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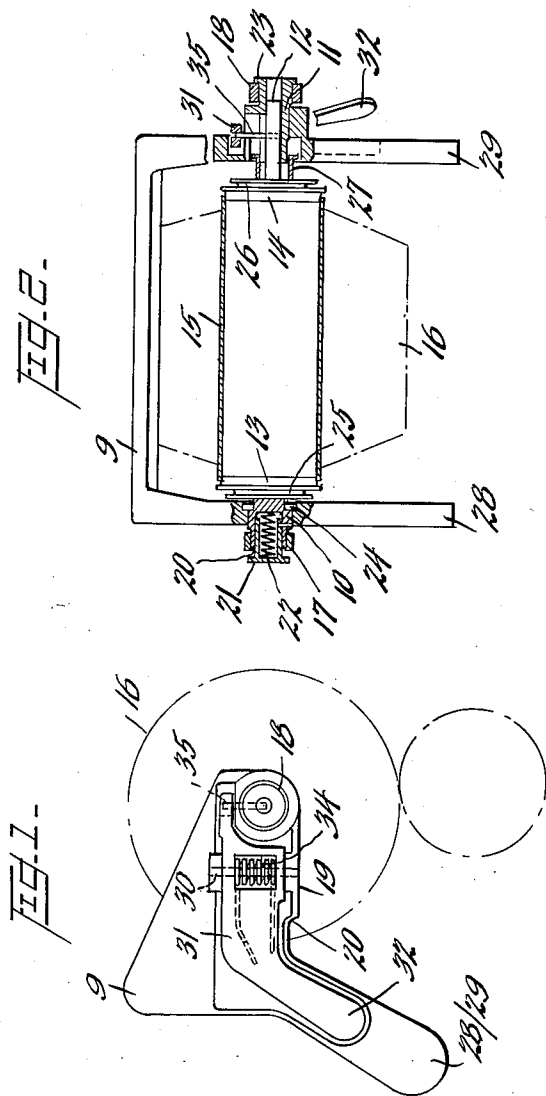
W. LENK

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WINDING BOBBIN CARRIER FRAME

Filed July 21, 1952

3 Sheets-Sheet 1



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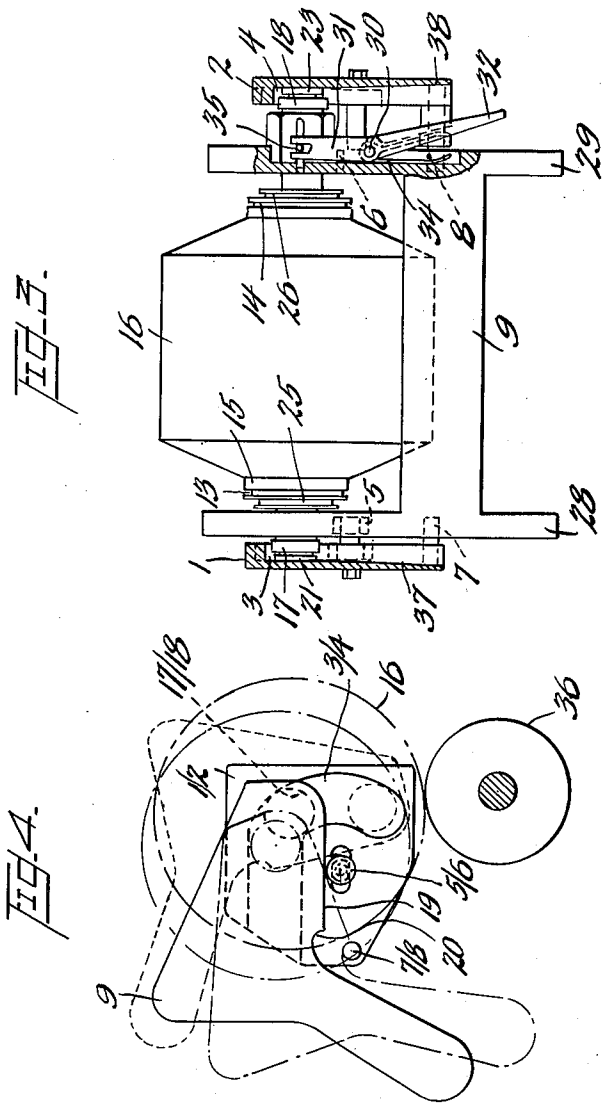
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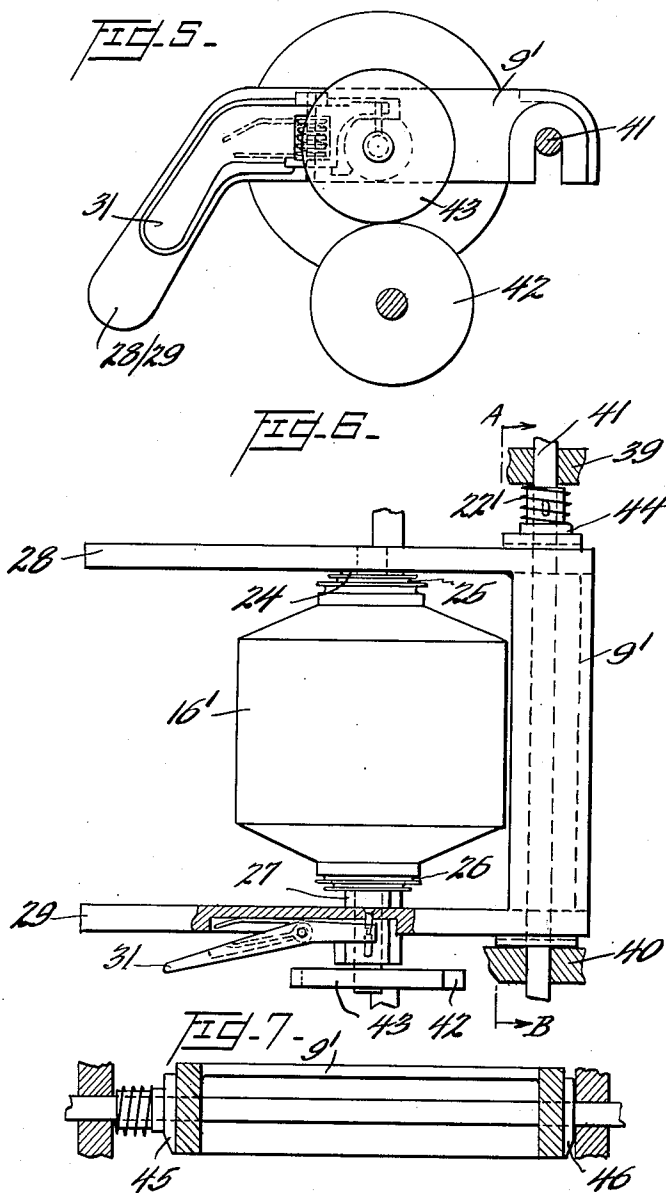
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WINDING BOBBIN CARRIER FRAME

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5 Claims. (Cl. 242—130)

This invention relates to winding machinery, and more particularly to winding machines of the kind having a winding bobbin carrier frame.

With known winding machines of this type, the frames serving to support the winding bobbins are designed and arranged in a manner such that when the winding operation is terminated, one must remove the winding bobbins from the frame by taking hold of the winding bobbin with one or both hands and lifting it out of the frame. Other prior art devices involve a manual displacement in longitudinal direction, of the winding bobbin for the purpose of removing it from its bearing, followed by its being lifted out of the frame. When it is attempted, for economic reasons, to provide winding bobbins having a materially increased capacity compared with existing bobbins, the various types of bobbin changing procedures briefly referred to above, are accompanied by various drawbacks. Thus the lifting out of the frame, of large bobbins weighing e. g. more than 1.5 kg., owing to the hands touching the layers of threads, leads to damaging, soiling and displacement of the exterior layers of threads. This is particularly disadvantageous in connection with fine artificial silk threads inasmuch as any damage to the threads causes flaws in any product made therefrom.

It is an object of this invention to provide winding machines wherein the afore-noted drawbacks are eliminated.

Other objects, and the manner in which the same are attained, will become apparent as this specification proceeds.

The invention contemplates so arranging the winding bobbin carrier frames in the winding machine that for purposes of exchanging bobbins outside the winding machine, the carrier frame can be removed from the winding machine by one hand. So the threads wound on the bobbin will not come in contact with the operator's hands, the carrier frame has handles arranged on the side from which it is to be handled, beyond the reach of the winding bobbin; the carrier frame is lifted out of the winding machine by the handles so the winding bobbin supported by the frame can be deposited on a support away from the winding machine. The separation of the carrier frame from the winding bobbin takes place in a manner such that when the bobbin is placed on the support, operation of a double lever disposed on the side of one of the handles on the carrier frame, by a pressure of the thumb on the hand grasping this handle, permits separation of the centering means for the tube or spindle of the winding bobbin, from this bobbin. After removal of the winding bobbin, an empty winding tube or bobbin is inserted in the carrier frame so the latter is ready for a new winding operation. In order to insure that the longitudinal position of the winding bobbin always remains the same during the winding operation as well as on interruption of the winding operation by removal and return of the same winding bobbin, a resilient means, preferably a spring is provided which always urges the carrier frame toward one side, in the longitudinal direction of the bobbin. With winding machines having a driving roller engaging the periphery of the winding bobbin, this resilient means, apart from maintaining the longitudinal

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position of the winding bobbin, tends to counteract any tendency of the carrier frame to move up and down when the winding on the bobbin is not round.

In order to prevent the thread ends from getting caught between the revolving portions for the winding bobbin and the stationary part of the carrier frame, guard grooves for the threads, revolving with the bobbin are provided which extend into recesses in the lateral jaws of the carrier frame. For the purpose of facilitating the introduction of the carrier frame into the winding machine, inclined faces are provided on one or both sides thereof.

When producing large bobbin windings by means of a driving roller acting on the circumference the force with which the driving roller presses on the winding bobbin should always be maintained substantially uniform to prevent the wound threads from being damaged. For this purpose the invention contemplates so arranging the carrier frame and the bearing or guide therefor that during the winding operation, the center of gravity of the carrier frame is displaced by the grooves and supporting rollers guiding the frame relative to the vertical through the rollers, from the side of the driving roller toward the opposite side, to an extent such that in spite of the increase in the weight of the winding, the pressure applied by the driving roller on the winding bobbin, always remains approximately the same.

A further advantage of the invention resides in the facility with which damaged or worn carrier frames can be replaced. The parts serving as guide or bearings for the carrier frame, preferably, are made entirely or partly from synthetic linear superpolyamides which lend themselves to manufacture at close tolerances by means of injection moulding. These plastics are capable of cushioning and absorbing the loads arising during operation and so render lubrication of the sliding surfaces unnecessary. This last-mentioned property prevents the threads to be wound or already wound from being soiled.

In the drawings accompanying this specification and forming part thereof, two embodiments of the invention are shown diagrammatically by way of example, the first involving a winding bobbin driven by a roller applied to the circumference thereof whereas the second has the winding bobbin driven by a driving means arranged on the side thereof.

In the drawings,

Fig. 1 shows a carrier frame according to the invention, with the winding bobbin and the driving roller just indicated in dot and dash lines;

Fig. 2 is a side view taken from the right side of Fig. 1, partly in section, of the carrier frame shown in Fig. 1;

Fig. 3 is a plan view of the carrier frame, partly in section, including an illustration of the stationary guide or bearing positions therefor;

Fig. 4 is a diagrammatic phantom representation of the various positions of the carrier frame in its guides or bearings, full lines indicating the position at the end, dashes the position at the beginning of the winding operation while dot and dash lines show the position with the winding bobbin lifted off;

Fig. 5 shows the carrier frame, indicates the winding bobbin and shows the lateral driving means therefor;

Fig. 6 is a side view of the carrier frame shown in Fig. 5, and

Fig. 7 is a section in the direction of the arrows A—B in Fig. 6.

Referring now to the drawings, wherein like elements are denoted by identical reference numerals, and the first to the embodiment of the invention illustrated in Figs. 1 to 4 inclusive, the standard (not shown) of the winding machine mounts the guide members 1 and 2 having grooves 3 and 4 (shown in Figs. 3 and 4), the adjustable supporting rollers 5 and 6, and the stops 7 and 8, which

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elements serve as mounts and guides for the carrier frame 9. Mounted in the carrier frame are bushes 10 and 11 the latter of which supports for longitudinal displacement, a bolt 12. The bush 10 and the bolt 12 mount for rotation the centering plates 13 and 14 designed to support the winding tube 15 mounting a roll of thread 16. The carrier frame 9 further is supported and guided by the rollers 17 and 18 mounted on the bushes 10 and 11 and supported for rotation in the grooves 3 and 4, and by the ledges 19 supported by the supporting rollers 5 and 6. During winding operations the winding bobbin 16 is driven by the rotary driving roller 36. The position of the carrier frame 9 when the winding bobbin 16 is lifted off the driving roller 36, is insured by the cooperation of the stops 7 and 8 mounted on the guide members 1 and 2, with the recesses 20 provided in the carrier frame 9. In order to maintain the winding tube 15 always in the same longitudinal position, a bush 20 having a collar 21 and a spring 22 is supported for displacement in the bush 10. The spring 22, on the one hand, urges the collar 21 against the base of the groove 3 and, on the other hand, via the carrier frame 9 and the bush 11, urges the collar 23 mounted on the bush 11 against the base of the groove 4. This arrangement results not only in maintaining the winding tube 15 always in the same longitudinal position, but moreover tends to counteract any tendency of the carrier frame 9 to move up and down when the winding bobbin is not round. In order to prevent thread ends from getting caught between the centering members 13 and 14 which revolve during the winding operation, and the bushes 10 and 11, guard grooves 24, 25, 26 and 27 for the threads are provided on the centering plates 13 and 14, on which the broken thread ends can be wound up. The guard grooves 24, 25, 26 and 27 extend into the lateral jaws of the carrier frame.

The handles 28 and 29 provided on the carrier frame 9 facilitate the removal thereof with the winding bobbin supported therein, and permit the ready deposit of the bobbin on a support located outside the winding machine. The handle 29, on the side, pivotally mounts, by means of a pin 30, a double lever 31 including a key 32. This double lever 31, under the influence of the spring 34 and via the pin 35, fixes the position of the bolt 12 with its centering member 14, and the tube 15 abutting against the centering member 13 mounted on the bush 10. In order to remove the winding bobbin 16 from the carrier frame 9 after it has been placed on a support outside the winding machine, all that needs to be done is to depress the key 32 on the double-lever 31 with the thumb on the hand holding the handle 29.

The carrier frame 9 and the guide and bearing portions 3, 4, 5 and 6 therefor, are so provided and arranged that during the winding operation the center of gravity of the carrier frame is so displaced that in spite of the increase in the weight of the winding bobbin, the pressure with which the driving roller 36 is applied to the winding bobbin is certain to be maintained substantially constant. The inclined faces 37 and 38 increasing the depth of the grooves 3 and 4 are provided to facilitate the introduction of the carrier frame into the machine.

Referring now to the second embodiment of the invention illustrated in Figs. 5, 6 and 7, this involves the facility of removing the carrier frame to change bobbins, the maintenance of the longitudinal position of the bobbin, the ready separation of the bobbin from the carrier frame and the easy introduction of the carrier frame into the machine as described above with reference to Figs. 1 to 4 which description, therefore, applies to corresponding parts of Figs. 5 to 7. According to Figs. 5 to 7, however, the carrier frame 9' is removably mounted, by means of V-shaped bearing portions, on a bolt or bar 41 mounted in stationary bearings 39 and 40. The driving disk 42 mounted for rotation, and the driven disk 43 mounted on the carrier frame and transmitting the

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rotary motion to the bobbin 16', maintain the carrier frame 9' always in the same position, throughout the winding operation. On the side of one of the open bearing portions on the carrier frame 9', the bush 44 mounted for longitudinal displacement on the bolt 41, under the influence of the spring 22' abutting against the bearing 39, always maintains the carrier frame 9' with its winding bobbin 16', in the same longitudinal position.

Inclined faces 45 and 46 (shown in Fig 7) are provided on the carrier frame 9' to facilitate the introduction of the frame into the machine.

I wish it to be understood that I do not desire to be limited to the exact details of construction, design, arrangement and operation shown and described as numerous modifications falling within the scope of the appended claims, are readily apparent to any person skilled in the art.

I claim:

1. A winding machine comprising a readily removable carrier frame for the winding bobbin, driving means adapted to be applied to the circumference of said bobbin, guide members including grooves open on one side on the machine, supporting rollers on said machine and ledges on said carrier frame adapted to be supported on said supporting rollers.

2. A winding machine comprising a readily removable carrier frame for the winding bobbin, driving means adapted to be applied to the circumference of said bobbin, guide members including grooves open on one side on the machine, rollers on said carrier frame adapted to be supported in said grooves and collars arranged on the side of said rollers adapted to guide the carrier frame on the bases of said grooves.

3. A winding machine comprising a readily removable carrier frame for the winding bobbin, driving means adapted to be applied to the circumference of said bobbin, guide members including grooves open on one side on the machine, stops on the machine and recesses on the carrier frame adapted to engage said stops whereby to secure the carrier frame on lifting said bobbin from said driving means.

4. A winding machine comprising a readily removable carrier frame for the winding bobbin, driving means adapted to be applied to the circumference of said bobbin, guide members including grooves open on one side on the machine, supporting rollers on said machine and ledges on said carrier frame adapted to be supported on said supporting rollers, said grooves and said supporting rollers being adapted to so displace, as the weight of the bobbin increases, the center of gravity of the carrier frame relative to the vertical through said rollers, from the side of said driving means toward the opposite side, that the pressure of the driving means on the winding bobbin remains substantially constant.

5. A winding machine comprising a readily removable carrier frame for the winding bobbin, driving means adapted to be applied to the circumference of said bobbin, guide members including grooves open on one side on the machine, rollers on said carrier frame adapted to be supported in said grooves and collars arranged on the side of said rollers adapted to guide the carrier frame on the bases of said grooves, the parts supporting and guiding the carrier frame being made, at least partly, of synthetic linear superpolyamides.

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