Jan. 24, 1939. W. BOCK 2,145,209

HEATER

Filed Nov. 5, 1932

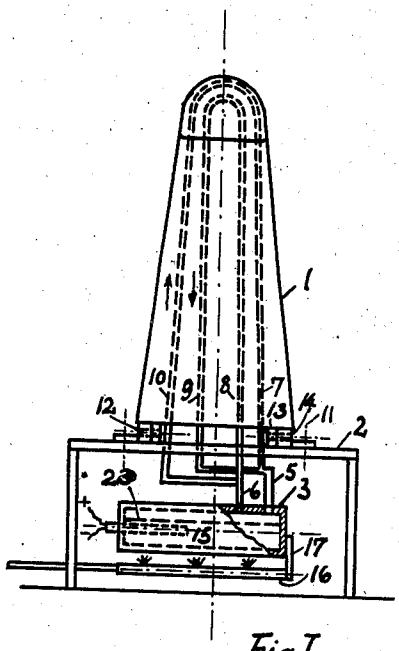


Fig. I.

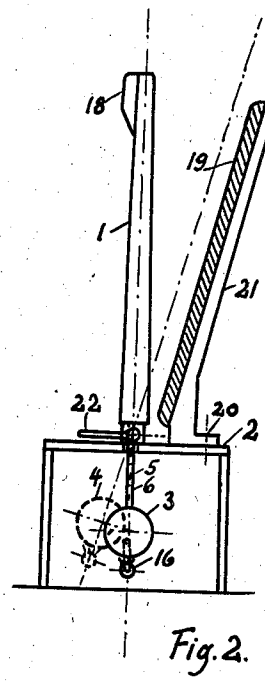


Fig. 2.

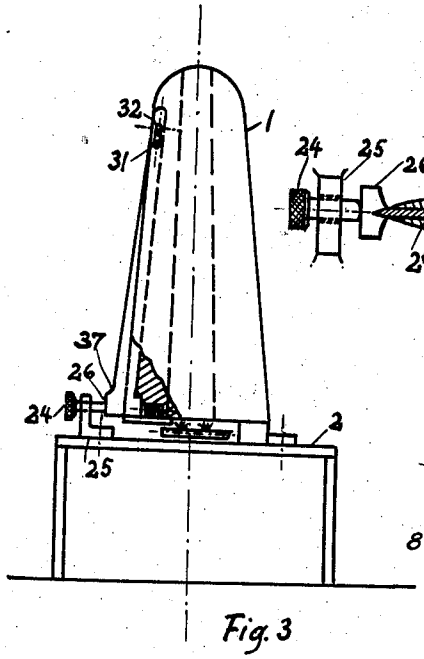


Fig. 3

Fig. 4.

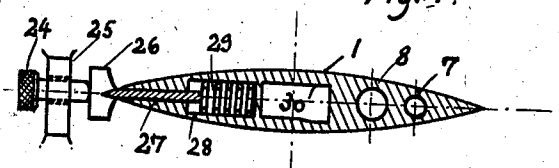
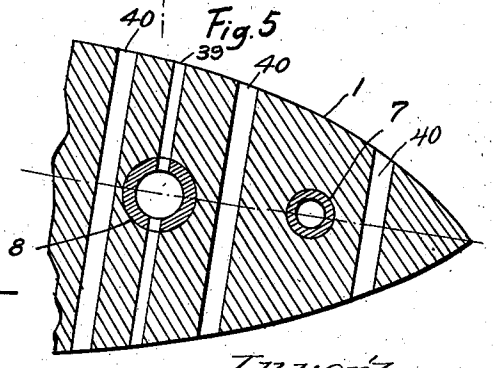


Fig. 5



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UNITED STATES PATENT OFFICE

2,145,209

HEATER

Wilhelm Bock, Gwynedd, Pa.

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In Germany October 31, 1931

4 Claims. (Cl. 223—57)

The principal object of the invention is to provide an improved heater for drying and finishing such as textile articles or other substances exposed to the transfer of heat. An additional object is to provide a generator rigidly connected with an oscillating heater. A plurality or group of tubes or hollow metal members constituting steam passages are embedded in a casting. Other objects relate to various features of construction and arrangement of parts, which will become apparent from a consideration of the following description and accompanying drawing herein.

Of the drawing:

Fig. I is a view of the heater, showing the heating body, tubes and generator;

Fig. II is a side view;

Fig. III is a side view of the adjustable part of the heater;

Fig. IV is a cross section of the heater; and

Fig. V a cross section of the heater, the tubes and steaming holes.

The same reference characters indicate the same parts in all the figures.

The heater is composed of a metal body **1** and shaped to the work to which it is adapted to transfer heat for example textile articles, as hosiery, trousers, stockings, sleeves, etc. Within the solid body **1**, a system of tubes **7**, **8**, **9**, **10** is arranged, terminating without interruption in a plurality of separate steam inlets and outlets. To assure an absolute heat contact, tubing of relatively small cross section is bent in the desired shape and the metal body cast around the tubes. As shown in Fig. I the shape of the tubes follows the outline of the body. Furthermore the tubes are arranged in a parallel and coplanar relation. This position allows the use of tubes which are different in length as shown in Fig. I. The different lengths of the tubes makes it possible to control the temperature in the different parts of the body as the temperature of the steam heated elements depends on their length or volume. During the moulding process the metals of the heating body will entirely surround the tubes with exception of the separate steam inlets and outlets arranged outside of the cast body, which results in a perfect thermal contact. To have the metal surrounding the tubes entirely, the single tubes **7** and **8** are shown in Figs. I and IV arranged in a spaced position, so that two adjacent tubes in the body are not touching each other. Therefore, the distance between the centers of two adjacent tubes is larger than the sum of their radii. For heaters exposed to high pressure, as 100 lbs. per square inch and more generally, iron castings of considerable wall thickness have to be used. This makes the heater heavy, clumsy and undesirable in shape. As tubing of relative small cross-section have a great pressure resistance, the surrounding metal body can be held thin, flat or curved, a shape which is desired for the correct finishing of hosiery, sleeves, etc. To assure a high drying speed, the coils are preferably chosen of copper and the metal body of aluminum. As both metals have a six times and three times respectively higher heat coefficient as cast iron, this combination proves to be very advantageous over the methods generally used. To prevent, during the casting process, corrosion of the tubes being either of electrolytical or metallurgical origin, a protective coat of a suitable heat resistant metal, as nickel or other substances as graphite, etc., is applied to the outside surface of the heating tubes before the metal body is cast around said tubes. To protect the tubes against excessive heat developed during the casting process, they are preferably filled with a cooling medium as water, etc. As the tubes are of relatively small cross section, it is necessary to employ several independent parallel or concentric tube systems **7**, **8**, **9**, **10**, which will prevent that the water of the condensed steam fills the tubes, and therefore maintaining an uninterrupted circulation of the steam. As shown in Figure I the heater and the tubes are arranged in an upright or angular position to the horizontal table **2** which secures the return of the condensed water automatically to generator **5** located under or lower than the body **1**. The tubes can be bent in such a way that condensed steam will be removed from the tubes to the generator by its own gravity.

The tubes are connected outside of the heater to a collector **5**, **6**, which is in communication with the heat generator **3**, located under the stand **2**. As shown in Figure I, the steam supplied by the generator enters the tubes from both ends, which increases the heat efficiency. The arrangement of a plurality of tubes of small cross section and great pressure resistance has the advantage of having a higher heat conduction than a single tube of the same volume as the total tubes. As shown in Fig. I, the body is cast only partly around the tubes. The ends of the tubes, which are connected with the collectors **5** and **6** are not surrounded by the body. The collectors are preferably placed under the table **2**. For garment presses and sleeve ironers it is necessary to have the ironer movably arranged. Therefore, the

metal body 1 is movably connected by means of pivot 12, resting in the bearing 14, which is fastened to the stand 2. The oscillating motion of the body can be either performed by means of an operating arm or handle 22 or by power. To prevent flexible connection between the body and the generator the latter is rigidly connected with the body or the tubing. By this arrangement, the boiler 3 is forced to the same movement as the body 7. The boiler is heated by a gas source 16 or an electric element 23. The heating means 16 is rigidly connected with the boiler 3 by a connection member 17, as shown in Figure I. The board 21, is likewise fastened to the stand 2. It is immaterial if the body is oscillating and the board stationarily arranged or the latter movable and the body rigidly connected. The body has a reenforcement 18 on the upper part. As the heater is designed very narrow, it often is desirable to have a larger round or curved surface especially for drying the lower part of shirt cuffs without depriving the form of the advantage resulting from the flat and narrow outlines. The reenforcement 18 extends from one side of the body as shown in Figure II.

It is often desirable to change the width of the form for stretching materials, as stockings and sleeves. For this reason the body 1 is provided with an adjustable plate 27 which is movably arranged in a slot of the body and pivotally held by pin 32. A spring 29, located in a recess 28 presses the adjustable plate against a screw arrangement 24, 25. By means of screw 24, the width of the form can be altered depending upon the stress desired in the article to be dried. The adjustable plate 27 is curved at the lower part 37, and the upper part is provided with a longitudinal recess 31, in which pin 32 is arranged. The recess allows the shifting of the turning center of the plate. This permits the proper stretching of tubular articles of irregular shape. To have the operator observing the proper placing of the article in the back of the form, a mirror 42 suitably arranged on the stand 2 by a support 43 is employed (not shown). A recess for taking up the seam of sewn articles will facilitate the drying and shaping. To prevent a certain amount of shrinkage during the drying, the surface of the body is polished or ground in the direction at right angles to the direction of placing the article on the form which provides a friction to keep the placed article in its original position. The cross-section of the heating tubes varies with the cross-section of the body (see Fig. IV, 8, 7). The body is preferably perforated which results in a higher drying speed. The holes 40 cover the whole body with exception of the places where the heating tubes are located. If a steaming effect is desired, an independent tube, cast in the body is perforated, so furnishing the desired amount of steam for a proper finish of the article to be exposed to the form. To overcome impressions caused by the perforations, the ironer can be movably arranged parallel to the board. This provides a desirable hand ironed effect.

The operation of the invention is as follows: Steam is generated in the boiler 3 and led to the tubes cast in the body 1. The article to be dried is exposed to the form and either finished by manual pressure or by means of the pressing board 21. If the width of the body is insufficient it can be decreased or increased by moving the adjusting screw 24. This stretches the article and diminishes the wrinkles in the material.

Although I have shown certain features of the invention for the purpose of illustration, it will be apparent that various changes may be made therein, without departing from the spirit of the invention and I do not wish to be restricted to the specific embodiments shown and described except as limited, thereto, by the appended claims.

I claim:

1. A heater comprising a body, a support, said body being pivotally arranged on said support, a steam passage in said body, a steam generator rigidly connected to said body, said steam generator being located lower than said body.

2. A heater comprising a body, a support, said body being pivotally fastened to said support, a plurality of tubes being embedded in said body, a steam generator rigidly connected with said body and said tubes, said generator being located lower than said body, and means for swinging said body.

3. A heater comprising a body, a support, said body being pivotally fastened to said support, a plurality of hollow members being embedded in said body, a steam generator rigidly connected with said body and members, means for swinging said body and a board adapted to be contacted with said metal body by said swinging means.

4. A heater for garment presses comprising a body, a support, said body being pivotally fastened to said support, a steam passage in said body, a steam generator rigidly connected with said body and said steam passage, means for swinging said body, a board, for contacting with said body, said steam generator being located lower than said body, gas heating means for generating steam, said gas heating means being rigidly connected with said steam generator.

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