Feb. 20, 1940. G. W. WARDWELL, JR 2,191,332

IRONING MACHINE

Filed April 14, 1937

Fig. 1.

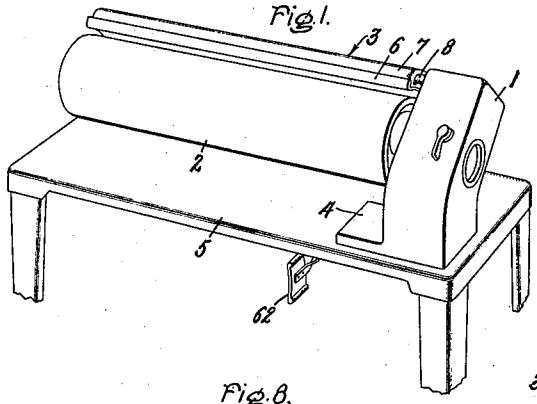


Fig. 2.

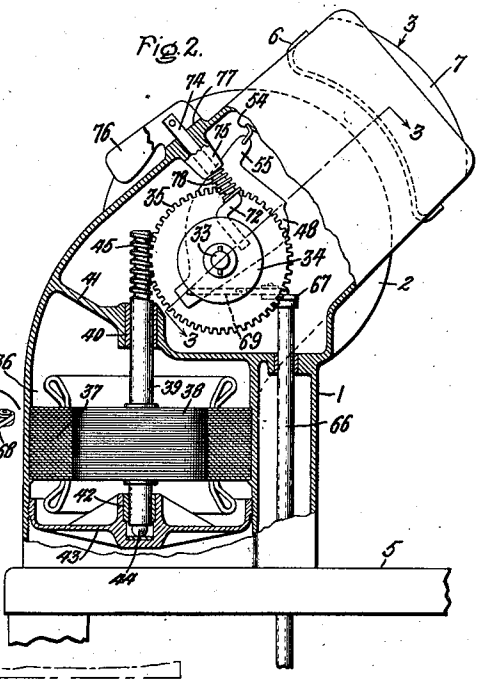


Fig. 8.

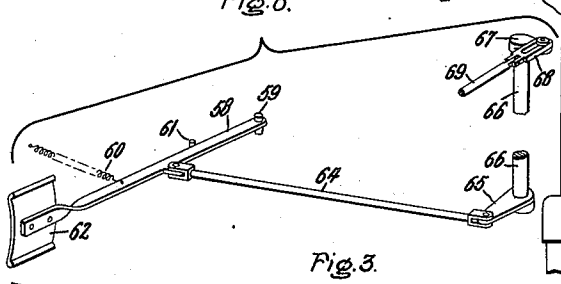
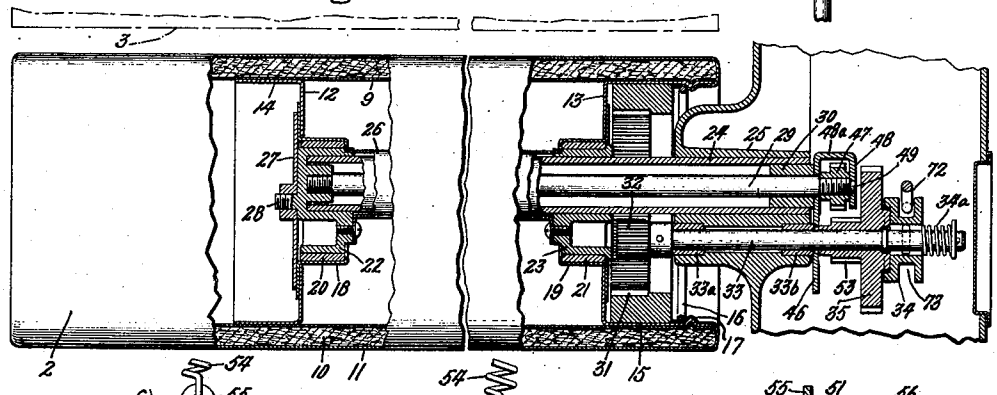


Fig. 3.



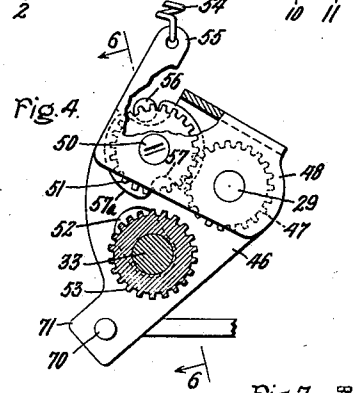


Fig. 4.

Fig. 5.

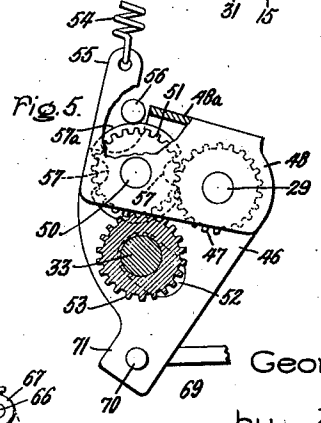


Fig. 6.

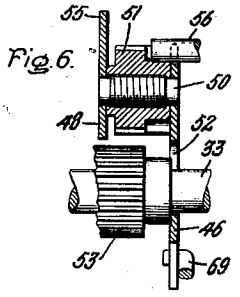
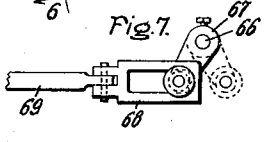


Fig. 7.



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George W. Wardwell Jr.
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His Attorney.

Patented Feb. 20, 1940

2,191,332

# UNITED STATES PATENT OFFICE

2,191,332

## IRONING MACHINE

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Application April 14, 1937, Serial No. 136,751

10 Claims. (Cl. 38—59)

The present invention relates to ironing machines of the type having power operated means for moving the cooperating pressing members into and out of engagement. The invention is in particular concerned with ironing machines in which one of the cooperating pressing members is a roll.

The object of my invention is to provide an improved construction and arrangement in ironing machines of this type and for a consideration of what I believe to be novel and my invention attention is directed to the following description and the claims appended thereto.

In the accompanying drawing, Figure 1 is a perspective view of an ironing machine embodying my invention; Figure 2 is an end elevation of the ironing machine, partly broken away; Figure 3 is a sectional view taken on line 3—3 of Figure 2; Figure 4 is a fragmentary view of the shifting mechanism for moving one of the cooperating pressing members toward and away from the other pressing member, the parts of the mechanism being shown in the inactive position; Figure 5 is a view similar to Figure 4, the parts being shown in the active position; Figure 6 is a sectional view taken on line 6—6 of Figure 4; Figure 7 is a top plan view of a portion of the linkage controlling the shifting mechanism; and Figure 8 is a perspective view of the linkage for controlling the shifting mechanism.

Referring to the drawing, the ironing machine comprises a frame or housing 1 which carries a roll 2, a shoe 3, and the driving mechanism for rotating the roll and for moving the roll toward and away from the shoe. The housing is provided with a flange 4 for supporting the ironing machine on the top 5 of a suitable table.

The shoe, which may be of any suitable construction, for example, as that shown in application, Serial No. 116,724, filed December 19, 1936, is shown diagrammatically. It comprises an arcuate metal plate 6 the underside of which cooperates with the roll and the upper side of which is covered by a metal cover 7 suitably attached thereto. Between the plate and the cover are arranged suitable electric heating elements (not shown). Projecting between the plate and the cover are a pair of arms 8 (only one of which is shown) which support the shoe. The arms 8 are fixed at one end to the housing and at the other end to the shoe. For the purpose of this application the shoe can be considered as rigidly supported by the housing in any suitable manner.

The roll comprises a cylindrical metal sheet 9 having a suitable padding 10 held on its outer surface by a pad cover 11. Within each end of the shell are disks 12 and 13 having flanges 14 and 15 respectively fixed to the inner surface of the shell. The pad cover is held in place by snap rings 16 within each end of the shell 9. The snap rings are held in place by internally projecting beads 17 respectively formed in the flange 15 and the opposite end of the shell 9. At the center of each of the disks 12 and 13 are respectively secured cup-shaped members 18 and 19 in which are fixed sleeve bearings 20 and 21. The sleeve bearings 20 and 21 rotatably support the roll on eccentrics 22 and 23. The eccentrics in turn are rotatably supported on a tubular arm 24 one end of which is fixed in boss 25 in the ironer housing. The bearings surfaces between the eccentrics and the tubular arm 24 are offset from the center of the eccentrics so that upon rotation of the eccentrics on the arm, the roll is moved transversely with respect to the arm. The eccentrics are connected together so as to rotate in unison by a tube 26 which fits over and is concentric with the tubular supporting arm 24. Endwise movement of the roll off the eccentrics is prevented by a retaining washer 27 which is threaded on a projection 28 on the eccentric 22.

The eccentrics 22 and 23 are rotated by a shaft 29 the right end of which is journaled in bearing 30 in the arm 24 and the left end of which is fixed to and is supported by the eccentric 22. The shaft 29 is rotated in 180 degree steps by means of mechanism which will be hereinafter described. When the parts are in the position shown in Figure 3 the roll is spaced from the shoe. When the shaft 29 has rotated 180 degrees from this position the roll is pressed against the shoe. In this latter position an internal gear 31 which is fixed to the flange 15 is moved into engagement with a pinion 32 fixed to a shaft 33 journaled in bearings 33*a* and 33*b* in the side walls of the ironer housing. The shaft 33 is continuously driven through a clutch member 34 which is pinned to the shaft and which engages a cooperating clutch surface on a continuously driven worm wheel 35 which is loose on the shaft. The clutch member 34 is biased to the engaged position by a spring 34*a*. The movement of the roll into engagement with the shoe therefore completes a driving connection to the roll. When the roll is away from the shoe this driving connection is broken by the movement of the internal gear 31 away from the pinion 32. Sufficient clearance is provided between the eccentrics 22 and 23 and the bearings 20 and 21 so

that the roll can have a slight tilting movement as it is pressed against the shoe. This tilting movement permits the internal gear **31** to pause in its movement toward the pinion **32** in case the teeth of the gears are in a position to cause clashing. Since the gear teeth engage before the roll is pressed against the shoe, the pressure on the teeth is relatively light compared to the full ironing pressure which is subsequently developed between the roll and the shoe. The tiltable mounting provided by the clearance between the eccentrics and their bearings allows the right end of the roll to pause sufficiently in its movement toward the pinion for the pinion to rotate and find its way into proper mesh with the internal gear. While the internal gear is pausing in its movement toward the pinion, the clearance between the eccentrics and their bearings permits the left end of the roll to move toward the shoe without building up any appreciable pressure between the teeth of the internal gear and the teeth of the pinion. This construction, therefore, obtains sufficient pause in the movement of the internal gear toward the pinion to prevent jamming or clashing of the gear teeth.

The ironer housing has a vertical hollow portion **36** which serves as the frame or outer casing for an electric motor used to drive the ironing machine. The stationary member **37** of the electric motor is fixed in the hollow portion **36** and the rotary member **38** of the electric motor is carried on a shaft **39**, the upper end of which is journaled in a bearing **40** carried in a web **41** and the lower end of which is journaled in a bearing **42** in a bearing housing **43** threaded into the lower end of the hollow portion **36**. The bearing housing **43** carries a thrust ball **44** which supports the shaft. The web **41** which is integral with the housing forms a closure for the upper end of the electric motor. The motor shaft **39** projects above the bearing **40** and on its projecting end is cut a worm **45** which meshes with the worm wheel **35**. The worm wheel is therefore continuously rotated by the worm.

Pivoted on the shaft **29** is a sheet metal frame having a wall **46** arranged between the inner end of the sleeve bearing **30** and a gear **47** fixed to the shaft **29** and having an integral parallel wall **48** connected thereto by a wall **48***a*. The wall **48** is pivoted on a reduced portion **49** of the shaft **29**. Between the walls **46** and **48** is rotatably carried a shaft **50** on which is fixed an idler gear **51** which meshes with the gear **47**. The wall **46** is provided with an elongated slot **52** which fits over the shaft **33** between the bearing **33***b* and the end of a pinion **53** which is integral with the worm wheel **35**. The frame, which serves as a carrier for the idler gear, is biased to the position shown in Figure 4 by means of a coil spring **54** arranged between the ironer housing and an ear **55** integral with the wall **48**. In this position the idler gear **51** is out of mesh with the continuously rotated pinion **53** and there is accordingly no driving connection between the pinion **53** and the shaft **29**. To complete the driving connection to the shaft **29** the carrier is pivoted in a counterclockwise direction, as viewed in Figure 3, thereby moving the idler gear **51** into mesh with the pinion **53**. Since the idler gear is always in mesh with the gear **47** a driving connection is completed to the shaft **29**. As soon as the idler gear has rotated to a position in which a fixed stop **56** is clear of the depression **57** in a cam surface **57***a* integral with the idler gear, the cam surface cooperates with the stop to hold the idler gear carrier in the position shown in Figure 5. When the gear **51** has rotated 180 degrees from the position shown in Figure 4 the stop is again opposite one of the depressions **57** and the spring **54** is therefore free to return the carrier to the position shown in Figure 4. This breaks the driving connection to the shaft **29**. Since the gears **47**, **51** and **53** are all of the same size it is apparent that upon each movement of the carrier to the position shown in Figure 5 the shaft **29** will be rotated through 180 degrees, thus moving the roll in successive steps toward and away from the shoe.

The linkage for moving the idler gear carrier to the position shown in Figure 5 is shown diagrammatically in Figure 8. It comprises a lever **58** pivoted at **59** on the underside of the table top and urged by a spring **60** against a stop **61**. The lever **58** is provided with a knee pad **62** so that the lever can be actuated by a sidewise motion of the operator's knee. The lever is connected by means of a link **64** to a crank **65** fixed to the lower end of a vertical rock shaft **66** journaled in the ironer housing. On the upper end of the rock shaft is fixed a crank **67** having a pin and slot connection with a link **68** which is pivoted to one end of a link **69**. The other end of the link **69** is provided with a hook **70** which is pivoted in an ear **71** on the idler gear carrier. Upon movement of the knee pad **62** to the right, as viewed in Figure 8, the carrier will be moved from the position shown in Figure 4 to the position shown in Figure 5. As soon as the gear **51** has rotated to a position in which the stop **56** is clear of the depression **57**, the carrier is held in the position shown in Figure 5 by the cooperation of the stop with the cam surface **57***a*. The knee pad may now be released and it will be returned to the position shown in Figure 8 by the spring **60**. As soon as the gears **47** and **51** have rotated through 180 degrees from the position shown in Figure 4 one of the depressions **57** is again opposite the stop **56** and the carrier is returned by the spring **54** to the position shown in Figure 4.

Under some circumstances, it is desirable that the roll remain stationary when pressed against the shoe. This is effected by moving the clutch member **34** to the right, as viewed in Figure 3, breaking the connection between it and the worm wheel **35**. The mechanism for moving the clutch member **34** to the disengaged position comprises a crank **72** which fits in an annular groove **73** in the clutch member **34**. The crank is integral with a shaft **74** which is journaled in a boss **75** in the ironer housing. Fixed to the outer end of the shaft is a handle **76**. The handle is held against the outer face **77** of the boss **75** by means of a coil spring **78**. Upon turning the handle **76** in a counterclockwise direction, as viewed in Figure 1, the crank **72** moves the clutch member **34** to the disengaged position. This stops the rotation of the shaft **33** and the roll, therefore, remains stationary although the pinion **32** is in mesh with the internal gear **31**. Upon release of the handle **76** the clutch **34** is returned to the engaged position by the coil spring **34***a*.

In the use of the ironing machine the material to be ironed is arranged on the roll while the roll is stationary and spaced from the shoe as shown in Figure 3. The knee pad **62** is then moved to the right as viewed in Figure 8 thereby moving the idler gear **51** to engagement with the pinion **53** and completing a driving connection to the shaft **29**. The rotation of the shaft **29**

continues through 180 degrees when it is automatically stopped in the manner explained above. At this time the roll has been pressed against the shoe and the internal gear 31 has been moved into mesh with the pinion 32 thereby causing rotation of the roll. At the completion of the ironing operation the knee pad 62 is again moved to the right to cause another 180 degree rotation of the shaft 29. This returns the roll to the position shown in Figure 3.

What I claim as new and desire to secure by Letters Patent in the United States is:

1. In combination, a driving gear, a driven gear, intermediate gearing movable to a position completing a driving connection between said gears, means for biasing said gearing away from the driving position, personally operable means for effecting movement of said gearing to the driving position, and automatic means for holding said gearing in the driving position for a predetermined angular rotation of one of said gears.

2. In combination, a driving gear, a driven gear, an idler gear meshing with one of said gears, a carrier for said idler gear for moving the idler gear into and out of mesh with the other of said gears, means for biasing said carrier to the out-of-mesh position, personally operable means for effecting movement of the carrier to the in-mesh position, and automatic means for holding said carrier in the in-mesh position for a predetermined angular rotation of one of said gears.

3. In combination, a gear, a movable gear movable into mesh therewith to complete a driving connection thereto, means for biasing said movable gear away from the driving position, personally operable means for effecting movement of the movable gear to the driving position, and automatic means for holding the movable gear in the driving position for a predetermined angular rotation thereof.

4. In combination, separable gears, one of said gears being movable toward and away from the position completing a driving connection between the gears, means for effecting movement of the movable gear to the driving position, automatic means for holding the movable gear in the driving position for a predetermined angular rotation thereof, and means for moving said movable gear away from the driving position on completion of said predetermined angular rotation.

5. In combination, a driving gear, a driven gear, an intermediate gear movable to a position meshing with said gears and completing a driving connection therebetween, personally operable means for effecting movement of said intermediate gear to the driving position, means for holding the intermediate gear in the driving position for a predetermined angular rotation of one of said gears, and means for moving said intermediate gear from the driving position upon completion of said predetermined angular rotation.

6. In combination, separable gears, one of said gears being movable toward and away from a position completing a driving connection between the gears, means for effecting movement of said movable gear to the driving position, cam means carried by said movable gear for holding the movable gear in the driving position for a predetermined angular rotation thereof, and means for moving said movable gear away from the driving position upon completion of said predetermined angular rotation.

7. In combination, separable gears, one of said gears being movable toward and away from a position completing a driving connection therebetween, means for effecting movement of the movable gear to the driving position, cam means carried by the movable gear, a stop cooperating with said cam means for holding the movable gear in the driving position, said cam means having a depression therein cooperating with said stop to permit movement of the movable gear away from the driving position upon completion of a predetermined angular rotation, and means for moving the movable gear away from the driving position upon completion of said predetermined angular rotation.

8. In an ironing machine comprising cooperating pressing members including a roll: gearing for driving the roll, shifting means for effecting engagement and separation of said pressing members, means including a rotatable member for moving said shifting means to the engaged and separated positions, a gear for driving said rotatable member, intermediate gearing movable to a position completing a driving connection between said gear and said roll driving gearing, automatic means for holding the intermediate gearing in the driving position for a predetermined angular rotation of one of said gears, and means for biasing the intermediate gearing away from the driving position whereby the driving connection will be broken at the end of said predetermined angular rotation.

9. In an ironing machine comprising cooperating pressing members including a roll: gearing for driving the roll, shifting means for effecting engagement and separation of said pressing members, means including a rotatable member for moving said shifting means to the engaged and separated positions, a gear for driving said rotatable member, an idler gear, personally operable means for effecting movement of the idler gear to a position completing a driving connection from said roll driving gearing to the gear driving said shifting means, automatic means for holding said idler gear in the driving position for a predetermined angular rotation of the gear driving the shifting means, and means for moving the idler gear to a position breaking the driving connection upon completion of said predetermined angular rotation.

10. In an ironing machine comprising cooperating pressing members including a roll: gearing for driving the roll, shifting means for effecting engagement and separation of said pressing members, means including a rotatable member for moving said shifting means to the engaged and separated positions, a gear for driving said rotatable member, a movable gear movable into mesh therewith to complete a driving connection thereto from said roll driving gearing, personally operable means for effecting movement of the movable gear to the driving position, and automatic means for holding said gear in the driving position for a predetermined angular rotation thereof.

GEORGE W. WARDWELL, JR.