Dec. 3, 1940. W. G. BAULE 2,223,593

ROLL IRONER

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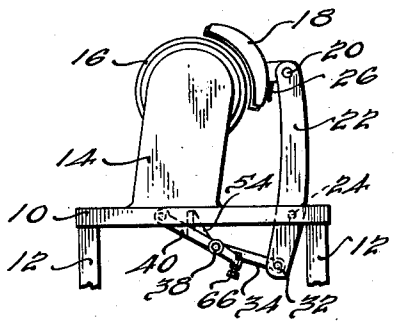


FIG. 1.

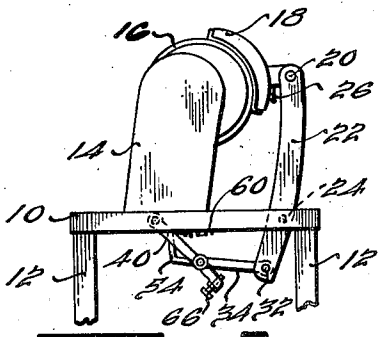


FIG. 2.

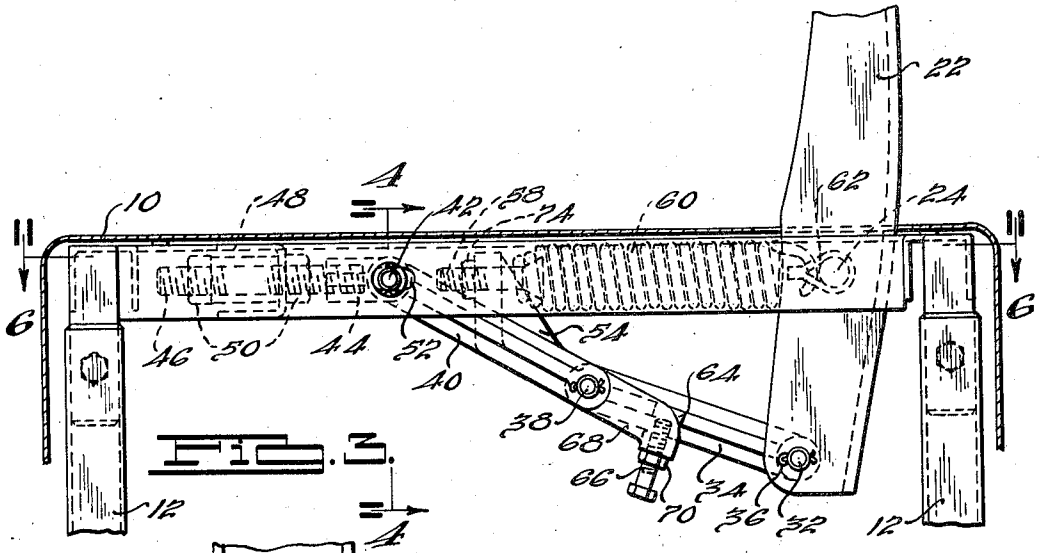


FIG. 3.

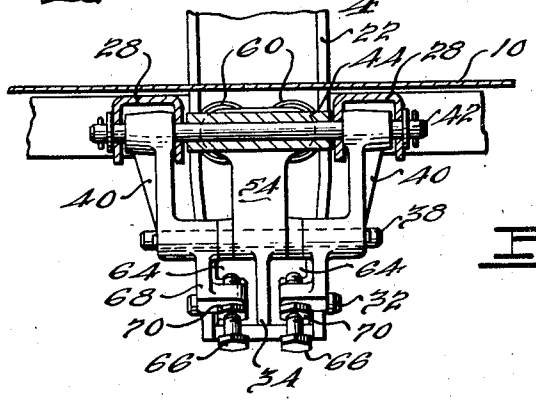


FIG. 4.

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ROLL IRONER

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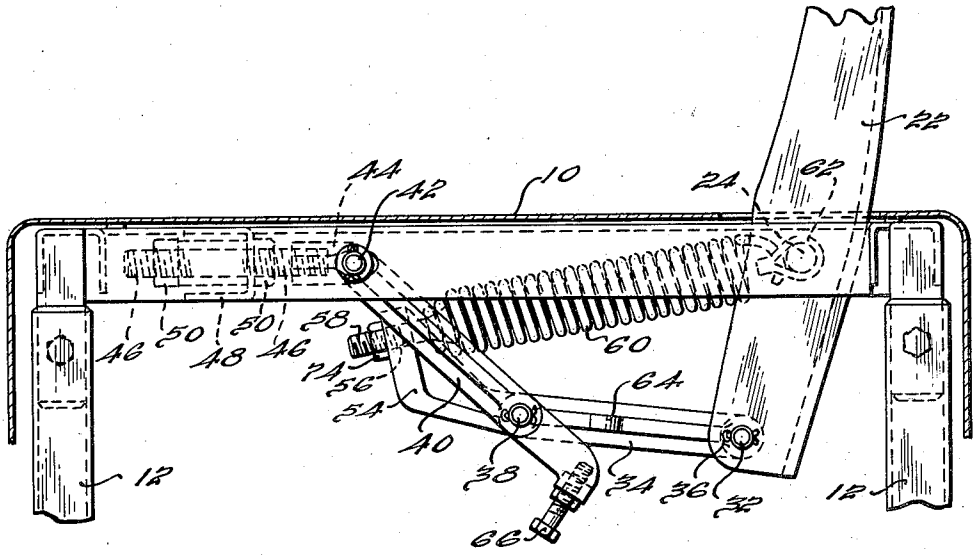


FIG. 5.

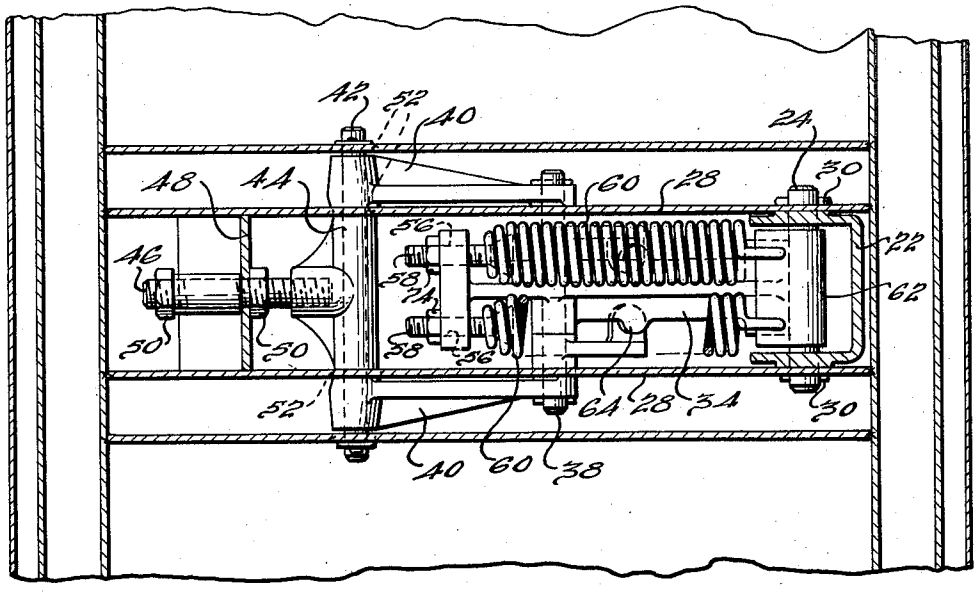


FIG. 6.

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ROLL IRONER

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Application September 25, 1937, Serial No. 165,612

15 Claims. (Cl. 38—58)

This invention relates to ironing apparatus and particularly to that class of ironing apparatus which is adapted for domestic use, and which embodies a shoe and a roll movable into and out of engagement with the shoe, the roll being adapted to be rotated to carry the material being ironed past the polished surface of the shoe.

In ironing machines of the class described in which the roll is movable toward and away from the shoe a problem has always been presented in the difficulty attendant upon maintaining a constant pressure between the roll and the shoe.

It is an object of this invention to provide a domestic ironing appliance of the class described which will overcome this difficulty.

It is a further object of this invention to provide an ironing mechanism of the movable roll type in which the pressure between the roll and the shoe is maintained constant regardless of the amount of displacement of the shoe or of the thickness of the material inserted between the roll and shoe.

It is a further object of the invention to provide an ironing mechanism in which the pressure between the roll and the shoe remains substantially constant but is adjustable to accommodate different thicknesses of material or to vary the pressure applied to materials being ironed.

Further objects will appear more fully hereinafter as the description proceeds and will be pointed out in connection with the appended claims.

In order to effectuate the foregoing objects, the invention is shown embodied in an ironing apparatus in which the pressure applying parts comprise a roll, oscillatable about a fixed axis into contact with a pivotally supported shoe. The roll is adapted to be rotated about its own axis while in contact with the shoe for moving the material being pressed between the two pressing elements. The invention resides more specifically in the mechanism employed to resist movement of the shoe away from its normal inoperative position. This mechanism is shown as comprising a toggle arrangement which employs a spring means to resist breaking of the toggle.

In the drawings, in which similar parts are designated by similar reference characters:

Fig. 1 is an end elevational view of a portion of the ironing apparatus showing the roll and shoe in their inoperative positions;

Fig. 2 is an end elevational view similar to Fig. 1, but showing the roll oscillated into engagement with the shoe and the shoe displaced against the action of the toggle mechanism and the spring;

Fig. 3 is a vertical sectional view through the shoe supporting and movement resisting mechanism showing the details of the toggle arrangement;

Fig. 4 is a vertical transverse sectional view through a portion of the toggle mechanism taken substantially upon the plane indicated by the line 4—4 of Fig. 3 and looking in the direction of the arrows;

Fig. 5 is a vertical sectional view similar to Fig. 3, but showing the parts displaced by movement of the roll into contact with the shoe; and,

Fig. 6 is a horizontal sectional view of the toggle mechanism taken substantially upon the plane indicated by the line 6—6 of Fig. 3 and looking in the direction of the arrows.

The ironing apparatus is shown as comprising a support 10 mounted upon legs 12 and having an upstanding portion 14 for housing the transmission which is adapted to impart motion to a roll 16 supported by such transmission housing 14 for oscillation into engagement with a shoe 18.

The shoe 18 is pivoted at 20 to a lever 22 supported pivotally at 24 from the frame of the table or cloth pan 10. The pivotal connection 20 between shoe 18 and lever 22 is of such a nature as to permit limited universal movement of the shoe with respect to the lever 22 in order to compensate for variations in thickness of the material presented between roll 16 and shoe 18. The shoe 18 is supported in position to engage the roll 16 by means of a spring 26 extending between the shoe 18 and the lever 22.

Pivot 24 extends through a pair of channel members 28 and is confined against endwise movement by cotter pins 30 to prevent endwise movement of the pivot shaft 24 (see Fig. 6).

The lower end of lever 22 projects below pivot 24 and has pivotally secured thereto at 32 a link 34 which constitutes one portion of a toggle mechanism. The pivot pin 32 is secured against endwise displacement by means of cotter pins 36 located exteriorly of the side portions of the channel member forming lever arm 22. The opposite end of the link 34 is pivotally connected at 38 to a pair of links 40 which are pivotally secured to a shaft 42 extending through an adjustable collar 44. The adjustable collar 44 has a bolt 46 threadedly engaged therewith and said bolt 46 extends through a web 48 secured to the frame of the table 10. Nuts 50 on opposite sides of the web 48 provide for adjustment of the pivot pin 42 through a limited distance, the channel members supporting the fixed portions of the toggle

mechanism being provided with elliptical slots as at 52 to permit such movement.

The primary link 34 of the toggle has its forward end bent upwardly as at 54 and apertured at 56 to receive screws 58, the heads of which are seated within frusto-conical end portions of coil springs 60. The opposite ends of springs 60 are hooked through a hanger 62 disposed around the fixed pivot pin 24.

A pair of lugs 64 projecting laterally from opposite sides of the link 34 provide a seat for stop screws 66 threaded into extensions 68 upon the toggle links 40. Stop screws 66 are secured in adjusted position by means of lock nuts 70.

It will be appreciated that as the roll 16 moves into engagement with the shoe 18 these parts will move from a position indicated in Fig. 1 to the position shown in Fig. 2, thus displacing the shoe supporting lever 22 clockwise as viewed in Figs. 1 and 2. This movement of the lever 22 will result in displacement of its lower end toward the left as viewed in Figs. 3 and 5, lever 22 rotating about the fixed axis 24. Movement of the pivot 32 to the left results in breaking the toggle 34, 40 against the action of the springs 60. The toggle, however, is never quite straightened because of stop screws 66 and stop lug 64. At the beginning of the toggle straightening action, the springs 60 act therethrough to exert maximum resistance to movement of the arm 22. As the breaking action of the toggle progresses the mechanical advantage of the toggle is increasingly diminished by reason of the angularity of the toggle. During this same breaking movement the springs 60 are being increasingly deformed and consequently applying a greater force to the upturned portion 54 of the link 34 and accordingly to the toggle mechanism. In the structure as shown this diminution and increase of forces as indicated above are such as to balance one another and result in an application of constant force to the lever 22 to resist the movement of shoe 18 to the right as viewed in Fig. 2.

The force with which movement of the shoe is resisted may be adjusted by tightening or loosening nuts 74 thereby increasing or decreasing the initial tension of the springs 60. The initial position of the shoe 18 may be adjusted by adjusting the pivot 42 through the nuts 50 threaded upon the bolt 46 in order to compensate for thicker or thinner material than will normally be ironed in the machine. After adjustment of the spring tension and the initial position of the shoe 18, the stop screws 66 may be set in engagement with the stop 64 so that the toggle, when at rest, is just slightly broken.

It will be observed that the invention carrics into effect the objects set forth hereinbefore. The force resisting movement of the shoe upon engagement therewith by the roll will be substantially constant in all positions of the shoe 18 and will not be increased materially by deflection of the shoe 18 out of its usual sphere of operation.

Although the invention has been described with respect to an ironer of the movable roll type, it will be readily understood that only slight changes would be necessary to adapt it to be used in connection with a movable shoe type of ironer.

While the invention has been described in considerable detail, it is to be expressly understood that the description given is for the purpose of illustration only and is not definitive of the limitations of the inventive idea. The right is reserved to make such changes in the details of construction and arrangement of parts as fall within the scope of the appended claims.

I claim:

1. Ironing mechanism comprising a roll movable into and out of engagement with a shoe, said shoe being pivotally supported upon a stationary portion of the mechanism upon a center offset from the path of movement of the roll, and means for resisting movement of the shoe about said center with a substantially constant force.

2. Ironing apparatus comprising a roll and a shoe, said shoe being supported upon a member pivotally mounted upon a stationary portion of the ironing mechanism, said roll being mounted for movement into and out of engagement with the shoe, a toggle extending between said member and the stationary portion of the ironing mechanism, and spring means so connected to the toggle mechanism and to the stationary portion of the ironing mechanism so as to apply a constant force to the shoe in resistance to movement of the shoe when engaged by the roll.

3. In a roll ironer, a shoe element engageable with a roll element, said elements being relatively movable into and out of engagement with one another, a lever pivotally mounted upon the ironer frame and supporting said shoe, a toggle disposed between the ironer frame and the shoe supporting lever and a spring acting upon the knee of the toggle to resist breaking of the toggle when moved by the lever.

4. A roll ironer comprising a roll movable into and out of engagement with a shoe, said shoe being connected to and supported by one end of a lever pivoted intermediate its ends upon a portion of the ironer frame, linkage connecting the other end of said lever to the frame, and spring means extending between an intermediate portion of said linkage and the frame, said linkage and spring connections being so disposed as to apply a substantially constant force resisting movement of said lever under the influence of said roll movement in any position which said lever may assume.

5. In a roll ironer, a roll movable into and out of engagement with a shoe, said shoe being supported upon the upper end of a lever pivoted to the ironer frame and projecting below the ironer frame, a toggle, one link of which is secured to the lower end of said lever and the other link of which is secured to said frame, and means acting through one of said links upon the knee of the toggle to resist breaking movement thereof.

6. A roll ironer comprising a roll, a shoe, said roll being movable into and out of engagement with said shoe, a lever pivoted intermediate its ends upon a stationary portion of the ironer frame, one end of said lever supporting said shoe adjacent said roll and the other end of said lever being pivotally attached to a toggle mechanism, said toggle mechanism comprising a pair of links pivotally connected to form the knee of the toggle and extending between said lever and a stationary portion of the frame, one of said links having an offset portion upon the knee of the toggle to provide a seat for a spring which exerts pressure upon the knee of the toggle, the other end of the spring being secured to a stationary portion of the ironer frame.

7. Ironing apparatus comprising a roll, a shoe, said roll being mounted for movement into and out of engagement with said shoe, a vertical lever pivoted to a stationary portion of the ironer frame and having its upper end supporting said shoe, and a toggle extending between the lower

end of said lever and a stationary portion of the frame, said toggle being urged toward its straightened position by means of a spring extending between the knee thereof and the pivot point for said vertical lever.

8. In an apparatus for resisting movement with a substantially constant force, a first class lever pivoted upon a frame and a toggle mechanism secured between one end of said lever and said frame and a spring extending between the end of the one of the links of said toggle mechanism connected to said one end of said lever and the lever pivot for resisting breaking movement of the toggle upon deflection of the other end of said lever.

9. Ironing apparatus comprising a roll, a shoe, said roll being movable into and out of engagement with said shoe, a vertically positioned lever for supporting said shoe at its upper end, a link pivoted to the lower end of said lever, the opposite end of said link being pivoted to a secondary link adjustably secured ot the frame, and a spring extending between the connecting pivot for said links and the frame.

10. In an ironing apparatus means for resisting movement of a shoe away from a roll and in which said roll is movable into and out of engagement with said shoe comprising a shoe-supporting lever pivoted to a stationary portion of the ironer frame intermediate its ends, a toggle linkage secured at one end to a stationary portion of the frame and at the other end to said lever, one of said links having an offset portion which provides a seat for one end of a spring, said spring being anchored at its other end about the frame pivot for said lever.

11. Apparatus for resisting motion with a substantially constant force comprising a first class lever pivoted to a frame, toggle linkage extending between said frame and one end of said lever, a spring acting between the knee of said toggle and the pivot point of said lever for resisting breaking movement of the toggle, and means for adjusting the frame connection of said toggle to vary the initial position of the movement resisting lever.

12. Apparatus for resisting motion with a substantially constant force comprising a first class lever pivoted to a frame, a set of toggle links extending between said frame and one end of said lever, one of said toggle links being extended past the knee of the toggle to provide a seat, a spring acting between said seat and the pivot point of said lever for resisting breaking movement of the toggle, and means for adjusting the frame connection of said toggle to vary the initial position of the movement resisting lever, the initial tension of said spring being adjustable.

13. Ironing apparatus comprising a base, a table on the base, a roll, a shoe, said roll being movable into and out of engagement with said shoe, said shoe being supported for movement above the table by means of a lever pivoted intermediate its ends upon a stationary portion of the apparatus and projecting through said table, and means intermediate one end of the lever and the frame of the apparatus for resisting movement of the lever about its pivot point with a substantially constant force in all positions of displacement of the lever.

14. In an ironing apparatus, a shoe, a roll, said roll being movable into and out of engagement with said shoe, a table, a lever projecting through the table and supporting said shoe upon its upper end, said lever being pivoted to the frame of the apparatus adjacent its point of projection through the table, and means extending between said lever and the frame of the apparatus for resisting movement of said lever about its pivot point in all positions of displacement thereof.

15. Ironing apparatus comprising a pair of ironing elements, one of said ironing elements being movable into and out of engagement with the other of said ironing elements, said other ironing element being supported for yielding movement when engaged by the first ironing element, and means forming a portion of the support for said other element resisting said movement of said other element with a substantially constant force in all positions of displacement thereof under the influence of said first ironing element.

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