G. L. BALLARD.

STRIPING ATTACHMENT.

APPLICATION FILED NOV. 8, 1911.

1,167,251.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

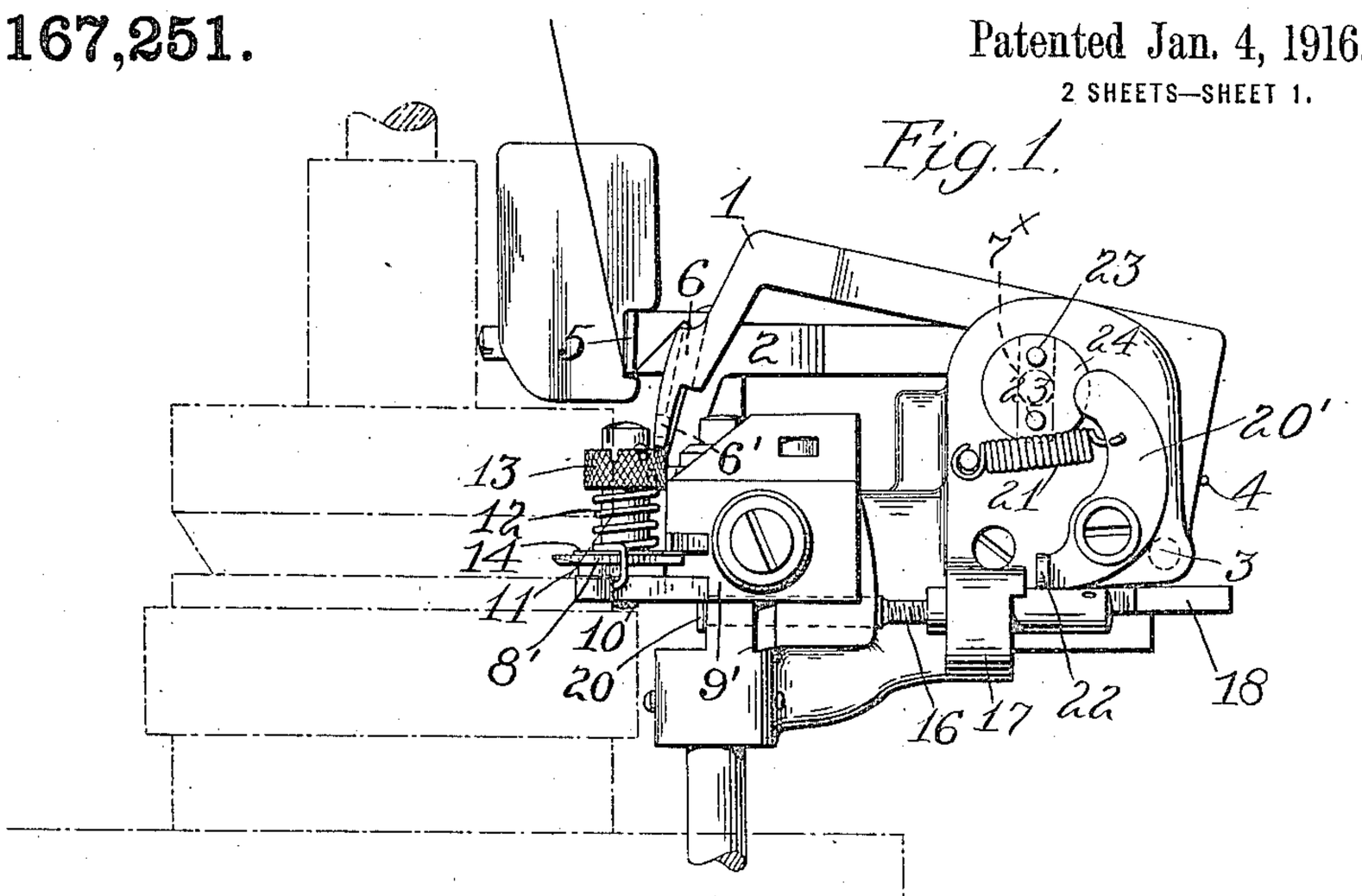

Fig. 2.

Attest:

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2 SHEETS—SHEET 2.

Fig. 3.

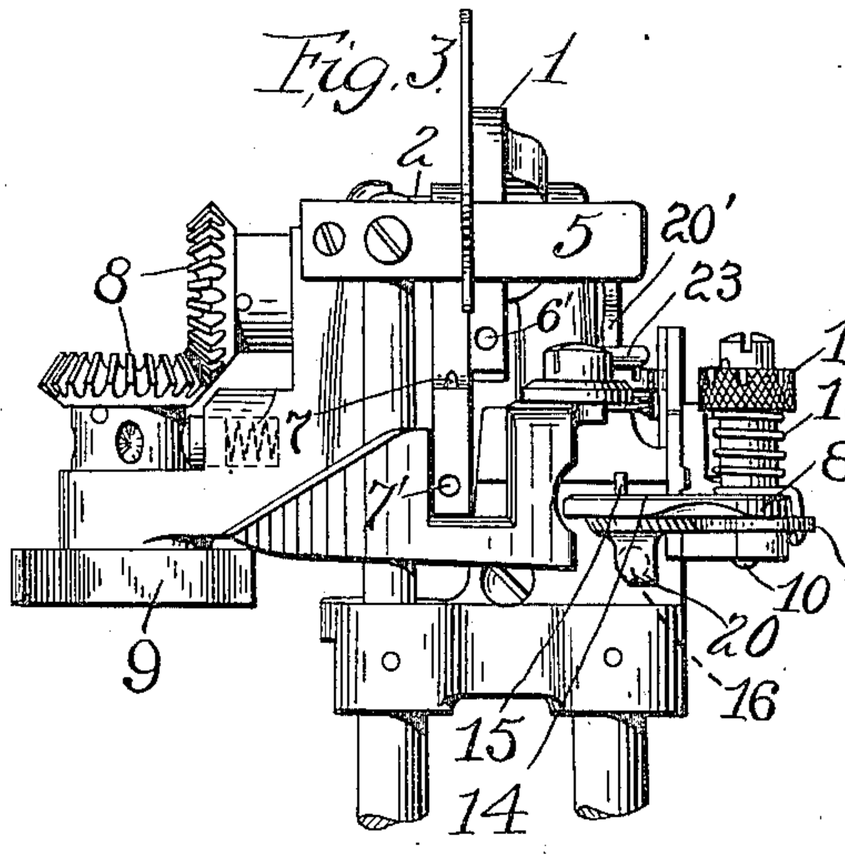


Fig. 4.

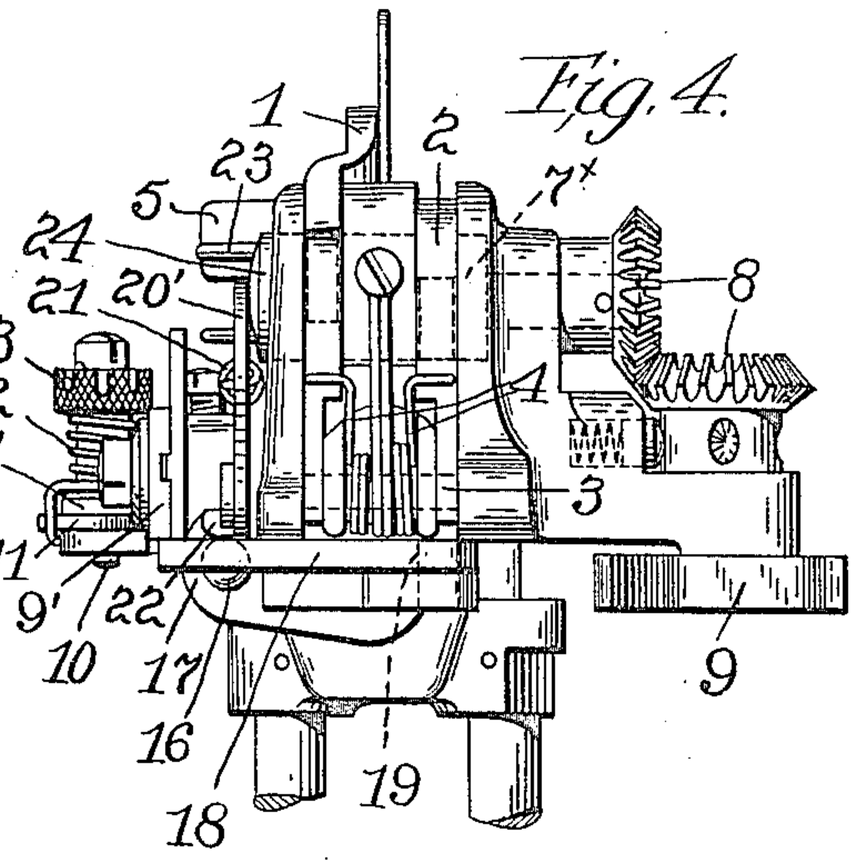


Fig. 5.

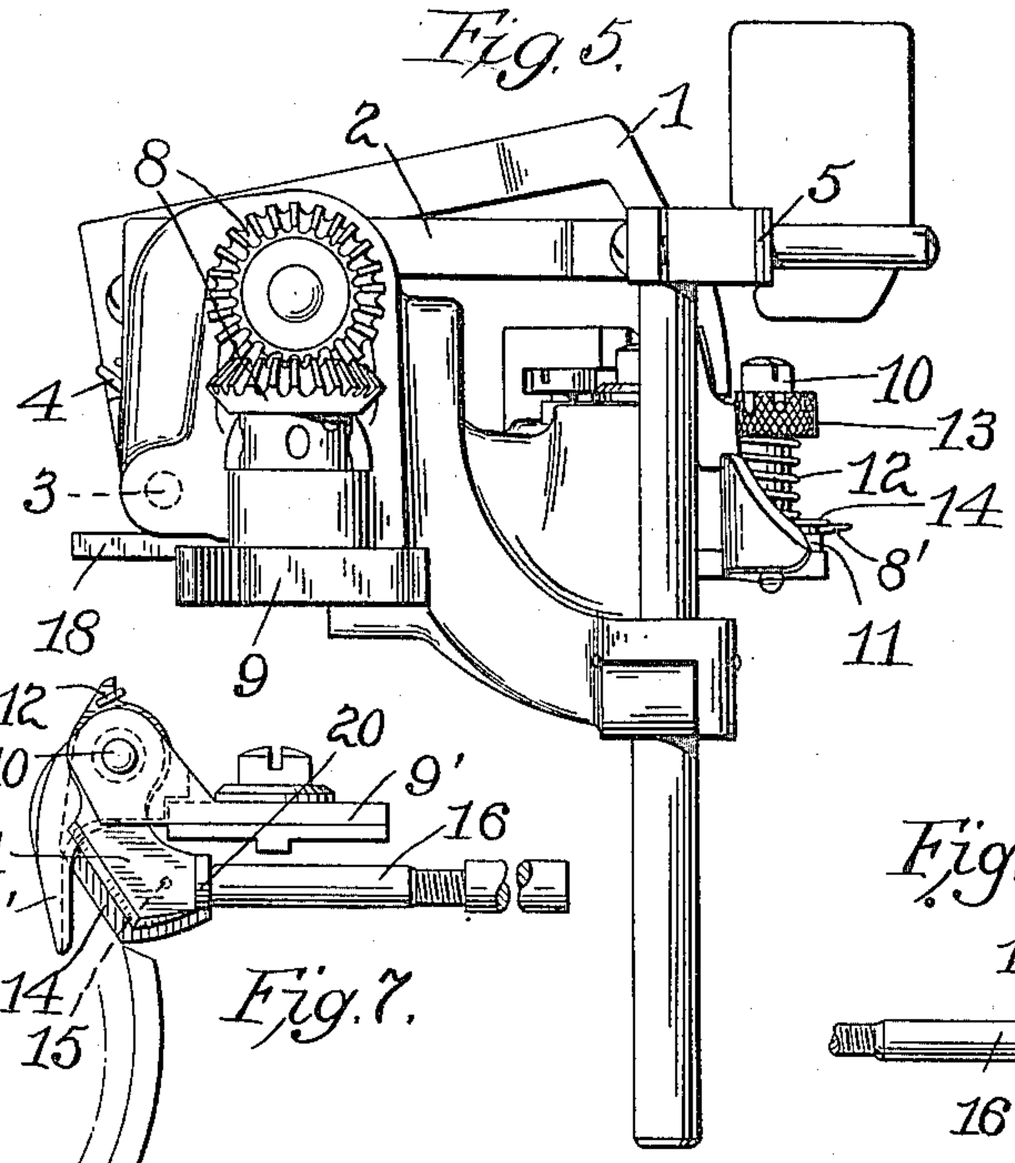


Fig. 8.

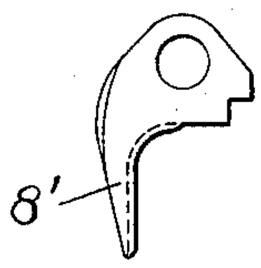
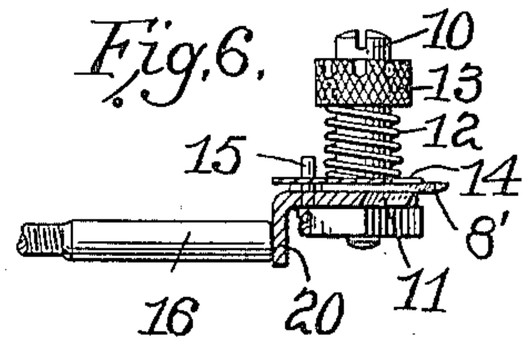


Fig. 7.

Fig. 6.



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UNITED STATES PATENT OFFICE.

GEORGE L. BALLARD, OF NORRISTOWN, PENNSYLVANIA, ASSIGNOR TO WILDMAN MFG. CO., A CORPORATION OF PENNSYLVANIA.

STRIPING ATTACHMENT.

1,167,251. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed November 8, 1911. Serial No. 659,233.

To all whom it may concern:

Be it known that I, GEORGE L. BALLARD, a subject of the King of Great Britain, and resident of Norristown, Pennsylvania, have invented certain new and useful Improvements in Striping Attachments, of which the following is a specification.

The invention relates to striping attachments for knitting machines whereby one thread may be presented to the needles and another thread withdrawn, and in its general features it concerns that type of attachment disclosed in Letters Patent of the United States granted to J. B. Hipwell, #815,167, March 13, 1906, though it will be understood that I do not limit myself to the use of my improvement in connection with the details of the attachment disclosed in the said patent.

In the accompanying drawings Figure 1 is a side view of the attachment in its relation to a knitting head, a part of which is indicated in a conventional manner; Fig. 2 is a plan view of the attachment; Fig. 3 is a front view of the attachment or of that face thereof which is next to the needles; Fig. 4 is a rear view of the attachment; Fig. 5 is a view of the side opposite to that shown in Fig. 1; Fig. 6 is a detail view of the shear and clamping arrangement partly in section, and looking from the opposite side of the attachment from that shown in Fig. 1; Fig. 7 is a bottom plan view of the shear blades with the supporting bracket therefor and the operating slide; Fig. 8 is a detail view of the stationary shear blade.

In these drawings, 1, 2, indicate the arms of the yarn or thread guide, these being pivotally mounted at 3, and pressed by springs 4, which springs tend constantly to lower the arms so that they will present the thread to the needles. The thread passes to the guide arms beneath a plate 5 which extends transversely of the downwardly extending ends of the guide arms, the thread after passing beneath this plate 5 extending thence to the guide eyes at 6, 7, in the arms, by which the thread is directed to the lower ends of the said guide arms and thence through eyes at these lower ends, as shown at 6′, 7′, to the needles. When the guide arm is up, as shown at 1 in Fig. 1, the thread is drawn beneath the plate 5 and thence upwardly, so that an amount of slack is provided which is necessary when the arm lowers to feed the yarn to the needles, it being observed from Fig. 1 that the upper guide eye 6, when the guide arm 1 is raised, is at some distance above the lower edge of the said plate 5. As in the Hipwell patent, I show two arms 1 and 2, and controlling means is provided whereby these arms will be operated alternately, one arm being lowered to present its thread to the needles before the other arm is raised to withdraw its thread, resulting in throwing in the new thread before the old thread is withdrawn, thus securing an overlap of the two threads when fed into the goods. For controlling these arms 1 and 2, a cam shaft is used substantially similar to that shown in the Hipwell patent, this shaft being indicated at 7×. It is operated by beveled gearing 8 from a star wheel 9, which star wheel is operated by striking a suitable projection on the frame as the attachment is carried around in the rotation of the machine. Supposing one of the arms is up, the first action of the star wheel when given a quarter turn will be to operate the cam shaft to lower this guide arm, and then the next quarter turn movement given to the star wheel will lift the other guide arm to withdraw its thread from the needle, this action being substantially similar to that disclosed in the Hipwell patent.

In order to sever the yarn which is withdrawn from the needles and to hold the end of the yarn thus severed, I provide a shear mechanism comprising a fixed cutter 8′, which is held in fixed position by its notched end engaging the edge of the bracket 9′, and by the pin 10 which passes through an opening in the said fixed blade. Associated with this fixed blade is a movable blade 11 which is mounted on the pin 10 to turn about the same, this blade being under the tension of spring 12 which is adjustable as to its tension by the head 13 to which one end of the spring is attached. The movable shear blade carries a clamping plate 14, which plate consists of a thin piece of sheet metal which is pinned to the movable shear blade by the pin 15, the said thin sheet metal plate having an opening through which the pin 10 passes and being borne upon by the spring 12. This thin sheet metal clamping

plate has an upward yielding effect and it extends beyond the edge of the movable shear blade and is adapted to move over the fixed blade. By this arrangement when the movable shear blade is turned about the pin 10 to coöperate with the fixed blade in severing the yarn, the clamping plate will immediately engage this severed end of the yarn and clamp the same between its edge and the upper surface of the fixed blade, the clamping plate yielding as may be necessary for this action. For operating the movable shear blade, I provide a rod 16 extending through the frame of the attachment and through a guiding boss 17, the said rod being arranged to be borne upon by a lever 18 which is pivoted at 19 and is arranged to strike a suitable projection as the attachment is carried around with the cam box of the knitting machine, it being understood that the attachment can be used on a machine in which the needle cylinder and dial are fixed and the cams rotated, though the invention is not limited in this respect. When the lever 18 is operated inwardly, the rod 16, by engaging a depending lip 20 on the movable shear blade, will swing the said shear blade, together with its clamping plate, to perform the severing and clamping operations. These actions take place after the arm is raised to withdraw its thread. When the shear blade has severed the yarn, and this has been clamped by the clamping plate, the parts will be held in this position by a detent lever 20′ under tension of a spring 21, said lever having a projection 22 on its end bearing upon the rod 16 and retaining it in its operated position by frictional contact therewith. The detent 20′ is operated to release the rod 16 and allow the spring 12 to open the shears and remove the clamping plate from the end of the thread, by means of pins 23 projecting from the disk or head 24 of the cam shaft 7 which operates the guide arms 1, 2. With the parts shown in Fig. 1, the arm 1 is raised, but when the star wheel is next operated for a quarter turn, the cam shaft 7 will be operated to lower the arm 1, the cam shaft performing a quarter revolution in this operation. This quarter revolution will bring the pin 23 into engagement with the detent 20′, and release the said detent from the slide bar 16, thus allowing the clamp to open and release the thread as the guide arm 1 completes its downward movement and presents the thread to the needles.

Some of the features above described can be used with an attachment having but one guide arm for the thread, for throwing in an additional thread, in a machine working for instance with a main thread, such, for instance, as the plate or arm for providing slack and the cutting and clamping means for the thread.

It will be observed that the clamp holds the thread at its extreme end or in other words, directly at the point where it is severed, and the position of the cutter and clamp in relation to the needles is such as shown in Figs. 2 and 7 that the end of the thread is back of the path or plane of action of the cylinder needles, so that when the thread is presented to the needles, it crosses the path of the hooks of the needles.

It will be seen that there are two of the pins 23 for operating the detent to release the movable shear blade and clamp.

I claim as my invention:

1. In combination a thread guide arm having a thread eye at its lower end and a guide opening at a point above the same for receiving the thread and directing it to the thread eye, and a slack producing member beneath which the thread passes to the guide opening, said guide opening being carried above the lower edge of the said slack producing member when the guide retracts from the needles, and means for advancing the guide to and retracting it from the needles, substantially as described.

2. In combination a thread guide movable toward and from the needles, means for moving the same, a fixed and a movable blade outside the needle row, a clamp also outside the needle row and movable with the movable blade, means for momentarily operating said movable blade and clamp to cut and clamp the thread, detent means for holding them in said operated position independently of the said operating means, and means for releasing the detent for effecting the opening of the cutter and clamp when the guide arm is advanced to present the thread to the needles, substantially as described.

3. In combination a thread guide movable toward and from the needles, a fixed and a movable blade, a clamp movable with the movable blade, means for operating said movable blade and clamp to close them to cut and hold the yarn, detent means for holding them in operated position independently of the operating means, means for effecting the opening of the cutter and clamp when the guide arm is advanced to present the thread to the needles, said means including the cam shaft which controls the guide arm, and a device operated thereby to release the detent, substantially as described.

4. In combination a guide arm for the thread, a cam shaft for controlling the same, a cutter and clamping means for the thread, means for operating the same, a detent operating independently of the said operating means of the cutter and clamp for holding the cutter and clamping means in operated position, a spring for opening the cutter and clamp and a member on the cam shaft

to withdraw the detent and allow the cutter and clamp to open under the action of the spring, substantially as described.

5. In combination a guide for the thread, a cam shaft for operating the same, a movable shear blade, a rod for operating the same, means for operating the rod, a spring detent lever bearing on the rod to hold the same in operated position independently of the operating means, and a pin on the cam shaft for operating the detent lever, substantially as described.

6. In combination a guide member for the thread, a fixed cutter blade, a pivotally mounted cutter blade, a pin about which the cutter blade turns, a spring extending about the pin and connected to the movable blade, a finger piece for adjusting the spring, and a spring clamping plate connected to and moving with the movable shear blade and turning about the pin and pressed by the spring, substantially as described.

7. In combination, a guide member for the thread movable toward and from the needles, a clamp for holding the thread adjacent the path of the needles, and a slack producing device about which the guide draws the thread as it retracts away from the needles and while the end of said thread is held by the clamp, said slack producing device being located in the course of the thread between the retracted thread guide and the source of thread supply, substantially as described.

8. In combination a thread guide pivotally mounted to move in a vertical plane toward and from the needles, a star wheel, a cam shaft operated from the star wheel for operating the thread guide, a cutter and a clamp, a rod for operating the same, a tappet lever for operating the rod one way to sever and clamp the yarn, a spring for opening the cutter and clamp, a detent for holding the rod when operated by the tappet lever, and means on the cam shaft for releasing the detent when the thread guide retracts from the needles.

9. In combination a thread guide pivotally mounted to move toward and from the needles, a star wheel, a cam shaft operated from the star wheel for operating the thread guide, a cutter and a clamp, a tappet lever for operating the cutter and clamp, a detent for holding the cutter and clamp in operated position, and means for releasing said detent from the cam shaft when the thread guide is moved to introduce the thread to the needles, substantially as described.

10. In combination a thread guide arm having a thread eye at its lower end and a guide opening at a point above the same for receiving the thread and directing it to the thread eye, a slack producing member beneath which the thread passes to the guide opening, said guide opening being carried above the lower edge of the slack producing member when the guide retracts from the needles, means for advancing the guide to and retracting it from the needles and a cutter and clamp adjacent the path of the needles, said cutter severing the yarn, and the clamp holding the cut end of the slack portion, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

GEORGE L. BALLARD.

Witnesses:

GEO. R. RALSTON,

OWEN BALLARD.