

Sept. 16, 1952

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2,610,338

PROTECTIVE FIRE RESISTANT COVERING FOR MATTRESSES

Filed March 10, 1947

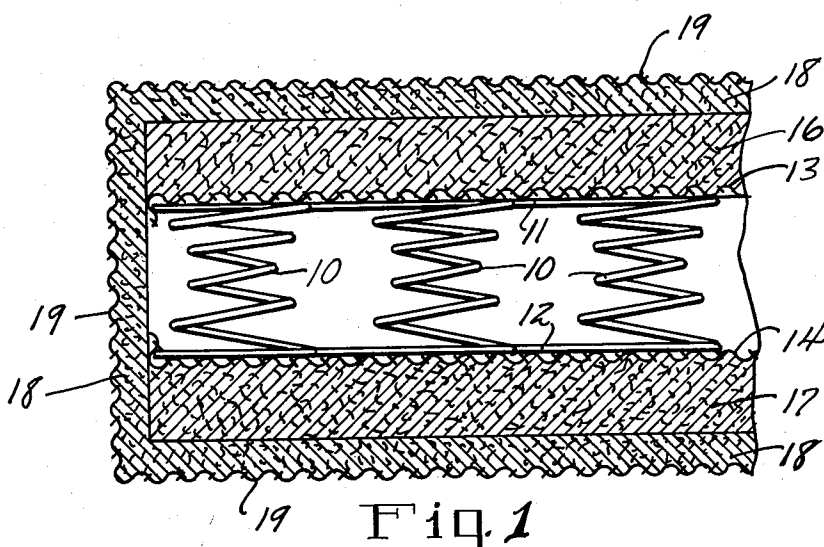
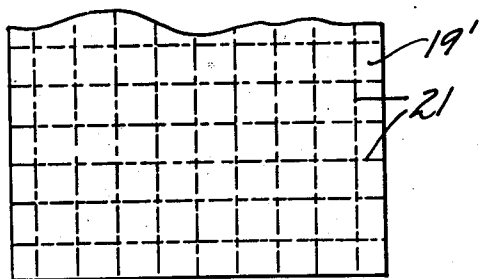


Fig. 1



Fig. 2

Fig. 3



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UNITED STATES PATENT OFFICE

2,610,338

PROTECTIVE FIRE RESISTANT COVERING
FOR MATTRESSESRobert J. Taylor, Birmingham, Ala., assignor to
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Application March 10, 1947; Serial No. 733,504

1 Claim. (Cl. 5—361)

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This invention relates to mattresses and has for an object the provision of a mattress which shall be fire resistant and yet retain its softness and resiliency.

A further object of my invention is to provide a protective covering for an innerspring mattress which shall be flame resistant and render the mattress safe against ordinary hazards of fire propagation.

A still further object of my invention is to provide a mattress having a cellulosic filling and a fire resistant protective covering therefor, including an insulating layer of resilient fibrous fire resistant material.

As is well known in the art to which my invention relates many disastrous fires in homes and in public places have occurred in which the cellulosic material forming the ticking and filling of a mattress has been first carelessly ignited as from a lighted cigarette, and propagated by the cellulosic material. Due to the fact that such fires spread slowly at first with no flame, they are often unnoticed until they are beyond control. While mattresses filled with fire resistant material have heretofore been proposed, all with which I am familiar, have been expensive and in most cases have sacrificed comfort for safety due to the coarse, relatively hard character of materials employed. It is accordingly the prime object of my invention to provide a fire resistant mattress which may be manufactured economically and which shall have all the qualities, as to comfort, of mattresses heretofore known and used.

It is well known that cotton felt forms one of the most satisfactory fillings for a mattress by reason of its cheapness, resiliency and compression-recovery properties. Methods are already available for rendering cotton and cotton fabrics fire resistant, but if applied to the entire filling of a mattress they render its manufacturing cost prohibitive. Non-inflammable fibrous materials, and mixtures of such materials with cotton are also known, but such materials are too expensive to form the entire filling of a mattress comparable in price to mattresses heretofore manufactured. My invention accordingly contemplates the provision of a fire resistant mattress which shall include an economical cotton or other fibrous filling which may not necessarily be fire resistant.

My invention further contemplates a separable fire resistant pad or cover for a mattress which shall be adapted to be spread over an ordinary inflammable mattress and intercept any burning

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object which might otherwise be dropped on the mattress.

A typical inner spring mattress embodying features of my invention is illustrated in the accompanying drawing forming a part of this application, in which

Fig. 1 is a fragmentary sectional view;

Fig. 2 is a similar view of a separable fire resistant covering for a mattress; and

Fig. 3 is a fragmentary plan view of the pad shown in Fig. 2.

Referring to the drawing, I show an inner-spring mattress comprising coil springs 10 secured together at their upper and lower ends as by straps 11 and 12. On top and underneath the springs is a layer of burlap 13 and 14. Over the layers of burlap are provided layers of filling 16 and 17, preferably of cotton felt or sisal.

Enclosing the springs and filling just described is a layer of fire resistant, insulating material 18. While different materials may be employed for this layer, I preferably employ a felt material comprised essentially of glass fiber because of its softness, resiliency, low creep and permanent set properties. Different forms of such felt material are already known, and I prefer to employ either a glass fiber felt in which the glass fibers are mixed with fire resistant cotton, or one in which the glass fibers are treated with a resinous bonding agent sufficient to prevent the fibers from separation when subjected to ordinary wear and tear.

Surrounding the layer 18 of insulating and fire resistant material, I provide the usual envelope or ticking 19, except that in my invention I provide a fire resistant fabric for forming the ticking. While several fire resistant agents for treating fabrics are known, I prefer to employ an agent that reacts chemically with the fibers to add a fire resistant constituent. One such process of rendering the fabric fire resistant comprises treating it, or the fiber or yarn from which it is formed, with an aqueous solution of phosphoric acid, or its ammonium salt, containing a large excess of urea or other nitrogen compound, drying the retardant mixture on the fibers, and curing at elevated temperatures. This results in the formation of a phosphate ester of cellulose in which the other acidic hydrogens of the phosphate are neutralized as the nitrogen salt. The excess nitrogen compound may then be removed by washing.

I have found that a mattress constructed in the manner just described and with a layer of insulating and fire resistant material 18 at least

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$\frac{3}{8}$ of an inch thick and preferably from $\frac{3}{8}$ of an inch to $\frac{3}{4}$ of an inch thick, will effectively resist the propagation of fire originating from ordinary causes as from dropping lighted cigarettes on the mattress, or on a sheet covering the mattress.

In order to protect mattresses as heretofore constructed, I may provide a fire resistant, protective covering, such as shown in Figs. 2 and 3 of the drawing. In accordance with this modification, I provide a layer of fire resistant insulating material 18' enclosed by an envelope of fire resistant fabric 19'. The fire resistant layer 18' and the envelope 19' are the same or have fire resistant properties equivalent to the layer 18 and the ticking 19 shown in Fig. 1. Such a protective covering would be spread over a conventional, inflammable, mattress as a protective covering and would prevent the propagation of fire caused by dropping burning articles on the bed. Preferably the pad shown in Figs. 2 and 3 is quilted as indicated by the lines 21 in Fig. 3.

Comprehensive tests made by me indicate that a mattress constructed as herein described does not propagate a fire originating from ordinary causes as from dropping burning objects thereon. For example, lighted cigarettes were placed on such a mattress in a gentle draft of air and were allowed to burn completely out. No evidence of burning was found in the inflammable felt fillings 16 and 17. Mattresses constructed in the ordinary way heretofore known in the art ignited and burned to completion when subjected to the same test. Also, I have found that mattresses containing an inflammable filler and covered with flame resistant ticking only, such as herein described, would have its filling ignited when subjected to the burning cigarette test.

While as hereinbefore stated, I prefer to employ cotton felt for the filling 16 and 17, other

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materials will suggest themselves to those skilled in the art as having the necessary properties and be within the spirit of my invention. Also, while I have described my invention as applied to bed mattresses, it will be obvious that it is equally applicable to pads, cushions of all kinds, pillows, and upholstery and the term "mattress" as used in the claim is to be interpreted in its broader sense as including such other articles.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claim.

What I claim is:

In a mattress having a cotton filling, a layer of fiber glass at least three-eighths of an inch thick surrounding the cotton filling, and a fire resistant envelope over the said layer comprised of cotton fabric embodying a phosphate ester of cellulose.

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