Nov. 25, 1941. F. B. CLARK 2,264,158

ASBESTOS CLOTH AND METHOD OF MAKING SAME

Filed July 30, 1938

Fig. 1.

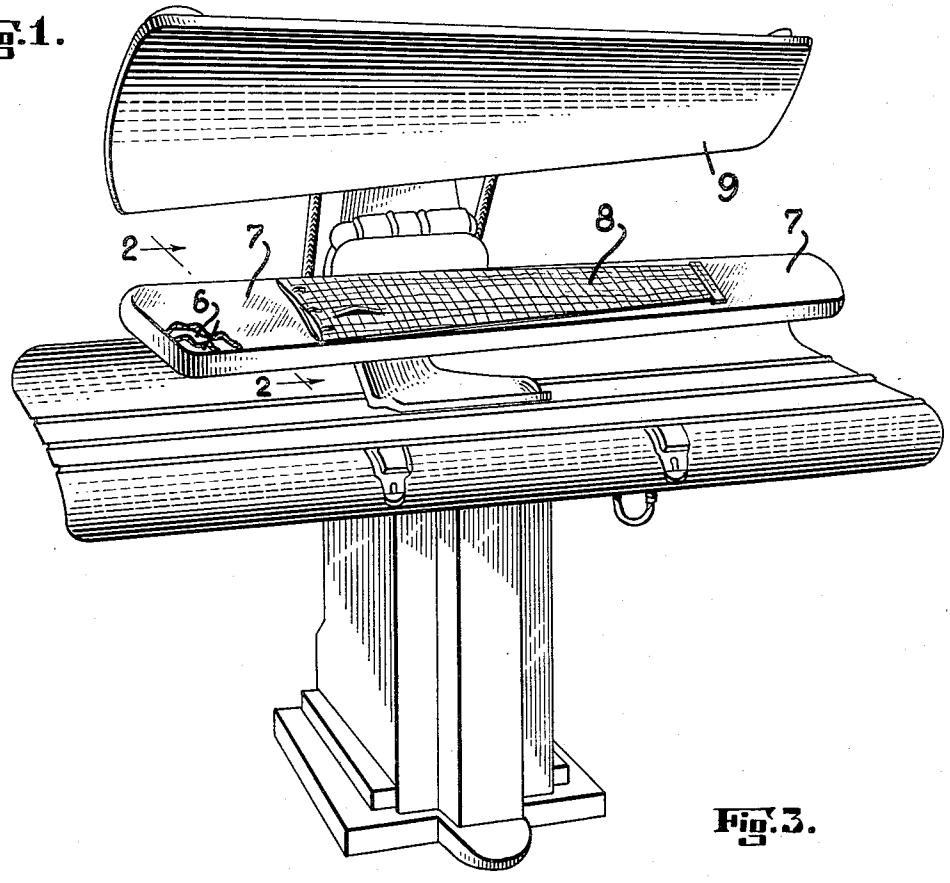


Fig. 3.

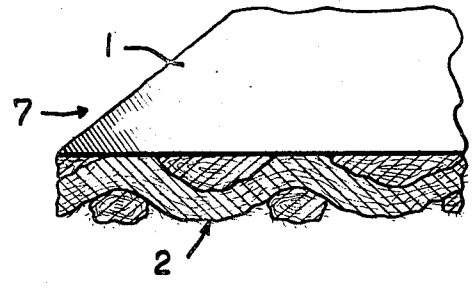
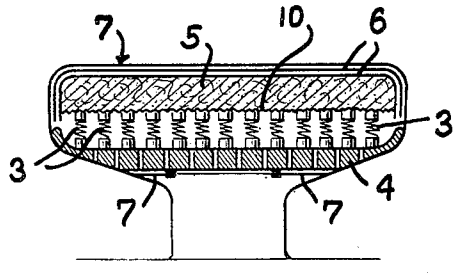


Fig. 2.



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ASBESTOS CLOTH AND METHOD OF MAKING SAME

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Application July 30, 1938, Serial No. 222,111

8 Claims. (Cl. 38—66)

This invention relates to a smooth-faced asbestos cloth and the method of making the same. More particularly, the invention relates to such a product for use as the cover cloth in ironing or pressing assemblies of the types commonly used in laundries, garment pressing shops, or in homes.

In the art of smoothing the surface of a fabric by ironing or pressing, there is commonly used a yieldable pad with a cover cloth disposed thereover, the cover cloth being in contact with the goods during the ironing or pressing thereof.

Because of its unique durability at high temperatures, asbestos is sometimes used as the material of the cover cloth. A difficulty arises, however, in that it has not been possible heretofore to make an asbestos cover cloth of face so smooth as not to print the pattern of its weave or irregularities of its surface on the article which it is desired to smooth.

It is an object of this invention to provide a smooth-faced asbestos cloth that obviates this difficulty. Other objects and advantages of the invention will appear from the detailed description that follows.

Special problems arise in making a smooth-faced asbestos cloth. The irregularities upstanding from the face of an asbestos fabric and also the various strands themselves contain numerous elements of relatively incompressible material. Thus, they may contain fragments of poorly milled asbestos ore. Particles of such rock-like material in milled asbestos are known as "pencils." These "pencils" in an asbestos fabric can not be smoothed down in such a simple method as the calendering that is commonly applied to wood pulp paper or like readily compressible material.

In accordance with my invention, asbestos cloth is smoothed on its face, by being pressed against a rigid member of smooth surface while, at the same time, hard elements such as pencils are displaced rearwardly and permitted to come to extend beyond the general plane of the back of the cloth.

The invention will be illustrated by description in connection with attached drawing, to to which reference is made.

Fig. 1 shows a side elevation of a press assembly utilizing the cloth of the present invention.

Fig. 2 shows a cross sectional view of the buck of the above press, taken on section line 2—2 of Fig. 1.

Fig. 3 shows a magnified, perspective view of an asbestos cloth made in accordance with the invention.

The various figures are diagrammatic. Also, they do not fully illustrate certain parts that are conventional.

In Fig. 3 there are shown the smooth face 1 of the asbestos cloth and the rough back 2 thereof.

In the other figures, there are shown the press buck, including the pad resting upon a wire grid 10 which, in turn, is supported upon coil springs 3 disposed over the perforated and rigid metal casting 4. The pad may include not only the thick matted material of the element 5 but also one or more layers 6 of a soft material such as felt, flannel, or the like. Resting upon the pad is the cover cloth 7 of kind shown in Fig. 3. In this assembly, the back of the cover cloth is turned towards the pad. The smooth face of the cloth is exposed, so that it will contact with the goods 8 being ironed or pressed, as the head 9 of the press is forced downwardly in the direction of the buck.

The element 5 is of conventional type as, for example, a layer an inch or so thick of steel-wool, cotton, or felted asbestos fibres. In any case, the pad is loose and resiliently yieldable.

Hooks or other fastening elements that are not shown hold the cover cloth 7 tautly over the supporting yieldable material.

A similar arrangement of the asbestos cloth over ironing pads may be made, in other conventional types of assemblies. Also various members, corresponding to the parts 3, 4, or 5 in Fig. 2, may be omitted, so long as there is used the smooth-faced asbestos cloth with an adequate support therefor. Thus, the asbestos cloth may be used on a domestic ironing board, suitably with a thick fabric backing between the board proper and the back of the asbestos cloth. The cover cloth may also be used on rotating cylinder ironing machines.

The base for the cover cloth of the present invention is asbestos fabric made by weaving strands of mixed fibres of asbestos and cotton or like reenforcing fibre. A typical cloth that may be used is one containing 15 to 20 per cent of cotton, the rest being chrysotile asbestos of spinning grade.

The asbestos cloth may, first, be subjected to treatment with an aqueous solution of a strong alkali, to increase the flexibility or impart other desirable property that facilitates the later smoothing of the face. Thus, the cloth is treated with about a 5 to 15 per cent solution of sodium

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or potassium hydroxide. An alkali-resistant penetrant or wetting agent may be used to increase the rate of penetration of the solution into the cloth. Temperature and time of treatment may be varied. Relatively short time periods and/or lower temperatures of treatment are used, the higher the percentage of alkali in the solution. With a 10 per cent solution of sodium hydroxide, for instance, I have obtained very favorable results by boiling the solution, in which the asbestos cloth is immersed, for 10 minutes. With a 10 per cent solution at atmospheric temperature, the treatment is preferably continued for about three hours or longer. After the treatment, the alkali solution is removed from the cloth, as by repeated washing with water, followed preferably by centrifugal extraction of most of the remaining water.

The cloth in wet or moist condition, advantageously after the alkali treatment, washing, and centrifuging described, is then strongly pressed, to smooth the face of the cloth.

On its face, the cloth is pressed against a smooth surface of a rigid or non-yielding member. Thus, it is pressed, for example against a highly polished steel plate or calender roll. Simultaneously, the asbestos cloth is pressed at its back against a yieldable member permitting penetration thereinto of relatively uncompressible elements that, unless displaced in direction away from the face of the cloth, would cause irregularities upstanding from the general plane of the said face. For this purpose a thick fabric is preferred as the backing member. Thus the cloth may be folded on itself, so that a ply of the cloth constitutes the backing for another ply. The folded cloth may then be pressed between two rigid polished plates or rolls. After the pressing, the cloth may be unfolded and, if desired, cut to size for use.

For some purposes, the cloth backing during the pressing operation may be replaced by another yieldable element, as, for instance, a felted wood product of about the yieldability of a thick, relatively soft desk blotter, a rather thin layer of compressed hair felt, or the like.

The pressure used to smooth the face should be high, say to 300 to 2,000 pounds to the square inch.

The smoothing is conducted to best advantage in a hydraulic press, with steam-heated platens provided in advance with a thin film of bay oil to avoid sticking of the fabric to the platens. Thus the platens may be heated by steam at a temperature of 300° to 400° F. or somewhat higher, a sponge containing bay oil having been previously wiped over the platens.

I prefer to open and close the heated press repeatedly, that is, to alternate pressing with exposure of the asbestos cloth to the air, until the cloth is practically dry. In this manner the smoothness of face is set.

As an alternative, the pressure may be provided by means of calendar rolls, provided there is used a yieldable backing for the ply of asbestos cloth, the face of which is being smoothed. Thus the cloth folded as described may be passed through the heated calender. Also, the pressed cloth may be dried in a drying oven or room.

The smooth-faced cloth so made is then given a resin impregnation.

The resin selected is one that retains substantially its original flexibility on long use at ironing or pressing temperatures. Also, it is one that is insoluble in water, non-tacky at the said temperatures, and adapted not to stain or injure in any way cotton, linen, wool or the like that may come in contact with the resin at ironing or pressing temperatures.

A suitable material meeting these requirements is a vinyl resin, such as a co-polymer of vinyl chloride and vinyl acetate, which may be obtained on the open market. The resin impregnation is best made by passing the smooth-faced asbestos cloth through a solution of the resin in usual volatile solvents or solvent therefor. Depending in part upon the exact temperature of use of the cloth, the vinyl resin may soften or melt. The term "retaining its original flexibility" is intended, therefore, to mean non-hardening under conditions of use, subsequent to the removal of volatile solvent from the resin as applied to the cloth.

The concentration of the resin solution may be varied within limits but should not be so dilute as to provide too little resin or so concentrated as to prevent thorough impregnation of the solution into the asbestos cloth. A 5 to 15 per cent solution of the resin is satisfactory. I have used, for example, a 10 per cent vinyl resin solution, the solvent being largely ethylene dichloride.

After the cloth has been immersed in the resin solution, by passage therethrough, the cloth is warmed, to vaporize the solvent used in the resin solution. The warming is continued till practically no more solvent is left in the cloth, the final stages of the drying being conducted at a temperature well above the boiling point of the solvent, as at 350° F. or so.

The impregnated and dried cloth is then repressed, with the face of the cloth against a smooth surface of a rigid member, to remove any roughness that may have formed during the handling and treatment subsequent to the first pressing.

A cloth made as described is flexible and remains so during long use in an ironing or pressing machine.

Furthermore, the cloth has a glaze (glossed finish) on its smoothed face, this glaze being due to concentration of resin on the face and to the smoothing of the resin produced by the process described. This glaze not only contributes to the over all smoothness of the face but also assists in maintaining the smoothness during use of the cover cloth.

In spite of the glazed appearance of the face and the treatment to which the cloth is subjected during its manufacture, the cloth is permeable to steam. For this reason steam or vapor may escape through the cover cloth, from the goods being ironed or pressed, without distortion of the face of the said cloth.

It will be understood that the details given are for the purpose of illustration, not restriction. It is intended, therefore, that variations within the spirit of the invention are to be included in the scope of the appended claims.

I claim:

1. In making a flexible asbestos cloth, the method which comprises forming a cloth of woven strands of mixed fibre of chrysotile asbestos and cotton, treating the cloth with an aqueous alkali solution, washing out the alkali solution, and pressing the resulting wet cloth between a smooth surface of a non-yielding member and a yieldable backing member.

2. An ironing cover cloth of asbestos yarn, said cloth having embedded within its wear surface

asbestos pencils and irregularities of said yarn, being smooth on its wear surface, and carrying a deposit of resinous material that, under the conditions of use at ironing temperatures, remains flexible and is insoluble in water, non-tacky, and without staining or injurious effect upon textile fibres.

3. An ironing cover cloth of asbestos yarn impregnated with a resinous material which is permanently flexible, insoluble in water, non-tacky, and without staining or injurious effect upon textile fabrics at ironing or pressing temperatures, said cloth being air and moisture permeable.

4. An ironing cover cloth of asbestos yarn, said cloth being impregnated with a vinyl resin but permeable to air and moisture, the resin used being one that, under the conditions of use at ironing temperatures, remains flexible and is insoluble in water, non-tacky, and without staining or injurious effect upon textile fibres.

5. An ironing cover cloth of woven asbestos yarn, the wear surface of said cloth being substantially smooth and having a glossed deposit of a vinyl resin, with any asbestos pencils projecting from said yarn embedded in the cloth below the wear surface, said cloth being air and moisture permeable, and the resin used being one that, under the conditions of use at ironing temperatures, remains flexible and is insoluble in water, non-tacky, and without staining or injurious effect upon textile fibres.

6. The method of making a smooth-faced asbestos cloth, which comprises strongly pressing the cloth while moist between a heated smooth surfaced rigid member and a yielding backing, to thereby embed any projecting asbestos pencils within the cloth face, and at intervals during the pressing relieving the pressure and exposing the cloth to air.

7. In making an asbestos ironing cloth, the method which comprises treating the cloth with an aqueous alkali solution, removing alkali remaining after the treatment, then depressing elements upstanding from the general plane of the face of the cloth while permitting depressed material to come to extend beyond the general plane of the back of the cloth, then impregnating the cloth with a solution of a resin in a volatile solvent and removing solvent from the said solution, the resin used being one that, under the conditions of use at ironing temperatures remains flexible and is insoluble in water, non-tacky and without staining or injurious effect upon textile fibres.

8. In making an asbestos ironing cloth, the method which comprises depressing elements upstanding from the general plane of the face of the cloth while permitting depressed material to come to extend beyond the general plane of the back of the cloth, then impregnating the cloth with a solution of a flexible resin in a volatile solvent, removing solvent from the impregnated solution, and pressing the face of the resin-impregnated cloth, after the removal of solvent, against a smooth surface, so as to remove any irregularity of surface of the said face formed during the impregnation, the resin used being one that, under the conditions of use at ironing temperatures, remains flexible and is soluble in water, non-tacky and without staining or injurious effect upon textile fibres.

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