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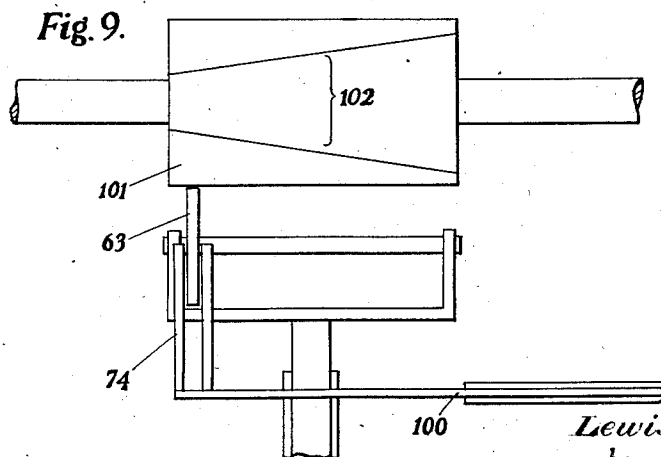
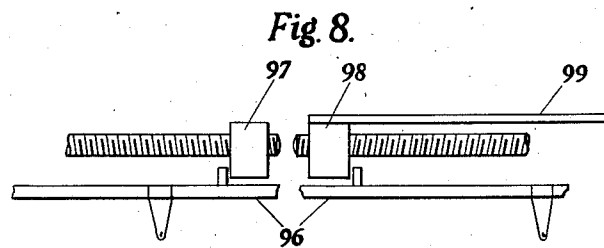
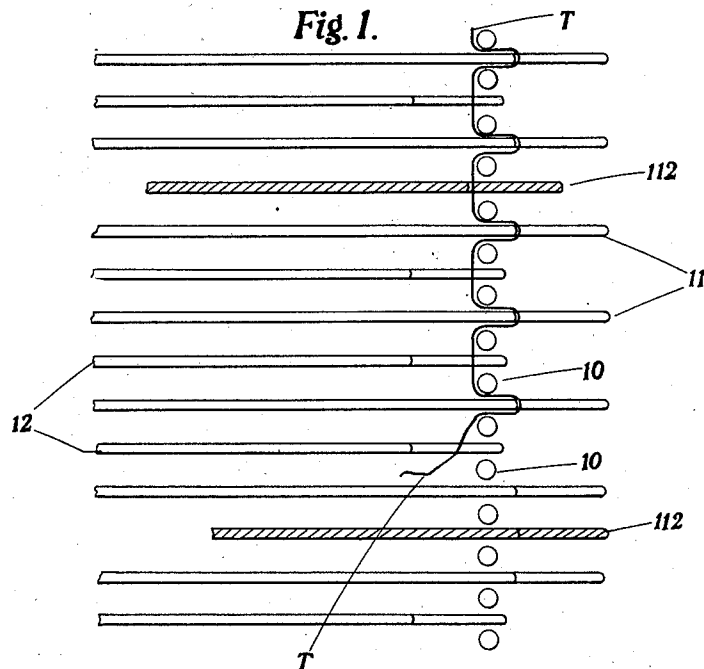
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2,265,100

KNITTING MACHINE

Filed April 5, 1940

9 Sheets-Sheet 1



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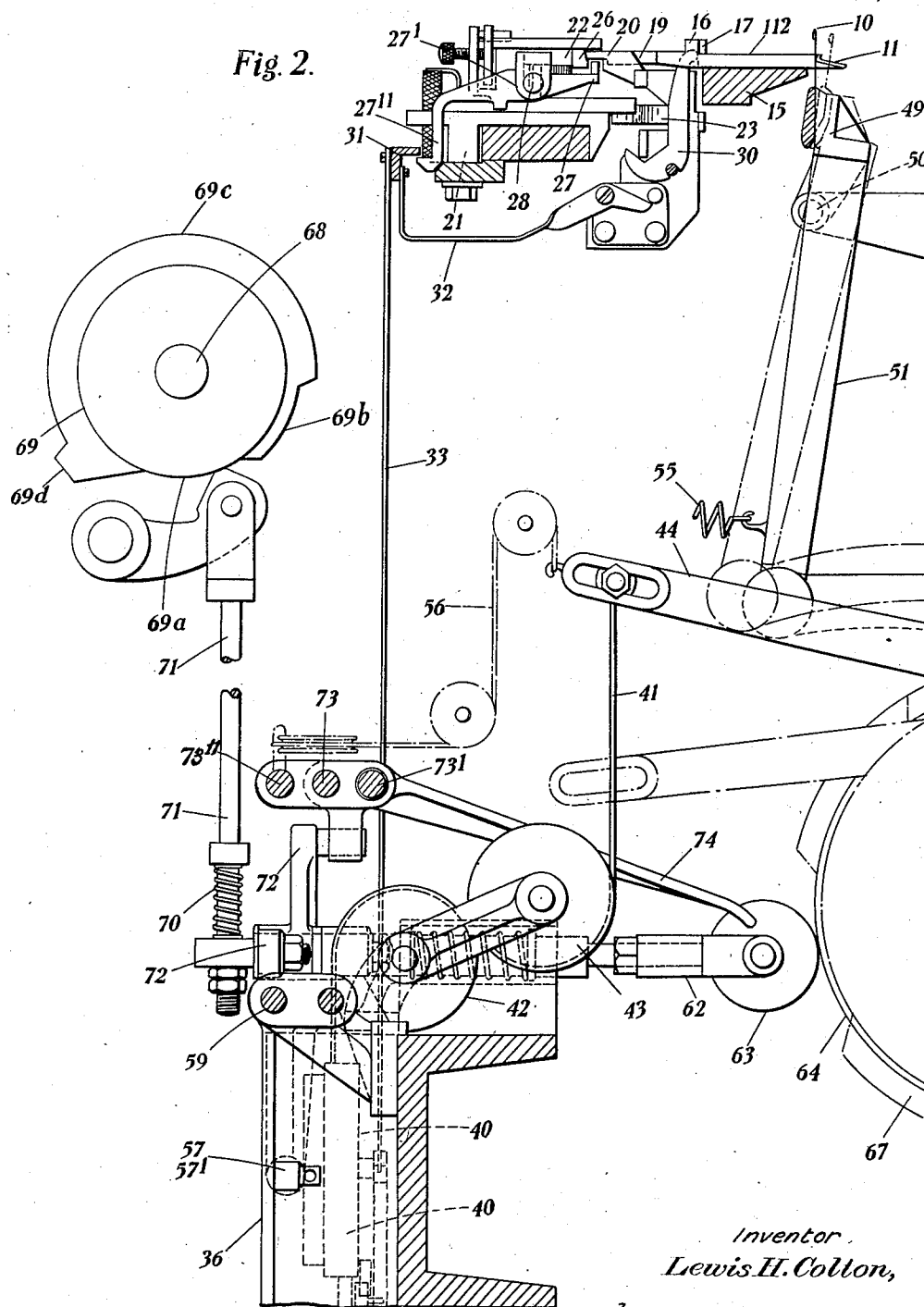
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9 Sheets-Sheet 2



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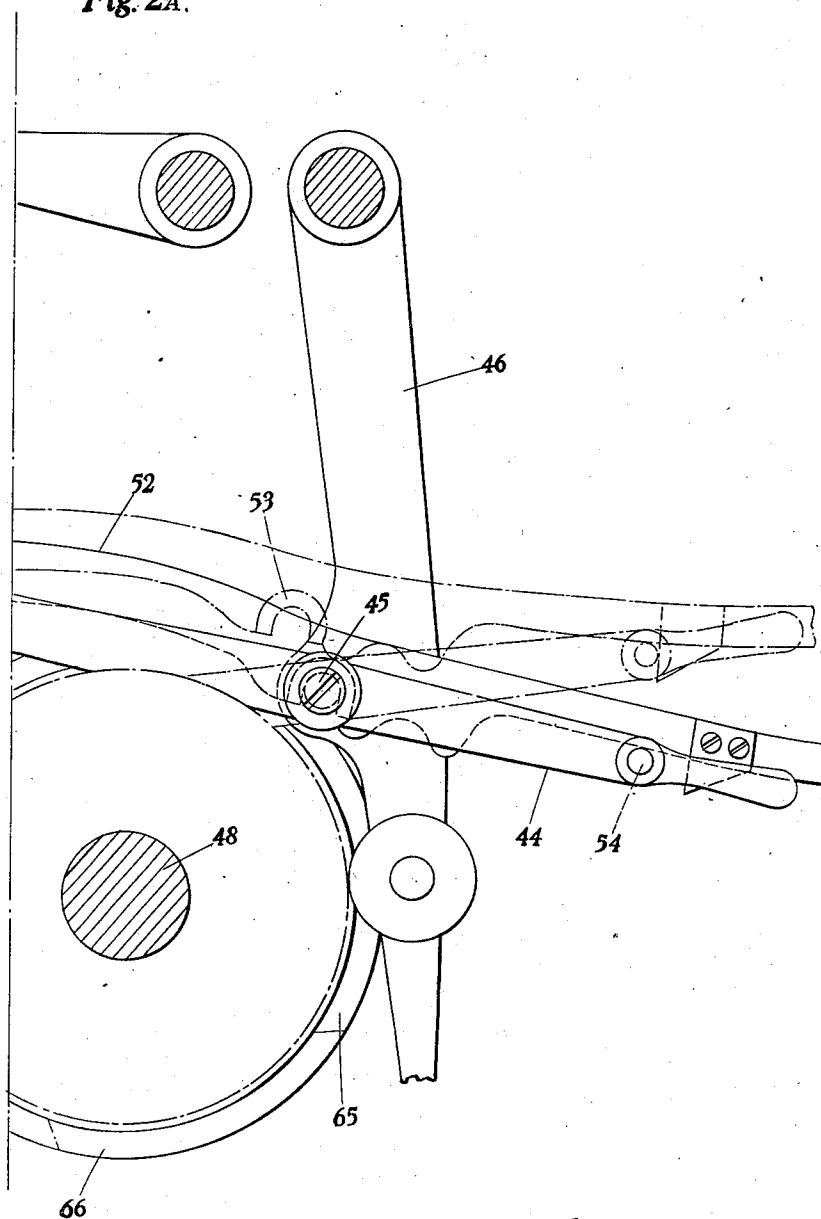
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9 Sheets-Sheet 3

Fig. 2A.



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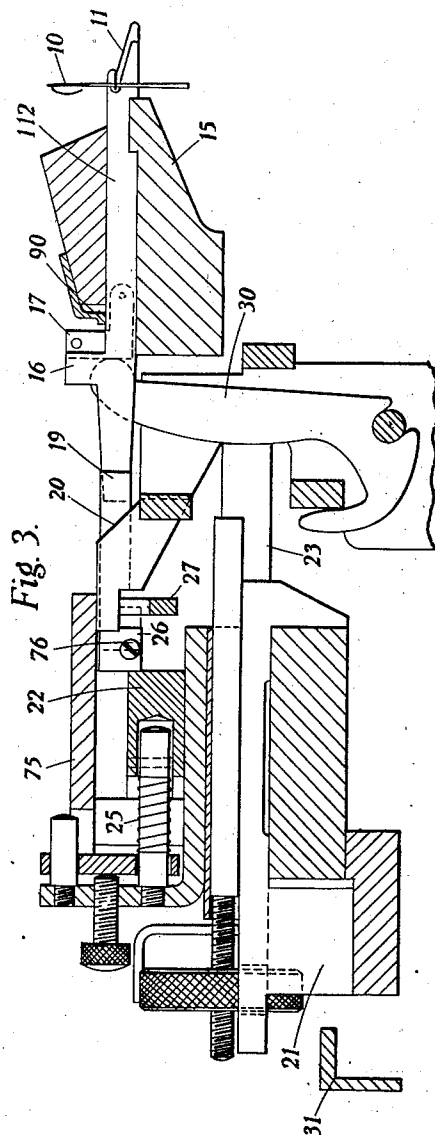
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9 Sheets-Sheet 4



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KNITTING MACHINE

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Fig. 4.

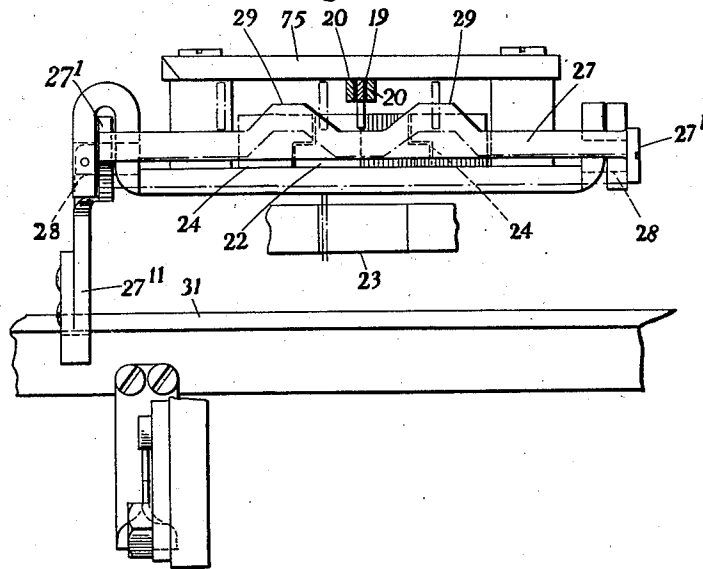
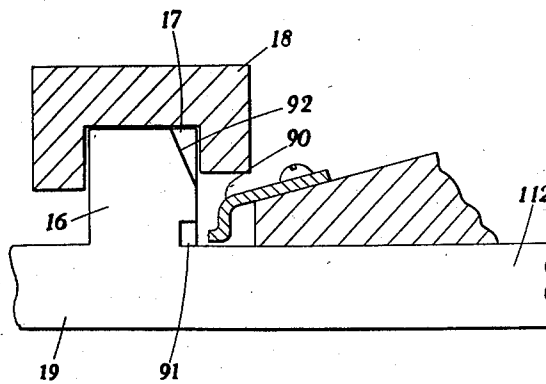


Fig. 11.



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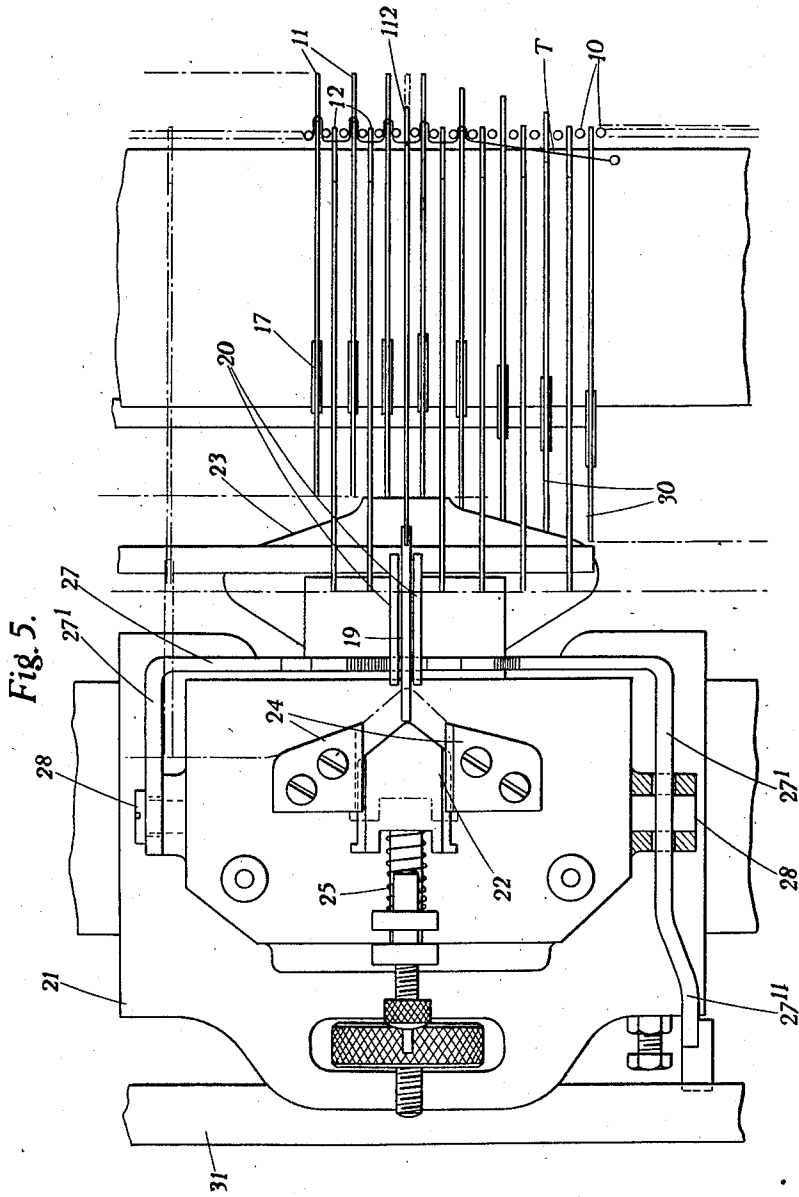
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9 Sheets-Sheet 6



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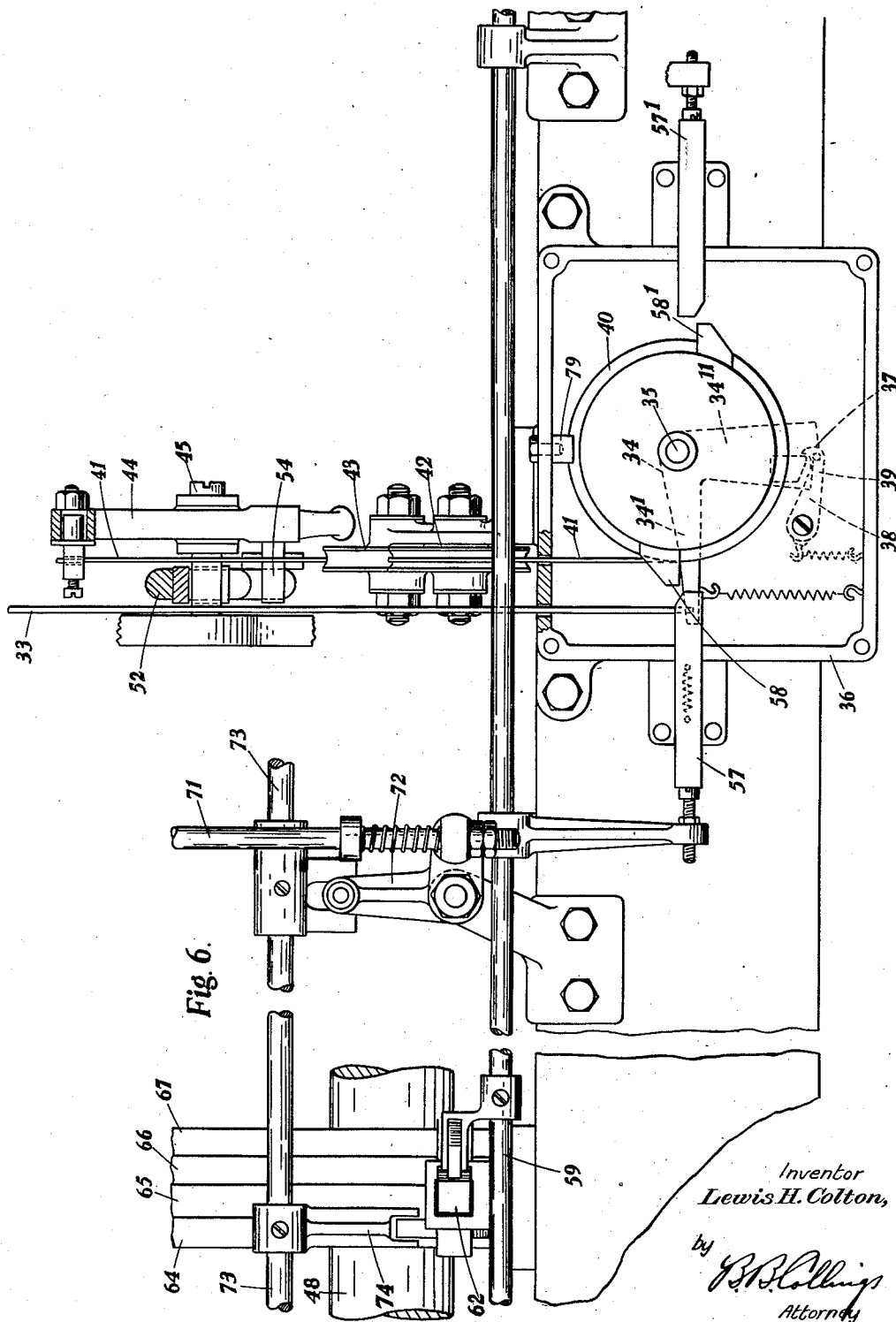
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Fig. 7.

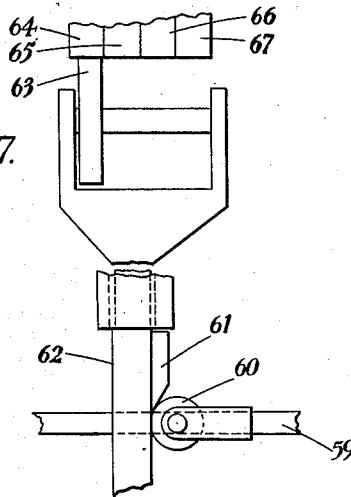
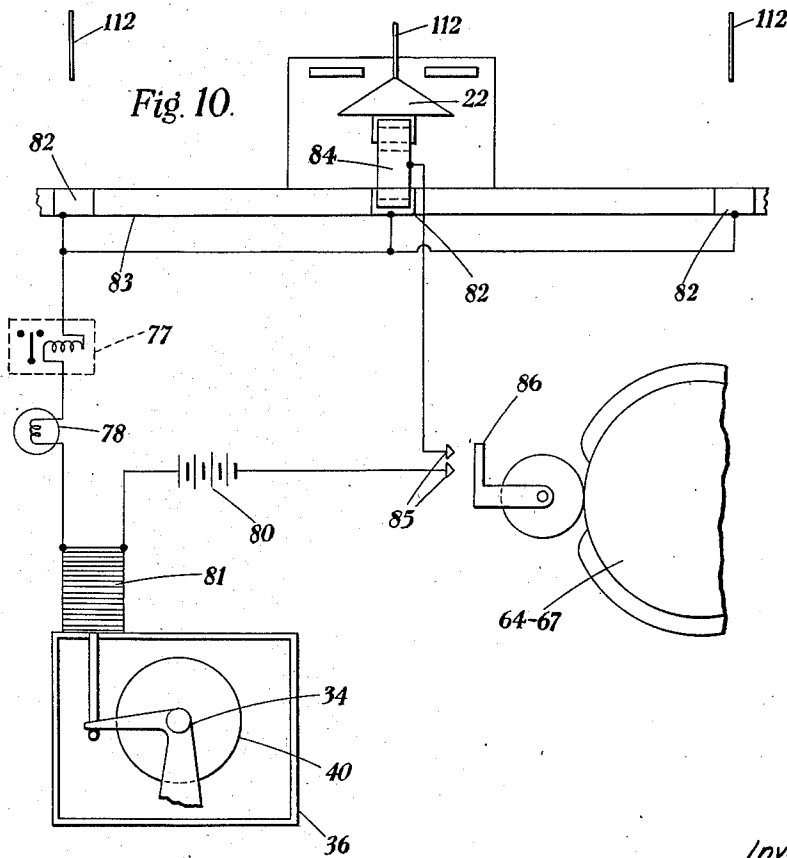


Fig. 10.



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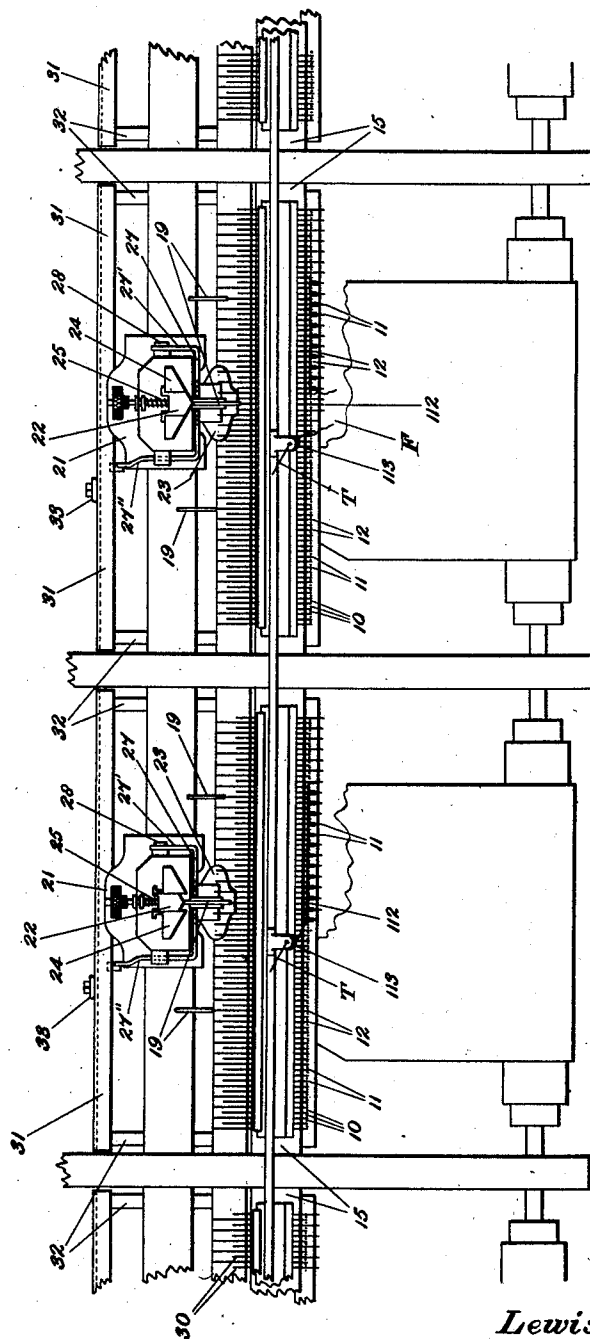
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Fig. 12.



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UNITED STATES PATENT OFFICE

2,265,100

KNITTING MACHINE

Lewis Henry Colton, West Bridgford, England

Application April 5, 1940, Serial No. 328,129
In Great Britain April 6, 1939

17 Claims. (Cl. 66—158)

This invention comprises improvements in or relating to knitting machines and is concerned mainly, but not exclusively, with straight bar or flat bar knitting machines.

When producing fabric on a straight bar knitting machine, such for example as a machine of the Cotton's patent type it frequently happens that the needles at a section or sections of the machine, or certain of the needles at a section or sections press off, i. e. the needles are moved to press and the produced fabric is cast off, by virtue of there being no new thread taken by the hooks of said needles prior to the pressing thereof. This press-off is usually caused by thread breakage or thread failure, and it also occurs if newly laid or fed thread is not disposed taut across and closely upon the needle shanks in a position to be taken into the hooks before pressing. For example, if yarn of a springy or "lively" nature is being employed, same may become deformed or fly out from close engagement with the needle shanks. In the event of a press-off, it is necessary either to bring the machine to rest and replace or "run-on" the fabric on to the needles, or in the alternative to permit the division or divisions where the needles have pressed-off to remain idle until the articles being knitted on the remaining divisions have been completed. In either event the loss in production is appreciable, and particularly so in the case of large machines (i. e. machines having a relatively large number of knitting sections), if the expedient of running-on is adopted, as knitting at each and every section is inevitably held up while the fabric is being run on to the needles at the section where the press-off has occurred. The likelihood of a press-off is increased when articles such for example as hose are being knitted by what is known as the three carrier process.

The main object of the present invention is to minimise the aforesaid disadvantage and obviate the possibility of an accidental press-off, and by so doing considerably to increase the output of the machine, and to decrease waste.

With the aforesaid object in view the invention provides, in a knitting machine, a member arranged normally to be brought into contact with new thread correctly disposed on the needles, which member controls and brings into operation means for preventing the last-knitted loops formed on the needles from being cast off said needles in the event of failure, undue slackness, or other incorrect laying of said thread. The invention also provides in a knitting machine, particularly a Cotton's patent or other

straight bar knitting machine, a stop motion functioning automatically to prevent the fabric from being pressed off or cast off the needles and/or to bring the machine to rest in the event of thread supply failure, or thread slackness or mispositioning, at the needles prior to stitch formation, which motion includes at least one thread detector operating at the needles. It may here be explained that the expression "stop motion" is employed herein in the same broad sense that it is used in the trade to include not only a motion (i. e. mechanism or apparatus) whereby the machine is actually brought to rest but also a motion whereby the knitting operations or certain thereof are suspended.

The detector is preferably arranged normally to engage the thread extending from needle to needle. Therefore if no thread is presented between the needles or if the thread occupies an incorrect position or is unduly slack these abnormalities, which would otherwise result in a press off, are detected by the detector before knocking-over and the stop motion is brought into operation.

The invention further includes in a knitting machine, particularly a Cotton's patent or other straight bar knitting machine, a stop motion comprising at least one detector for detecting at the needles a fault in the supply of thread to the needles to be knitted thereby, and means controlled by said detector for suspending the knitting operations of at least the needles affected by a fault detected by said detector. It will be appreciated from the foregoing explanation that a fault in the supply of thread to the needles may consist in an absence of thread, such as is caused by thread breakage or failure; or in undue slackness in the thread, such for example as may be caused by a thread breakage at some point remote from the needles, or in the failure of a tensioning device; or in the mispositioning of the thread at the needles, such for example as may be caused by virtue of a lively thread springing above, the sinkers in the case of a straight bar machine. The knitting operations may be suspended either by stopping the machine, or by suspending its motions which result in a press off, or by both. For example, in a straight bar knitting machine, the needles may be prevented from pressing and this may be effected by an interruption or adjustment of the connection that extends between the presser cam and the needle bar in the case of a machine of the English type, or by moving the presser edge. The knitting operations of all the needles, or of

some only of them, may be suspended. Thus in a multi-division straight bar knitting machine the knitting operations may be suspended only in that division or divisions wherein the fault in the thread supply at the needles occurs, the other divisions continuing to knit.

Conveniently the detector is movable in a space between successive needles and is so arranged that its movement is influenced by resistance offered by the thread to be knitted, the arrangement being such that the extent of said movement determines the operation of the stop motion. There may be means for projecting the detector between the needles to engage the thread to be knitted, combined with means whereby the degree of resistance, if any, offered by the thread to said projection determines the operation of the stop motion. It will therefore be appreciated that the said detector may be constituted by a sinker.

In order that the invention may be better understood its application to a straight bar knitting machine of the Cotton's patent type will now be described in detail by way of example with reference to the accompanying drawings in which

Figure 1 is a diagram illustrating the principle of the invention;

Figures 2 and 2a together constitute a cross section through a knitting machine incorporating the invention, but only showing such parts of the machine as are relevant to an understanding of the invention, those parts which are not shown being well known and needing no illustration or description herein;

Figure 3 is a sectional view on a larger scale of a portion of the mechanism shown at the top of Fig. 2;

Figure 4 is a front elevation of part of the mechanism shown in Fig. 3;

Figure 5 is a plan of the mechanism shown in Fig. 3;

Figure 6 is an elevation, looking from the rear of the knitting machine, of some of the mechanism shown in Fig. 2;

Figure 7 is a plan of a portion of the mechanism shown in Fig. 6;

Figures 8 and 9 illustrate modifications which may be applied to the construction shown in Figs. 2, 6 and 7 in a manner hereinafter described;

Figure 10 is a diagram illustrating an electrical control for the stop motion, while

Figure 11 illustrates, on a large scale, a modified form of detector and adjacent parts; and

Figure 12 is a plan view illustrating the application of the invention to a multi-division straight bar knitting machine, wherein all of the divisions normally operate in unison to knit separate widths of fabric.

As is well known, in the type of machine of which this invention is especially concerned, that is to say a Cotton's patent or other straight bar knitting machine, there is usually a needle bar for each of several sections each of which is arranged to knit a separate width of fabric, and threads are simultaneously traversed over the various sections or divisions, the traverse being variably determined by adjustable thread carrier bar stops to produce in conjunction with the narrowing mechanism the required shaped or fashioned blanks. Referring especially to Fig. 1, following the laying of thread T across the needles 10 of each section (which occurs while said needles are raised) jack sinkers 11 are progres-

sively projected between alternate pairs of needles to sink loops of thread therebetween, and subsequently divider sinkers 12 are simultaneously projected to a relatively smaller distance between the remaining alternate pairs of needles by a catch bar and the needles are moved slightly away from the sinker heads, thereby forming loops of equal size between all the needles.

The projection of the jack sinkers 11 operates in the customary manner to draw a bar of thread tightly across each of the alternate needle spaces at which the divider sinkers 12 subsequently operate; and in this invention prior to said divider sinkers 12 coming into operation an element 112 is projected at one or more positions in the length of each needle bar section and at a position or positions usually occupied by the customary divider sinkers. Each such element 112, which for convenience of description will be referred to as a detector, is so mounted or arranged that if when projected same engages one of the aforesaid thread bars extending straight and taut across a needle space (as illustrated in the upper portion of Fig. 1) said detector 112 is restrained from further projecting movement by said thread bar and the knitting operation proceeds in the normal manner. If, however, the thread is broken, or for any other reason does not extend taut and straight across the needle space and/or at the correct level the detector in its projection meets with no resistance and is moved forward to a relatively greater distance, as is illustrated in the lower portion of Fig. 1. When this occurs, means are brought into operation by virtue of said increased forward movement of the detector 112 to bring the machine to rest and/or to throw out of operation the customary needle pressing mechanism.

Since each detector 112 occupies a position in the sinker head 15 which is normally occupied by a dividing sinker the said detector may, as is shown in Figs. 2 and 3, be shaped at its forward or thread-engaging end in exactly the same manner as a dividing sinker 12. Each detecting sinker 112 is provided with a butt 16 of the same height as the butts 17 of the jack sinkers, which butt is adapted for engagement with the usual catch bar such as that indicated at 18 in Figure 11. The said detector sinker 112 has, however, a reinforced rearward extension 19 which is guided between guides 20 provided on or formed integral with the upper rear bar of the usual jack head. The detector is projected by means of the engagement, with this extension 19, of a cam 22 suitably positioned and mounted in the slurcock box 21 centrally of the slurcock 23. This cam 22 is slidably mounted in guides 24 and is pressed forward by a light adjustable compression spring 25. As will be understood, if in its forward projection the detector 112 engages a correctly positioned and taut thread bar (which circumstances are illustrated in the upper part of Fig. 1) the spring 25 will yield slightly. If on the other hand the detector 112 does not engage a correctly positioned and taut thread bar, the spring 25 will not yield and the detector will be projected to its maximum extent, as is illustrated at the base of Fig. 1. This extra projection of the detector carries a butt 26 at its tail end to a position above a cam bar 27 traveling with the slurcock-box 21. This cam bar 27 is of stirrup-like formation and its side arms 27' are pivoted to the slurcock-box at 28. The said cam bar 27 has two crests 29, as shown in Fig. 4,

which are symmetrically disposed with regard to the apex of the cam 22 and the centre line of the slur-cock 23. The butt 26 is projected between these two crests and the continued travel of the slur-cock-box carries it over one of them. The detector extension being prevented from rising either by a cover plate 75 or by a screw 76 on the detector butt 26 which screw engages beneath the guides 20, or by both means, the cam bar 27 is therefore depressed about its pivots 28. This movement is utilised, through any suitable relay which is conveniently either mechanical or electrical, to suspend the knitting operations in the particular section of the machine wherein the detector has detected the fault of the thread supply at the needles.

It may here be mentioned that the spacing of the two cam rises 29 in relation to the width of the flat-nosed portion of the slurcock 23 is such that according to the direction of movement of the slurcock one or other of said rises 29 acts as a guard co-operating with the butt 26 on the detector 112 to prevent said detector being projected to its full extent by the cam 22 until the jack sinkers 11 at each side of the detector have been moved to their fully advanced positions by the slurcock 23. Otherwise, of course, the detector would engage the thread T before it has been drawn tautly across the needles by the jack sinkers. After the passage of the slurcock 23 and the cam 22, if the detector 112 has not advanced to an abnormal extent because of the presence of a thread supply fault, the butt 16 of the detector is left in position for subsequent advance with the butts of the other dividing sinkers 12 by the catch bar in the usual dividing operation.

One of the side arms 27' of the cam bar 27 is provided with a rearward extension 27'' which traverses underneath a light angle bar 31 which extends for the length of each division of the machine and is suitably supported by means such as are indicated at 32, whereby when the bar 27 is depressed by the detector 112 said extension 27'' raises said angle bar 31. This movement is communicated by a connection indicated at 33, Figs. 2 and 6, to one arm 34' of a bell-crank-lever 34 pivoted at 35 in an appropriate casing 36. The other arm 34'' of said bell-crank-lever is formed with a small incline 37 which, when the bell-crank-lever 34 is rocked by reason of the angle bar 31 being lifted, disengages a spring pawl 38 from a catch 39 on a drum 40. The said drum is biased by suitable means such as spring means to rotate about the axis 35 in an anti-clockwise direction as viewed in Fig. 6, so that the release of said pawl 38 results in said rotation. Connected to the drum 40 there is a wire cable 41 which extends over suitable pulleys 42, 43 to a lever 44 which is pivoted on a stud 45 carried by the usual lever 46 which is rocked by an appropriate cam on the main cam shaft 48 of the machine to produce the pressing movements of the division of needles. It will be understood that the needle bar 49 is pivoted about the horizontal axis 50 and is provided with a depending lever 51 which is connected to the said stud 45 on the press lever 46 by the usual hand lever 52, which has a recess 53 for the reception of the stud. Therefore, in the normal manner by raising the hand lever 52 the pressing motion of the lever bar may be suspended. According to this invention the mechanism hereinbefore described serves to raise this hand lever 52 automatically. To this

end the lever 44 carries at its forward end a stud 54 adapted to engage underneath the forward end of the hand lever 52. Therefore, when the lever 44 is rocked by a pull on the cable 41 the stud 54 raises the hand lever so that the recess 53 thereof is disengaged from the stud 45. Upon such disengagement the needle bar is moved by a spring indicated at 55 to the position shown in chain dotted lines in Fig. 2. In this position the needles are incapable of pressing. Therefore, the detection of a fault by a detector 112 results in the knitting operations of the machine being suspended and a press-off prevented.

It is here to be pointed out that the foregoing mechanism may be common to the whole machine. Thus, referring to Fig. 12, there is shown the relevant parts of a multi-division knitting machine, each division of which is provided with thread feeding means 113, detectors 112, and a separate bar 31. A cable 33 extends from each of the said bars and all of such cables may be connected to one lever 34, so that if a fault is detected in one division, as illustrated at F, pressing is prevented on the needles of all the divisions. It is preferred however that there shall be a bar 31, a drum 40, and a connection 41, 44, for each division to the hand lever 52 of said division, so that if a fault is detected in one division, knitting is suspended in that division only.

The drum 40 and the lever 44 are re-set automatically when the needle bar lever 52 is manually replaced in normal engagement with stud 45.

The movements initiated by the detector 112 or any one thereof may alternatively or additionally be applied to stopping the machine. In one arrangement shown in Fig. 2 there is a cable or the like 56 which extends from the rear end of each lever 44 to a rod 73'' which extends past all sections and operates appropriate trip mechanism, not shown, controlling the switch of the driving motor of the machine, so that when the rear end of the lever 44 is pulled down following the operation of a detector 112, the current to the motor is cut off.

It is, of course, preferable that in each division of the machine there shall be a plurality of detectors such as 112 since a fault may occur at any position in a division of needles. However, since during the normal operation of fashioning the stocking blank during its production on a Cotton's patent machine, there are, at certain times, certain needles to which thread is not supplied owing to the reduction in the traverse of the thread carriers, at certain times there will also be one or more detectors associated with such normally inactive needles. It is, therefore, necessary to provide means whereby such detectors are rendered inoperative, otherwise they will prevent the operation of the machine. This mechanism will now be described and it is to be pointed out that in the case of a multi-division machine said mechanism is common to a plurality of (e. g. two) or all the divisions.

Referring to Figs. 2, 6 and 7, associated with each drum 40 there is a sliding latch 57 adapted to engage under a projection 58 on the drum and to prevent said drum from rotating except at predetermined intervals, determined by the withdrawal of said latch 57. The latter is connected to a horizontal slide bar 59 extending past all the divisions and carrying a truck 60 adapted to be engaged by a ramp 61 on a slide 62, Figs. 6 and 7. The said slide 62 carries a truck 63 which is ad-

justable into register with any one of a number of control cams on the main cam shaft 48. These cams are so constructed that at the appropriate times they effect such endwise movement of the rod 59 as will result in the release of the latch 57. The peripheries of the cams differ, each one of certain thereof having a lift the peripheral length of which bears such relation to the length of draw of the machine as will result in the latch 57 being withdrawn throughout a predetermined portion of the draw. For example, in each division there are conveniently five detectors, one near each extremity of the division where they lie slightly inwards of the selvedge edges of the welt; two somewhat closer together where they occupy positions slightly inwards of the selvedge edges of the ankle; and one centrally disposed. There are four control cams on the cam shaft 48, one being a plain cam 64, the diameter of which is such that when the truck 63 is in register with it the latch 57 is either withdrawn during the full extent of the draw or is inserted during said full extent. The latter is preferred so that the said cam 64 may be employed to hold the detectors inoperative during the period from the completion of one stocking blank and the commencement of the next. There is another cam 65 into register with which the truck 63 is shogged at the commencement of the welt which renders all the detectors operative. The next cam 66 is adapted to render the two outside detectors inoperative shortly after the commencement of the reduction in the width of the blank, and the third cam 67 is arranged to render inoperative those detectors which are located endwise of the selvedge edges of the ankle. Shogging movements of the truck 63 are derived from any suitable shaft 68 of the machine, such, for example, as the automatic shaft. This shaft carries a cam 69 adapted to depress, to varying extents against the action of a spring 70, a vertical rod 71. The latter is connected by a bell-crank-lever 72 to a slidable rod 73 provided with a fork 74 engaging the truck 63. Therefore, the contour of cam 69 determines with which of the cams 64-67 the truck 63 shall register. The said cam 69 has four surfaces of differing radii and differing circumferential length. There is a portion 69a corresponding to cam 64, a portion 69b corresponding to cam 65 and employed for the welt, a third portion 69c corresponding to cam 66 and employed for the panel, and a fourth portion 69d corresponding to cam 67 and employed for the toe.

In certain cases it may be desirable to render the detectors inoperative in a selective manner other than those indicated. For example, in a machine which knits the complete stocking blank a stage is reached at which heel tabs are being knitted while the instep needles are inactive. While during this process it is practicable to render all the detectors inoperative since it is common practice to knit each heel tab of two threads, a main thread and a splicing thread, so that a press-off is unlikely, yet it may be desirable to render the central detector and the two outer detectors inoperative but to continue in operation the two detectors which are located inwards of the selvedge edges of the ankle. For this purpose a second latch 57' is provided diametrically opposite the latch 57 and adapted to engage a lug 58' on the drum 40. This second latch 57' may be connected to any part of the machine which undergoes an adjustment when the heel tabs are being knitted e. g. rod 73'.

Instead of employing a cam such as 69 on the automatic shaft of the machine for shogging the truck 63, the latter may be connected to the carrier stops. This is illustrated diagrammatically in Figs. 8 and 9. The carrier rod is indicated at 96 and the screw blocks by which its traverse is determined at 97 and 98. The fork 74 for adjusting the truck 63 is connected to one of these stops by means of rods indicated at 99 and 100. In association with this arrangement for shogging the truck 63, or even in association with the shogging arrangement described with reference to Figs. 2, 6 and 7, a single cam may be employed instead of a number of cams such as 64 to 67. Such a single cam is indicated at 101 (Fig. 9), and it is provided in its periphery with an axially extending and tapered recess 102 so that from end to end of said cam the circumferential length of the raised portion of the cam periphery varies. In this manner, according to the adjustment of the truck 63, the period in each revolution of the cam shaft 48 during which the truck 63 is forced forward varies.

The foregoing mechanism is entirely mechanical in character but an electrical control is within the scope of this invention. and Fig. 10 is a diagram illustrating one form of such electrical control. There is a circuit including a source of electrical supply 80, a solenoid 81 for operating the bell-crank-lever 34 to release the drum 40, contact strips 82 on a fixed bar 83 extending the length of the machine, there being one such contact strip 82 for each detector 112, a movable contact 84 associated with the detector-advancing cam 22, and contacts 85 arranged to be connected and disconnected for predetermined periods by a switching member 86 operated by cams 64 to 67 or cam 101. It will be understood that when any detector 112 and its cam 22 move forward to that additional extent which is only permitted by a fault in the thread supply, communication is made between contact 84 and one of the contacts 82. The circuit is, therefore, completed to release the drum 40 provided that the contacts 85 are connected by the switching member 86. In this circuit there is also included a switch 77 for stopping the machine and a visual and/or audible signalling device 78 for giving a signal when the stop motion operates.

It will be appreciated that the difference between the normal and the abnormal advance of the detector 112 is limited since the detector cannot advance further than is permitted by the fall bar 90. Since this limited movement is required to set in operation the stop motion it may be desirable that it should be extended. Therefore, as illustrated in Fig. 11, the butt 16 of each detector 112 may be provided with a recess 91 in its front edge to permit of a slight additional abnormal movement. Since this recess 91 is provided the detectors will not necessarily be lined up with the sinkers by the fall bar 90, but may be projected (by cam 22) somewhat further than the other sinkers. Therefore, the top of the butt 16 of each detector 112 is chamfered as at 92 so that when the catch bar 18 descends onto the sinker butts the detectors are retracted to be levelled up with all the other sinkers.

The invention is not restricted to the herein-described and illustrated means for interrupting the knitting motions of the needles upon the detection of a fault.

I claim:

1. In a straight bar knitting machine having a line of needles for knitting a thread fed thereto,

jack sinkers for sinking said thread around pairs of needles, and dividing sinkers for dividing the sunk thread around the needles; at least one detector element among the sinkers for responding to abnormal thread conditions at the needles, and means controlled by said detector for suspending knitting operations upon the detection of an abnormality.

2. In a straight bar knitting machine of the type in which thread is supplied to the needles of a line thereof and is first sunk around successive pairs of needles by jack sinkers so that a thread kink is formed in every second needle space, said jack sinkers being projected progressively along the needle line, and is then divided equally between the needles by dividing sinkers that are projected into every other needle space to engage the thread bars extending between said kinks and thereby to measure a loop in each needle space, said loops being then knitted by the needles; the combination of at least one detector operating at one of said other needle spaces for detecting a press-off-producing thread-fault at said one space, means for projecting it, subsequent to the projection of the jack sinkers at the needle spaces at each side thereof, to an extent determined by such resistance as may be offered to it by thread at said space, said resistance being greater if the thread is correctly laid across said space than it is if a fault aforesaid occurs thereat, means for suspending the knitting operations of the needles, and means for establishing an operating connection from the detector in the fault-detecting position thereof to said suspending means and for causing the latter to operate.

3. A combination according to claim 2 wherein the detector comprises a dividing sinker, and including means for projecting said detector-sinker for dividing purposes together with the other dividing sinkers.

4. A machine according to claim 2 when of the type wherein means are provided for varying the number of needles knitting the thread to fashion the fabric produced; having a plurality of said detectors at differing locations along the line of needles, and means for preventing the establishment of said operating connection from any detector the location of which is outside the edges of the blank.

5. In a straight bar knitting machine of the type in which thread is supplied to the needles of a line thereof and is first sunk around successive pairs of needles by jack sinkers so that a thread kink is formed in every second needle space, said jack sinkers being projected progressively along the needle line, and is then divided equally between the needles by dividing sinkers that are projected into every other needle space to engage the thread bars extending between said kinks and thereby to measure a loop in each needle space, said loops being then knitted by the needles; the combination of at least one detector operating at one of said other needle spaces for detecting a press-off-producing thread-fault at said one space, means for projecting said detector to one position to engage the thread when correctly disposed across said one needle space and to another position should there be a thread fault at said space, which fault includes one of the following:—no thread, a slack thread, and a mis-positioned thread, and automatic means for suspending knitting operations upon the detector assuming said second position.

6. In a straight bar knitting machine of the

type in which, for each of successive courses, thread is fed to the needles of a line thereof and as it is fed is sunk around successive pairs of needles by jack sinkers operated by a slurcock travelling along the line of the needles in time with the thread feed, whereby normally said thread is kinked in every second needle space and thread bars joining said kinks each extend over a pair of needles at a correct location and at a correct tension for normal knitting without press-off of the fabric, said thread bars being subsequently engaged by dividing sinkers projected simultaneously along the line by a catch bar and the thread being thereby divided equally among the needles, and said divided thread thereupon being knitted by the needles; the combination of at least one fault detector located opposite a space between a pair of needles aforesaid, for serving as a dividing sinker, a resilient device travelling with the slurcock for projecting said detector to engage the thread bar at said space, without substantial kinking of said bar if present and correctly disposed, which device yields under the resistance of said thread bar in normal knitting conditions to position the detector for subsequent projection as a dividing sinker by the catch bar but which device projects the detector to a greater extent if abnormal knitting conditions at said needle space afford a less resistance to said projection, means travelling with the slurcock and resilient device for displacement by the detector upon said greater projection of the latter and for causing safety means to operate, and safety means for preventing the needles from knitting and for obviating a press-off resulting from abnormal conditions permitting of said greater displacement of the detector.

7. In a straight bar knitting machine of the type in which, for each of successive courses, thread is fed to the needles of a line thereof and as it is fed is sunk around successive pairs of needles by jack sinkers operated by a slurcock travelling along the line of the needles in time with the thread feed, whereby normally said thread is kinked in every second needle space and thread bars joining said kinks each extend over a pair of needles at a correct location and at a correct tension for normal knitting without press-off of the fabric, said thread bars being subsequently engaged by dividing sinkers projected simultaneously along the line by a catch bar and the thread being thereby divided equally among the needles, and said divided thread thereupon being knitted by the needles; at least one dividing sinker movable to the normal position and to an abnormal position as determined by thread resistance offered to its movement, a resilient device travelling with the slurcock for projecting said dividing sinker, and means brought into operation by the projection of said sinker to said abnormal position for preventing a press-off.

8. A combination according to claim 6, wherein the slurcock has a substantially flat extremity for temporarily holding a plurality of successive jack sinkers in projected position, and having the resilient device symmetrically disposed with regard to said slurcock, for projecting said detector between adjacent jack sinkers only while said jack sinkers are held projected by said flat extremity.

9. In a combination according to claim 5 the combination with a presser cam for effecting pressing of the needles, a truck lever movable thereby, and a hand lever normally engaged with said truck lever to transmit pressing

movements from said cam but capable of being manually disengaged therefrom to interrupt pressing; of a source of energy for disconnecting said hand lever, an operative connection from said source to said lever, and means for rendering said source operative upon movement of the detector to the second said position.

10. In a knitting machine having needles arranged in a line to form stitches from thread fed to them and the number whereof in knitting actively varies, a stop motion comprising a plurality of detectors at different locations along said line each for detecting at the needles a fault in the supply of thread to the needles to be knitted thereby, means controlled by the detectors for suspending the knitting operations of at least the needles affected by a fault detected by any said detector, and control means for rendering inoperative any detector located in a part of the line the needles whereof are at a given time inoperative to knit.

11. In a knitting machine of the type having a line of substantially vertical needles for knitting thread fed thereto, and substantially horizontally slidable sinkers spaced along the line of needles for engaging and positioning the fed thread and for co-operating with the needles in knitting, the combination of at least one detector for engaging at the needles the thread fed thereto and movable to an extent determined by the pressure between it and the thread, and means, controlled by said detector when in a position consequent upon lack of a predetermined thread pressure, for preventing a press off.

12. In a knitting machine of the type having needles operable to knit thread fed to them and having thread-engaging elements located at the spaces between successive needles for co-operating with the needles to kink the fed thread and to control it, the combination of a thread detector movable between said elements to engage thread correctly extending between and positioned by said needles and elements and to detect a fault by lack of resistance offered by the thread to its movement, means for projecting said detector to engage the thread at a time whereat a correctly ordered thread would be positioned and controlled, by said needles and by said elements at each side of the detector, to offer resistance to the detector advance, and means for preventing a press off upon lack of resistance being encountered by the detector.

13. In a knitting machine of the type having a line of needles for knitting thread fed thereto and sinkers located between the needles, wherein correctly-laid thread is engaged and kinked by co-operation of the needles and sinkers, the combination of at least one detector movable, at a location whereat there is at least one sinker at each side of it, to either of two positions accord-

ing to resistance offered by the thread; a normal position reached against the resistance of thread correctly disposed and kinked by the needles and the said sinkers at each side of it, and a further position reached against a less resistance, means for projecting said detector as aforesaid at a time whereat a correctly disposed thread would be engaged and kinked by the needles and said sinkers at each side of it, and means controlled by said detector consequent upon projection to the second position to prevent a press-off.

14. In a knitting machine of the type having a line of needles for knitting thread fed thereto and a line of sinkers located along the line of needles, which sinkers are movable one after another between the needles to engage the fed thread, the combination of at least one detector movable at a location whereat there is at least one sinker at each side of it, to engage the fed thread at the needles, means for projecting it, subsequent to the projection of the sinkers at each side of it to thread-engaging position, to a normal extent against the resistance of a correctly-ordered thread and to an abnormal extent against a less resistance, and means controlled by said detector upon movement to said abnormal extent for preventing a press off.

15. In a multi-division straight bar knitting machine of the type wherein each division comprises needles, sinkers, and thread feeding means traversing over that division only, all of the divisions normally operating in unison to knit separate widths of fabric, the combination, in at least one division, of a detector operating at the needles of said division for detecting, prior to stitch formation, a fault in the supply of thread to the needles of said division, and means controlled by said detector upon the detection of a fault for preventing a press-off in that division while at least one other of the divisions continues knitting activity.

16. In a machine according to claim 15, means controlled by said detector upon the detection of a fault at the division wherein it is provided, for also bringing the entire machine to rest.

17. In a straight bar knitting machine, having a line of needles for knitting thread fed thereto and sinkers disposed between said needles for engaging the thread extending from needle to needle, the combination of stop mechanism for controlling the operations of said needles; and connections between said stop mechanism and certain of said sinkers whereby said mechanism will be actuated in response to abnormal conditions of the thread where engaged by such sinkers to suspend knitting operations on at least those needles whereat such abnormal conditions exist.

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