Feb. 29, 1944. W. B. BYERS 2,342,839

INSULATING BLANKET

Filed Aug. 2, 1940

Fig. 1.

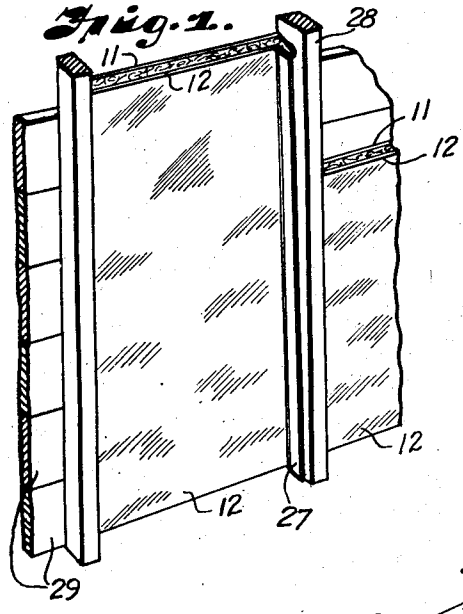


Fig. 2.

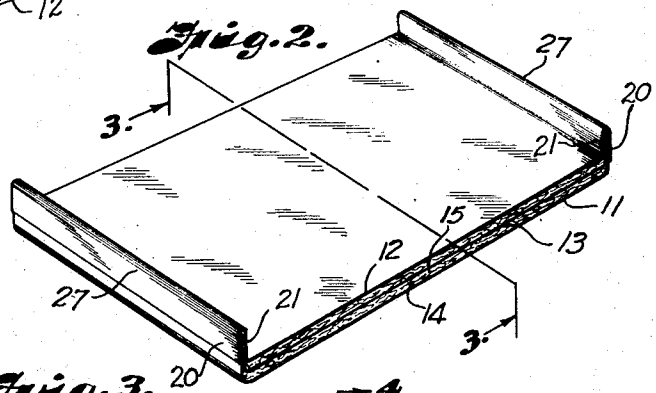


Fig. 5.

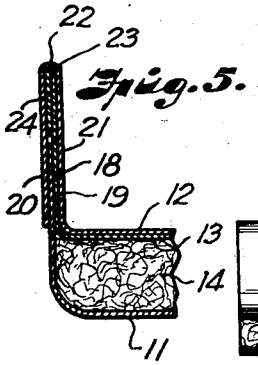


Fig. 3.

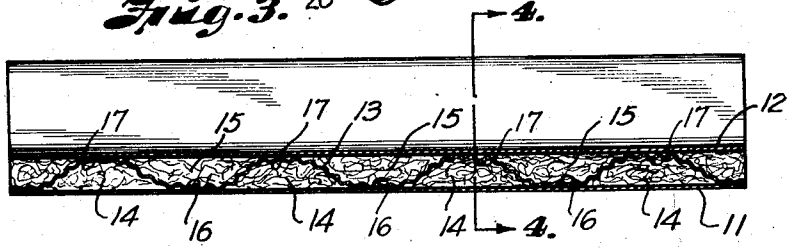


Fig. 4.

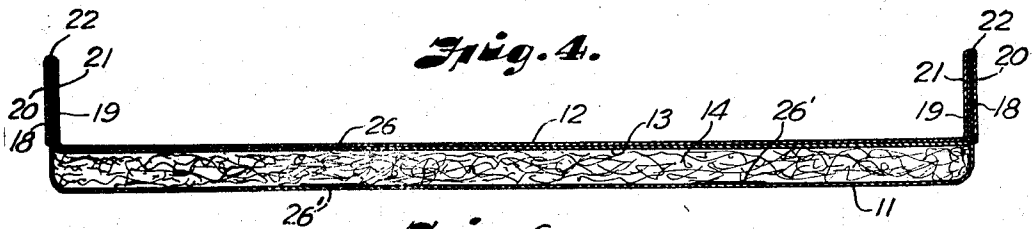
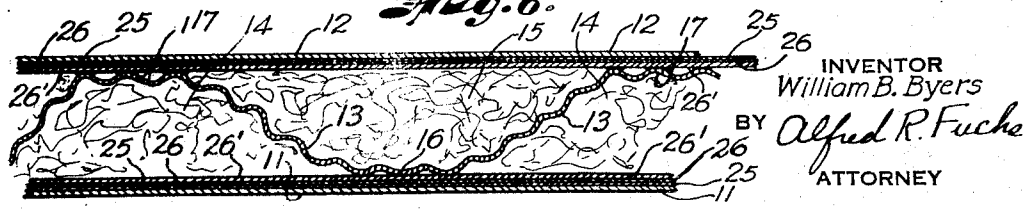


Fig. 6.



INVENTOR
William B. Byers
BY Alfred R. Fuchs
ATTORNEY

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INSULATING BLANKET

William B. Byers, Kansas City, Mo.

Application August 2, 1940, Serial No. 350,023

19 Claims. (Cl. 154—44)

My invention relates to insulating blankets.

The blanket of my invention is a composite insulating blanket, comprising loose insulating fibers with covering sheets of paper for holding the fibers in position. It is particularly an important feature of my invention that the fibers are absolutely loose, that is, that the same are not secured to each other in any manner, but are merely held in position in pockets, the fibers in each pocket being entirely unattached to each other.

It is an important purpose of my invention to provide an insulating blanket having new and improved means for holding loose fibers in position between cover sheets, so as to prevent shifting thereof out of position.

The insulating blanket forming the subject matter of my invention is of a flexible type, long lengths of which may be rolled up for transportation purposes and cut in proper lengths on the job for installation in walls, ceilings, and the like.

It is a further purpose of my invention to provide an insulating blanket that avoids the defects present in insulating blankets at present on the market, such as those in which layers of fibers are sewed between two cover sheets to hold the same in position, and to avoid the difficulties in manufacture that exist in certain types of insulating blankets, in which a mat of loose fibers is made by spraying an adhesive on the fibers as the same are laid into the mat, and drying the damp mat before covering it with enclosing sheets of paper. My invention utilizes the good properties of the above mentioned types of insulating blankets without having the defects of either. For example, in the stitched type of blanket the cover sheets are perforated by the holes made during the stitching process and thus cannot be made vapor proof. In the type of blanket in which the fibers are fastened together in relatively fixed position to each other by adhesive, the cover sheets have a pronounced tendency to separate further apart than the actual thickness of the insulation between them, unless the fiber mat to which the covering sheets are cemented to form the blanket is denser than is necessary to provide the maximum insulating efficiency. On the other hand, my blanket can be made vapor proof and the cover sheets cannot separate further apart than these are intended to, and yet the fiber can be inserted between them in a lighter or fluffier form than has heretofore been possible in insulating blankets.

It is a further purpose of my invention to provide an insulating blanket, in which the loose fiber cannot settle or fall out of position, and in which it is possible to use a short fiber insulation, such as wood fiber, or wood cotton, without impregnating the fiber with adhesives, which may lower its insulating efficiency.

It is another purpose of my invention to provide an insulating blanket that is provided with a water proof and vapor proof membrane between the warm side of the blanket and the insulation. This is of great importance, because in the previously known insulating blankets, a puncture at any place in the liner of a panel of insulation lets moist air into the entire panel, thereby jeopardizing the efficiency of the entire panel, while in my invention a puncture will not let moist air into but a small section of the blanket, which in any case would be a very small fraction of the whole panel.

It is a further purpose of my invention to provide an insulating blanket that is provided with a series of overlapping pockets, or chambers, in which the loose fibrous insulating material is enclosed. This avoids all possibility of there being any air pockets that are unfilled with insulating material between the two covering plies, the pockets being formed by an intermediate ply of material that is corrugated so as to make the same variable in length and which extends back and forth between the covering plies diagonally, being at no points whatsoever perpendicular to the outer or enclosing sheets.

It is a further purpose of my invention to provide stripes of asphaltic material, of higher melting point than that utilized over the major portions of the blanket, for securing the intermediate ply to the outer plies, certain of said stripes being applied to the plies of material at such points that these will act to secure wide folds of the plies together to firmly secure these to each other, with one of said plies doubled back along the side edges of the blanket, to seal the longitudinal edges thereof.

Other objects and advantages of my invention will appear as the description of the drawing proceeds. I desire to have it understood, however, that I do not intend to limit myself to the particular details shown or described, except as defined in the claims.

In the drawing:

Fig. 1 is a fragmentary perspective view partly in section, showing my improved insulating blanket applied to a wall.

Fig. 2 is a fragmentary perspective view of the insulating blanket before application to the wall.

Fig. 3 is a fragmentary longitudinal enlarged

sectional view through the insulating blanket, taken on the line 3—3 of Fig. 2.

Fig. 4 is a section taken on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary sectional view on a still larger scale through one of the side edge portions of the blanket, and

Fig. 6 is an enlarged fragmentary sectional view, similar to Fig. 3, but on a considerably larger scale.

Referring in detail to the drawing, my improved insulating blanket comprises covering plies 11 and 12, which are made of a fibrous sheet material, such as kraft paper, and which can be either plain or craped, if desired. Mounted between said covering plies 11 and 12 is an intermediate ply 13 and alternating bodies of fibrous insulating material 14 and 15, which lie on opposite sides of the intermediate ply 13 and which overlap each other longitudinally of the blanket, as will be clear from Figs. 3 and 6. Each of the bodies of fibrous insulating material 14 and 15 extends crosswise the full width of the insulating blanket, except for the folded flange portions provided thereon along the opposite margins thereof, as will be explained below.

The fibrous material is in a loose fluffy condition and is, preferably, made of a wood fiber of a character ordinarily known as wood cotton, or may be made of waste paper, or similar material, treated in a manner to form a fluffy fibrous cottony material thereof. The intermediate ply 13 has portions 16 that engage the one covering ply 11, and portions 17 that engage the other covering ply 11 and are secured thereto. Said intermediate ply 13 is made of such a character that the length thereof can be varied to get the desired positioning thereof between the outer or covering plies. Due to the undulating character of its path in the blanket, it must, of course, be considerably longer than the other plies, and furthermore there may be slight variations in the length necessary between any two points of engagement with the opposite covering plies to allow for any slight variations in the amount of the fibrous material in the pockets formed by it and the covering plies. Preferably, the intermediate ply 13 is corrugated to allow for the necessary variation in the length thereof, although other means could be used to get this flexibility of length, such as craping. It has, however, been found much simpler to corrugate the sheet, and such a corrugated sheet has all the desirable characteristics required of the intermediate sheet. Preferably, this intermediate sheet is made of similar kraft paper to that used for the outermost, or covering, plies, or sheets.

Along the longitudinal edges of the blanket the various plies are folded together so as to form a strong and tight seal, and nailing strip, or flange. The longitudinal edge portions 18 of the covering ply 11 are engaged on one side by the longitudinal edge portions 19 of the intermediate ply 13 and on the other side by the longitudinal edge portions 20 of the other outer ply 12. The ply 12 extends at 21 along the opposite side of the edge portion 19 of the ply 13 to that engaged by the longitudinal edge portion 18 of the ply 11 and is doubled, or folded back on itself at 22, to form the outermost ply of the fold, which is formed by the longitudinal edge portion 20 of the ply 12. The ply 11 is narrower than the ply 13, and the ply 13 is narrower than the ply 12, the ply 13 being also doubled back on itself at 23 inside the fold or doubled back portion 22 of the ply 12, to form an outer fold 24 of the edge portion 19 of the ply 13 that on one side engages the edge portion 19 of said ply 13 and on the other side engages the outermost ply of the fold formed by the longitudinal edge portion 20 of the ply 12.

Each of the plies 11 and 12 is provided with an undercoating of wax 25 on the inner face thereof, which enters the pores of the sheets, or plies, 11 and 12, and a coating 26 of asphaltic material, which has a lower melting point than the wax, the wax thus preventing any penetration of the asphaltic material through the outer plies 11 and 12, which might otherwise cause stickiness on the outer side thereof, such as might cause the adjoining turns of a blanket, if rolled up on itself, to stick together. The melting point of the wax is high enough above the maximum temperatures encountered in the atmosphere to prevent any melting thereof under any usual conditions of use in a building. The wax and the asphaltic material provide moistureproofing means for the blanket and the asphaltic material also serves as means for uniting the intermediate ply with the covering plies 11 and 12 at the points where these contact, that is, at 16 and 17, as indicated in the drawing, and also along the longitudinal side portions of the blanket where the folds of the various plies are made to form the flanges 27. The intermediate ply 13 extends obliquely from one outer ply to the other outer ply, and then along substantially parallel with the outer ply that it approaches for a desired distance, to form the pockets, tapering somewhat in cross section, and with the bases thereof alternately arranged to form the overlapping pockets, or chambers, for the fluffy wood fiber insulating material, or similar insulating material, within the blanket. The flange portions 27 are secured in any desired manner, as by means of headed fastening elements, such as nails, to such structural members as the studs 28 with the flat body portion of the blanket in contact with the flat faces of the sheathing members 29.

The melting point of the wax 25 is, preferably, about 150 degrees F., while that of the asphaltic material 26 is, preferably, about 120 degrees F.

Stripes 26' of asphaltic material of still higher melting point are provided on the sides of the covering plies that are next to the corrugated ply and these stripes are, preferably, relatively narrow, in the standard form of insulating blanket in which the bodies, or parcels, of loose fluffy fibrous material lying between the flanges 27, are sixteen inches long, being about an inch wide, and two of the stripes being placed approximately at the side edges of the outer plies and the other two stripes being also about an inch wide and being spaced substantially about equal distances from each other and the two outermost stripes. The material of the stripes 26' has a melting point of about 160° F.

The purpose of the stripes 26' of the asphaltic material having the higher melting point is primarily to fasten together the edges of the three sheets as these engage in going through the machine that makes the blanket, at a higher temperature than would be possible with the waterproofing asphaltic material 26. A final temperature of from 100 degrees F. to 130 degrees F. exists in the blanket at the time it leaves the machine, particularly in warm weather, because the blanket travels at the rate of from 60 to 70 lineal feet per minute as it is going through the

machine and does not have time to cool to a lower temperature. As the water proofing asphaltic material 26 has a melting point of substantially 120 degrees, it will not be adhesive enough to hold the sheets together in their proper relationship, while the stripes 26' will do this.

While considerable pressure is applied to the marginal edges of the sheets where the flaps are formed to seal them, and these will seal under this pressure at a wide variation in temperature, that is, from 50 to 130 degrees F., on the other hand, only a very slight pressure is exerted on the fibrous portion of the blanket, so that the fibers will remain in a fluffy condition, and for that reason a very tacky asphalt of very low melting point is used for securing the intermediate ply to the covering plies over that portion of the blanket where the fluffy insulating material is incorporated therein. It is not essential that this be congealed as the blanket comes off the machine, as experience has shown that all that is necessary is to have such tackiness as to hold the middle sheet in place, which is accomplished by means of the stripes 26'. The blanket can then be rolled up and placed in cartons after it leaves the machine, where it will go through the final cooling step and solidification of the soft asphaltic material 26. The harder asphaltic stripes adjacent the side edges of the plies are sufficient to hold the middle or intermediate ply in position relative to the covering plies, and while the stripes of the harder asphaltic material in the middle portion of the webs, or sheets, help to hold the middle, or intermediate, ply to the covering plies while the blanket is hot, it is not absolutely necessary to provide these intermediate or central stripes.

In the finished blanket the corrugations are almost stretched out and only a slight crimping is noticeable.

While the middle sheet, or ply 13 is shown as being wider than the formed bodies of loose fibrous material, this is not absolutely essential, as these bodies could be held in place, even if the intermediate ply did not extend into the flaps of the blanket, but were merely wide enough to weave back and forth from one covering ply to the other through the fibrous filling.

What I claim is:

1. A flexible insulating blanket comprising a pair of spaced cover plies of sheet material, flexible extensible means mounted between said plies to divide the space between the same into a plurality of adjacent flexible walled pockets, and loose insulating material in said pockets, said cover plies and said means being secured together along the longitudinal margins of said blanket to close the ends of said pockets.

2. An insulating blanket comprising loose fluffy fibrous insulating material enclosed within an imperforate covering of fibrous sheet material, and flexible partitioning means entirely within said covering and secured thereto for holding said insulating material from shifting lengthwise of said blanket with the fibers thereof unattached to each other.

3. A flexible insulating blanket comprising a plurality of staggered overlapping bodies of loose fluffy insulating material enclosed within a sheath of sheet material having a vapor-proofing coating on only the inner side thereof.

4. A flexible insulating blanket comprising loose fibres of fluffy insulating material unattached to each other enclosed within a covering of fibrous sheet material having a vapor-proofing coating on the inner side thereof, and flexible means of sheet material entirely within said covering and secured thereto to form flexible transverse partitions for holding said insulating material from shifting lengthwise of said blanket with the fibers thereof unattached to each other.

5. An insulating blanket comprising a pair of spaced cover plies of sheet material, flexible, extensible means mounted between said plies to divide the space between the same into a plurality of adjacent pockets having flexible walls, and loose insulating material in said pockets, said pockets having walls extending obliquely to said cover plies, said cover plies and said means being secured together along the longitudinal margins of said blanket to close the ends of said pockets.

6. An insulating blanket comprising a plurality of staggered overlapping bodies of loose fluffy insulating material mounted within a sheath of sheet material, said blanket having an extensible ply of sheet material lying within said sheath and extending between said bodies to form pockets having flexible walls to hold said bodies in position in said sheath, said sheath comprising plies secured together along the longitudinal margins of said blanket to close the ends of said pockets.

7. An insulating blanket comprising a plurality of staggered overlapping bodies of loose fluffy insulating material mounted within a sheath of sheet material, said blanket having a ply of extensible sheet material lying within said sheath and extending between said bodies and alternately secured to opposite sides of said sheet to hold said bodies in position in said sheath, said ply of extensible sheet material being slack between the points of securement thereof to provide flexible partitions within said blanket.

8. A flexible insulating blanket comprising a pair of spaced cover plies of sheet material, an intermediate ply of extensible, flexible sheet material mounted between said plies and extending back and forth between the same to divide the space between the same into a plurality of adjacent pockets having flexible walls, and loose insulating material in said pockets, said plies being all secured together along the longitudinal margins of said blanket to close the ends of said pockets.

9. An insulating blanket comprising a pair of spaced cover plies of sheet material, an intermediate ply of extensible sheet material mounted between said plies and extending back and forth between the same to divide the space between the same into a plurality of adjacent pockets having flexible walls, and loose insulating material in said pockets, said intermediate ply having portions extending alongside each of said outer plies and secured thereto and portions extending obliquely between said plies to provide inclined flexible extensible partitions between said pockets.

10. An insulating blanket comprising a pair of spaced cover plies of sheet material, an intermediate flexible ply of corrugated sheet material mounted between said plies and having inclined portions extending back and forth between the same to divide the space between the same into a plurality of adjacent pockets, each of said inclined portions having a plurality of corrugations therein and loose insulating material in said pockets.

11. An insulating blanket comprising a pair of spaced cover plies of sheet material, and loose insulating material between said plies, said cover plies having a wax coating on the inner sides thereof and a coating of asphaltic material hav-

ing a lower melting point than said wax over said wax coating.

12. An insulating blanket comprising covering plies having an undercoating of wax on the inner side thereof and a coating of an asphaltic material having a lower melting point than said wax over said undercoating.

13. An insulating blanket comprising a pair of spaced cover plies of sheet material, means mounted between said plies to divide the space between the same into a plurality of adjacent flexible walled pockets, and loose insulating material in said pockets, said cover plies having an undercoating of wax on the inner side thereof and a coating of an asphaltic material having a lower melting point than said wax over said undercoating securing said means to said plies at spaced intervals.

14. A flexible insulating blanket comprising a pair of spaced cover plies of sheet material, means mounted between said plies to define the space between the same into a plurality of adjacent overlapping, oppositely directed, flaring flexible walled pockets, extending from one of said cover plies to adjacent the other thereof, and loose insulating material in said pockets.

15. A flexible insulating blanket comprising a plurality of overlapping bodies of fluffy insulating material made up of loose unconnected fibers mounted within a sheath of sheet material, said blanket having a ply of flexible extensible sheet material mounted within said sheath for holding said bodies from shifting lengthwise of said blanket and in predetermined overlapped relation to each other, said ply having portions thereof extending along opposite walls of said sheath and secured thereto and oppositely inclined extensible portions extending between said walls to form flaring, alternating, oppositely directed, flexible walled pockets extending from one wall to the other wall of said sheath.

16. An insulating blanket of composite structure comprising two external plies of fibrous sheet material, a longer inner ply of fibrous sheet material, said inner ply extending back and forth between the inner sides of said external plies and having portions lying alongside said external plies and adhesively secured thereto, said external plies being held in flexible spaced relation to each other by said inner ply, said inner ply being extensible between the cemented portions thereof to form flexible walled deformable compartments, and bodies of loose insulating fibers in said compartments.

17. An insulating blanket of composite structure comprising two external plies of fibrous sheet material, a longer inner ply of fibrous sheet material, said inner ply extending back and forth between the inner sides of said external plies and having portions lying alongside said external plies and adhesively secured thereto, said external plies being held in flexible spaced relation to each other by said inner ply, said inner ply being corrugated between the cemented portions thereof to form flexible walled deformable compartments having extensible walls extending obliquely between said external plies, and bodies of loose insulating fibers in said compartments.

18. An insulating blanket of composite structure comprising two external plies of fibrous sheet material, a longer inner ply of fibrous sheet material, said inner ply extending back and forth between the inner sides of said external plies and having portions lying alongside said external plies and adhesively secured thereto, said external plies being held in flexible spaced relation to each other by said inner ply, said inner ply being extensible between the cemented portions thereof to form flexible walled deformable compartments, and bodies of loose insulating fibers in said compartments, said plies extending laterally beyond said bodies and said lateral extensions being secured together along the entire length of said blanket to close the ends of said compartments and form flaps along the longitudinal margins of said blanket.

19. A continuous insulation blanket of determined width and thickness flexible in all directions, having a medial insulating portion and marginal mounting portions narrower than said insulating portion, said blanket comprising paper cover plies and a paper ply therebetween, the medial portion thereof constituting a continuous undulating web extending back and forth between said cover plies having spaced portions thereof engaging said cover plies and cemented thereto and free portions alternating with said cemented portions to provide alternately arranged overlapping pockets on opposite sides of said web between said cover plies, in said medial portion of said blanket, said web being transversely corrugated to form undulations in said free portions thereof extending parallel to the undulations of said web to provide flexible walls for said pockets extensible longitudinally of said blanket, said pockets being filled with a fluffy mass of insulating fibres unattached to each other, the marginal portions of the ply between said cover plies being flattened and engaged continuously with said cover plies, said plies being folded longitudinally of said blanket and cemented together to seal said pockets and form multiple ply flanges along the margins of said blanket providing said mounting portions.

WILLIAM B. BYERS.