March 9, 1965 OSMO JUHANI IVANTO 3,172,187

THREAD ADVANCING DEVICE FOR THREAD MACHINES

Filed March 14, 1962

Fig. 1

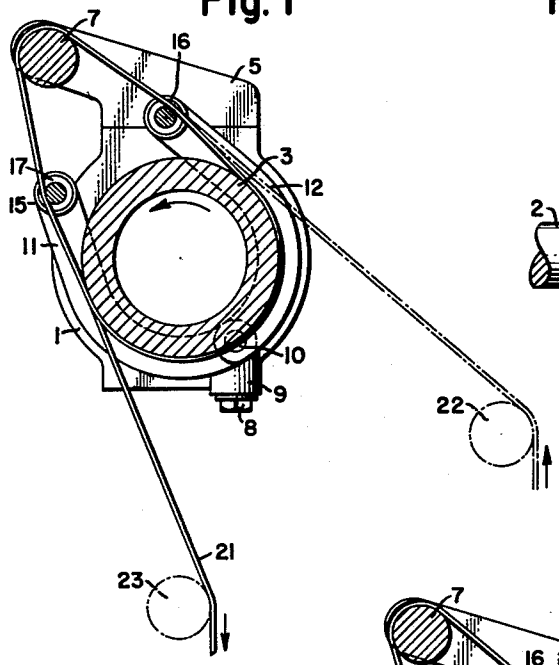


Fig. 2

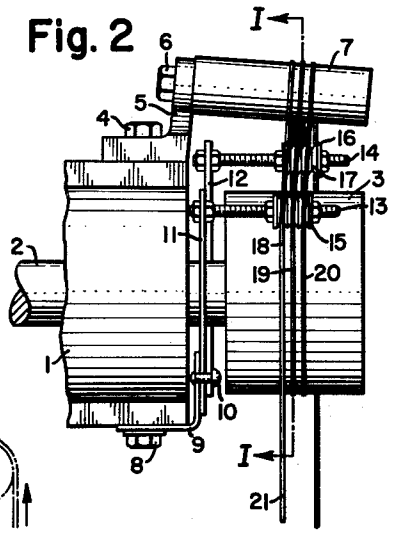


Fig. 3

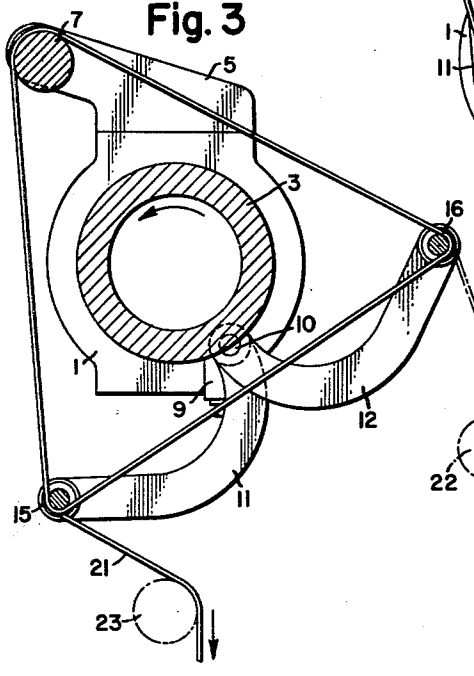
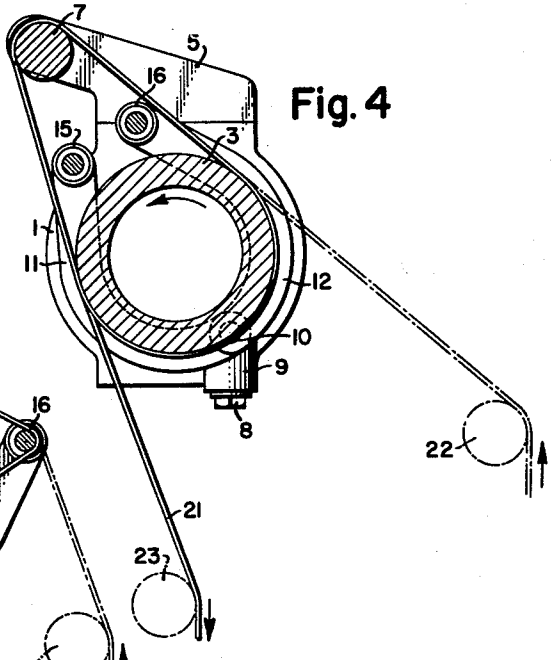


Fig. 4



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United States Patent Office 3,172,187 Patented Mar. 9, 1965

3,172,187

THREAD ADVANCING DEVICE FOR THREAD MACHINES

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Filed Mar. 14, 1962, Ser. No. 179,722
3 Claims. (Cl. 28—71.3)

This invention relates to a device useful with thread processing or handling machines for advancing the thread. The device is comprised of two rolls. One roll, being rotated directly by separate power means, advances the thread. The other roll is an idler roll. The thread is arranged to be wound two or more times around these rolls in such manner that each thread winding passes around peripheral portions of both said rolls while the device is in action. The device is further comprised of two thread guides which are so arranged that they keep the circulating thread winding a predetermined distance from each other so that the winding cannot become entangled.

All machines in which thread is to be processed include a device which advances the treated thread through the machine. At the end of such device there is arranged a spool, the beak, or traveller, of which winds the thread on the spool. The above described thread advancing device, including the spool and traveller, is widely used.

The devices of this kind, intended for advancing the thread, have, in general, worked satisfactorily. Only quite recently, however, has the advancement speed of the thread been increased considerably, with the result that the thread, being advanced by such a device, has often broken. The breaking of the thread has in most cases occurred while the machine is being started due to the fact that the friction between a drive roll and the thread is greatly increased when the thread advancing roll, operating by power, suddenly starts to rotate.

One object of the present invention is to eliminate the above stated disadvantage. The invention is characterized in that thread guides are arranged to be movable between two extreme, or limiting, positions. When arranged in one of the extreme positions, the thread guides are shifted outward away from the advancing roll so that the passing turns of the thread form triangle-like windings, the corner points of the triangular configuration being the idler roll and both of the thread guides. When the thread guides are to be placed at their other extreme position, they are shifted inwardly only to the extent that only the turns of the thread are in contact with the rolls. When starting the machine, the thread guides are placed at their former (outward) extreme position, in which case the turns of the thread do not contact the thread advancing roll at all. When the machine is in operation, the thread guides are gradually moved inwardly towards the latter extreme position, whereby the turns of the thread are put in contact with the advancing roll, which, while friction gradually increases, begins to advance the thread. The thread guides are, in general, not moved to their latter extreme position, but are left at a position where they can guide the running turns of the thread. The latter extreme limit position is intended for use in those cases where the machine, for one reason or another, is made to run at a slow speed, in which case the thread guides are not needed.

By arranging the thread guides displaceable relative to their outer extreme position, there is further attained the advantage that the thread, after an eventual breaking off, may again be arranged in the machine while the machine is running, because the thread does not in this case touch the roll which is advancing the thread. Such an

advantageous feature is not to be found in the known prior art devices.

The invention is further described in detail in the following specification and in the accompanying drawing which illustrates a preferred practical embodiment of the invention. In the drawing:

FIG. 1 is a sectional view of FIG. 2, taken along the section line I—I thereof, of the device according to the invention;

FIG. 2 shows the device in a side elevation view;

FIG. 3 corresponds to FIG. 1 and shows the thread guides as being in their extreme outer position; and

FIG. 4 corresponds to FIG. 1 and shows the thread guides as being in their extreme inward position.

In the drawing figures, the reference numeral 1 designates the frame of a device for advancing thread. Suitably journalled for rotation on the frame 1 is a driving axle 2. On the end of the axle 2 there is mounted a thread advancing roll 3 which rotates together with the axle 2. On the top surface of the frame 1 there is secured an angle bracket 5 by means of a screw 4. On the bracket 5 there is mounted, for substantially frictionless rotation on shaft means 6, an idler roll 7. On the bottom surface of frame 1 there is secured an angle bracket 9 by means of a screw 8. On the bracket 9 there are pivoted by means of the rivet 10 two arcuately shaped levers 11 and 12 which, as shown in FIGS. 1 and 4, can be moved into position so that they substantially encompass the axle 2. The diameter of the rivet 10 is such that it is snugly fitted just tight enough with respect to the bracket and levers to allow the levers 11 and 12 to be moved toward or away from the axle 2 and, also, such that the levers may be kept in any desired position by means of friction contact with the rivet 10.

On both of the levers 11 and 12, at their free ends, there is mounted by means of two suitable nuts the rods 13 and 14, which are perpendicular with respect to the levers 11 and 12. On the rods 13 and 14 there are mounted thread guides 15 and 16, respectively, each of which is in the form of a roller having three circumferential grooves 17 for receiving three thread turns, or windings, 18, 19 and 20. The thread guides 15 and 16 are positioned somewhat out of line relative another, as shown in FIG. 2, and secured to the rods 13 and 14 by the two securing nuts, so that they will not rotate on the rods 13 and 14. As a result, the thread will continually contact the grooves 17 at the same points. When these contact points become too worn, the securing nuts can be loosened enough to allow turning of the thread guide rollers 15 and 16 such that the thread contacts other, non-worn positions of the grooves 17.

The arrangement of the thread 21 in the device according to the invention, either before the machine is started or while it is running, is accomplished as follows: The levers 11 and 12, together with their supported thread guides 15 and 16, are moved to their extreme, or limiting, positions, as shown in FIG. 3. The thread 21 is led into the device over a suitable guide 22, over the thread guide 16, over the idler roll 7, and over the thread guide 15. Thereafter, the thread 21 is again fed over guide 16, roll 7 and guide 15. This is continued until the thread 21 has made three circuitous triangular-like windings about the roll 7 and guides 15 and 16, as shown in FIG. 3.

Thereafter the thread 21 is led away from the device over the guide 23 to a spool (not shown). The windings of the thread do not make contact with the advancing roll 3. Starting from the position shown by FIG. 3, the levers 11 and 12, and their attached thread guides 15 and 16, are gradually moved inward to their acting position, as shown by FIG. 1. During this movement those

sections of the thread that now are between the thread guides **15** and **16** come into contact with the peripheral surface of the advancing roll **3**. The spool (not shown) receiving the thread **21** over the guide **23** has associated therewith a well known beak, or traveller, which winds the thread **21** on the spool. This beak, or traveller, tensioning the thread **21**, causes the triangular thread windings to collapse tautly toward the rolls **3** and **7** upon removal of the guides **15** and **16** out of contact with the thread windings. As is well known, the force exerted by the beak, or traveller, is so slight that it will not cause a pivoting of the levers **11** and **12** about the pivot **10**.

It will, of course, be understood that the details given above are by way of illustration to give a clear idea of the invention and that they are not to be regarded as limiting the scope of the invention as defined in the appended claims. This is particularly so regarding the form and shape of the thread guides.

Moreover, the device according to the invention may vary even in regard to how the movement of the thread guides between the extreme limit positions is arranged.

What there is claimed is:

1. A thread advancing device, useful with thread handling machines, comprising: a frame; a rotatable thread advancing roll; drive means on said frame for rotating said advancing roll; an idler roll mounted for free rotation on said frame and spaced apart from said advancing roll; a pair of arms mounted on said frame, one end of each said arm being pivoted from a common point whereby the other free ends of said arms may be moved in directions toward and away from a line passing through the central axis of said advancing roll to respective positions remote from and proximate to said line; a pair of thread guide means, one said guide means being mounted at the free end of one of said arms and the other guide means being mounted at the free end of the other of said arms; the thread being arranged on said device when said arms are in said remote position to form plural triangle-like turns, each turn passing over a portion of both said guide means and a portion of said idler roll, the thread sections of each turn between said guide means being brought into contact with a peripheral surface of said advancing roll when said arms are moved to said proximate position.

2. The device according to claim 1, wherein said thread guide means are mounted on rods which are connected to said arms, and said arms are movable in a plane which is perpendicular to said central axis of said advancing roll.

3. The device according to claim 1, wherein said thread guide means include circumferentially running grooves for receiving portions of the thread turns.

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