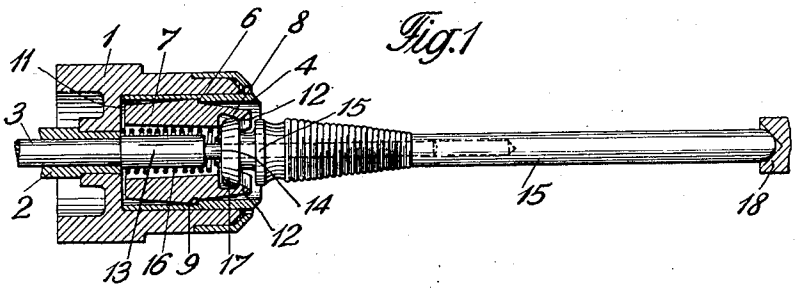
March 6, 1945. W. SIEGENTHALER 2,370,924

SPOOL HOLDER FOR WINDING MACHINES

Filed Dec. 31, 1943

Fig. 1



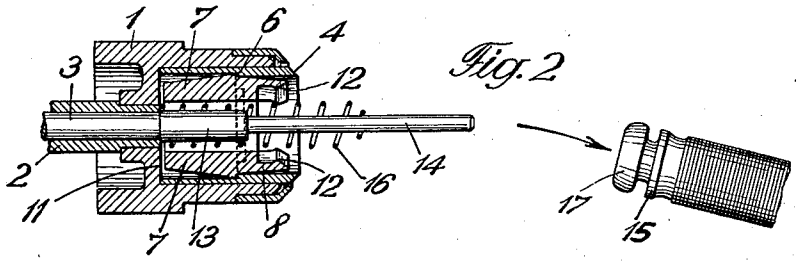


Fig. 2

Fig. 3

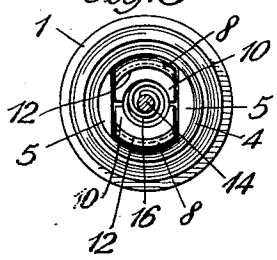
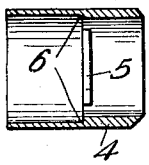


Fig. 4



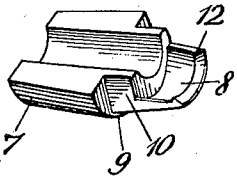


Fig. 5

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SPOOL HOLDER FOR WINDING MACHINES

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Application December 31, 1943, Serial No. 516,459
In Switzerland February 1, 1943

5 Claims. (Cl. 242—46.5)

This invention relates to spool holders for winding machines.

According to this invention the spool holder is provided with clamping jaws one of which at least is movably arranged so as to exert a clamping effect on the spool by action of centrifugal force as set up due to actuation, that is, rotation of the holder, if the spool is inserted between the clamping jaws. The clamping effect thus produced diminishes when the actuation of the holder ceases.

By this means, the spool is safely held by the spool holder during the winding operation and at the same time the insertion of the empty spool and the removal of the full spool is facilitated. The last named operations may be effected automatically if, for example, a helical spring is resorted to which is arranged in the spool holder so as to be effective in the axial direction thereof. The spool holder is thus particularly well suited for use in winding machines having a revolving head for supporting a plurality of spools which are fed to the working, that is, winding position and are removed therefrom again to a position of delivery after having been wound by intermittent advancing, i. e. turning of the revolving head.

An embodiment of the invention is illustrated by way of example only in the accompanying drawing in which

Fig. 1 shows the holder with the spool inserted therein in an axial section;

Fig. 2 shows the holder after the ejection of the spool in an axial section;

Fig. 3 is a sectional front face view of the holder;

Fig. 4 is an axial section of an inserting sleeve, and

Fig. 5 is a perspective view of a clamping jaw.

The numeral 1 refers to a socket which is fixed to a hollow spindle 2 through which protrudes the massive winding spindle for common rotation with said hollow spindle when the winding spindle is actuated. In a cylindrical bore of the socket 1 a sleeve 4 is arranged which is provided with two inner oppositely disposed ribs 5 one side of which registers with a shoulder 6 on the inner circumference of the inserting sleeve 4. The shoulder 6 thus forms a raised portion within the embrace of the two ribs 5.

In the sleeve 4 two oblong clamping jaws are loosely inserted which have a rear portion 7 and a front portion 8. The rear clamping jaw portion 7 has a cross section approximately like a half-ring the circumferential length of which decreases continuously towards the free rear end face. A shoulder 9 forms the boundary between the rear clamping jaw portion 7 and the front clamping jaw portion 8 which is provided with two oppositely disposed flattenings 10 by virtue of which the front portions 8 of the two clamping jaws find room for their accommodation between the two ribs 6 on the sleeve 4, as shown in Fig. 3.

Due to cooperation of the flattenings 10 on the clamping jaws 7, 8 with the guide ribs on the sleeve 4 the clamping jaws 7, 8 are so arranged relative to the sleeve 4 as to be kept from rotation in the circumferential direction. On the other hand the clamping jaws 7, 8 are secured axially in the direction towards the front in that the shoulder 9 provided on the individual clamping jaws 7, 8, which shoulders within the range of the flattenings 10 on the clamping jaws are correspondingly broadened, cooperate with the respective shoulders 6 on the sleeve 4, which shoulders 6 are correspondingly broadened within the range of the guide ribs 5.

A rear wall 11 arranged on the socket 1 makes allowance for a limited movement of the clamping jaws 7, 8 so that these can operate in the manner of two-armed levers by their shoulders 9 cooperating with the shoulders 6 on the sleeve 4 as bearing seatings or as thrust bearing surfaces for pivoting movement of the jaws relative thereto. The portion 7 of each clamping jaw constitutes a lever arm which is longer and heavier compared with the shorter portion 8 the free end of which presents a catching edge 12.

The spindle 3 is provided within the range of the clamping jaws 7, 8 with a thickened portion 13 which joins with a reduced, smooth part, that is, a part not carrying a spring and projecting out of the socket 1 for the reception of the spool 15. On the thickened portion 13 on the spindle 3 a helical spring 16 is pushed, the rear portion of which, lying within the embrace of the said thickened portion, is fixed relative to the spindle 3 and which in the non-loaded condition thereof extends far out over the reduced part 14 of the spindle 3.

On the said part 14 of the spindle 3 the empty spool 15 is pushed as shown in Fig. 1 so that the helical spring 16 is compressed to a corresponding extent. The spool 15 has been pressed into the spool holder described above to such an extent that the flange 17 on the spool base has come to lie behind the catching edge 12 of the portion 8 of both clamping jaws, for which purpose the two clamping jaw portions 8 had to be slightly

spread apart by means of the spool in inserting the latter. The second end of the spool 15 is received in a counter holder 18 which is indicated in Fig. 1 only fragmentarily.

On actuating the winding spindle 3, the described spool holder arranged thereon is turned in unison with the spindle together with the clamping jaws 7, 8. By action of centrifugal force the two heavier lever arms 7 of the clamping jaws 7, 8 tend to move apart, whereas the lever arms 8 of lighter weight tend to approach on each other, whereby their clamping effect is enhanced so that conjoint movement of the spool 15 and of the holder, that is, of the winding spindle 3 is ensured.

After the empty spool 15 has been wound in the required manner the drive of the winding spindle 3 is disconnected and the counter holder 18 is retracted from position of operation. As the spool holder then slows down the clamping jaws 7, 8 incline to move into position of rest so that their clamping effect is accordingly reduced and is then overcome by the action of the helical spring 16, due to instability of equilibrium, whereupon this spring in being released pushes the completely wound spool 15 from the donning spindle 14 so that the spool is slid off in appropriate position towards, that is, into a receiving vessel, as shown in Fig. 2.

Thereupon, a fresh empty spool can be inserted in the immovable holder by the clamping jaws being moved out of position of rest by means of the spool, whereupon the clamping jaws by overcoming their inertia are accordingly pivotally displaced for clampingly engaging with the spool.

The spool holder described permits of lastingly reliably securing the respective spools as inserted in winding position with the aid of relatively simple means as well as of safely automatically ejecting the spools on the termination of the winding so that manual handling of the full spool is dispensed with and thus care is taken for obviating the risk of soiling the thread winding.

Obviously the spool holder as described above by way of example is adapted to be employed also in connection with machines which at all times accommodate only just the spool arranged in winding position and are thus not qualified for receiving a certain amount of stored spools.

The construction of the spool holder may, if desired, be such that the socket and the inserting sleeve as described with reference to the present instance are dispensed with. In certain circumstances the thickened portion 13 provided on the donning part 14 may serve as a bearing seating for the clamping jaws provided that the bearing seating or thrust bearing surface is transposed from the outer side of the clamping jaws to the inner side thereof. Obviously more than two movable clamping jaws may be provided or only one clamping jaw may be movably arranged in a manner to serve for enhancing or diminishing the clamping effect for the purposes described.

Alternatively, the wound spool can be doffed from the spool holder in other manner than described in connection with this instance, for example, automatically by means of a driving device in order to obviate touching the thread winding by hand. If desired, also the arrangement of means for automatically ejecting the spool may be dispensed with.

I claim:

1. In a drivable spool holder for winding machines, clamping jaw means for conjointly clampingly holding the spool arranged in position of winding in the holder having an inner circumference, a housing surrounding all of said jaw means arranged in said holder along said inner circumference of said holder, an inner set-back on said housing, means for loosely mounting one of said jaws in said housing for movement relative to the remaining jaw means for allowing the insertion of said spool into locking engagement with all of said jaw means, a shoulder on said loosely mounted jaw means for cooperation with said set-back for adapting the lastnamed jaw means to function as a two-armed lever by pivoting about said set-back by action of centrifugal force set up in the holder for enhancing said spool locking engagement during the winding operation and diminishing said locking engagement as the driving speed of said holder slows down, and stop means on said housing for preventing said two-armed lever from rotating circumferentially of said holder relative to said housing.

2. In a drivable spool holder for winding machines, clamping jaw means for conjointly clampingly holding the spool arranged in position of winding in the holder having an inner circumference, a housing surrounding all of said jaw means arranged in said holder along said inner circumference of said holder, an inner set-back in the inner circumference of the holder, means for loosely mounting one of said jaw means in said housing for movement relative to the remaining jaw means for allowing the insertion of said spool into locking engagement with all of said jaw means, flattenings provided on said loosely mounted jaw means, a shoulder on said loosely mounted jaw means for cooperation with said set-back for adapting the lastnamed jaw means to function as a two-armed lever by pivoting about said set-back by action of centrifugal force set up in the holder for enhancing said spool locking engagement during the winding operation and diminishing said locking engagement as the driving speed of said holder slows down, and stop means arranged on said housing within the embrace of said set-back for cooperation with said flattenings for preventing said two-armed lever from rotating circumferentially of said holder relative to said housing.

3. In a drivable spool holder for winding machines, clamping jaw means for conjointly clampingly holding the spool arranged in position of winding in the holder having an inner circumference, a housing surrounding all of said jaw means arranged in said holder along said inner circumference of said holder, a seating on said housing, means for loosely mounting some of said jaw means in said housing for movement relative to the remaining jaw means for allowing the insertion of said spool into locking engagement with all of said jaw means, a shoulder on each of said loosely mounted jaw means for cooperation with said seating for adapting the lastnamed jaw means to function as two-armed levers by pivoting about said seating, by action of centrifugal force set up in the holder for enhancing said spool locking engagement during the winding operation and diminishing said locking engagement as the driving speed of said holder slows down, and stop means on said housing for preventing said two-armed levers from rotating circumferentially of said holder relative to said housing.

4. In a drivable spool holder for winding ma-

chines, clamping jaw means for conjointly clampingly holding the spool arranged in position of winding in the holder having an inner circumference, a housing surrounding all of said jaw means arranged in said holder along said inner circumference of said holder, a seating on said housing, means for loosely mounting some of said jaw means in said housing for movement relative to the remaining jaw means for allowing the insertion of said spool into locking engagement with all of said jaw means, flattenings provided on said loosely mounted jaw means, a shoulder on each of said loosely mounted jaw means for cooperation with said seating for adapting the last named jaw means to function as two-armed levers by pivoting about said seating by action of centrifugal force set up in the holder for enhancing said spool locking engagement during the winding operation and diminishing said locking engagement as the driving speed of said holder slows down, and stop means arranged on said housing within the embrace of said seating for cooperation with said flattenings for preventing said two-armed lever from rotating circumferentially of said holder relative to said housing.

5. In a drivable spool holder for winding machines, clamping jaw means for conjointly clampingly holding the spool arranged in position of winding in the holder having an inner circumference, a housing surrounding all of said jaw means arranged in said holder along said inner circumference of said holder, means for loosely mounting one of said jaw means in said housing for movement relative to the remaining jaw means for allowing the insertion of said spool into locking engagement with all of said jaw means, a spindle extending coaxially with said winding position and projecting beyond said housing, a helical spring surrounding said spindle for being compressed as said spool is inserted into said locking engagement, and means cooperating with said loosely mounted jaw means by action of centrifugal force set up in the holder for enhancing said spool locking engagement during the winding operation and diminishing said locking engagement as the driving speed of said holder slows down, whereupon said spool is automatically removed from said spindle by pressure action of said spring.

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