March 2, 1937. K. B. BLAKE ET AL 2,072,152

HEAT INSULATING MATERIAL

Filed Nov. 27, 1934

Fig. 1

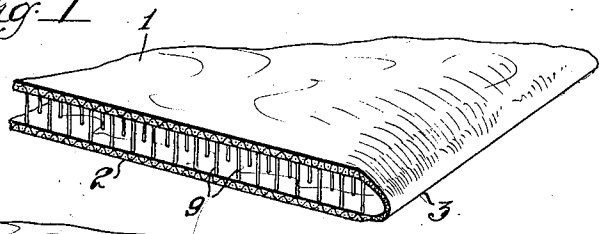
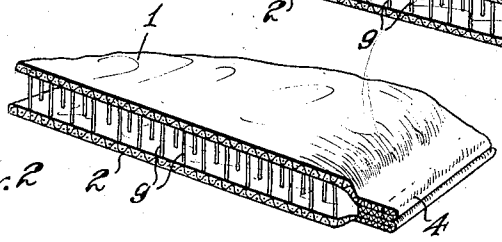


Fig. 2



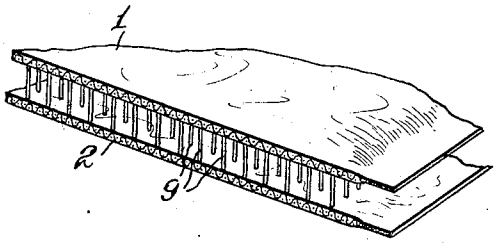


Fig. 3

Fig. 4

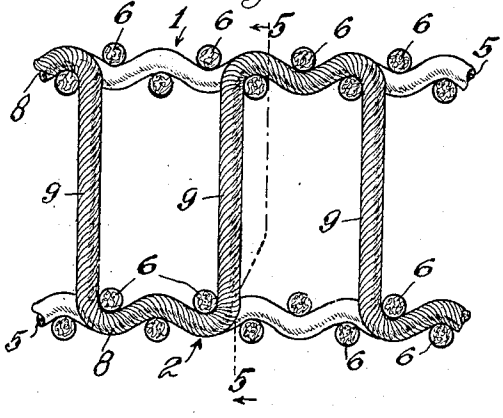
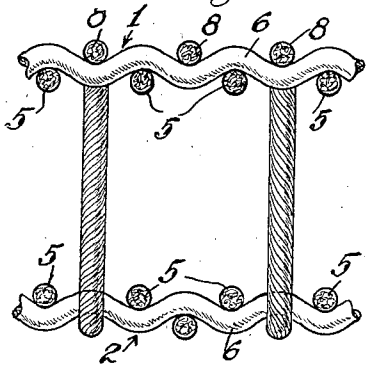


Fig. 5



INVENTORS
Kenneth B. Blake,
and Cornelius S. Kemp,
BY Harry B. Cook,
ATTORNEY

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Patented Mar. 2, 1937 2,072,152

UNITED STATES PATENT OFFICE

2,072,152

HEAT INSULATING MATERIAL

Kenneth B. Blake, Ardsley, N. Y., and Cornelius S. Kemp, Upper Montclair, N. J.

Application November 27, 1934, Serial No. 755,074

3 Claims. (Cl. 139—384)

This invention relates in general to improvements in heat insulating material for use particularly as blankets for bed coverings although it may be used in other capacities, for instance, for wall or receptacle insulation, or like purposes.

Bed coverings are generally made either of a single thickness of heavy wool textile fabric, or of two thicknesses or plies of fabric having a filling or padding of cotton or down between them. Such known bed coverings as will provide adequate warmth or heat insulation are usually uncomfortably heavy, relatively stiff and hard, while many known coverings which are light in weight and flexible and soft fail to provide sufficient heat insulation.

Therefore, the primary object of our invention is to provide a material for use as a blanket and which shall be light in weight, soft and flexible and at the same time shall provide a high degree of heat insulation.

Another object is to provide a material which shall embody novel and improved features of construction including spaced, superposed thicknesses or plies of soft, flexible, light material and flexible means for holding said plies in spaced apart relation to provide a space or chamber containing air, so that the air shall serve as insulation against passage of heat through said thicknesses or plies, whereby said material shall be light in weight, soft and flexible and shall have excellent heat insulating qualities.

Another important object of our invention is to provide an air insulated material comprising superposed thicknesses or plies of woven material and novel flexible means interwoven with said thicknesses or plies for spacing the latter apart to provide a heat insulating chamber or space therebetween.

Other and subordinate objects will presently appear and the nature of our improvements will be more clearly understood from a reading of the following description and claims in conjunction with the accompanying drawing.

Referring to the drawing in which corresponding and like parts are designated throughout the several views by the same reference character,

Figure 1 is a perspective view of a fragment of material constructed according to our invention.

Figure 2 is a similar view illustrating a modification of the invention.

Figure 3 is a similar view of another modification.

Figure 4 is a fragmentary longitudinal sectional view, drawn to an enlarged scale, and,

Figure 5 is a view in transverse section taken on the line 5—5 of Figure 4.

Specifically describing the invention, the reference characters 1 and 2 designate superposed, upper and lower thicknesses or plies of woven fabric formed of such material and so constructed as to permit only slow passage of air therethrough or so as practically to be impervious to air. Preferably the fabric is close woven silk, although it is to be understood that other flexible materials may be used.

The thicknesses or plies 1 and 2 may be connected together on all sides thereof, as in Figures 1 and 2, or they may be left unconnected as shown in Figure 3. Connection of said edges may be accomplished by weaving the selvage of the edges together as indicated at 3 in Figure 1 or by sewing said edges together as indicated at 4 in Figure 2, or in any other suitable manner. Each thickness or ply 1 and 2 includes the usual warp and weft threads 5 and 6, respectively, woven in the usual manner.

The plies or thicknesses 1 and 2 are spaced apart to form an air space between them extending to the edges of said plies. In the case of a blanket said plies are preferably permanently connected so that said space is formed into a closed dead air heat insulating chamber. However, said edges may be unconnected in a blanket if desired, and preferably will be unconnected when used for other heat insulating purposes. As shown on the drawing, the plies are maintained in spaced relation, preferably in the manner about to be described.

Interwoven with the plies or thicknesses 1 and 2, are extra warp threads or cords 8 extending substantially from end to end of said plies and spaced laterally thereof. The threads 8 are shown as interwoven so as to provide right angularly related rows of struts between the plies or thicknesses 1 and 2 and spaced apart as far as is practicable without impairing their efficiency as struts, to secure the maximum air space between said plies. To this end the threads 8 are spaced apart relatively greater distances than said warp threads 5, the weave being in open, substantially rectangular loop formation to provide strut portions 9 extending approximately perpendicularly between the plies or thicknesses 1 and 2, and said loops being preferably aligned in rows to correspondingly locate the strut portions 9, each loop embracing more weft threads than the loops of the warp threads 5 so that the struts are widely spaced in each row. The extra warp threads 8 may be woven into the plies 1 and

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2 in the same manner in which the pile warp threads of pile fabric are woven, although the extra warp threads are more distantly spaced from each other than the usual warp threads. As an alternative to weaving the threads 8 in the manner previously described the weave of said threads may be irregular to stagger the strut portions 9. Also certain warp threads 8 may be twisted oppositely to other threads 8 as shown in Figure 5; so that the said threads twisted in one direction will counteract the tendency to collapsing of the threads twisted in the other direction, whereby the threads 8 will be maintained substantially perpendicular to the plies of thicknesses 1 and 2. Said warp threads 8 may also be formed of mohair or impregnated with resin or similar substances, or made of larger gauge than the threads 4 and 5, to make the threads relatively stiff.

It will be observed that a blanket embodying our invention is light in weight, soft and flexible, and that the struts 9 hold the plies 1 and 2 in spaced relation so that air is trapped between the plies and serves as an efficient heat insulator.

The foregoing constitutes a detailed description of our invention, but it is to be understood that right is herein reserved to changes and modifications falling fairly within the scope of the following claims when construed in the light of the prior art.

Having thus described our invention, what we claim is:

1. A fabric heat insulating blanket or sheet, said fabric being composed of a plurality of parallel closely woven sheets which are substantially spaced apart by an interwoven warp which has been woven alternately with the weft of the different sheets, said warp forming a series of closely spaced struts extending longitudinally and laterally and extending between said sheets and maintaining said sheets spaced apart, whereby collapse thereof together is prevented and said struts also being arranged in a series of spaced rows longitudinally and laterally to form a series of substantially separate air pockets in the space between the sheets, whereby dead air, heat insulating chambers are formed between said sheets.

2. A fabric heat insulating blanket or sheet, said fabric being composed of a plurality of parallel closely woven sheets which are substantially spaced apart by an interwoven warp which has been woven alternately with the weft of the different sheets, said warp forming a series of closely spaced struts extending longitudinally and laterally and extending between said sheets and maintaining said sheets spaced apart, whereby collapse thereof together is prevented and said struts also being arranged in a series of spaced rows longitudinally and laterally to form a series of substantially separate air pockets in the space between the sheets, whereby dead air, heat insulating chambers are formed between said sheets, said interwoven struts being substantially stiffer and more rigid than the weft and warp of the sheets.

3. A fabric heat insulating blanket or sheet, said fabric being composed of a plurality of parallel closely woven sheets which are substantially spaced apart by an interwoven warp which has been woven alternately with the weft of the different sheets, said warp forming a series of closely spaced struts extending longitudinally and laterally and extending between said sheets and maintaining said sheets spaced apart, whereby collapse thereof together is prevented and said struts also being arranged in a series of spaced rows longitudinally and laterally to form a series of substantially separate air pockets in the space between the sheets, whereby dead air, heat insulating chambers are formed between said sheets, at least some of the adjacent struts of said interwoven warp being oppositely twisted.

KENNETH B. BLAKE.
CORNELIUS S. KEMP.

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