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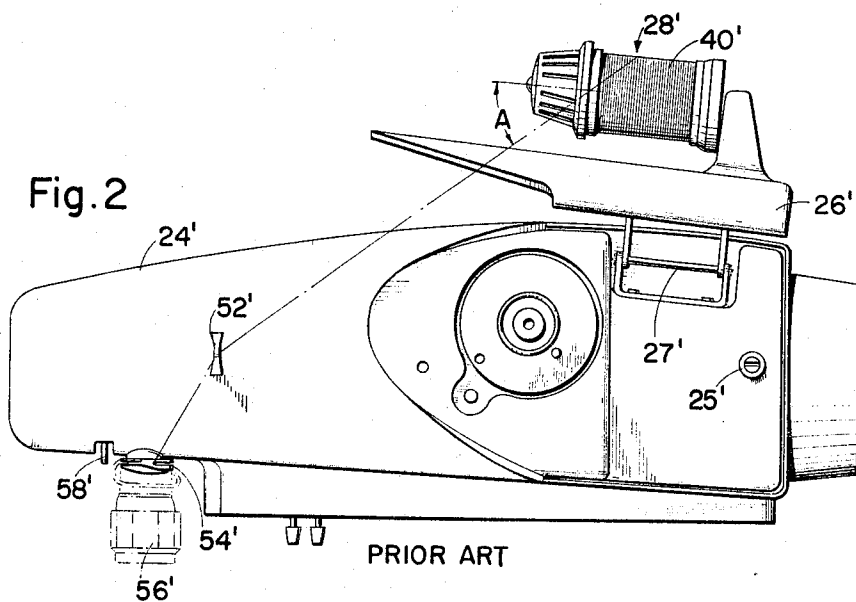
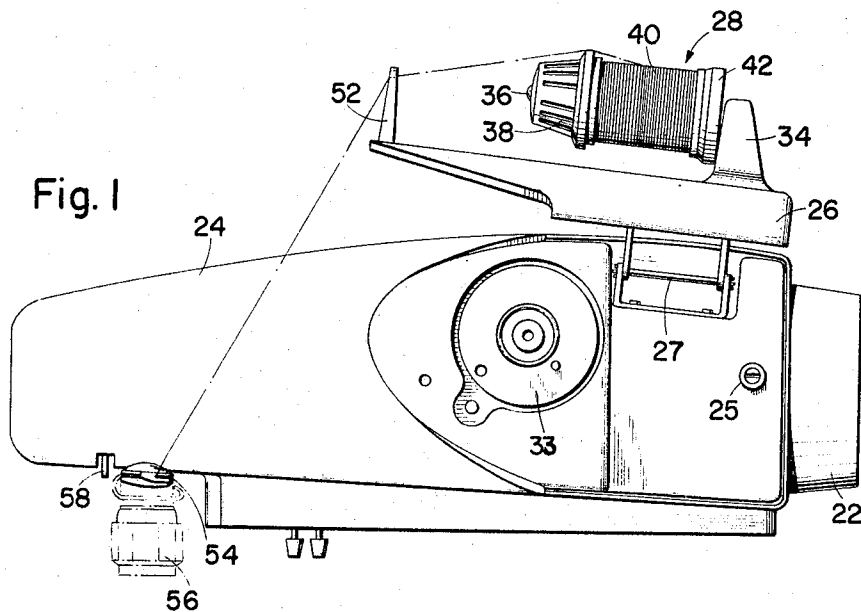
E. W. BIALY ETAL

3,381,641

ZIGZAG SEWING MACHINE THREAD SPOOL UNWINDERS

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2 Sheets-Sheet 1



WITNESS:
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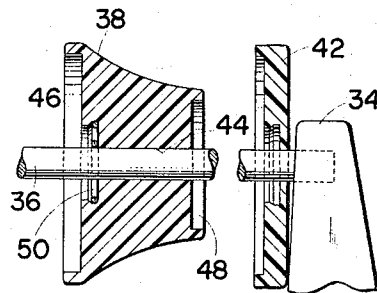
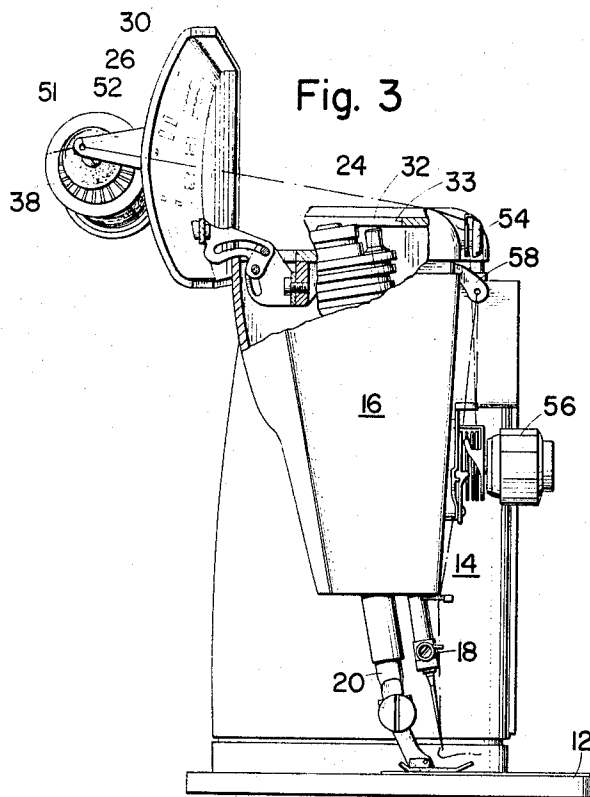
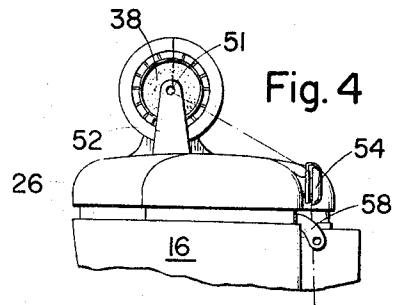
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ZIGZAG SEWING MACHINE THREAD SPOOL UNWINDERS

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ABSTRACT OF THE DISCLOSURE

A means is disclosed which will allow an axial thread spool unwinder to feed thread coils properly to a zigzag sewing machine, when the sewing machine is sewing with its hinged cover plate in either opened or closed position. More specifically the thread spool will not rotate while feeding the coils of thread to the zigzag machine and therefore, the thread will not snag and/or break. The means for accomplishing this result include placing a thread guide post on the external surface of the hinged cover plate, in spaced relation and substantial axial alignment with the thread spool unwinder so that the thread will be withdrawn axially from the unwinder through the upright thread guide member.

This invention relates to a thread spool unwinder for a sewing machine and, more particularly, to a sewing machine having a hinged cover plate and an axial thread spool unwinder mounted thereon.

Although the horizontal spool unwinder of the type disclosed in United States Patent of W. J. Edwards, No. 3,122,113, Feb. 25, 1964, has met with much commercial success, problems may be encountered when this axial spool unwinder is applied to a hinged cover plate on the sewing machine since the thread spool unwinder must then be capable of operation with the hinged cover plate either closed or in its opened position.

A sewing machine operator often may leave the hinged cover plate in its opened position while sewing in order to view the stitch chart located under the plate or in a zigzag sewing machine in order to view the cam stack located in the sewing machine frame.

The horizontal spool unwinder as disclosed in the aforementioned patent, requires that the thread be fed from the spool in an axial direction so that thread coils will slip axially from the spool without rotating the spool. It is an object of the present invention to arrange both an axial spool unwinder and a thread guide axially of the spool unwinder in permanently fixed relation on a hinged cover plate of the sewing machine so that whether the cover plate occupies opened or closed position, thread will always be drawn in an axial direction from a spool on the thread unwinder.

It is, therefore, an object of this invention, to provide means which will allow a zigzag sewing machine to perform satisfactorily while the hinged top plate portion having an axial unwinder mounted thereon is in its opened position.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it, when read in conjunction with the accompanying drawings in which:

FIG. 1 is a top plan view of a zigzag sewing machine embodying the present invention wherein the hinged cover plate is in its opened position and the thread is being fed from the axial spool unwinder,

FIG. 2 is a top plan view of a zigzag sewing machine in contrast to the embodiment of the present invention illustrated in FIG. 1 in which a thread spool unwinder is carried by the hinged cover plate in its opened position and the thread guide is carried by the fixed portion of the sewing machine top cover,

FIG. 3 is a side elevational view partly in section of the zigzag sewing machine of FIG. 1 embodying the present invention wherein the hinged cover plate is in its open position and the thread is being fed from the axial spool unwinder.

FIG. 4 is a partial side elevational view of the zigzag sewing machine of FIG. 1 embodying the present invention wherein the hinged cover plate is in its closed position and the thread is being fed from the axial spool unwinder, and

FIG. 5 is a side elevational view in section of the frusto conical constraining member of the thread spool unwinder.

The present invention is illustrated in FIGS. 1 and 3 to 5, in which a zigzag sewing machine is shown having a frame comprising a sewing machine supporting bed 12, which supports a hollow standard 14 in which the sewing machine motor (not illustrated) is housed, a bracket arm portion 16 extends from the hollow standard and supports an endwise reciprocating needle 18 and presser device 20. A handwheel 22 is rotatably journaled in the bracket arm at the extremity opposite the needle and presser device. A top cover plate 24 fixedly secured to the bracket arm as by a screw 25 has cover plate 26 pivoted thereon by a hinge 27. A thread spool unwinder 28 is carried on the hinged cover plate 26.

A stitch chart 30 is imprinted on the interior surface of the hinged cover plate and a stack of removable cams 32 is located in the bracket arm under the hinged cover plate and accessible through an access opening 33 in the top cover plate 24. A sewing machine operator has frequent occasion to view the stitch chart and cam stack while sewing. The hinged cover plate must be raised to remain in the position illustrated in FIGS. 1 and 3 when the operator wishes to simultaneously sew and view the stitch chart and/or the cam stack.

The thread spool unwinder 28 comprises a standard 34 supporting one extremity of a spool pin 36. (see FIG. 5) extending therefrom. The spool of thread 40 may be constrained on the spool pin between a frusto-conical member 38 of the type described in detail in the aforementioned United States patent and an abutment member 42.

The frusto-conical member 38 has an axial bore 44 extending therethrough which accommodates the spool pin 36. Formed at each end of the frusto-conical member are shallow counterbores 46 and 48 of different diameters to accommodate different sized spools. The counterbore of largest diameter has an undercut recess formed therein within which is snapped a wire spring 50 which has its free extremity protruding into the bore for frictional engagement with the spool pin. The abutment member 42 has a similar spring inserted therein which also frictionally engages the spool pin. The frusto-conical member 38 and abutment member 42 may thus be forced against opposite ends of the spool 40 to deter the latter from rotation.

Thread from the spool 40 carried by the unwinder is directed to the needle 18. The thread passes from the spool 40 through an eyelet 51 in a thread guiding post 52 mounted on the hinged cover plate 26. From thread guide eyelet 51, the thread passes to a side thread guide 54, a thread tension device 56, take up lever 58 and then to the needle. As thread is used from the needle either in sewing or bobbin thread replenishment, the thread is taken in coils axially from the stationary spool.

It has been found that positioning thread guides post 52 on the hinged cover plate 26 with the eyelet 51 in

alignment axially with the spool pin 36 the thread spool unwinder 14 permits the thread to be directed from the spool in a generally axial direction (as illustrated in FIGS. 3 and 4). A proper thread flow is thereby achieved without undesirable spool rotation and accompanying resistance to unwinding, snagging and breaking.

Referring now to FIG. 2 there is illustrated an arrangement which in contrast with this invention may give rise to problems in thread unwinding with the hinged cover plate open. FIG. 2 illustrates a sewing machine similar to that of FIGS. 1 and 3 to 5, in which the corresponding parts are identified with the same reference characters as used in FIGS. 1 and 3 to 5, but with prime numbers. The sewing machine illustrated in FIG. 2 includes a top cover plate 24' fixed on the machine frame as by a screw 25' and a cover plate 26' pivoted on the top cover plate 24' by a hinge 27'. A thread spool unwinder 28' is carried on the hinged cover plate 26' for delivery thread from a spool 40' to the needle.

The thread passes from the spool 40' through the guiding eyelet of a thread guide post 52' mounted on the fixed top cover plate 24', thence to a side thread guide 54', a thread tension device 56', take up lever 54' and then to the needle.

Since the thread guiding post 56' is located on the top cover plate 24' when the hinged cover plate 26' is opened the thread will not be directed axially but rather tangentially from the spool; i.e. the thread forms an angle A, with the axis of the spool. It is reiterated that the spool 40' must remain stationary in order not to impose objectionable inertia forces preventing satisfactory unwinding of the thread. However, it had been found that tangential thread unwinding occasioned by an arrangement as illustrated in FIG. 2 may cause the spool 40' to rotate resulting in objectionable resistance to tread unwinding, overspinning of the spool, and thread snagging and/or breaking. Obviously, this condition is intolerable for efficient sewing machine operation.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure

relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention, are intended to be included within the scope of the appended claim.

Having thus set forth the nature of the invention, what we claim herein is:

1. In a sewing machine having a frame formed with an access opening, a cover plate for said access opening, hinge means pivotally connecting said cover plate with said frame over said access opening, a non-rotatable axial thread spool unwinder carried exteriorly on said hinged cover plate and including a spool pin, said spool pin being horizontally disposed relative to said cover plate, said spool pin having a free extremity and means securing the opposite extremity of said spool pin on said hinged cover plate, means on said spool pin for constraining a thread spool thereon, and an upright thread guiding post separate from said spool pin and carried exteriorly on said hinged cover plate, said thread guiding post being formed with a thread guiding eyelet disposed in spaced relation to the free extremity of said spool pin and in substantial axial alignment with the free extremity of said spool pin to guide thread axially from a spool on said spool pin in any selected position of said pivoted cover plate, said spaced relation being greater than the length of the spool pin less the width of the constraining means so that the thread spool can be easily replaced.

References Cited

UNITED STATES PATENTS

558,437	4/1896	Tivy et al.	242—130 X
1,367,387	2/1921	Hayes	242—128
2,862,468	12/1958	Johnson	112—158
2,938,478	5/1960	Johnson	112—218
3,122,113	2/1964	Edwards	112—218

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