

J. H. BROWN.
Plaiting-Machine.

No. 215,790.

Patented May 27, 1879.

Fig. 2. α

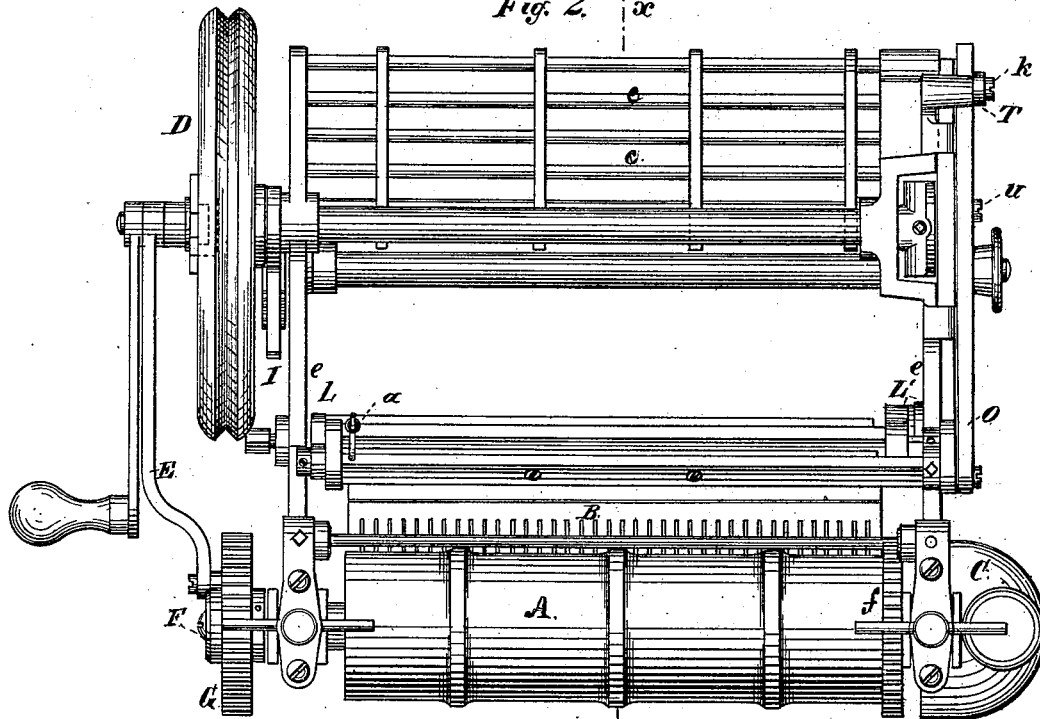
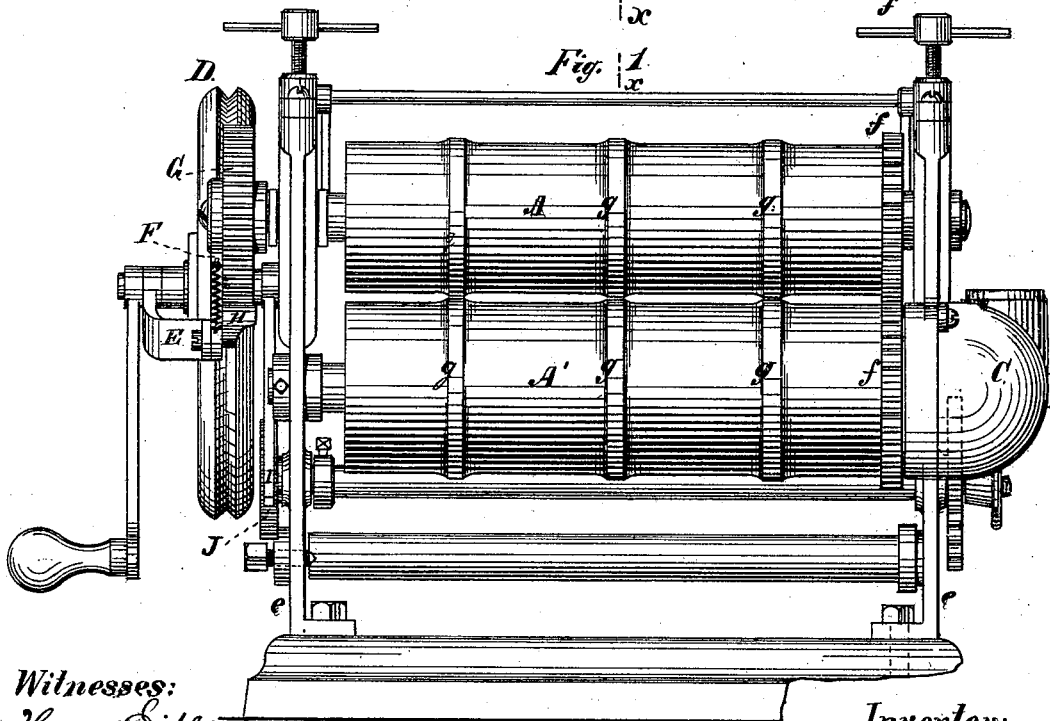


Fig. 1. α



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Fig. 3.

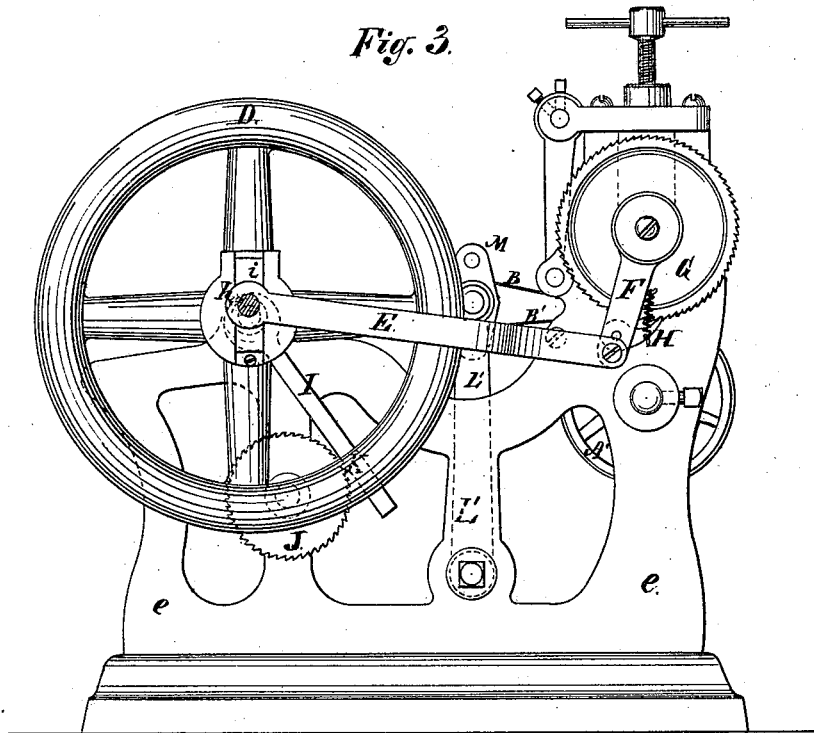
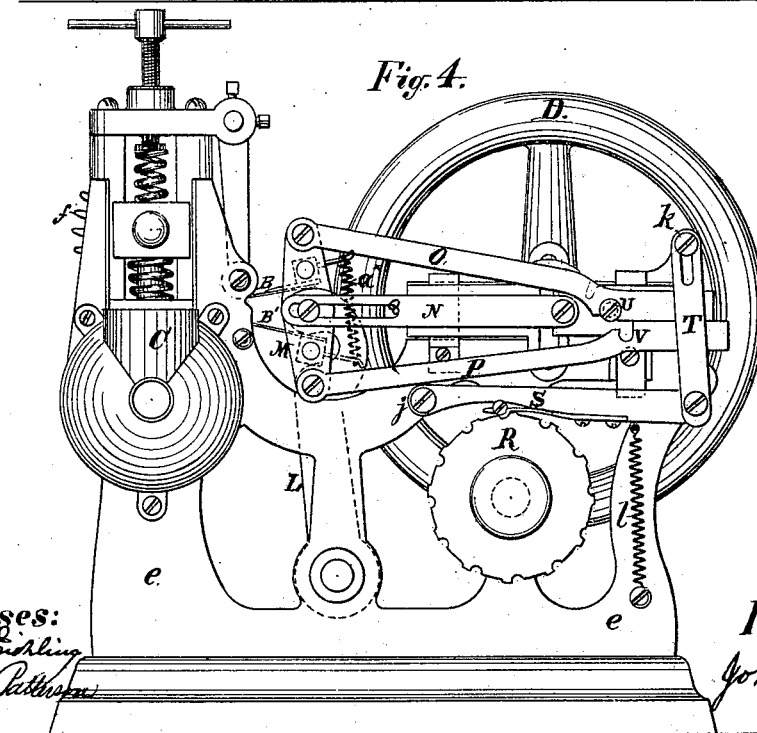


Fig. 4.



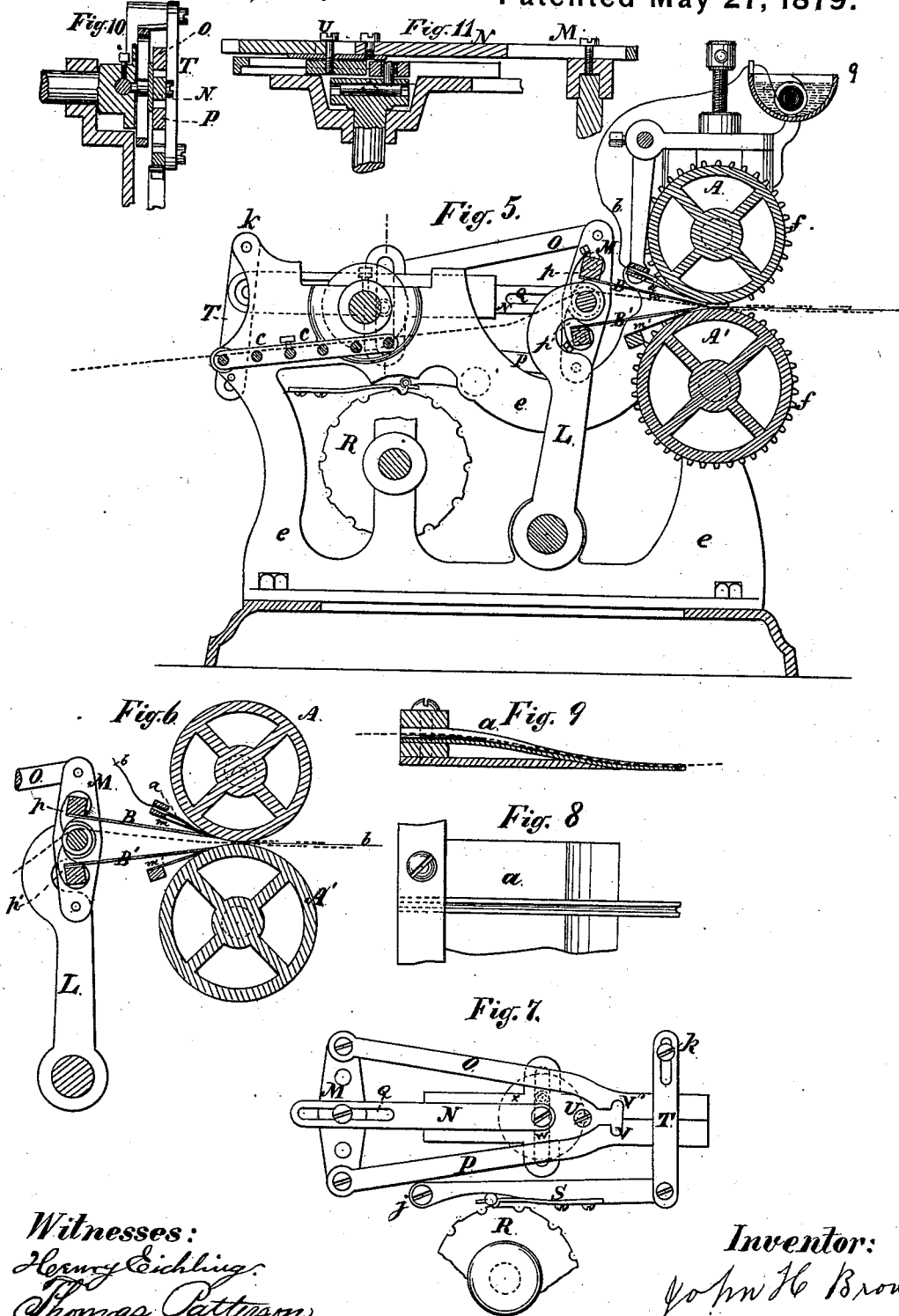
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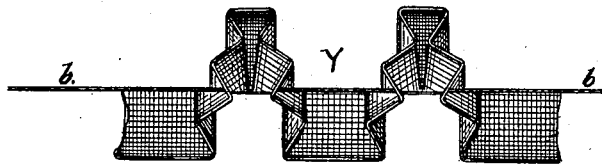


Witnesses:
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Fig. 13.



Z.

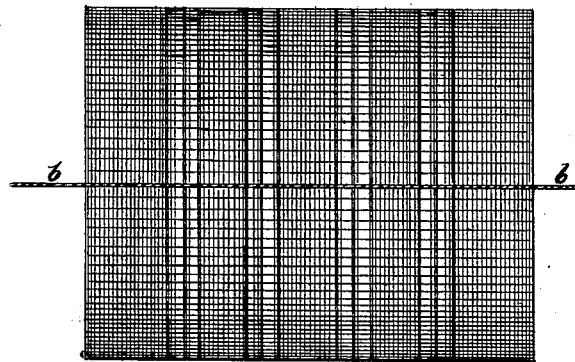


Fig. 12.

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Inventor:

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UNITED STATES PATENT OFFICE.

JOHN H. BROWN, OF NEW YORK, N. Y., ASSIGNOR TO THE KURSHEEDT
MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN PLAITING-MACHINES.

Specification forming part of Letters Patent No. 215,790, dated May 27, 1879; application filed
July 29, 1878.

To all whom it may concern:

Be it known that I, JOHN H. BROWN, of the city, county, and State of New York, have invented a new and useful Machine for Forming Ruffles and Trimmings; and I do hereby declare that the following is a true, full, and complete description of the same, reference being had to the accompanying drawings, forming part of the specification.

In each of said drawings the same part is designated by the same letter.

Figure 1 is a front view of my machine, the end from which the goods are delivered after being operated upon. Fig. 2 is a top view of the machine, showing the upper roller and upper plaiting-blade and the supporting-guide for the material. Fig. 3 is a side view of my machine, showing the left side of Fig. 1. Fig. 4 is a side view of my machine, showing the right side of Fig. 1. Fig. 5 is a view of cross-section of my machine through the line *x x*, Figs. 1 and 2. Fig. 6 is a detailed view, in section, of the rollers, plaiting-knives, and other adjoining parts. Fig. 7 is a separate view of the connections between the former R, Fig. 12, and the plaiting-knives. Fig. 8 is a top view of the guiding-channel for a cord, which may be used with the plaited goods. Fig. 9 is a sectional view of the same. Fig. 10 is a vertical sectional view of the bars N, O, and P, and the crank that imparts motion to them. Fig. 11 is a horizontal sectional view of the same parts. Fig. 12 is a form of former for regulating the movements of the plaiting-knives. Fig. 13 shows a top and side view of a form of ruffle which can be made on my machine with a gummed cord attached thereto.

In said drawings, *ee* is the frame of my machine for supporting the various shafts for operating the mechanism and for the rollers. At one end of said frame, in suitable standards, are mounted two parallel horizontal rollers. These rollers *a a'* may be geared by cogs *f*. In order to form some styles of plaiting the surface of these rollers is cut away or made of less diameter in portions, so as to leave a free space between the surfaces of the rollers, except at given points, such as *g g g*. The object of this is, that while the rollers touch each other at the points *g g g*, so as to grasp

the goods at those points, and thereby feed the same through the machines, yet goods which pass between the rollers at the other points may pass between the same freely and without being flattened or pressed. This is very important in manufacturing fine goods of delicate texture, or those which are desired to be loosely plaited.

When rollers are used with portions cut away or made of less diameter, I prefer the form shown in the drawings, in which the diameter of the rollers gradually diminishes from the point of contact to the point of smallest diameter in a curve of large radius. When this form is used the rollers operate gently upon the whole surface of the fabric to feed it along, but without pressing or flattening it, except at the points *g g g*. The rollers being often heated, this, combined with the pressure at the points *g g g*, tends to cause the fabric to curl slightly—about in the direction of the curve of the cut-away portions of the rollers—and it is thus brought into gentle contact with such cut-away portions, and the plaitings are delivered straighter than they otherwise would be.

I do not, however, limit myself to the use of the rollers above described, as the other portions of my mechanism may be used with rollers of different forms, several of which are well known.

It is often desirable to have these rollers heated, as the goods are often operated upon in a moist state, and it is desirable to dry them in passing through the machine. If this is desired, the rollers are made hollow, and the flame of gas may, by proper connections, be made to burn within the same, a funnel or chimney for the escape of the smoke being shown at C. Any other known mode of heating the rollers, when desired, may be employed.

Motion may be imparted to the rollers by means of a pawl, H, operating upon a ratchet-wheel, G, attached to the end of the shaft of one of the rollers. The point of the pawl is held against the ratchet by a spring, (see Fig. 3,) the pawl being pivoted to an arm, F, extending from the shaft to the ratchet-wheel, and connected by a link, E, to a crank-pin on

the wheel D, which is preferably a fly-wheel. As the wheel D revolves the link E is given a reciprocating motion, and the pawl causes the rotation of the ratchet-wheel and rollers, as will be readily understood from inspection of the drawings. The amount of motion may be regulated by varying the distance of the pin *h* from the center of the fly-wheel D. This distance may be varied by sliding the support of the pin in the slot *i* in the hub of the fly-wheel D.

It is obvious that the greater the distance of the pin *h* from the center of the fly-wheel D the greater will be the extent of motion of the ratchet-wheel G and rollers at each revolution of the fly-wheel. By this contrivance the amount of motion of the rollers at each revolution of the fly-wheel may be varied, the pawl either acting upon every tooth of the ratchet or upon every second, third, or fourth, or more, as desired. The motion imparted to the feeding-rollers by this contrivance is not a continuous motion. Motion may be communicated to other parts as follows: From the shaft of the wheel D an arm, I, extends downward, having near the lower end a small hook, K, which fits into the teeth of another ratchet-wheel, J. This ratchet-wheel is mounted upon a shaft supported by a standard in the frame *e e*, and by means of the link I a regular but not continuous movement is given to the ratchet-wheel J. On the other end of the shaft of this wheel J is fixed the former or pattern-cam R.

It will be readily understood that other known methods of imparting motion may be substituted for those specifically described, and the motion by proper arrangements may be continuous. The former R has its periphery either depressed or elevated, according to a set pattern, variations in the pattern causing alterations in the operation of the machine, as will be hereinafter more fully described.

Above the former or pattern-cam R is a bar, S, pivoted to the frame at *j*, Fig. 4. This bar rides upon the periphery of the former, and has on its lower surface a small piece of metal, preferably a spring, of such a shape that it can enter the depressions in the periphery of the former. The bar S is pivoted at the end opposite to *j* to a link, T, which at its upper end is held to the frame of the machine by a pin passing through a slot in such bar. (See *k*, Fig. 4.) The bar T is slotted at its upper end, so that it can slide upward around the pivot *k* a certain distance. As the bar S rides over the periphery of the former it is alternately raised by the projections on the former and depressed into the depressions in the same by the action of the spring *l*, Fig. 4. Above the bar S are two sliding bars, O and P. They pass under the link T at one end, and at the other are pivoted to the upper and lower ends of a yoke, M.

I have found in practice that the most convenient form is to adjust these bars to each other so that they resemble a letter V laid

horizontally, the ends being pivoted to the yoke M and the apex under the link T.

The two bars O and P have each a recess, V V', of such form that the same will fit around a pin, U. The pin U projects from the surface of a horizontal sliding bar, N. Said bar is slotted at Q at its end, a pin on the end of the shaft which carries the center of a yoke, M, passing through the slot Q in said bar.

A reciprocating motion is imparted to the bar N by means of a crank-pin from the shaft of the fly-wheel D turning in a vertical slot in a plate attached to and back of the bar N. (See Fig. 11.)

Between the standard which supports the shafts of the former R and the standards which support the shaft of the feeding-rollers is mounted a shaft bearing at one end a hook-shaped projecting carrier, L, and at the other end a corresponding carrier, L'. On these carriers, on each side of the machine and near the upper ends, are hung the yokes M on a central pivot.

The plaiting-blades are fastened on shafts hung between these yokes, the upper plaiting-blade, B, being fastened to a shaft fixed to the upper end of the yokes, and the lower plaiting-blade, B', being fixed to the shaft near the lower end of said yokes. Stationary pawl-shaped pieces *p p'* on the yokes and about the shafts of the knives are so arranged that as the yoke is tipped by the advancing of the bars O and P the points of said pawl-shaped pieces will be brought to bear against the projecting ends of the pin or shaft by which the yoke is hung to the hook-shaped carrier, and so cause the carriers, with the blades, to advance.

Instead of the stationary pieces *p p'*, set-screws may be arranged to accomplish the same result, and be capable of adjustment.

The front edges of the knives are held slightly apart, when not forming plaits, by spring *a^x*, Fig. 4, which spring permits them to close on one another, so as to form plaits. A reciprocating motion is thus imparted to the plaiting-blades through the yoke M and by the bars O and P.

The plaiting-blades B B' are preferably formed with their edges like separate blades, or like flat teeth of a comb, as seen in Fig. 2.

Under the lower blade and above the upper blade are two plates, *m m'*, against or over the surfaces of which, in part, the blades act in carrying the fabric to form a plait. The upper blade, B, slides along the under surface of the plate *m*, and the lower blade, B', slides over the upper surface of the plate *m'*.

In the operation of the machine, the former being set in motion operates in connection with the bar S. When the bar S is raised by an elevation on the periphery of the former, it lifts the link T, and with it the ends of the bars O and P, whose rear support is in ways in the back of said bar T. When said bars O and P are thus raised, the pin U is caught in the recess V, and the lower bar, P, is advanced, thereby first tipping up the lower end of the

yoke M, and with it the lower plaiting-knife, B. This brings the edge of said knife in advance of the upper one, and causes it to bear against and grasp the fabric, which lies between its edge and the upper plate, *m*. The same tipping of the yoke brings the point of the piece *p* against the pin or shaft of the yoke, and the further advance of the bar P causes the carriers L L' to advance with the knives. This action forms a plait by the lower knife. When the bar S rides over a portion of the periphery of the former R, which is not elevated or depressed, the support of the bars O and P is so raised that the pin U will not be caught by either of the recesses V or V', and the consequence will be that the bar N will reciprocate backward and forward past the pin on the yoke N without moving said yoke; consequently there will be no movement of the plaiting-knives, and no plait will be formed; but the rollers being in motion the fabric will be fed between them, plain and unplaited. When the bar S falls into a depression in the periphery of the former R, the link T will be pulled down by the spring I, and with it the two bars O and P, and thereby the pin U will be caught on the recess V' in the bar O, and said bar O will then reciprocate backward and forward as long as said bar S remains in the depression in the former, and thereby advance and retract the upper end of the yoke M, and thereby operate the upper plaiting-blade, as specifically described in the case of the lower blade.

It will be seen by this description that by suitable depressions, elevations, and intermediate places on the periphery of the former any desired form of plaited goods may be produced with any desired length of space between the plaits or between groups of plaits, and any number of plaits may be made close together, elevations on the former causing the lower plaiting-knife to act and under plaits to be formed as often and as long as the bar S is riding over such elevations. Plain portions of the periphery of the former, of such a radius that neither of the bars O or P will be caught by the pin U, will cause plain portions or spaces between the plaits in the plaited goods, for while the bar S is riding over such plain spaces neither of the plaiting-knives will operate; and in the same way as above described depressions in the periphery of the former will cause corresponding plaits by the upper plaiting-knife. By combinations of suitable elevators and depressions on the former any desired side or box plaiting may be formed, different-shaped formers or pattern-cams being used according to the pattern or style of plaiting desired.

It is important that the hook-carrier L should not turn too easily with or on its shaft, so that the tipping of the yoke by the bars O or P, to cause pressure of the knives on the fabric, may precede the movement forward of the carriers and the plaiting-knives to form the plaits.

The operation of the knives is to form the plaits and tuck them in between the surfaces of the feeding-rollers. The rollers then advance the goods. Above the plate *m* is the cord-guide *a*. (See Fig. 5 and Fig. 9.) This cord-guide carries the cord *b*. The cord may come from a reservoir of gum-water situated at any convenient place above or in the vicinity of the machine, as at *g*, Fig. 5; and the cord drawn from this reservoir of gum-water and saturated therewith is conducted by the guide *a* to a point between the feeding-rollers, and there delivered onto the surface of the fabric which is being operated upon. The guide should be so arranged as to deliver the cord at a point where the rollers press upon each other. By this arrangement a gummed cord will be laid upon the surface of the plaited goods and pressed thereon, and dried by the heat of the rollers, and thereby, when the fabric is delivered plaited from the machine, the plaits will be held in place by the gummed cord affixed to their surface, and thereby the necessity of sewing or starching the goods to keep the plaits in place will be obviated. By soaking the cord in gum-water in a reservoir attached to and forming a part of the machine it is made adhesive and can be fed directly from the reservoir to the guide, thus avoiding the trouble of separately preparing adhesive strips, as heretofore, or pasting directly on the surface of the goods, which is found objectionable in many fabrics.

The passage of the fabric through the machine is as follows: The fabric is delivered into the rear of the machine over the supporting-guide *c c*. It passes between the plaiting-blades B B' and between the feeding-rollers. It is drawn through the machine by the movement of the feeding-rollers. As it is so drawn through the machine it is plaited either by one of the plaiting-blades alone, so as to form single plaiting, or by both plaiting-blades, so as to form box-plaiting, the spaces between the several plaits (either plain or boxes) being regulated by the configuration of the former, as above described. At the same time that the goods are thus plaited one or more gummed cords are attached to its surface, as before described, and those portions of the plaiting which pass between the portions of the feeding-rollers which are not in contact are not pressed flat, but are left loose and in delicate condition.

By forming flutes or meshes on some of the portions of the feeding-rollers which come in contact with each other fluting may be combined with ruffling.

I do not limit myself to the exact configuration or movement of the parts, or to the particular methods of imparting motion to the several combinations claimed by me, as these may be varied without departing from my invention; but

What I do claim is as follows:

1. The combination, with suitable devices for forming ruffling or plaiting, of a pair of

rollers touching each other, and feeding the goods only at the narrow zones or points *g g g*, the rest of these surfaces being cut away, so as to permit the passage of portions of the ruffled goods in an unpressed or unflattened condition, substantially as described.

2. In combination, feeding-rollers, a former or pattern-cam, a plaiting-knife and yoke with bar for tilting the same, and a device controlled by the pattern-cam for automatically connecting and disconnecting said bar with the operating mechanism, substantially as described.

3. In combination, a former or pattern-cam, bar S, link T, and bars O, P, and N, constructed and arranged to operate substantially as described.

4. In combination, a former or pattern-cam, bar S, link T, bars N, O, and P, and yoke M, constructed and arranged to operate substantially as described.

5. In combination, the former R, bar S, link T, bars O and P, and two plaiting-knives, substantially as described.

6. In combination, a former or pattern-cam, bar S, link T, and bars N and O, (or P,) and a plaiting-knife, constructed and arranged to operate substantially as described.

7. In combination, feeding-rollers, a former or pattern-cam, plaiting-knives and bars for operating the same, and a device controlled by the action of the pattern-cam for bringing either of said bars in connection with the operating mechanism or keeping them both free from it, substantially as described.

8. In combination, feeding-rollers, one or more plaiting-knives, the yoke M, one or more bars for tilting the yoke, the slotted bar N', and suitable connection with a former or pattern-cam, constructed and arranged to operate substantially as described, so that while feeding-rollers are regularly feeding the goods the plaiting-knives may, from time to time, operate or remain at rest, as desired.

9. In combination with feeding-rollers, substantially as described, and plaiting devices, a guide for laying a gum cord on the surface of the plaited goods at the points where the feeding-rollers press upon each other, arranged substantially as described.

10. The method of securing the plaits of ruffles or similar goods in position by means of a cord soaked in some adhesive substance, fed from a reservoir connected with the machine directly into the same simultaneously with the goods, and pressed upon the plaits formed in said goods, whereby the cord is gummed and the plaits secured in position at the same operation without the necessity of first pasting the fabric to be plaited, substantially as described.

11. In combination with a plaiting blade or blades, arranged to operate substantially as described, a pair of rollers with their faces recessed in sections, curving from the points of contact, substantially as shown.

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