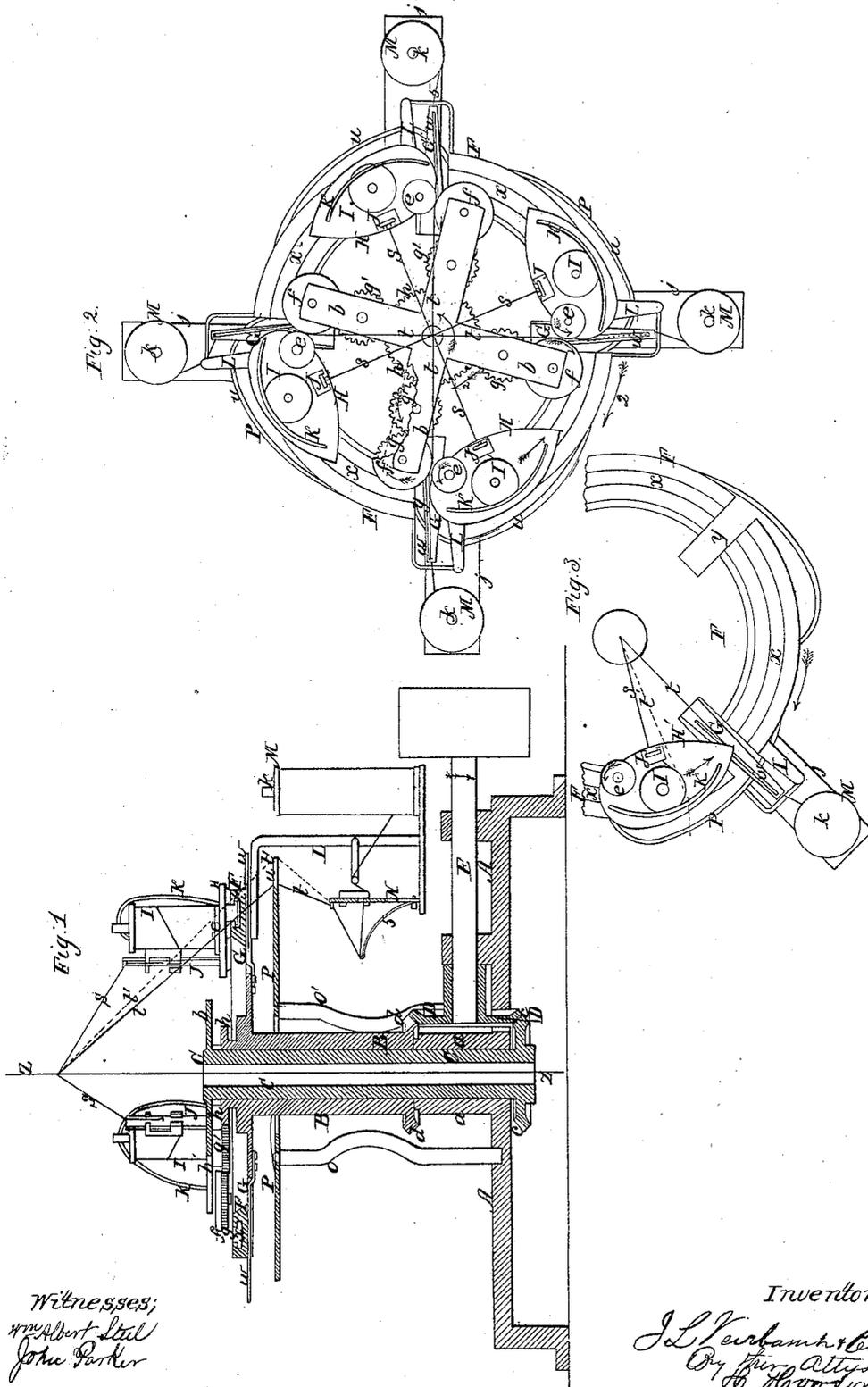


F. L. Veerkamp & C. F. Leopold.
Braiding Mach.

N^o 56,643.

Patented Jul. 24, 1866.



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UNITED STATES PATENT OFFICE.

FLORENCE L. VEERKAMP AND CHARLES F. LEOPOLD, OF PHILADELPHIA,
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IMPROVEMENT IN BRAIDING-MACHINES.

Specification forming part of Letters Patent No. 56,643, dated July 24, 1866.

To all whom it may concern:

Be it known that we, FLORENCE L. VEERKAMP and CHARLES F. LEOPOLD, both of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improved Braiding-Machine; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Our invention consists of certain mechanism, fully described hereinafter, whereby threads carried by two sets of shuttles or bobbins may be platted together so as to form a braid or hose or a covering for a central cord or wire.

In order to enable others skilled in the art to make and use our invention, we will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of the braiding and weaving machine; Fig. 2, a plan view, and Fig. 3 a detached plan view, of part of the machine.

A is the base of the machine, in the center of which is a hollow cylindrical projection, *a*, and on the upper end of the latter rests the lower end of a sleeve, B. Through both the sleeve B and the hollow projection *a* extends a tubular shaft, C, at the upper end of which are secured four arms, *b b b b*, and at the lower end of the shaft is a bevel-wheel, *c*, into which gears a similar wheel, D, on the end of a horizontal driving-shaft, E, the latter turning in suitable bearings on the base of the machine.

At the lower end of the sleeve B is a bevel-wheel, *d*, which gears into the driving-wheel D, and to the upper end of the sleeve is secured a circular plate, F, in the face of which is an annular groove, *x*. In the plate F are four radial slots or recesses, *y*, for a purpose described hereinafter.

Into the groove *x* fit projections on the under sides of four shuttles or spool-carriers, H H H H, each of which carries a bobbin, I, and is pointed at one end, as shown in Figs. 2 and 3 in the drawings, and to each shuttle, at one side of the bobbin, may be secured a tension device, J, of any well-known kind. To the

opposite ends of each shuttle are secured the opposite ends of a curved rod, K, which is bent over the upper end of the bobbin I, for a purpose described hereinafter.

On a pin projecting from each shuttle, near the rear end of the same, turns a horizontal roller, *e*, against the edge of which bears a similar roller, *f*, turning at the outer end of one of the arms *b*, and to the under side of the latter roller is secured a pinion, *g*, which gears into a similar pinion, *g'*, the latter gearing into a cog-wheel, *h*, formed on the upper end of the sleeve B.

Secured to the under side of the plate F, and projecting beyond the edge of the same, are four hangers, L, to each of which is secured a plate, *j*, and to each plate may be connected a tension device, N, of any well-known kind, and a rod *k*, and on the latter turns a spool, M.

To the upper ends of standards *o o'*, attached to the base A, is secured a stationary cam-plate, P, of the form shown in Fig. 2, the said plate being parallel to and a short distance below the plate F, and the plate having four curved wires, *u*, as shown in the drawings.

A thick cord or wire, Z, which is to be covered with braid, is carried from a bobbin situated below the machine through the hollow shaft C, and is secured at the upper end to a spool caused to turn by means of any suitable mechanism, so as to take up the cord or wire as it is covered with braid. A thread, *s*, from each of the bobbins I is then passed through the adjacent tension device J, as shown in Fig. 1, and is secured at the end to the cord or wire Z, while a thread, *t*, from each of the bobbins M is passed through its adjacent tension device N, across the edges of the cam-plate P, into the recess *y* in the disk F, and is also secured at the end to the cord or wire Z.

The parts of the machine being now in the position shown in Figs. 1 and 2, a revolving motion in the direction of its arrow is imparted to the driving-shaft E, when the operation of the machine will be as follows: The sleeve B and hollow shaft C will be caused to revolve in opposite directions, the plate F and its bobbins M being carried round in the direction of the arrow 2, Fig. 2, while the arms *b* are carried round in the opposite direction. As the peripheries of the rollers *f*, carried by the arms *b*,

are brought against those of the rollers *e* on the shuttles *H* the latter will be pushed forward in the groove *x* in a direction contrary to that in which the plate *F* turns; hence the threads *t* will traverse in contact with the edge of the cam-plate *P*, and the curved wires *u* on this plate will push the threads outward, while the springs *5*, one of which forms a part of each tension device, tend to draw the said threads inward, the threads being thus moved back and forth in the slots *w* of the bars *G* and in the radial recesses *y* of the plates *F*. As the shuttles *H* cross each of these recesses *y* each shuttle will pass over one of the threads *t*, and will carry over the latter one of the threads *s*. As the shuttle leaves the thread *t* the latter will pass between the rollers *f* and *e*, these rollers revolving at such a speed that the thread is carried outward without being in the slightest degree detained or injured by friction between the surfaces. After each shuttle passes over one thread, *t*, in one recess it will be carried toward the next recess, *y*, the thread in which, as the plate revolves in a direction toward the shuttle, is gradually brought over one of the projections *u*, and is thus carried outside the path of the shuttle. As the shuttle continues its forward motion it passes below and carries the thread *s* beneath the thread *t*, which slides readily over the curved rod *K*, and is thus prevented from being caught by the bobbin.

As the operation of the machine is continued the threads *s* and *t* will be carried round the inner cord or wire, *Z*, the threads *t* being passed over one thread *s*, and then under the next, so that the threads are platted round the central cord in the same manner as in cording and braiding machines of the usual construction.

In the ordinary braiding-machines two sets of shuttles moving in opposite directions are used. These shuttles slide in two scroll-grooves, which cross each other in such a manner that a shuttle moving in one direction passes first outside one shuttle and then inside the next, moving in the opposite direction, the threads being thus carried round and platted over the central cord or wire.

In consequence of the irregular form of the grooves in which the shuttles slide the friction is excessive, and it is impossible to drive the machine at a great speed.

By carrying each set of bobbins or shuttles round in a circle, and by causing the threads of the outer bobbin, to pass first to one side and then to the other of the inner shuttles, as in the machine above described, all excessive friction is avoided, and the machine may be operated with such rapidity that it will produce twice as much braid as one of the same dimensions made in the ordinary manner.

It will be apparent that the number of bobbins and shuttles may be increased or diminished, and that the construction and arrangement of the parts may be varied without departing from the main features of the invention, and that the central cord or wire, *Z*, may be dispensed with when a hose or an ordinary flat braid is to be formed.

We wish it to be understood that we have no desire to claim in this application any devices not shown in the model first filed, but forming part of the additional model filed with the amended papers on the 9th day of April, 1866, and we hereby relinquish any right which we might have were such additional model received without a disclaimer to claim in a re-issue any of the devices introduced in the new model and not shown in the original.

We claim as our invention and desire to secure by Letters Patent—

1. In a braiding-machine, two sets of spools, *M* and *I*, caused to traverse in contrary directions in concentric annular paths, when the threads of the two sets of spools are made to cross each other and be platted by the devices herein described or any equivalent to the same, for the purpose specified.

2. The plate *F*, with its radial recesses *y*, in combination with the cam-plate *P* and its wires or projections *u*, the whole being constructed, arranged, and operating substantially as and for the purpose herein set forth.

3. The combination, substantially as described, of the shuttle or spool-carrier *H* and its guard-rod *K*, for the purpose specified.

In testimony whereof we have hereunto set our hands to this specification in presence of two subscribing witnesses.

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Witnesses:

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