

# United States Patent

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831,186  
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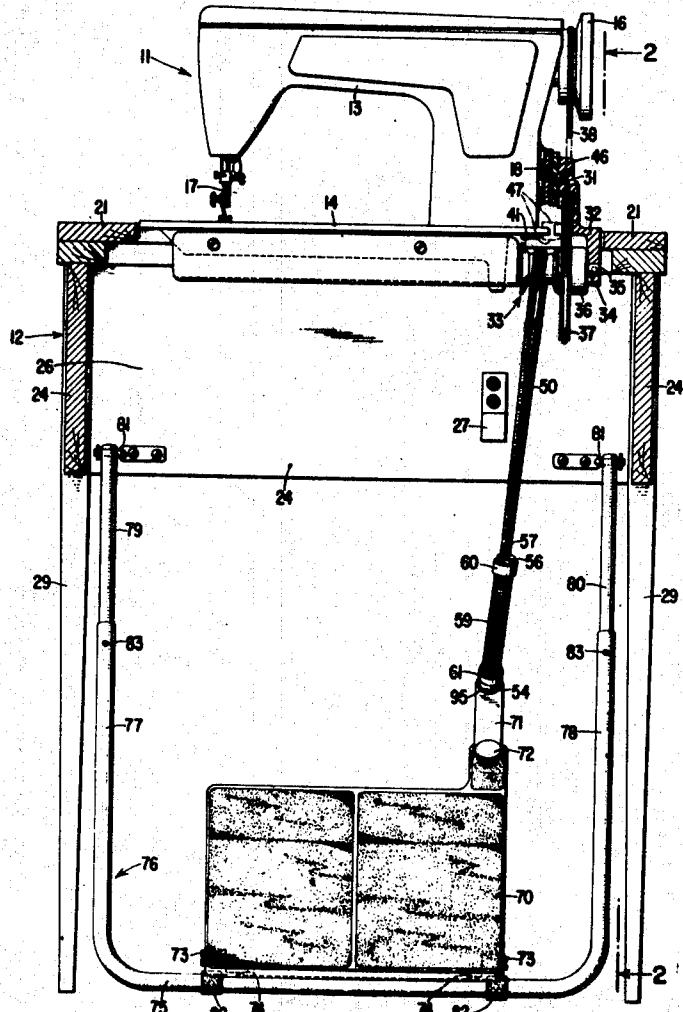
[54] TREADLE SUPPORT FOR SEWING MACHINE  
DRIVE  
4 Claims, 7 Drawing Figs.

[52] U.S. Cl. 112/220, 112/217.1  
[51] Int. Cl. D05b 69/00  
[50] Field of Search 112/220,  
218, 258, 217.1, 217.2, 217.3, 217.4, 259; 74/138,  
141, 142, 126

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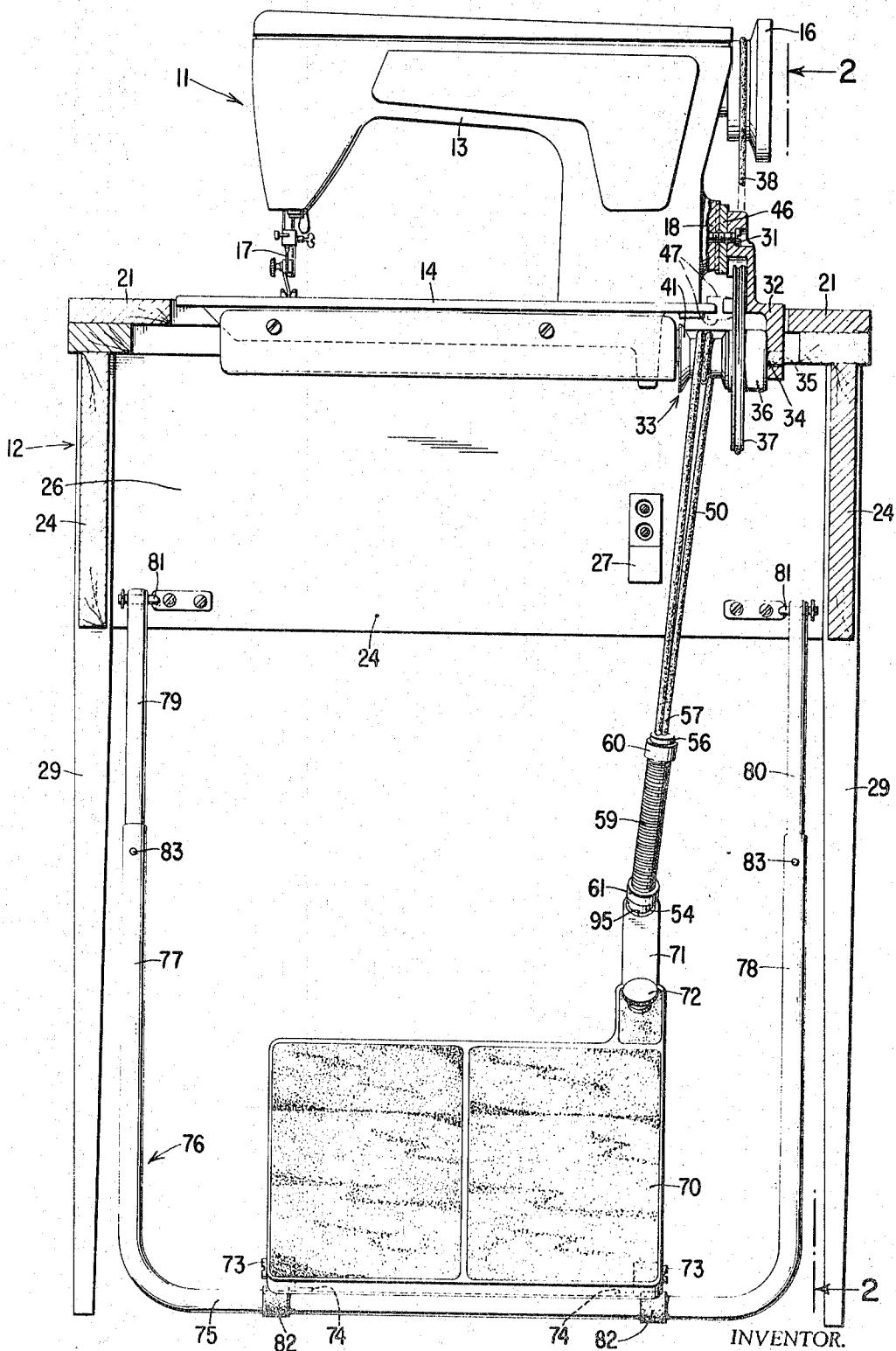
**ABSTRACT:** A treadle drive for a sewing machine is disclosed in combination with a treadle construction for use with a sewing machine cabinet of the "drop head" type in which the sewing machine is pivotally supported and may be dropped beneath the cabinet top for storage. The treadle construction includes a telescoping treadle support which may be folded into compact form for storage beneath the dropped sewing machine in the cabinet. A unique connection between the treadle and the treadle drive accommodates the telescoping arrangement of the treadle support.



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SHEET 1 OF 4



WITNESS

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Fig. 1

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Fig.2

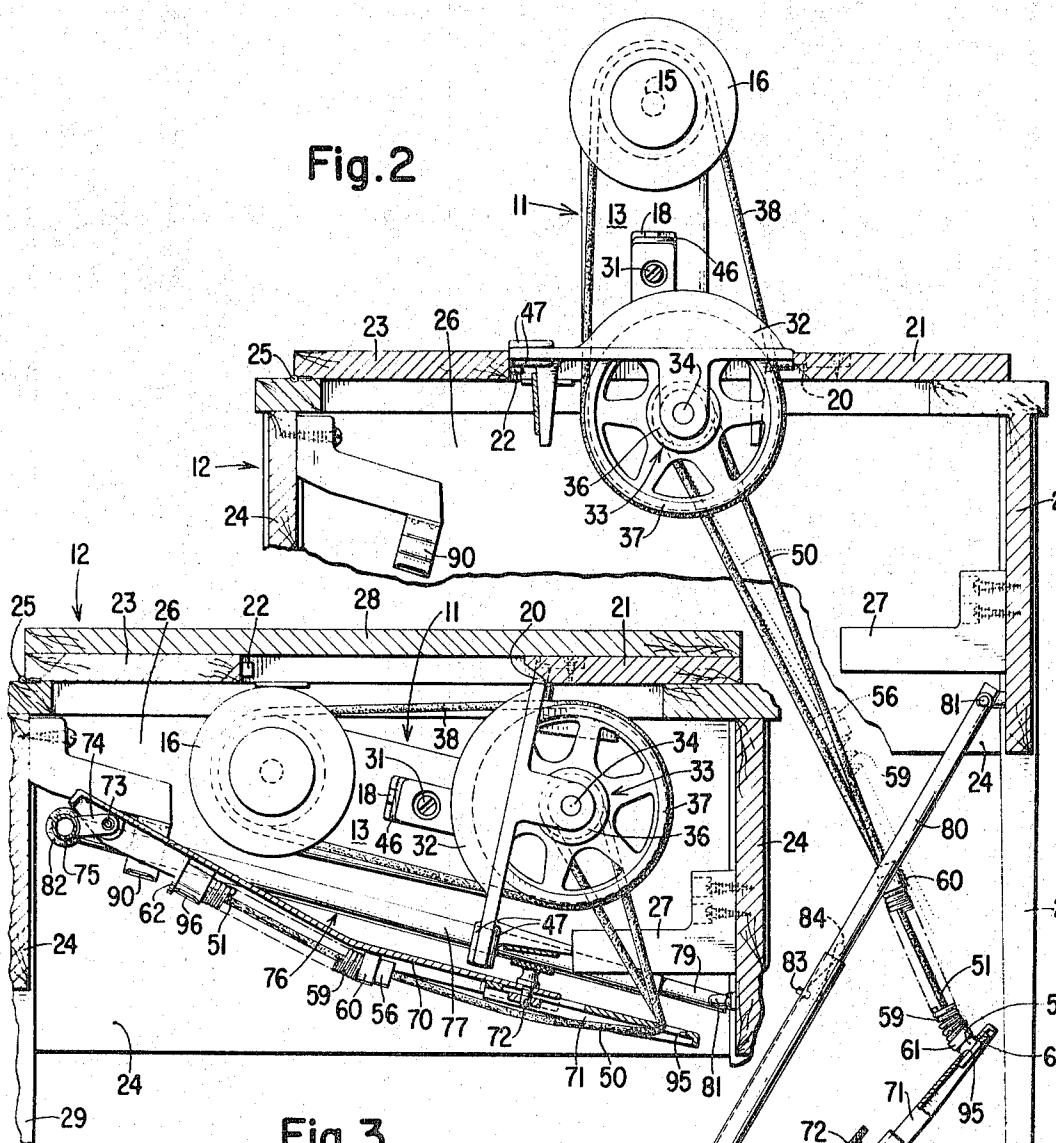
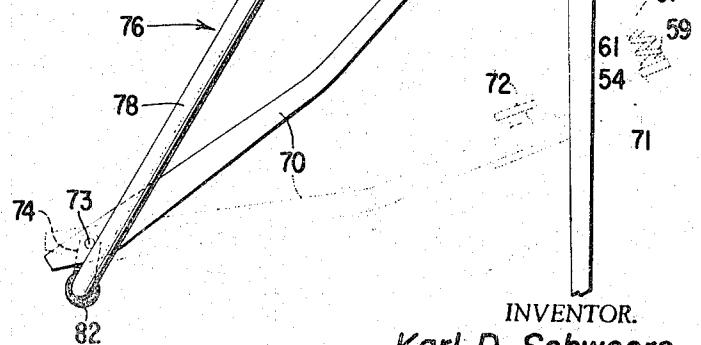


Fig.3



**WITNESS**

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SHEET 3 OF 4

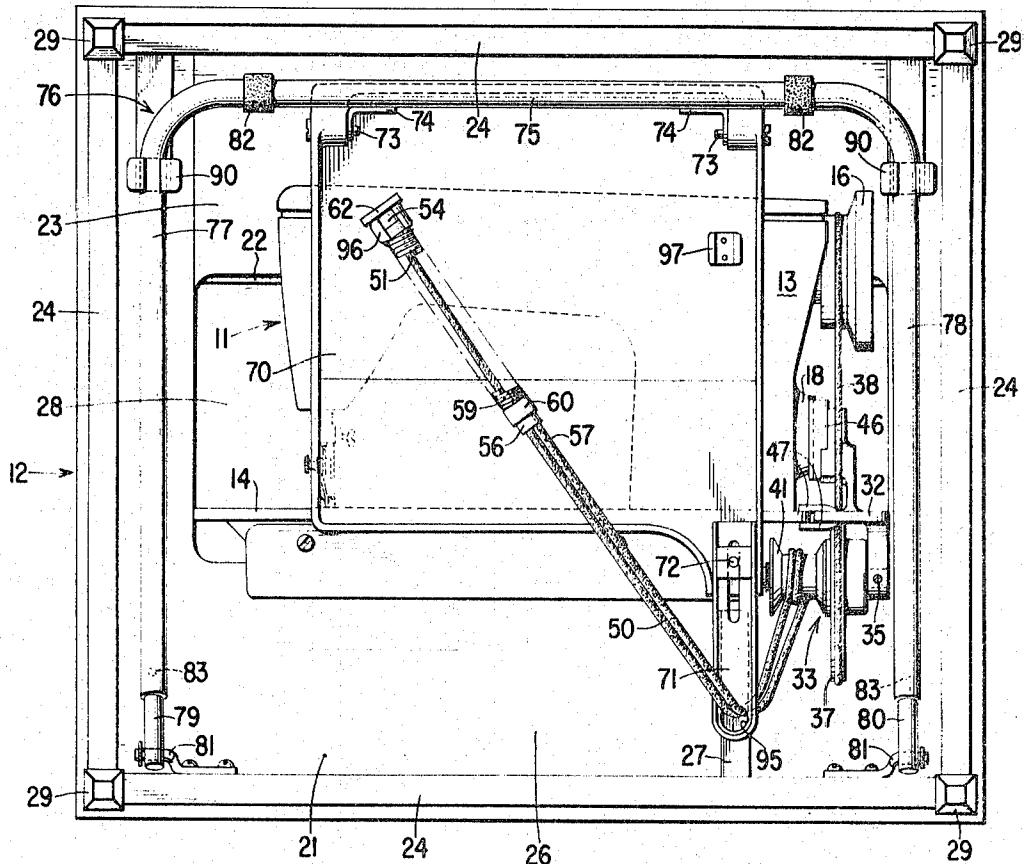


Fig. 4

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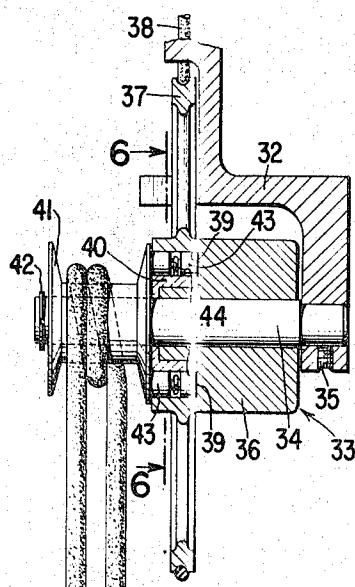


Fig. 5

Fig. 6

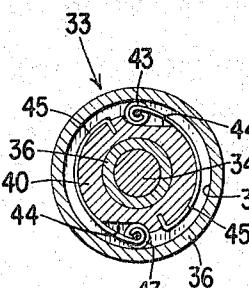
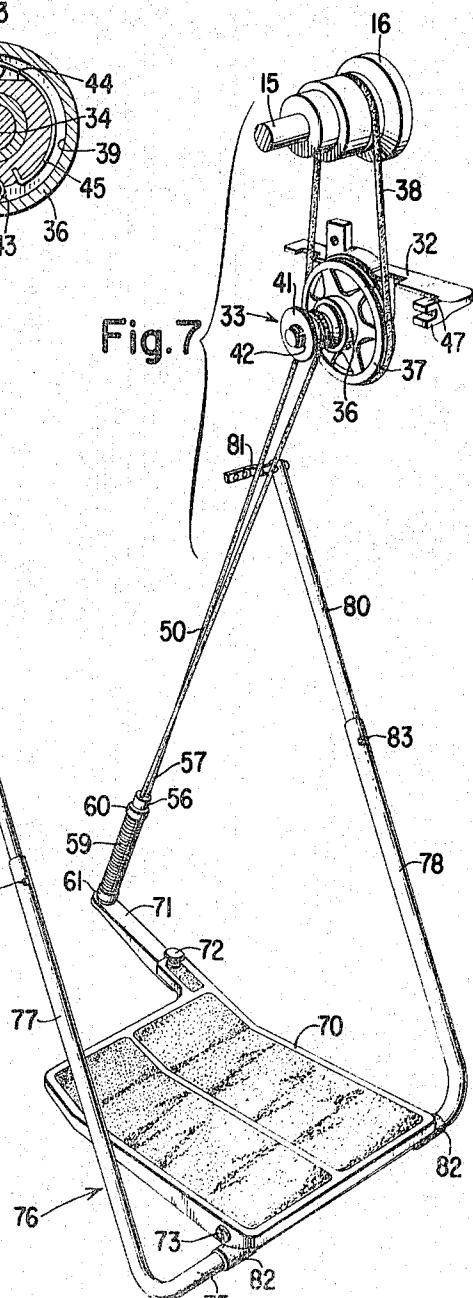


Fig. 7



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## TREADLE SUPPORT FOR SEWING MACHINE DRIVE

## BACKGROUND OF THE INVENTION

In a prior Pat. application Ser. No. 817,083, filed Apr. 17, 1969, I have disclosed a treadle drive for a portable sewing machine; portable in the sense that the sewing machine may be operated when placed upon any supporting surface. The present invention utilizes a drivebelt arrangement similar to that of my above referenced patent application with provision when in operating condition to secure one extremity of the drivebelt directly to the treadle, and to interpose a spring between the other extremity of the belt and the treadle. In the referenced patent application, the belt and the spring are permanently secured to the treadle and the treadle may be placed anywhere on the floor. In the present invention the treadle is carried by a support permanently secured to a cabinet and treadle drive must accommodate shift of the treadle and the treadle support from an operative to a stored position in the cabinet.

## SUMMARY OF THE INVENTION

The drivebelt of the treadle drive of this invention is wrapped about the driven pulley of a one-way clutch device which is carried on the conventional motor bracket of a sewing machine frame. One end of the drivebelt and the spring to which the other end of the drivebelt is fast, are secured to a ferrule formed with a wide flange. The treadle is formed with a clearance opening which will pass the belt and the spring but not the ferrule flange. The treadle is fulcrumed on a telescoping support frame which is pivoted beneath a sewing machine cabinet. With this arrangement, the treadle drive does not impose any restriction whatever upon the construction of the treadle support for shift between storage and operative positions. In stored position, the belt and spring may be drawn through the clearance opening on the treadle and the ferrule may be held in storage position in a clip provided beneath the treadle.

## DESCRIPTION OF THE DRAWINGS

With the above and additional objects and advantages in view, as will hereinafter appear, this invention comprises the devices, combinations, and arrangements of parts hereinafter described and illustrated in the accompanying drawings of a preferred embodiment in which:

FIG. 1 is a front elevational view of a sewing machine in raised operative position in a cabinet which is shown in vertical cross section and to which the treadle drive mechanism of this invention has been applied;

FIG. 2 is a cross-sectional view taken vertically through the cabinet substantially along line 2-2 on FIG. 1;

FIG. 3 is a cross-sectional view similar to that of FIG. 2 but showing the sewing machine and the treadle drive in stored position in the cabinet;

FIG. 4 is a bottom plan view of the sewing machine and treadle drive in stored position in the cabinet;

FIG. 5 is an enlarged elevational view partly in cross section of the belt drive and the one-way clutch device of this invention;

FIG. 6 is a transverse cross-sectional view of the one-way clutch device taken substantially along line 6-6 of FIG. 5;

FIG. 7 represents a perspective view of the treadle mechanism, belt drive, one-way clutch device and sewing machine balance wheel arrangement of this invention.

Referring to the drawings, a sewing machine indicated generally at 11 is illustrated in association with a drop head cabinet indicated generally at 12. The sewing machine may be of the conventional type including a frame with a bracket arm 13 rising from a work-supporting bed 14. A main drive shaft 15 in the bracket arm carries a balance wheel 16 and is provided within the bracket arm with conventional connections to impart endwise reciprocatory movement to a needle 17 of the sewing machine and to impart operative motion to the

other moving parts of the sewing machine. The bracket arm 13 of the sewing machine is formed with a mounting seat 18 intended to accommodate an electric motor-mounting means when electric power is used to drive the main shaft 15. In the present invention, as will be described hereinbelow, the mounting seat 18 is utilized to support portions of the treadle drive mechanism of this invention.

Referring particularly to FIGS. 2 and 3, the work supporting bed 14 of the sewing machine is fitted with hinges 20 which are secured in a fixed top portion 21 of the cabinet 12. The work supporting bed 14 of the sewing machine in this operative position of the sewing machine, as illustrated in FIG. 2, rests upon a lip 22 formed in a pivoted top portion 23 of the cabinet 12, which may be secured to the side panel pieces 24 of the cabinet by hinges 25. In order to shift the sewing machine 11 from an operative sewing position, as illustrated in FIG. 2, to a stored position beneath the level of the top portions 21 and 23, as illustrated in FIG. 3, the sewing machine is first tipped backwardly slightly, the hinged top portion 23 is turned upwardly, the sewing machine is dropped into the storage space 26 between the side panel pieces 24, after which the pivoted top portion 23 is lowered. An abutment block 27 may be secured to a side panel piece 24 for engagement with the work supporting bed 14 of the sewing machine to establish a definite stored position of the sewing machine in the storage space 26. The drop head cabinet may also be provided with a top cover 28 hinged or otherwise secured to the cabinet for positioning over the opening between the top portions 21 and 23 when the sewing machine is shifted into stored position as illustrated in FIG. 3. The drop head cabinet 12 may be provided with legs 29 of any desired configuration for supporting the side panel pieces 24 sufficiently above the level of a floor that a sewing machine operator may find convenient leg room beneath the side panel pieces when seated at the cabinet.

Secured by a fastening bolt 31 to the motor-mounting seat 18 on the sewing machine bracket arm is a support bracket 32 for a one-way clutch device indicated generally at 33. As best illustrated in FIGS. 5 and 6, the one-way clutch device comprises a stud shaft 34 secured in the support bracket 32 by means of a set screw 35. Freely journaled on the stud shaft 34 is the hub portion 36 of a pulley 37 which is connected by means of a belt 38 to the balance wheel 16 of the sewing machine. The hub portion 36 of the pulley 37 is formed with an annular recess 39 which accommodates an annular projection 40 from a drive pulley 41 journaled on the stud shaft 34 adjacent to the pulley 37. A clip 42 set into the stud shaft 34 retains on the stud shaft both pulleys 41 and 37. Referring to FIG. 6, there is provided in the recess 39 a pair of roller clutch members 43 between the hub portion 36 of the pulley 37 and the annular projection 40 of the pulley 41. The annular projection 40 of the drive pulley 41 is preferably formed with tapering seats 44 for the roller clutch members 43 so that when the drive pulley 41 is turned in one direction, i.e., counterclockwise as viewed in FIG. 6, the roller clutch members 43 will lock the pulleys 41 and 37 for rotation as a unit, and when the drive pulley 41 is turned in the opposite direction, i.e., clockwise in FIG. 6, the roller clutch members 43 will move into a deeper portion of the tapering seats 44 and drivingly separate the pulleys 41 and 37. For a more desirable control of the position of the roller clutch members 43, each may be embraced by a wire spring member 45, the wire spring members being engaged at the opposite extremity in the annular projection 40 of the pulley 41.

The motor-mounting seat 18 on the sewing machine bracket arm 13 is a conventional feature of sewing machines and is designed so as to accommodate an electric motor-supporting bracket (not shown). In areas where electric power is dependable only an electric motor-supporting bracket would be fastened on the seat 18. There are numerous areas in the world where electric power is available only on a sporadic or haphazard basis so that while an electric drive motor is required to be included on the machine for use when electric power is available, facilities for rapid conversion to a treadle

drive are also required. In these situations it is desirable that the support bracket 32 for the one-way clutch device should be applied in addition to an electric motor on the sewing machine. The support bracket 32, therefore must be so dimensioned as to properly orient the belt 38 when an electric motor-mounting seat 18 and the support bracket 32.

Other areas exist where no electric power is available and where no electric motor need be included on the sewing machine. In order that in such instances, the same supporting bracket 32 may be used, a spacing insert 46 is positioned between the supporting bracket 32 and the motor-mounting seat 18, with the spacing insert preferably dimensioned so as to occupy the same space as an electric motor-mounting bracket. Bifurcated fingers 47-47 on the support bracket 32 embrace the work-supporting bed 14 of the sewing machine so as to stabilize the supporting bracket when it is fastened by the single fastening bolt 31.

Wrapped preferably in several turns about drive pulley 41 is a flexible belt 50 which, as best illustrated in FIG. 5, is formed at one extremity 51 with machine screw threads for accommodating a nut 52 by which the belt extremity 51 may be prevented from withdrawal from a bore of 53 of a ferrule 54. The belt extremity 51 which is thus secured to the ferrule 54 passes through a clearance opening 55 in a second ferrule 56 to which second second ferrule the opposite extremity 57 of the belt 50 is secured as by a metal clip 58. A coil spring 59 is secured to the second ferrule 56, and therefore to the extremity 57 of the belt 50 as, for instance, by a locking tape or band 60, and the spring 59 which encompasses the first extremity 51 of the belt 50 is secured at the other end to the ferrule 54 similarly by use of a locking tape or band 61. The ferrule 54 is formed with a wide flange 62 for the purpose, as will be described hereinbelow, of providing an interlocking engagement with a treadle.

Indicated at 70 in the drawings is a foot treadle to which an extension 71 is secured by a knurled fastening screw 72. The treadle 70 is fulcrumed on pintles 73 set into the treadle which pintles engage apertures formed in angle brackets 74 secured to the base portion 75 of a U-shaped treadle supporting frame indicated generally at 76.

Secured to the base portion 75 of the treadle supporting frame are limb portions 77 and 78 which are preferably tubular and accommodate each a telescopically arranged limb extension 79 and 80 respectively. The limb extensions 79 and 80 are apertured each pivotally to embrace a hinge pintle 81 secured to the side panel 24 of the sewing machine cabinet so that the treadle supporting frame is pivoted to the cabinet for movement selectively to a stored position beneath the sewing machine storage space 26 and to an operative position in which cushion rings 82 on the base portion 75 of the frame contact the floor.

The telescopically arranged plural sections of the limbs of the U-shaped treadle supporting frame provide for the treadle supporting frame to be collapsed when shifted into stored position. In this way the width of the sewing machine cabinet may be considerably less than the distance from the hinge pintles 81 to the floor.

To lock the plural sections of the treadle supporting frame limbs in extended position or operative position of the treadle, a locking detent 83 urged outwardly by a spring 84 may be provided on each of the limb extensions 79 and 80, each detent 83 cooperating with an appropriate aperture in the limb portions 77 and 78.

When the treadle is to be shifted into stored position, as illustrated in FIGS. 3, and 4, the locking detents 83 are depressed, the frame limbs are telescoped into compact relation and the supporting frame 76 is swung upwardly about the hinge pintles 81 until the limb portions 77 and 78 of the U-shaped treadle supporting frame U-shaped engaged and held by spring clips 90 secured to the cabinet side panel 24.

The belt 50 and the spring 59 pass through a clearance opening 95 in the treadle extension 71, the wide flange 62 of the ferrule 54 being larger in diameter than the clearance

opening 95 provides for an operative connection between the belt and the treadle on downward movement of the treadle. The spring 59 provides for the return movement of the belt and the treadle.

5 When the treadle supporting frame 76 is swung upwardly into the stored position, the ferrule 54 may be grasped and the belt 50 and spring 59 drawn thereby through the clearance opening 95 into a position as shown in FIGS. 3 and 4. A spring clip 96 is provided beneath the treadle 70 for engaging the ferrule in the stored position thereof which serves two purposes, i.e. it maintains the belt 50 and spring in a stored inconspicuous location between the side panels 24 of the cabinet, and it also maintains the treadle 70 in a raised and inconspicuous position between the side panels 24 of the cabinet.

15 As shown in FIGS. 3 and 4, the spring clip 96 accommodates the ferrule 54 when the treadle is to be stored and the sewing machine 11 occupies a dropped or stored position in the sewing machine storage space 26. A second ferrule 20 accommodating clip 97 may be provided beneath the treadle for engaging the ferrule 54 when the treadle is to be stored while the sewing machine remains in an operative position in the cabinet as shown, for instance, in FIG. 1.

I claim:

25 1. A treadle operated driving mechanism adapted for use with a sewing machine having a frame including a bracket arm, a main drive shaft journaled in said frame, and a seat formed on said bracket arm for the reception of an electric motor-mounting means, said treadle operated driving mechanism comprising a one-way clutch device including a driving wheel adapted to be operatively interconnected with said sewing machine main drive shaft and a driven wheel journaled coaxially in a support bracket, and clutch elements interlocking said wheels for rotation of said driven wheel, means 30 for positioning the support bracket of said one-way clutch device on said electric motor-mounting seat on said sewing machine bracket arm, a treadle, a flexible belt engaged between its extremities in driving relationship on said driven wheel of said one-way clutch device and a spring having one end secured to one extremity of said flexible belt, the other end of said spring and the other extremity of said flexible belt being secured closely adjacent each other to said treadle, said flexible belt and adapted to be reciprocated by said treadle means and oscillatable in response to operator influence.

40 2. A treadle operated driving mechanism for a sewing machine adapted to be supported on a cabinet, said treadle operated driving mechanism comprising a one-way clutch device supported on said sewing machine and drivingly inter-

50 connected with said sewing machine main drive shaft, a treadle sustaining frame shiftably supported on said cabinet for movement selectively to a stored position beneath said sewing machine and to an operative position depending downwardly from said cabinet, a treadle fulcrumed on said treadle sustaining frame, a flexible belt engaged between its extremities in driving relationship with said one-way clutch device, a spring secured to one extremity of said flexible belt, said spring and the other extremity of said flexible belt both passing through a clearance opening in said treadle, a ferrule secured to said spring and to said other extremity of said flexible belt at the opposite side of said treadle from said one-way clutch device, a flange formed on said ferrule larger than said clearance opening in said treadle, and a ferrule holding clip secured to 60 the underside of said treadle remote from said clearance opening.

65 3. A treadle operated driving mechanism as set forth in claim 2 in which said treadle sustaining frame comprises a U-shaped member which is shiftably supported on said cabinet by means of hinges attached to the extremity of each limb of the U-shaped member, said treadle being fulcrumed on the base portion of said U-shaped member, and each limb of said U-shaped member being formed of plural sections telescopically arranged so that the U-shaped frame member may be collapsed for storage.

4. A treadle operated driving mechanism as set forth in claim 2 in which said sewing machine is supported in a drop head cabinet having a top, side panels depending from said top, and a sewing machine storage space beneath said top and between said side panels and in which said one-way clutch device is supported on said sewing machine frame and moves with said sewing machine relatively to said cabinet when said sewing machine is shifted from operative to stored position in

said cabinet, and in which two ferrule holding clips are secured to the underside of said treadle at different distances from said clearance opening in said treadle, said ferrule holding clips being effective in the stored position of said treadle for accommodating said flexible belt in either the stored or operative position of said sewing machine in said cabinet.

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