

Nov. 14, 1933.

H. SCHWEITER

1,935,524

APPARATUS FOR WINDING SPOOLS AND COPS

Filed Aug. 12, 1931

3 Sheets-Sheet 1

Fig. 1.

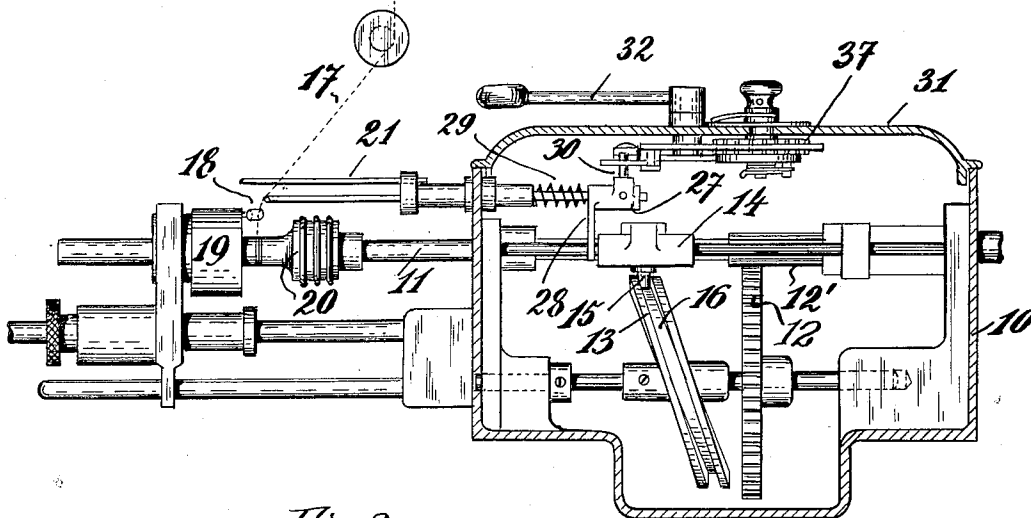


Fig. 2.

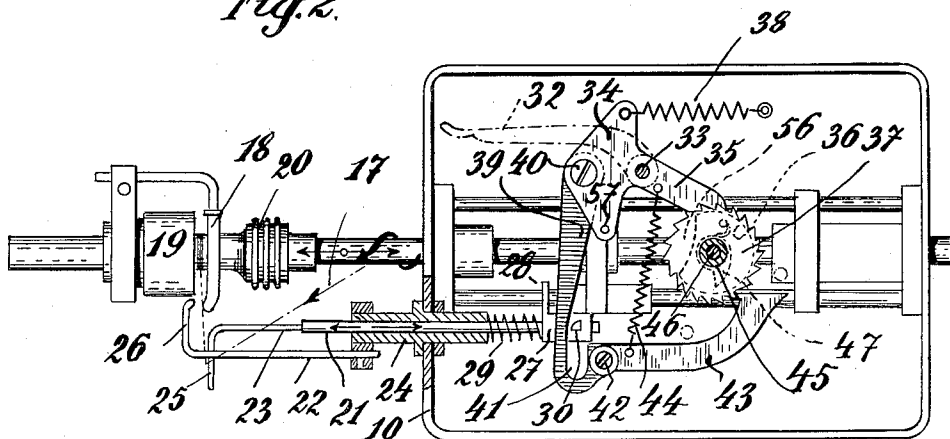
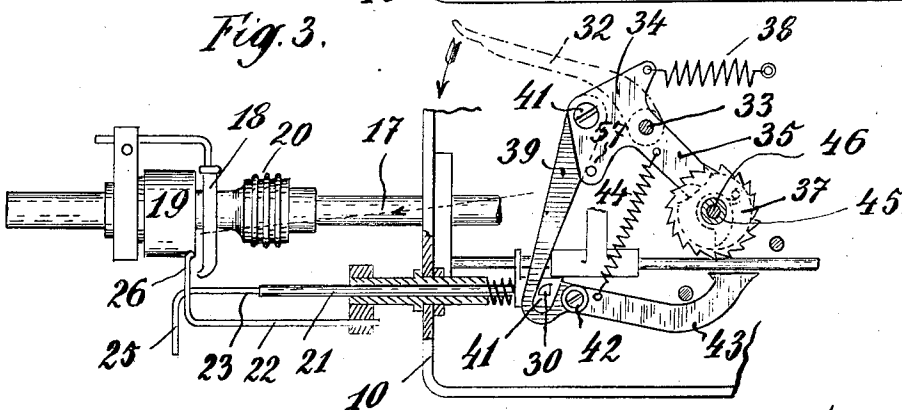


Fig. 3.



Inventor:
HANS SCHWEITER

by *Knight Bros.*
Attorneys

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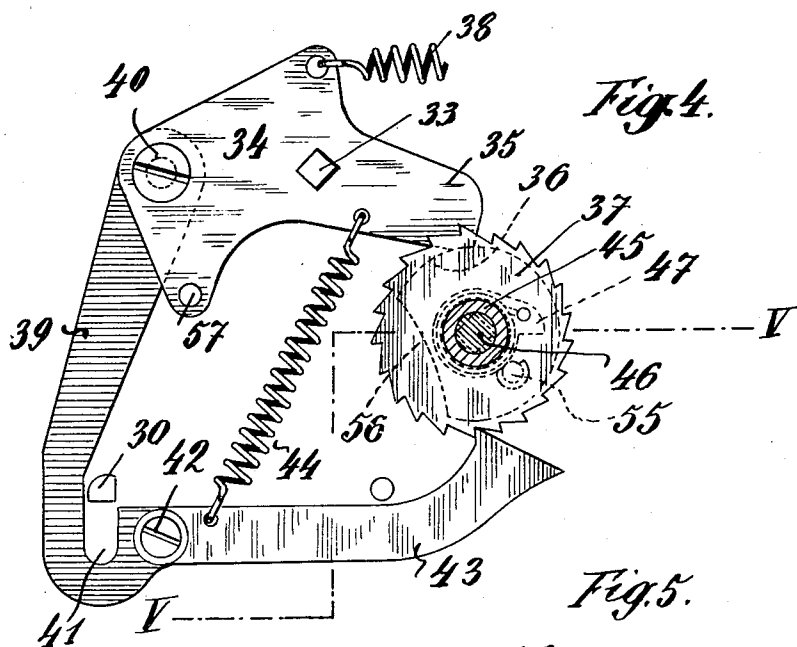
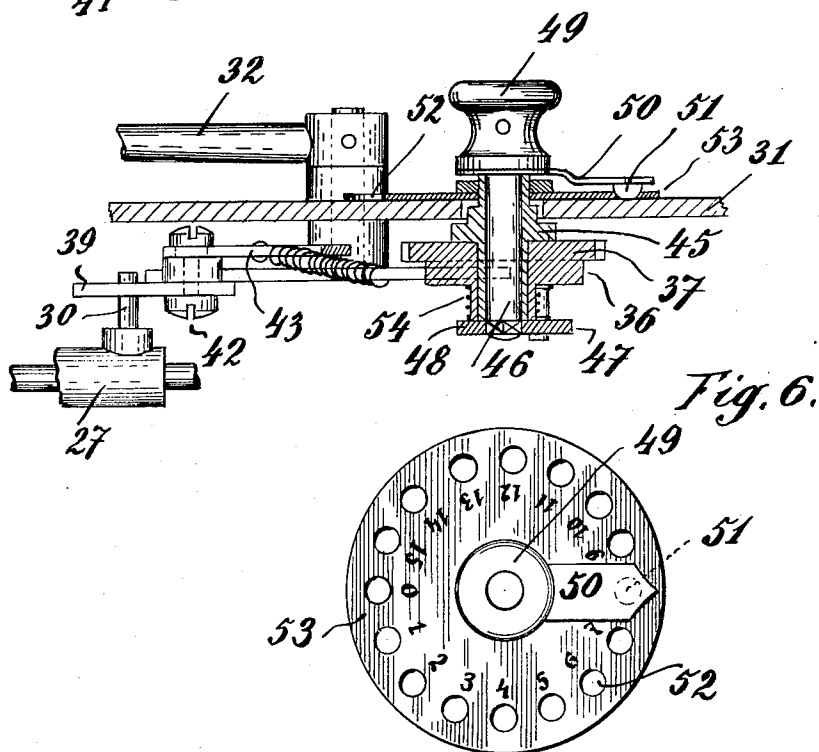
H. SCHWEITER

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Inventor:
HANS SCHWEITER
by *Knight Bros.*
Attorneys

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3 Sheets-Sheet 3

Fig. 7.

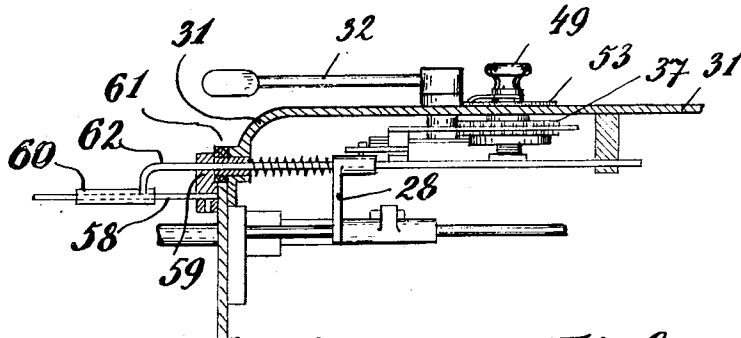


Fig. 8.

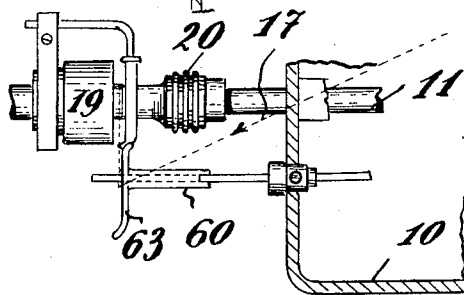
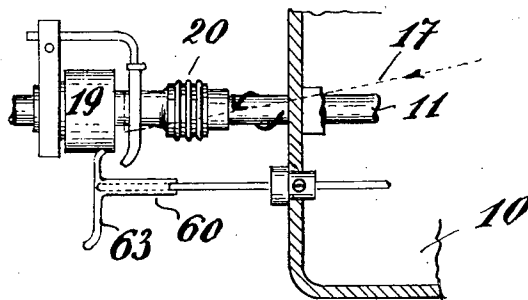


Fig. 9.



Inventor:
HANS SCHWEITER
by *Knight Bros*
Attorneys

UNITED STATES PATENT OFFICE

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APPARATUS FOR WINDING SPOOLS
AND COPS

Hans Schweiter, Horgen, near Zurich, Switzerland

Application August 12, 1931, Serial No. 556,667,
and in Germany October 20, 1930

6 Claims. (Cl. 242—27)

The invention relates to weft winders of the kind having an axially movable winding spindle and an auxiliary thread guide to which the winding spindle imparts a reciprocating or traversing movement against the action of a spring, for the purpose of winding a reserve of thread at the beginning of the spool, the auxiliary guide being after completion of the thread reserve, removed from the path of movement of the winding spindle and stopped at the same time releasing the thread.

The known winders of this kind are so designed that the thread on its way to the spool is guided by the principal thread guide to the auxiliary guide, the latter, reciprocated by the winding spindle, being pulled away from this spindle after completing the reserve, and releasing the thread, so that the thread is then guided by the main guide alone. In this arrangement the thread, while the reserve is being wound, is subjected to an increased stress, due to being guided through an angle by both the thread guides, and its tension is alternately increased and reduced. In consequence, breakages of thread and the troubles resulting therefrom are very liable to occur.

Weft winders are also known in which during the formation of the reserve, the winding spindle and the thread guide rod are simultaneously moved to and fro, with strokes of different lengths, and the thread guide rod is then stopped. In this case undue stress in the thread is avoided, but large masses have to be moved, which affect the running of the machine unfavourably.

The object of this invention is to remove these drawbacks. This is effected, in the first place, by arranging that the reciprocating auxiliary thread guide forms with a stationary guide member, an angle which receives the thread during the formation of the reserve winding, and that the auxiliary guide is, by a lever operated by a ratchet device, given an additional displacement, so that the thread slips over the free end of the stationary guide member and is caught by the principal guide. In this way the guiding of the thread during the winding of the reserve takes place independently of the principal guide, which only comes into operation after the completion of the reserve winding. Undue stress and wear are consequently avoided, so that the device is particularly suited for delicate yarns.

The ratchet device may be arranged with the disengaging lever on the under side of the gear box cover, and can be lifted off together with the latter without unfastening screws or the like. In this way access is very greatly facilitated, both

to the gearing of the winder and also to the mechanism of the auxiliary guide, so that anything which goes wrong can be detected and put right without loss of time.

Two examples of apparatus according to the invention are shown in the annexed drawings, in Figs. 1 to 6 and Figs. 7 to 9 respectively.

Fig. 1 is a sectional elevation of the winder, and Fig. 2 is a plan view thereof, assuming the cover to be transparent.

Fig. 3 is a plan view showing some of the parts in another position.

Fig. 4 shows the ratchet mechanism to a larger scale.

Fig. 5 is the section on the line V—V of Fig. 4. Fig. 6 shows a detail in elevation.

Fig. 7 is a vertical section of a modified form, and

Figs. 8 and 9 are the plan views showing some of the parts in two different positions.

In the gear box 10 shown in Fig. 1, there is mounted the winding spindle 11, which is rotated in the usual way by devices not shown, and is given a reciprocating movement by means of a cam 13 driven by a spur wheel 12 and a pinion 12' on the spindle. On the spindle 11 there is a driver 14, having a pin 15, which engages in the groove 16 of the cam 13. The thread 17 passes through a stationary main guide 18, which is part of the usual feeler 19, and is wound on the weft spool 20. Owing to the movement of the spool 20 in relation to the thread guide 18 a tapered package of thread is wound.

For guiding the thread during the winding of the reserve there is a device 21, which consists of a stationary bent rod 22 and an axially movable auxiliary thread guide 23. The rod 22 is fixed to a bush 24 in the wall of the gear box 10, and the bush acts as a guide for the auxiliary thread guide 23. The adjacent ends of the rod 22 and guide 23 are bent at right angles in opposite directions to form arms 25 and 26. During the formation of the reserve of thread, the thread lies in the angle made by the arm 25 where it extends across the rod 22. At the rear end of the auxiliary guide 23 there is a bracket 27, on which are an upwardly directed pin 30 and a fork 28. The latter engages one of two rods on which the driver 14 moves, and is held by a spring 29 against the driver. The auxiliary guide 23 consequently takes part in the reciprocating movement of the spool 20, and the thread 17 always runs on to the spool at the same place, so that a reserve of thread is wound.

The following arrangement serves to put the auxiliary guide out of action.

On the lid 31 of the gear box 10 there is a starting lever 32 fixed to a shaft 33. On the shaft 33 inside the lid there is mounted a lever 34, having an arm or disengaging lever 35 abutting against the hub 36 of a ratchet wheel 37. A spring 38 tends to rock the levers 34 and 32 clockwise. To the lever 34 an actuating lever 39 is pivoted at 40 and the end of the lever 39 is bent to form a U-shaped guide 41. At 42 a pawl 43 is pivoted to the guide 41 and this pawl engages the ratchet wheel 37. The pawl is connected to the lever 34 by a spring 44.

The ratchet wheel 37 is mounted on a bush 45 fixed to the box lid 31 which bush serves as a bearing for a pin 46. On this pin there is a disc 48 provided with a stop 47, and the pin has a knob 49 for turning it. This knob has a spring arm 50, with a stud 51 adapted to engage depressions 52 in a disc 53, for the purpose of retaining the stop 47 in selected positions. Between the disc 48 and the ratchet wheel 37 there is a helical spring 54, which tends to rotate the ratchet wheel 37 so that a pin 55 fixed to the ratchet wheel abuts against the stop 47. In the hub 36 of the ratchet wheel 37 there is a recess 56, which the lever 35 engages when the ratchet wheel 37 has been rotated to a certain position.

The mode of operation of the device is as follows:—

When by the aid of the knob 49 the adjustment has been made for the desired reserve of thread, the lever 32 is rotated counter-clockwise. The lever 34 is consequently disengaged from the recess 56 in the hub 36 and releases the ratchet wheel 37, which turns under the action of the spring 54 until its stop pin 55 strikes the stop 47 on the disc 48. The auxiliary guide then takes part in the reciprocating movement of the spool, its pin 30 driving the lever 39, so that the pawl 43 rotates the ratchet wheel 37 to the extent of one tooth. The spring 44 causes the lever 39 to swing back so that by the reciprocating movement of the auxiliary guide the ratchet wheel 37 is gradually rotated until the recess 56 reaches the lever 35 and the latter is rocked clockwise by the spring 38. The pin 57 on the lever 34 strikes the lever 39 and moves the same. As, however, the pin 30 has previously entered the U-shaped guide 41, the auxiliary guide 23 is shifted to the left, beyond its dead centre. It is then in the position shown in Fig. 3, in which the thread 17 no longer receives any guidance from the rod 22, but slips past the arm 26 and is caught by the principal guide 18. At this stage the normal winding begins.

In the modification shown in Figs. 7 to 9, the stationary guide member is a straight rod 58, which is fixed by an extension 59 to the lid 31.

On the rod 58 there is a sliding bush 60, into which engages a rod 62, axially movable at 61 in a hole in the lid 31. The bush 60 has a cross bar 63. The reciprocating movement of the auxiliary guide 62, 63 and the throwing out of operation thereof are effected in the same way as in the case of the auxiliary guide 23. The guiding of the thread 17 is then effected by the angle formed between the stationary rod 58 and the cross bar 63. When the auxiliary guide is put out of operation the bush 60 assumes the position shown in Fig. 9, in which the cross bar 63 is beyond the end of the stationary rod 58. The thread 17 is therefore no longer guided and slips into the principal guide 18.

The lid can be lifted off the gear box without having to unfasten any screws, inasmuch as with the construction form according to Figs. 1 to 6 the pin 30 and lever 39 can be disengaged freely and with the construction according to Figs. 7 and 9 the fork 28 is lifted off the guide rod.

What I claim as my invention is:

1. In a cop winder, a rotatable and reciprocable winding spindle, a main thread guide associated with said spindle, an auxiliary thread guide unit comprising a stationary guide member and a reciprocating guide member cooperatively disposed with respect to each other, connecting means between said spindle and said reciprocating guide member for reciprocating said guide member synchronously with said winding spindle to wind a reserve of thread from said auxiliary guide unit to said spool, and means responsive to a predetermined number of turns of the spindle for transferring said thread, running directly from its source, from said auxiliary guide to said main thread guide and rendering inoperative said auxiliary guide unit.

2. In a cop winder, a winding spindle, a spindle shaft connected to said spindle, means for rotating and reciprocating said spindle shaft, a main thread guide associated with said spindle, an auxiliary thread guide unit comprising a stationary guide member and a reciprocating guide member cooperatively disposed with respect to each other, means on said spindle shaft for actuating said last mentioned guide member in conjunction with said spindle to apply a reserve of thread directly from said auxiliary guide unit to said spool, a lever actuated by the movement of said reciprocating member, intermittently operating means actuated by said lever, and means controlled by a predetermined setting of said last mentioned means for disengaging said reciprocating guide member from said spindle shaft and simultaneously transferring the thread carried by said auxiliary thread guide unit to said main thread guide.

3. In a cop winder, a winding spindle, a spindle shaft connected to said spindle, means for rotating and reciprocating said spindle shaft, a main thread guide associated with said spindle, an auxiliary thread guide unit comprising a stationary guide member and a reciprocating guide member cooperatively disposed with respect to each other, means on said spindle shaft for actuating said last mentioned guide member in conjunction with said spindle to apply a reserve of thread directly from said auxiliary guide unit to said spool, an actuating lever controlled by the movement of said reciprocating member, a disengaging lever connected to said actuating lever, a ratchet pawl connected to said actuating lever, a ratchet wheel intermittently actuated by said pawl, a hub connected coaxially with said wheel having a depression therein, means for pressing said disengaging lever against said hub, a lug on said disengaging lever cooperating with said actuating lever, and means for rocking said actuating lever by said lug responsive to the entry of said disengaging lever in the depression of said hub to transfer the thread from said auxiliary thread guide unit to said main thread guide and for arresting said reciprocating guide member.

4. In a cop winder, a winding spindle, a spindle shaft connected to said spindle, means for rotating and reciprocating said spindle shaft disposed in a gear box, a main thread guide associated with said spindle, an auxiliary thread guide unit comprising a stationary guide member

and a reciprocating guide member cooperatively disposed with respect to each other, means on said spindle shaft for actuating said last mentioned guide member in conjunction with said spindle to apply a reserve of thread directly from said auxiliary guide unit to said spool, means responsive to a predetermined number of turns of said spindle to render inoperative said auxiliary thread guide unit mounted on the cover of the gear box comprising an actuating lever controlled by the movement of said reciprocating member, a disengaging lever connected to said actuating lever, a ratchet pawl connected to said actuating lever, a ratchet wheel intermittently actuated by said pawl against the action of a yielding force, a hub connected coaxially with said wheel having a depression therein, means for pressing said disengaging lever against said hub, means for adjusting the angular displacement between said depression and said disengaging lever, a lug on said disengaging lever cooperating with said actuating lever, and means for rocking said actuating lever by said lug responsive to the entry of said disengaging lever in the depression of said hub to transfer the thread from said auxiliary thread guide unit to said main thread guide and for arresting said reciprocating guide member.

5. In a cop winder, a winding spindle, a spindle shaft connected to said spindle, means for rotating and reciprocating said spindle shaft, a main thread guide associated with said spindle, an auxiliary thread guide unit comprising a stationary guide member and a reciprocating guide member cooperatively disposed with respect to each other, means on said spindle shaft for actuating said last mentioned guide member in conjunction with said spindle to apply a reserve of thread directly from said auxiliary guide

unit to said spool, an actuating lever controlled by the movement of said reciprocating member, a disengaging lever connected to said actuating lever, a ratchet pawl connected to said actuating lever, a ratchet wheel intermittently actuated by said pawl against the action of a yielding force, a hub connected coaxially with said wheel having a depression therein, means for pressing said disengaging lever against said hub, means for adjusting the angular displacement between said depression and said disengaging lever, a lug on said disengaging lever cooperating with said actuating lever, and means for rocking said actuating lever by said lug responsive to the entry of said disengaging lever in the depression of said hub to transfer the thread from said auxiliary thread guide unit to said main thread guide and for arresting said reciprocating guide member.

6. In a cop winder, a rotatable and reciprocable winding spindle, a main thread guide unit associated with said spindle, an auxiliary thread guide member designed to guide the thread directly from its source to a spool upon the spindle, connecting means between said spindle and guide member for reciprocating said guide member synchronously with said winding spindle to wind a reserve of thread from the thread source to the spool, and means responsive to a predetermined number of turns of said spindle for shifting the thread, running directly from its source, from said auxiliary guide member onto said main thread guide unit and rendering inoperative said auxiliary guide member.

HANS SCHWEITER.

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