June 23, 1925.

1,543,350

C. E. WAREAM ET AL

COLLAR IRONING MACHINE

Filed Jan. 26, 1923

7 Sheets-Sheet 1

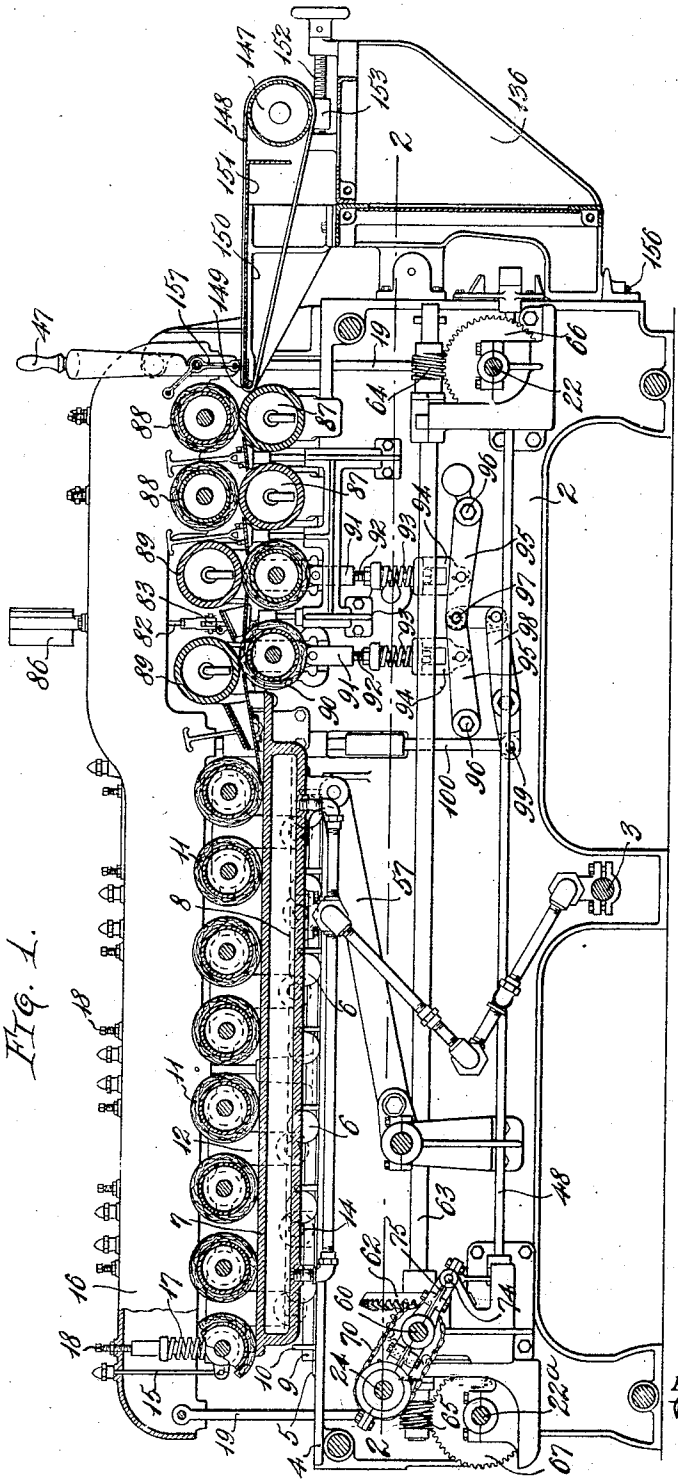


FIG. 1.

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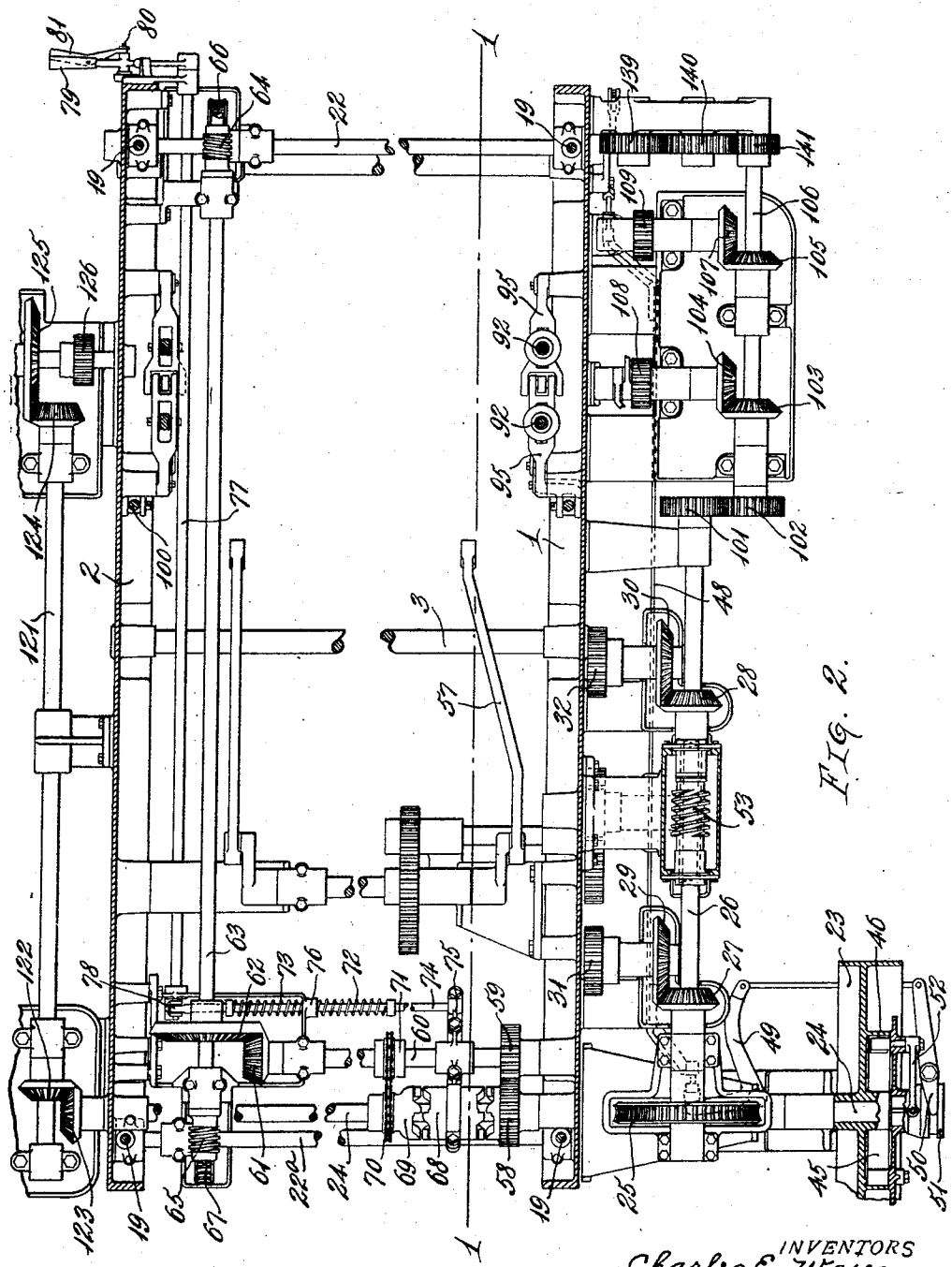


FIG. 2.

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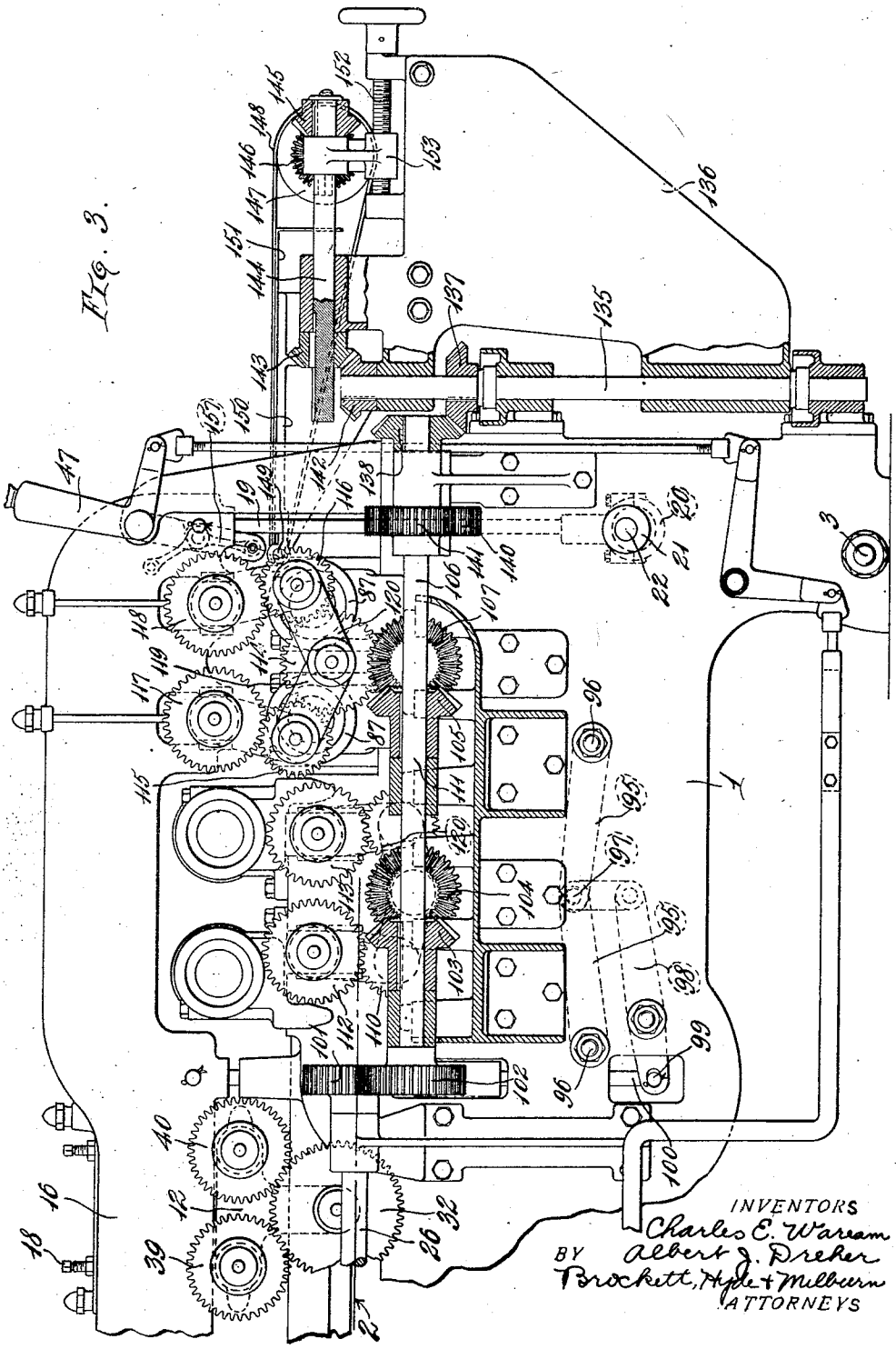
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Fig. 3.



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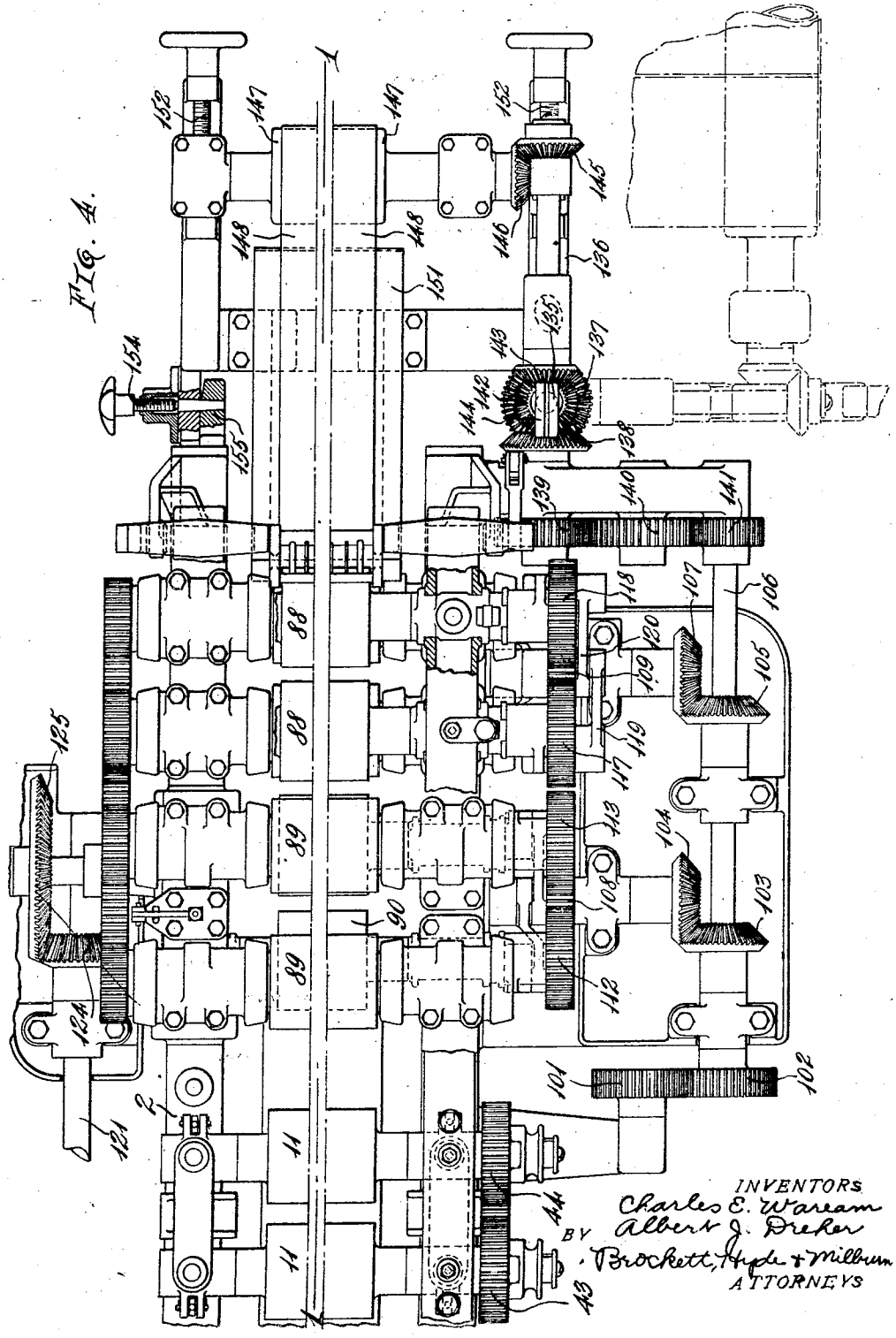


FIG. 4.

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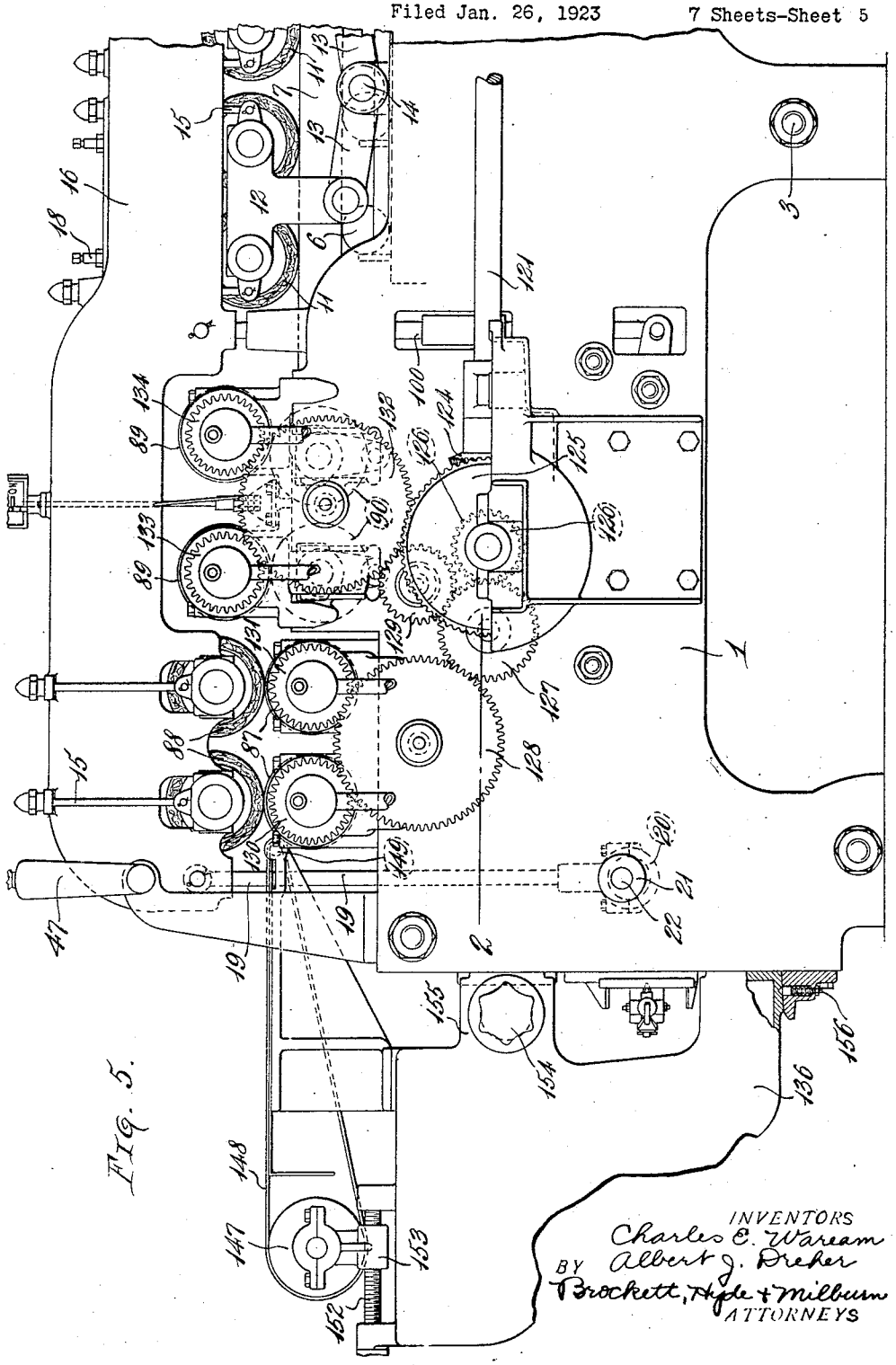


FIG. 5.

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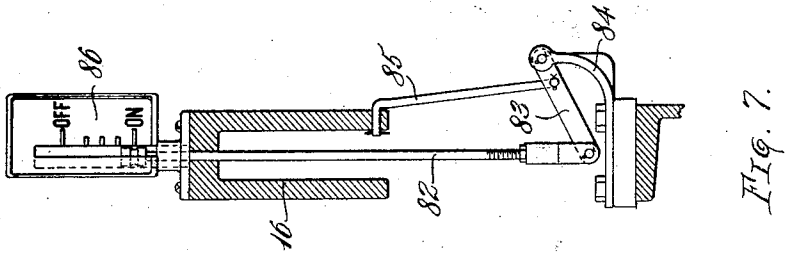


Fig. 7.

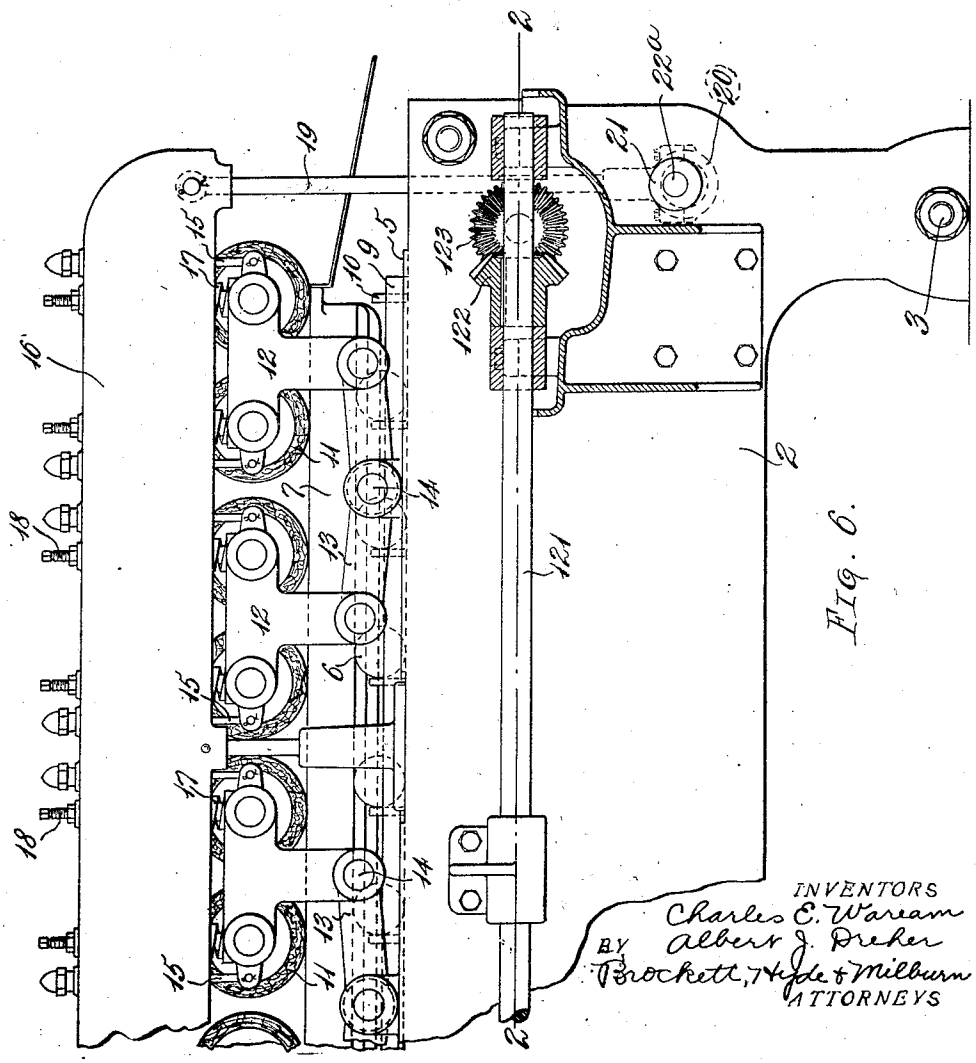


Fig. 6.

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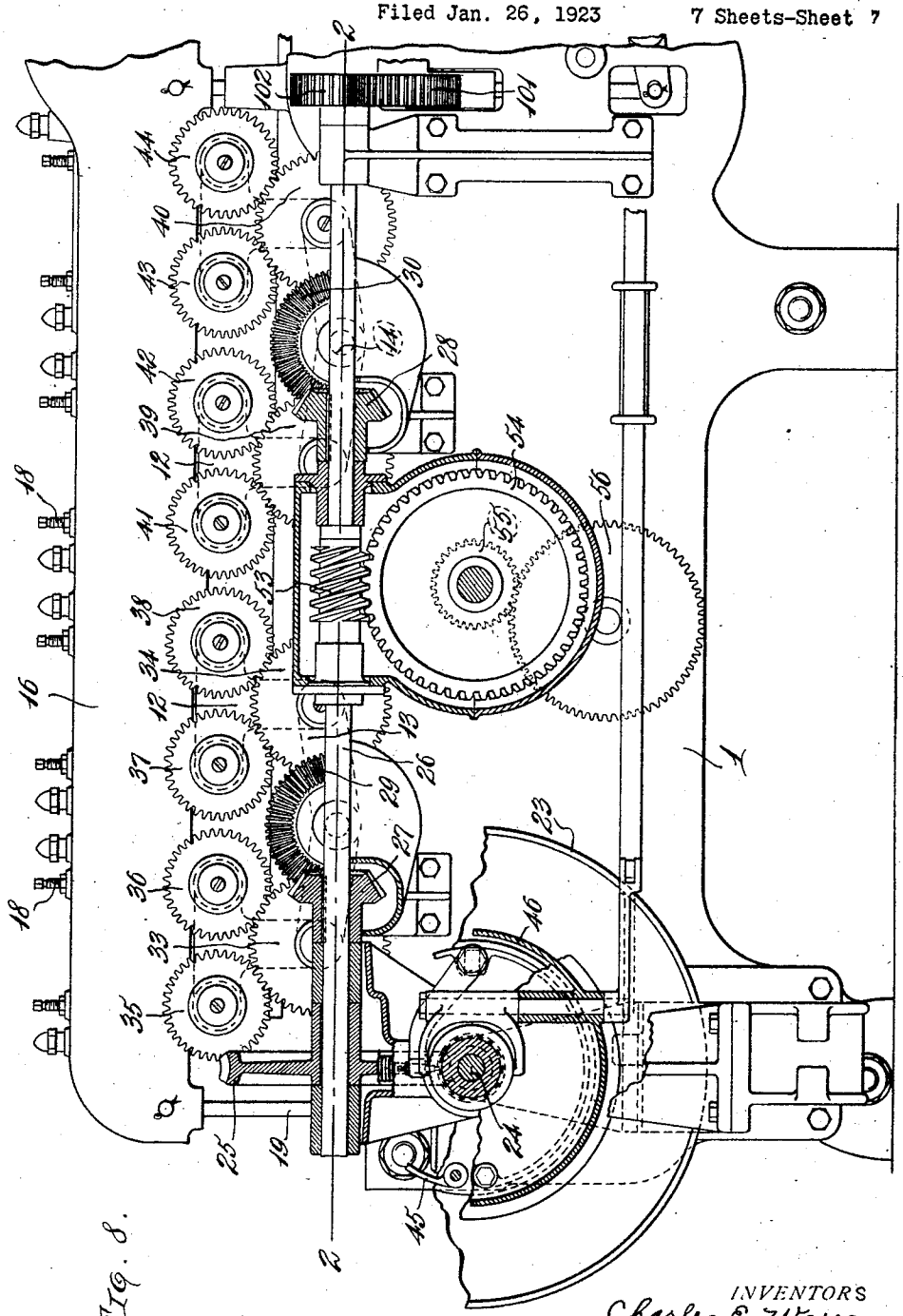


FIG. 8.

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Patented June 23, 1925. 1,543,350

UNITED STATES PATENT OFFICE.

CHARLES E. WAREAM AND ALBERT J. DREHER, OF NORWOOD, OHIO, ASSIGNORS TO THE AMERICAN LAUNDRY MACHINERY COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

COLLAR-IRONING MACHINE.

Application filed January 26, 1923. Serial No. 615,038.

To all whom it may concern:

Be it known that we, CHARLES E. WAREAM and ALBERT J. DREHER, citizens of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Collar-Ironing Machines, of which the following is a specification.

This invention relates to improvements in ironing machines.

The type of ironing machine to which the present invention relates is the same as that disclosed in the copending application of Charles E. Waream, Serial No. 490,100, filed August 15, 1921, to which reference may be had for a full understanding of the general arrangement and operation of the present device, so far as the common subject-matter extends. This type of machine, considered in a general way, comprises a heated chest which is slowly reciprocated, and a gang of padded rolls arranged thereabove for cooperation therewith, together with a set of preliminary padded and heated rolls to which the work is fed by means of an endless belt or apron and from which the work is delivered onto the reciprocating chest. In this type of device the padded rolls above the heated chest are suspended in hanger members which are adapted to be raised and lowered toward and away from the chest. Likewise the padded preliminary rolls are also adjustable toward and away from their corresponding heated rolls.

The object of the present invention is to provide separate and distinct trains of driving mechanism for the padded pressure rolls and heated ironing rolls respectively, not only enabling the gear ratios of said two trains to be varied for producing different rates of rotation of the pressure rolls and ironing rolls in a given machine, but also, in different machines, by rearrangements of one or both of said trains of gearing enabling the differential between the two ratios to be varied, all for purposes which will more fully appear hereafter.

Other objects of the present invention will appear from the following description and claims when considered in connection with the accompanying drawings.

Figure 1 is a longitudinal section taken on line 1—1 of Figs. 2 and 4; Fig. 2 is a horizontal section taken on line 2—2 of Figs. 1, 3, 5, 6 and 8; Fig. 3 is an elevation of the left side of the machine showing the ribbon feed and the first four padded roll drives; Fig. 4 is a plan view of the front part of the machine; Fig. 5 is an elevation of the right-hand side of the machine showing the hot roll drive; Fig. 6 is an elevation of the right-hand side of the machine showing the bevel gear drive for the hot roll drive shaft; Fig. 7 is a detail of the pressure indicator; and Fig. 8 is an elevation of the left side of the machine showing the main drive and the chest padded roll drive.

The two frame members 1 and 2 are connected by tie rods 3 and are provided with flanges 4 along the top thereof for track members 5. Rollers 6 on the tracks 5 support the metal hollow heated chest or ironing member 7. Chest 7 is provided with track portion 8 for engagement with rollers 6 which are maintained in proper position by means of angle irons 9 engaging the ends thereof while pins 10 limit the rolling movement thereof. Arranged directly above the ironing chest there is provided a gang of padded rolls 11 for feeding the work along chest 7. These rolls are mounted in the arms of the bearing members 12, the lower arms of which are pivotally connected to links 13 which in turn are pivoted at point 14 to the frame of the machine. Brackets 12 are suspended by means of rods 15 to hanger or pressure members 16 which extend above the two sides of the machine. Each roll is provided with a spring 17. Springs 17 are capable of adjustment by means of screws 18 so as to regulate the individual pressure of each of the padded rolls. Pressure bars or hanger members 16 are adjustable vertically so as to move the padded rolls as a whole toward and from the heated chest, the mechanism for this purpose comprising connecting rods 19 which are provided at their lower ends with strap members 20 within which engage eccentric cams 21 for actuation thereof. Cam members 21 are mounted upon shafts 22 and 22ª, the operation of which will be described later.

Flywheel 23, which may be driven from any suitable source of power, drives shaft 24, which carries a worm section meshing with gear 25 which in turn is mounted upon shaft 26. Beveled gears 27 and 28 which

are fixed upon shaft 26 mesh with beveled gears 29 and 30 to drive pinions 31 and 32. Pinion 31 meshes with gears 33 and 34 which in turn mesh with and drive the pairs of roll gears 35 and 36, 37 and 38, respectively, which last-named gears have clutch connection with the padded rolls above the heated chest for driving the same. Likewise pinion 32 meshes with gears 39 and 40 which in turn drive the pairs of padded roll gears 41 and 42, 43 and 44, respectively, which are also provided with clutch connection with their respective padded rolls for driving the same.

The pulley drive 23 is adapted to be rendered effective or ineffective by means of brake shoe 45 which is adapted to engage brake band 46 carried by pulley 23. This is accomplished by means of handle 47 which is provided with suitable lever and link connections, indicated in a general way by reference numerals 48 and 49, with yoke member 50 for actuation of cone member 51, which in turn actuates the lever arm 52 connected with brake shoe 45. Lever handle 47 is conveniently arranged at the feeding end of the machine so as to be readily accessible to the operator, as clearly indicated in Figs. 1 and 2.

Shaft 26 carries also worm 53 which drives gear 54 which is one of a train of gears including others indicated as 55 and 56 for operation of crank arm 57 which is connected at one end to the underside of chest 6 for reciprocating the same.

The means for operating shafts 22 and 22ª for vertical adjustment of hanger or pressure bars 16 comprises gear 58 loosely mounted upon shaft 24 and having meshing engagement with gear 59 fixed on shaft 60. Shaft 60 carries bevel pinion 61 which meshes with bevel gear 62 on shaft 63. On the two end portions of the shaft there are provided worm gears 64 and 65, which have meshing relation with gears 66 and 67, respectively. These last-named gears are mounted upon and drive shafts 22 and 22ª for raising and lowering the hanger or pressure members in the manner above referred to. The drive connection for shaft 60 comprises also clutch member 68 which is splined upon shaft 24 and is adapted for engagement with the clutch member provided upon the face of pinion 58. The other side of clutch member 68 is adapted for clutching engagement with the clutch member provided upon the face of sprocket 69 which is loose upon shaft 24. Sprocket chain 70 which is driven by sprocket 69 drives sprocket 71, which is fixed upon shaft 60. Thus, clutch member 68 may be engaged either with the clutch on the face of gear 58 or with the clutch provided upon the face of sprocket 69 to drive either of these two members according to the direction of movement desired for the pressure or hanger bars. Clutching engagement with the clutch on the face of pinion 58 will drive shaft 60 through pinions 58 and 59 in one direction while engagement of clutch members 68 and 69 will drive shaft 60 through the sprocket and chain connection in the opposite direction as will be evident from the arrangement of parts as shown in Fig. 2 of the drawings. Intermediate clutch member 68 is normally maintained in neutral or idle position by springs 72 and 73, the outer ends of which engage stops provided upon actuating bar 74 connected with arm 75 which in turn is slidably mounted upon shaft 60. The adjacent ends of springs 72 and 73 have a fixed abutment indicated at 76 provided on the frame of the machine. Operating arm 74 is controlled by means of rod 77 which has suitable lever connection therewith at point 78, while its other end is adapted for manipulation by means of handle 79. Spring-pressed pin 80 is adapted to engage in an aperture in the machine frame and is carried by lever 81 which is mounted upon handle 79 so as to constitute means for locking the handle 79 in neutral position.

The means for indicating the position of the padded rolls with respect to the chest, that is as to whether they occupy raised or lowered position, comprises a vertically extending bar or rod 82 which extends up through the top of one of the hanger bars as indicated in Fig. 8 and is connected at its lower end with link 83 pivoted at its extreme end portion to bracket 84. This bracket is clamped to the side frame member 2 by the same screws that are used to clamp the hot roll bearings. Connection 85 is provided between link 83 and the hanger member so that as the hanger member is raised or lowered the indicating rod 82 will likewise be given a corresponding movement. Fixed upon the top of the hanger member there is provided scale 86 with graduations thereon for co-operation with the upper end of rod 82 in indicating the relative position of the padded rolls.

The preliminary ironing of the work is performed by means of heated lower metal rolls 87 with upper padded rolls 88 and upper heated rolls 89 with companion lower padded rolls 90. Upper padded rolls 88 are mounted in bearings which are adapted to slide in the pressure or hanger members and are provided with spring pressure means, the same as shown by reference numerals 17 and 18; while heated rolls 87 and 89 are fixedly mounted in the frame of the machine. Padded rolls 90 are mounted in bearing blocks which are adapted for vertical sliding engagement in the frame of the machine by means of clevis members 91 which are provided with threaded rods 92

carrying nuts against which abut springs 93. The lower ends of these springs are provided with suitable bearings 94 through which rods 92 are adapted to extend, the nuts carried on the ends of the rods maintaining these parts in co-operative engagement. Bearing members 94 are in turn pivotally mounted upon links 95 which are pivoted in the frame of the machine at their outer ends, as indicated at 96. The inner or adjacent ends of links 95 are pivotally connected as indicated at 97 to which point there is also pivotally connected one arm of lever 98 by means of an intermediate link. The other end of lever 98, which is pivotally mounted in the frame of the machine, has pivotal connection at 99 with vertically extending rod 100, the upper end of which is secured to the corresponding hanger or pressure bar. The same structure is provided at each end of the padded rolls 90. Thus, with this arrangement, it will be seen that as the pressure bars are raised and lowered so as to move rolls 11 toward and away from the heated chest, padded rolls 90 will also at the same time be moved toward and away from heated rolls 89. And as will be apparent, padded rolls 88 will at the same time be raised or lowered toward and away from their corresponding heated rolls 87, since these last-named padded rolls are carried by the hanger members.

The four preliminary padded rolls 88, 90 are all driven from shaft 26 upon which is provided pinion 101 meshing with pinion 102 for driving bevel pinions 103 and 104. Likewise bevel pinion 105, which is mounted upon the same shaft 106 with pinion 103, meshes with and drives bevel pinion 107. Mounted upon the stub shafts of bevel pinions 104 and 107 are pinions 108 and 109, respectively. Pinion 108 meshes with pinions 110 and 111 which in turn mesh with gears 112 and 113 which have clutch engagement with the lower preliminary padded rolls for driving the same.

Pinion 109 meshes with gear 114 which in turn meshes with intermediate pinions 115 and 116 to drive gears 117 and 118. The last-named gears have clutch engagement with the upper preliminary padded rolls for driving the same. Tumbler links are provided for the ends of these rolls, as indicated in Fig. 3 of the drawings, so as to at all times maintain the pinions and gears in proper meshing relation regardless of the position to which the rolls may be adjusted. These links are indicated in a general way by reference numerals 119 and 120.

Shaft 121 which constitutes part of the driving connection for the preliminary heated rolls has bevel pinion 122 meshing with bevel pinion 123 which is fixed upon shaft 24. Bevel pinion 124 drives bevel gear 125. upon the shaft of which there is provided pinion 126. Pinion 126 drives gear 127 which meshes with gear 128 and pinion 129. Gear 128 meshes with and drives gears 130 and 131 which are mounted upon the shafts of the lower heated preliminary rolls. Pinion 129 drives gear 132 which in turn drives gears 133 and 134 of the upper heated preliminary rolls.

From the foregoing it will appear that all of the padded pressure rolls, including not only the gang of padded rolls 11 cooperating with the chest, but also the padded rolls 88 and 90, are driven by shaft 26, whereas the four heated ironing rolls 87, 89 in the specific machine shown are driven, as a gang, from the shaft 121. In the present machine the gear ratio between shaft 121 and the heated ironing rolls is different from the gear ratio between shaft 26 and the padded pressure rolls, so that the ironing rolls rotate at a greater rate of speed than the pressure rolls, the purpose of this difference in speed being to produce a polishing or burnishing effect upon the work as it passes through the preliminary ironing portion of the machine and before it reaches the reciprocatory chest, which serves to dry the previously polished or burnished collar, as it is moved along the chest by the padded feeding rollers 11. Because the padded and heated rolls are driven by distinct trains of gearing, it is also possible, for example, to build one machine with a given ratio of gearing to its ironing rolls, and another machine with a different ratio of gearing to its ironing rolls, thereby providing for variation in the polishing or burnishing effect due to differential speed between the heated ironing and padded rolls, thus providing for what is known as a domestic or relatively rough finish where the speed of ironing and padded rolls is practically the same, or a highly polished or glossed appearance, such as is desirable in the English market, where the ironing rolls rotate at greater speed than the pressure rolls, as described in my prior application, Serial No. 490,100, before referred to.

All of the padded rolls are provided with clutch connections with their respective driving gears so as to facilitate the removal and renewing of the padding upon each individual roll as may be necessary from time to time. No such clutch connection is necessary, however, for the heated rolls which accordingly have direct permanent drive connection with their respective gears. Suitable steam connections are provided for the preliminary heated rolls as well as for the heated chest as indicated in the drawings.

The feeder ribbons or belts for feeding the work to the preliminary rolls are mounted at one end of the machine so as to be readily swung into and out of operative

position, this means comprising vertical shaft 135 which is pivotally mounted in the frame of the machine and about which bracket 136 is adapted to be swung. Fixed upon shaft 135 is bevel gear 137 which is driven by bevel gear 138 which in turn is driven by pinion 139 mounted on the shaft thereof. Gear 139 in turn is driven by gear 140 which meshes therewith and also with gear 141 carried by shaft 106. Mounted upon the extreme upper end of shaft 135 is bevel pinion 142 which drives bevel pinion 143 which has spline connection with shaft 144 for driving the same. The other end of shaft 144 carries bevel pinion 145 which meshes with bevel pinion 146 on the shaft of roll 147 for driving the same. Ribbons 148 extend about roll 147 and also about fixed shaft 149 provided upon the inner ends of brackets 150, which are suitably supported on main bracket 136. The ribbons are prevented from sagging by means of supporting plate 151. Thus, it will be seen that through the gear connections, just described, the roll, about which the ribbons extend, will be driven so as to feed the work to the preliminary ironing rolls, and this feeding device may be moved into or out of operative position with respect to the ironing machine without disturbing its operative connection therewith. As a means of taking up any undue slack in the ribbons, I have provided adjustable screw members 152 which are mounted in brackets 136, and which are threaded through arms extending from the bearings of the roll as indicated at 153, as will be clear from Fig. 3 of the drawings. Screw pin 154 is adapted to engage in a hole in bracket 155 so as to lock the swinging feeder means in operative position with respect to the ironing machine, and spring plunger pin 156 is adapted to engage the ribbon feed frame or bracket for the same purpose.

Guard member 157 is carried by handle 47 and is adapted to be moved into guarding position with respect to the preliminary rolls so as to prevent accidental insertion of the operator's fingers between the rolls at a time when the pressure or hanger bars are in lowered or operative position. Upon raising of the hanger bars by manipulation of handle 47, guard 157 is automatically withdrawn so as to then permit access by the operator.

From the above, it will be understood that in the operation of this type of machine, the work is laid upon the feeder ribbon and is fed into the preliminary rolls; the pressure bars at this time being in lowered position so that the padded rolls engage their corresponding heated rolls and likewise the gang of padded rolls above the ironing chest are in operative position. The work is then carried over the first pair of ironing rolls so as to iron one side of the work, the other side being ironed as it is passed under the second pair of heated rolls. The hot rolls are operated at a greater speed than the padded rolls, thereby producing a smooth finish on the work. The work, which is then fed onto the ironing chest, is further dried, and the ironing chest being slowly reciprocated back and forth gives the proper set to the finish on the work. The padded rolls are here shown as being equi-distant from each other, and the chest is moved in each direction a distance equal to at least the space between the padded rolls, as more fully set forth in the co-pending application above referred to. The work is then delivered from the other end of the machine. For instance, in ironing collars for which this machine is especially well adapted, the collars are fed into the machine with the outer surface of the lap and the inner surface of the band portion engaging the lower preliminary heated rolls, the inner surface of the lap and the outer surface of the band portion engaging the upper pair of heated rolls as the work progresses through the preliminary rolls. As the work is carried over the ironing chest the outer surface of the lap and the inner surface of the band portion engage the chest surface.

What we claim is:—

1. An ironing machine, comprising padded pressure rolls and heated ironing rolls, a power source, separate trains of gearing therefrom to the pressure rolls and to the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls, and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same.

2. An ironing machine, comprising padded pressure rolls and heated ironing rolls, a power source, separate trains of gearing therefrom to the pressure rolls and to the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same, said gear trains being of different ratios to drive the ironing rolls at a different speed from the pressure rolls.

3. An ironing machine, comprising padded pressure rolls and heated ironing rolls, a power source, separate trains of gearing therefrom to the pressure rolls and to the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls, and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same, the gear train of the ironing rolls being of

higher ratio than the gear train of the pressure rolls to drive the ironing rolls at a greater speed than the pressure rolls thereby to produce a burnishing effect upon the work.

4. An ironing machine, comprising padded pressure rolls and heated ironing rolls arranged in parallel cooperating relation, separate trains of gearing located at the opposite ends of said rolls, one train for driving the pressure rolls and the other train for driving the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls, and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same.

5. An ironing machine, comprising padded pressure rolls and heated ironing rolls arranged in parallel cooperating relation, separate trains of gearing located at the opposite ends of said rolls, one train for driving the pressure rolls and the other train for driving the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls, and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same, said trains being of different ratio to drive the ironing rolls at a different speed from the pressure rolls.

6. An ironing machine, comprising padded pressure rolls and heated ironing rolls arranged in parallel cooperating relation, separate trains of gearing located at the opposite ends of said rolls, one train for driving the pressure rolls and the other train for driving the ironing rolls, a heated ironing chest adapted to receive work from said ironing rolls, and a gang of padded pressure rolls rotating at the same speed as said first named pressure rolls for feeding the work along said chest for drying the same, the train of gearing to the ironing rolls being of a higher ratio than that of the pressure rolls to drive the ironing rolls at a greater speed than the pressure rolls and thereby burnish the work.

In testimony whereof we hereby affix our signatures.

CHARLES E. WAREAM.
ALBERT J. DREHER.