

March 31, 1936.

E. R. THOMPSON

2,035,848

SEWING MACHINE

Filed April 26, 1934

4 Sheets-Sheet 1

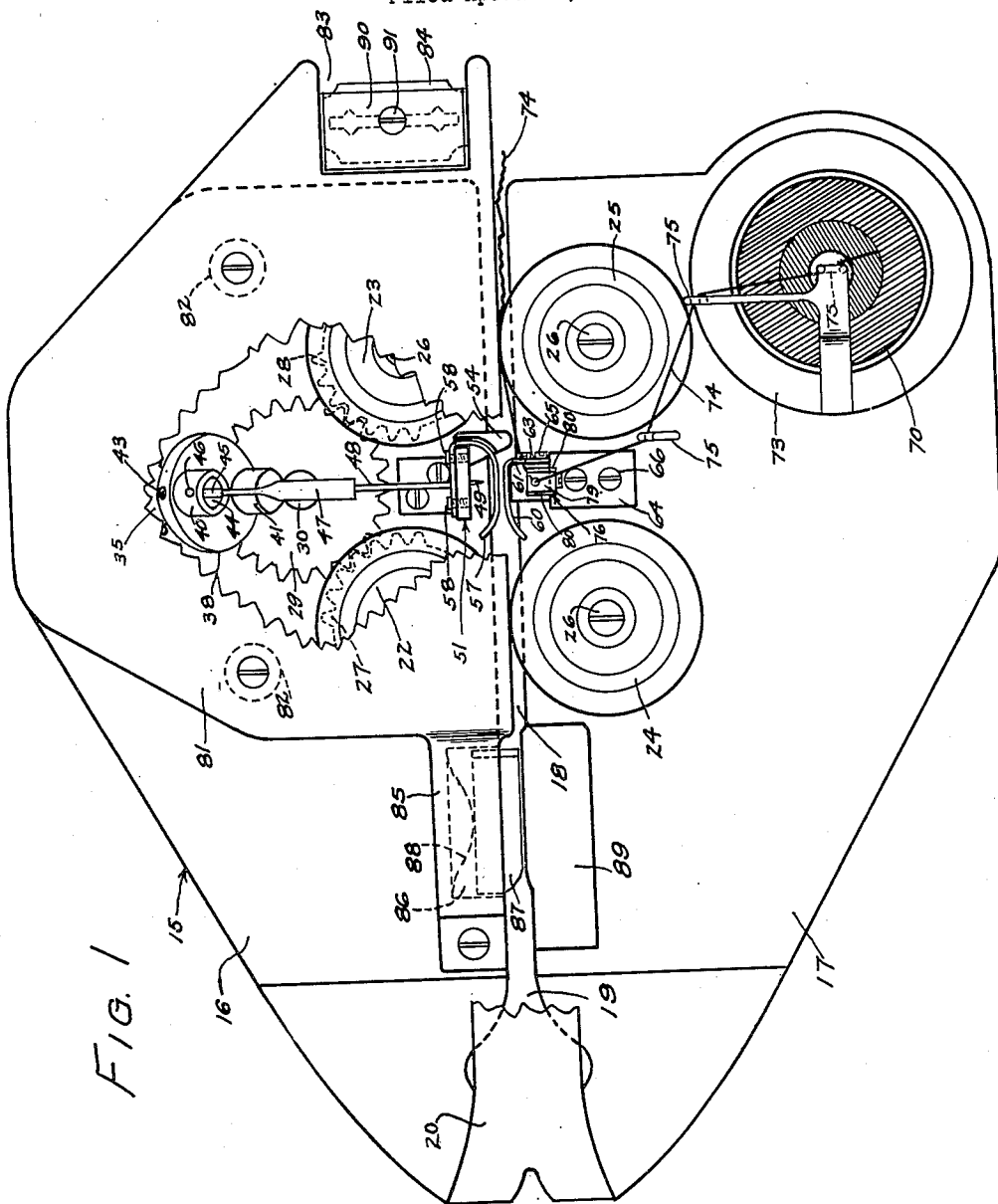


FIG. 1

INVENTOR.

Elliott R. Thompson
BY *W. H. Williamson*

ATTORNEY.

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E. R. THOMPSON

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4 Sheets-Sheet 2

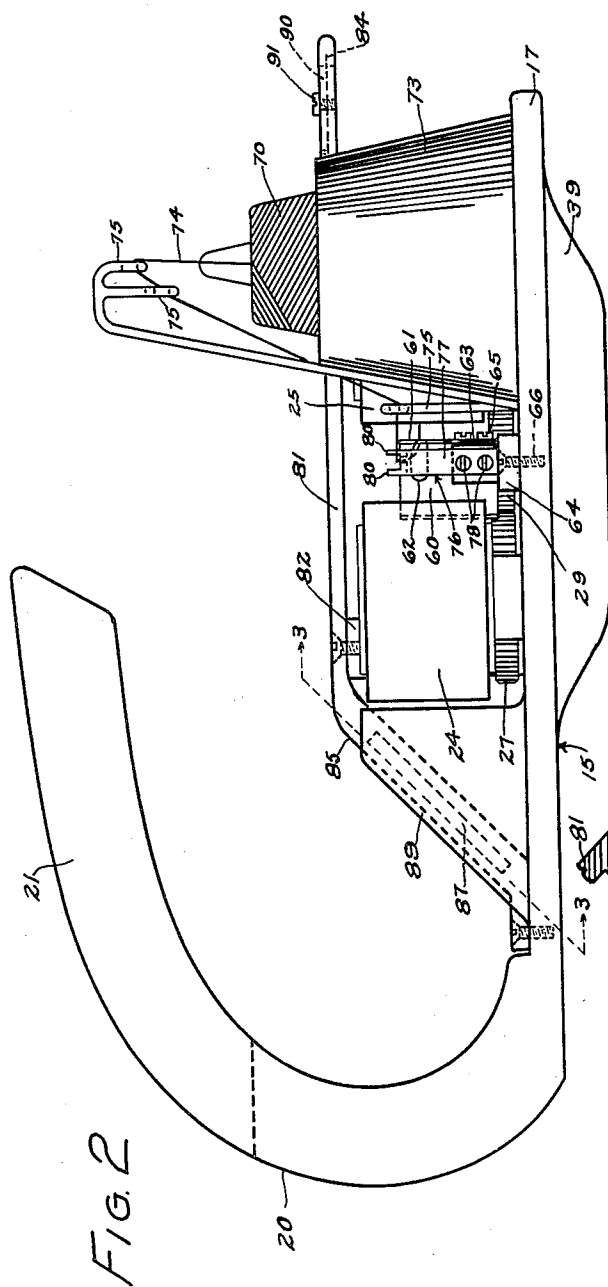


FIG. 2

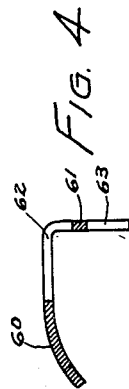


FIG. 4

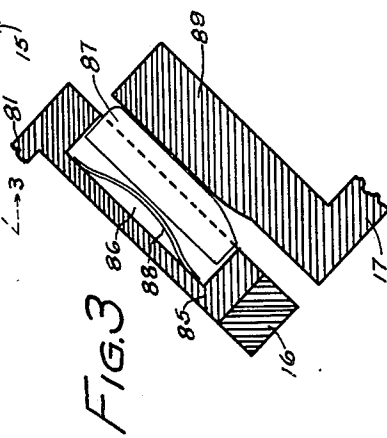


FIG. 3

INVENTOR.
E. R. Thompson
BY *W. B. Williamson*
ATTORNEY.

March 31, 1936.

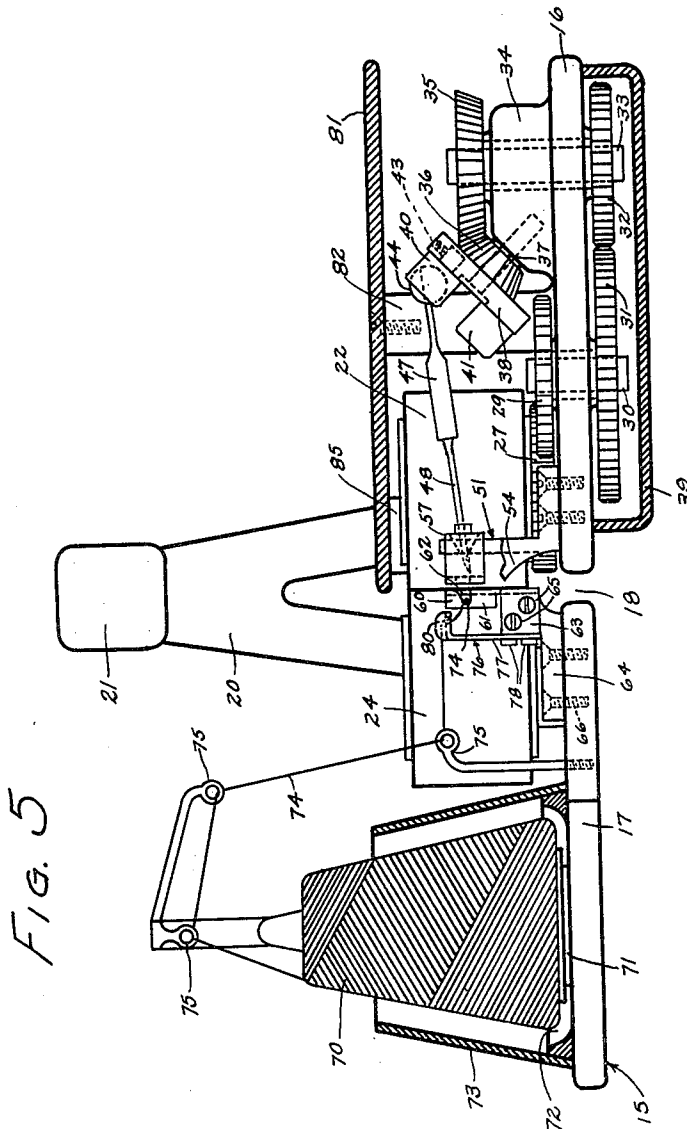
E. R. THOMPSON

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SEWING MACHINE

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4 Sheets-Sheet 3



INVENTOR.

Elliott R. Thompson

BY

W. B. Williamson

ATTORNEY.

March 31, 1936.

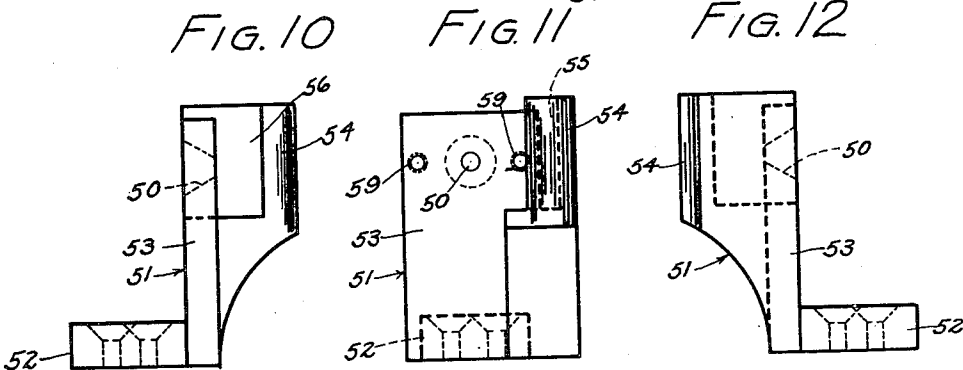
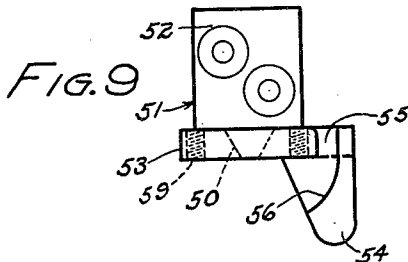
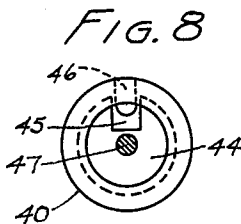
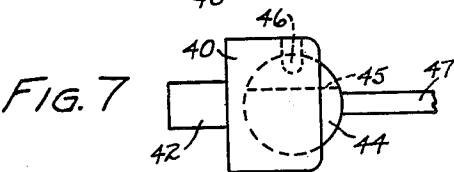
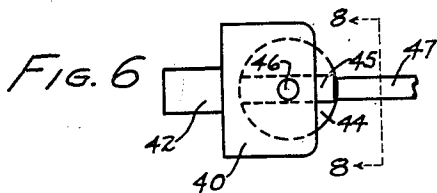
E. R. THOMPSON

2,035,848

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4 Sheets-Sheet 4



INVENTOR.

Elliott R. Thompson

BY

H. W. Williamson

ATTORNEY.

UNITED STATES PATENT OFFICE

2,035,848

SEWING MACHINE

Elliott R. Thompson, Wycombe, Pa.

Application April 26, 1934, Serial No. 722,425

12 Claims. (Cl. 112—11)

My invention relates to new and useful improvements in a sewing machine and especially to improvements on my co-pending application, Serial No. 647,571, filed December 16, 1932. The present device, as was the former one, is particularly adapted for embodiment as a portable, manually manipulated bag sewing or closing machine.

One of the objects of the present invention is to provide a compact unitary sewing machine structure which will be relatively light in weight, therefore adapting it for use as a hand manipulated machine.

Another object of the invention is to produce a bag sewing machine of rugged construction which will be strong, durable and capable of withstanding hard usage.

Another object of the invention is to utilize two sets of driving wheels or rollers, one set at each side of the needle or point of sewing, whereby the sewing operations, or at least the stitch forming operations, will start prior to the material reaching the location of the needle and continue for a considerable period after the material has passed the said location of the needle.

Another object of the invention is to provide a drive mechanism including gear trains with portions thereof above and below the supporting frame or base plate, thereby inverting the location of the needle and its coacting parts relative to their positions illustrated in my prior application.

A further object of the invention is to provide simple and effective means for straightening the mouth of a bag as the machine is passed over it.

A still further object of the invention is to provide a deflector which will assure a fixed position for the thread to assure said thread's engaging with the needle during all phases of sewing.

With these and other objects in view, which will become apparent from the description, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawings forming a part of this application, in which:—

Fig. 1 is a top plan view of a sewing machine constructed in accordance with my present in-

vention, a portion of the top cover and handle broken away.

Fig. 2 is a side view of the machine with the movable guide, its support, the deflector, needle, and the needle driving crank omitted to clarify other structural details.

Fig. 3 is a fragmentary section on the line 3—3 of Fig. 2, illustrating the bag straightening and feeding device.

Fig. 4 is an enlarged sectional view of the stationary guide.

Fig. 5 is a rear end view of the machine with the top cover and gear casing broken away, as well as part of the deflector and the near side rollers omitted.

Fig. 6 is an enlarged plan view of the universal joint assembly.

Fig. 7 is a side view thereof.

Fig. 8 is a section on the line 8—8 of Fig. 6.

Fig. 9 is an enlarged top view of the movable guide support and integral deflector.

Fig. 10 is a left hand side view thereof.

Fig. 11 is a face view of the same, and

Fig. 12 is a right hand side view of Fig. 9.

In carrying out the invention as herein embodied, 15 represents generally the framework, which includes two plates 16 and 17 having adjacent edges spaced apart to provide a bag or work receiving channel 18 which may be enlarged at the entrance end to provide a wide mouth 19. The two plates are rigidly held in their relative positions by a forked and arched handle 20, including a horn 21, which is the grip. Said handle may be formed as an integral part of the framework or otherwise connected to the two plates.

On top of one of the plates, as 16, are revolvably mounted two rollers 22 and 23 in spaced relation and preferably including compressible tires, and on top of the other plate as 17 are revolvably mounted two other rollers 24 and 25 in the same spaced relation as the first mentioned rollers, and these also preferably include compressible tires.

Each roller on one plate cooperates with a roller on the other plate so that they function in pairs and the peripheries of the rollers of each pair engage one another midway the width of the channel 18. All of the rollers are mounted on suitable axles 26, mounted in the plates.

Each roller 22 and 23 carries a gear wheel 27 and 28 respectively, both of which mesh with a gear wheel 29 mounted above the plate 16 on a shaft 30 journaled in and passing through the said plate 16. Another gear wheel 31 is mounted

on the same shaft 30 beneath said plate 16, and meshes with a gear wheel 32 mounted on a shaft 33 journaled in and passing through the plate 16 and a bearing block 34.

5 On the upper end of the shaft 33 is mounted a bevel gear 35 meshing with a bevel pinion 36 on an axle 37 suitably mounted in the bearing block 34, and said axle 37 is located in an oblique position relative to the shaft 33, or it is oblique to an imaginary perpendicular line having the plates as a base. The bevel pinion 36 revolves a crank 38, here shown as a disc for the purpose of balance.

The drive rollers 22, 23, 24, and 25 are mounted in the same plane, and as above pointed out, they have peripheral contacts above the channel between the two frame plates. Therefore, as the machine is passed over the mouth of a bag, said drive rollers will engage the same and be revolved. As the rollers 22 and 23 are revolved, motion will be transmitted to the crank means 38 through the gear trains, including either of the gears 27 or 28, and gears 29, 31, 32, 35 and 36. The gear wheels 31 and 32 are enclosed in a gear case 39 mounted on the under side of the framework, and particularly the plate 16.

The crank means revolves in a plane at an angle of about forty-five degrees to the plane of rotation of the bevel gear 35 and carries the socket member 40 of a universal joint and, if desirable, a counterbalance weight 41. The socket member 40, Figs. 6 and 7, has a shank 42 which is set in a hole in the crank means 38 and held in place by a suitable fastening such as a set screw 43.

The open end of the socket member 40 is smaller in diameter than is the diameter of the ball 44 of the universal joint so as to permit rotation of the ball while preventing withdrawal of said ball from the socket member. There are a number of ways that these elements may be assembled, but for convenience of illustration the rim of the socket member is represented as having been spun inward about the ball after the latter has been inserted in the socket member.

The ball 44 has a slot 45 formed therein and a pin 46 carried by the socket member 40 projects into said slot but only for a short distance in order not to interfere with certain rotary movements of the ball. Considering only Fig. 8, the assembly of the elements of the universal joint is such that the ball can rotate to some degree in all directions except in the plane crosswise of the plane of the slot, or so that the rod 47 carried by the ball, cannot rotate, relative to socket 40, upon its own axis. The movement of the rod is taken care of by the crank means as will be later described.

The rod 47 is the holder for the needle 48, the free end of which is pointed at 49 and to the rear of the pointed end is a hook for picking up the thread. The needle is supported, intermediate its ends, in an eyelet or needle guide 50 which is the fulcrum for said needle. Said eyelet, needle guide or fulcrum is produced by forming a tapered hole in the bracket or support 51, Figs. 9 to 12 inclusive.

The bracket 51 comprises a foot 52, through the medium of which it may be attached to the framework of the machine, and especially the top of the plate 16, an upright portion or panel 53, in which the tapered hole is formed to provide the needle fulcrum or eyelet 50, and a deflector 54 projecting from one side of the panel near the top thereof and extending across the channel

18. The rear vertical edge of the deflector is separated from the panel 53 by a deep notch 55 and the inner surface of said deflector adjacent the forward edge is concave as at 56.

A movable or spring guide 57, which is practically U shaped, has an end fixed to the back of the panel 53 of the support or bracket 51 by fastening devices 58 inserted in holes 59 in the panel in the region of the eyelet 50, wherefore said guide must have a hole corresponding to the eyelet 50 to permit passage of the needle. The free part of the movable guide extends around the edge of the panel, through the notch 55, thence along the inner surface of the deflector and toward the handle end of the machine and in the same vertical plane as, but above, the channel 18. The free portion of said movable guide 57 also has an aperture for the passage of the needle.

Co-operating with the aforementioned movable guide is a practically fixed or stationary guide 60, provided with a right angle extension 61 at the top of its rear edge. An elongated aperture 62 is provided which extends longitudinally of the guide, through the angle and into the extension 61. The guide has a toe 63 at the lower end by which it may be secured to a bracket 64 with fastening means 65. The bracket 64 is attached to the framework, and more particularly the plate 17, by fastening means 66.

The guides 57 and 60 form a passageway between them, for the bag or other work and since the terminal of the free portion of the movable guide projects in the direction of travel of the machine on the work an even tension is provided throughout the length of said movable guide whereas if the movable guide is reversed it will be canted and only the heel will be effective. When arranged as shown, it positively insures the keeping of the thread on the needle as the bag seam passes and the needle is in a retracted position during the formation of a loop.

The stationary guide 60 provides a rigid support or backing for the work when being pierced by the needle and affords a fixed guide for the thread when the passageway between the guides is opened by the work therein. The deflector 54, while located rearwardly of the guides, cooperates therewith in positioning a portion of the thread, and especially fixes the location of the thread while the guides are spread apart by the work.

The thread cop 70 is mounted on a spindle 71 carried by the framework of the machine and the base of said spindle is surrounded by a collar 72 over which the cone housing 73 is telescoped to hold said housing in place. The housing surrounds the major part of the cop and limits the whipping action of the thread as it is pulled from the cop.

The thread strand 74 passes through suitable thread guides 75 to a thread conductor 76 including a standard 77 fixed at its lower end to the bracket 64 by fastening means 78 and having a lip 79 formed at the upper end. The lip is in a horizontal position with a hole therethrough for the passage of the thread and at opposite sides of the lip are produced upstanding cheeks 80 for stiffening the lip and producing a channel for the thread.

The thread strand 74 passes through the hole in the lip 79, thence through the aperture 62 in the stationary work guide and then between the rollers 23 and 25 as shown in Fig. 1. Thus a portion of the thread is held in a straight line

crosswise the path of travel of the needle so as to be picked up by said needle.

A top cover 81 is mounted above the rollers 22 and 23, the universal joint mechanism, needle and movable work guide, on posts 82 or their equivalent, and at the rear end of said cover is formed a recess 83 for the reception of a removable, interchangeable thread cutter 84, such as a safety razor blade. Screw 91 passes through a clear hole in removable block 90, thence through the razor blade and into the tapped hole in top cover 81, thus holding said razor blade in position. When the machine has passed completely over the bag, in the closing operation, its movement is continued for a few inches to produce a length of thread cable. Then, arresting the motion of the machine, the operator, still supporting the machine with one hand, grasps the thread cable with the other hand and draws it over the cutting edge of the blade 84, thereby severing the thread cable. Of course it will be understood that said cutter may be located in any desirable position and may have a guard associated therewith to protect the machine operator.

At the front end of the cover 81 is a downwardly and forwardly projecting inclined leg 85 attached to the plate 16 so that the inner edge of said inclined leg is in the same plane as the edge of the plate 16 along the channel 18. Said leg has a chamber 86 formed in the inner edge, in which is slidably mounted a presser member 87 normally forced outward by a spring 88. This presser member is part of the bag straightening and feeding device, and cooperates with the contiguous face of the presser block 89 carried by the other plate 17.

That portion of the face of the presser block with which the presser member 87 coacts protrudes beyond the plane of the inner edge of the plate 17 so as to be approximately on the center line of the channel 18, and likewise the inner edge of the top cover 81 overhangs the channel 18 and is parallel to a line between the contact points of the rollers to facilitate operation of the machine by a user.

To use the machine for stitching a bag to close the mouth thereof, the operator holds the machine by the handle or horn and introduces one ear of the bag into the channel 18, with the other hand, at the handle end of the machine, and between the presser member 87 and the presser block 89. By holding onto the bag ear and moving the machine along in a left hand direction as the device is illustrated in Figs. 1 and 2, the bag will be first introduced between the cooperating pair of rollers 22 and 24. The bag straightening device will smooth out all puckers in the bag mouth and provide sufficient hold-back tension to maintain the bag mouth taut between the straightening device and the forward rollers 22 and 24. It will also bring the unsupported portion of the bag mouth up into position for being closed as the machine progresses along the top of the bag. The inner edge of the top cover 81 functions as a guard for the operator's hand which holds the bag ear. On starting the bag closing operation the operator has a tendency to pull the bag ear sidewise, or toward the rollers 22 and 23. The edge of the top cover 81 being directly over the channel 18 between the plates, and being also directly over the channel formed by the work guides, entrance of the folded edge of the bag mouth between the work guides is thus assured. The folded edge of the bag mouth is stretched over the inner edge of top cover 81 and

facilitates the piercing of the material by the needle as said material first enters the channel between the work guides.

As the machine is drawn over the bag, motion will be first transmitted to the needle from the rollers 22 and 24, as above outlined and a section of thread cable will be produced until such time as the bag reaches the path of travel of the needle. Thereafter, said needle will be projected through the parts of the bag mouth which are now passing between the work guides. When the needle has pierced the bag, the hook of said needle will pick up a thread strand and pull it through the bag material to form a loop.

The needle is now projected through the loop as it again penetrates the bag fabric and picks up another portion of the thread and pulls it through the fabric and the previously formed loop to produce a stitch and form another loop. These operations continue until the bag mouth is completely stitched from end to end. After the bag mouth has been disengaged from the rollers 22 and 24 the needle will be operated by the rollers 23 and 25 as before stated and any desired length of after thread cable may be produced by prolonging the operation of the machine with the thread cable as the work over which the rollers 23 and 25 pass.

By virtue of the method of mounting the needle and its passing through a definitely placed needle guide or fulcrum, it will be caused to oscillate through the bag once every revolution of the bevel pinion. The universal joint allows it to vary its angle with the plane of the bevel pinion, but causes it to make a complete revolution on its own longitudinal axis during every revolution of the bevel pinion, or for every oscillation of the needle through the bag. The needle guide is so located as to cause the sewing or pointed end of the needle to move through a generally circular orbit while piercing and withdrawing from the bag. This movement not only accomplishes the projection and retraction of the needle, but also compensates for the travel of the machine over the bag. The needle guide being to one side of the axis of the bevel pinion produces the oscillatory motion of the needle as said pinion rotates.

As the needle enters the fabric, the pinion and its associated crank means will be starting into the lower half of the travel of the universal joint, or the piercing stroke of the needle, and the open part of the needle hook will be towards the front end of the machine. The continued movement of the parts will cause the needle to rotate on its own longitudinal axis so that the hook will turn upward to engage the thread. During the retracting movement of the needle, the hook will be turned towards the rear end of the machine, carrying the loop of thread with it.

As the crank means turns through the upper half of its travel, the needle turns another one hundred eighty degrees on its longitudinal axis so that when it again enters the fabric, the thread is looped around it and remains on the near side of the bag. Upon the next retracting movement of the needle with a new loop, the first loop is in contact with the back of the needle, or that part opposite the open side of the hook, permitting the new or subsequent loop to be drawn through the former one, thereby producing a chain stitch with a single thread. By virtue of the needle turning through the last mentioned one hundred eighty degrees to form a

loop, said loop is twisted, which twisting gives additional strength to the stitching.

Of course I do not wish to be limited to the exact details of construction herein shown and described and these may be varied within the scope of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful, is:—

1. A sewing machine including a pair of spaced plates in the same plane constituting a frame with a channel therethrough, two pairs of co-operating rollers mounted on the frame so that the peripheries of the rollers of each pair contact in a plane bisecting the channel, said pairs of rollers being spaced apart, a needle mounted to reciprocate across the channel between the pairs of rollers, and means to transmit motion to said needle from one of the rollers of each pair.
2. The structure in claim 1, in combination with a top cover having an edge in the same plane as the contact points of the pairs of rollers.
3. A sewing machine including a pair of spaced plates in the same plane constituting a frame with a channel therethrough, two pairs of co-operating rollers mounted on the top of the frame so that the peripheries of the rollers of each pair contact in a plane bisecting the channel, said pairs of rollers being spaced apart, a gear wheel connected to each of the rollers on one side of the channel and above the frame, a gear wheel meshing with both of the first mentioned gear wheels, an axle for the second mentioned gear wheel, another gear wheel mounted on said axle below the frame, another gear wheel meshing with the third mentioned gear wheel, an axle for the last mentioned gear wheel, a bevel gear above the frame on the second mentioned axle, a bevel pinion meshing with the bevel gear, an axle for the bevel pinion, crank means connected with the bevel pinion, and a needle having a universal joint connection with the crank means whereby said needle will be reciprocated across the channel, said needle being loosely supported adjacent said channel.
4. The structure in claim 3, in combination with a work straightening device carried by the frame adjacent to the entrance to the channel and comprising a presser block on one side of said channel, and a spring actuated presser member on the opposite side of said channel and cooperating with the presser block.
5. A sewing machine including a pair of spaced plates in the same plane constituting a frame with a channel therethrough, two pairs of co-operating rollers mounted on the frame so that the peripheries of the rollers of each pair contact in a plane bisecting the channel, said pairs of rollers being spaced apart, a gear wheel connected to each of the rollers on one side of the channel, an axle journaled in the frame equidistant from the said gears, a gear on said axle meshing with both of the first mentioned gears, another gear on said axle, a second axle journaled in the frame, a gear on said second axle meshing with the second gear on the first axle, a bevel gear on the second axle, a bevel pinion meshing with the bevel gear and journaled on a shaft positioned oblique to the second axle, crank means connected with the bevel pinion, a universal joint including a rod carried by said crank means, a bracket supported by the frame adjacent the channel and on the same side of said channel as the crank means and associated elements, said bracket having a hole therethrough, a hook needle mounted in the rod and projecting through the hole in said bracket and loosely supported by said bracket, and guides mounted in the region of said bracket and having apertures for the passage of the needle, said guides cooperating to support work over which the machine is passed.
6. The structure in claim 5, in combination with a deflector carried by the bracket and projecting part way across the channel to the rear of the guides, said deflector fixing the position of the thread beyond the guides.
7. In a sewing machine including a frame composed of two plates in the same plane and spaced apart to provide a channel, a needle to be oscillated across said channel, means to actuate said needle, a top cover supported by the frame and disposed above the needle, a downwardly inclined leg extending from the forward end of said top cover and positioned adjacent the channel, said leg having a chamber therein opening toward said channel, a spring operated presser member in said chamber, and a presser block carried by one of the frame plates and opposed to the presser member.
8. The structure in claim 7, in combination with guides located above the longitudinal center of the channel intermediate the ends thereof and including a movable and a stationary guide, a right angle extension formed with the upper rear edge of the stationary guide, said guide and extension having an elongated aperture therein extending through the angle of the parts, and a toe at the lower end of the stationary guide by which it may be secured to a portion of the machine.
9. A portable sewing machine including a frame composed of two plates in the same plane and spaced apart to provide a channel, a needle to be oscillated across said channel, means to actuate said needle, means to straighten the work as it enters the channel during the passage of the machine thereover, cooperating stationary and movable guides in the region of the needle to assist in holding the work in position for sewing, and a thread conductor adjacent the stationary guide and comprising a vertical standard, a horizontal lip at right angles to the standard and projecting from the upper end thereof toward the stationary guide, said lip having a hole therethrough, and upwardly projecting cheeks at the sides of said lip.
10. The structure in claim 9, in combination with a spindle carried by the machine frame adjacent the thread conductor and adapted to receive a thread cop, a collar formed with the machine frame about the base of the spindle, and a hollow, open ended cone shaped housing removably mounted on the collar to house said thread cop and prevent an undue whipping action of the thread as the latter is drawn from the cop.
11. A portable sewing machine including a frame composed of two plates in the same plane and spaced apart to provide a channel, a needle to be oscillated crosswise of said channel, means to actuate said needle, means to straighten the work as it enters the channel during the passage of the machine thereover, guides in the region of the needle to assist in holding the work during the sewing operations, a top cover supported above the needle with an edge thereof parallel with the center of the channel above the latter, said top cover having a recess at its rear edge and a communicating depression, a thread cutter in said

depression and projecting into the recess, a block superimposed on the cutter within the depression, and means to temporarily fasten the block for clamping the cutter in place.

5 12. In a part for a portable sewing machine, a bracket comprising a foot, a panel projecting
from said foot and having a tapered hole there-
through with the largest diameter at the back of
the panel, a deflector projecting forwardly from
10 the upper part of the panel and having a curved
nose and a concave inner surface, said bracket

being provided with a deep notch separating a
portion of the rear of the deflector from the
panel, and a guide member fixed to the back of
the panel and projecting through the notch with
a part of said guide occupying the concavity of
the deflector while the free end of said guide mem- 5
ber projects from the deflector in front of the
panel and in substantially parallelism with the
face of said panel.

ELLIOTT R. THOMPSON. 10