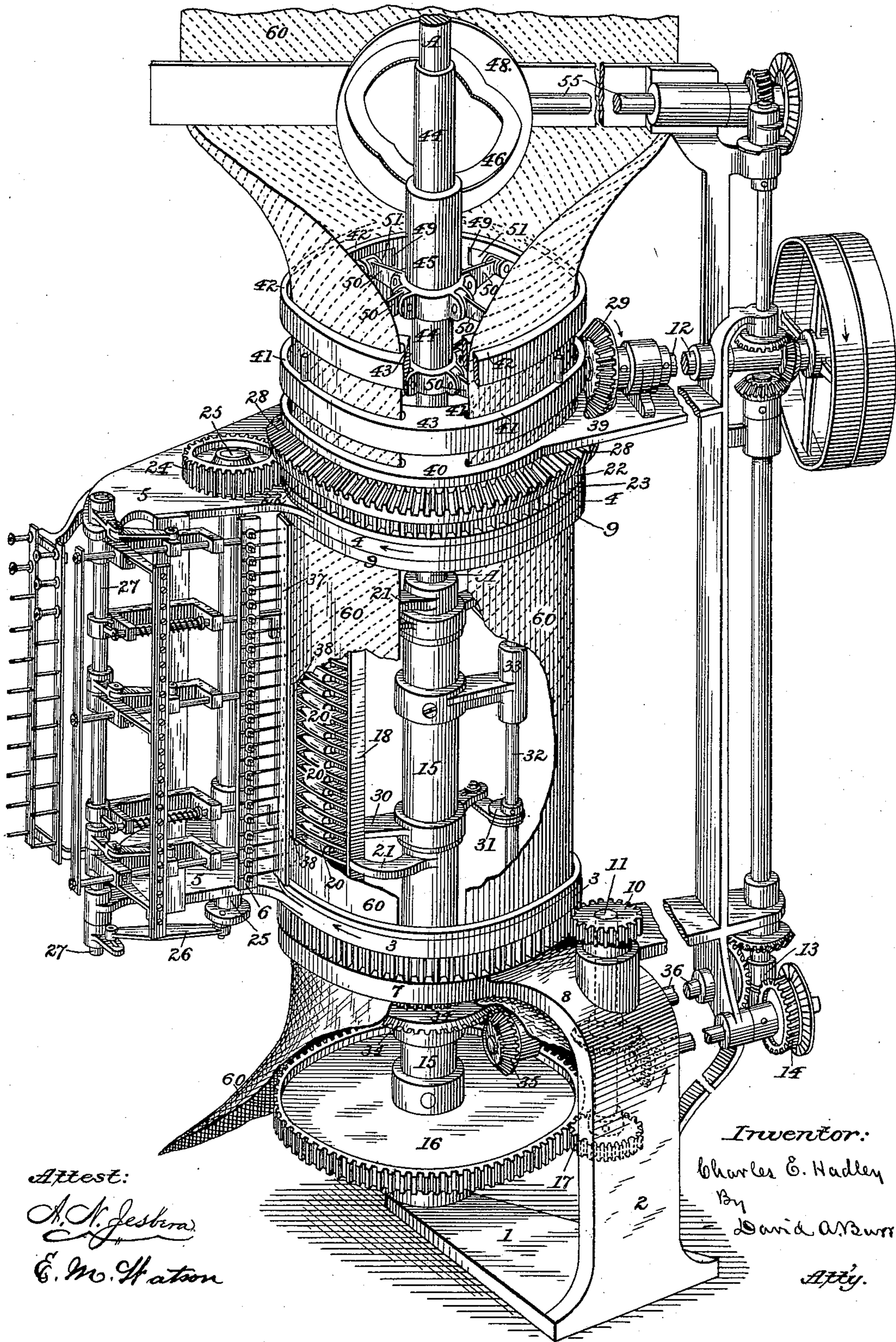


(No Model.)

C. E. HADLEY.
QUILTING MACHINE.

No. 467,138.

Patented Jan. 12, 1892.



UNITED STATES PATENT OFFICE.

CHARLES E. HADLEY, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR
TO WILLIAM KOCH, OF NEW YORK, N. Y.

QUILTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 467,138, dated January 12, 1892.

Application filed July 23, 1888. Serial No. 280,722. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HADLEY, a citizen of the United States, and a resident of Washington city, in the District of Columbia, have invented certain new and useful Improvements in Quilting-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, and to the letters and figures of reference marked thereon, making a part of this specification.

The object of my invention is primarily to produce continuously-diagonal lines of quilting across the length of the fabric without reversing the feed of the goods under the needles or the movement of the needles over the goods, as in the machines now in use, and this object is attained by causing the needle-bars and stitching mechanism in a quilting-machine to revolve about a central axis while the fabric to be sewed is fed under the needles in a direction parallel with said axis and concentrically thereto.

My invention consists, broadly, in the organization in a sewing-machine of a complete stitch-forming mechanism of customary form made to revolve about a central axis, toward which the needles in said mechanism are made to reciprocate radially, in combination with feed devices encircling the shaft at one end of the machine and which operate in unison with the movements of the needles to feed the fabric to be stitched concentrically in tubular form and in a direction parallel with said axis between the needles and their shuttles and across the endless circular path over which they travel, all as hereinafter more fully described.

In the accompanying drawing, in which my revolving quilting-machine is illustrated in perspective, with portions of the fabric fed through it, A represents a vertical shaft, which is stepped at its lower end in the foot-plate 1 of a standard 2, forming part of the outer support for the driving-gear, and is fixed at its upper end in a cross-bar. (Not shown in the drawing.)

3 4 are two rings of equal diameter encircling said shaft and which carry a frame 5, in which a needle-bar 6 is suitably mounted parallel with the shaft A to reciprocate in the

customary manner to and from it. This frame 5 supports also the mechanism for producing the radial reciprocation of the needle-bar to and from the shaft. The lower ring 3 is supported to revolve upon an annular horizontal bed or bearing-plate 7, encircling the shaft A concentrically, and which is supported by a bracket 8, projecting from the standard 2. The upper ring 4 rests and revolves in like manner upon a second annular plate 9, corresponding to the lower plate 7, and which is similarly supported to encircle the shaft A in a concentric manner by a radial arm projecting from the shaft, but which does not appear in the drawing. As the upper and lower rings 3 and 4 are connected by the frame 5, they will revolve in unison. Their revolution and that of the frame carried thereby is effected by means of cogs upon the lower ring 3, which are engaged by a pinion 10 upon a vertical counter-shaft 11, geared to the main driving-shaft 12 of the machine. An interrupted worm 13, engaging a worm-wheel 14, is interposed in the gearing by which the vertical counter-shaft 11 is connected to the main shaft 12, so as to produce an intermittent rotation of said counter-shaft, and consequently an intermittent revolution of the stitching mechanism about the central shaft. A long sleeve 15 is fitted upon the lower end of the fixed central shaft A to extend up nearly to the upper annular plate 9, and a cogged wheel 16 of equal diameter and bearing the same number of teeth as the lower ring 3 is fixed to the lower end of said sleeve to gear with a pinion 17, corresponding with the pinion 10, and which is secured upon the same counter-shaft 11. Hence the sleeve 15 and the frame 5, carrying the stitching mechanism, will both revolve intermittently in the same direction and at the same speed about the central shaft A. The shuttle-box 18, in which the shuttles 20 are fitted to play in the customary manner under the needles carried by the needle-bar 6, is fixed by means of suitable radial arms 21 21 to the sleeve 15 to revolve with it, so that the proper relative position of the shuttle-carriers and needles is constantly maintained during their necessary reciprocation of the needle-bar 6

is produced mediately during its revolution about the central shaft A by means of a concentric toothed ring 22 of a diameter slightly greater than that of the upper carrying-ring 4 of the frame 5. This driving-ring 22 is supported immediately above the ring 4 upon an interposed annular bearing-plate 23, corresponding with the bearing-plate 9, and, like it, rigidly supported by a radial arm (not shown in the drawing) which projects fixedly from the central shaft A immediately above the arms supporting said plate 9. A series of cogs formed upon the periphery of the ring 22 engage a pinion 24 upon the end of a counter-shaft 25, mounted in the frame 5 parallel with the needle-bar, and this pinion 24 serves, by means of an eccentric and link 26, to oscillate a rock-shaft 27, to which the needle-bar 6 is coupled, so as to be actuated thereby in the customary manner, and which need not herein be more fully described. The driving-ring 22 is preferably made to revolve independently of the revolution of the frame 5 and in the opposite direction by means of beveled teeth 28 on its upper edge, which engage a beveled pinion 29 on the end of the main shaft 12 of the machine.

In order to insure the proper synchronism in the movements of the shuttles 20 and needle-bar 6, the shuttles are actuated by a rocking lever 30, pivoted upon the sleeve 15, and which is actuated by an eccentric 31 upon a vertical counter-shaft 32, supported in a bearing 33, fixed to and carried by the sleeve 15, said counter-shaft 32 being geared to a toothed wheel 34, revolving loosely upon the sleeve 15, and which by means of a bevel-gear 35 is driven from a counter-shaft 36, supported by the standard 2, parallel with the main shaft 12, to which it is properly geared so as to rotate in unison therewith. The fabric 60 to be quilted is passed up longitudinally inside of the lower ring 3, so as to encircle the central shaft A in a tubular form more or less complete, and is carried between the needles and the shuttles under a suitable throat-plate 37, carried by the frame 5, and over an underlying plate 38, carried by the shuttle-box 18, and up inside the annular plates 9 and 23 and the rings revolving thereon, so as to pass out above the same.

The feed device by which the cloth is drawn forward or upward between each stitch consists of two pairs of concentric rings 41 41 and 42 42, mounted upon the shaft A above an annular plate 40, encircling the shaft concentrically immediately above the driving-ring 22, and which is supported upon an arm 39, extending from the outer frame carrying the main and counter shafts. The two rings in each pair are connected by a single radial arm 43, and each is supported upon the ends of a series of radial levers 50 50, pivoted, the one set for the lower ring, to a long sleeve 44, sliding longitudinally upon the shaft A, and the other, for the upper ring, to an outer con-

centric sleeve 45, sliding freely upon the sleeve 44. The outer ends of the levers are pivoted to loose plates 51 51, curved to fit against the fabric, while the latter bears upon the inner face of the outer ring, the inner ring being slotted, as shown at 49 49, to allow of a connection between said levers and plates, and the levers are all fitted to incline upwardly from the central shaft outwardly, so as to operate as toggles when the sleeve to which they are attached is lifted, and thereby cause the curved plates to clamp the fabric between them and the outer ring. The inner sleeve 44 is made long enough to engage, by means of a pin projecting laterally and radially from its upper end, a cam-groove 46 in the face of a cam-wheel 48, mounted to rotate in proximity thereto upon a counter-shaft (not shown in the drawing) suitably geared to a shaft 55, rotating parallel with the main shaft of the machine to which it is mediately geared, as shown in the drawing, while the length of the outer sleeve 45 adapts it to permit a pin projecting radially therefrom to engage the lower portion of the same cam-groove 46. The cam-groove 46 is so shaped that the two sleeves 44 and 45 are alternately raised and lowered in the revolution of the cam-wheel 48. As either sleeve is lifted its toggle-levers 50 50 are brought into play to cause the clamp-plates 51 51 to close upon the cloth within the rings 41 41, so that the cloth shall be drawn upward with the rings, and as they descend the toggles are loosened so that the rings may slide freely over the fabric. As one set of toggles tighten and are ascending the other set are loosened and descend, so that a constant intermittent feed of the cloth is produced thereby in a direction parallel with the central spindle A, about which the needles and their shuttles in the meantime revolve at a right angle to the feed of the cloth, producing as a result diagonal lines of stitches across the face thereof.

I claim as my invention—

1. In a quilting-machine, the combination of a sewing mechanism, rotary supports arranged in line about a common axis and by which the sewing mechanism will be revolved around the axis of said supports, mechanism, substantially such as described, for rotating said supports, a work-support, and a feed mechanism for engaging with a fabric and moving it over the work-support, substantially as specified.

2. In a quilting-machine, the combination of sewing mechanism, supports rotating around a vertical axis and carrying the sewing mechanism, the needle-bar of the sewing mechanism operating radially to said vertical axis, mechanism, substantially such as described, for rotating the supports, a vertical work-support curved concentrically to the axis of the sewing-mechanism supports, and a feed mechanism for engaging with a fabric and moving it lengthwise of the work-support, substantially as specified.

3. The combination, in a quilting-machine, of the stitch-forming mechanism, substantially as described, revolving about a central axis, toward which its needles reciprocate radially, a toothed gear encircling the axis concentrically to engage and actuate said mechanism, and a feed mechanism engaging with a fabric and moving it lengthwise of the said central axis, substantially as specified.

4. The combination, in a quilting-machine organized substantially as set forth, of a central axial shaft, a carriage revolving about the axis of said shaft, needles reciprocating in said carriage radially with the shaft, shuttles interposed between the needles and shaft to reciprocate at right angles with the needles and revolving in unison therewith about the shaft, a driving-shaft, and gearing, substantially as described, connecting the needle and shuttle actuating mechanism with the driving-shaft, whereby the needles and shuttles are actuated synchronically, substantially as specified.

5. The combination, in a quilting-machine, of a central axial shaft, a carriage mounted to revolve about the shaft upon annular bearings encircling the same concentrically, needles reciprocating in said carriage radially with the shaft, a sleeve revolving independently upon the shaft inside of the carriage, a shuttle-box mounted upon said sleeve, a vibratory shuttle-arm pivoted upon the sleeve to revolve therewith and oscillate thereon, shuttles playing in the shuttle-box and actuated by the oscillation of said arm, a rotating shaft carried with the sleeve and geared to the shuttle-arm to produce its oscillation, and gearing, substantially as described, connecting the carriage and the sleeve with the driving-shaft, substantially as specified.

6. The combination of the central axial shaft, the carriage revolving concentrically about said shaft, the needle-bar upon said carriage, the radial needles upon said bar, the mechanism, substantially as described, for producing the radial reciprocation of said bar, the rotating shaft mounted upon the carriage to actuate said mechanism, a toothed wheel upon said shaft, a toothed ring encircling the central axial shaft and geared with said toothed wheel, an annular bearing upon which the toothed ring is mounted to revolve about the central shaft, and an outer driv-

ing-shaft geared to the ring, substantially in the manner and for the purpose herein set forth.

7. The combination of the central axial shaft, an annular bearing-plate encircling said shaft concentrically, a peripherally-toothed ring revolving upon said plate, a carriage mounted upon said ring and revolving therewith about said shaft, a needle-bar mounted to reciprocate radially upon said carriage, mechanism, substantially as described, actuating said needle-bar, needles fitted to the needle-bar to project inwardly toward the central shaft, a sleeve encircling the shaft to revolve freely thereon, a shuttle-box carried by said sleeve under the needles, a toothed wheel fixed to the sleeve of equal diameter with the toothed carriage-supporting ring, a counter-shaft mounted parallel with the axial shaft, and pinions upon said counter-shaft engaging the toothed carriage-supporting ring and the toothed wheel of the sleeve, whereby the shuttle-box and carriage are made to revolve in unison, substantially in the manner and for the purpose herein set forth.

8. The combination, with the central axial shaft, of the needle-bar carriage revolving concentrically about the shaft, the fixed annular bearing supporting said carriage, the sleeve revolving upon said shaft in unison with the carriage, the shuttle-box carried by said sleeve, a shuttle-carrier fitted in the box, shuttles attached to said carrier, a collar encircling the sleeve loosely, an arm connecting said collar with the shuttle-carrier, a shaft rotating in bearings supported by the sleeve, an eccentric upon said shaft geared to the collar on the sleeve to produce its oscillation, and gearing, substantially as described, whereby the eccentric-shaft is made to rotate upon its axis while it revolves with the sleeve about the central shaft, all substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES E. HADLEY.

Witnesses:

FRANK BLAIR RIVES,
E. M. GALLAHER.