

UNITED STATES PATENT OFFICE.

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OPERATING MECHANISM FOR SEWING-MACHINES, LATHES, &c.

SPECIFICATION forming part of Letters Patent No. 292,436, dated January 22, 1884.

Application filed February 6, 1883. (No model.)

To all whom it may concern:

Be it known that I, PIERRE F. JONTE, a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Operating Mechanism for Sewing-Machines, Lathes, and the like, of which the following is a specification:

The object of my invention is to provide an operating mechanism for foot-power machinery which shall dispense with all cranks, thereby obviating the difficulty heretofore experienced by reason of dead-points.

My invention is especially applicable to sewing-machines, and in the present instance I have illustrated it as being applied to a sewing-machine, though it may be advantageously employed in connection with lathes and the like.

Referring to the drawings forming part of this specification, Figure 1 is an elevation of a sewing-machine with my invention applied thereto. Fig. 2 is a side elevation of one end of said machine. Figs. 3, 4, 5, and 6 are enlarged detail views of portions of my invention.

A is the top of the machine, which is supported on suitable legs or supports. Upon a shaft, *a*, suitably journaled in journal-bearing connected to the top A, or otherwise suitably supported, is a chain-gear wheel, *b*, upon which moves an endless drive-chain, E. This chain E also moves in a curved bearing-surface, preferably rotatable, as wheel C', the diameter of which is equal to the diameter of the chain-gear wheel *b*. This drive chain or belt E is strained or extended between the wheel *b* and bearing C', and the links of the chain engage with the gear-wheel *b*, after the manner shown in Fig. 5. This drive-chain consists of alternate double links *e* and single links *e'*, and the periphery of each of the gear-wheels is divided by ridges *f* into a number of depressions, *f'*, the depressions *f'* being capable of receiving the double links *e*, as shown in Fig. 5, each of the ridges *f* being provided with a notch, *f''*, into which the single links *e'* drop to permit the double links *e* to enter the depressions *f'*, so that when the chain travels around the wheels *b* it will cause the latter to turn. This wheel *b* and bearing C' are provided with side

flanges, E', to prevent the chain from running off the wheels and bearing. When desired, the bearing C', when rotatable, may have the ridges *f* and depressions *f'*, and may be used to turn its shaft, and also impart power to mechanism; but when its power is not needed, as in the present instance, its periphery is preferably smooth, and its sole function is to aid in retaining the chain E in position.

A treadle, F, oscillates with a supporting-rod, K, upheld by the legs A', or otherwise in any preferred manner. To the rear end of this treadle is connected the lower end of a pitman, F', the upper end of which pitman is connected to a pawl-carrier, F², which carries the pawls G G', which engage with the chain E. This pawl-carrier consists of a base, *g*, provided with the flanges *g'* *g''*, preferably located, as shown, at diagonally-opposite corners of said base. These flanges *g'* *g''* are so formed as to act as yokes in which are received the ascending and descending portions of the chain E.

To the base *g* are pivoted the pawls G G', the faces of the pawls being serrated to correspond with the serrations of the chain E, the pawl G being opposite and opposed to the yoke *g'*, and the pawl G' opposite and opposed to the yoke *g''*. The pawl G is so shaped that when the pawl-carrier F² is raised the ascending portion of the chain E will be tightly grasped between said pawl and the flange or yoke *g'*, and the chain will therefore be carried up by this pawl, and the pawl G' is so shaped that the descending portion of the chain will be grasped between the yoke *g''* and said pawl G', and the chain will be carried down thereby. The heels of these pawls are slightly separated from the chain, so that each pawl will carry the chain in one direction only. The lower portion or heel, *h*, of the pawl G is made heavy, as shown, so that it will keep the point of the pawl at all times against the chain, and the pawl G' is provided with a suitable weighted portion, as *h'*, which will keep the point of this pawl at all times against the chain. Thus when the pawl-carrier is raised and lowered by the pitman F' the ascending and descending portions of the chain are alternately grasped by the pawls G and G'. When the pawl-carrier is raised, the pawl G engages with

the ascending portion of the chain and grasps it tightly in the yoke g' , and this ascending portion is carried upward and the descending portion passes through the yoke g'' without being at all interfered with by the pawl G' , and when the pawl-carrier begins to descend the pawl G is at once released from the ascending portion, and the pawl G' at once engages with the descending portion of the chain, clamping it in the yoke g'' , and the descent of the pawl-carrier will therefore carry the descending portion of the chain downward, the ascending portion of the chain passing through the yoke g' without being interfered with by the pawl G .

It will be seen that the alternate raising and lowering of the pawl-carrier causes the chain E to constantly move in one direction, and this, acting on the gear-wheel b , causes it and the balance-wheel B' to revolve, and that there can be no dead-points in the revolution of the belt-wheel, as the chain E will be grasped by one of the pawls, G or G' , at any point in the ascent or descent of the pawl-carrier, and the balance-wheel B' causes a steady revolution; also, there can be no retrograde or backward movement of the chain E —viz., in a direction the reverse of that indicated by the arrows—for the reason that should any impulse toward a movement in said backward direction be imparted to the chain the pawls engage the chain and altogether prevent such a movement.

The lower end of the pitman F' may be directly connected to the end of the treadle F , and without any spring-connection. Preferably, however, a spring is interposed between the pitman and the treadle, to prevent a quick upward motion of the treadle from jerking and jarring the teeth of the pawl and gear-wheel as they engage the chain, and also for imparting a more even movement to the chain and the mechanism which this chain is employed to operate. A preferred mode of employing such a spring is as follows: The lower end of the pitman F' is connected to the said treadle by a bar or plate, H , and a spring, H' , the lower end of the pitman being kept in contact with the upper end of the plate H by straps I , through which the end of the pitman is free to slide, the spring H' being connected at one end to the plate H and at the other to the lower end of the pitman F' .

It is desirable that suitable means be present to regulate the strain or tension to which the drive-chain E is subject. A preferred form of such mechanism is as follows: To a portion of the machine—as, for instance, the leg A' —is pivoted one end of an adjustable bracket-arm, C . The end of the bracket-arm C which is pivoted to the leg A' is provided with a slot, d , through which passes a set-screw, d' , which latter is screwed into the leg, or supported by the other portion of the machine. The adjustable bracket-arm C serves as a tension for the chain E , and by means of its slot and set-screw may be adjusted to tighten the chain to the required degree.

When, from the length of the driving-chain belt, or from the position of the latter, or from any other reason, the chain sags, any preferred means may be employed to prevent it from sagging. In the present instance a preferred device is shown, consisting of a flat rod or bearing-piece, D , preferably connected at one end to the bracket-arm C , at some point between its pivoted end and its free end, the other end of this bearing-piece D being connected to the frame of the machine. Upon the face of this bearing-piece, when the chain tends to sag, the side of the pawl-carrier F^2 rests.

My improved pawls and chain will operate without fly-wheel, as there are no dead-points, and can be no retrograde movement of the chain; but to insure perfect regularity and smoothness in the running of the axle a , I employ a fly-wheel or balance-wheel B' in some portion of the mechanism to be operated, and this wheel B' is preferably placed at some point on the shaft a , and is concentric therewith.

A convenient brake for quickly stopping the machine when in operation may be employed, and a desirable form of brake is shown in the drawings, and is as follows: I provide a brake-lever, J , one end of which is pivoted to the leg A' or frame-work. On the upper side of this brake-lever is a brake-shoe, j , so situated as that it may be caused to bear against the lower edge of the balance-wheel. On the pitman F' , just below the pawl-carrier F^2 , is a pin, k , which, when the pitman is raised sufficiently, will come in contact with the arm K' of the brake-lever J , elevating the same and causing the brake-shoe j to press against the periphery of the balance-wheel B' . This brake, when not against the balance-wheel, rests on the pin k' . When the machine is in operation, the pitman is not raised to such an extent as to cause the pin k to come in contact with the brake-lever; but when it is desired to stop the machine the operator simply bears down on the front end of the treadle a little more than when operating the machine, and this causes the pin k to lift the brake-lever J , and the brake-shoe j is thus pressed firmly against the periphery of the balance-wheel, which at once stops its revolution. As soon as the pawl-carrier begins to descend, the brake drops away from the balance-wheel, which is then free to be turned by the continued descent of the pawl-carrier.

The shaft a may impart its rotary motion in any suitable manner to the mechanism which it is to operate—as, for instance, by a tooth-gear, pulley, and belt or crank, &c. In the present instance an eccentric, m , on the shaft a , engages an embracing yoke, m' , terminating above in a vertical shaft, m^2 , which in turn imparts a reciprocating motion to the main operating-arm of the sewing-machine.

A desirable means for raising the forward end of the treadle when the pressure of the foot is lessened upon it, and also thus actually depressing the pawl-carrier, consists of the

spring N, coiled around the treadle-rod K, and connected at one end to the treadle and at the other end to the machine-frame, or other stationary object, so that when the forward end of the treadle is depressed the spring is strained and tends to lift the said forward end of the treadle as soon as the pressure of the foot of the operator is removed therefrom. This enables the machine to be worked with great ease.

Should it be found that the forward end of the pawls G and G' have a tendency during a rapid movement of the pawl-carrier to fly too far away from that side or part of the chain which they are to engage, stops *p p* may be placed on the pawl-carrier, behind said forward ends of the pawls. (See Fig. 3.)

When desired, a suitable bobbin-winder, as L, may be connected to the stand at any convenient point and operated by a belt from a pulley-wheel, B, located at a desired point on the shaft *a*.

I have described a drive-chain, E, as being the preferred form of band to be used in connection with the remaining features of my invention; but, if preferred, a round or flat belt, duly provided with serrations or projections, may be employed instead of the drive-chain.

As before stated, my invention may readily be employed for operating various kinds of foot-power machinery, such as lathes and the like.

Guide flanges or projections *t t'* are preferably fixed to the pawl-carrier on the inside of the chain; the pawl G' being between them, the function of the said guides *t t'* being to keep that side of the chain which the pawl G' engages in line and close to flange *g*².

In Letters Patent No. 265,099, granted to me on September 26, 1882, is shown and described mechanism for operating a sewing-machine, which mechanism is designed to accomplish results similar to those accomplished by my present invention; and I do not therefore claim, broadly, in this application those features whose operation is similar to corresponding features shown in and covered by said Letters Patent; but the improved form of the mechanism of my present invention is such that the results sought to be accomplished by the invention covered by my said Letters Patent are accomplished more perfectly than by said last-named invention, and it is upon this improved form of mechanism that my present claims are based.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The endless serrated drive belt or chain, in combination with the pitman provided with clutch mechanism, substantially as hereinbefore set forth, for engaging said serrated drive-chain, and for causing the upward and downward movements of the pitman to move the chain in one direction, substantially as and for the purposes described.

2. The endless serrated drive belt or chain, engaging the projections of a wheel, as *b*, and

at the other end against a bearing, as *C*, in combination with the pitman provided with clutch mechanism, substantially as hereinbefore set forth, for engaging said serrated drive-chain, and for causing the upward and downward movements of the pitman to move the chain in one direction, substantially as and for the purposes described.

3. The herein-described mechanism for operating foot-power machinery, consisting of a drive-chain composed of serrated links, said chain passing around an appropriate chain-gear on the driving-shaft of the machine, and a pawl-carrier connected by a pitman to the treadle of the machine, and provided with serrated pawls adapted to engage the drive-chain, substantially as and for the purposes described.

4. The pawl-carrier F², consisting of a base, *g*, provided at opposite corners with the flanges *g*' and *g*², and the pawls G G', pivoted to the base *g* and opposing the flanges *g*' and *g*², substantially as and for the purposes specified.

5. The pawl-carrier F², having the flanges *g*' and *g*², and the pawls G G', having serrated edges to engage with the chain E, said pawls being provided with the weighted portions *h h'*, to keep the points of said pawls in contact with the chain, substantially as and for the purposes specified.

6. The pawl-carrier F², having the flanges *g*' and *g*² and flanges *t t'*, and the pawls G G', pivoted to the carrier, and respectively opposing the flanges *g*' and *g*², substantially as and for the purposes specified.

7. The combination of the pawl-carrier F², pawls G G', driving-chain E, pitman F', and treadle, substantially as and for the purposes specified.

8. The combination of the pitman F' and the treadle F, the pitman being connected to the treadle by the plate H and spring H', to permit a slight amount of variation in length of said pitman, substantially as and for the purposes specified.

9. The combination of the treadle F, spring H', and pitman F', substantially as and for the purposes specified.

10. The combination of the treadle F, spring H', and pitman F', the pitman being connected to the treadle by a spring, substantially as and for the purposes specified.

11. The combination of drive-belt, pawl-carrier, pawls, pitman, spring, as H', and treadle, substantially as and for the purposes specified.

12. The combination of drive-chain, pawl-carrier, pitman, spring, as H', treadle, and spring N, substantially as and for the purposes specified.

13. The combination of the wheel B, brake J, having shoe *j*; and pitman provided with pin *k*, and drive-belt and pawl-carrier and pawls, substantially as and for the purposes specified.

14. The combination of the pitman F', provided with a pin, *k*, and the brake J, having a shoe, *j*, and the wheel B', said brake being

adapted to be raised and brought into contact with the wheel J by said pitman, substantially as and for the purposes specified.

15. The drive-chain, serrated on inside of links *e*, and smooth on outside, in combination with the pawl-carrier and gear-wheel and bearing C', substantially as and for the purposes specified.

16. In combination with a drive-chain com-

posed of alternate single links *e'* and double links *e*, serrated on the inside, the gear-wheel provided with depressions *f* and slots or depressions *f'*, substantially as and for the purposes specified.

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Witnesses:

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