May 31, 1955 A. N. HALE 2,709,371

UNIVERSAL BOBBIN WINDER PULLEYS

Filed Oct. 1, 1951

2 Sheets-Sheet 1

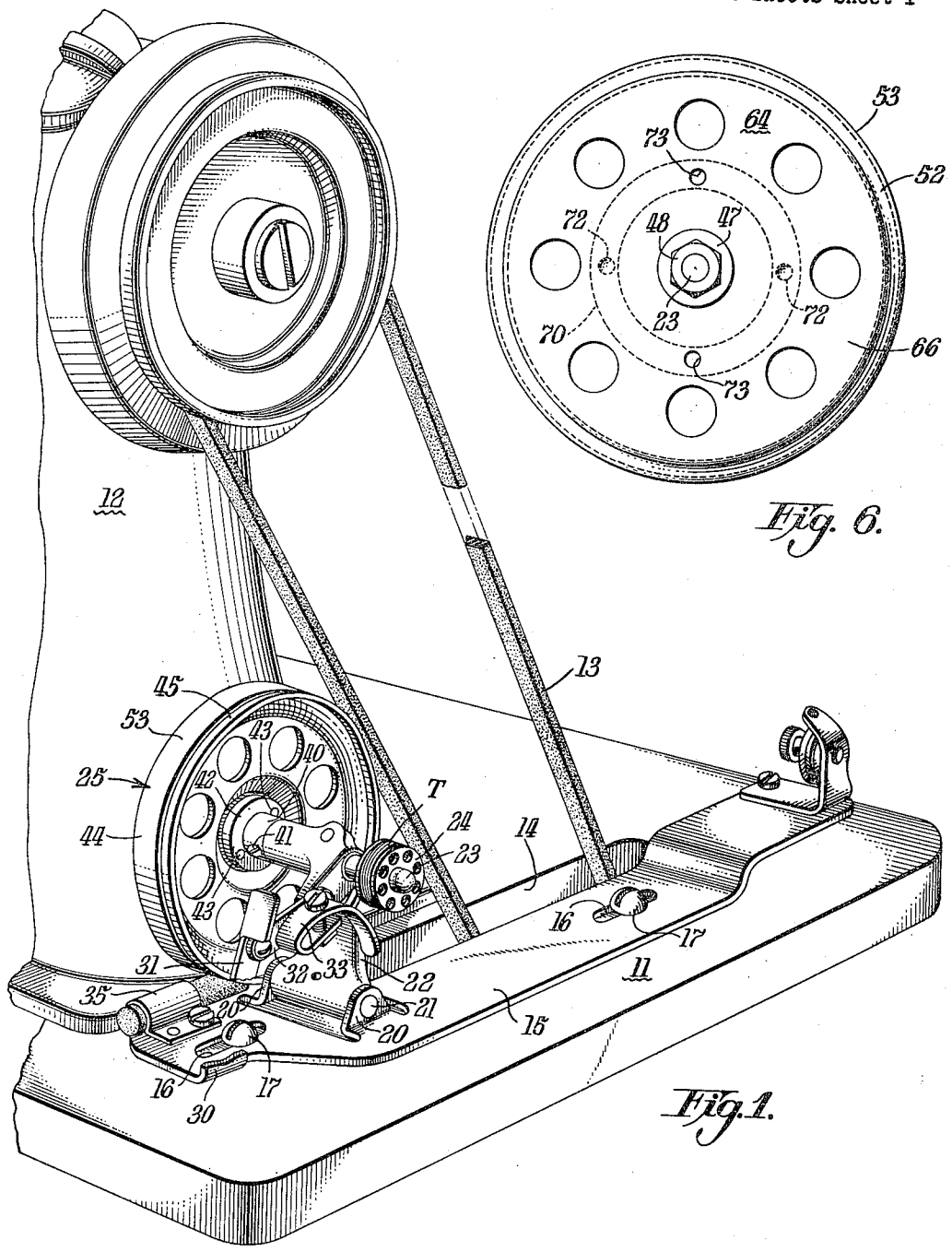


Fig. 1.

Fig. 6.

WITNESS

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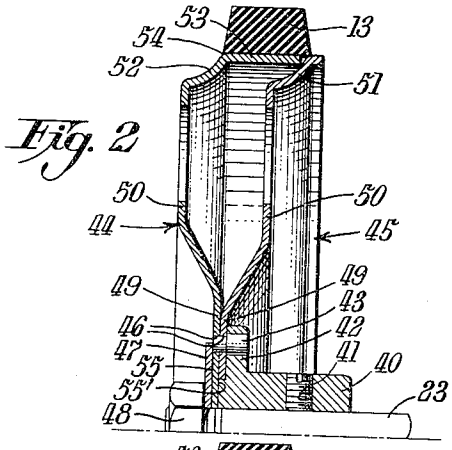


Fig. 2

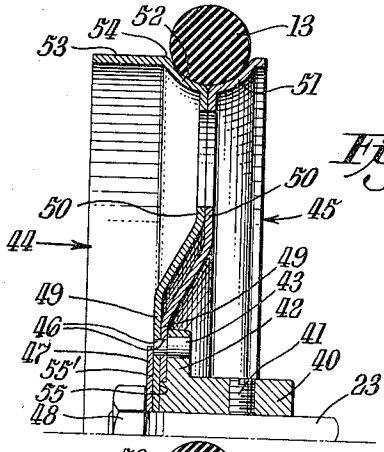


Fig. 3.

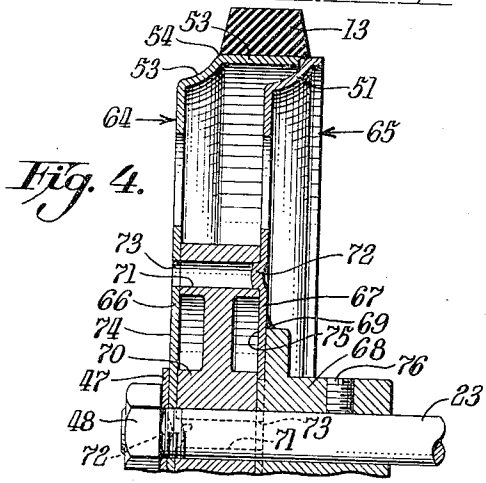


Fig. 4.

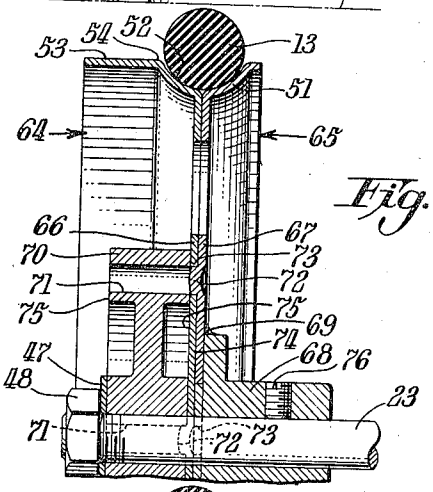


Fig. 5.

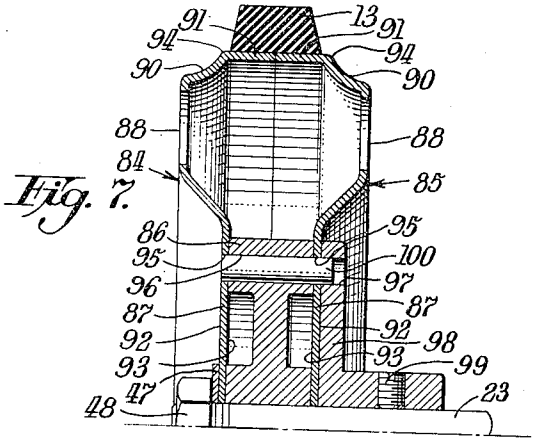


Fig. 7.

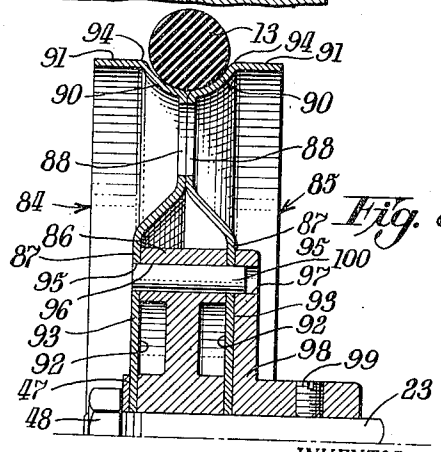


Fig. 8.

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UNIVERSAL BOBBIN WINDER PULLEYS

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Application October 1, 1951, Serial No. 249,098

6 Claims. (Cl. 74—230.5)

This invention relates to sewing machine bobbin winders and more particularly to a pulley construction for a belt driven bobbin winder.

In the usual commercial sewing machine installation in which the sewing machine frame is positioned in a cut-out portion of a power-table top, there is frequently provided a bobbin winding device of the type which is driven by means of a bobbin winder pulley that is arranged to bear against the outside face of the sewing machine driving belt. It is common practice in the manufacture of sewing machines and power-table tops to provide for interchangeability of one or more types of machines in any one particular table top, so that stitching operations may be changed simply by replacing one machine with another without disturbing the power transmitter or the table. Sewing machines differ however, with regard to the type of driving belt to which they are adapted; certain machines being designed for use with a belt of trapezoidal cross section, commonly called "V-belts" which present a flat outer face to the bobbin winder pulley, while other machines are adapted for use with round belts which present a surface of circular cross-section to the bobbin winder pulley. In the past, several different bobbin winder pulleys have had to be used each having a different belt accommodating peripheral shape, in order that the various belt shapes might be accommodated. It is a primary object of this invention to provide in one simple and inexpensive pulley an arrangement capable of accommodating driving belts of different cross-sectional shapes.

In addition to the fact that most power-table tops may accommodate more than one type of sewing machine, it is also known in the art that the lateral position of the driving belt with respect to the power-table top remains substantially constant no matter which type of sewing machine is secured in place on the table top. In other words, for each table top, the centerline of the driving belt of any and all sewing machines which may be accommodated, defines for all practical purposes, a single vertical plane. A bobbin winder pulley which merely provides a periphery having different belt accommodating surfaces arranged side-by-side would, therefore, not be completely satisfactory since it would require an inconvenient and time consuming lateral adjustment of either the entire bobbin winding attachment or of the pulley with respect to the attachment in order to position the proper belt accommodating surface in the plane of the belt. It is a further object of this invention therefore, to provide a unitary bobbin winder pulley of which the cross sectional shape of the peripheral surface in the plane of the belt may be changed without shifting the attachment or the lateral position of the pulley.

The above and other objects and advantages of this invention will best be understood by the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of one preferred form of my invention illustrated as a part of a bobbin winding attachment applied to a power table top with the table top, sewing machine and driving belt illustrated fragmentarily.

Fig. 2 represents a cross section of half of a preferred form of pulley construction including the driving belt and illustrating the arrangement of parts which will position a flat belt-accommodating surface in the plane of the driving belt.

Fig. 3 represents a cross-section of half of the pulley of Fig. 2 with the parts arranged to accommodate a round belt.

Fig. 4 represents a cross-section of half of one modified form of pulley construction including the driving belt and illustrating the arrangement of parts which will position a flat belt-accommodating surface in the plane of the driving belt.

Fig. 5 represents a cross-section of half of the pulley of Fig. 4 with the parts arranged to accommodate a round belt.

Fig. 6 is an end elevational view of the pulley illustrated in Figs. 4 and 5.

Fig. 7 represents a cross-section of half of a second modified form of pulley construction including the driving belt and illustrating the arrangement of parts which will position a flat belt-accommodating surface in the plane of the driving belt and,

Fig. 8 represents a cross-section of half of the pulley of Fig. 7 with the parts arranged to accommodate a round belt.

Referring more particularly to Fig. 1 of the drawings, my invention is illustrated as applied to a bobbin winding attachment which is shown secured in place on a power table top **11** on which is supported a sewing machine **12** driven by an endless belt **13** which passes through a clearance slot **14** in the table top to a suitable power transmitter (not shown) beneath the table top.

The bobbin winding attachment is of the type having a base plate **15** formed with spaced slots **16—16** through which fastening screws **17—17** pass in order to secure the attachment to the table top for limited adjustment parallel to the plane containing the driving belt **13**. Opposed lugs **20—20** which are struck up from the base plate **15**, support a pivot-pin **21** on which is journaled a swinging frame member **22**. A shaft **23** journaled in the upper extremity of the swinging frame member **22** is formed at one end to accommodate a bobbin **24** as it is being wound with thread T. The shaft is provided at the other end with a driving pulley indicated generally as **25** which is arranged in the plane of the driving belt **13**. Between the swinging frame member **22** and an ear **30**, which is struck up from the base plate **15**, there is pivoted a toggle linkage comprising links **31** and **32**. The toggle linkage serves to control the position of the pulley supporting frame member **22**; that is, when the toggle is straightened, the pulley is forced against the outer face of the belt so that the bobbin **24** is rotated as the sewing machine is operated. A spring finger **33** which is secured to the toggle link **32** is disposed to bear against the thread mass on the bobbin when the toggle links are straightened so that as the thread mass reaches a predetermined size, the spring finger will urge the toggle linkage into a broken or angular position which moves the frame member **22** and the pulley **25** away from the driving belt and into an inoperative position as shown in Fig. 1. A stop member **35** is secured to the base plate **15** in position to be engaged by the pulley **25** when it is in inoperative position and thus to prevent accidental turning or unwinding of the bobbin.

Figs. 1, 2 and 3 illustrate one preferred form of bobbin winder pulley which is constructed in accordance with the present invention. In this construction, a hub member **40** is secured to the shaft **23** by means of the setscrew **41**. The hub member **40** is formed with a radial flange

42 into which one or more locating pins 43 are pressed or otherwise secured. Arranged on the shaft 23 are two adjacent sheet-metal pulley disks 44 and 45 which are each apertured, as at 46, to accommodate the locating pins 43 and are maintained in face to face relation adjacent the hub flange 42 by means of a washer 47 and nut 48, which is threaded on the extremity of the shaft 23. Both of the pulley disks 44 and 45 are dish-shaped, each having an inner body portion 49 and a laterally offset outer body portion 50. The disk 45 is formed with a concave or segmental peripheral belt-accommodating portion 51. The disk 44 is formed with a belt-accommodating segmental rim portion 52 which is shaped similar to the peripheral portion 51 of the disk 45. In addition, the disk 44 is formed with a cylindrical rim portion 53 which joins the concave portion 52 at 54 substantially in the plane of the inner body portion 49 of the disk 44.

In Figs. 2 and 3, the position of the sewing machine driving belt 13 is indicated by a cross sectional representation of the belt. It is pointed out that, in each of the figures, the belt occupies the same position relative to the shaft 23 and the hub; that is, a medial plane disposed coincident with the belt centerline would represent a common plane in each figure. Comparison of Figs. 2 and 3 will indicate the changes and arrangements of parts which are necessary to accommodate selectively a round or flat belt surface. In Fig. 3, the pulley disks 44 and 45 are illustrated in proper arrangement to accommodate a driving belt of circular cross section. In this arrangement, the disk 44 has been reversely positioned on the shaft 23 with the concave peripheral or rim portion 52 disposed adjacent the concave peripheral portion 51 of the disk 45, such that the two disks present a composite belt accommodating surface of semicircular cross-sectional shape which is disposed symmetrically about the medial plane of the belt centerline. Fig. 2 illustrates the position of parts in which the pulley is arranged to accommodate the flat inner surface of the V-belt. The change from a round belt accommodating surface of Fig. 3 to a V-belt accommodating surface of Fig. 2 involves merely the axial reversal of the position of disk 44 on the shaft 23. Since the juncture 54 of the cylindrical rim portion 53 with the concave rim portion 52 of disk 44 occurs substantially in the plane of the inner body portion 49, the body portion provides locating surfaces 55, 55′ one at each side, which surfaces are correspondingly symmetrical about the plane containing the juncture of the rim portions. When the disk 44 is axially reversed on shaft 23, therefore, the rim portions 52 and 53 are shifted each into the space previously occupied by the other and, consequently, the belt accommodating surface which is provided in either axial position of disk 44 remains symmetrical about a common belt-centerline.

In the modified form of pulley construction illustrated in Figs. 4, 5 and 6, two pulley disks 64 and 65 are utilized. The rim portions of these disks are shaped in a fashion identical with the disks 44 and 45, respectively, of the previously described construction, including the concave rim portions 51 and 52, the cylindrical portion 53 and the juncture 54 of the two rim portions of disk 64. The body portions 66 and 67 of pulley disks 64 and 65 respectively are flat and planar rather than dished or laterally offset as is the construction described above. The disk 65 is secured for rotation with a hub member 68 by a weld 69 rather than by means of a pin as in the previously described embodiment, the hub being secured for rotation with the shaft 23 by means of a setscrew 76. The change from a composite semicircular belt accommodating rim contour, as is illustrated in Fig. 5, to a flat cross-sectional periphery disposed in the plane of the belt centerline as shown in Fig. 4 is accomplished by axially reversing pulley disk 64 on the shaft 23. A spacing collar 70 which is associated with pulley disk 64, is formed with four evenly spaced apertures 71. Formed on each of the disks 64 and 65 in a spaced relationship which corresponds to the spacing of the apertures 71 of the collar 70, are raised or struck up diametrically opposed buttons 72, 72 as shown in Fig. 6 which serve to enter apertures 71 so as to interlock the disks 64 and 65 and the collar 70 for rotation when clamped together by means of the nut 48 and the washer 47. Also formed on each disk 64 and 65 are a pair of apertures 73—73 which are positioned so as to register with apertures 71 of the spacing disk. The body portion 66 of disk 64 provides one locating surface 74 for disk 64 with respect to the disk 65 as shown in Fig. 5. The spacing collar 70 provides a second disk locating surface 75 which is spaced equidistant from and at the opposite side of the plane containing the juncture 54 of the rim portions 52 and 53, so that the belt accommodating surface provided in either axial position of the disk 64 is symmetrical about a common belt centerline.

In another modified form of pulley construction, as illustrated in Figs. 7 and 8, two pulley disks 84 and 85 are provided of identical size and shape, together with a spacing collar 86. Each of the disks 84 and 85 is dish shaped, having an inner body portion 87 and a laterally offset outer body portion 88. Each disk rim is formed with a concave belt-accommodating surface 90 which is joined substantially in the plane of the inner body portion of the disk by a cylindrical rim portion 91. The body portion 87 of each disk provides at each side a disk locating surface 92 and 93 which surfaces are symmetrical about the plane containing the juncture 94 of the rim portions of the disk. The contour of the belt-accommodating surface may be altered by axially reversing both disks 84 and 85 of the shaft 23; however, in either position, the spacing collar 86 is disposed between the disks. Aligned apertures 95, 96 and 97 are formed respectively in each of the disks 84 and 85, in the spacing collar 86, and in a hub member 98 which is secured for rotation with the shaft 23 by a setscrew 99. In the preferred form, a pin 100 is pressed or otherwise permanently secured in the spacing collar aperture 96 and arranged so as to enter apertures 95 and 97 in order to interlock the parts of the pulley for rotation with the shaft 23.

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

1. A shaft pulley comprising a hub, two pulley disks, a body portion of each disk associated with said hub in rotationally interlocked relation and in axially reversible positions of at least one of said disks on said shaft, a marginal portion of at least one of said disks being formed with two belt accommodating surfaces extending asymmetrically about a plane defining the juncture of said surfaces, and disk locating surfaces associated with the body portion of said last mentioned disks, said surfaces being arranged to locate said plane equidistant from said hub in reversed positions of said disks on said shaft.

2. A shaft pulley comprising a hub adapted to be secured for rotation with said shaft, a radial seat formed on said hub, two pulley disks arranged in rotationally interlocked relation with said hub, a body portion formed on each of said disks, means locating each of said disk body portions with respect to said hub seat, a peripheral margin formed on each of said disks to provide half of a composite first belt-accommodating surface in one arrangement of said disks with respect to said hub, an additional peripheral marginal portion formed on at least one of said disks providing a second belt-accommodating surface, said last mentioned disk being reversible axially with respect to said hub, and means associated with the reversible disk for locating the plane of division between the peripheral marginal portions of said reversible disk equidistant from the hub seat in reversed positions of said disk on the shaft.

3. A shaft pulley formed to accommodate in a single path a belt having either of two cross-sectional surface contours, said pulley comprising a hub member, a seat formed on said hub member, two pulley disks, a body

portion formed on each of said disks, means locating said body portions with respect to said hub seat, a first rim portion formed on each of said disks and arranged to provide a composite first belt-accommodating surface in one arrangement of said disks on said hub, at least one of said disks being reversible on said hub, an additional rim portion formed on said reversible disk to provide a second belt-accommodating surface, the body portion of said reversible disk having associated therewith parallel disk locating surfaces disposed one at each side of and equidistant from a plane defining the juncture of the rim portions of said disk.

4. A shaft pulley comprising a hub, a seat formed on said hub, two pulley disks adapted to be assembled in face-to-face relation in axially reversed positions of at least one of said disks, means locating said assembled disks against said hub seat, a concave rim portion which is quadrant shaped cross-sectionally formed on each of said disks, said quadrant shaped rim portions together forming a semicircular belt-accommodating surface, an additional straight cylindrical rim portion formed on at least one of said disks, said pulley disks having additional straight cylindrical rim portions being reversible axially on said shaft, and means associated with said reversible pulley disks for positioning either the semicircular r the straight cylindrical belt-accommodating surface in substantially symmetrical relationship about a common medial belt-plane upon reversal of said disks.

5. A shaft pulley formed to accommodate in a single path a belt having either of two cross-sectional surface contours, said pulley comprising a hub member, a seat formed on said hub member, a first sheet metal pulley disk formed with a body portion and a rim portion, said rim portion forming part of a composite first belt-accommodating surface, a second sheet metal pulley disk,

two differently shaped rim portions on said second pulley disk one forming part of said composite first belt-accommodating surface and the other providing a second belt accommodating surface, a body portion formed on said second pulley disk, said body portion disposed substantially symmetrical about a plane defining the juncture of the rim portions of said disk, and means securing said disk body portions against said hub seat.

6. A shaft pulley formed to accommodate on a single path a belt having either of two cross-sectional surface contours, said pulley comprising two pulley disks, a body portion and a first rim portion provided on each pulley disk, the first rim portion of each disk being disposed to cooperate in one arrangement of said pulley disks to provide a composite first belt-accommodating surface, at least one of said pulley disks being reversible on the shaft, an additional rim portion formed on said reversible disk providing a second belt-accommodating surface, a spacing collar associated with said reversible disk to provide together with the body portion of said disk parallel disk locating surfaces disposed one at each side of and equidistant from a plane defining the juncture of the rim portions of said disk.

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