April 17, 1928. 1,666,599

L. HOFFMAN

PRESSING IMPLEMENT

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Fig. 1.

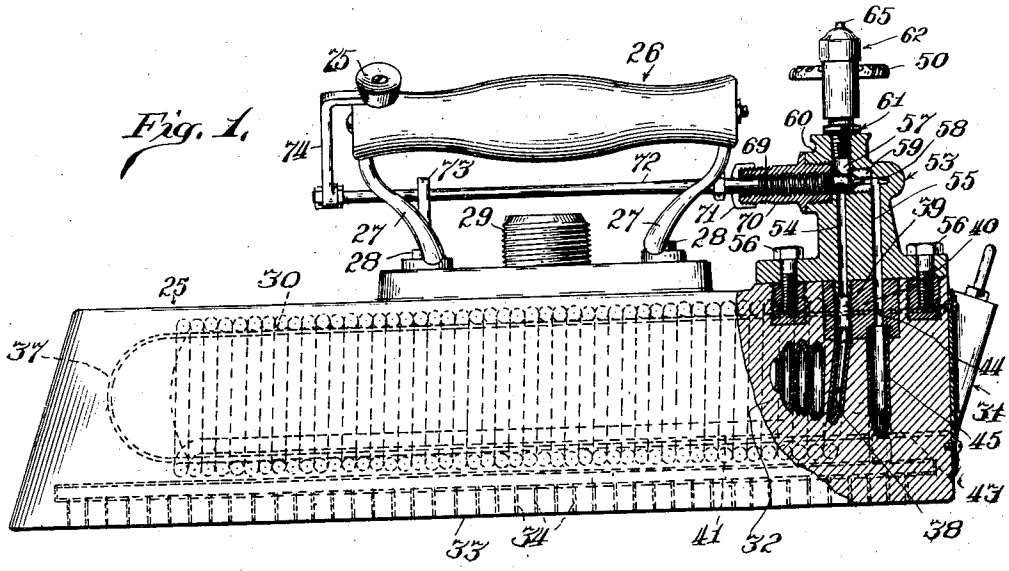
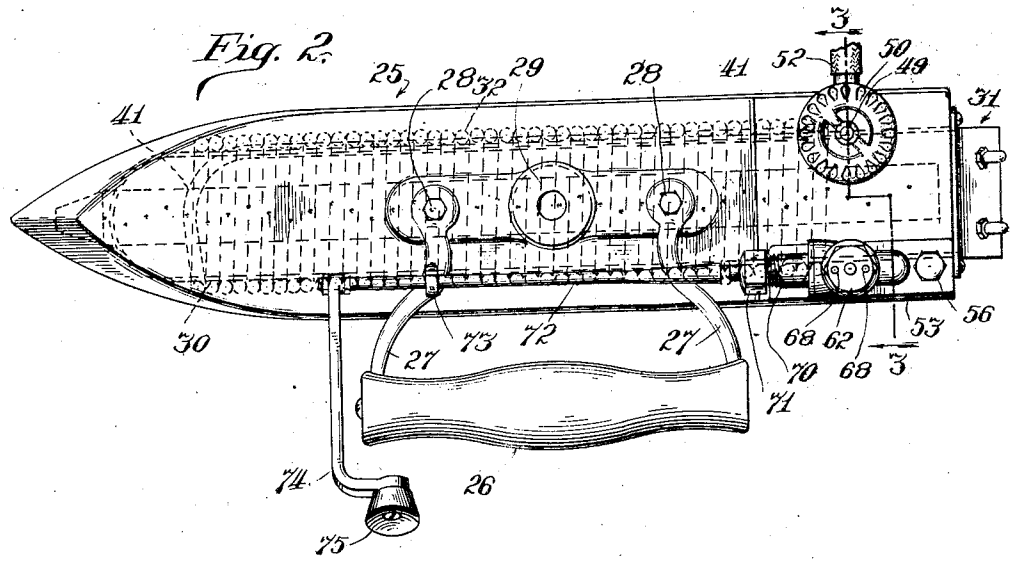


Fig. 2.



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Fig. 3.

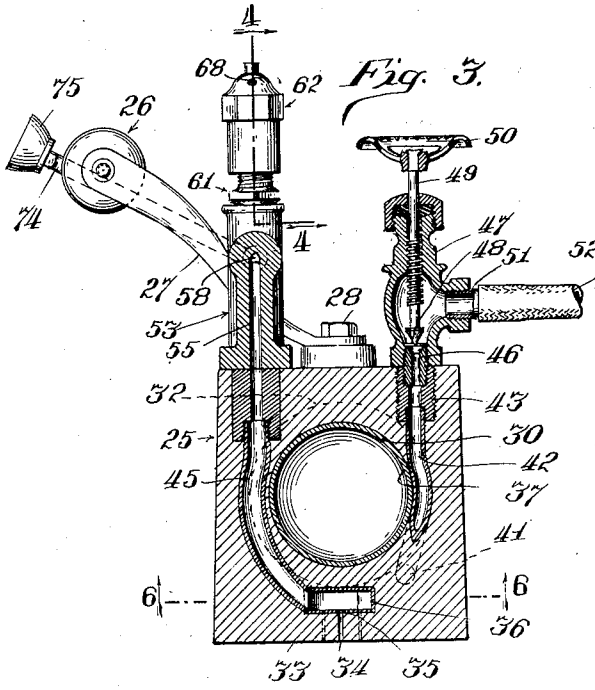


Fig. 7.

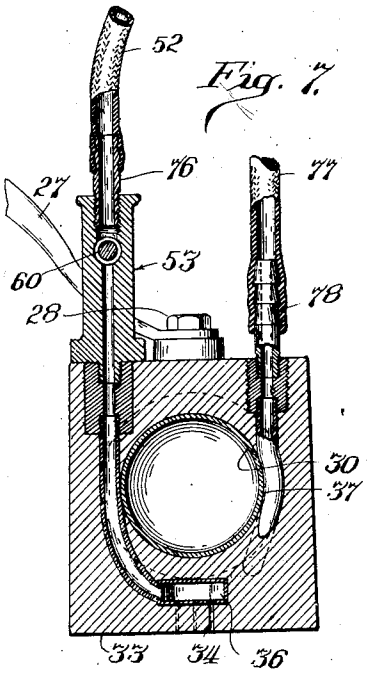


Fig. 5.

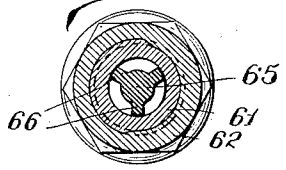


Fig. 6.

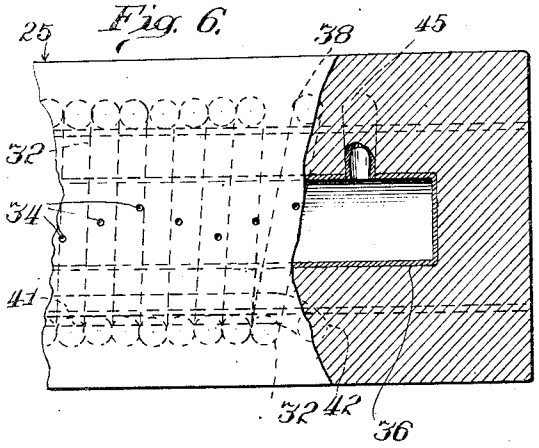
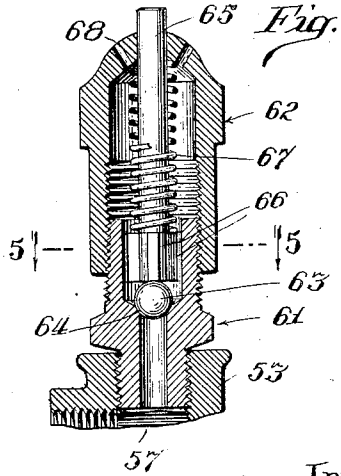


Fig. 4.



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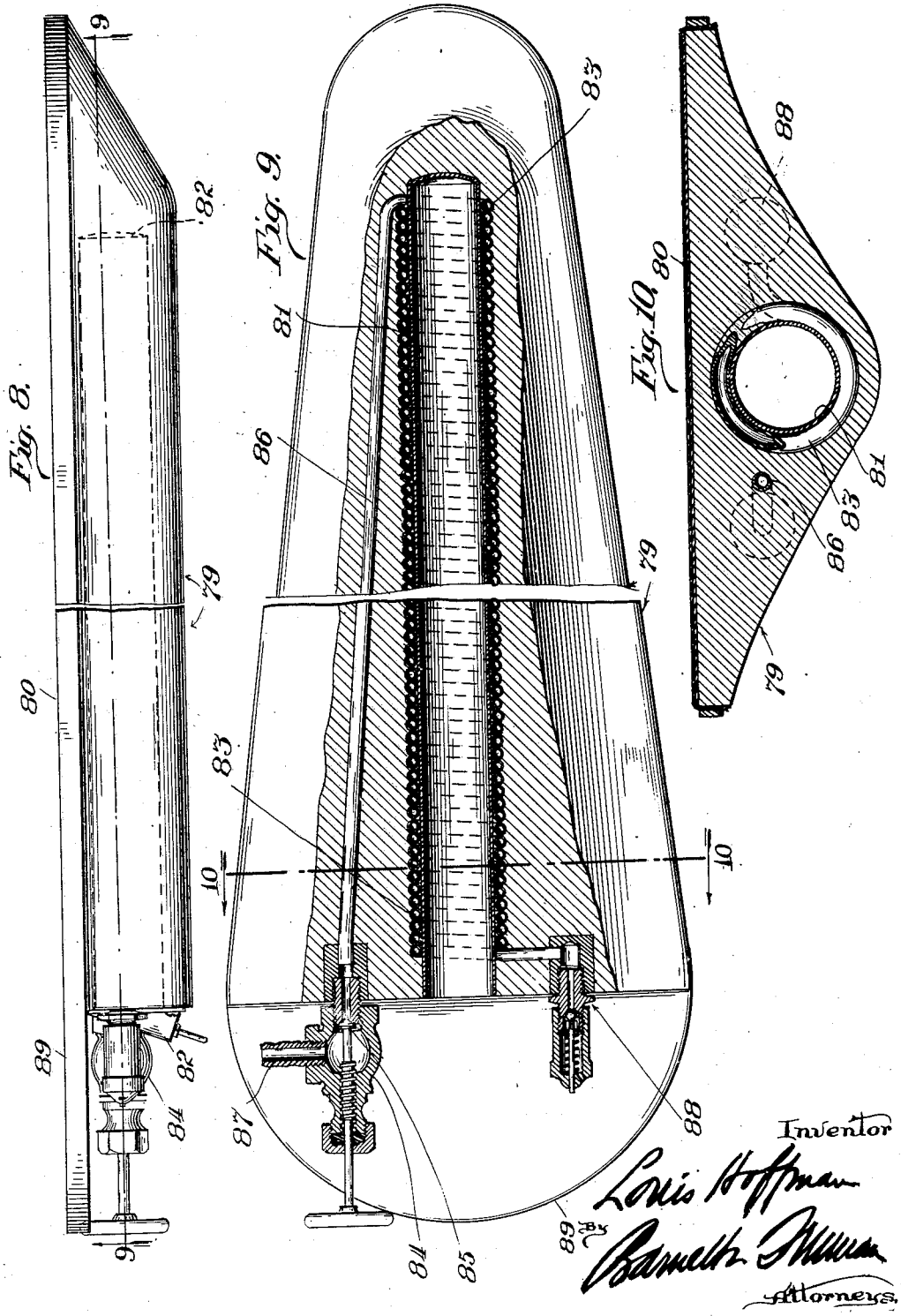
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PRESSING IMPLEMENT

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April 17, 1928.

1,666,599

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PRESSING IMPLEMENT

Filed Nov. 13, 1920

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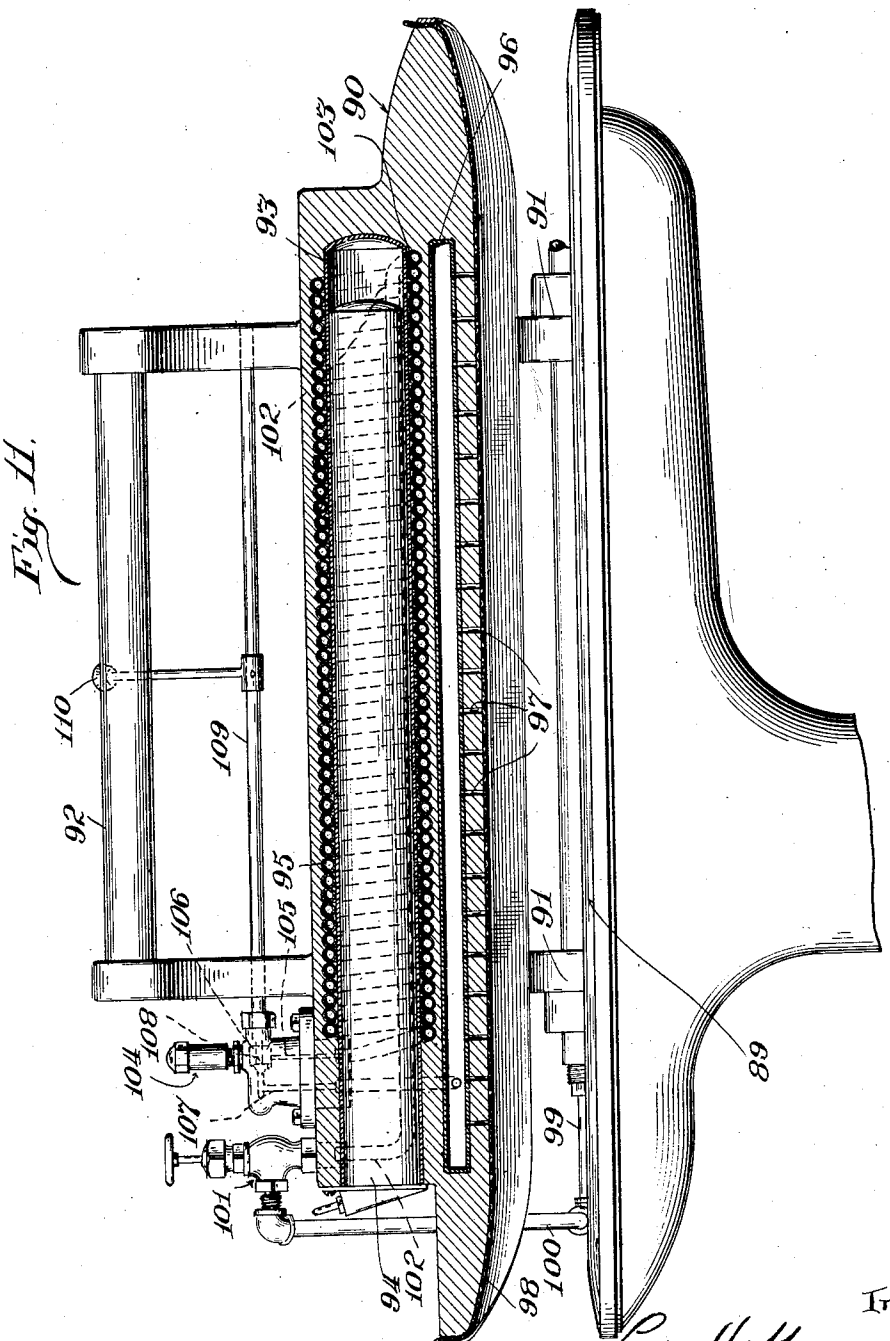


Fig. 11.

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Patented Apr. 17, 1928. 1,666,599

UNITED STATES PATENT OFFICE.

LOUIS HOFFMAN, OF DULUTH, MINNESOTA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO STEAM PRESSING IRON COMPANY, A CORPORATION OF DELAWARE.

PRESSING IMPLEMENT.

Application filed November 13, 1920. Serial No. 423,866.

My invention relates to apparatus, devices and appliances for pressing, steaming, shaping or blocking fabrics, garments or other articles by treatment of this sort; the invention being more especially concerned with the pressing apparatus and appliances used in tailoring shops for pressing and shaping garments. The novel devices, arrangements and constructions constituting the present invention are capable of utilization in connection either with a pressing, steaming or shaping implement which is moved against the garment operated on; or with one which is moved back and forth across the garment, a sad iron or tailor's goose, for example; or with the support or "buck" (this term being used herein in its broad signification) upon which the garment is supported during the pressing operation. The primary objects of the invention are:

To provide a pressing implement of any of the types mentioned which may, with very slight changes and adjustments, be heated either (1) by steam alone supplied to the implement from an outside source; (2) by steam so supplied and by heat derived from a heating element carried by the implement itself, for example, a gas burner or electric heater, or (3) by means of a heating element carried by the implement in conjunction with steam which is generated in the body of the implement from water supplied from an outside source. Different tailoring establishments favor one or another of the types mentioned, or find it desirable to use one type on one class of garments and another type on another class, so that an economy both in manufacture and in the use of these implements is effected by the provision of an implement which may be used interchangeably as above set forth.

To provide the implement with new and improved means whereby a portion of the steam supplied, to be superheated in or generated in the same, may be ejected, controllably, through a suitable perforation or perforations in the face of the implement against the garment, or other work, to moisten the same during the pressing operation; the invention having a special utility, as will hereinafter appear, in connection with a pressing implement of this so-called moistening type.

To so construct the implement that in the case of implements of type (1)—as specified above—steam is used most efficiently, and in case of implements of types (2) and (3) an economy is effected in fuel or current consumed by the heating element carried by the implement.

To dispose the moisture duct in the body of the implement so that the steam introduced thereinto, or superheated or generated therein, will be distributed to the best advantage and so that when a part of the steam is diverted and ejected against the garment it will reach the work in a highly heated and dry condition.

To automatically regulate the circulation of moisture through the implement, in cases of types (2) and (3) so as to eliminate the danger of overheating either the implement or the steam ejected against the work (when the moistening feature is utilized) to the damage thereof.

To provide a practical self heated pressing implement of the moistening type in which the moisture is supplied to the implement in the form of water and generated and ejected against the work as steam. Numerous attempts have been made heretofore to provide a pressing implement of the moistening type, for example, a tailor's goose of this type, which can be supplied with water, instead of steam; but so far as I am aware, these attempts have not been wholly successful due to the difficulty of obtaining from the heating elements with which the irons have been provided a sufficient quantity of dry, high-temperature steam for a sufficiently long period at a time to make these water-supplied irons adaptable for all sorts of pressing operations.

To provide a pressing implement of the self heated moistening type, especially a tailor's goose of this type, which will be much lighter than the ordinary cast iron tailor's goose and yet equally effective as a pressing implement. This I accomplish by employing aluminum instead of cast iron for the body of the implement, this substitution being possible, without loss of pressing efficiency, because of the increased capacity of the device so constituted for generating water into steam, superheating the steam and preventing condensation due to the greater thermal conductivity of the aluminum.

Other objects are attained by the use of this metal instead of cast iron, namely, the

equalization of heat throughout the implement and consequent diminution of the danger of scorching the goods by overheating the iron at one place, and the elimination of the possibility of staining the work with rust.

The invention consists in the new and improved arrangements, constructions and devices to be hereinafter described and claimed for carrying out the above stated objects and such other incidental objects as will be referred to in the following description of the preferred embodiments of the invention shown in the drawings. Referring to the drawings,

Fig. 1 is a side elevation, with parts in section, of a tailor's goose constructed in accordance with my invention, the implement being shown as provided with a heating element and equipped so that the moisture ejected against the goods may be supplied to the implement either as water or steam.

Fig. 2 is a plan view of the implement shown in Fig. 1.

Fig. 3 is a sectional view on line 3—3 of Fig. 2.

Fig. 4 is a vertical sectional view on a somewhat larger scale than the preceding figures, illustrating the construction of the relief valve for limiting the pressure accumulation in the generating or superheating duct.

Fig. 5 is a sectional plan on line 5—5 of Fig. 4.

Fig. 6 is a sectional plan on line 6—6 of Fig. 3, the scale being larger.

Fig. 7 is a view similar to Fig. 3, illustrating the same implement with certain parts removed and its fluid connections reversed, adapting it to be heated by steam alone.

Fig. 8 is a side elevation of a buck provided with steam heating arrangements in accordance with my invention.

Fig. 9 is an inverted sectional plan on line 9—9 of Fig. 8.

Fig. 10 is a sectional view on line 10—10 of Fig. 9, and

Fig. 11 is a view, in elevation, with parts in section, illustrating the application of the principles of my invention to a garment pressing machine having a hinged head which is brought down upon the work by a swinging movement.

Like characters of reference designate like parts in the several figures of the drawings.

I shall first describe the tailor's goose shown in Figs. 1 to 7 inclusive and shall assume that the moisture ejected against the work is supplied to the implement either in the form of water or steam.

The implement consists of the following parts: 25 is a body composed preferably of aluminum (which may be alloyed with copper or other metal to give it closer texture if desired). 26 is a handle carried by supports 27 secured by bolts 28 to the body of the implement, and 29 is a socket piece (forming no part of my present invention) by means of which the implement may be supported on a pressing machine. It will be understood that the invention is not limited to the use of the implement in connection with a pressing machine. Many of these implements are used by hand as the ordinary tailor's goose is used. The body of the implement is formed with a longitudinally extending chamber 30 adapted to receive a heating element. In Figs. 1 and 2 I have indicated at 31 an electric heating element which will preferably make a snug fit in chamber 30. 32 is a pipe coil imbedded in the body of the implement so as to surround chamber 30. The pipe coil is preferably composed of copper or other metal having a high coefficient of thermal conductivity. The pressing face 33 of the iron is formed with a plurality of fine perforations 34 which register with perforations 35 through the bottom of a hollow member 36 constituting a distributing duct and extending from end to end of the iron between the coil 32 and the pressing face 33. 37 is a tubular member within coil 32, this member constituting the chamber 30 above referred to. One end 38 of coil 32 is fitted into a perforation 39 in a block 40 imbedded in the body of the iron. Continuous with the other end of the coil is a pipe 41 which runs lengthwise of the coil, is bent upwardly, as shown at 42, and set into a perforated block 43. The block 40 is formed with a second perforation 44 and a pipe 45, set into the block at this perforation, leads to the hollow steam distributing duct 36. In manufacturing the device a piece of copper pipe is wound around the tubular member 37, the member 36 is soldered to the coil so formed, blocks 40, 43 are put in place and the aluminum is cast around these parts to form the body of the implement, and perforations 34, 35 are drilled. The implement is completed by adding the valve devices which will now be described.

Block 43 is provided with an upwardly extending nipple 46 to which is screwed a valve casing 47 of any suitable type. The end of the nipple 46 forms a seat for a feed regulating valve 48, the stem 49 of which is threaded through the valve casing 47. The stem is provided with a hand wheel 50 for adjustment of the valve 48. In the side of valve casing 47 is a nipple 51 for a flexible hose 52 adapted to be connected with a source of water or steam supply (not shown). The valve 48 is normally open to a greater or less extent. Its adjustment regulates the inflow of water or steam to the coil 32. This valve has been shown in a conventional way. Any other suitable pipe valve might be employed in this connection.

At the other side of the iron is arranged a

fitting 53 having ducts 54, 55 which register with ducts 39, 44, respectively, of the block 40, the fitting 53 being secured to the body of the iron by screws 56. Within the fitting is a chamber 57 to which duct 54 extends and which is connected to duct 55 by means of a horizontal passageway 58, the latter extending through a plug 59 formed to provide a seat for a valve 60. Fixed to the top of the fitting 53 is a two-part valve casing 61, 62, the interior of which communicates with chamber 57. In this valve casing is a ball valve 63 adapted to bear against a seat 64 provided by casing member 61. The ball is held to its seat by a stem 65 formed with guiding ribs 66 between which and the top of member 62 is interposed a coiled spring 67. The upper member 62 of the valve casing has a threaded engagement with the lower casing 61 so that the spring pressure on the ball valve 63 may be varied. 68 are outlet ports in the upper end of the casing member 62. The relief valve device just described operates to limit the possible pressure in the coil 32, valve 63 unseating when the pressure in the coil exceeds that exerted by spring 67.

Valve 60, which controls the flow of steam from the coil 32 to the perforated pressing face of the implement, is formed with a stem 69 threaded into the interior threading of a bushing 70 set into the side of fitting 53. The stem is prolonged beyond the bushing, in its cap piece 71, this outer portion 72 of the stem being supported by a lug 73 formed on the forward handle support 27. 74 is a lever fixed to the end of the valve stem extension 72 and provided with a thumb piece 75 lying close to handle 26. The valve 60 may be opened and closed by movement of the thumb piece 75.

In order to utilize the tailor's goose just described as an "all steam" iron, that is, as an implement heated by steam alone, it is only necessary to remove the relief valve by unscrewing the casing section 61 from the fitting 53, and replace it with a nipple 76 (Fig. 7) for the steam supply connection 52, and to attach a steam discharge hose 77 to the nipple 51 of valve casing 47 (Fig. 3) or to a nipple 78 (Fig. 7) which may, if desired, replace the valve casing 47. These changes involve, it will be seen, a reversal of the flow through the coil 32.

Résumé of operation:

First.—Assume that the device is heated by an electric heater or burner and is supplied with water which is to be generated into steam and ejected against the work. Water flows into the coil 32 from flexible tube 52 in regulatable quantities determined by the position of valve 48. The relief valve 63 is closed and it will be assumed that valve 60 is also closed. The water in the coil will be generated into steam and a pressure developed which checks inflow of more water. The generation of steam from the water will be very rapid because of the length of the coil and its small diameter and its position surrounding the heating element. In using the implement the operator moves the thumb piece 75 to open valve 60. Steam at the accumulated pressure and correspondingly high temperature passes from the discharge end of coil 32 through ducts 54, 58, 55 and 45 to the distributing member 36 and thence through perforations 35, 34 to the work. The steam issuing from the perforations in the pressing face at a high temperature and pressure readily penetrates the work and is quickly evaporated by the heat of the pressing face so that the removal of wrinkles or shaping of the garment is effected with great rapidity and ease. The outflow of steam through the pressing face reduces the pressure in the coil and allows additional water to enter the coil. This water is heated in the inlet end of the coil and generated into steam further on. The fact that the relief is normally closed insures a constant supply of hot, dry steam for use as required, the application of moisture to the work being ordinarily intermittent and the amounts needed varying with the particular sort of garment operated on. One of the objections to the use of self-heated sad irons of the moistening type is that the careless workman may damage the garments either through overheating the iron, that is, its pressing face, or superheating the steam used for moistening purposes to too great an extent, by allowing too great a steam pressure to accumulate in the generating or superheating duct. Such rise of pressure, if excessive, will overheat the iron so as to scorch the garment, besides raising the temperature of the moistening fluid to such a point as to make its ejection against the work injurious. The steam in passing through the minute perforations in the pressing face is wire drawn and its temperature thereby augmented. It has sometimes happened that the temperature of the steam was so high as to burn pin holes in the garment being pressed. These overheating dangers are eliminated by the employment of the relief valve which forms an important feature of my invention. The valve may be set to operate at any pressure desired and when this pressure is reached steam will pass out of the coil and the resultant diminution of pressure will admit water to the coil which, of course, cools down the body of steam therein and has a cooling effect upon the iron itself. In this connection the arrangement of the coil around the heating element is important because the coil acts not only as a steam generator but as an insulator separating the body of the iron, to a certain extent, from

the heat delivered from the heating element. Once valve 48 has been set to a proper position, dependent upon the pressure in the water main and the heating capacity of the heating element, the relief valve will act automatically to prevent any possible overheating of the iron, or overheating of the moisture fluid and this regardless of whether the intervals between applications of the moisture fluid be long or short.

Another important feature of my invention is the making of the body of the implement of aluminum. It has generally been supposed that a flat iron should be heavy in order that it should press with sufficient force against the goods to drive the moisture into the work and subsequently effect its evaporation. This is probably true of the ordinary intermittently heated flat iron of the non-moistening type because in using this sort of an iron even with a wet cloth or after sprinkling or sponging the work there is almost always an excess of moisture and this moisture is cold. The function of the iron is to evaporate the water and compel it to enter the goods and the closer the iron is pressed against the goods the better this function and the evaporation of the water are accomplished. When flat irons were constructed so as to be self heating and so as to eject moisture against the goods it was not realized that if the moisture could be ejected against the goods at a high pressure and in a dry state the close contact required with the old type of iron was not essential. It was not realized, moreover, that if implements of this type were made as other flat irons, of cast iron, the low thermal conductivity of the cast iron would make it difficult to generate into steam a stream of water continuously flowing through the fluid ducts of the implement. At first the water will flash into steam but as the surfaces of the ducts become cooled the generating power of the iron is diminished with consequent lowering of the temperature and pressure of the ejected moisture. By using a metal having a much higher coefficient of thermal conductivity than cast iron it is possible to continuously convert the water into steam at high pressures and temperatures and to prevent any appreciable diminution of temperature and tendency to condense as the steam moves away from the heat source toward and through the pressing face, which latter, of course, is constantly cooled by contact with the moist garment. By making the body of the implement largely of aluminum, which besides having a high coefficient of thermal conductivity is also very light in comparison with cast iron, the laboriousness of manipulation of the implement is very much diminished and this advantage is obtained without any loss of efficiency. Because of the capacity of the device to eject steam at high temperature and pressure, it is not essential that there be such intimate contact between the pressing face of the implement and the goods operated upon. In the tailor's goose above described the steam generating duct is made of copper for manufacturing convenience and because the porosity of aluminum makes that metal less suitable for the parts of an implement which have to resist considerable steam pressures. This involves no disadvantage because copper has also a relatively high coefficient of thermal conductivity. The copper coil is imbedded in the aluminum body so that the rapid conduction of heat throughout the implement, which is an important consideration, is insured.

The use of these metals has another advantage over cast iron in that the danger of soiling the garment with rust stains is obviated.

Second.—Assuming that the implement is provided with a heating element and is supplied with steam instead of water, the operation will be substantially as described above. The steam will be superheated in coil 32, the maximum pressure of which is determined by the adjustment of the relief valve. The steam, being introduced necessarily at a lower pressure than this maximum, will act to a certain extent to cool the iron. One advantage of this method of operation is that the initial heat of the steam makes it possible to use a heating element of smaller capacity.

Third.—If the implement is to be heated by steam alone the relief valve 61, 62 (Fig. 3) is replaced by a nipple 76 (Fig. 7) and the steam inlet pipe 52 instead of being attached to nipple 51 is attached to nipple 76 so that the flow of steam through the coil 32 is reversed. In order to carry off the steam from the iron a steam hose 77 may be attached to the nipple 51 (Fig. 3) or the valve casing 47 may be removed and the discharge hose attached to a nipple 78 (Fig. 7) which replaces the valve casing 47. With the iron used in this manner it will be observed that the steam diverted to the pressing face is not taken from coil 32 but is live steam taken from the supply pipe, or more accurately, from the fitting 53—now the inlet fitting—a portion of the steam supplied to the iron being thus diverted to the pressing face while the remainder is circulated through the coil 32 which, in this case, functions purely as a heating element. By this arrangement the steam ejected against the work is dry and at a relatively high temperature. Condensation of the steam in passing from the inlet to the pressing face is minimized by making the body of the implement of aluminum and duct 45 and distributing duct 36 of copper. This is an important feature in an all steam iron since

the effectiveness of the device as a pressing implement depends upon the velocity and temperature of the steam jets and practical considerations place a limit upon the pressure of the steam supplied to the device. In other words, the body of the implement must be kept heated by steam at not excessive pressure sufficiently to prevent any appreciable condensation of that portion of the steam diverted and ejected against the work.

In Figs. 8, 9 and 10 I have shown a buck which is furnished with steam heating devices in accordance with this invention. This embodiment of the invention does not contemplate the ejection of moisture against the work although the moistening of the goods or garment by steam taken from the buck might be accomplished, if desired, by modifications which will be quite apparent from the description of the pressing implements shown in the first seven figures of the drawings.

Referring now to Figs. 8, 9 and 10, 79 designates the body of the buck which is so formed as to provide an extended upper pressing surface 80. The buck may be made of aluminum or other metal. It is formed with a longitudinally extending recess 81 for a gas burner or other heating element. In Fig. 8 I have indicated the use of an electric heating element, the end of which is shown at 82. Cast into the body of the buck is a pipe coil 83, preferably of copper, which surrounds the recess 81. 84 designates the casing for a valve 85 which controls the introduction of heating medium, water or steam, to coil 83, 86 being a pipe connecting casing 84 with the remote end of coil 83, and 87 a pipe for supplying fluid to the casing. Outflow from the coil 83 is automatically controlled by a valve device 88 corresponding in all respects to the valve device shown in detail in Fig. 4. This valve and the inflow valve are preferably arranged under an extension portion 89 of the buck.

The operation, so far as the heating of the buck is concerned, is the same as that of the said iron previously described. If water is used it flows through pipe 86 and is generated into steam in the coil 83, inflow being determined by the adjustment of valve 85 and by steam pressure developed in the coil. When this pressure reaches the point at which relief valve 88 is set to operate, valve 88 opens to relieve the pressure and admit additional water.

In Fig. 11 I have illustrated, in a somewhat diagrammatic manner, the application of the principles of my invention to the construction of a pressing head in a machine, otherwise of familiar construction, in which the pressing, shaping or smoothing of the garment is accomplished by pressing it between a stationary buck and hinged head. In this figure, 89 designates the lower or stationary buck and 90 the pressing head which is shown as hinged to the buck at 91. The head is provided with a handle 92 although any suitable means might be employed for moving the head against the buck. The head consists of a metal casting formed with a recess 93 for a heating element 94 of any suitable character. 95 is a coil cast into the head around recess 93, and 96 is a moisture distributing duct which consists preferably of a tubular member cast into the body of the head. 97 are perforations through the pressing face of the head for ejection of steam from the distributing duct 96. The pressing face may be covered, if desired, with a fabric covering 98 although this feature is not regarded as essential. Water or steam enters the coil 95 through a pipe 99 preferably concentric with the axis of hinges 91, a branch pipe 100, a controlling valve 101 and a pipe 102 cast into the body of the head and leading to the remote turn 103 of coil 95. The water is generated into steam, or if the steam is used it is superheated in coil 95, the pressure in which is regulated by relief valve 104 corresponding to the relief valves previously described. Duct 105 leads from coil 95 to a valve chamber 106 with which the relief valve communicates. 107 is a duct leading from the valve chamber 106 to the distributing pipe 96. This duct is controlled by a valve 108, the spindle 109 of which is operated by a finger piece 110. I have not shown any special means for heating the lower pressing member or buck, the heating arrangements and, if desired, also the moistening arrangements, shown in connection with the pressing head may be employed for heating the buck and supplying moisture to the goods or garment through the buck.

It will be understood that the heating arrangement shown in Figs. 8, 9 and 10 and the heating and steaming arrangements shown in Fig. 11, may be adapted so as to be supplied with steam without the use of the heating elements 82, 94, or their equivalents, in the same manner as has been described in connection with the sad iron shown in the first seven figures.

I claim:

1. A pressing implement comprising a metal body formed with a chamber adapted to receive a heating element, and a pipe coil surrounding said chamber and constituting a fluid circulating conduit.

2. A pressing implement comprising a metal body formed with a chamber adapted to receive a heating element, and a pipe coil imbedded in said metal body and surrounding said chamber to provide a fluid circulating conduit.

3. A pressing implement comprising a metal body, a pipe coil imbedded therein,

terminal fittings for said coil on the outside of the body, the pressing face of said implement being perforated for ejection of steam, means providing a duct from one of said fittings to the perforated face of the implement, a feed regulating valve associated with one of the fittings, and a relief valve also in this fitting.

4. A pressing implement comprising a metal body, a pipe coil imbedded therein parallel with the pressing face of the implement and a hollow distributing member communicating with said coil and imbedded in the body between the coil and the pressing face, said pressing face and hollow member being formed with communicating perforations for ejection of moisture against the work.

5. A pressing implement comprising a metal body, a pipe coil imbedded therein parallel with the pressing face of the implement and a hollow distributing member communicating with said coil and imbedded in the body between the coil and the pressing face, said pressing face and hollow member being formed with communicating perforations for ejection of moisture against the work, said body being formed with a recess lying within said coil and adapted to receive a heating element.

6. A pressing element comprising a metal body, a tubular member providing a chamber for a heating element, and a pipe coil surrounding said tubular member, both imbedded in said body.

7. A pressing implement comprising a body having a pressing face perforated for ejection of moisture against the work, a coil in said body adapted for circulation of fluid through the body, means providing a duct leading from the outlet end of the coil to the perforated face, a heating element in said body, a relief valve at the outlet end of the coil and a manually operable valve at the outlet end of the coil for controlling the flow of fluid from the coil to the perforated pressing face.

8. In a pressing implement, the combination of a body formed with a perforated pressing face and with a continuous steam circulating conduit, inlet and outlet fittings at the ends of said conduit, the outlet fitting providing a discharge orifice for the circulating medium in the conduit independent of the perforations of the pressing face, and means constituting a duct leading from one of said fittings for divergence of steam to the perforated pressing face.

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