To all whom it may concern:

Be it known that we, WALTER C. CUNNINGHAM and WALTER A. STEBBINS, citizens of the United States of America, residing in the city and county of Denver, State of Colorado, have invented certain new and useful Improvements in Edge Ironing and Shaping Machines; and we do declare the following to be a full, clear, and exact description of the invention, such as 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.

Our invention relates to improvements in edge ironing and shaping machines, our object being to provide a machine especially adapted for ironing the edges of collars and cuffs in laundries where large quantities of these articles are to be handled.

Our further object is to provide an apparatus of this class which shall be automatic in action as well as reliable, durable, and efficient in use; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a side elevation of our improved machine. Fig. 2 is a top or plan view of the machine with parts above cut away in order to more perfectly disclose the mechanism below. Fig. 3 is a section taken on the line 3,3, Fig. 2. Fig. 4 is a section taken on the line 4,4. Fig. 2.

The same reference characters indicate the same parts in all the views.

Let A designate a suitable stationary support provided with a flat top A', upon which is mounted an integral bracket A'', provided with upwardly-projecting arms A', having bearings A', in which is journaled a shaft A'.

To the outer extremity of this shaft is made fast a pulley A', while between the bearings A' is located a pulley A', both pulleys being made fast to the shaft and rotating therewith. The pulley A', as shown in the drawings, is considerably larger in diameter than the pulley A'. The last-named pulley is connected by means of a belt A' with a pulley A'', fast on a shaft A', journaled in the bearing A', formed integral with the support A.

Also made fast to the shaft A' is a flat-faced pulley or band wheel A', which may be connected, by means of a belt, with any suitable motor for the purpose of operating the machine. To the inner extremity of the shaft A' is made fast a beveled pinion A', which meshes with a gear A, fast on a vertical shaft A, journaled in the support A and projecting above the horizontal face A of the table. Located above the table and made fast to this shaft is a large roller A, which co-operates with a relatively small roller A', the latter being made fast to a vertical shaft A', also journaled in the support A. The upper extremities of the shafts A' and A' are bored vertically to receive pins A and A', to which are connected the lower extremities of a bow-shaped spring A, to which is applied a ring A. The sides of this spring A are somewhat inclined, whereby their lower extremities are farther apart than the upper portions of the sides of the spring, whereby as the ring A is moved downwardly the tendency of the spring is to draw the rollers A and A' closer together, whereby their tension or the power with which they grasp the article to be shaped, as a collar or cuff, is increased. The shaft of the outer roller A' is journaled somewhat loosely in order that the spring A may produce the effect above stated.

Made fast to the lower extremity of the shaft A', just above the beveled gear A', is a sprocket-wheel B, which is connected, by means of a chain B', with a wheel B', fast on the lower extremity of a vertical shaft B, journaled in the support A. To the shaft B' is made fast a roller B', which co-operates with a similar roller B', made fast to a suitable shaft B', also journaled in the stationary support A. The upper portions of the shafts B' and B' are bored to receive pins B', to the upper extremities of which pins are attached the lower extremities of a bow-shaped spring B, the sides of which diverge as they extend downwardly. Applied to this spring B' is a ring B' for controlling the tension of the spring. By moving the ring B' upwardly or downwardly on the spring B' the tension of the rollers may be regulated, since the shaft B' of the roller B' is journaled somewhat loosely in order to permit the necessary play.
for tension-regulating purposes. Also made fast to the lower extremity of the vertical shaft B" is another sprocket-wheel B° to which is connected a chain B, which leads to a sprocket-wheel B°, made fast to another shaft journaled in the support A and to which is made fast another roller B, cooperating with a roller B. These last-named rollers B" and B" are substantially of the same construction as the pair originally described and designated by the same reference characters. The first-described pair of rollers B" and B" is located at about the center of the length of the table top on one side, while the last-described pair of rollers B" and B" is located at what we will term the "forward" end of the table, or the end farther to the right, in Figs. 1 and 2 of the drawings. The forward pair of rollers B" and B" also have their shafts bored to receive pins B", whose upper extremities are attached to the lower ends of a bow-shaped spring B', provided with a ring B", the same as the first-described pair of rollers B" and B". The two pairs of rollers B" and B" may be called "feed-rollers," since through their instrumentality the articles whose edges are to be ironed are moved along the top of the table. The two pairs of rollers B" and B" together with the rollers A" and A" are so located that their peripheries or curved surfaces engage each other in the same straight line. The individual rollers of each pair of feed-rollers are of the same diameter, while the rollers A" and A" are of different diameter, the roller A" being much larger than the roller A", whereby the article to be ironed when it passes between the rollers A" and A" is shaped or caused to curve or bend in the direction of the smaller roller or in a direction having a tendency to curl or bend around the smaller roller.

A belt C leads from the pulley A" to a smaller pulley C", fast on a horizontal shaft C", journaled in separated bearings C", formed in the lower extremity of a yoke C", whose upper extremity is provided with bearings C" and C", movably mounted on the shaft A". Extending forwardly from the bearing C" is a bar or rod C", upon which is slidably mounted a counterbalance-weight C", which may be secured to the rod by a set-screw C. By loosening this set-screw the weight may be moved back and forth on the rod C", according to the counterbalancing effect required.

To the extremity of the shaft C" remote from the pulley C" is made fast an edge-ironing wheel D, which is provided on one zone of its periphery with a circumferential V-shaped groove D, while the wider zone D of its periphery incloses a gas-chamber, to which combustible fluid is carried through a conduit D.. This fluid is composed of air and gas mixed in suitable proportions for purposes of combustion. The air and gas are introduced to this conduit through nipples D and D and are controlled by valves D and D. These nipples may be connected with conduits which lead from air and gas under pressure. One of these conduits is illustrated in Fig. 1 of the drawings and designated D.

The gravity and location of the weight C" are so regulated that the edge-ironing wheel D shall have the desired pressure upon the edge of the article to be ironed in order to give the necessary or proper result during the ironing operation. The V-shaped zone of the edge-ironing wheel is located in one line with the points of peripheral contact of the three sets of rollers—that is to say, the two sets of feed-rollers and the pair of shaping-rollers.

Movably mounted on the shaft A" is an arm E, to whose forward extremity is attached a rod E', upon which is adjustably mounted a weight E', held in place when properly adjusted by a set-screw E. By loosening this set-screw it is evident that the weight may be moved forward or back on the rod, as may be desired. The arm E' is provided with a nipple E", which communicates with a central opening E", leading to a moistening-wheel E", journaled on the lower extremity of the arm E, which is bent outwardly, as shown at E", in order to bring the moistener into line with the points of contact of the several sets of rollers heretofore described. A suitable flexible conduit F leads from a valve-casing F, connected with a water-tank F by means of a short branch pipe F. The passage of water to the conduit F from the tank F' is controlled by means of a valve F", and in this way the absorbent portion E" of the moistening-wheel is kept sufficiently saturated for the proper performance of its function, as hereinafter explained. As shown in the drawings, this absorbent portion of the moistening-wheel is interposed between two disks, which project somewhat beyond the absorbent portion, whereby the disks form guides for the edge of the article to be moistened.

Between the moistener E' and the forward pair of feed-rollers is located a bracket G, which is made fast to the arm E and is of sufficient length to carry a number of rollers G, there being four of these rollers shown in the drawings. The peripheries of these rollers are grooved, and they are engaged by an endless belt G, which is transversely curved to fit the peripheries of the rollers. These rollers and their engaging belt are located in the tangential plane of the pairs of rollers heretofore described and also in line with the absorbent portion of the moistening-wheel.

It will be understood that since the arm E is movably mounted or journaled on the shaft A" the moistening-wheel E", together with the rollers G and their belt, are vertically movable and may move upwardly or downwardly.
wardly, according to the width of the article to be ironed, as a cuff, as it is fed thereto by one pair of feed-rollers or drawn beneath by the other pair of feed-rollers during the operation of the machine. The position of the weight \( E' \), being located in front of the fulcrum of the arm \( E \) or the shaft upon which it is mounted, determines the pressure of the belt \( G \) and the moistening-wheel \( E'' \) upon the edge of the article to be ironed, as will be readily understood. In this respect the operation of the arm \( E \) is substantially the same as that of the yoke \( C \), which is adapted to oscillate upon the shaft \( A^3 \) as a fulcrum, as the articles to be ironed are passed into engagement with the \( V \)-shaped part \( D^\prime \) of the edge-ironing wheel. Immediately forward of the edge-ironing wheel and between said wheel and the rear pair of feed-rollers is located a set of guide-rollers, consisting, as shown in the drawings, of three rollers \( H \), engaged by an endless belt \( H' \). The peripheries of these rollers are grooved in the same manner as the rollers \( G' \), and the engaging belt \( H \) is made to fit the grooves of the rollers, whereby the outer surface of the belt is transversely grooved to receive the edge of the article to be ironed and guide it to the edge-ironing wheel. These rollers \( H \) are all mounted on a bracket \( I \), made fast to the yoke \( C^\prime \), as shown at 1.

Made fast to the top of the table in the tangential plane of the several sets of rollers, and also in the plane of the moistening-wheel and the grooved portion of the edge-ironing wheel, is a number of pairs of short guides \( J \), one pair of guides being located about midway between the two sets of feed-rollers, another pair near the rearward set of feed-rollers, and the other pair beneath the grooved periphery of the edge-ironing wheel. These guides assist in directing the article to be ironed in a straight line across the table during the operation of the machine.

From the foregoing description the use and operation of our improved machine will be readily understood. The edge-ironing wheel, the large shaping-roller, and the roller \( B^\prime \) of each set of feed-rollers are all rotated through the instrumentality of power applied to the shaft \( A^{16} \). Motion is transmitted to the edge-ironing wheel from the shaft \( A^{16} \) through the instrumentality of the pulley \( A^5 \), the belt \( A^8 \), the pulley \( A^8 \), the pulley \( A^7 \), the belt \( C \), the pulley \( C' \), and the shaft \( C^\prime \). Attention is called to the fact that the pulleys \( C', A', A^4 \), and \( A^4 \) are all grooved or provided with \( V \)-shaped peripheries, whereby belts or cables circular in cross-section may be employed, the said belts being prevented from slipping off by the peculiar shape of the pulleys' peripheries.

Movement is transmitted from the shaft \( A^{16} \) to one of each of the different sets of rollers through the beveled gears \( A^{14} \) and \( A^{15} \), the sprocket-wheel \( B \), the chain \( B' \), the sprocket-wheels \( B^0 \) and \( B^9 \), the chain \( B^{10} \), and the sprocket-wheel \( B^{11} \). The feed-rollers are preferably composed of some yielding material, as soft rubber, in order to give the necessary friction to cause the articles to move rearwardly across the table or from right to left thereon, referring to Figs. 1 and 2 of the drawings.

After the movable parts of the machine are set in motion in the manner heretofore described the article to be ironed, as a cuff, is first inserted between the forward pair of feed-rollers and carried thence to the guides \( J \) on the table, between which one edge passes, and to the guide-belt \( G \), mounted on the rollers \( G' \), the belt being actuated by the cuff as the cuff is moved along underneath it. The collar passes thence to the absorbent zone \( E' \) of the moistening-wheel, whereby its upper edge is moistened, after which it passes to the rear pair of feed-rollers to engagement with the guide-belt \( H' \), and thence to the \( V \)-shaped zone of the edge-ironing wheel, where the ironing of the upper edge of the article is completed, after which it passes between the shaping-rollers located at the rear extremity of the table, thus completing the edge-ironing operation.

Having thus described our invention, what we claim is——

1. The combination with a suitable relatively stationary table provided with an upwardly-projecting bracket, a shaft journaled in suitable bearings formed in the said bracket, an arm movably mounted on said shaft, provided with a counterbalance-weight in front, and a moistening-wheel at its rear and lower extremity, the said arm having a passage leading to the moistening-wheel, means for delivering water to the passage of the said arm, a yoke also movably mounted on the said shaft and provided with a counterbalance-weight at its upper and forward extremity, and an edge-ironing wheel at its lower and rear extremity, the operating portion of the edge-ironing wheel and of the moistening-wheel being located in the same vertical plane, suitable means for imparting the necessary rotary movement to the edge-ironing wheel, and suitable means for causing the article to be ironed to travel along upon the table in the vertical plane of the said wheels, the moistening-wheel being located forward of the edge-ironing wheel whereby the edge of the article to be ironed is first moistened.

2. The combination with a suitable table, of an upright bracket mounted thereon, a shaft mounted in said bracket, a yoke fulcrumed on the said shaft and having a forwardly-extending counterbalance-weight, an edge-ironing wheel revoluably connected with the lower and rear extremity of the yoke, means for delivering combustible fluid to the
edge-ironing wheel for heating purposes, an arm fulcrumed on the said shaft and having a forwardly-extending counterbalance-weight in the rear and lower extremity of the said arm being provided with a moistening-wheel, means for delivering the necessary water to the said wheel through a passage-way formed in the arm, the moistening-wheel and the edge-ironing wheel being located in the same vertical plane, and suitable means for feeding the article to be ironed across the table, whereby its upper edge is first brought into engagement with the moistening-wheel, substantially as described.

3. The combination with a suitable table, of a bracket mounted thereon and projecting upwardly therefrom, a shaft mounted on said bracket, a yoke fulcrumed on the shaft and having a counterbalance-weight located in front of the shaft, an edge-ironing-wheel shaft journaled in the lower and rear extremity of the yoke, an edge-ironing wheel fast on said shaft, a number of rollers mounted on the yoke in the plane of the edge-ironing portion of the edge-ironing wheel, an endless belt mounted on said rollers, and suitable means for feeding the article to be ironed whereby it comes in contact with the belt as it approaches the edge-ironing wheel.

4. The combination with a suitable support, of a shaft mounted on said support, an arm fulcrumed on the shaft and provided with a counterbalance-weight in front, a moistening-wheel mounted on the lower extremity of the said arm, means for supplying the moistening-wheel with water, a number of rollers mounted on the said arm, an endless belt engaging said rollers in the plane of the moistening-wheel, and suitable means for causing the article to be ironed to travel on the support in the plane of the moistening-wheel.

5. The combination with a suitable support, of a shaft mounted thereon, means for transmitting motion to said shaft, a yoke movably mounted on the shaft and extending downwardly and rearwardly therefrom, a shaft journaled in the rear extremity of the yoke, an edge-ironing wheel mounted on the said shaft and provided with a V-shaped portion and a hollow drum portion, means for delivering combustible fluid to the hollow drum portion, means for transmitting motion from the first-named shaft to the edge-ironing-wheel shaft, a number of rollers mounted on the said yoke forward of the edge-ironing wheel and in the plane of the V-shaped groove of the said wheel, and an endless belt mounted on the said rollers, the peripheries of the rollers being grooved and the belt being made to fit the grooves of the rollers.

6. The combination with a suitable support, of a shaft mounted thereon, a yoke movably mounted on the shaft and extending downwardly and rearwardly therefrom, a shaft journaled in the rear extremity of the yoke, an edge-ironing wheel made fast to the said shaft, the said wheel having an edge-ironing portion and a hollow drum portion adapted to receive combustible fluid for heating purposes, means for transmitting motion to the first-named shaft and from it to the edge-ironing-wheel shaft, a hollow arm movably mounted on the first-named shaft and extending downwardly and rearwardly from the said shaft, a moistening-wheel mounted on the rear extremity of the said arm and in communication with its hollow portion, and means for delivering the necessary water to said wheel through the hollow arm, the grooved portion of the edge-ironing wheel and the periphery of the moistening-wheel lying in the same plane.

In testimony whereof we affix our signatures in presence of two witnesses.

WALTER C. CUNNINGHAM.
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Witnesses:

DENA NELSON,
A. J. O'BRIEN.