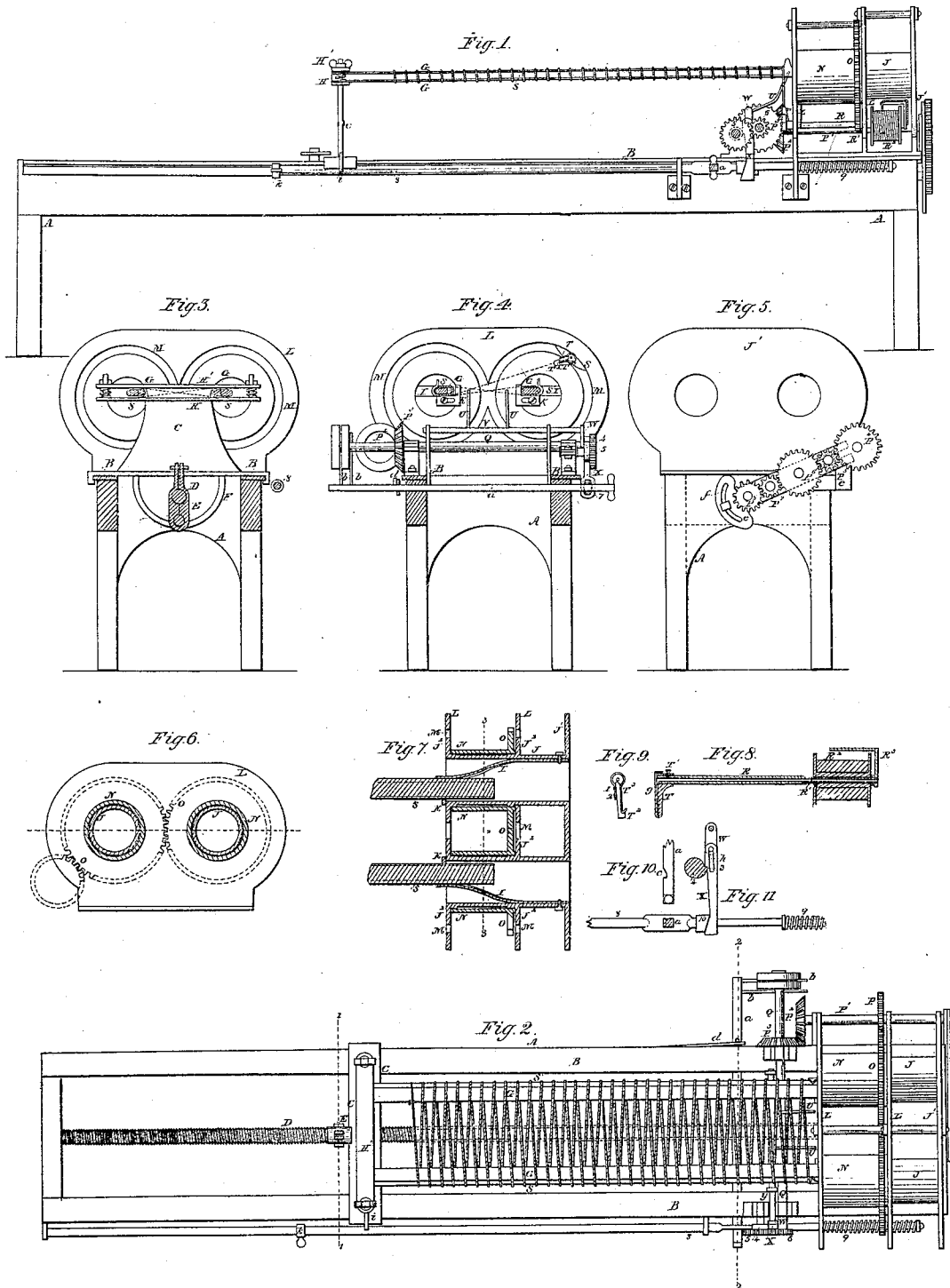


J. Senneff.
Making Loom Harness.

N^o 13,152.

Patented Jan. 26, 1855.



UNITED STATES PATENT OFFICE.

JACOB SENNEFF, OF PHILADELPHIA, PENNSYLVANIA.

MACHINE FOR MAKING HARNESS FOR LOOMS.

Specification of Letters Patent No. 13,152, dated June 26, 1855.

To all whom it may concern:

Be it known that I, JACOB SENNEFF, of the city and county of Philadelphia and State of Pennsylvania, have invented a new and useful Mode of Forming and Winding Weavers' Single or any Number of Strand Heddles or Harness; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a side elevation of the machine for winding the heddles to the improved form. Fig. 2 is a top or bird's-eye view of ditto. Fig. 3 is a transverse section of ditto, at the line 1, 1, of Fig. 2. Fig. 4 is a transverse section of ditto at the line 2, 2, of Fig. 2. Fig. 5 is an end elevation of ditto. Fig. 6 is a transverse section of the concentric cylinders, at the line 3, 3, through which the shafts of the heddles pass. Fig. 7 is a horizontal section through the center of ditto. Fig. 8 is a section through the center of the tube and radial swinging arm, through which the yarn for forming the heddles pass. Fig. 9 is a front view of the radial swinging arm. Fig. 10 is a top view of a portion of the notched sliding bar. Fig. 11, is a side view of the longitudinal sliding rod and the parts for operating the same, to detach the notched sliding bar.

The same letters in the several figures refer to corresponding parts.

The nature of this invention and improvement consists in the combination and arrangement of certain mechanism to wind the strand or strands of the heddles to a novel and peculiar form, by which each successive strand or strands is made to incline from and cross the preceding one, as they are wound around the shafts, for the purpose of enabling an eye to be attached to each single strand, or series of strands of yarn, and forming a lease in the heddles and enabling the weaver in drawing to readily distinguish the right heddles.

To enable others skilled in the art to make and use my invention, I will proceed to describe the construction and operation of the same.

The heddle yarn is wound around the shafts to form the heddles by commencing at one end, where it is temporarily made fast to say the upper shaft, and extending it in an inclined direction toward the opposite end, and on the opposite side of the

lower shaft, around the edge of which it is wound in a spiral form, and thence extended upward, and in an inclined direction, toward the unfilled end of the upper shaft, and on the side of the same from whence it was first started, and thence around its edge in a spiral form, and downward as before, and so on in this manner, until the full leaf of heddles is formed—the heddles inclining one way being on the front of the upper shaft, and extended to the back of the lower one, and the heddles inclining the opposite direction vice-versa, so as to cross each other above or below the point where they receive the eyes, midway between the shafts, or a short distance above or below. The heddles being formed in this manner, they will more readily form a lease than in the ordinary plan, and can be worked with much less friction and wear.

The machine for winding the heddles to the form described, consists of a rectangular or other suitable frame A, having ways B, on the upper surface of the side rails, extending their full length, for receiving and guiding an upright sliding frame C, over their surface. This upright frame is moved, when the heddles are being wound, by means of a longitudinal screw shaft D, extending the full length of the frame, and geared to the upright frame by jointed jaws E, attached to a semi-circular bar E. Secured to the under part of the upright frame, and having a female screw formed in them where they clasp the screw shaft, and being held firmly together for this purpose, by a metallic clasp, capable of being detached, to disengage them from the screw shaft, or by other suitable means. The heddle shafts (s) are placed between longitudinal clamp bars G, with their edges projecting a short distance beyond the outer edges of the clamp bars, the ends of which are placed between transverse bars H, H', on the upright frame, the lower bar H, being fixed permanently to the top of the same, and the upper one attached immediately above, by means of upright screws, rising from the extremities of the lower bar H, and passing through openings in the upper bar H' and provided with thumb screws above, for holding the ends of the clamp bars G, and the shafts (s) within them, firmly between the transverse bars. The opposite end of the clamp bars and shafts are supported and guided in their

longitudinal movement with the upright frame, by right angled guides K, secured to the front face of the cylinders, capable of being moved transversely to accommodate themselves to the distance apart of the clamp bars G, by means of set screws, and slots through which they pass, the inner edges and lower surfaces of said bars respectively resting against the upright and horizontal surfaces of the right angled guides. The edges of the shafts are covered with tape, which is held in its place, while the heddles are being wound by horizontal curved springs I, secured inside stationary cylinders J, at the end of the frame, which springs press against the edges of the shafts as they pass through the cylinders, being made convex near their ends to fit the same.

The cylinders J, through which the shafts and their clamp bars are guided in the manner stated, are arranged parallel to each other, side by side, at the rear end of the machine, and are supported by a flange J', at their rear end, rising from the bed plate, assisted by upright plates L, of a similar form to the flange J', and rising from the bed plate in like manner, at the front end and near the middle of the cylinders, and bolted at their upper parts to the flanges J'. These cylinders have other flanges J² on their peripheries, immediately opposite and within the upright plates L, which latter flanges J², are made circular except near where they approach each other, at which part they extend tangentially out of a circle and come to a point on a horizontal line with their centers—spaces or circular slots M, being left between them, and the inner peripheries of the upright plates L, which slots intersect each other above and below the centers of the flanges J², so as to cause the two to communicate with each other between the tangential lines of the flanges.

These cylinders are surrounded by other concentric cylinders N, extending the full length of the spaces between the flanges J² and resting at their extremities on projections on the peripheries of the stationary cylinders J, around which they are caused to revolve in reverse directions, by means of cog wheels O. Secured to their rear ends, and meshing in gear with each other, and one of them with a smaller cog wheel P. Secured on a horizontal shaft P', supported in boxes at the side of the frame, and having a bevel cog wheel P², on one end, which meshes in gear with a corresponding bevel wheel P³, secured on the main driving shaft Q, arranged transversely in front of the cylinders and below the same, being supported by suitable boxes rising from the side rails of the frame. The longitudinal shaft P', is provided with a cog wheel P⁴, at its rear end, which meshes in gear with

a pinion P⁵, geared to another cog wheel P⁶, similar to the last mentioned, and this cog wheel P⁶ is geared to another pinion P⁷ similar to the pinion P⁵ which meshes in gear with a pinion P⁸, secured on the end of the screw shaft D, by which means it receives its motion. The shafts of the pinions P⁵, P⁷, and cog wheel P⁶ are fixed in an inclined slotted bar (e) through the lower end of which the screw shaft D, passes, and upon which it can be moved, when not clamped by the screw bolt, passing through the segmental slot (f) in its lower end. At the upper end of this bar is a straight slot represented by dotted lines in Fig. 5 in which the shaft of the pinion P⁵ is secured by a nut on its end, so as to enable it to be removed, and a larger one substituted, to lessen the number of revolutions of the screw shaft D, and consequently the speed of the carriage c and the distance apart of the heddles on the shaft—the segmental slot and screw bolt enabling the upper end of the bar to be raised and fastened at the proper height, to suit a larger sized wheel or pinion, in place of pinion P⁵.

A horizontal tube R, arranged parallel to the cylinders, extends through the spaces or circular slots M, being fastened at the parts within the spaces or circular slots, to followers or guides S, formed somewhat after the manner of an ellipsis, except that their ends are made pointed to cause them to traverse through said spaces or slots, alternately, and in contrary directions, their motions through the same being in the form of the Fig. 8. The ends of the tubes R, rest in slots formed in the cog wheels o and in radial arms projecting from the front of the outside cylinders N, and said tube is transferred respectively from the slots of one cog wheel and arm to those of the others by the followers S, as they move through the spaces or circular slots. To the rear end of this tube R, is screwed another tube R', on which is placed loosely the spool R² containing the yarn for forming the heddles, on the end of which tube R', is screwed a radial arm R³ bent at right angles over the periphery of the spool, and having an opening near the end of its bent part, for the passage of the yarn, and another guide or opening where it is bent at right angles for the same purpose. At the forward end of the first mentioned tube R, which projects a short distance beyond the follower or guide S, a radial swinging arm T, is attached by means of a screw T', which passes through the hub of the arm, and enters a circular groove formed in the periphery of the tube R, over which the hub of the arm moves loosely. This radial arm is shown in section and front view, in Figs. 8 and 9, and is provided with projections T², at its side and outer extremity, so formed

as to leave a space between them for the insertion of the yarn, which, when inserted and passed through a groove in the side of the arm, is covered by a spring T^3 extending up the side and around the hub and half way down the opposite side of the radial arm, being secured to the same by a screw 1, near its circular part, upon which it moves as a pivot when it is desired to remove its opposite side from over the groove (g) and yarn, and provided with another screw 2, on the same side of the arm as the other but nearer its extremity, which screw 2, passes through the spring T^3 and presses against the surface of the arm, and in this manner tempers the pressure of the spring on the yarn, and regulates its tension. This radial swinging arm T , is always kept in the same line as the yarn passing from it, as it is being wound on the heddle shafts by the tension of the same, and during its movement with the followers, its yarn is caused to strike against the under part of the ends of the bent rods V , and slightly raise the same, and by this means throw out of gear an apparatus, which would otherwise, in case the yarn were to break) stop the operation of the machine. This apparatus consists of a horizontal transverse rock shaft V , to which the bent rods v are attached, extending up from the same in an inclined direction, so as to terminate a short distance above the centers of the cylinders J , and between the same and in the rear of the opening or groove (g), in the radial swinging arm T through which the yarn is payed out—being in such relation to the circuitous routes taken by the followers, as to be struck and raised, as before stated, by the yarn at every revolution they make. This rock shaft V , rests in boxes in the frame, and is provided with an arm W , extending downward at one end, to which is suspended by a pin, passing through a slot (h) at its upper end, an upright bar X , having a notch or protuberance 3 formed on its edge, and kept by its gravity in a pendent state constantly in contact with the eccentric surface of a cam 4, (except when moved from the same, by the alternate vibrations of the arm W of the rock shaft) which cam is affixed to a short transverse shaft, turning in a box in the frame, and having a cog wheel 5, outside the eccentric cam, meshing in gear with a pinion 6, on the end of the main driving shaft a through which the cam receives a constant rotary motion during the operation of the machine. The lower end of the slotted bar X is enlarged and rounded, and contains a slot 7, through which passes a longitudinal rod 8, suspended in openings formed in lugs projecting from the side rail of the frame, and having a spiral spring 9, surrounding it at its rear end, compressed between a nut on its end and the rear lug, so as to constantly keep

the inclined surface of a hub 10, on the rod 8, in contact with the forward corresponding inclined surface of the enlarged lower part of the slotted bar X through which the rod 8, passes.

Immediately in front of the hub 10 the horizontal bar 8 is made flat on its sides, and enlarged, and perforated with a square opening to receive a transverse notched sliding bar (a), which passes through corresponding openings in the side rails of the frame, and projects a short distance beyond the rod 8 and is provided with a handle at this end, and extends at its opposite end the full length of the driving shaft 2, where it is provided with curved bars (b) partially surrounding a permanent and loose pulley, affixed to the end of the driving shaft. The notch (c) in this bar, as seen in Fig. 10, is on its side, near where it passes through the flat part of the rod 8, and its abrupt or right angled surface, is held firmly against the outer flat surface of the rod 8, when the machine is in operation, by means of a spring (d), secured to the rail of the opposite side of the frame, the elastic end of which spring is made to press against a pin on the transverse bar (a). The portion of the bar 8 next the notch, is held at all times firmly against that side of the bar (a) by the spiral spring 9, at its end, and is only disengaged from the notch, by the inclined surface of the enlarged end of the slotted bar X , which is prevented from moving toward the rear, by a stop (h) secured to the frame acting on the corresponding surface of the hub 10, when raised by the abrupt radial surface of the eccentric cam 4, acting on the notch or protuberance (3) on its side, in case of the breakage of the yarn, and consequent failure of the rock shaft arm W moving it from the cam 4,—or when the required number of heddles have been wound on the shafts, and the projection (i) on the side of the upright frame C or carriage, acts on the movable hub (k), surrounding the rod 8, and previously set at the point, corresponding with the number required.

The operation of the machine is as follows: The cogged gearing at the back end of the machine, being arranged to correspond with the required distance apart of the heddles, in the manner before stated, and the hub (k) set on the horizontal rod 8 to regulate the number of heddles desired on each leaf, and the shafts (s) properly secured in their places with their edges covered with tape between the clamp and transverse bars G, G, H, H' and curved springs I , and right angled guides K , motion is communicated to the several moving parts of the machine, by a band passing around the inner and permanent pulley, on the end of the main driving shaft Q . The followers or guides S will be caused to alternately re-

5 involve around the shafts (*s*) within the
 spaces or circular slots *M*, being transferred
 at every revolution, from one circular slot
 to the other, alternately forming a cima-
 10 reversa, and cima-recta, in their move-
 ments, between the shafts (*s*) and the yarn
 from the radial swinging arm *T*, will act
 upon the curved bars *U* and by oscillating
 the arm *W* on the end of the rock shaft *V*
 15 will throw the upper end of the slotted bar
X, from the eccentric cam 4 at every time
 it passes in its revolutions. In case of break-
 age of the yarn, the radial swinging arm *T*
 will hang in a pendant state, and the yarn
 20 not operating on the bent bars *U*, the slotted
 bar *X* will be permitted to remain against
 the eccentric cam 4 and the abrupt edge of
 said cam, in its revolution will operate on
 the notch or protuberance 3 on the side of
 25 the slotted bar *X* and raise it, and disengage
 the rod 8, from the notch of the transverse
 bar (*a*) which being left free will be moved
 by the spring (*d*) so as to transfer the band
 embraced between the rods (*b*) from the
 30 driving, to the loose pulley, and thus stop
 the motion of the machine. The same effect
 is produced through the projection (*i*) on
 the side of the upright frame *C*, or carriage
 coming in contact with the adjustable hub
 35 (*k*) on the horizontal rod when the required
 number of heddles for which it was set,
 have been wound.

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

35 1. I claim the method of winding the

heddles on the shafts (*s*) by revolving the
 tube *R*, through which the yarn is sup-
 plied from the spool at its end, alternately
 around the shafts, and flanges *J*², surround-
 ing the stationary cylinders *J*, as they pass 40
 through said cylinders, and guiding the
 same by the followers or guides *S*, at its
 ends, passing through the circular spaces or
 slots *M* communicating with each other, and
 delivering the yarn to the shafts, during the 45
 revolutions of the tube from the end of the
 grooved radial swinging arm *T*, turning
 loosely on its end as before described.

2. I claim the combination of the adjust-
 able spring *T*³, and radial swinging arm *T*, 50
 with the tube *R*, for delivering and temper-
 ing the tension of the yarn, as described.

3. I also claim the combination and ar-
 rangement of the bent rods *U*, on the rock
 shaft *V*, alternately operated upon by the 55
 tension of the yarn, as it is laid on the shafts
 (*s*) eccentric cam 4, slotted bar *X*, having
 a notch 3, on its side, and enlarged at its
 lower end, hub 10 with inclined surfaces,
 corresponding with the inclined surface of 60
 the enlarged part of the slotted bar, and the
 horizontal longitudinal and transverse slid-
 ing rods (8) (*a*); the whole forming the
 essential parts of the apparatus for stop-
 ping the machine, upon the breakage of the 65
 yarn, in the manner herein set forth.

JACOB SENNEFF.

Witnesses:

GEO. TIEL,

C. BRUZER.