Jan. 9, 1945. A. M. SHELDON 2,367,145

SEWING MACHINE

Filed Nov. 10, 1941 2 Sheets-Sheet 1

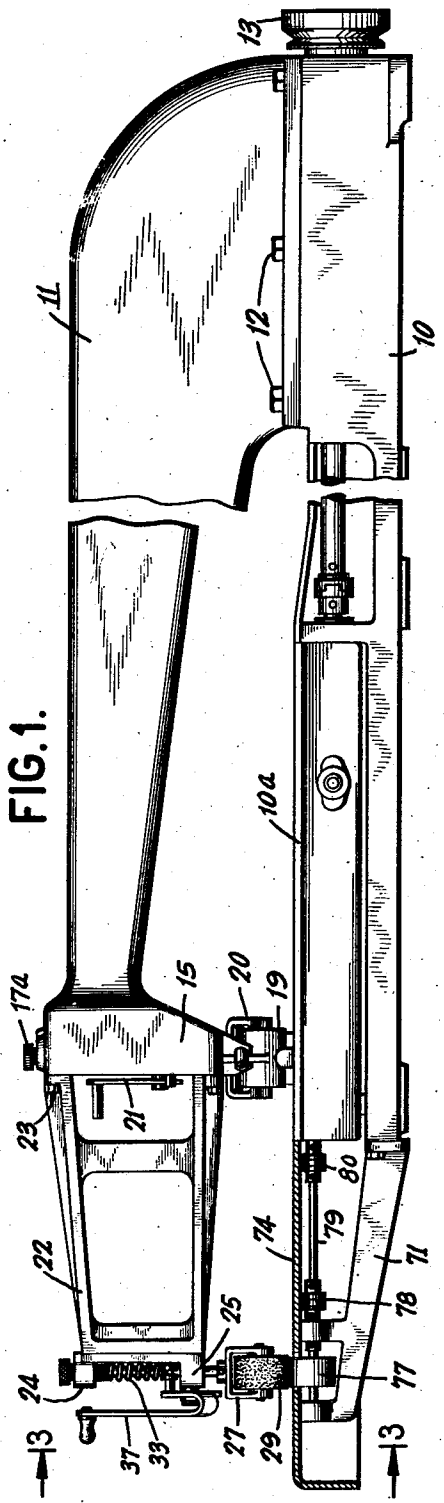


FIG. 1.

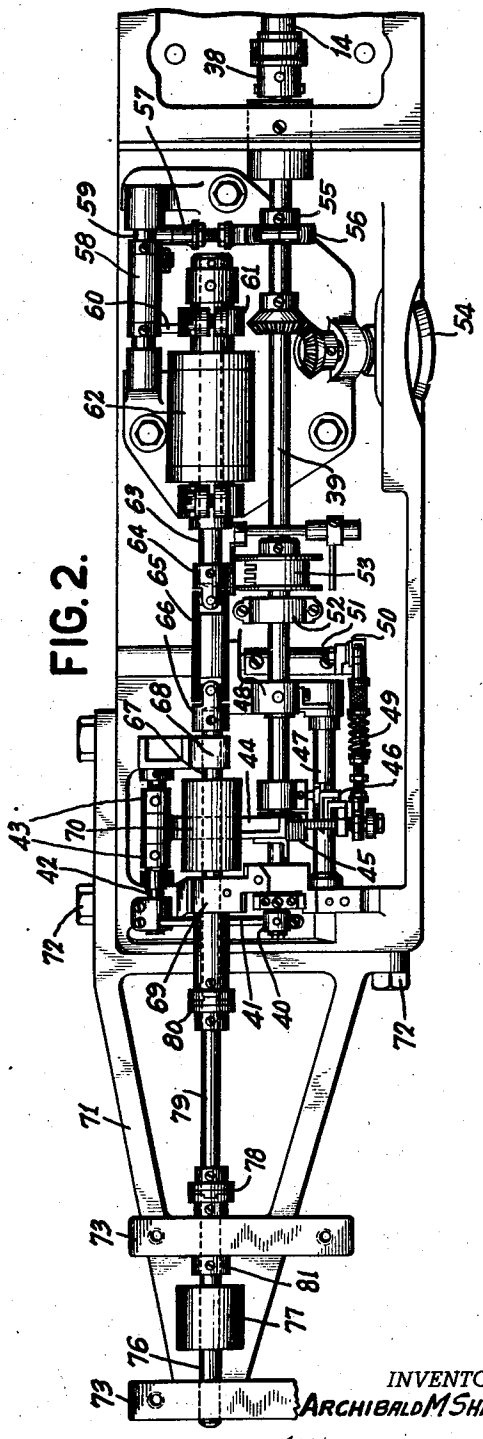


FIG. 2.

INVENTOR
ARCHIBALD M SHELDON
by H. C. Hiseman
ATTORNEY

Jan. 9, 1945. A. M. SHELDON 2,367,145

SEWING MACHINE

Filed Nov. 10, 1941 2 Sheets-Sheet 2

FIG. 4.

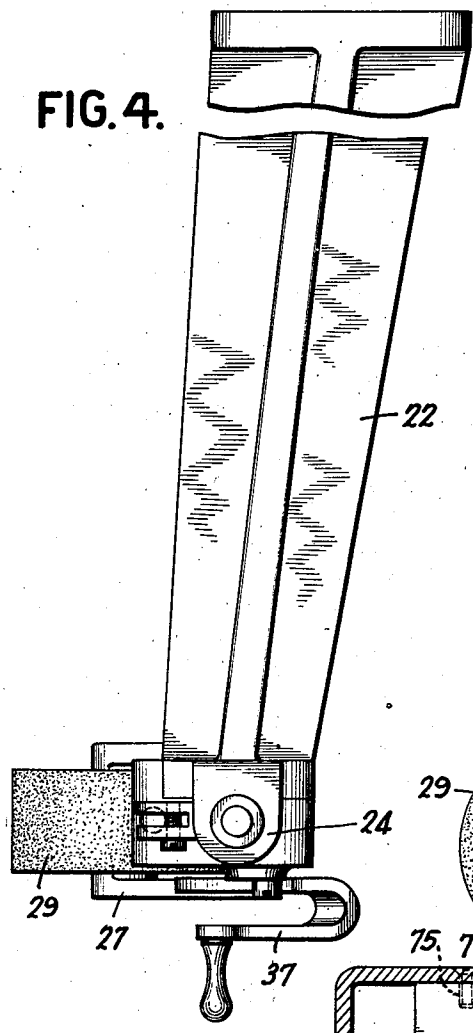
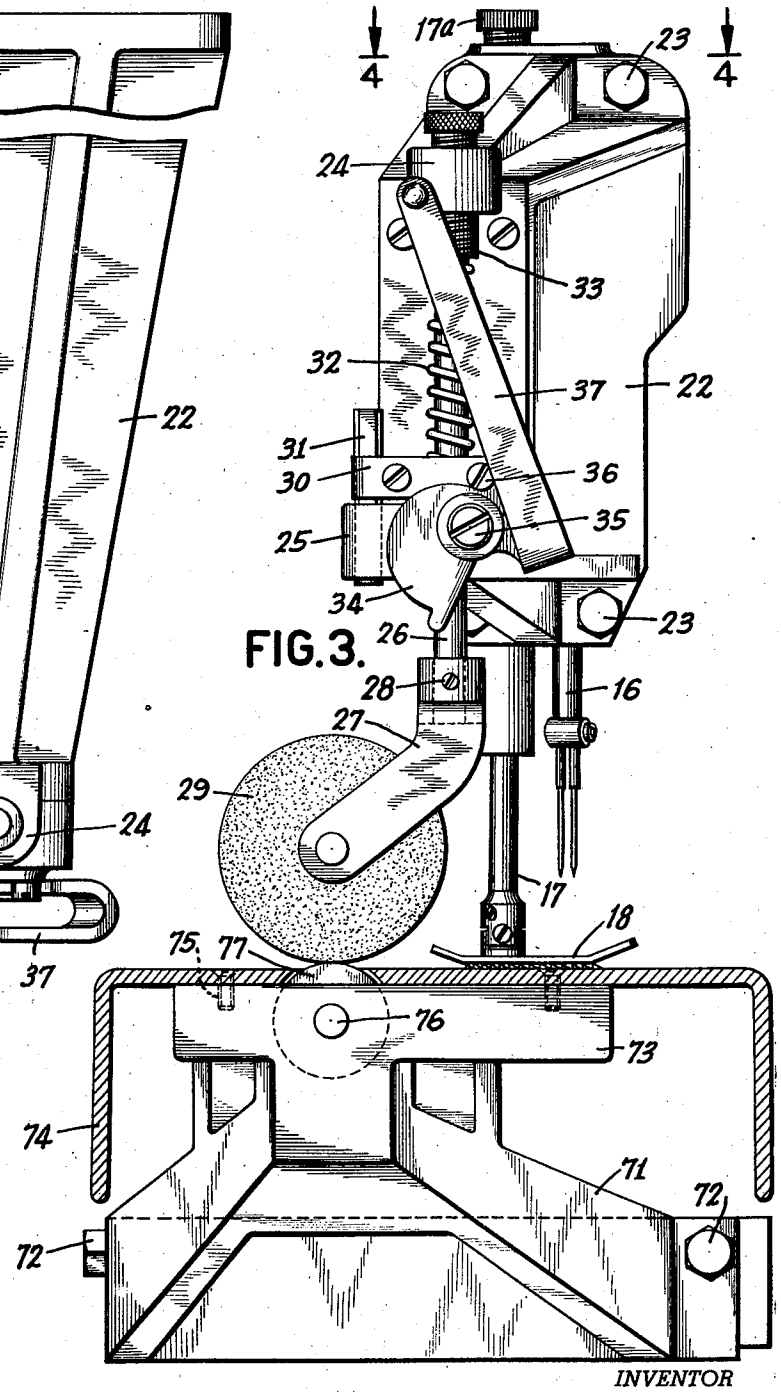


FIG. 3.



INVENTOR
ARCHIBALD M SHELDON

BY

ATTORNEY

Patented Jan. 9, 1945 2,367,145

UNITED STATES PATENT OFFICE

2,367,145

SEWING MACHINE

Archibald M. Sheldon, St. Charles, Ill., assignor to Union Special Machine Company, Chicago, Ill., a corporation of Illinois

Application November 10, 1941, Serial No. 418,489

5 Claims. (Cl. 112—214)

This invention relates to an improved sewing machine construction and more particularly to one adapted to handle large pieces of work, such as awnings, tents, tarpaulins and the like.

It is difficult in forming long seams in large and heavy work pieces to feed the latter uniformly and in such a way as to insure the formation of straight and regular seams. An object of the present invention has been to provide auxiliary feeding devices, in addition to the regular feed dog and presser foot of a sewing machine, for insuring the uniform advance of all portions of the work in a region adjacent the stitch forming devices so as to eliminate, as far as possible, a drag upon the material at the point where it is being stitched. Toward this end the invention contemplates the provision of auxiliary feeding means or puller devices not only in line with the regular feed dog but also at some distance to the side thereof. It is especially important to provide such auxiliary means at the left of the needles, when facing the machine in the direction of feed.

A feature of the invention is the provision of a common drive for separate auxiliary feed devices, certain of which are adjacent to and in line with, while others are removed from and at one side of, the regular feed means.

Another feature is the provision of readily connectible units or attachments for sewing machines of the character mentioned serving to supply the auxiliary feed means located at some distance to the side of the regular feed dog. These units have frame members which may very simply be attached to the regular frame of the machine while the driving connection for the feeding devices embodied therein may be coupled with equal facility.

Still another feature of the invention is the provision of means for independently disabling either or both of the separate auxiliary feed means.

A general object of the invention has been to provide auxiliary feed means and associated devices of the character mentioned which are simple and sturdy of construction and reliable in their operation.

A further object has been to provide an auxiliary feed of the character set forth which may be applied to existing machines capable of sewing heavy and bulky articles of the type specified.

Other objects, features and advantages of the invention will appear from a detailed description of an illustrative form of the same which will now be given in conjunction with the accompanying drawings, in which:

Fig. 1 is a side elevation of a machine embodying the invention, the machine being shown as partly broken away intermediate its ends.

Fig. 2 is a top plan view of the operating means embodied in the machine beneath the work support, this view being on a larger scale than Fig. 1.

Fig. 3 is a front elevation of the machine, on an enlarged scale, disclosing one of the auxiliary work feeding devices, the work support being shown in section, and

Fig. 4 is a top plan view, as indicated by the line 4—4 in Fig. 3, of a unit forming the upper portion of one of the auxiliary feeding devices.

Turning now to the drawings, the machine to which the present improvement is shown applied is of the type more fully disclosed in the Christensen Patent No. 1,999,893, granted April 30, 1935. For details of the operating connections for driving the stitch forming devices and the regular work feeding device, as well as an auxiliary work feeding device or puller aligned with the regular feed dog, reference may be had to the disclosure of said patent.

As shown, the improved machine preferably comprises a main frame structure, including a base portion 10 and an upper overhanging arm member 11 which is secured to the base portion by means of bolts 12, or the like. The base portion has a work-supporting surface 10a over which the arm 11 extends. Power is supplied to the machine by means of a pulley 13, suitable gearing being provided, as disclosed in the above-mentioned Christensen patent, for driving a shaft (not shown) which extends longitudinally of the overhanging arm 11. Connections are also provided in the base portion from the pulley 13 to a shaft 14. Any suitable means may be provided in the upper arm for driving a needle bar and connections are provided in the base portion from the shaft 14, for driving complementary stitch-forming devices and work-feeding devices.

It will be understood that the machine contemplated by the present invention is of large construction and is adapted for handling large pieces of work. In a typical embodiment, the arm 11 may have an overhang of some six feet. At the end of the arm 11 a needle head 15 is provided, this having mounted in it, for vertical reciprocation, a needle bar 16 and a presser bar 17, the latter carrying a presser foot 18. The needle bar may be operated by connections similar to those shown in the above-mentioned

Christensen patent. Presser bar 17 is urged downwardly by a spring (not shown) whose tension may be varied by a screw-threaded adjusting sleeve 17a. Suitable means may be provided as disclosed in said Christensen patent, for lifting the presser bar against the action of its spring, whenever desired, to facilitate the introduction of work.

In rear of the presser foot 18, and in direct line with the same, there is mounted on the needle head a relatively broad roller 19, which is simply an idler and forms a part of a puller mechanism acting upon the work along the line of stitching. This roller is mounted in a yoke 20 carried by a presser bar (not shown) which is slidably mounted on the needle head and is spring-urged downwardly to press the roller 19 against the work. A lever 21 may be provided for lifting the presser bar which carries the roller 19, to facilitate the introduction of work or to disable the roller feed whenever desired. This lever may operate in the manner disclosed in said prior Christensen patent.

Secured to the needle head, and projecting a substantially distance therefrom, is an extension frame 22, this being fastened to the needle head by a series of screws 23. At the forward end of the extension frame there is a pair of bearing lugs 24 and 25 through which a vertically disposed rod or presser bar 26 is adapted to slide. The lower end of this presser bar is provided with a yoke 27, secured to the bar by a screw 28 and retaining between its arms an idler roll 29. Secured to the presser bar 26, above the lug 25, is a block or arm 30 whose outer end is forked to straddle and slide along the flat sides of a guide pin 31 fixedly mounted in the bearing lug 25. This serves to prevent turning of the presser bar while permitting longitudinal movement. A spring 32 surrounding the presser bar 26 and acting between the top of the arm 30 and the bottom of a sleeve 33, which has screw-threaded engagement with the lug 24, serves to urge the presser bar, and hence the roller 29, downwardly under a pressure determined by the adjustment of the sleeve 33. Whenever desired, the roller 29 may be lifted against the action of the spring 32 by means of a cam plate 34 rockably mounted on a stud 35. The periphery of this cam plate cooperates with the shank of a screw 36 carried by the arm 30. A lever arm 37, formed as an integral extension of the cam plate and bent outwardly and upwardly, is provided with a small handle at its upper end to facilitate the operation of the cam plate. It will be apparent that as the lever arm 37 is rocked clockwise (Fig. 3), the bar 26 and roller 29 will be lifted and may be held in raised position against the action of the spring 32.

Turning now to the base portion of the machine, the shaft 14 is connected by a coupling 38 with a shaft 39 mounted in suitable bearings on the frame and extending substantially to the outer end of the main base portion. At its outer end the shaft 39 is provided with a crank pin connected by a link 40 with an arm 41 secured to a rock shaft 42. A pair of upstanding arms 43, secured to the rock shaft, serves to pivotally carry a feed bar 44, having at its forward end a feed dog 45. The latter is raised and lowered through a suitable opening in the work support by an eccentric (not shown), such as disclosed in the above-mentioned Christensen patent. Reciprocation of the feed dog for feeding the work is produced by the crank at the end of the shaft 39.

Loopers 46 are mounted on a carrier which is oscillatable on a support 47 to provide an appropriate needle-avoid movement. An eccentric on the shaft 39, acting upon a strap 48, suitably connected with the support 47, serves to impart this oscillating movement. The movement of the loopers to carry the ends of the latter through the needle loops is effected by means of a link 49 connected with an arm 50 extending upwardly from a sleeve 51 which is rocked by an eccentric on the shaft 39 cooperating with a strap 52. For further details regarding the construction and operation of the loopers, reference may be had to the above-mentioned Christensen patent. So also, reference may be had to said patent for further disclosure of other details of the thread-handling and stitch-forming devices, including a thread controller 53 and a knob 54 for manually operating the shaft 39 whenever desired.

An eccentric 55 on the shaft 39 cooperating with a strap 56 and a connecting rod 57 serves to rock a frame 58 about a supporting rod 59 mounted on the machine frame. The opposite end of the frame 58 is connected by a link 60 with an arm 61 attached to the driving member of a one-way clutch unit 62. This may be of any suitable and well-known construction and preferably involves a pair of ball or roller clutches through which the driven member is operated upon each movement of the arm 61 in one direction and is held against movement as the arm 61 is rocked in the opposite direction. A shaft 63, which is thus driven step by step upon the oscillation of the arm 61, is connected by a universal coupling 64 to a short extension shaft 65, and a second universal coupling 66 with a shaft 67 mounted in bearings 68 and 69 carried by the frame. Secured to the shaft 67 is a feed roller 70 which extends through an opening in the work support 10a and cooperates with the idler roller 19. This is all substantially as disclosed in said prior Christensen patent.

An auxiliary extension frame 71 is provided beneath the frame 22. This is secured to the frame of the base portion 10 by means of screws or bolts 72 and serves to provide an elongation of the base. In order to render the attachment of the auxiliary frame more rigid, it is provided with an L-shaped formation at the end cooperating with the frame of the base portion so that the bolts 72 enter both the side and end of the base, as shown. A pair of upright supports 73 is provided on the auxiliary frame and these serve to carry at their upper ends an extension 74 of the work support which is secured by a series of screws 75. Bearings are provided in the supports 73 for a shaft 76 which carries a roller 77 extending through an opening in the work support extension 74. Roller 77, which is driven, cooperates with the idler roller 29 to assist in feeding the work across the work support. Driving of the roller 77 is accomplished through a flexible coupling 78, an extension shaft 79 and a second flexible coupling 80 which connects the extension shaft with the shaft 67. Thus, the two rollers 70 and 77 are driven in unison and to the same extents. A collar 81 secured to the shaft 76 adjacent one of the supports 73 serves to retain the shaft against endwise movement in one direction while a collar on one member of the coupling 78 serves to

retain the parts against endwise movement in the opposite direction.

It will be seen from the foregoing that a large piece of work being stitched on the improved machine will be fed across the work support not only by the regular feed dog **45**, cooperating with the presser foot **18**, and by a puller comprising the driven roller **70** and the idler roller **19**, but also by an extension puller comprising the driven roller **77** and the idler **29**. This extension puller is disposed at a point considerably removed from, and at the left side of, the line of stitching. It serves to assist in keeping the work properly alined and eliminates an excessive drag and twisting action upon the material at the point of stitching. Either set of puller rollers may be disabled at will by lifting and retaining in raised position the corresponding idler roller **19** or **29**. Both of these rollers may be raised also whenever it is desired to introduce a new piece of work. The means for driving the rollers **70** and **77** may be provided with any suitable form of adjustment, not shown but well known in the art, so as to vary the extent of the feeding action imparted upon each cycle of operation of the machine. This adjustment may either be in unison with or independent of an adjustment of the stroke of the feed dog **45**.

While an illustrative form of the invention has been disclosed in considerable detail, it will be understood that various changes may be made in the construction and arrangement of the various parts without departing from the general principles and scope of the invention.

What I claim is:

1. In a sewing machine a base having a work support, an arm connected with and overhanging said work support, cooperating stitch forming means carried by said base and arm, means including a puller adjacent said stitch forming means for feeding the work on said support, detachable extension members for said arm and base extending longitudinally beyond the ends thereof, and a second puller means mounted on said extension members for feeding the work at a point removed a substantial distance to the side of the line of stitching, said second puller means being driven by connections from said first named puller for synchronous rotation therewith.

2. A puller attachment for sewing machines having a base with a work support and an intermittently rotatable shaft, and an overhanging arm connected with said base adjacent one end thereof, which comprises a member adapted to be secured to said base at its opposite end and carrying a longitudinal extension of said work support, a feed roller carried by said member, means arranged to connect said feed roller with said shaft, a member adapted to be secured to said arm and forming an extension thereof overlying said extension of said work support, and means carried by said last mentioned member for retaining the work against said feed roller.

3. Extension means for a sewing machine having a base with a work support and a driven feed roller extending through said support and an arm connected with said base adjacent one end thereof and overhanging said support, which comprises members adapted to be readily and detachably secured respectively to said base and arm at their ends remote from the point of connection thereof to form longitudinal extensions thereof, cooperating work feeding means carried by said members, said means including a feed roller in the member secured to said base, and means adapted to connect said feed roller with said driven feed roller in said base for synchronous rotation therewith.

4. Extension means for a sewing machine having a base with a work support and an arm connected with said base adjacent one end thereof and overhanging said support, the base having an intermittently rotatable shaft, which comprises members adapted to be readily detachably secured respectively to said base and arm at their ends remote from the point of connection thereof to form longitudinal extensions thereof, and cooperating work feeding means carried by said members, said work feeding means in said member secured to said base having means for detachable connection with said intermittently rotatable shaft.

5. Extension means for a sewing machine having a base with a work support and an arm connected with said base adjacent one end thereof and overhanging said support, the base having an intermittently rotatable shaft, which comprises members adapted to be readily detachably secured respectively to said base and arm at their ends remote from the point of connection thereof to form longitudinal extensions thereof, cooperating work feeding means carried by said members adapted to grip and feed the work, said work feeding means in said member secured to said base having means for detachable connection with said intermittently rotatable shaft, and means on one of said members for shifting the related feeding means and thereby disabling said cooperating feeding means at will.

ARCHIBALD M. SHELDON.