April 15, 1947. B. BRYSON 2,419,006

SEWING MACHINE

Filed Aug. 30, 1945 2 Sheets-Sheet 1

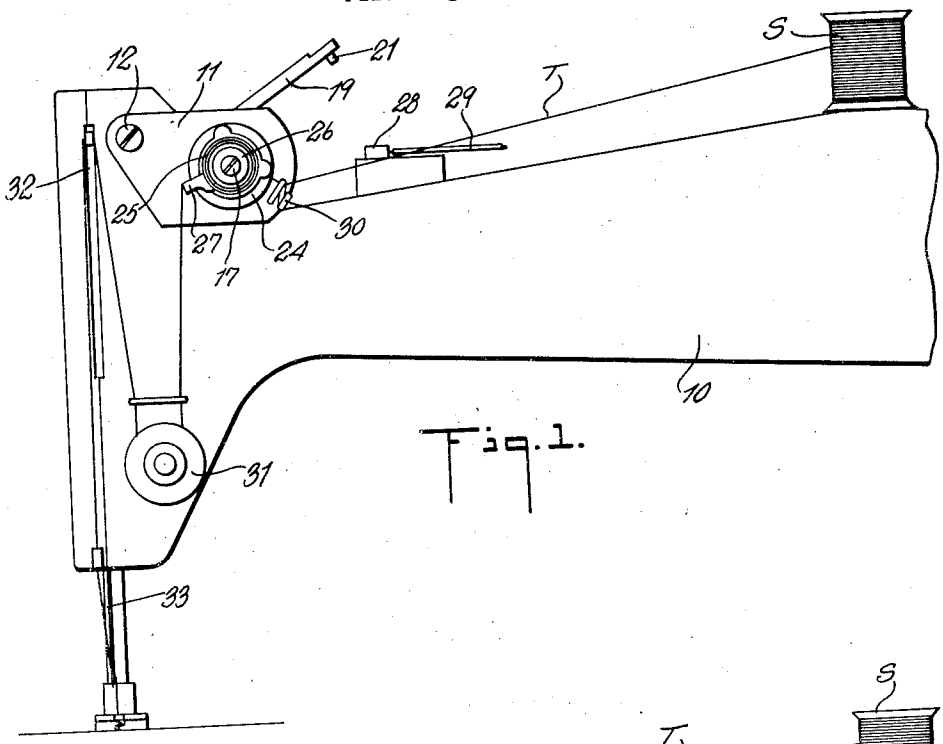


Fig. 1.

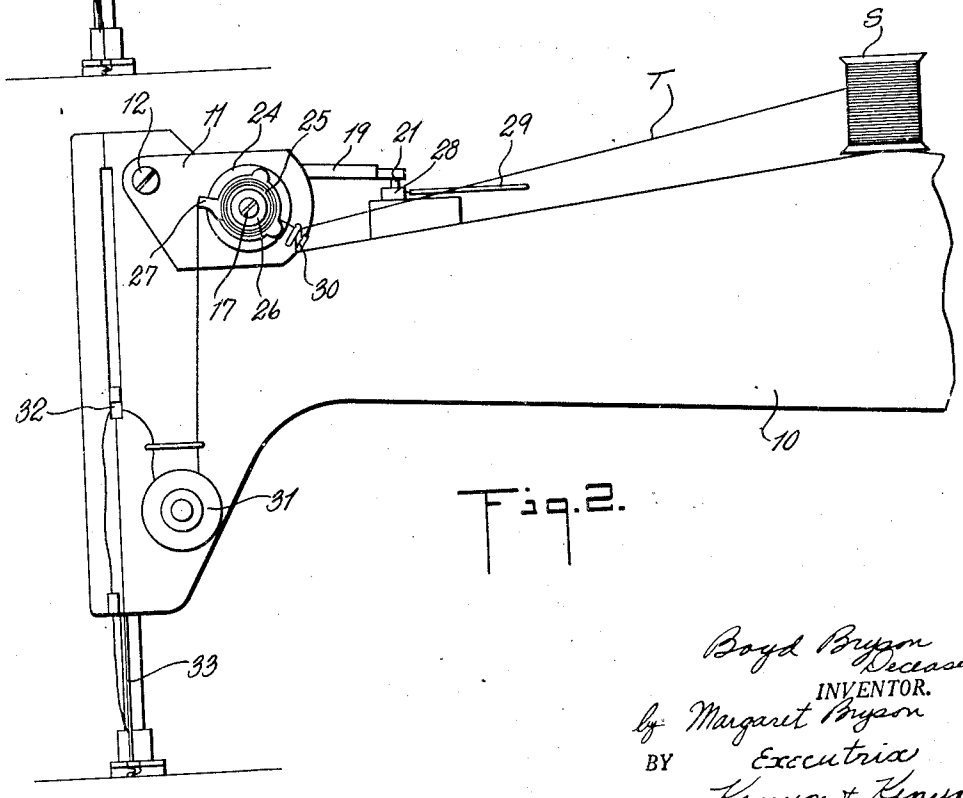


Fig. 2.

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INVENTOR.
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SEWING MACHINE

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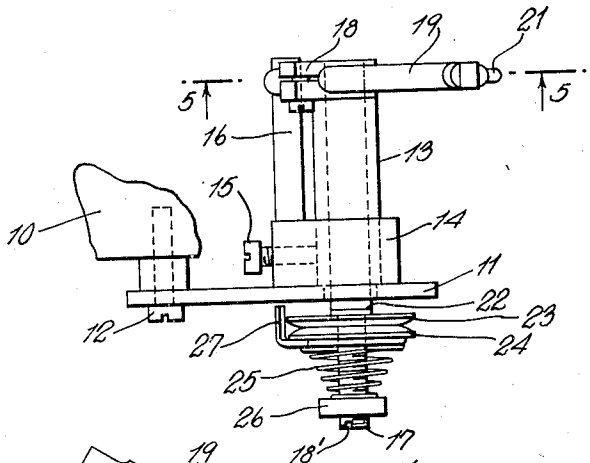


Fig. 3.

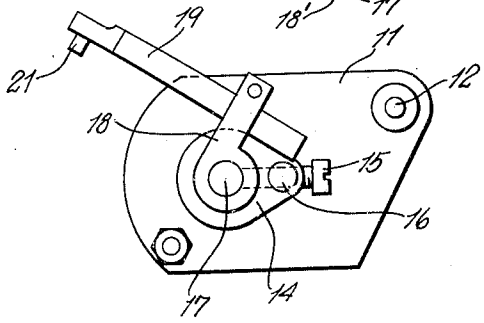


Fig. 4.

Fig. 5.

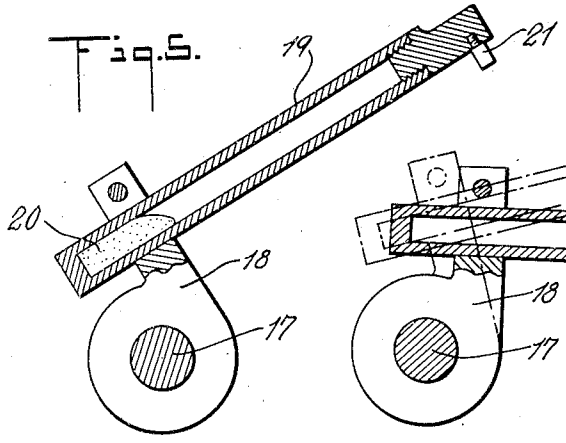
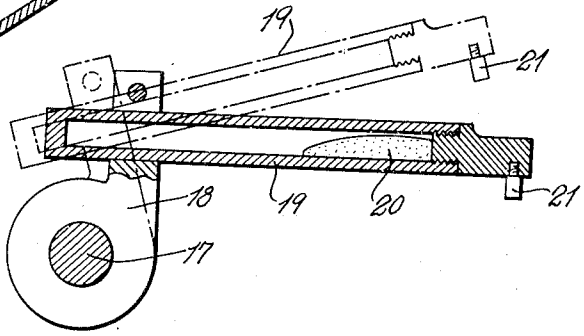


Fig. 6.



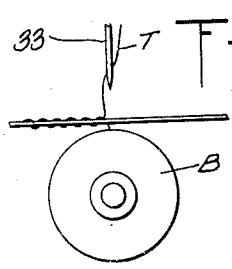


Fig. 2.

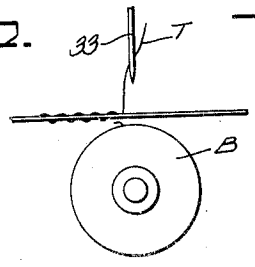


Fig. 8.

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Patented Apr. 15, 1947 2,419,006

UNITED STATES PATENT OFFICE

2,419,006

SEWING MACHINE

Boyd Bryson, deceased, late of Clifton, N. J., by Margaret Bryson, executrix, Clifton, N. J., assignor to Bryson Manufacturing Co. Inc., Clifton, N. J., a corporation of New Jersey

Application August 30, 1945, Serial No. 613,537

2 Claims. (Cl. 112—219)

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This invention relates to sewing machines.

In the stitching of certain types of material in large scale production, electrically driven sewing machines operate for a considerable period of time without the attention of the operator. It is not unusual for a single operator to have charge of a battery of twelve to fifteen such machines. It sometimes happens that the needle thread or the bobbin thread breaks or runs out of a machine and if the machine continues to operate under such conditions, material is passed through it without being stitched. The operator cannot always be immediately aware of the failure of either thread due to the large number of machines serviced by a single operator.

An object of this invention is the provision on a sewing machine of this type of automatically operated means for stopping the sewing machine in the event of failure for any reason of either the needle thread or the bobbin thread.

Other objects, novel features and advantages of this invention will become apparent from the following specification and accompanying drawings, wherein:

Fig. 1 is an elevational view of a sewing machine embodying the invention and being in operating condition;

Fig. 2 is a view similar to Fig. 1 but in inoperative condition because of bobbin thread failure;

Fig. 3 is a fragmentary plan view of Fig. 2;

Fig. 4 is a rear elevation of Fig. 3;

Fig. 5 is a section on the line 5—5 of Fig. 3 with the machine in operating condition;

Fig. 6 is a view similar to Fig. 5 following thread failure;

Fig. 7 is an elevation of the needle and bobbin with both threads functioning, and

Fig. 8 is an elevation of the needle and bobbin following failure of the bobbin thread.

In one-needle hemstitching sewing machines, the goods being hemstitched have a feed cycle in which the goods are first advanced a predetermined distance and then are returned a distance less than said predetermined distance after which they are again advanced said predetermined distance and the cycle repeated. The invention of this application is of particular utility in controlling the operation of a power driven hemstitching sewing machine in response to failure either of the needle thread or the bobbin thread.

The head 10 of a sewing machine supports a vertical plate 11 by means of a bolt 12. The plate 11 supports a fixed boss 13 surrounded by a collar 14 provided with a set screw 15 by means of which the collar may be retained in any desired position on the boss 13. The collar 14 also carries a rod 16 extending parallel to the boss 13.

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A shaft 17 is journalled in the boss 13 with one end projecting beyond the end of the boss and the other end projecting beyond the plate 11. A bracket 18 is carried by the shaft 17 in engagement with the free end of the boss 13 and in the bracket 18 is adjustably mounted transversely of the shaft 17 a tubular arm 19 in which is contained a unit 20 preferably a very small body of mercury, movable longitudinally of the arm. A contact 21 is provided at the free end of the arm 19.

The shaft 17 is formed with a shoulder 22 against which abuts a disk 23 rotatably mounted on the shaft 17. A second annular disk 24 also is mounted on the shaft 17 and a spring 25 biases the disk 24 toward the disk 23 and the two disks toward the shoulder 22, the spring 25 being arranged around the shaft 17 between the disk 24 and a nut 26 threaded onto the shaft 17. The shaft 17 is provided with a slot 18 in which are received cross-bars (not shown) on the disk 24 and spring 25 for preventing rotation thereof relative to the shaft. The disk 24 has an arm 27 oriented approximately 180° from the arm 19 and has a portion overlying the rims of the disks 22 and 23, the disks being properly shaped to form a circular peripheral groove.

A contact 28 is insulatingly supported by the head 10 and is arranged in the path of the contact 21. A conductor 29 leads from the contact to suitable control means for the power drive for the machine which also is elecrically connected to the contact 28 through the sewing machine head. The arrangement is such that the sewing machine will continue to operate so long as the contact 21 is out of engagement with the contact 28, but the sewing machine becomes inoperative upon engagement of the contact 21 with the contact 28.

The needle thread T passes from the spool S through a guide 30 part-way around the groove formed by the disks 23 and 24, over the arm 27, around a guide 31 and through the aperture of the take-up arm 32 to the eye of the needle 33. No attempt has been made to illustrate in the drawings the particular construction of the mechanism co-operating with the needle to effect hemstitching inasmuch as such mechanism constitutes no part of the instant invention and is well-known in the art. The bobbin thread is applied from the bobbin B in the usual manner. The needle thread T is kept under the desired tension by the disks 23 and 24.

Assume that the machine is fully threaded and is functioning properly. The thread T exerts a counterclockwise pull on the arm 27 tending to locate the arm 19 in the position shown in Figs. 1, 3, 4 and 5. The arm 19 is retained substantially in such position although it may oscillate slightly by reason of the temporary slight slack in the needle thread produced by the rearward intermittent movement of the goods during the hemstitching cycle resulting in intermittent clockwise rotation of the shaft 17 from the position shown in Fig. 1, and then back into such position, but the extent of this oscillation is insufficient to engage the contact 21 with the contact 28. As shown in Fig. 4, the rod 16 serves as a stop for engagement by the arm 19 to limit movement of the contact 21 away from the contact 23.

In the event of failure of the needle thread, the counterclockwise drag of the thread on the disks 23 and 24 is interrupted whereupon the arm 19 rotates clockwise by gravity to engage the contact 21 with the contact 28 as shown in Figs. 2 and 6, thereby de-energizing the power drive. In the event of failure of the bobbin thread, the needle thread is no longer tied into the goods by the bobbin thread so that upon the retrograde movement of the goods incidental to the operation of the machine, there results a somewhat larger than usual slack in the needle thread which, of itself, may not be sufficient to permit the necessary clockwise rotation of the arm 19 under the influence of gravity to bring the contact 21 into engagement with the contact 28, but permits movement of the arm 19 into the position shown in dot-dash lines in Fig. 6. The extent of clockwise rotation of the arm 19 under the circumstances just described is, however, sufficient to cause the body of mercury 29 to flow outwardly in the arm 19 toward the contact 21 and thus increase the leverage of the arm 19 to such extent as to overcome the counterclockwise drag of the thread on the disks 23 and 24 to cause further

rotation of the arm into the full-line position of Fig. 6, thereby bringing the contact 21 into engagement with the contact 28 with consequent interruption of the operation of the machine.

What is claimed is:

1. An attachment for single-needle hemstitching sewing machines comprising a horizontal shaft, a tubular arm carried by said shaft and containing a movable unit, a pair of disks mounted on said shaft, means biasing said disks toward each other, a contact carried by said arm, a fixed contact arranged in the path of said first contact and a second arm rotatable with said shaft for engagement by a thread passing between said disks and exerting a pull on said second arm tending to rotate said shaft to space apart said contacts.

2. An attachment for single-needle hemstitching sewing machines comprising a horizontal shaft, a tubular arm carried by said shaft and containing a body of mercury, a pair of disks mounted on said shaft, means biasing said disks toward each other, a contact carried by said arm, a fixed contact arranged in the path of said first contact and a second arm rotatable with said shaft for engagement by a thread passing between said disks and exerting a pull on said second arm tending to rotate said shaft to space apart said contacts.

MARGARET BRYSON,
Executrix of the Estate of Boyd Bryson, Deceased.

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The following references are of record in the file of this patent:

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