

W. O. GROVER.
SEWING MACHINE.

No. 21,752.

Patented Oct. 12, 1858.

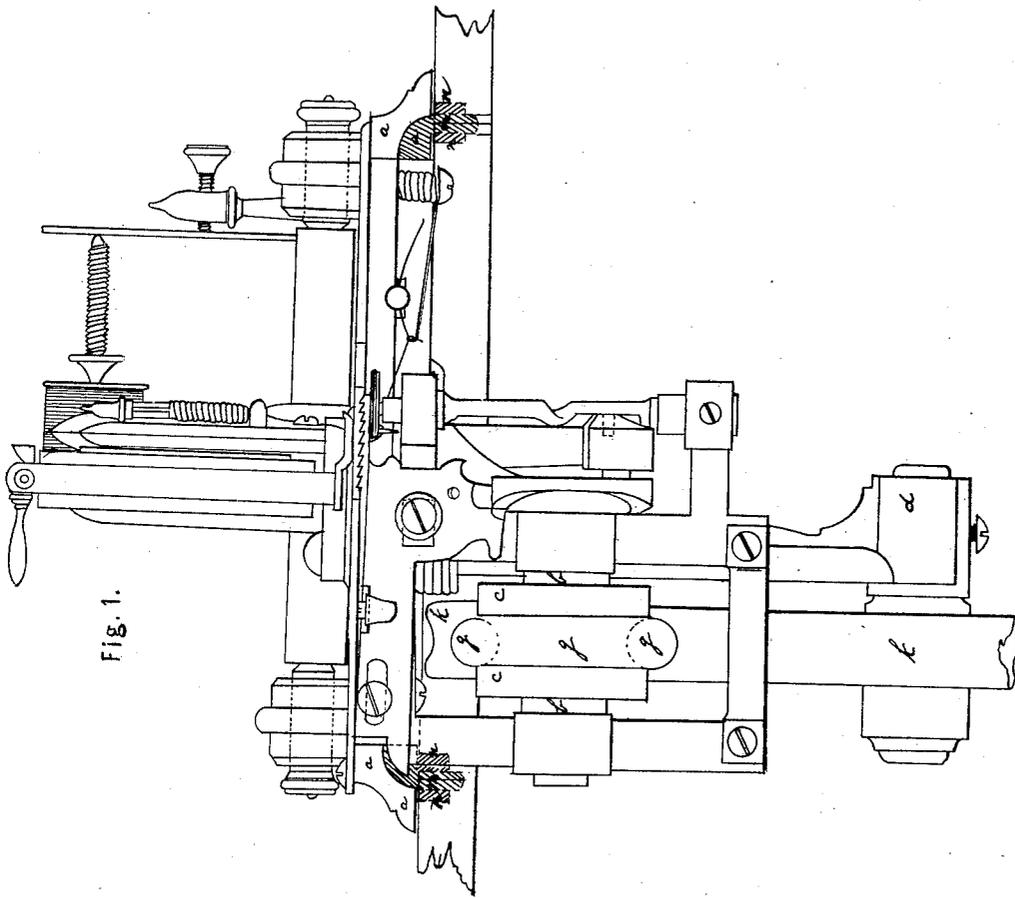


Fig. 1.

Inventor.

Wm. O. Grover.

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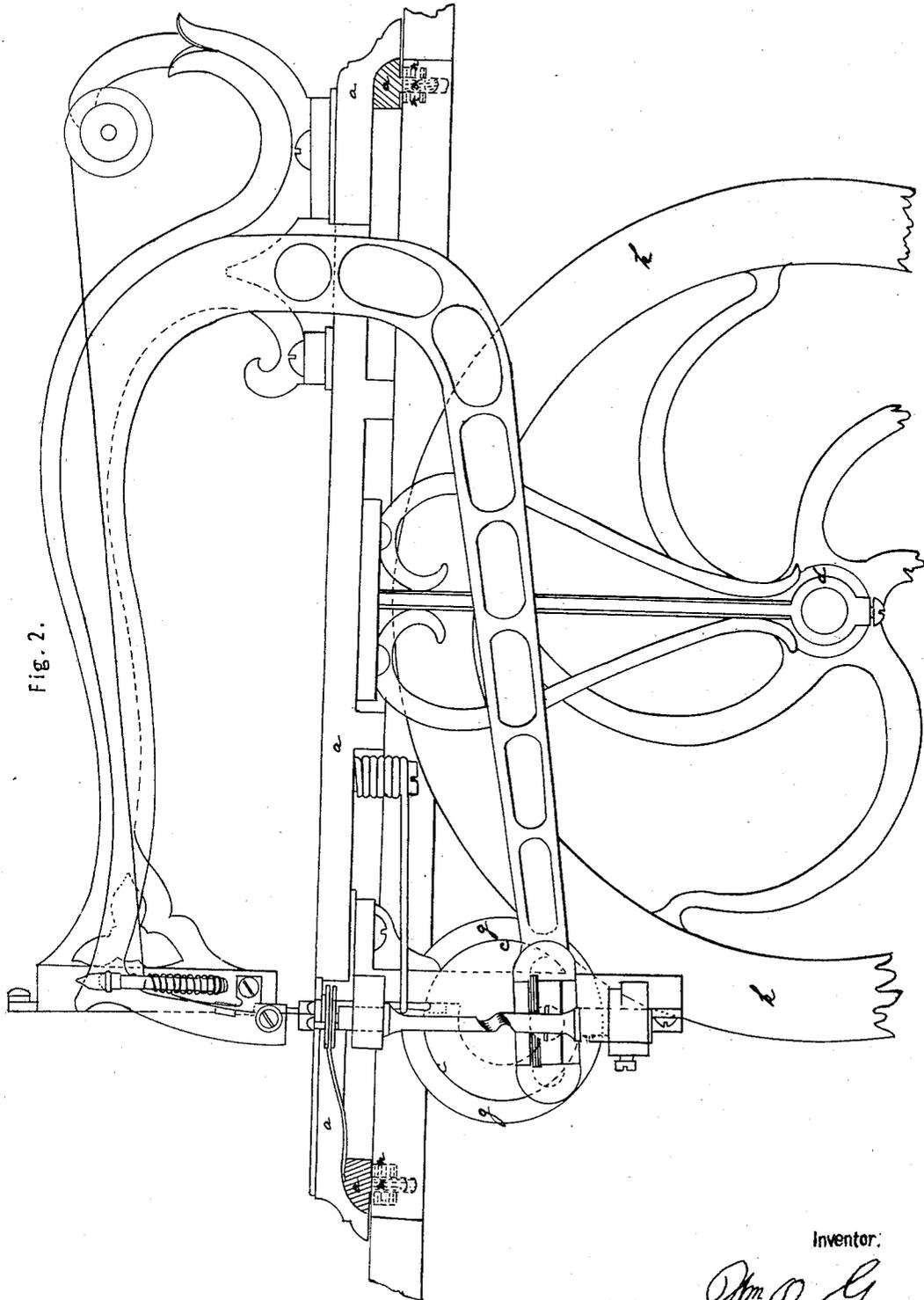


Fig. 2.

Inventor:

Wm. O. Grover

UNITED STATES PATENT OFFICE.

W. O. GROVER, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 21,752, dated October 12, 1858.

To all whom it may concern:

Be it known that I, W. O. GROVER, of the city of Boston, in the State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is a front and Fig. 2 a side elevation thereof. My improvements are applicable to all sewing-machines, although represented in the drawings as applied to a machine which forms a double chain-stitch by the interlocking of two threads, and they are applicable to all the varieties of style of bed-plate, and to any arrangement of treadle and driving-wheels.

These improvements relate to the support and driving apparatus of the machine exclusively, and have for their object the driving of the machine when geared up in a manner not liable to derangement or needing adjustment after a certain amount of use, and the supporting of the machine in such manner that it shall work without noise; and to these ends the nature of the first part of my invention consists in driving or speeding up a sewing-machine by the use of two concave-faced wheels, to either one of which is applied a tire-belt or working-face of india-rubber or gutta-percha, or equivalent elastic material, the whole combined and acting substantially as specified.

The nature of the second part of my invention consists in supporting and steadying the machine upon its table or bench by the intervention of a tube of india-rubber or other equivalent material, when this is combined with a pin or plug of metal attached to either the bed-plate or the table and passing through the tube aforesaid, the whole being and acting substantially as hereinafter set forth.

In describing my invention there exists no necessity for reference to the sewing mechanism of the machine, as my invention has no relation to any special machine, all that is necessary being to say that the bed-plate *a a* supports the parts necessary to constitute a sewing mechanism. On some proper part of this bed-plate are attached proper standards or hangers, in which is mounted a main driving-shaft, *b b*, mounted upon or attached to which is a driving-pulley, *c c*. The face of

this pulley is turned out concave, and either to the bed-plate or to the table is fastened another box, *d*, or any proper means of supporting the axis *f* of a large wheel, *k*, the face of which is also concave. An endless band or tire of india-rubber or gutta-percha, either solid or tubular, (but I prefer the latter,) is then procured and stretched over the greatest diameter of wheel or pulley, and allowed to shrink into the concave, hugging tightly the face which it surrounds. In the drawings this tire or belt is shown at *g g*, and is applied to the pulley, for this application is less costly than that to the wheel, as less length is required. The two wheels are set at such distances from each other that the convex periphery or greatest circumference of the belt enters into the concave of the opposite pulley or wheel to a sufficient extent to drive the machine by the friction of one face on the other, and this adjustment need not be a nice one, as a friction between the two surfaces much more than necessary to drive the machine will not affect materially the amount of power required to drive it. Moreover, the india-rubber belt flattens at the point of contact, thus increasing its grasp upon the driving-surface, and, further, it is narrowed or pinched up at the point of contact by the grip of the concave surface, which it acts upon. If the belt or tire be tubular, this flattening and pinching up are increased, and a power that would almost break down the machine can be applied without danger of slipping.

To the bed-plate of the machine are attached pins or rods *m m*, projecting downward therefrom, and in the table or bench, with centers coincident, or nearly so, with the pins, are bored out holes, into which are inserted tightly cylinders of india-rubber or equivalent material, such as *n n*. These holes must be closed or have a ledge at the bottom, or some other support preventing the tubes from being pressed through the table; and it is best to permit the tubes, when put in, to rise slightly above the surface of the table. Now, inspection of the drawings will show that all the sidewise jars of the bed-plate are received by the bore and the periphery of the tubes, and that all the up and down vibrations are received by the upper surfaces of the short tubes on which the machine rests, as on cush-

ions. Practice proves that this method of supporting and steadying a bed-plate obviates almost entirely the ring or rattle of a sewing-machine in operation, and it follows that the machine will wear longer and remain in adjustment for a greater length of time than is now usual, and it is needless to debate upon *the cheapness of the device by which these ef-*

fects are accomplished, as a mere inspection of the drawings will prove this to any mechanic. When the bed-plate is supported by this method, or by any method in which it rests, as it were, upon cushions, and the treadle-wheel and driving-pulley are also in contact by an elastic belt or working-face applied to either of them, then the machine rests its weight partly upon the elastic cushions and partly upon the elastic belt. Its own or part of its own weight therefore regulates the amount of compression of the elastic driving-face, and as that face wears away the machine comes down farther and farther, itself compensating for the wear. Moreover, there is no need of any primary adjustments, in the proper sense of the term, of the distance between the face of the wheel and pulley, all that is necessary being that the elastic belt or the cushions shall yield to something less than the whole weight of the machine. The combined use of these two kinds of elastic supports, moreover, obviates any trifling irregularities in the thickness of the elastic belt, any slight eccentricity in either wheel or pulley, and any differences of elasticity in different portions of the belt; and all these are items of importance in machinery which requires such nice workmanship and adjustment as a sewing-machine.

I intend at times to secure the pins to the table and let the rubber tubes into sockets drilled out of the bed-plate of the machine.

I am aware of the fact that cushions or elastic supports for the bed-plate of sewing-machines are now in use, but do not know that such supports provide against both lateral and vertical vibrations.

I am also aware of the fact that wheels and

pulleys, the one driving the other by friction, have lately been proposed, in which the faces of both wheels and pulleys were non-elastic, and were formed into a series of grooves or elevations and concavities; those in the pulley matching and fitting into those of the wheel; but I do not know of any elastic convex driving-face running in contact with a

concave non-elastic face, by which arrangement the pinching and flattening of the elastic belt are brought into play; and although I speak in this specification of two concave feed-wheels, in combination with an elastic belt inclosing and gripping one of them, I wish it distinctly understood that the concavity in that wheel to which the belt is applied and which it grips is a mere matter of convenience, not a material part of the invention, as the apparatus would be the same in principle and effect, no matter what may be the contour of the periphery which the belt hugs, all that is necessary being that a concave rigid face should drive or be driven by contact with a convex-elastic face.

Having thus described my improvements, I claim as of my own invention—

1. Driving or speeding up a sewing-machine by means of a convex elastic face on one wheel or pulley acting in combination with and by friction upon a non-elastic concave face on another wheel or pulley, combined and acting together substantially in the manner and for the purposes specified.

2. Supporting and steadying a sewing-machine by the combination of a tube of india-rubber or its equivalent with an internal pin or projection, the two being fitted and acting substantially in the manner and for the purposes herein set forth.

In testimony whereof I have hereunto subscribed my name, in the city of Boston, this 30th day of September, A. D. 1857.

W. O. GROVER.

In presence of—

WM. E. BAKER,

R. G. BROWN.