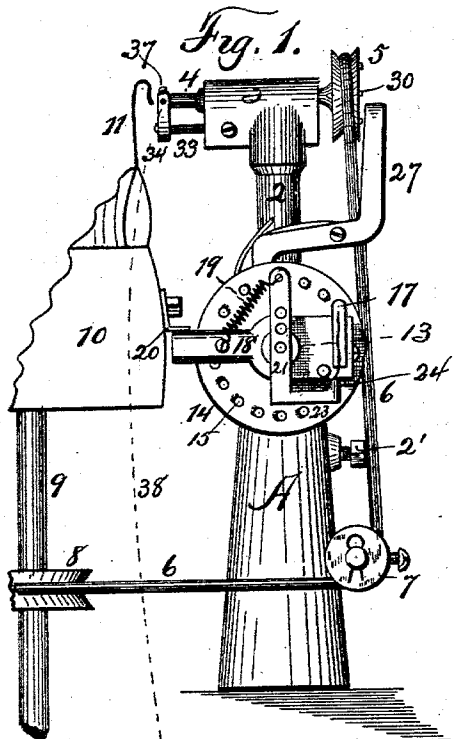


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No. 561,739.

Patented June 9, 1896.



WITNESSES:

M. M. Borch
Chas. W. Marvin.

INVENTOR
Benjamin Thackrah.

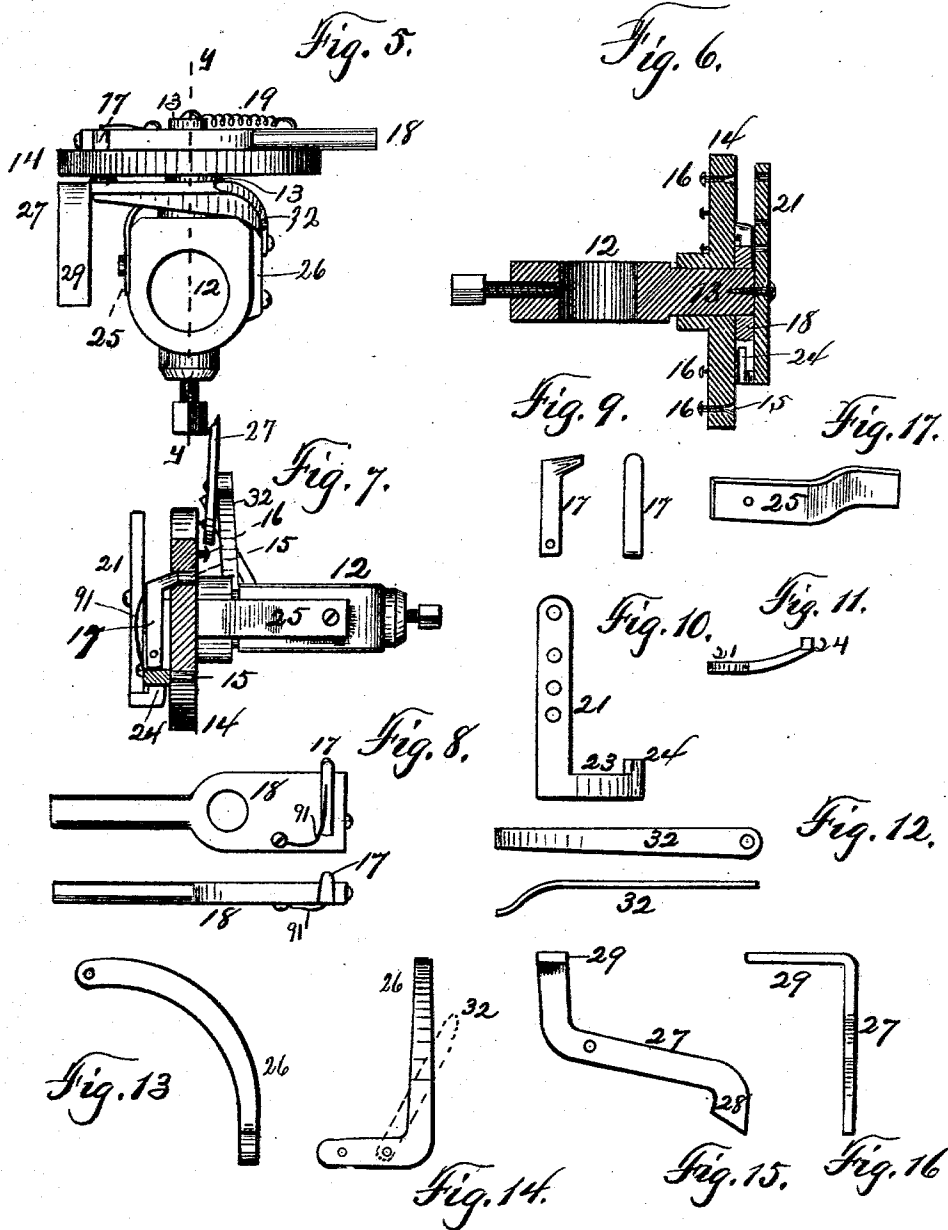
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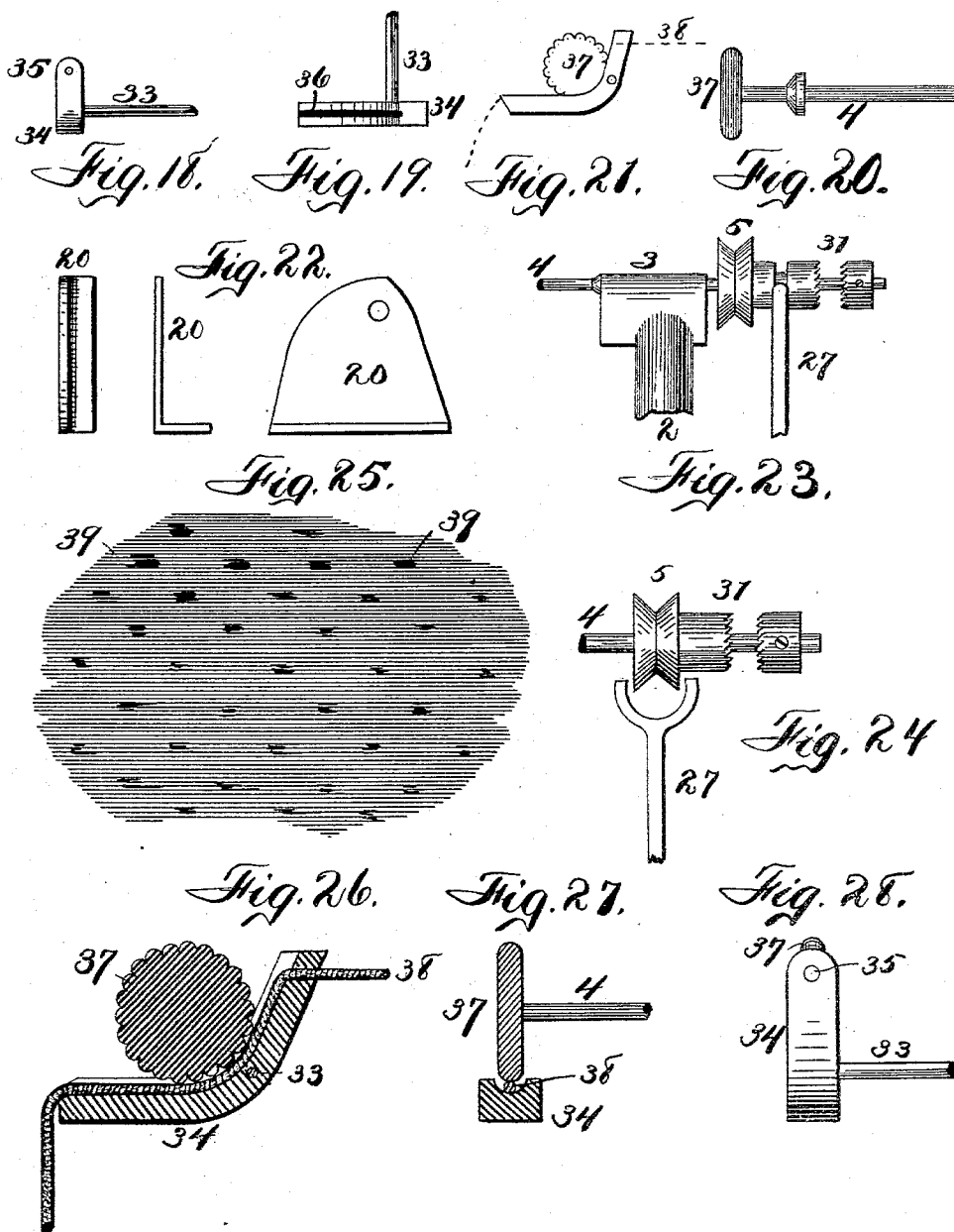
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UNITED STATES PATENT OFFICE.

BENJAMIN THACKRAH, OF AMSTERDAM, NEW YORK.

SPOTTING-FEED FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 561,739, dated June 9, 1896.

Application filed May 3, 1894. Serial No. 509,883. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN THACKRAH, of Amsterdam, in the county of Montgomery, in the State of New York, have invented new and useful Improvements in Spotting-Feeds for Knitting-Machines, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

10 My invention relates to knitting-machines and to mechanism for feeding the yarn or thread to be knitted into the fabric with the regular yarn to produce spots or spotted effects.

15 My mechanism consists of a grooved and pivotally-mounted shoe into one end of which the spotting-yarn is fed, and a feed wheel or head either geared, scored, or roughened to engage with the yarn in said groove and adapted to be intermittently rotated to feed said yarn forward over the free end of said shoe into position to be caught by one or more of the needles of the rotating cylinder as they severally engage with the stitch-wheel.

25 Means are also provided to apply a brake to the pulley driving the feed-wheel to stop and release it intermittently to rotate said head and feed said yarn, consisting of a lever pivoted upon the pattern-wheel arbor, with which said cylinder engages, to actuate a pawl and ratchet to rotate the pattern-wheel, whereby a pattern-pin on said wheel engages with the arm of the brake-lever to release the pulley therefrom during such engagement, a spring

35 being provided to return said brake and stop said pulley when said pin becomes disengaged from the brake-lever, such stoppage or breaking of said pulley being effected by the direct engagement of the lever therewith or by the shifting of an ordinary clutch by the operation of said lever, and in either case the feed stops during the stoppage of said pulley or opening of said clutch; and as this feed, when open, is slower than the rotation of the cylinder the spotting-yarn is caught by one or more needles and broken into pieces, which are knitted into the fabric, producing the spots, the pattern of which is regulated by the arrangement of the pattern pins or screws upon the pattern-wheel. When the pattern-wheel is removed, then the feed of the spotting-yarn is continuous, the yarn is broken

as before, and the spots are irregular and without any pattern. These several mechanisms operate automatically, requiring no hand-labor, as for lapping the ends or trimming off projecting ends, as the ends are all knitted in. It is constructed as follows, reference being had to the accompanying drawings, in which—

60 Figure 1 is a front elevation of the spotting mechanism with the pattern-wheel connected thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a front elevation of the pattern-wheel and brake-bar actuated thereby. Fig. 4 is a rear elevation thereof. Fig. 5 is a top plan thereof. Fig. 6 is a vertical section thereof on line *yy* in Fig. 5. Fig. 7 is a sectional elevation thereof on line *xx* in Fig. 3. Fig. 8 shows a front elevation and a top plan of the lever and pawl thereon by which the pattern-wheel is actuated. Fig. 9 shows a side elevation and a front elevation of the push-pawl. Fig. 10 shows a front elevation of the angular stirrup, which is mounted upon the arbor of the pattern-wheel and operates to both retract the pawl and lever and to stop them at the proper point for the reengagement of the pawl. Fig. 11 is a top plan thereof. Fig. 12 is an elevation and edge view of the spring which engages with the brake-bar. Fig. 13 is a front elevation of the bar which carries the brake-bar. Fig. 14 is a side elevation thereof. Fig. 15 is a rear elevation of the brake-bar, as in Fig. 4. Fig. 16 is a side elevation thereof. Fig. 17 is a perspective of the friction-bar which bears against the pattern-wheel to retard its rotation. Fig. 18 is a front elevation of the spotting-shoe. Fig. 19 is a top plan of the same, showing the groove therein. Fig. 20 is a front elevation of the spotting feed-wheel detached. Fig. 21 is an elevation of the side of the spotting-shoe and of the ends of the feed-wheel. Fig. 22 shows a top plan, a front elevation, and a side elevation, of the trip-plate, which is mounted upon the side of the cylinder and adapted to engage with and actuate the lever and pawl to rotate the pattern-wheel. Fig. 23 is a front elevation of the head, the drive-pulley loose upon the feed-wheel shaft, and a clutch mechanism which is actuated by the brake-bar to shift the pulley into and out of engagement. Fig. 24 is a like view of the

drive-pulley, the feed-wheel shaft, and a clutch mechanism operated by a fork on the brake-bar to shift said pulley. Fig. 25 is a plan of a piece of spotted fabric. Fig. 26 is an enlarged vertical section, longitudinal to the shoe, of the same and of the spotting-head, and also showing the spotting-yarn in the shoe. Fig. 27 is a like view of the same transverse to the shoe. Fig. 28 is a rear elevation of the shoe and spotting-head.

A is a tubular standard erected and detachably mounted upon the bed of a knitting-machine, in which a post 2 is adjustably mounted by means of the set-screw 2', and 3 is a tubular bearing transverse to said post, in which the feed-wheel shaft 4 is journaled, and 5 is a drive-pulley secured in any ordinary manner upon said shaft, being driven slower than the needle-cylinder 10 by the belt 6, carried around the idlers 7, and the pulley 8 upon the shaft 9, upon which the cylinder 10 is mounted, of any ordinary construction and carrying the needles 11. A collar 12 is detachably and adjustably mounted upon the post 2, and an arbor 13 is secured to said collar, upon which the pattern-wheel 14 is mounted and is free to rotate. This wheel is perforated transversely, the holes 15 receiving the pattern-screws (or pins) 16 and having their outer ends enlarged or countersunk to more freely receive and release a push-pawl 17, pivoted in any ordinary manner upon a lever 18, as in a slot or groove across its face, and having a spring 19 acting upon said pawl to hold its point in engagement with one of said holes, said lever being pivoted upon said arbor and thence extending outwardly, so that its other end will be engaged with the inclined depressor 20, consisting of an angular plate of sheet metal secured upon the cylinder, so that as said cylinder rotates it will depress that end of said lever, raise the other end, and thus actuate the push-pawl to rotate the pattern-wheel over to the left in Fig. 1, the distance of one space, said pawl snapping into the next hole. A bar 21, secured adjustably upon said arbor by a bolt or screw inserted into the end of said arbor through one of several holes, as shown, has a spring 19 connected to it and to said lever, to retract the latter when necessary, and is provided with an arm 23, having a stud 24, adapted to engage with said lever when retracted and stop it at the proper point, said adjustment permitting the pawl to rotate the pattern-wheel a distance of more than one space when desired. A bar 25 is secured upon said collar, having its front end in frictional contact with the rear face of the pattern-wheel sufficient to control its rotation, prevent its overrunning, and to hold it while the pawl is being retracted, but permitting it to be rotated by said pawl. An arm 26 is also mounted upon said collar, and the brake 27 is pivoted thereon and has a head 28, with which the pattern-screws engage, and also an arm 29, adapted to frictionally engage with

the side of the pulley 5 or with pins 30 thereon, Fig. 1, or connected to or engaging with the sliding member of a clutch 31, Fig. 25, or forked, as in Fig. 26, to swing into engagement with the pulley on opposite sides to operate the clutch, one member of which is secured to said shaft and the other to said pulley, and 32 is a spring upon the arm 26 and engaging with the head of the brake-bar to hold the other end or arm 29 normally in contact with the pulley, or to hold the clutch members out of engagement and brake or stop the pulley. Then when the rotation of the pattern-wheel brings a pattern-screw into engagement with the head 28 the arm 29 of the brake is thrown away from said pulley to release it for rotation, or the clutch members are closed and the pulley rotated until said head is released from the screw or screws with which it has engaged and drops into a space between two of them, being forced thereto by the spring 32, and this brakes and stops the pulley or throws the clutch members out of engagement and stops said pulley and the feed.

An arm 33 is secured upon the head 3, and 34 is a shoe pivoted thereon of substantially the shape shown in the drawings, Figs. 20 and 23, provided with a yarn-hole 35 and having a longitudinal groove 36 in its upper face, Fig. 21. The yarn-hole 35 is in the heel of the shoe, and this end overbalances the other grooved end, or vice versa, and swings it upward against the head or spotting-wheel hereinafter described and aids it in gripping the yarn to feed it for spotting, thus automatically and evenly regulating the action of said head.

Upon the shaft 4 a circular feed head, wheel, or disk 37 is secured, having its periphery geared, scored, corrugated, or otherwise roughened to engage with the spotting-yarn 38 and adapted to fit somewhat closely in said groove and hold said yarn therein, and by its rotation to feed said yarn through said shoe and over its end into proper position to be engaged by one or more needles, and as the cylinder is rotated at a higher speed than the feed of the spotting-yarn, and as the feed-wheel is stopped, through the brake or clutch mechanism, the strain of the needles upon the yarn breaks it into pieces of a length proportional to the frequency of the stoppages of the feed-wheel, and these pieces are knitted into the fabric, each piece creating a spot therein, substantially as shown in Fig. 27. The pattern of said spots 39, or that produced thereby, is regulated by the arrangement of the screws in the pattern-wheel, and the presence or absence or variations in length of the spaces between them.

The body of the fabric is knitted in the ordinary way from a yarn fed or guided to the needles in the usual manner. Also, if the pattern-wheel is wholly omitted and the feed-wheel is permitted to rotate continuously, then the spotting-yarn, being continuously

fed, is usually broken into larger pieces or shreds and longer spots are created in the fabric, but in an irregular and broken manner and not according to any pattern.

5 What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the rotating cylinder and needles of a knitting-machine, of a feed-shaft provided with a drive-pulley, a shoe adapted to receive the yarn, a feed wheel or disk upon said shaft engaging with the yarn to feed it to the needles, and means to rotate said pulley and feed-wheel from said cylinder.

2. The combination with the rotating cylinder and needles of a knitting-machine, of a shoe adapted to receive the yarn, a feed wheel or disk mounted upon a suitable shaft, and means to rotate said shaft to drive said wheel at a slower speed than said cylinder, whereby the yarn fed through the shoe is caught by the needles and broken into shreds which are knitted into the fabric irregularly as to pattern.

3. The combination with the cylinder and needles of a knitting-machine, of a pattern-wheel and means to rotate it, actuated by the cylinder, a feed-shaft and drive-pulley thereon, and means to stop its rotation controlled

by the pattern-wheel, a shoe adapted to receive the yarn and a feed wheel or disk upon said shaft engaging with the yarn to feed it to the needles. 30

4. The combination with the cylinder and needles of a knitting-machine, of a pattern-wheel and means to rotate it, actuated by said cylinder, a feed-shaft provided with a drive-pulley, and means to stop its rotation controlled by the pattern-wheel, a shoe adapted to receive the yarn, a feed wheel or disk upon said shaft engaging with the yarn to feed it to the needles and a bar frictionally engaging with said pattern-wheel to regulate its rotation. 35 40

5. In a spotting-feed mechanism for knitting-machines, a rotating feed wheel or disk and means to rotate it, in combination with a shoe receiving the yarn and pivoted so that one end overbalances the other to hold the yarn in yielding contact with said feed-wheel to be fed thereby. 45 50

In witness whereof I have hereunto set my hand this 24th day of April, 1894.

BENJAMIN THACKRAH.

In presence of—

JOHN S. MAXWELL,

BENJAMIN THACKRAH, Jr.