(Model.) 4 Sheets—Sheet 1.

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WEAVING MACHINE FOR COVERING BOTTLES.

No. 262,241. Patented Aug. 8, 1882.

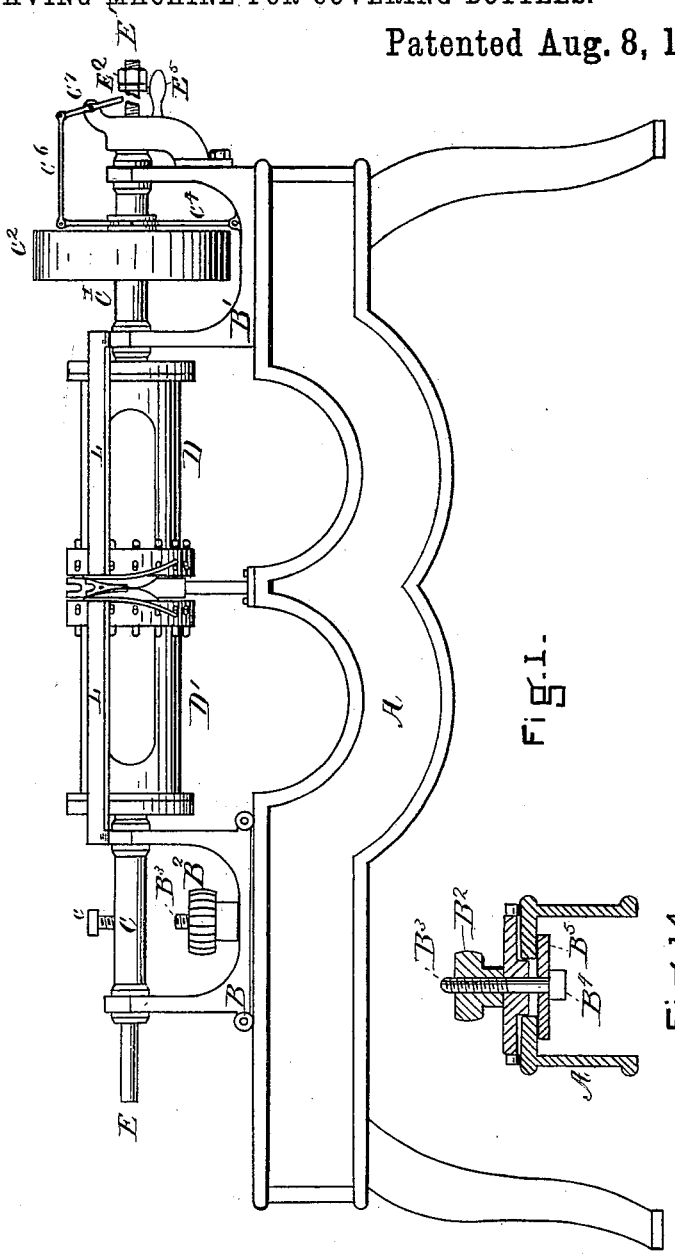

Fig. 1.

Fig. 14.

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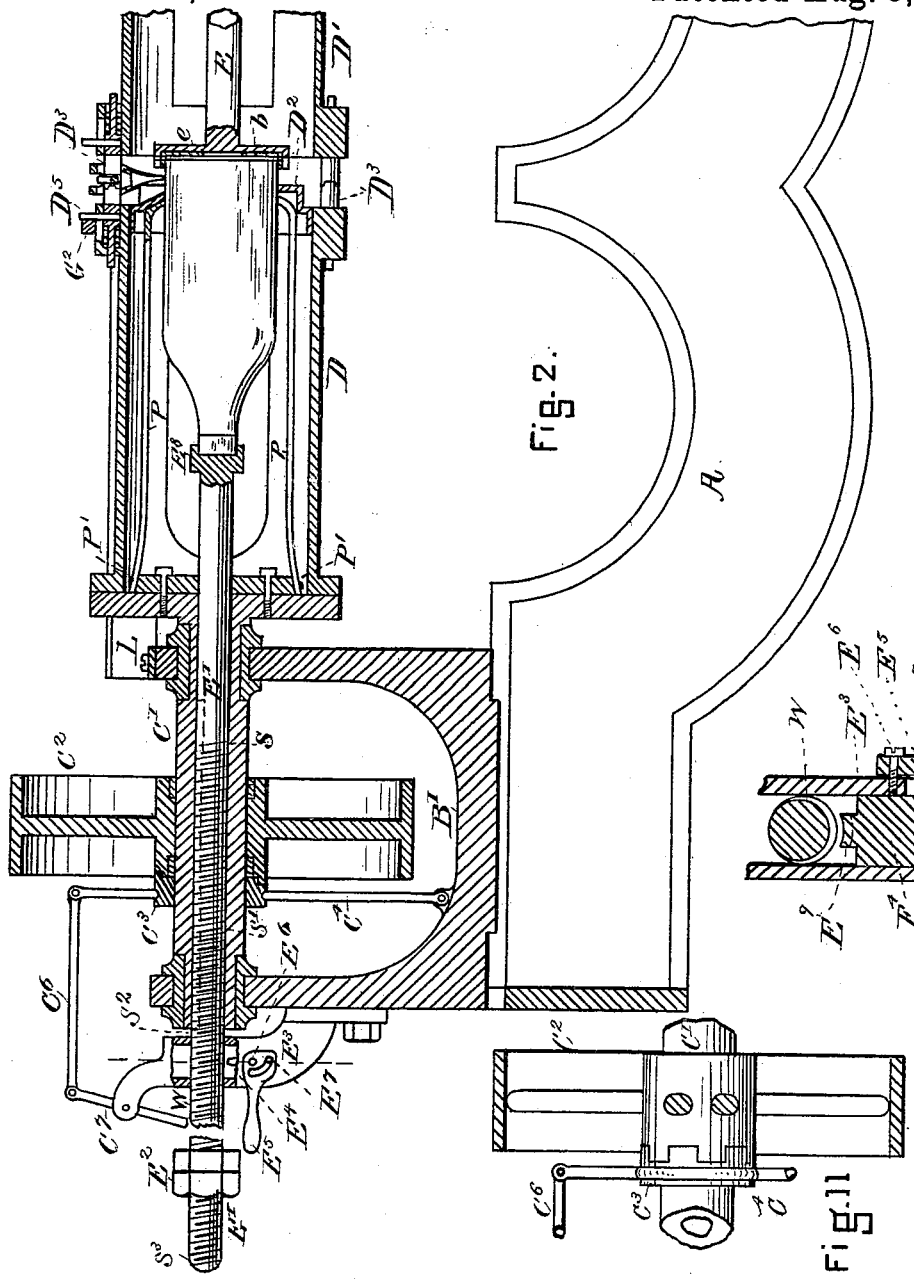

Fig. 2.

Fig. 12

Fig. 11

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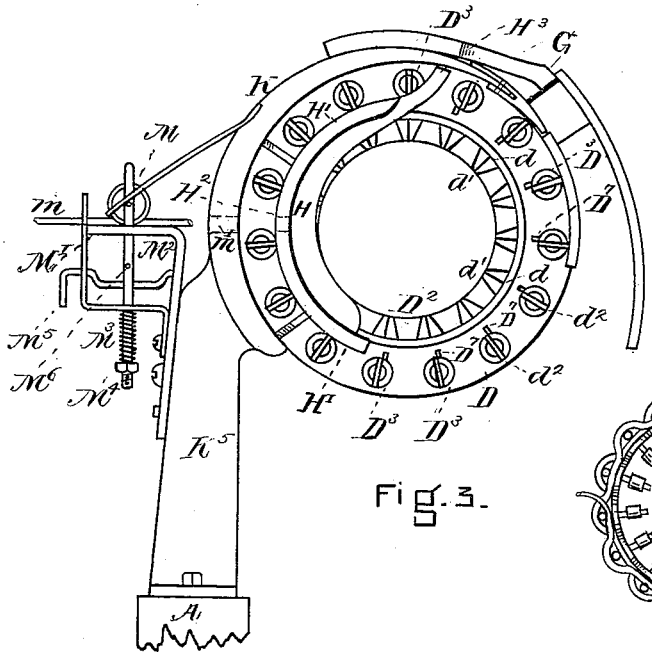

Fig. 3.

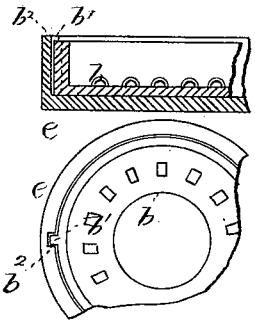

Fig. 13.

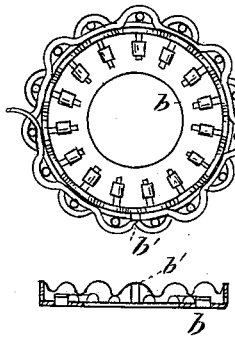

Fig. 4.

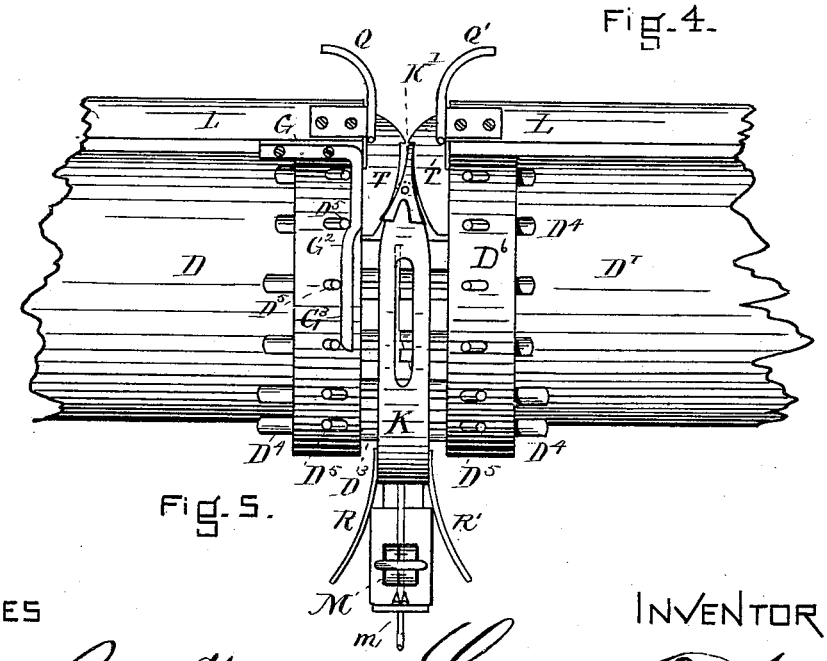

Fig. 5.

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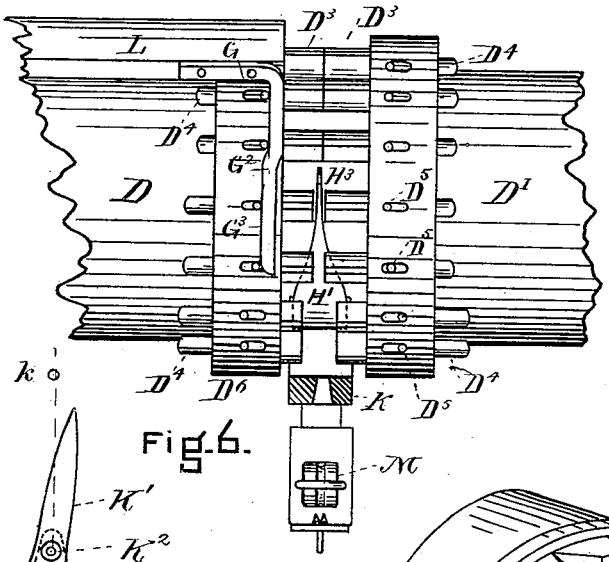

Fig. 6.

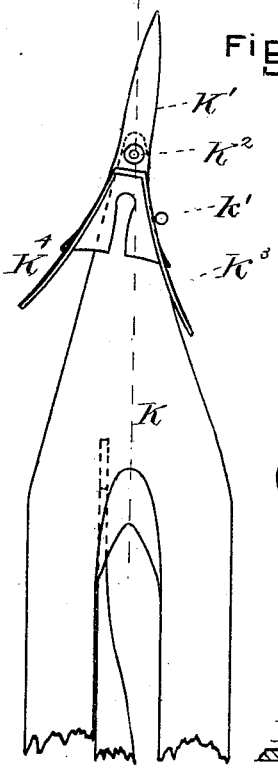

Fig. 7.

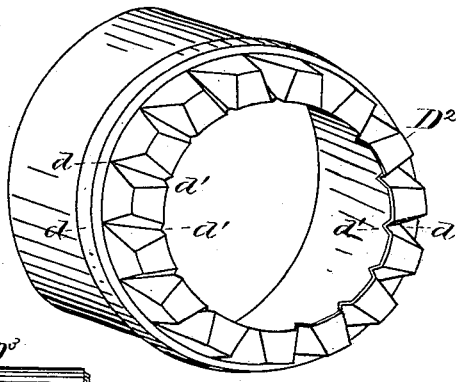

Fig. 8.

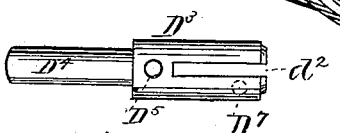

Fig. 10.

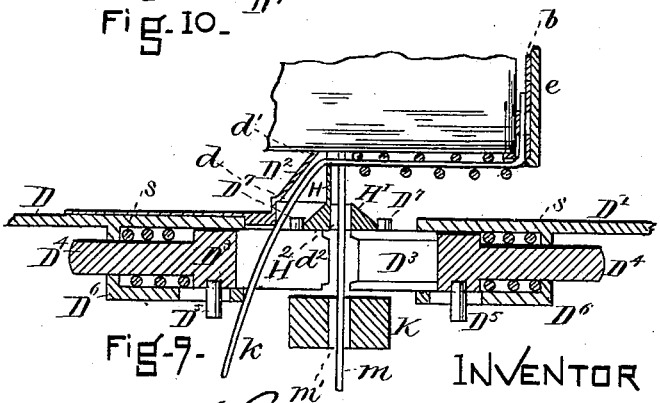

Fig. 9.

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UNITED STATES PATENT OFFICE.

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WEAVING-MACHINE FOR COVERING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 262,241, dated August 8, 1882.

Application filed February 5, 1881. (Model.)

To all whom it may concern:

Be it known that I, SAMUEL OAKMAN, of Winchester, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Weaving-Machines for Covering Bottles, &c., of which the following is a specification.

My invention relates to weaving-machines for covering bottles and other articles; and the objects of my improvement are, first, to secure a firm and moving support for the bottle or other articles operated upon; second, to provide an improved feeding mechanism for the longitudinal movement of the article being covered; and, third, to provide devices for guiding and holding the reeds, &c., used for covering.

I attain the objects of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my machine, showing its general features. Fig. 2 is a vertical section looking from the front, showing the principal parts of my machine. Fig. 3 is an end elevation of the part D of Fig. 2, also showing some of the connected parts. Fig. 4 shows in plan and section the warp or post holding device to be applied to the bottom of the bottle. Figs. 5 and 6 are plan views, showing the warp or post carrying jaws and their adjuncts. In Fig. 6 the parts marked K K′ in Fig. 5 are omitted. Fig. 7 is a detail showing the alternating separating device. Fig. 8 is a perspective view, showing the device for holding the warps or posts in position. Fig. 9 is a sectional detail, showing the operation of my machine. Fig. 10 shows one of the post-holding jaws. Fig. 11 is a view showing the clutch device for the driving-wheel C^2. Fig. 12 is a sectional detail, showing the screw W and the sectional nut E^4. Fig. 13 is a part section and part plan of the post-holding device *b* and of the cup *e* of Fig. 2. Fig. 14 is a cross-section to illustrate the clamping device for holding the tail-stock in place.

A represents the frame for the machine.

B′ and B represent what may be called the "head" and "tail" stocks. The head-stock B′ is stationary, while the tail-stock B is movable, but is provided with a clamping device for holding it in any desired position.

C′ is a hollow shaft running in the head-stock B′, and provided with a loose pulley, C^2, said loose pulley being connected with a clutch device, which connects it with the hollow shaft C′ B^3, Figs. 1 and 14, being the clamp-screw. This clamp screw B^3 passes up through the washer B^5 and the base of the tail-stocks B, and engages with the hand-nut B^2, the head B^4 drawing against the under side of the washer B^5, so that when the hand-nut B^3 is screwed down the tail-stock B is securely clamped in place.

D is a cylinder attached to the hollow shaft C, and provided with a series of jaws, D^3. (See Figs. 2, 3, 5, 6, and 9.) One of these jaws is shown in detail in Fig. 10.

The movable tail-stock B supports the hollow shaft C, which has upon its end a jaw-carrying cylinder, D′, the jaws of the cylinder D′ being identical in construction and operation with those marked D^3 of the cylinder D, except that the ends of the jaws of the cylinder D′ are recessed to receive corresponding projections on the ends of the jaws of the cylinder D. This provision insures the movement of both sets of jaws and the cylinder in unison. One of these jaws is shown enlarged in Fig. 10, and two of them are shown in section in Fig. 9. Each of these jaws is provided with a shank, D^4, Figs. 6, 9, and 10, which passes through the flange D^6 of the jaw-carrying cylinder, and is provided with a spring, S, Fig. 9, to throw it forward when not operated upon by other parts of the machine.

D^5 are pins projecting through slots made in flanges D^6, and serving to keep the jaws D^3 in place, and also to throw the jaws that are connected to the cylinders back, as will be explained hereinafter. The jaws D^3 are also provided with small pins D^7. (See Figs. 3 and 9.) These pins D^7 project inwardly, and serve as a means to open the jaws during a part revolution of the jaw-holding cylinders D and D′. This opening is effected by the stationary wedge-cam H′. (See Figs. 3 and 6.) A section of this cam H′ is shown in Fig. 9, the section being taken across the orifice H^2 of Fig. 3, through which the filling-reed *m* enters. Upon the inner side of the wedge-cam H′, I affix a parting flange, H, the upper end of which, H^3, extends upward, as shown in Fig. 3, the function of which will be hereinafter explained.

The guide-piece D^2 (shown in connection with

other parts in Figs. 2, 3, and 9, and shown in detail in Fig. 8) is inserted within the jaw-carrying cylinder D, and is provided with a series of inclined grooves, *d d'*. The number of these grooves is the same as the number of the jaws D^3, and when the machine is ready to operate these grooves are made to correspond in position, as shown in Fig. 3, with the grooves d^2, formed in the jaws D^3. These grooves *d d'* serve as guides and holders for the reeds that form the warps or posts of the bottle-covering. One of these warps or posts is indicated at *k*, Fig. 9.

G G^2 G^3 is a bar attached to the frame-work L, (see Figs. 5 and 6,) and is so placed that as the pins D^5 of the jaws D^3, carried by the cylinder D, come in contact with it they will be pushed backward, thus causing the jaws D^3 of the said cylinder D to slide backward. This action takes place on each of the jaws in the cylinder D just before it reaches the point H^3 of the parting flange H H', Figs. 3 and 6. The parting flange H H' is not located precisely in the center between the ends of the cylinder D D', but nearer to D than to D', so that it is only necessary to cause the jaws D^3, that are attached to the cylinder D, to retreat before they reach the point H^3 of the parting flange H H'.

K, Figs. 3, 5, and 7, is an outside post-parting shield, and is attached by the standard K^5, Fig. 3, to the frame A of the machine. This serves to part and hold apart the post-reeds, and to admit of the filling-reeds. (Shown in Figs. 3 and 5.) An opening, *m'*, Fig. 3, in this shield K allows the filling-reed *m* to pass into the opening H^2 in the wedge-cam H', and thence to the bottle. (See Fig. 9.) At the extreme end of the shield K (see Fig. 7) is placed a vibrating separating-lever, K'. This vibrating lever is hung on a pivot, K^2, at about its center, the rear end of this lever terminating in laterally-spreading horns K^3 and K^4. This lever is so long as to overreach the space between two consecutive posts, and is so arranged that at least one post is always resting upon it. The distance between the pivot K^2 and the point of the lever is less than the distance between the two posts, so that when a post has entered upon one side—the post *k'*, for instance—and has passed the pivot K^2, it, acting upon the horn K^3, throws the lever over, so that its point is at the right-hand side of the path of the posts. Hence the post *k*, as it comes forward, must enter upon the left-hand side of the lever K' and remain on the left-hand side of the lever, and also on the left-hand side of the shield K. (See Fig. 7.) By the time the post *k* has passed beyond the pivot K^2 the preceding post *k'* will have passed beyond the end of the horn K^3, thus leaving the lever K' free to be thrown over to the left-hand side by the action of the post *k* on the horn K^4, so that the post following *k* will strike the lever on the right-hand side. In other words, each alternate post is thrown on the opposite side of the shield K.

E', Figs. 1 and 2, is a rod which passes through the center of the shaft C', and is provided with a cup-shaped holder, E^8, which receives the extreme end of the neck of the bottle, as shown in the drawings, Fig. 2. This rod E' is connected to the hollow shaft C' by means of a spline and groove so arranged that although it must revolve with the hollow shaft C' it is free to slide longitudinally in it. The rod E' has also a screw-thread cut upon it, which operates, in conjunction with a segment-nut, E^4, in the housing E^3, Figs. 2 and 12, to thrust the bottle backward as the process of weaving goes on. This segment-nut E^4 (see Figs. 2 and 12) is provided with a single Λ-shaped projection, E^9, Fig. 12, which is in fact a short segment of a screw-thread, and is so made in order that it may accommodate itself to the varying thread on the rod E'. The nut E^4 slides freely up and down in the casing E^3, and is provided with a pin, E^7, Figs. 2 and 12, which projects through a vertical slot made in the side of the casing E^3 and enters into a cam-slot made in the lever E^5. (See Fig. 2.) This lever E^5 is pivoted to the casing E^3 by the screw-pivot E^6, so that by turning the lever E^5 the nut E^4 is made to slide up and down—that is, into and out of gear with the screw-thread on the rod E'.

For convenience in stopping the machine when the bottle is fully covered, I place a nut and check-nut on the rod E' at E^2, Fig. 2, this nut being so adjusted that when the bottle has passed its full length through the weaving section of the machine it (the nut) will hit the lever C^7, and, acting through it and the link C^6, will draw the lever C^4 back, which action will throw the clutch C^3 (see Figs. 2 and 11) out of connection with the driving-pulley C^2, thus making the driving-pulley C^2 simply a loose pulley upon the shaft C'. This clutch C^3, sometimes called a "gland," is secured to the shaft C' by means of the ordinary spline and groove, so that it must revolve with the shaft, and yet is free to slide longitudinally on it. It is provided with projections which fit into corresponding recesses made in the hub of the loose band-pulley C^2, (see Fig. 11,) so that when the clutch-gland C^3 is moved up into contact with the hub of the pulley C^2 it must revolve with the pulley, and thus cause the shaft C', and all of the connected parts to also revolve. The screw-rod E', which is within the shaft C' and revolves with it, as already explained, is provided with a screw-thread the pitch of which—that is, the measurement between the threads taken on a line parallel to the axis of the screw—varies, so that the longitudinal movement of the rod E', as it revolves, shall correspond with the differential movement required by the bottle in the process of being covered, as will be explained hereinafter, the coarser part of the thread on the screw E' being located between the letters S S' and S^2 S^3, while the finer part of the screw-thread is located between the letters S' S^2. (See Fig. 2.) As the screw-thread on

the rod E′ is of varying pitch, it is necessary that the screw-nut E⁴, Figs. 2 and 12, should be provided with simply a single Λ-shaped projection, so as to fit between the threads of any part of the screw.

E is a rod passing through the hollow shaft C of the tail-stock B, Fig. 1, and having upon its end a cup-shaped disk, *e*, Figs. 2 and 13. This disk receives and holds the post-holding device *b*, Figs. 2, 4, 9, and 13. The rod E is held in place by pressure exerted by the screw *c*, Fig. 1. In use this pressure is only sufficient to prevent the rod E from sliding too freely; but it allows it to be pushed backward by the action of the positively-moving rod E′.

The post-holding device *b*, Figs. 4, 9, and 13, may be of any suitable material, it forming a permanent part of the bottle-covering, and serves to receive and hold the lower ends of the reeds that form the posts of the bottle-covering, and is preferably open in the center to allow light to enter the bottle for convenience of inspection.

b′, Figs. 4 and 13, is a projection on the post-holder *b*, which fits in a corresponding recess, b^2, made in the disk *e*, Fig. 13. This arrangement serves to cause the bottle and disk *e* to revolve together, and also serves as a guide for inserting the bottle in such a manner that the posts will all coincide with the channels *d d′* and the slots d^2 in the jaws D^3.

Although the rod E, to which the disk *e*, having the recess b^2, is attached, is free to slide back and forth, it cannot revolve except as the shaft C and jaw-holding cylinder D′ revolve, from the fact that the point of the set-screw projects into a longitudinal groove made in the rod E. From the above it may be seen that since the recess b^2 in the disk *e* has a constant angular position in relation to the jaws, it follows that the post-holder *b*, when its projection *b′* is in the recess b^2, must be in a fixed position in relation to the jaws.

The rod E and its cup *e* may be held against the post-holder *b* by the friction-screw *c*, Fig. 1, so as to yield to the positive motion of the bottle caused by the longitudinal motion of the screw-rod E′; or it may be retained by a weight or spring, or by any device which will admit of its yielding longitudinally to the positive motion of the rod E′.

P P, &c., Fig. 2, represent a series of springs, attached at P′ to the cylinder D. These are sufficiently elastic to open to receive the body of the bottle, and also to close up closely about the neck of the bottle as the bottle moves longitudinally, their object being to hold the weft or filling-reed close up to the finished woven part of the covering.

M, Figs. 3 and 6, is a tension-wheel held to the table M′ by means of a loop, M^2, and spring M^3. The wheel M is journaled to the loop M^2, as indicated. The tension or pressure of the wheel may be adjusted by the screw-nut M^4, or may be removed entirely by throwing up the crank M^5. This acting on the cross-pin M^6, will lift the wheel M off the table M′.

Q Q′, Fig. 5, are guards extending from the frame-work L, and serve to prevent the outer ends of the posts from striking other parts of the machine.

R R′ are guides attached to the shield K, and serve to prevent the ends of the posts from interfering with the filling or the tension device.

T and T′, Fig. 5, are guides attached to the frame-work L, and serve to direct the posts into the sphere of action of the vibrating lever K.

The operation of my machine is as follows: The reeds which form the posts may be of any desired number, provided the number is an uneven number. In this case I use fifteen. The ends of these reeds *k* are inserted in receptacles made for them in the post-holder *b*. (See Figs. 4 and 9.) Then the post-holder, with the post-reeds attached, is applied to the bottle. The tail-stock and the jaw-carrying cylinder D′ being pushed back, the bottle is inserted within the cylinder D, with its neck in the holder E^8. (See Fig. 2.) Now the cup *e*, attached to the rod E, is pushed forward so as to embrace the post-holding device *b* and the lower end of the bottle, as shown in Fig 2. Next the filling-reed *m* is inserted through the openings *m′* and H^2, made in the shield K and cam H′. (See Fig. 3.) The end of this reed is inserted in an orifice made in the post-holder *b;* or it may be attached by any other method. Now the cylinder D′ is brought up to place, as shown in Figs. 1, 2, 5, and 6, and there fastened, care being taken that each post shall occupy one of the channels *d d′* and also pass through the slots d^2 in the jaws D^3, one post to each channel and jaw. The machine is now ready to start, the further operation being automatic. As the machine revolves the jaws D^3, assisted by the channels *d d′*, carry the posts *k* first successively past the point of the separating-lever K′, which alternately directs the posts to the right and left hand side of the cam H′, parting flange H, and shield K. Thence the posts are carried past the place of entrance H^2 of the filling-reed *m*, which necessarily is placed between each pair of posts. Thus one post will be under it, while the other will be over it, as shown in Fig. 4. While this operation is going on the bottle is being moved longitudinally by the action of the screw-thread W on the rod E′. This action continues until the entire bottle is covered. Then the nuts E^2 will come in contact with the lever C^7 and throw the driving-pulley C^2 out of gear, thus stopping the machine. The longitudinal movement of the bottle during the process of weaving should be uniform while the cylindrical part is being covered; but the rate of motion should be much slower while the inclined part—that is, the part between the body and the neck of the bottle—is being covered, since this part, being inclined, exceeds in length the corresponding longitudinal movement of the screw-thread W on rod E′. Therefore the longitudinal motion should be slower while the inclined parts of the bottle are being covered

than while the parallel parts are being covered. I effect this by varying the pitch of the screw-thread W on the rod E′ between the points S′ and S².

Having thus described my invention, what I desire to secure by Letters Patent is—

1. The combination of the driving-shaft C′, the nut E⁴, and nut-operating devices E⁵ E⁷ with the cup E⁸, a screw-threaded rod supporting the same, the cup *e*, and rod E, all operating together substantially as described, and for the purpose set forth.

2. The combination of the shaft C′, provided with a driving-pulley, C², the jaw-holding cylinder D, and its jaws D³ with the jaw-holding cylinder D′, its jaws D³, and the shaft C, all operating together substantially as described, and for the purpose set forth.

3. The combination of the post-carrying mechanism with the vibrating switch-lever K′, shield K, and parting cam H H′, all operating together substantially as described, and for the purpose set forth.

4. The combination of the cylinder D, its jaws D³, the cylinder D′, its jaws D³, and their driving mechanism with the wedge-cam H′ and channeled guide-piece D², all operating together as described, and for the purpose set forth.

5. The combination of the driving-shaft C′, the differentially-screw-threaded rod E′, the nut E⁴, nut-operating devices E⁵ E⁷, and cup E⁸ with the cup *e* and rod E, all operating together substantially as described, and for the purpose set forth.

SAMUEL OAKMAN.

Witnesses:
JAMES BARRETT,
THOMAS BARRETT.