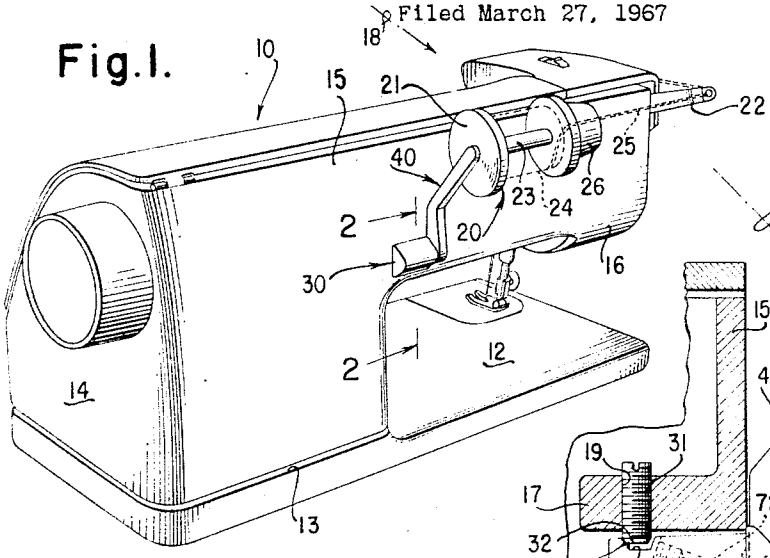
May 20, 1969 J. BLACKWOOD ET AL 3,444,833

FOLD-AWAY SPOOL HOLDER FOR A SEWING MACHINE

Filed March 27, 1967

Fig.1.



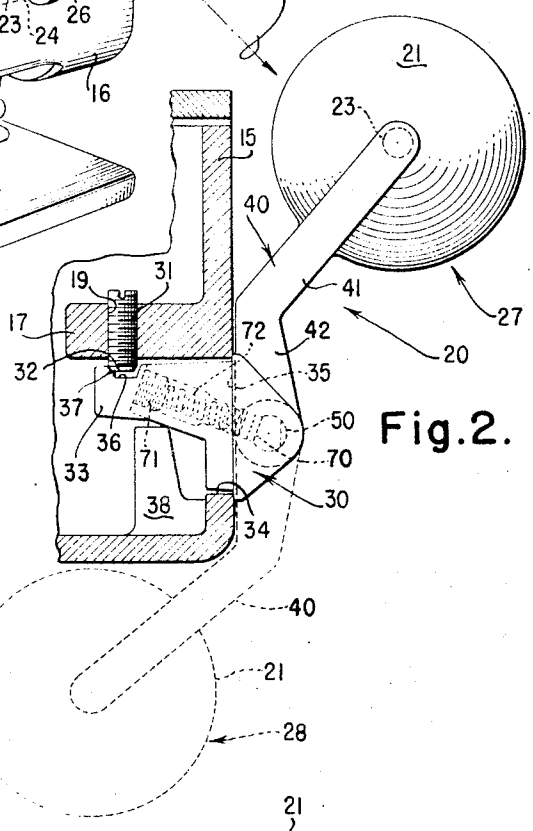


Fig.2.

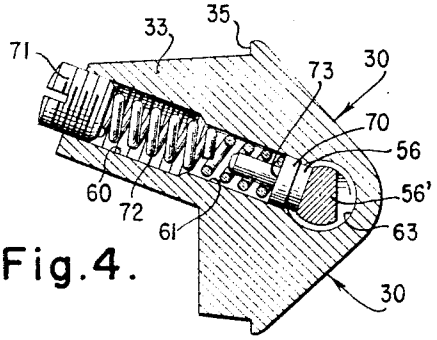


Fig.4.

Fig.5.

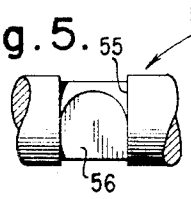


Fig.3.

Witness

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FOLD-AWAY SPOOL HOLDER FOR A SEWING MACHINE

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ABSTRACT OF THE DISCLOSURE

A spool holder for a sewing machine rotatable into an exposed position when the machine is to be operated and into a stored position in a cavity in the sewing machine when the machine is to be stored or moved.

BACKGROUND OF THE INVENTION

Field of the invention

The invention pertains to an adjustable spool support for a sewing machine adapted to be placed in an upright or lowered position and having fold-away means for accomplishing the same in a novel, efficient, desirable manner.

Description of the prior art

Sewing machines usually are equipped with a conventional stationary spool support having a pin upon which a spool of thread may be mounted and used as the source of needle thread supply. Generally, the pin is mounted on the bracket arm of the machine frame such that a line drawn through the axis of the pin is substantially perpendicular to the plane defined by the flat work supporting surface of the frame. The overall height of the bracket arm, as measured from the work supporting surface to the topmost surface of the bracket arm, is thereby increased by the height that pin protrudes from the bracket arm surface.

Sewing machines intended for use in the home generally are stored in a cabinet provided with means for lowering the machine into stored position within the cabinet or the machine may be of the portable type and stored in a portable carrying case. The top of such cabinets have a substantially rectangular machine mounting memebr which is pivotally supported by the cabinet top and is disposed to move in and out of the cabinet. When the machine is lowered to stored position, every point thereof describes an arc around the pivot axis. The greatest arc is described by the free end of the spool support pin. Accordingly, the opening which receives the machine must be dimensioned to accommodate the greatest arc. Thus, it is apparent that relocating the pin will allow for a reduction in one of the dimensions of the opening. This allows for the corresponding dimensions of the cabinet top to be reduced thereby allowing for the manufacture of a more compact, space saving, less expensive cabinet. Substantially similar advantages are present in regard to the type of portable carrying case which can be manufactured since with the present invention, the machine per se is the significant consideration in determining the size of the case.

Furthermore, protrusion of the spool support pin from the surface of the bracket arm breaks the line of design of the bracket arm and detracts from the overall aesthetic appeal of the machine. Accordingly, it is desirable that the pin be otherwise positioned to enhance aesthetic appeal.

SUMMARY

This invention relates to the art of sewing machines,

and more particularly to a novel and improved spool holding means adapted to be mounted on the sewing machine whereby the spool can be held in either a lowered stored position or in an upright exposed operable position.

The present invention overcomes the prior art deficiencies by providing a spool holding means including a fold-away mechanism. This mechanism comprises a pivotally supported spool supporting arm to which a regular spool pin may be secured. A pivot stud carried by the arm is journaled for rotation in a bore formed in a bracket which is adapted to be secured to the sewing machine. A spring loaded adjustable plunger housed in the bracket engages an annular recess on the pivot stud to lock the stud in place with capacity for turning movement on the machine. In the annular recess, the stud is formed with slabbed surfaces providing plunger abutments adapted to maintain the spool holder in an operable or inoperable position. The slabbed surfaces are formed so as to provide stops which limit the turning movement of the spool pin arm so that the latter cannot abut against and damage the sewing machine upon which it is mounted. This construction facilitates storage of the machine in a cabinet or carrying case without having to worry about any elements protruding therefrom which might preclude storage in certain areas only large enough for the machine per se. Also, the possibility of damaging the spool holder itself is substantially decreased since it is well concealed within a cavity in the machine frame when the latter is stored away.

Accordingly, it is an object of the present invention to provide a novel and improved adjustable spool support.

Another object is to provide a fold-away spool holder whereby the overall height of the sewing machine frame is substantially reduced.

It is also an object of this invention to provide a sewing machine having a more compact silhouette which is most desirable for sewing cabinets of the drop head type.

Another object of this invention is to facilitate manufacture of a portable sewing machine carrying case which is smaller and slimmer than heretofore attainable.

Having in mind the above and other objects that will be evident from an understanding of the 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:

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a rear perspective view of a sewing machine embodying the present invention;

FIGURE 2 is an enlarged fragmentary vertical cross-sectional view taken substantially along the line **2—2** of FIGURE 1;

FIGURE 3 is an enlarged exploded perspective view of an embodiment of the present invention;

FIGURE 4 is an enlarged assembled vertical cross-sectional view taken substantially along the line **4—4** of FIGURE 3; and

FIGURE 5 is an enlarged rear elevational view taken substantially along the line **5—5** of FIGURE 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, wheren like reference characters designate like or corresponding parts throughout the several views, there is shown in FIGURE 1 a conventional type sewing machine **10**, such as illustrated in United States Patent No. 3,204,594, having a frame

which includes a bed **11** having a flat work supporting surface **12**. The bed has a raised platform **13** disposed at one end upon which is mounted a standard **14** of a bracket arm **15** terminating in a head **16**. As best illustrated in FIGURE 1, an adjustable spool support **20** which includes a spool supporting arm **40** pivoted to a supporting bracket **30** is adapted to be secured to the back portion of the bracket arm **15** of the sewing machine **10**.

The spool supporting arm **40** terminates in a circular spool pin holder **21** to which the regular spool pin **23** is secured. Commercially available spools of thread **24** may be axially mounted on the spool pin **23** and used as a source of supply of needle thread **25**. The sewing machine **10** has a thread guide **22** located on the head **16** to guide the thread to a take-up mechanism (not shown). The thread guide **22** is hinged in a conventional manner so that it does not protrude from the sewing machine when the machine is placed in stored position.

The type of thread unwinder used in this embodiment has proven to be highly advantageous and desirable, and reference may be had to United States Patent No. 3,122,113 for a more complete description thereof. The disposition of the spool **24** on the pin **23** as shown in FIGURE 1, provides for relatively constant, substantially reduced, thread tension since the spool need not be rotated as thread is supplied therefrom. A circular retaining cap **26** mounted on the free end of the pin **23** prevents the spool **24** from being pulled off the pin as needle thread is drawn therefrom.

The supporting bracket **30** and supporting arm **40** are positioned substantially out of the line of sight **18** of the operator without sacrificing visibility of needle thread supply **24**. The upright position **27** of the spool supporting arm **40** and holder **21**, as shown in FIGURES 1 and 2, is the position in which these members are held relative to the bracket arm **15** when the machine is being operated. The dashed lines in FIGURE 2 illustrate the lowered storage or inoperative position **28** of these members.

Referring now to FIGURE 2, it is seen that a portion **17** of the frame of the bracket arm **15** is provided with an internally threaded channel **19** which is adapted to threadably receive an anchoring screw **31** having a beveled lower end **32**. An aperture **34** formed in bracket arm **15** is adapted to receive a lug **33** therein. The lug **33** extends from the peripherally disposed substantially rectangular supporting surface **35** of the supporting bracket **30**. A recessed channel **36** (see FIGURE 3) having a sloping wall **37** is formed on the top surface of lug **33** and is laterally disposed to the rear of surface **35**. Formed within the bracket arm **15** is an upstanding boss **38** which abuts the bottom upwardly sloping surface of the lug **33**. The beveled end **32** of the anchoring screw **31** engages the sloping wall **37** thereby causing the bottom surface of lug **33** to contact the boss **38**. The above arrangement secures the rectangular surface **35** tightly against the back surface of the bracket **15**. The supporting surface **35** is slightly larger than the aperture **34** formed in the bracket arm **15** so that the aperture is completely hidden from view as shown in FIGURE 1.

The spool supporting arm **40** is elongated and comprises an upper portion **41** and a lower portion **42** angularly disposed in obtuse relationship to each other. The upper portion **41** terminates in an integrally formed circular spool pin holder **21** which carries the spool pin **23** in a manner well known in the art. Press fitted into a substantially annular recess **43** having a flat **44** formed in the lower portion **42** of the supporting arm **40**, is a pivot stud **50** keyed against rotation within the recess **43**. The pivot stud **50** is formed with a flat **53** which is adapted to be aligned with the flat **44** formed within the recess **43**. The pivot stud **50** has a radially disposed groove **55** formed substantially intermediate of its extremities with said radial groove **55** having two slabbed plunger abutment surfaces **56** and **56'**. The plunger abutment surface **56** is located to maintain the adjustable spool support **20** in its elevated operable position **27** while plunger abutment surface **56'** is located to maintain said spool support **20** in its lowered storage position **28**. Thus it is seen that the angularly shaped arm **40** is adapted to support a spool **24** both in an operable and inoperable position.

As shown in FIGURES 3 and 4, the supporting bracket **30** is provided with concentrically disposed upper and lower channels **60**, **61** respectively, for housing a spring loaded adjustable plunger mechanism comprising a plunger **70**, an adjusting screw **71** and a coil spring **72**. The plunger **70** which is endwise slidable in the lower channel **61** is provided with a spring abutment surface **73**. The adjusting screw **71** threadably engages the internally threaded upper channel **60**. As best illustrated in FIGURE 4, the coil spring **72** is situated between the plunger **70** and the adjusting screw **71**, and has a lower portion thereof disposed about an upper end of the plunger **70** which extends from the surface **73**. The spring **72** is compressively constrained against the plunger spring abutment surface **73** by means of the adjusting screw **71** thereby axially loading the plunger **70**. The loading can be varied to any desired degree by merely adjusting the screw **71**. As shown in FIGURE 3, the supporting bracket **30** is also provided with a channel **63** substantially normally disposed relative to channels **60** and **61** and located at the lower end of the plunger mechanism channels to lower channel **61** whereby the channels intersect and form an orifice through which the lower extremity of the plunger **70** may protrude.

As shown in FIGURES 3 and 4, the pivot stud **50** carried by the arm **40** is journaled for rotation in the channel **63**. The pivot stud is locked in place, having only a capacity for turning movement, when the spring loaded adjustable plunger **70** engages the pivot stud radial groove **55**. The pivot stud slabbed surfaces **56** and **56'** are preferably formed by an end mill which has not cut completely across the stud so as to form stops thereon which limit the turning movement of the spool pin arm **40**, so that the latter cannot abut against and damage the sewing machine upon which it is mounted.

The radial groove **55** formed with the slabbed surfaces **56** and **56'** form a cam section as shown by the cross-section in FIGURE 4. As the operator rotatably moves the arm **40** between operating and storage positions, the plunger **70** reciprocates endwise in the supporting bracket lower channel **61** and continuously applies tension to the pivot stud **50** during rotation. The tension is such as to allow for rotation of the pivot stud **50** whereby one of the surfaces **56** or **56'** will contact the lower end of the plunger **70** depending on whether the spool is in operative or stored position.

However, when the spool pin arm **40** is rotated to storage position **28**, the spool pin **23** is disposed beneath the bracket arm **15** in a cavity or opening formed between the bracket arm **15** and flat work supporting surface **12**, thereby facilitating the storage of the machine in either a cabinet or carrying case without having to make provisions for any added height or depth.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the foregoing disclosure relates to a preferred embodiment of our invention which is for purposes of illustration only and not to be construed as a limitation of the invention.

What is claimed is:

1. In a sewing machine having a frame, spool supporting means including a support arm, means for pivotally securing said arm to said sewing machine frame for turning movement between an upright operative position and a lowered inoperative position, said pivotal securing means comprising a bracket having a bore formed therein, said bracket being secured to the frame of said machine, a pivot stud carried by the support arm

having formed thereon cam surface means comprising surfaces providing abutments defining the limits of turning movement of said support arm, said abutment surfaces being adapted to maintain the support arm in one of its upright operative and lowered inoperative positions, said pivot stud being journaled for turning movement in said bore, and pin means capable of supporting a spool carried by the upper end of said spool supporting arm.

2. In a sewing machine as set forth in claim 1 wherein said pivot stud is formed with a peripheral groove including said cam surface means, constructed and arranged to resiliently engage said cam surface means for cooperating with said abutments to maintain sufficient tension on said pivot stud to facilitate turning movement thereof and to maintain said support arm in a selected one of its operable and inoperable positions.

3. In a sewing machine as set forth in claim 1 wherein said sewing machine includes a bracket arm, said cam surface means being constructed and arranged such that

in its lowered inoperative position said support arm is disposed with said supporting pin means substantially below said bracket arm.

4. The device as set forth in claim 1 wherein said spool supporting pin is disposed horizontally.

5. The device as set forth in claim 1 wherein said pivot stud is disposed in substantially the same axial direction as is said spool supporting pin.

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H. HAMPTON HUNTER, *Primary Examiner.*

U.S. Cl. X.R.

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