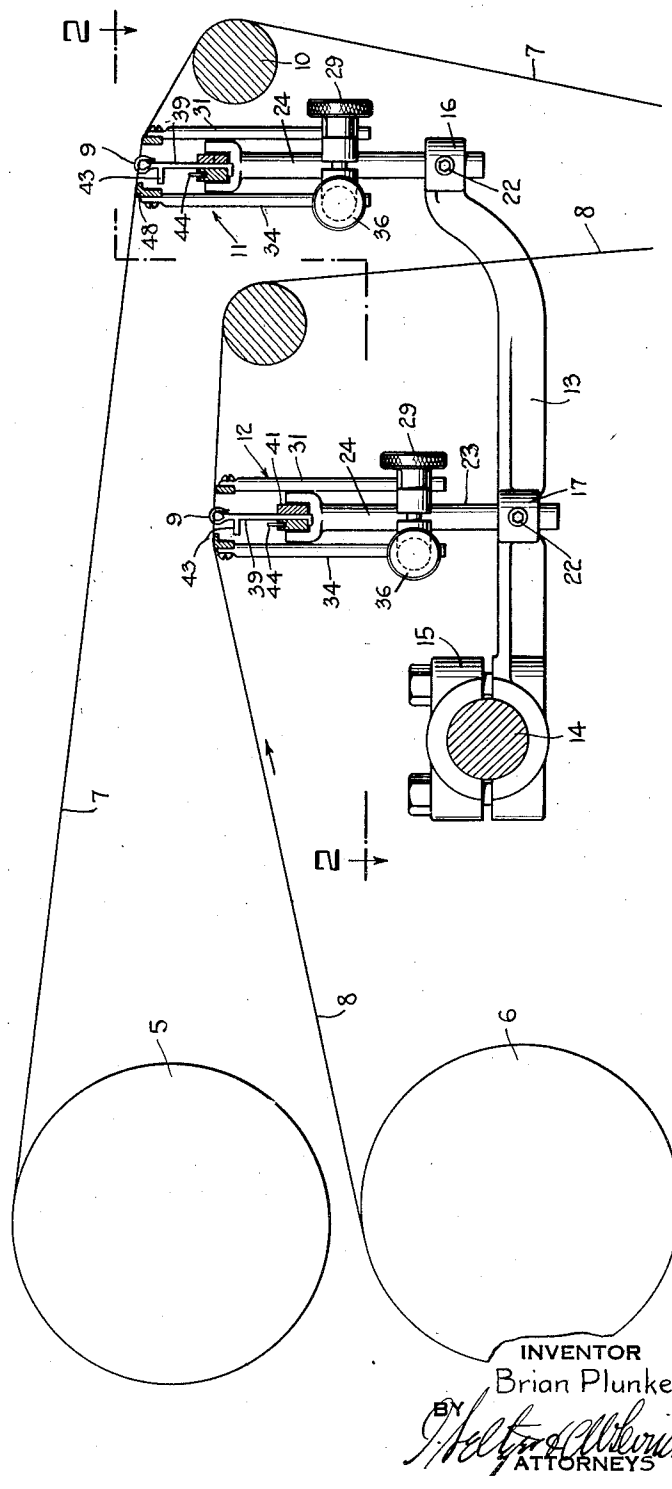
Aug. 1, 1939. B. PLUNKETT 2,167,907

WARP STOP MOTION

Filed July 23, 1937 2 Sheets-Sheet 1

Fig. 1.



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Filed July 23, 1937 2 Sheets-Sheet 2

Fig. 4.

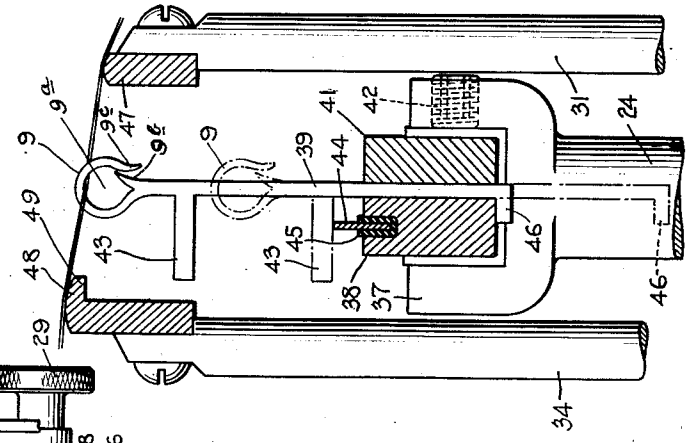


Fig. 2.

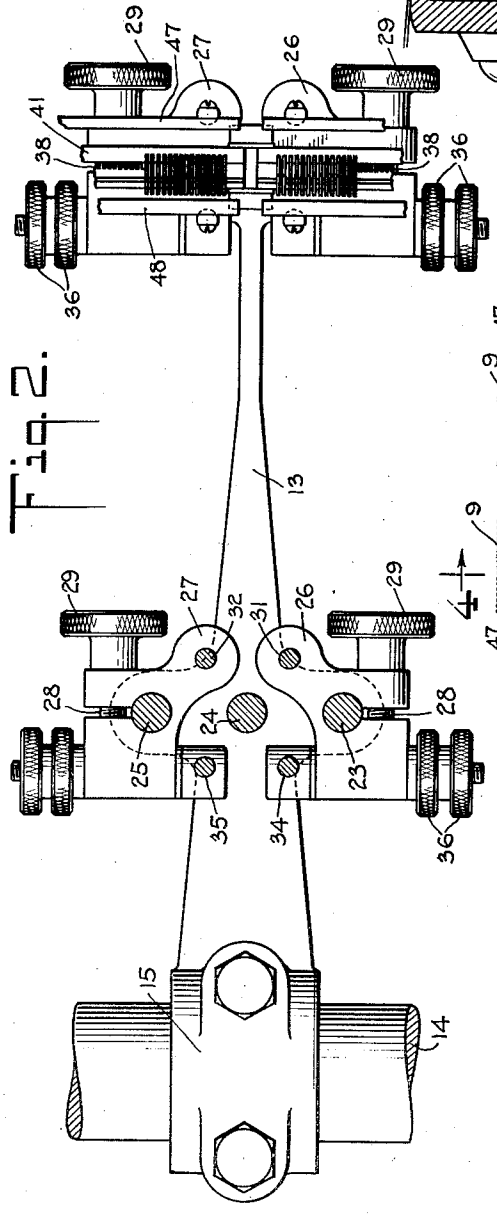
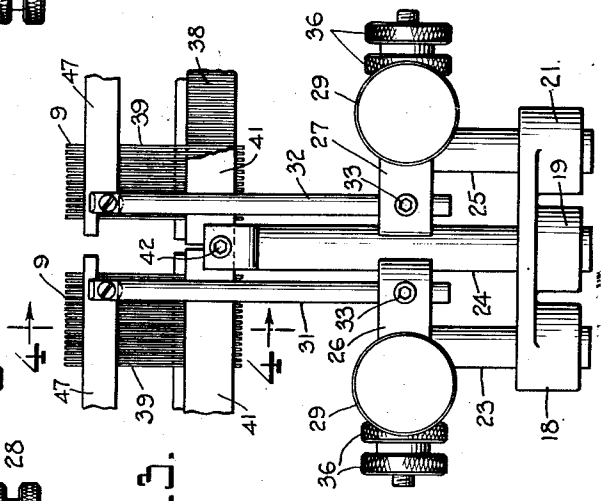


Fig. 3.



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Patented Aug. 1, 1939

2,167,907

UNITED STATES PATENT OFFICE

2,167,907

WARP STOP MOTION

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Application July 23, 1937, Serial No. 155,208

5 Claims. (Cl. 28—51)

This invention relates to warp stop motions which are adapted to be employed upon machines in which a sheet of warp threads is used, and are designed to stop the machine upon breakage or undue slackening of any one of the warp threads. The invention is applicable generally to any machine in which a sheet of warp threads is employed, but is especially advantageous in connection with warp knitting machines.

It is an object of this invention to provide an improved loom stop motion mechanism in which, upon breakage or undue slackening of a warp thread, a drop wire falls on to a contact bar thereby completing an electrical circuit and stopping the loom.

Another object of this invention is the provision of a novel means for supporting and guiding the drop wires.

Still another object of my invention is to provide an improved drop wire construction.

Other objects of this invention, together with certain details of construction and combinations of parts, will appear from the following detailed description and the appended claims.

In accordance with my invention, the warp stop mechanism comprises a series of drop wires supported in a serrated bar. The serrations in the bar are adapted to positively guide and keep separated the individual drop wires of the series or bank, so that the drop wires do not become entangled with each other or with the threads of the warp. Furthermore, since the drop wires are separated and perfectly gauged, the difficulty of sleying up the threads of the warp is obviated, and automatic threading of the warp threads is possible.

The drop wires of this invention are of smaller size than those heretofore used and their weight has been materially reduced. The instant invention therefore has an increased practicability since the drop wires may be used on the most delicate of yarns.

The invention will now be described in greater detail, particularly with reference to the accompanying drawings wherein the preferred embodiment of my invention is shown. It is to be understood, however, that this description is given by way of example only and is in no way limitative.

In the drawings:

Figure 1 is a sectional side elevational view showing the mounting of banks of drop wires and their supports;

Figure 2 is a top plan view taken on line 2—2 in Figure 1.

Figure 3 is a detail view on a slightly larger scale than Figures 1 and 2 and shows the serrated guide and separating bar of the invention; and

Figure 4 is a detail view taken on line 4—4 in Figure 3 and is on a slightly larger scale than Figure 3.

Like characters of reference indicate like parts throughout the several views of the drawings.

In Figure 1, the reference numerals 5 and 6 represent two warp beams, or two sections of a warp beam, from which are drawn warps of threads 7 and 8, respectively. The threads comprising the warps are passed through openings in drop wires 9 arranged in banks and then over polished guide rods 10 to the needle bars (not shown) of the warp knitting machine. The banks of drop wires and their holders, which are generally indicated by reference numerals 11 and 12, are supported by an arm 13 carried by a cross-rod 14 which may be fixed to the frame of the warp knitting machine. The arm 13 is maintained in position on the cross-bar by means of a split-nut arrangement 15.

The arm 13 is provided with integral members 16 and 17, each of which comprises three spaced bushings 18, 19 and 21. Members 16 and 17 are each adapted to receive a structure, hereinafter described, designed to support series of drop wires. Since the drop wire supports are identical in construction, the description will be confined to one of them.

The bushings 18, 19 and 21 are adapted to receive and hold in any desired position, as by means of set screws 22, uprights or standards 23, 24 and 25. Mounted on uprights 23 and 25 are brackets 26 and 27, respectively, which are vertically adjustable on the uprights and which are held in adjusted position by means of a screw 28 passing through a split portion of the bracket, the screw being adapted to be turned by a knurled head 29 thereon. The brackets 26 and 27 carry adjusting pins 31 and 32, respectively, which are held in the brackets by set screws 33. The brackets 26 and 27 also support adjusting pins 34 and 35, respectively. These pins may be adjusted vertically and knurled nuts 36 are provided for this purpose.

The upper extremity 37 of standard 24 is enlarged and the enlarged portion is bifurcated to receive a bank or banks of drop wires.

The means for holding the drop wires in the form of a bank comprises a serrated bar 38, each of the serrations of which is made of a depth sufficient to receive the shank 39 of the drop wire. After the required number of drop wires

have been placed in position in the serrations, a flat-faced bar **41** is positioned over the serrated face of the bar **38** and suitably fastened thereto, thus retaining the drop wires so that a bank of the same may be handled without fear that they may become entangled, lost or displaced from the desired position in the bank. The serrations in the bar may be lubricated in any suitable manner to permit of the drop wires to slide freely up and down therein. Two banks or series of drop wires, each comprising a serrated bar **38** and a covering bar **41** with their complement of drop wires, are fastened in the bifurcated portion **37** of standard **24** by means of a set screw **42**.

The drop wires of the present invention are made of relatively thin needle steel and are highly polished. Each drop wire is provided with an extension **43** at right angles to the shank **39** and lying in the plane thereof. This extension, upon breakage or undue slackening of a thread, is adapted to fall on to a contact member **44** set in the serrated bar **38** but insulated therefrom by suitable insulation **45**. The lower extremity of the drop wire is provided with a portion **46** at right angles to and in the same plane as the shank and extension **43**. The portion **46** prevents the drop wire from being pulled out of the drop wire holding means. The eye **9***a* of the drop wire **9** is provided with a tongue **9***b* and a point **9***c* separated from the tongue and extending for a substantial distance beyond the same. The construction of the eye of the drop wire is such that when a bank of threads (usually 6'' wide at 28 per inch each) is placed between each drop wire and given the necessary side twist to place the thread under the point of the drop wire eye and actually lifted into the eye, the tongue **9***b* prevents the threads from dropping out again which they would do during the threading-up process before the threads are under tension as in regular operations.

The upper or free ends of the adjusting pins are adapted to carry guide bars **47** and **48** of any suitable material. The guide bar **48** is provided with a lip **49** which is used in the threading-up operation to hold the drop wires firmly in contact with the electric contact bar, the current of course being switched off during the threading-up operation. It is essential that the drop wires be held down, otherwise during the threading-up operation when the threads are placed between the drop wires, as described above, given a sidewise twist and lifted, the friction of the thread against the side of the drop wire would tend to lift the drop wire instead of slipping under the point of the eye of the same and behind the tongue. Furthermore, where the drop wires are held down so that the head is close to the perfectly gauged serrations in the bar **38**, the heads of the drop wires are themselves more perfectly gauged than would be the case with the drop wires in the operative position shown, for example, in Figure 4 of the drawings. It will be appreciated that the drop wires may be slightly off gauge in the operative position without causing any harm as the threads are already threaded through the eyes of the drop wires.

In operation, the banks of drop wires are placed in position in the bifurcated portion of the enlarged head **37** of standard **24**. The threads of the warp are then threaded into the split eyes of drop wires **9** and the guide bars adjusted to the desired height. The drop wires **9** are maintained in the raised position shown, for example, in Figure 4 so long as the threads are unbroken. When a thread breaks or there is an undue slackening of the same, the drop wire falls to the position indicated in dot-dash lines in Figure 4. In this position extension **43** rests on contact bar **44** and closes a circuit which effects a stopping of the loom as is well understood in the art.

The device of the instant invention is so constructed and arranged that fine adjustments of the various parts may be quickly and readily made.

It is to be understood that the foregoing detailed description is given merely by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. A drop wire for use in a textile machine of the class described, comprising a thin, flat metal shank having a split eye in the upper extremity thereof, and a plurality of extensions in the same plane as said shank and at right angles thereto.

2. In a warp stop mechanism for a textile machine of the character described, drop wires, means for supporting said drop wires and means for holding said drop wires in a predetermined fixed position against movement in any direction during the threading-up operation.

3. In a warp stop mechanism for a textile machine of the character described, a bar having serrations therein, drop wires carried in said serrations, means for supporting said bar and drop wires and means for holding said drop wires in a predetermined fixed position and against movement in any direction in said serrations during the threading-up operation.

4. In a warp stop mechanism for a textile machine of the character described, a bar having serrations therein, drop wires carried in said serrations, means for supporting said bar and drop wires and means movable relative to said supporting means for holding said drop wires in a predetermined fixed position in said serrations during the threading-up operation.

5. In a warp stop mechanism for a textile machine of the character described, a bar having serrations therein, drop wires, comprising a shank having an extension thereon, carried in said serrations, means for supporting said bar and drop wires and a pin movable relative to said supporting means, said pin having a lip thereon adapted to cooperate with the extension on the drop wire for holding said drop wire in a predetermined fixed position in said serrations during the threading-up operation.

BRIAN PLUNKETT.