Sept. 12, 1933. E. O. DAYTON 1,926,803

PADDED IRONING AND PRESSING APPLIANCE

Filed Nov. 7, 1931

Fig. 1.

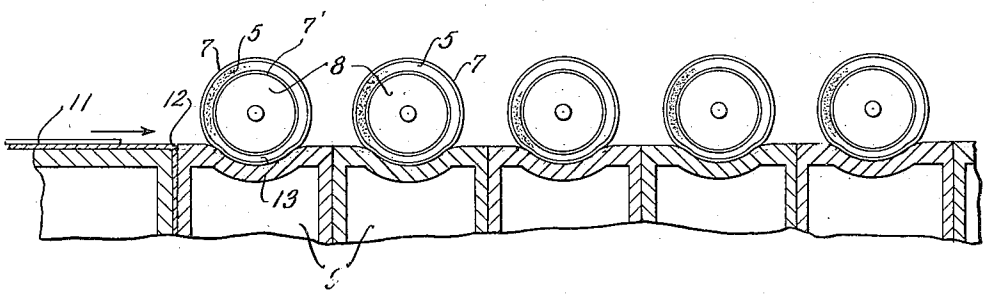


Fig. 2.

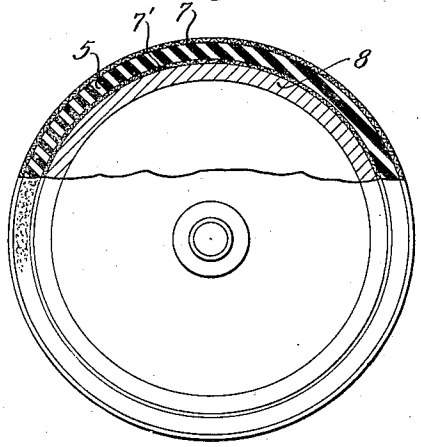


Fig. 3.

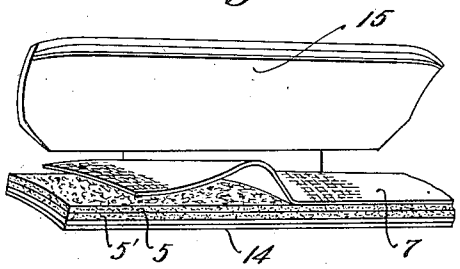
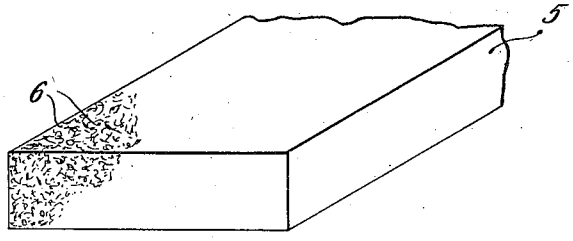


Fig. 4.



Inventor,
Edmond O. Dayton,
by Pollitt, Cushman & Woodhams,
Attys.

Patented Sept. 12, 1933 1,926,803

UNITED STATES PATENT OFFICE

1,926,803

PADDED IRONING AND PRESSING APPLIANCE

Edmond O. Dayton, Hillsdale, N. J.

Application November 7, 1931. Serial No. 573,559

4 Claims. (Cl. 68—9)

This invention relates to apparatus for ironing or pressing purposes, and pertains more particularly to improvements in the backing for the surface which supports or presses the cloth against the heated element, as on the ironing rolls and press bucks.

Ironing implies the coincident application of heat and substantial pressure to a moist article with vaporization of water, smoothing and drying. The problem is to get rid promptly and continuously of the steam produced by the heat without reduction of efficiency, that is to say, to provide for the discharge of the steam as effectively at the end of a period of use on wet or damp cloth as at the beginning.

The ordinary fibrous backing for the cloth-supporting surface of ironing machines is designed to be readily absorbent of moisture and is frequently made somewhat open, loosely woven, shaggy, or is constructed of relatively large cotton strands or rovings providing crevices or open spaces to facilitate that action. This is a step in the right direction, but it fails to produce continuous ventilation, on which, as I have found, depends uniformity of the performance of the machine throughout the whole of the run, the quality of the work, and the speed and sustained efficiency of the ironing at every stage of it. Without adequate ventilation, not only at the beginning but continuously throughout the run, there is a constantly augmented, or renewed, accumulation of water in the body of the backing which, if permitted, subjects the usual fibrous backing to the progressive densification of the mass and loss of efficiency due to continuous soaking of the fibers of the mass under heat and pressure. The backing thus becomes more and more compressed at each ironing operation and incapable of the full and immediate expulsion of the steam at each stage of the ironing process.

Failure to get rid of the steam as produced, condensation of steam and consequent accumulation of water not only results, under recurrent pressure, in a dense soggy mass, too thin to properly back the goods being ironed, as already explained, but in a drying out of this mass in its thin dense state when the machine is idle between runs, so that it becomes progressively more lifeless and less capable of elastically resuming its original position and volume and its original avidity for moisture and ability to dispose of it, and becomes ultimately a hard shell practically inert, non-resilient and useless as a cushion and incapable of further moisture absorption and therefore subject to scorching, charring and disintegration. Efficiency of the machine and good quality of the work require that the machine be stopped before this condition is reached and the exhausted material removed and replaced with new, but as the breaking up and removal of the dried or charred layer which sticks to the roll or other supporting surface is a disagreeable job, it is frequently postponed for considerable periods to the further detriment of the amount and quality of the output, both of which for reasons stated tend to fall as the run continues. Waste of time, labor and expense thus accompany evidences of inefficiency such as the appearance of wet or rough-dried spots necessitating running articles through the rolls a second time, the breakage of buttons, flattening of embroideries, etc. Where the ventilation is not continuous, the backing is not held closely to the work throughout the entire run owing to the thinning of the backing and the reduction of such elasticity as it has, and as this is the expected action of the old fibrous backing, it is customary to "overpad", i. e. to use an unduly thick backing at the start, which in flat work machines reduces the area of ironing contact and is thus objectionable, and which does not dispense with the irksome necessity, under penalty of inferior work, of readjustment of the rolls from time to time, as the run proceeds, to offset the thinning effect.

In order to take care of the steam produced by the heat, I avoid a predominantly fibrous backing and provide instead in the body of my backing a widely extended network of intercommunicating passages opening to the active or cloth-supporting side and readily and immediately accessible to all parts of the surface being ironed, so as to receive the steam, the walls of the passages being elastic and sufficiently firm or pressure-resistant to support yieldingly but adequately the pressure of the ironing operation and to expand sharply on release of ironing pressure to restore the network of passages to its original state and the backing to substantially its original volume after each ironing operation in readiness for the next. In the preferred form of my invention the passages are cellular, by which I mean that they include connected cell portions, have cell-like parts, or are of a generally tubular character, and I regard this as an aid to effective ventilation.

In my backing, therefore, by virtue of continuous ventilation the steam is dispersed as such before it can condense in objectionable amounts, water does not accumulate, the passages are not clogged or filled with water, the backing does not

become sodden or dense but retains its ability to expand sharply on each release from ironing pressure to expel the steam, or release it, and leave the network of passages ready to receive the steam on the next ironing pressure. Each ironing operation from beginning to end of a run is thus performed with equal efficiency, and as the backing dries sufficiently between successive ironing operations in the same run and is not subject to densification, there is no drying out in a hard thin layer between runs.

The network of passages is thus retained at all times in condition to receive the steam and their walls, whether wet or dry, retain their stiffness and elasticity. This is understood to be due to the presence in the wall structure of a multitude of non-fibrous particles impermeable to water and unaffected thereby and which give the walls the like character, the walls being non-fibrous, or at all events not sufficiently fibrous to swell and close or seriously obstruct the passages and thus impede ventilation. This, although in line with the purpose of the old relatively loose or open fibrous backing to promote ventilation is a step in a direction counter to the fibrous tradition and practice of the art, which in reality obstructed effective ventilation.

It will be apparent also that the structure thus described and the throwing open of the passages of the network insures free escapes of steam therefrom, its expulsion or withdrawal, and the requisite continuous ventilation, as well in ironing or pressing apparatus of known vacuum type, as in apparatus not so equipped, and with the further advantage in addition to avoidance of clogging of the passages in the backing by swelling of water-permeable fibrous walls and by stray bits of fibre, of protection of the vacuum line from blocking and the vacuum apparatus generally from defective operation or injury by the carrying over thereto of charred fibre particles detached from the backing.

A backing for the surface which supports or presses the cloth against the heated element and which has passages and passage walls of this nature may be made of sponge rubber, provided the walls be given the stiffness and elasticity necessary to enable them to press the mouths of the network of passages closely against the cloth being ironed to receive the steam and to sustain without undue yielding the customary ironing pressure, and to return to place sharply on release of ironing pressure to fully expel the steam, or release it.

The practical application of my invention is illustrated in the accompanying drawing, which shows more or less diagrammatically and by way of example only, typical installations of ironing and pressing machines equipped with the improved backing. In the drawing,

Fig. 1 is a sectional view of a multi-roll, chest type, flat-work ironer in which the rolls are covered with the improved backing;

Fig. 2 is an enlarged end elevation, partly in section of one of the rolls of Fig. 1;

Fig. 3 is a perspective view of the head and buck members of a press; and

Fig. 4 is a fragmentary detail perspective view indicating cellular structure.

The non-metallic central layer 5 of the backing has incorporated therein an irregular network of contractible and expansible passages communicating with the exterior surface of the backing to receive steam and readily and immediately accessible to all parts of the surface being ironed, and the walls of said passages being relatively stiff and elastic wet or dry and sufficiently firm to support, without undue yielding, the pressure of the ironing operation and to expand sharply on release of ironing pressure as hereinbefore explained. The passages are preferably "cellular" in the sense already defined, and for the best results, as already noted, the cells 6 should be relatively small and fine, the network of passages opening through the outer surface as already explained and also through the back. Hence if sponge rubber responding to the prescribed requirements is used the imperforate outer envelope or skin, if present, should be removed from both sides, as indicated in the drawing, or suitably perforated to provide surface openings for the purpose stated.

The texture as well as the size and thickness of the backing may be varied according to the type of machine to which it is applied and the particular conditions of use and one or more layers may be used as desired. Sponge rubber of the requisite strength, firmness and structure may be prepared in sheet form and cut therefrom or molded to the required size; or it may be molded in curved form for use upon an ironer roll, thereby preserving a uniform body texture and preventing unequal stresses during application or use. The layer 5 which may be of sponge rubber of this nature is preferably covered or dressed (at least on its exposed side) with one or more plies of fabric 7, for example duck or sheeting. A similar ply of fabric 7' constitutes a binder between the layer 5 and the metal body 8 of the ironing roll; although layer 5 may be applied directly to the body 8 if desired. The use of a removable dressing or cover cloth is usual for cleanliness and smoothness, and since such a cloth permits steam to pass through, it does not interfere with the action of the network of passages when applied thereto.

My improved backing may be used for various ironing appliances. In flat work ironers of the chest type indicated in Figs. 1 and 2, for example, the backing is wrapped around the body of the rolls 8 in one or more skinless layers as desired. The rolls are mounted above a series of steam chests 9 having concave upper faces 10 upon which the padded rolls are pressed, or which are forced against the peripheries of the rolls under considerable pressure. The rolls which are standard 120" long (in the smallest size 100") each weigh approximately 725 lbs. and it is usual to further increase their pressure by adjustable springs. In the standard 6 roll chest type ironers, the rolls are as above described and the pressure per roll is about 1850 lbs., 1.4 lbs. per sq. in. (120"×11" area of contact surface=1320 sq. in.). The bearing of these facts on the stiffness necessary in the backing will be apparent. The work 11 to be ironed is fed to the first roll 8 upon an apron or ribbon 12 and thence passes between the padded surface of the rotating rolls and the heated surfaces 10 of the steam chests, the backing being compressed by the weight or tension of the roll as indicated at 13.

In a typical press shown in Fig. 3, the buck or bed 14 constitutes the body and the backing is formed by two layers 5 and 5' of the sponge rubber, both free from skin on both sides, the upper layer being covered with the cloth strip 7. The swinging steam-heated head 15 is adapted to be pressed onto the fabrics or garments placed upon the padded buck for pressing, the pressure being about 7 lbs. per square inch regardless of the

press area—in the case of a "utility press" the total pressure being 6500 lbs., more or less, and the area approximately 928 square inches. It will be understood that the press members may be flat or curved as shown, and that the backing may be fastened on the buck in any suitable manner; also that the auxiliary elements of the press are arranged to operate in the customary way.

Sponge rubber for this backing may be made of usual rubber mixture according to known methods under appropriate pressures to produce a sponge product of partially vulcanized rubber of the character stated having small intercommunicating pores or cells opening through the surface. If the backing is likely to be subjected to excessively high temperatures in use, reagents may be added to the rubber composition, in accordance with known practices, substantially to prevent further oxidation or vulcanization of the sponge rubber product.

My backing, in addition to characteristics already mentioned, provides a sufficiently smooth ironing surface of uniform texture yielding enough to receive without injury buttons, plaits, embroidery or other uneven surfaces of the work being ironed or pressed. It may be used in combination with other types, such as the fiber padding or so-called spring pads of metal which are now in use; and it will be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents which fall within the scope of the appended claims.

I claim:

1. Ironing apparatus comprising members between which the articles acted upon by the apparatus are subjected to pressure and ironed, one member being a heated ironer and one having a backing for the surface which supports or presses the cloth against the heated element, the body of said backing having incorporated therein a network of intercommunicating passages communicating with the said surface for the reception of steam produced by the heat, the passages of the network opening at the pressing surface so as to be accessible to all parts of the cloth being ironed, the walls of said passages being sufficiently elastic, whether wet or dry, and sufficiently firm or pressure resistant to adequately support the pressure of the ironing operation and hold the backing to its work and to expand sharply on release of ironing pressure to provide continuous ventilation.

2. Ironing apparatus comprising members between which the articles acted upon by the apparatus are subjected to pressure and ironed, one member being a heated ironer and the other having a backing for the surface which supports or presses the cloth against the heated element, said backing having an exterior covering of textile fabric through which steam produced by the heat may penetrate into the interior of the backing, the body of the backing being pervaded with a network of passages opening to the exterior surface of the backing and readily and immediately accessible to all parts of the surface being ironed and receiving the steam at each ironing operation, said passages including connected cell portions and having relatively stiff walls sufficiently elastic, whether wet or dry, and sufficiently firm or pressure resistant to adequately support the pressure of the ironing operation and hold the backing to its work and to expand sharply on release of ironing pressure to open up the mouths of the passages, provide continuous ventilation and restore the network of passages to its original state and the backing to substantially its original volume after each ironing operation in readiness for the next.

3. Ironing apparatus comprising members between which the articles acted upon by the apparatus are subjected to pressure and ironed, one member being a heated ironer and the other an extended support having a backing for the surface which supports or presses the cloth against the heated element, said backing having an exterior covering of textile fabric through which steam produced by the heat may penetrate into the interior of the backing, the body of the backing covering the face of said support and being a vulcanized sponge rubber or equivalent artificial sponge structure pervaded with a network of passages including connected cell portions and opening to the exterior surface of the backing to receive steam at each ironing operation from the cloth being ironed and to expel the steam at each ironing operation on release of ironing pressure, said body being sufficiently firm and elastic, whether wet or dry, to adequately support the pressure of the ironing operation and hold the backing to its work and to expand sharply on release of ironing pressure to provide continuous ventilation and resume substantially its original thickness after each ironing operation in readiness for the next.

4. Ironing apparatus comprising members between which the articles acted upon by the apparatus are subjected to pressure and ironed, one member being a heated ironer and the other an extended support having a backing for the surface which supports or presses the cloth against the heated element, the body of said backing covering the face of said support and being a natural or artificial rubber structure pervaded with a network of intercommunicating passages communicating with the said surface to receive at each ironing operation steam produced by the heat and to open up the passages at each ironing operation on release of ironing pressure, said body being sufficiently firm and elastic, whether wet or dry, to adequately support the pressure of the ironing operation and hold the backing to its work and to expand sharply on release of ironing pressure to provide continuous ventilation, and resume substantially its original thickness after each ironing operation in readiness for the next.

EDMOND O. DAYTON.