March 24, 1953 C. H. WOOFFENDALE 2,632,187

FIRE RESISTANT PAD

Filed July 26, 1947

Fig. 1.

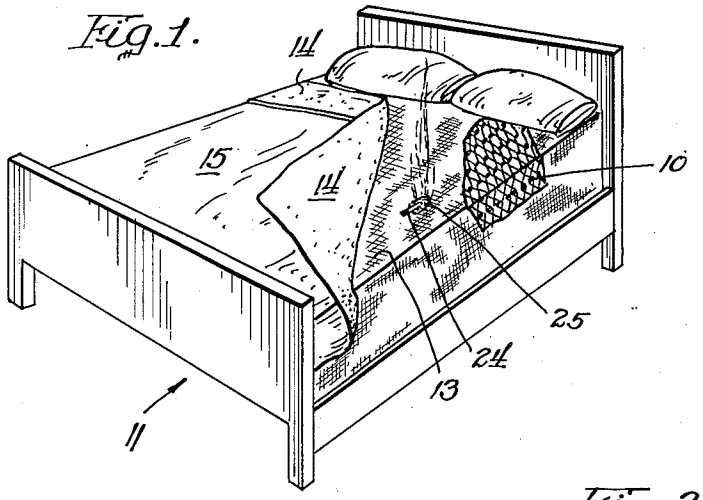


Fig. 3.

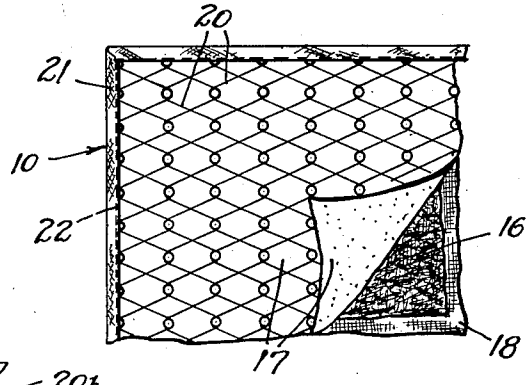
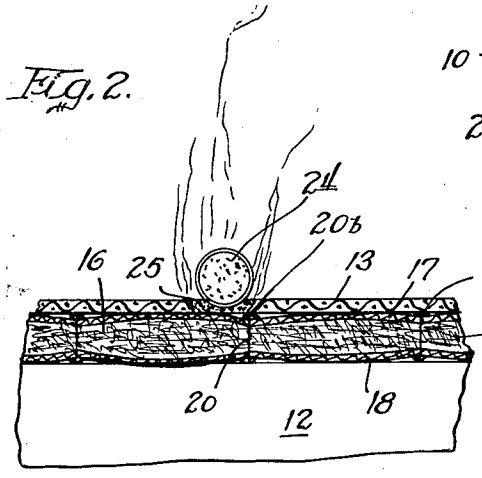


Fig. 2.



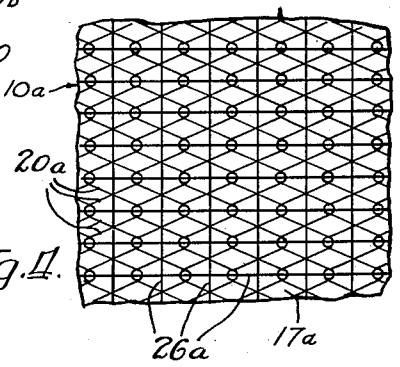


Fig. 4.

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FIRE RESISTANT PAD

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4 Claims. (Cl. 5—354)

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This invention relates generally to pads or quilts and more particularly to a novel fire resistant, water repellent pad constructed largely of fiber glass.

The pad of this invention, although applicable to many other uses, is intended primarily for use as a bed pad or mattress cover. However, by merely increasing the thickness of the filler material, a quilt or comforter may be formed in the same manner as the pad of this invention.

The occurrence of fires arising from the habit of smoking cigarettes, cigars, or pipes while in bed is constantly increasing. Whenever a person smoking a cigarette in bed falls asleep before extinguishing it, the cigarette falling from his fingers onto the bedding is almost certain to start a fire, generally a smouldering one, which causes either suffocation or serious burns to the sleeper before he is awakened by the heat of the fire.

Most of these fires are caused by the cigarette's falling onto the bed sheet and igniting it. The sheet quickly burns through to ignite the mattress which, being usually formed of either hair, felt or cotton batting, burns readily to produce thick clouds of suffocating smoke.

When a cigarette is dropped onto a conventional quilt or comforter the danger is equally great, and the sleeper will usually be suffocated or so seriously burned that death results before being awakened and able to get out of the bed.

One object of this invention, therefore, is to provide a fire resistance or fireproof pad which may be used beneath the lower sheet on a bed and thereby prevent the spread of a fire to the mattress as well as a thicker embodiment which may be used as a comforter or quilt.

Another object is to provide a pad constructed largely of fireproof materials, namely, cloth woven of glass fibers and glass wool batting.

Another object is to provide a pad or quilt in which the individual layers are quilted together by stitching with a fire resistant thread so that fire cannot be transmitted through the pad by burnable threads.

A further object is to provide a pad or quilt having an upper layer of glass cloth and a bottom or backing layer of cotton cloth, the layers being quilted together preferably by chain stitching, the major portion of each stitch being formed on the surface of the glass cloth in order to provide the maximum frictional resistance of the upper and lower surfaces, for glass cloth presents an extremely slippery surface.

A further object is to provide a pad having an upper layer of glass cloth which is sewn by spaced lines of chain stitching extending through the

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glass cloth only and which is also quilted by additional lines of stitching in such a pattern that the lines of chain stitching are disposed on the thickest portions of said pad for purposes of increasing the frictional resistance of said glass cloth.

A further object of the invention is to provide a pad which is easily constructed out of a temporarily stiffened soft batting for handling purposes until put into use.

A further object is to provide a pad having lines of quilting stitching arranged in such a manner as to reduce the possibility of unraveling should the stitching thread break.

Other and additional objects and advantages of this invention present themselves to those familiar with the art on reading the following description in conjunction with the drawing, in which:

Fig. 1 is a perspective partially cutaway view of a bed equipped with a pad of this invention used as a mattress cover;

Fig. 2 is a vertical section of a portion of the bedding of Fig. 1 showing a burning cigarette lying on the bed sheet;

Fig. 3 is a top view of a portion of the pad of this invention partially cut away to show the construction; and

Fig. 4 is a top view of a portion of a modified embodiment of the pad of this invention.

The manner in which the pad 10 of this invention is used in a bed 11 as a covering for the mattress 12 is shown in Figs. 1 and 2. When used in this fashion the pad 10 is preferably of such size that it completely covers the upper portions of the mattress 12, and it is laid directly on the mattress 12 beneath the lower sheet 13.

If a thicker pad is to be used as a comforter or quilt to protect not only the mattress but the bedding also, it is preferably placed above the upper sheet 14 as indicated at 15 in Fig. 1.

The following detailed description will deal primarily with a pad 10 to be used directly on the mattress 12, but it will be obvious to those familiar with the art that a pad used as a comforter or quilt is similarly constructed and functions to resist fires in substantially the same manner as the pad 10 used as a mattress cover or bed pad.

As shown in Figs. 2 and 3, the pad 10 comprises a rather thick layer of fiber glass batting 16 contained between a facing or upper layer 17 of fiber glass cloth and a backing or lower layer 18 preferably of cotton fabric. The three layers are quilted together by crossed lines of stitching indicated at 20, and the edges are secured together by a conventional binding tape 21 which is stitched to the

three layers on its inner edge by a single line of stitching 22.

It is preferred to have the batting 16 sized or coated at least upon one side with a stiffening agent which loses its effect by mechanically bending when put into use. Thereby the manufacturing of the article is made easier in cutting and handling and in holding its shape during quilting. Furthermore, the newness of any article presented for sale can be quickly determined and the article itself can be easily packaged.

By way of example, such batting may be formed by lightly spraying glass fibers ranging from .00015 inch, and smaller, with a phenol formaldehyde solution preferably upon selected fibers such as those on one side of the mass, and then pressing and baking the mass to polymerize the phenol formaldehyde and bind the fibers lightly together. This binding will persist during fabrication of the pad but will be broken down quickly to provide a soft pad when the pad is placed in use upon a mattress.

When it is desired to make a comforter or quilt, the thickness of the layer 16 is increased over that required for a pad 10 and the density of the glass wool batting 16 used is preferably less.

In some instances it has proved desirable to use fiber glass cloth for both the upper and lower layers 17 and 18 to produce a reversible pad or quilt, but because of the low coefficient of friction of glass cloth it has generally proved more desirable to use a cotton fabric for the backing layer 18 particularly when the pad 10 is used as a mattress cover. The cotton cloth, having a high coefficient of friction holds the pad in its proper place with respect to the mattress to prevent slipping. Were glass cloth used on the bottom of the pad, it would be quite difficult to make the bed up and the pad 10 would be inclined to slip on the mattress 12 to bunch up and form lumps.

By way of example, and not to be construed as limiting the invention, a pad made up of the following materials has proved quite satisfactory for use as a mattress cover. The upper or facing layer is formed of a fiber glass cloth manufactured by Fiberglas Corporation known as Corning #118 having a #10 finish. The batting layer is formed of one inch thick superfine fiber glass wool manufactured by the same corporation, while the backing layer is formed of unfinished cotton fabric. These three layers are stitched together with nylon thread, a single thread chain stitch being used. The stitching is performed in such a manner that the major portion of each stitch where the threads of one stitch cross those of the next lies on the outer surface of the glass cloth layer.

The use of nylon thread and the chain stitching result in particular advantages and make the use of a cotton backing layer possible. Nylon is not a completely fireproof material but is highly fire resistant, a highly elevated temperature and high concentration of oxygen usually being required before ignition can occur.

When a cigarette 24, or other burning material falls onto the sheet 13 above the pad 10, it quickly burns a hole 25 through the sheet 13. However, since neither the glass cloth 17 nor the batting 16 is burnable, the fire stops at this point and can only spread sidewise in the sheet 13.

When nylon, or other thread having similar properties, is used for the stitching 20, the fire cannot burn through, via the thread 20, to the backing layer 18. It has been found that when conventional cotton thread is used and the upper end of the stitch 20 is ignited either by a cigarette 24 or by the sheet 13, the fire burns down through the threads of the stitch 20 to ignite the backing 18. When the backing layer 18 is formed of fiber glass cloth and cotton thread is used, it is possible for the stitch 20 to transfer the fire directly to the mattress 12.

In pads where nylon is used, a cigarette or lighted match brought into direct contact with the upper end of a stitch 20 will not ignite the stitch sufficiently to allow burning through but, at the most, merely fuses the upper portions of the stitch.

Furthermore, the use of nylon thread resists the passage of any water through the pad which might be spilled on top thereof. Cotton thread serves as a wick, transmitting water very quickly. Any wicking action is entirely eliminated by the use of nylon thread.

As has been stated, the use of a single thread chain stitch serves to increase the frictional resistance of the glass cloth 17 surface, for this type of stitch produces a knot 20*b* or twisting of the thread on the top side of the glass cloth 17; and the sheet 13 rests on top of the knots 20*b* so that a greater frictional force is exerted on the sheet 13 to prevent its being moved sidewise with respect to the pad 10.

Because a chain stitch is likely to unravel if broken, it has been found of particular advantage to arrange the lines of quilting stitching 20 in an overlapping pattern such as that shown in Fig. 3. With this pattern, when a thread breaks and the stitches start to unravel, the unraveling is stopped at a point where one line of stitching 20 crosses another line 20, the second line holding the loose end of the thread against further unraveling. Other geometric patterns than the one shown have proved equally satisfactory, the only requisite being that the lines 20 intersect and cross one another frequently so that the uninterrupted lengths are as short as possible.

When a pad 10 is desired which is thicker than that shown in Fig. 2 or which is to be more tightly quilted so that the stitching 20 lies beneath the top surface, good results have been obtained when it is constructed in a modified form as the pad 10*a* shown in Fig. 4.

This pad 10*a* is substantially the same as the preferred embodiment except that extra lines of stitching as indicated at 26*a* are provided. The fiber glass cloth 17*a* is first cross-hatched with parallel lines of chain stitching 26*a*, which stitching passes through the glass cloth 17*a* only, the knotted side of each stitch being on the top surface. After this has been done, the three layers are assembled and quilted together as in the preferred embodiment, a standard two-thread stitch being used instead of a chain stitch for greater strength. The patterns of each of the lines of stitching 20*a* and 26*a* are arranged so that the chain stitch 26*a* lies largely on the high points formed on the surface of the cloth 17*a* by the quilting.

In the case of the modified pad 10*a* it is not necessary that the intersecting pattern be followed, for the lines 20*a* of regular stitching serve to stop unraveling of the lines 26*a* of chain stitching should the latter break.

From the above description it will be obvious to those familiar with the art that a novel form

of pad or comforter has been provided which greatly decreases the possibility of serious fires occurring from smoking in bed, and which is attractive in appearance while having all the advantages of conventional nonfire resistant pads or quilts.

Furthermore, the pad of this invention is water repellent and nonabsorbent, which makes it of advantage for use in children's beds and infants' cribs, as well as in hospitals, hotels and similar institutions where its fire resistant properties are of particular value.

Various changes and modifications in the described embodiments will of course present themselves to those familiar with the art and may be made without departing from the spirit of this invention whose scope is defined in the following claims.

What is claimed is:

1. A pad comprising a layer of glass wool batting, a backing layer of cotton fabric, and an upper layer of glass fiber cloth, said upper layer having lines of chain stitching of a fire resistant thread thereon and said three layers being quilted together by other lines of stitching, the knot portion of each stitch lying on the upper surface of said glass cloth and said other lines of stitching being spaced from said first mentioned lines.

2. A bed pad comprising a layer of glass wool batting, a bottom layer of cotton fabric adjacent thereto, and another layer of woven glass fabric on the upper side of said glass wool batting layer, said layers being quilted together by lines of stitching of a thread composed of fire resistant material, each stitch passing through all of said layers.

3. A bed pad comprising a layer of glass wool batting, a bottom layer of fabric having a high coefficient of friction, and an upper layer of glass fiber cloth, said layers being held together by lines of stitching applied through all three of said layers, the knots thereof lying adjacent the upper layer and the stitch thread exposed on the upper layer being made of a fire resistant material.

4. A pad comprising an intermediate layer of glass wool batting, a bottom layer of cotton fabric having a high coefficient of friction, and an upper layer of glass fiber cloth, said layers being quilted together by overlapping lines of chain stitching of a water repellant thread made of a fire resistant material, each stitch passing through all of said layers.

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