April 7, 1931. W. M. CISSELL 1,799,281

FLATIRON

Filed Dec. 10, 1929 2 Sheets-Sheet 1

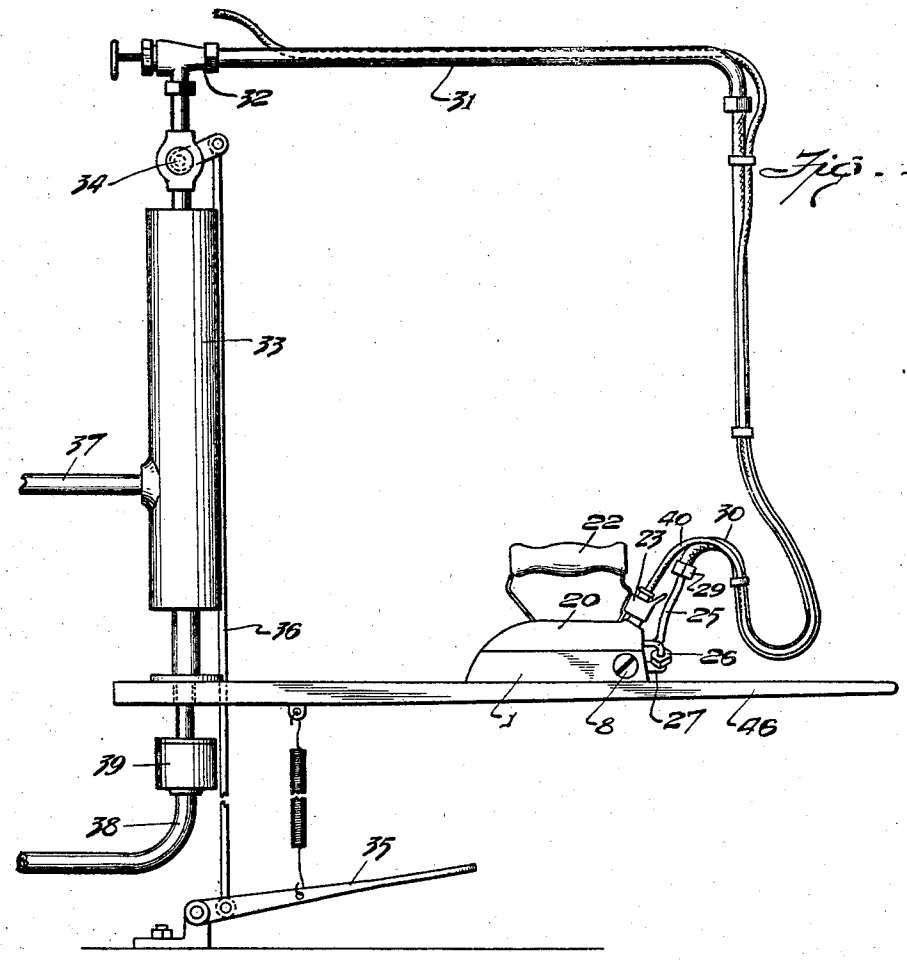

Fig. 1.

Fig. 5.

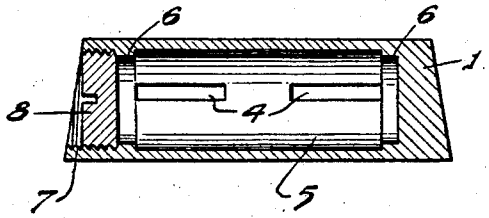

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Fig. 2.

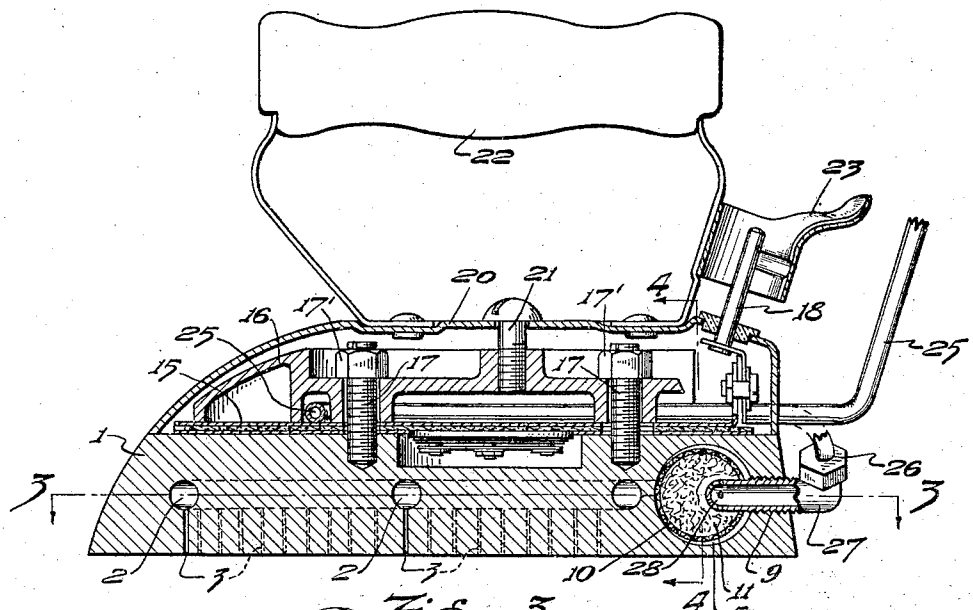


Fig. 3.

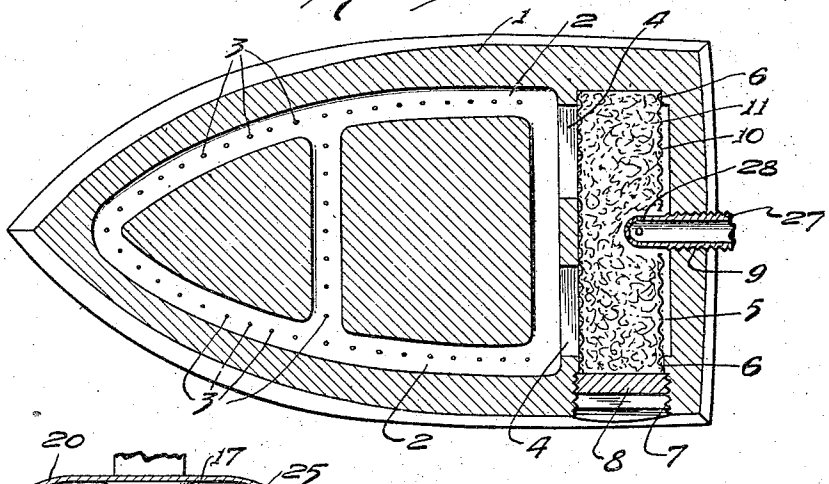
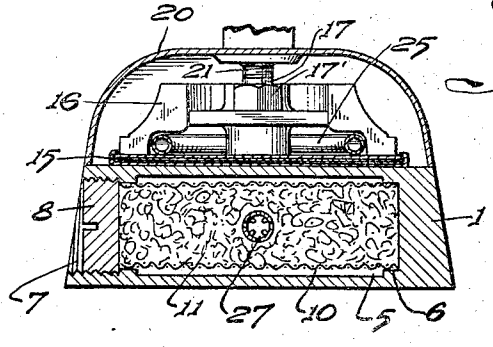


Fig. 4.



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UNITED STATES PATENT OFFICE

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FLATIRON

Application filed December 10, 1929. Serial No. 413,115.

The invention relates to certain improvements in flat irons involving self-contained heating units, preferably electrical, and provided with means for supplying live steam through the face of the iron to the fabric operated upon, the invention comprising means for supplying steam to the iron, preferably associated with the heating means to maintain the steam at a proper temperature, a passage or passages for the steam within the body of the iron provided with vents opening into the operating surface of the iron, with an expansion chamber formed within the body of the iron between the source of steam supply and the vented passage or passages, which will serve as a trap to retain any condensation of the steam that may occur, the expansion chamber preferably being provided with a filling of absorbent heat resisting material, which will prevent any water of condensation entering the passages within the body of the iron and escaping through the vents, as will be more particularly pointed out in the following specifications, predicated on the accompanying drawings, in which:—

Fig. 1 is a side elevation of an iron involving the invention, together with the accessories for supplying the heating current and the steam.

Fig. 2 is a longitudinal sectional elevation of an iron.

Fig. 3 is a horizontal section on line 3—3 of Fig. 2.

Fig. 4 is a vertical section on line 4—4 of Fig. 2.

Fig. 5 is a section similar to that shown in Fig. 4, with certain elements omitted.

Referring to the drawings, 1 indicates the body proper or base member of a flat iron, which is preferably formed as a casting suitably cored to form within the body one or more steam passages 2, which are connected with the operating face of the iron by a multiplicity of vent openings 3.

Formed in the rear portion of the base member 1 is an enlarged chamber 5, which is preferably circular in cross section and communicates with the steam passage or passages 2 through openings 4, 4, as more particularly shown in Figs. 3 and 5.

The ends of the substantially cylindrical expansion chamber 5 are provided with eccentric extensions 6, 6, which constitute seats for a foraminated cylinder 10 of perforated metal, wire gauze or the like, which constitutes the casing or cartridge holder for a body of absorbent heat resisting material 11 of any suitable character, but preferably asbestos fibre, which is packed into the cylinder 10, so that, when the latter is engaged in the seating extensions 6 of the expansion chamber, one wall of the foraminated cylinder will overlie the openings 4, 4 and the remainder of the cylinder will be spaced from the inner wall of the expansion chamber 5 in the manner and form particularly illustrated in Fig. 2.

A threaded opening 7 is formed in one side of the base member in axial alignment with the seating extensions 6, 6 of the expansion chamber 5 to permit the insertion and removal of the foraminated cylinder 10 containing the absorbent heat resisting material, which cylinder is held in position by means of a screw plug 8, which takes into the opening 7.

Mounted on top of the base member 1 is the electrical heating unit 15, which may be of any preferred type, provided with the usual thermostatic control and which is held in position by means of a follower or top section 16 formed as a casting and secured to the base by screw studs 17 and nuts 17'. The heating unit is provided with the usual terminal posts 18, which are adapted to be engaged by the usual cord and socket connector leading to the source of electrical supply. A sheet metal cover 20 of conventional form is secured to the top section 16 by means of the usual screw stud 21, said top section having fastened thereto a handle 22 equipped with the usual guard 23 for the terminal connecting posts.

A section of flexible metallic piping 25 leads into the interior of the iron and is formed with a U-bend lying within the hollow interior of the top section 16 and in engagement with the top of the electrical heat-

ing unit 15, the inlet end of the piping 25 being bent upwardly and the outlet end thereof being bent downwardly and laterally and provided with a coupling 26 by means by which it is connected with an elbow nipple 27, which is threaded in an opening 9 in the rear face of the base member 1 and has a perforated end portion extending through an opening in the foraminated cylinder 10 into the body of the absorbent material 11. The inlet end of the piping 25 is also provided with a coupling 29 by means of which connection is established with the flexible supply pipe 30, which, in turn, is connected to a fixed supply pipe 31 mounted above the board or table 46, upon which the iron is operated. The pipe 30 is preferably provided with a regulating valve 32 and with a shut off valve 34, which latter is operated by a spring treadle 35 and connecting rod 36, the valve 34 being normally closed by the spring treadle and opened when the treadle is depressed by the foot of the operator. Preferably interposed within the line of piping 31 is a steam chest 33, which is connected by a pipe 37 with the source of steam supply, the bottom of the chest opening into a drain pipe 38, provided with a trap 39, which takes care of any condensation. As a matter of convenience, the cord or similar electric conductor 40 may be clipped to the flexible pipe or hose 30, which supplies the steam, so that the cord and pipe move together, as the iron is operated.

In irons of this general type, as heretofore constructed, in order to prevent spotting of the material, which is being pressed, with water of condensation, it has been found absolutely essential to operate the electrical heating unit at such a temperature that any water within the iron would be converted immediately into steam. The maintenance of this high temperature renders the iron unfit for use with certain types of fabrics, more particularly those formed of synthetic filaments and generally known as artificial silk, rayon or the like, as such temperature is above the melting point of the synthetic material and would destroy the fabric made therefrom. By providing the iron with an expansion chamber between the source of steam supply and the vented steam passages within the body of the iron, any water of condensation will collect in the expansion chamber and will ultimately be converted into steam by the normal temperature of the iron maintained only slightly above the boiling point of water and, therefore, not sufficiently high to damage the fabrics being operated upon by the iron. Furthermore, the provision of the expansion chamber with the cartridge containing the heat resisting absorbent material in the manner and form shown will prevent any sudden surge of the steam, when admitted to the iron, forcing any water which may have collected in the expansion chamber into the steam passage or passages within the body of the iron, as all such water will be immediately absorbed by the material within the cartridge or foraminated cylinder 10, which material is also capable of being heated far beyond the vaporization point of water without damage, so that the absorbed water will be evaporated by the heat taken up by the fibrous filling.

In the normal operation of the device, the operator depresses the treadle 35, which opens the valve 34 and permits the steam to be delivered by pipe 37, steam chest 33, pipe 31 and flexible pipe or hose 30 to the metallic piping 25, the U-bend of which is in direct contact with the top of the electrical heating unit within the iron and which, therefore, serves as a superheater for the steam, which latter is delivered from the discharge end of the pipe 25 into the nipple 27, thence into the interior of the body of the absorbent heat resisting material 11 within the foraminated cylinder 10 and thence through the openings 4 into the steam passages 2 and by way of ducts 3, which open into the face of the iron, deliver the steam directly onto the material being operated upon. Should any water be carried by the steam or any condensation of the steam occur in its passage through the iron, the moisture will immediately be absorbed by the body of fibrous material 11, where it will be held until it has been evaporated by the heat of the iron. Should such an accumulation of water occur as to be beyond the absorptive capacity of the material 11, the excess water will merely accumulate in the lower portion of the expansion chamber 5, which is below the inlet to the steam passage 2 within the body of the iron and this accumulated water will be eventually converted into steam, as the iron heats up to normal capacity. It will be seen, however, that the iron may be operated to best advantage without the necessity of raising the same to an excessive temperature, which would damage the fabrics being operated upon, but which will nevertheless insure the delivery of dry steam to the fabric and the complete avoidance of any water of condensation being permitted to enter the steam passages and vents within the body of the iron.

What I claim is:

1. A flat iron, comprising means for heating the same, means for supplying steam to the operating face of the iron, means within the body of the iron to trap and separate any water of condensation from said steam, and an absorbent in the trapping means.

2. A flat iron, comprising means for heating the same, means for supplying steam to the operating face of the iron, an expansion chamber within the body of the iron to trap and separate any water of condensation from

said steam, and an absorbent in said expansion chamber.

3. A flat iron, comprising means for heating the same, means for conducting steam adjacent the heating means and delivering the same to the operating face of the iron, said conducting means including an expansion chamber within the body of the iron to trap and separate any water of condensation, and an absorbent in said expansion chamber.

4. A flat iron, comprising means for heating the same, passages for conducting steam adjacent the heating means and delivering the same to the operating face of the iron, said passages including an expansion chamber within the body of the iron having a portion at a lower level than the passages to trap and separate any water of condensation, and a heat resisting absorbent material in the expansion chamber.

5. A flat iron, comprising a base member having a plurality of steam passages formed therein provided with vents leading therefrom to the face of said base member, a steam inlet communicating with said passages, an expansion chamber interposed between said steam inlet and said passages, having a portion below the level of said passages to trap and separate any water of condensation from the steam, and means within said expansion chamber for absorbing any excess moisture entering said base member from said inlet passage.

6. A flat iron, comprising a base member having a plurality of vented steam passages formed therein, a steam inlet passage opening into said base and an expansion chamber having a portion thereof located below the plane of said steam passages, and heat resistant moisture-absorbing means within said expansion chamber said means being adapted to permit the passage of live steam and to absorb excess moisture entering said base member through said inlet passage.

7. A flat iron, comprising a base member having a plurality of vented passages therein, a steam inlet passage and an expansion chamber interposed between said steam inlet and the first named passages, portions of said expansion chamber being located below the plane of the said passages, a steam pipe adapted to communicate with said inlet passage and heat resisting moisture-absorbing means removably positioned within said expansion chamber said means being adapted to act as a separator whereby live steam will pass therethrough and the water of condensation will be entrapped within said means or within the lower portion of said expansion chamber.

8. A flat iron, comprising a base member having a plurality of vented steam passages therein, a steam inlet passage and an expansion chamber communicating on opposite sides with said steam passages and said inlet passage, a portion of said expansion chamber being below the plane of the said passages, a removable screen member positioned within said expansion chamber, means connected to said inlet passage and extending within said screen member said screen member being eccentrically placed within said expansion chamber whereby a portion of the steam contacts the wall of said chamber beneath the outlet passages therefrom, and heat resisting moisture-absorbing packing means within said screen member, said last named means being adapted to permit the passage of live steam while entrapping the water of condensation within the lower portion of said expansion chamber.

In testimony whereof, I affix my signature.

WILLIAM M. CISSELL.