2 Sheets—Sheet 1.

W. & J. COUTIE.
Ironing-Machine.

No. 199,898. Patented Feb. 5, 1878.

Fig. 1.

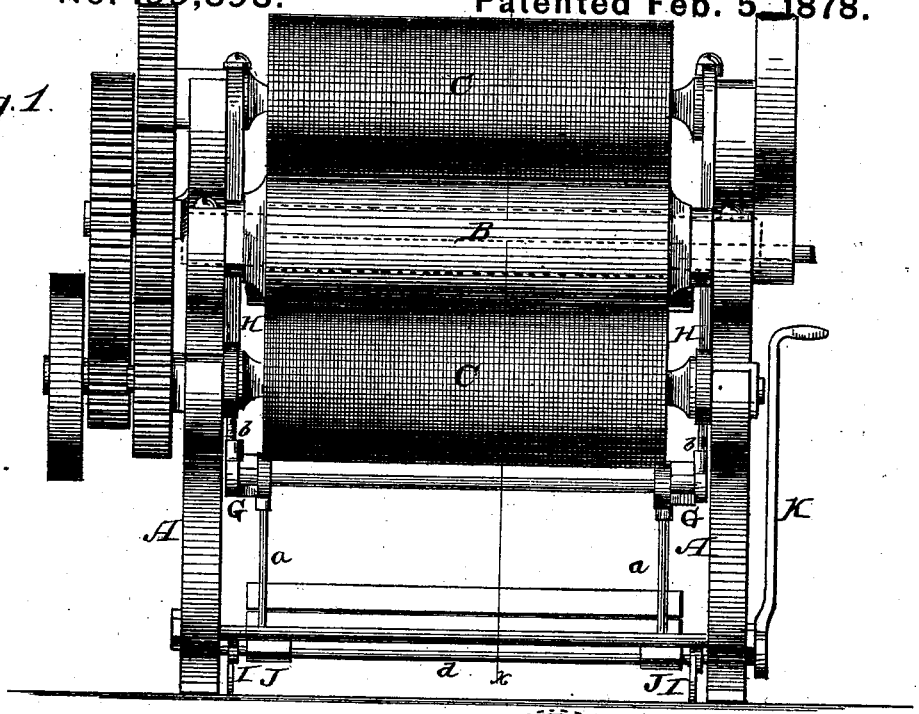
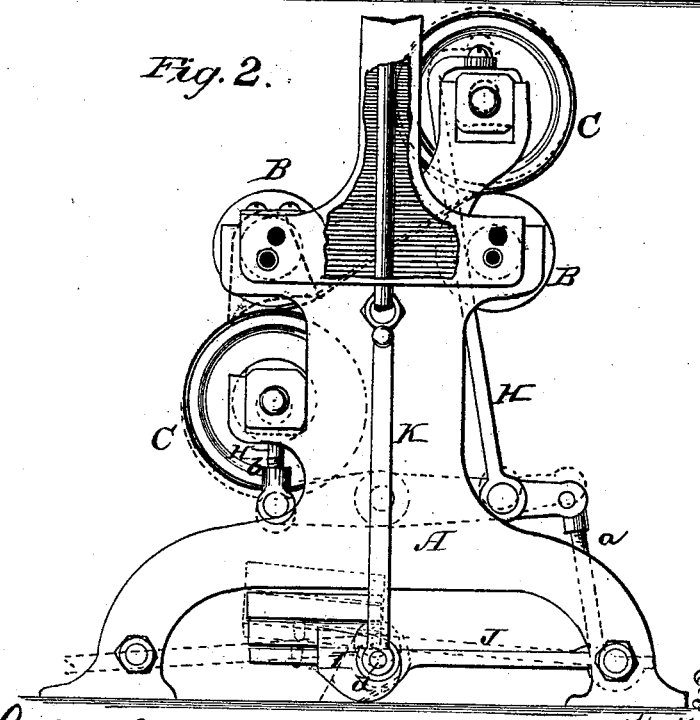


Fig. 2.



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2 Sheets—Sheet 2.

W. & J. COUTIE.
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Fig. 3.

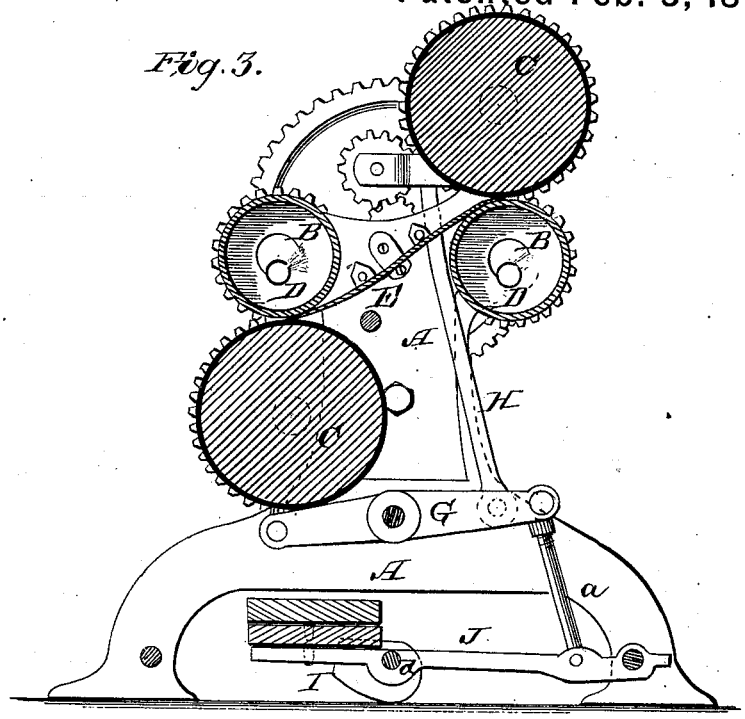


Fig. 4.

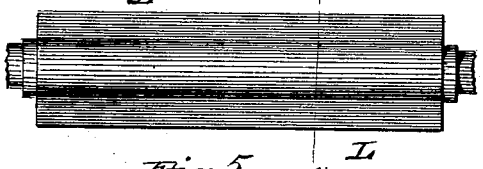


Fig. 5.

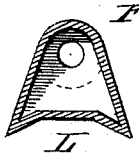


Fig. 7.

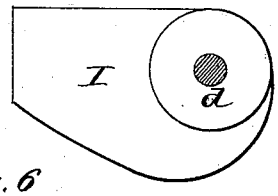
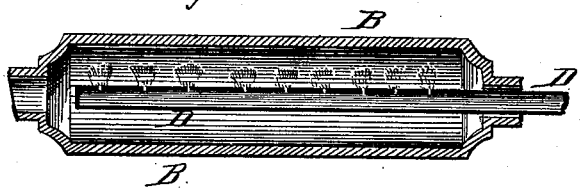


Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM COUTIE AND JAMES COUTIE, OF TROY, NEW YORK.

IMPROVEMENT IN IRONING-MACHINES.

Specification forming part of Letters Patent No. **199,898**, dated February 5, 1878; application filed August 18, 1877.

To all whom it may concern:

Be it known that we, WILLIAM COUTIE and JAMES COUTIE, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Calenders; and we do hereby declare that the following is a full, clear, and exact description of our invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The nature of this invention consists in the construction and arrangement of a machine that will properly calender or finish both sides of collars and cuffs at one operation, and in the method of doing the same, as will be hereinafter more fully set forth.

In the annexed drawings, which fully illustrate our invention, Figure 1 is a front elevation of our machine. Fig. 2 is a side view, and Fig. 3 a transverse vertical section, of the same. Figs. 4, 5, 6, and 7 are detailed views of parts thereof.

The ordinary calender for webs or paper in rolls will not accomplish what we have aimed at on account of the seams, the low temperature of the finishing-roll, the difficulty of feeding so great a number of separate pieces, and the want of any known means of preserving these pieces at their natural length.

A represents the frame-work of our machine, wherein are arranged two pair of rolls, each pair consisting of one finishing-roll, B, and one covered roll, C, the position of said rolls in the two pairs being reversed.

For the finishing-roll we use an ordinary hollow cast-iron roll, open at one end to admit air, and closed at the other by a chimney or exhaust-pipe. Through the chimney and journal we pass a pipe, D, perforated as shown, for carrying a mixture of gas and air, which burns inside and supplies the heat. As the proper mixture of air and gas is too cold to burn perfectly, and an ordinary burning will not give the temperature required, we leave one end of the roll full open, and apply a jet of air from a fan to the chimney, and form a rapid draft through this open end, which converts the roll into a sort of blow-pipe, and gives the temperature required.

As the covered roll C needs to be unusually elastic on account of the heavy seams, and the high pressure and temperature require frequent renewals, we use the cheapest elastic covering convenient, preferring two thicknesses of heavy woolen blanket covered by six to twelve thicknesses of canton-flannel, this again by a temporary finishing-cover of fine muslin, all being run on by the ordinary working motion of the machine when ready for use.

Each of the covered rolls C performs in one machine separate functions:

First, they feed the material, and the speed of the work passing through the machine is the same as the speed of the surface of these rolls.

Second, they receive thick parts or inequalities of the goods, and press the whole surface of the goods against the finishing-rolls.

Third, they assist in heating the goods, as the work we wish to perform is best done at the highest temperature that will not scorch. To obtain this we fix the covering on the roll, and make this roll of the smallest diameter that will work well, so that the whole roll will be at the highest temperature that will not scorch the covering, thereby assisting the heating-roll in heating the goods, and at the same time keeping both sides at a more equal temperature.

Fourthly, when short goods, such as collars and cuffs, are calendered, they are first dampened, and the dampening shortens or shrinks the goods. When these goods are then passed through calender-rolls which move with the same surface velocity, the finished goods will be the same length as the dampened goods; and when the finishing-roll moves faster than the covered roll the shortening is increased, because the feed of the goods is always equal to the speed of the covered roll, and because the stretch or shortening is always on the damp part of the goods, and not on the dry. When, however, the feed or covered roll moves faster than the finishing-roll, it constantly and uniformly draws the damp part away from the dry part, and brings the whole piece to its true length when dry, so that short goods, and particularly crooked pieces, which cannot have a tension otherwise, are calendered to their true dry length. For example, a sixteen-inch collar or No. 10 cuff has heretofore always been cut from one-half to three-fourths of an inch longer than it is in-

tended to be, to compensate for the shrinkage; but by our process the goods may be cut the exact length required, and the shrinkage caused by the dampening of the goods is nullified, or the goods stretched again while passing through the machine.

By practical experiments we have found that when the motion of the covered roll is from three to five per cent. greater than the finishing-roll this object is perfectly obtained.

In the arrangement of the rolls we place either the two finishing or the two covered rolls in nearly the same horizontal plane, at a distance of about the length of the goods between the centers, and place the other two rolls, one on the upper and the other on the lower side, but inclined so that the right line which joins their points of contact passes through both pairs; or the rolls may be placed vertically, one of each pair directly under or over the other.

The goods are conveyed from the highest or first pair to the second pair by an inclined plane, E, set so that it will act as a scraper to the lower one of the first pair, and the angle is such that the goods will retain their proper position to the rolls, and slide from one pair into the other. It also acts as a platform where goods can be arranged to pass through one pair of rolls only.

The pressure by which the rolls are forced together varies from one to two tons; and the temperature of the finishing-rolls is so high that a stoppage of one or two seconds will burn the covering on the other rolls. We make the covered rolls movable upward and downward away from the hot rolls, and rest or connect their bearings by rods H H upon opposite ends of two beams, G, under the rolls. These beams are pivoted to the frame, and the rolls and beams balanced, so that when one roll is moved away from the hot roll the other is moved away in the opposite direction, and this without having to lift the weight of the rolls.

These beams are extended upon one end beyond the points upon which the rolls rest, and connected by rods *a* to the levers J, upon which the weights rest, so that they continually pull one covered roll and push the other toward the hot rolls. The length of the connection between the upper rolls and beams G is fixed and permanent, while that between the lower roll and beams is adjustable in length by means of a screw at *b*, and can be varied at pleasure, by which arrangement the pressure may be equally divided between the two pairs of rolls; or the whole of it may be applied to one pair, or divided in any other proportion the finish of the goods may require, for while the weights remain the same, what we apply to one roll we take from the other.

To vary the total pressure, the weights are made of a number of pieces, and it is varied by the number of pieces applied.

To throw the rolls apart, we attach a shaft, *d*, on the under side of the levers J, which carry the weights, and on this shaft, alongside the levers, we place two cams, I I, arranged so that a half-revolution will raise the ends of the levers which carry the weights, and by the connection with the beams G easily and instantly move the rolls out of contact by means of the handle K at one end of the machine.

Our calender, as thus constructed, is in proper condition for producing a dead or domestic finish on the goods; but for goods requiring a rubbed or polished finish on one side, we replace the polishing-roll with a rectilineal stationary piece, L, that fits the same place as the polishing or hot roll, with all the heating connections the same. The polishing part of this piece is the same length, and its rubbing-face is part of a polygon whose least diameter is the same as that of the covered roll. We generally use three sides for the goods to rub on in passing through. The advantage of this over a roll, besides polishing the goods, is that we can reduce both the temperature and pressure, for the goods receive three rubs or more, while the roll only gives one, and the goods are longer exposed to the heat on account of the concave form and the number of faces; and as the working of the machine is due to heat, time, and pressure, and as these are convertible into each other in the work done, the longer the goods are in the heat the lower the temperature and the less pressure required, and the more the rubs the less the pressure required, so that with this concave polygon we can do some work better, and do more of it in the same time, and do it with less heat and pressure.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The method of ironing articles of a plurality of thicknesses, such as collars, cuffs, &c., by stretching the damp short side simultaneously with the drying and natural expansion of the other side, substantially as set set forth.

2. In a calender-machine having two calender-rolls set in reversed position, as described, the combination, with said rolls, of the movable bearings in which the rolls are mounted, the rods H H, pivoted beams G G, rods *à a*, weighted levers J J, screw *b*, and shaft *d*, with cams I I, all constructed substantially as and for the purposes herein set forth.

3. In a calender-machine, the concaved polygonal-faced polisher L, in combination with a rotating calender-roll, substantially as and for the purposes herein set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

WILLIAM COUTIE.
JAMES COUTIE.

Witnesses:
WM. COUTIE, Jr.,
EDWIN MORRISON.