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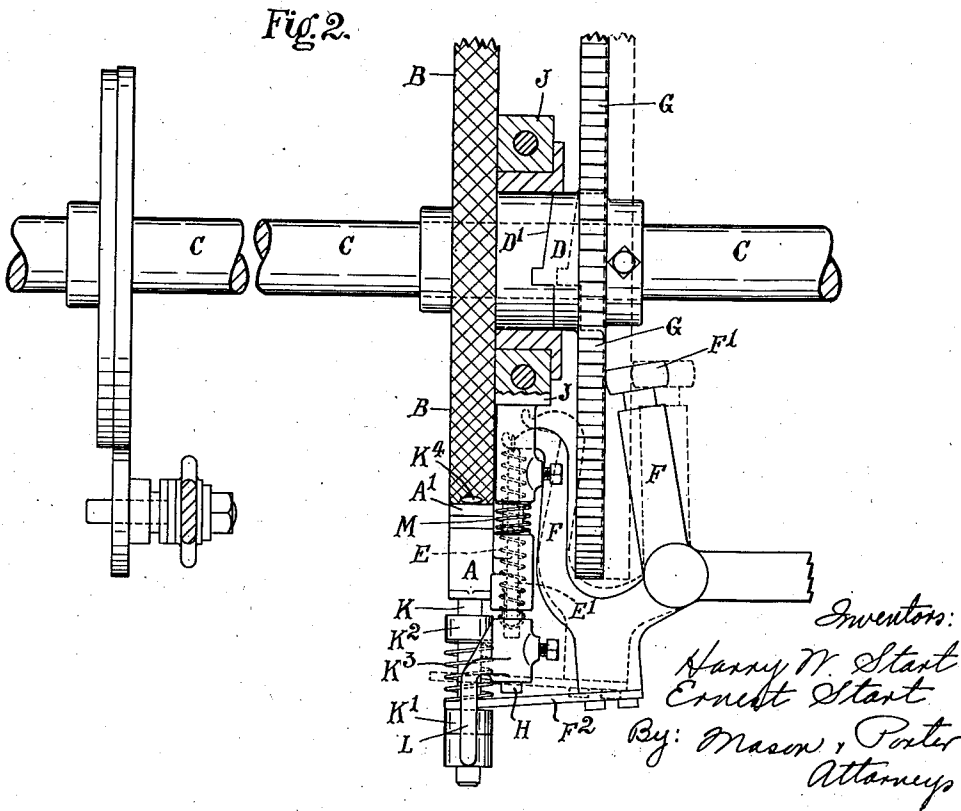
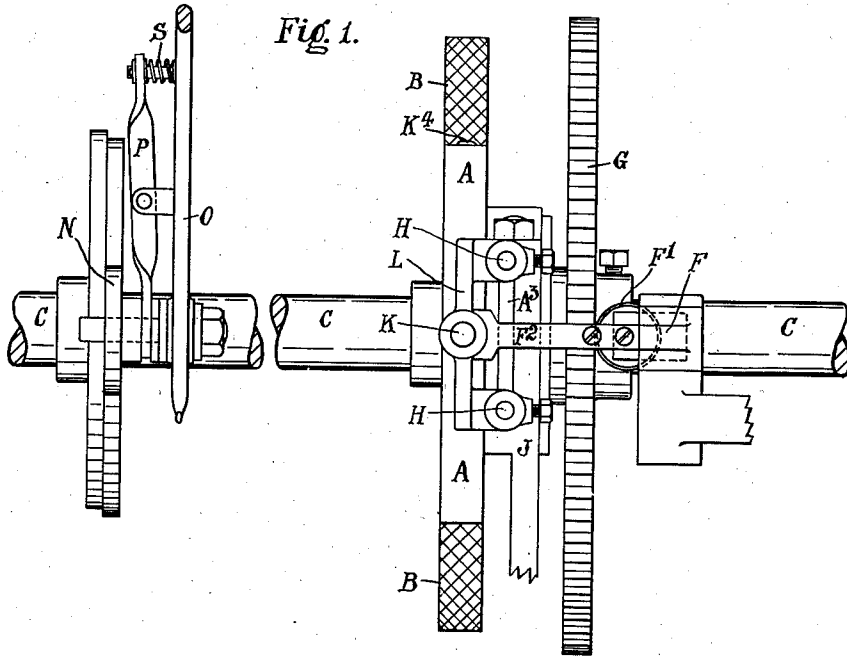
H. W. START ET AL

2,274,565

STRAIGHT-BAR KNITTING MACHINE

Filed Aug. 12, 1941

2 Sheets-Sheet 1



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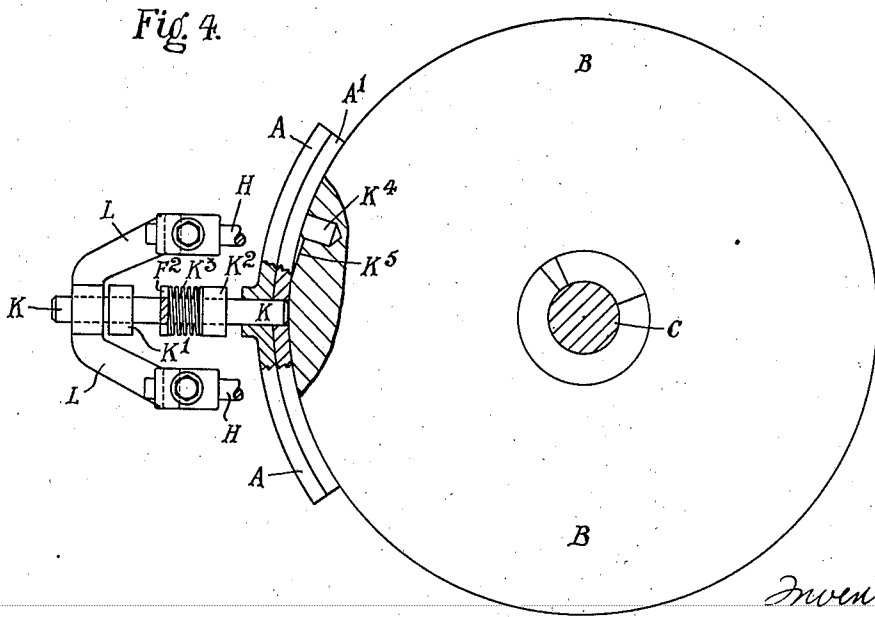
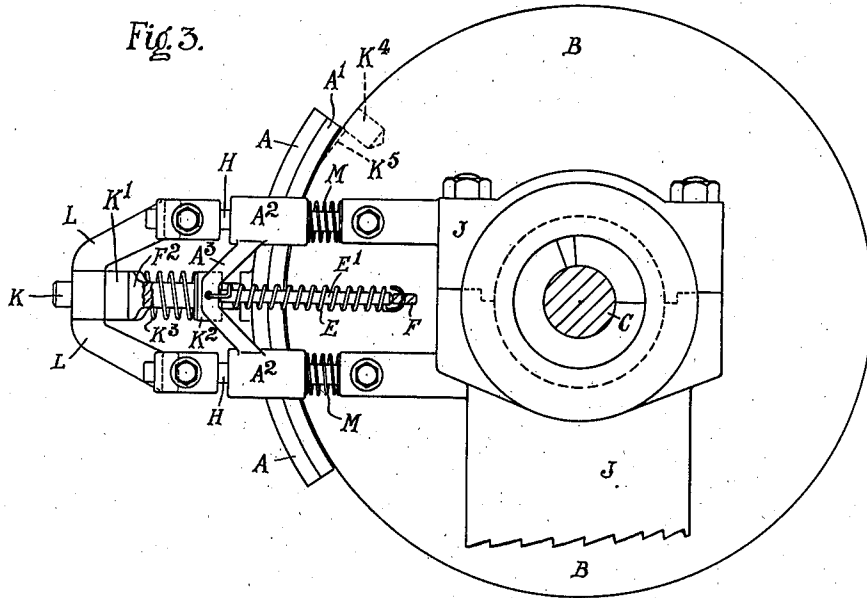
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STRAIGHT-BAR KNITTING MACHINE

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UNITED STATES PATENT OFFICE

2,274,565

STRAIGHT-BAR KNITTING MACHINE

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8 Claims. (Cl. 66—82)

This invention relates to improvements in straight-bar knitting machines and refers particularly to machines of the type adapted to knit the heel tabs to a stocking blank comprising leg and foot portions.

Machines for this purpose run at high speed and in order to stop the draw when it is desired to transfer loops to fashion the heel tabs a friction brake is provided in connection with the draw operating mechanism. This brake is brought into action when the cam shaft is shogged in the usual manner to bring the narrowing cams into operation and its object is to stop the draw mechanism with the thread carriers disposed just clear of the selvedge edge of the heel tabs.

The brake is normally moved into operating position by a spring and in time its effectiveness decreases owing to oil getting on the brake drum and wear on the brake shoe so that there is a tendency for the draw mechanism to overrun and for the carriers to come to rest at a position which is inside the selvedge edge and consequently the loops on the needles between the thread carrier and the selvedge edge will be pressed off on the next knitting course.

The object of the present invention is to provide means which will ensure that the draw mechanism is stopped when the thread carriers are just clear of the selvedge edge of the tabs.

According to this invention positive locking means are provided which are operated in conjunction with the normal friction brake associated with the draw mechanism to engage with and lock the latter in a pre-determined position.

The invention will now be more particularly described with reference to the accompanying drawings in which:

Fig. 1 is a front elevation,

Fig. 2 a plan and

Fig. 3 a side elevation of positive locking mechanism associated with the friction brake and constructed according to our invention.

Fig. 4 is a side elevation partly in section showing the positive locking mechanism.

Like letters indicate like parts throughout the drawings.

In carrying out this invention the friction brake comprises a brake shoe A which is adapted to engage with the periphery of a brake drum which as shown in the drawings comprises a disc B, which is loosely mounted on the main cam shaft C of the machine. The disc B is connected to the draw by any convenient means and may conveniently be a part of the draw cam and is

driven by a dog clutch D secured on the cam shaft C. This clutch D is normally in engagement with the disc as shown in Figs. 1 and 2 but is disengaged therefrom as indicated in dotted lines in Fig. 2 when the cam shaft is shogged longitudinally in the usual manner to bring the narrowing mechanism into operation. This movement of the cam shaft C is utilized to apply the brake to the disc B and bring the draw mechanism to rest.

The brake comprises a shoe A provided with a suitable lining A¹ and is moved into engagement with the periphery of the disc B by a spring E connected between the brake shoe A and one end of a cranked lever F, pivoted on the fixed framing of the machine, the other end of which is provided with a roller F¹ which engages the side of a disc G secured on the cam shaft C so that the longitudinal movement of the latter will angularly adjust the cranked lever F and apply the brake. In order to disengage the brake an abutment may be provided on the cranked lever F which engages with the brake shoe A when the cam shaft C returns to its normal position and positively disengages the brake but preferably the arrangement hereinafter described is adopted.

The brake shoe A is preferably carried by two parallel rods H which pass through bosses A² on the brake shoe and these rods are located in guides carried by the fixed framing of the machine or a bracket J attached thereto and in order to ensure that the draw mechanism stops in the correct position the following arrangement is adopted.

Associated with the brake shoe is a sliding bolt K which is carried in guides provided for the purpose on the shoe and on the yoke L secured to the rods H previously described and is adapted to extend through the shoe A and the friction lining A¹ attached thereto. The bolt is normally held retracted by an arm or extension F² on the cranked lever F engaging a collar K¹ on the bolt K. A second collar K² is secured on the bolt and between this collar and the extension F² previously described is a compression spring K³. When the cam shaft C is moved longitudinally to bring the narrowing mechanism into operation the cranked lever F previously described not only applies the brake but the extension F² thereon compresses the spring K³ on the sliding bolt K and forces the inner end of the latter into engagement with the periphery of the disc B as shown in Fig. 4. In order to stop the latter at the appropriate position a hole K⁴ is provided

therein at the appropriate point and the sliding bolt K moves by the action of the spring K³ into engagement with this hole K⁴ when the latter and the bolt K comes into register.

In order to assist the bolt K to engage with the hole K⁴ the leading edge K⁵ of the latter may be bevelled off as shown in Fig. 4.

The bosses A² on the brake shoe A are interconnected by an arm A³ and the spring E previously described is connected between this arm A³ and one end of the cranked lever F as shown more clearly in Fig. 3. In order to make the spring E inoperative when the dog clutch is in its normal driving position a rod E¹ is disposed within the spring E and is made of such a length that its ends engage with the arm A³ and the cranked lever F as shown in Fig. 3 just before the dog clutch reaches its normal driving position. Further movement of the cranked lever moves the brake shoe away from the disc B and in order to assist in moving the brake shoe clear of the disc, light springs M may be provided on the rods H as shown.

Before the dogs on the driving clutch re-engage the bolt K must be moved into its inoperative position and in order to permit of this the dogs are shaped as shown in Fig. 2, that is, they are chamfered off as shown at D¹ to permit of sufficient longitudinal movement of the cam shaft to allow for angular adjustment of the cranked lever F for the arm F² to engage with the collar K¹ on the bolt K and withdraw the latter before the dogs engage, the movement of the cranked lever F being effected by the spring E.

As the bolt K has to be withdrawn before the dog clutch engages, the initial movement of the cam shaft takes place earlier than otherwise would be the case and owing to the difference in the shape of the fashioning and knitting cams, before they are in a position to permit of the truck N on the arm O connected to the needle-bar rising and falling motion shaft moving from the fashioning cam to the knitting cam. To overcome this difficulty the truck N is held in its normal position by a spring controlled arm P pivoted on the arm O so that when the cam shaft moves longitudinally the truck N can move laterally with it and remain in engagement with the fashioning cam until the position where it can be moved onto the knitting cam is reached when the movement onto the latter will be effected by the spring S and the truck restored to its normal position.

With the arrangement described the draw mechanism is always brought to rest in the same position and overrun of the mechanism is prevented and the machine always stops with the thread carriers outside the needles.

What we claim as our invention is:

1. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a friction brake, positive locking means and a clutch to drive the rotatable member and means adapted to apply the brake to and move the positive locking means into engagement with the rotatable member when the clutch is disengaged, substantially as described.

2. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a friction brake, a sliding bolt, a clutch to drive the rotatable member and means adapted to apply the brake and move the sliding bolt into engagement with a recess in the

rotatable member when the clutch is disengaged, substantially as described.

3. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member mounted on the main cam shaft, a brake drum associated therewith, a friction brake, a sliding bolt, a clutch to drive the rotatable member and means adapted to apply the brake and move the bolt into engagement with a recess in the periphery of the brake drum, when the clutch is disengaged, substantially as described.

4. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a brake drum associated therewith, a friction brake, a sliding bolt, a driving clutch and a disc associated therewith adapted to angularly adjust an arm connected to the brake and the sliding bolt and apply the brake and move the bolt into engagement with a recess in the brake drum when the clutch is disengaged, substantially as described.

5. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a brake drum associated therewith, a brake shoe, a sliding bolt, a pivoted arm connected to the sliding bolt and having an extension connected to the brake shoe by a coil spring, a clutch to drive the rotatable member and means adapted to angularly adjust the arm when the clutch is disengaged and apply the brake and move the bolt into engagement with a recess in the brake drum, substantially as described.

6. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a brake drum associated therewith, a brake shoe, a sliding bolt, a pivoted arm, a collar on the bolt, a spring disposed between the collar and the end of the arm, an extension on the arm connected by a spring to the brake shoe, a clutch to drive the rotatable member and means adapted to angularly adjust the arm when the clutch is disengaged and apply the brake and move the bolt into engagement with a recess in the brake drum, substantially as described.

7. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a brake drum associated therewith, a brake shoe, means to positively lock the rotatable member, a pivoted arm, an extension thereon connected by a coil spring to the brake shoe, a rod disposed within the spring to limit the contraction of the spring, a clutch to drive the rotatable member and means associated therewith to angularly adjust the arm and apply the brake and move the positive locking means into operative position when the clutch is disengaged, substantially as described.

8. In a straight-bar knitting machine the combination with the draw mechanism of a rotatable member, a brake drum associated therewith, a brake shoe, a sliding bolt, a pivoted arm, an extension thereon connected to the brake shoe, a clutch to drive the rotatable member, means associated therewith to angularly adjust the arm when the clutch is disengaged, a collar on the sliding bolt, a spring disposed on the sliding bolt between the collar and the end of the adjustable arm and a second collar on the sliding bolt engaged by the end of the arm to withdraw the bolt when the arm returns to its inoperative position, substantially as described.

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