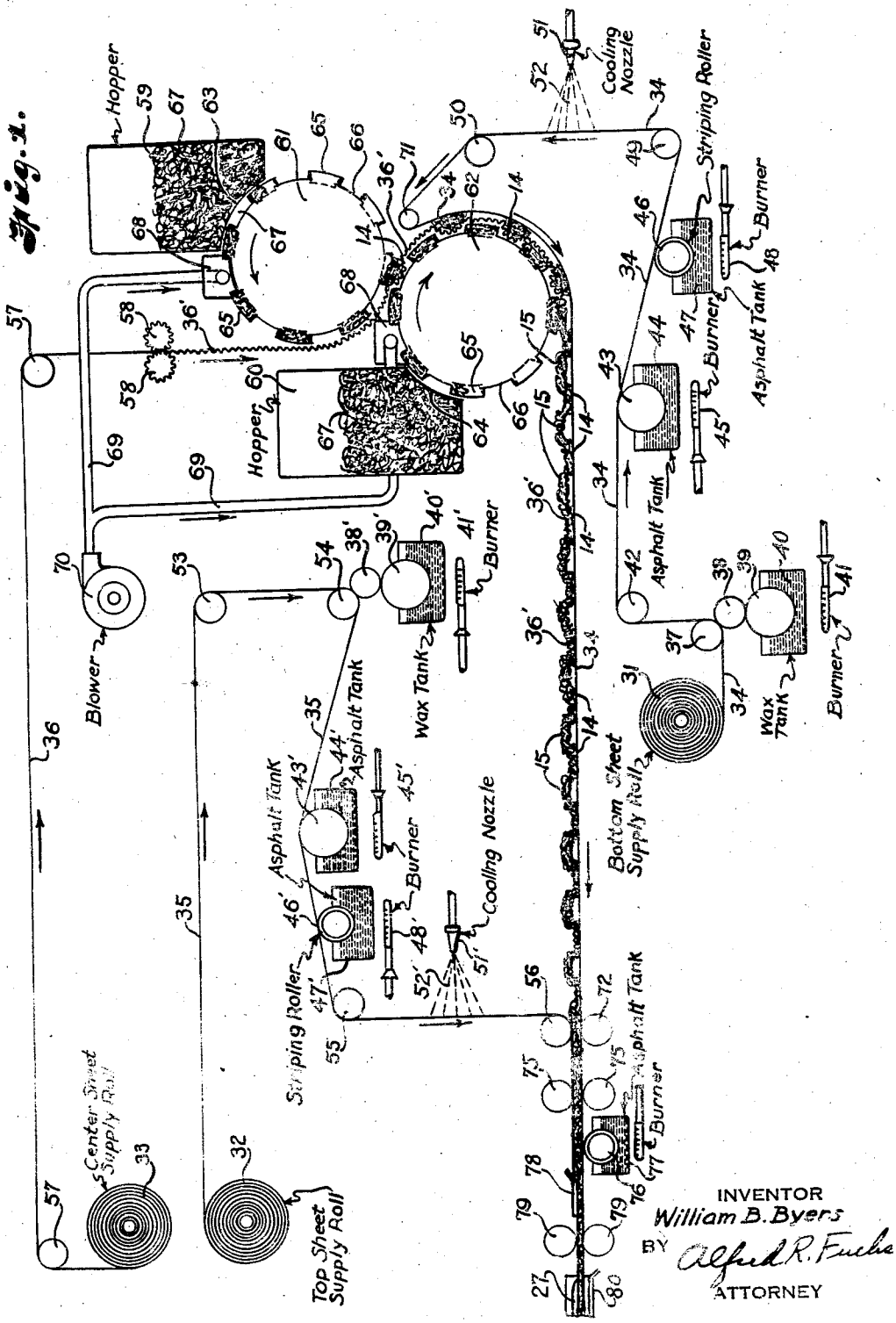
Sept. 3, 1946. W. B. BYERS 2,406,801

METHOD OF MAKING INSULATING BLANKETS

Original Filed Aug. 2, 1940 2 Sheets-Sheet 1

Fig. 1.



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METHOD OF MAKING INSULATING BLANKETS

Original Filed Aug. 2, 1940 2 Sheets-Sheet 2

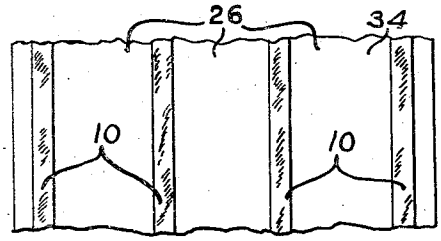


Fig. 2.

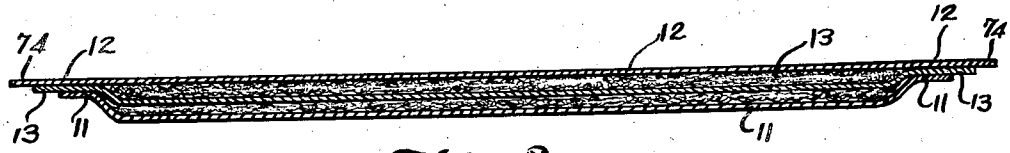


Fig. 3.

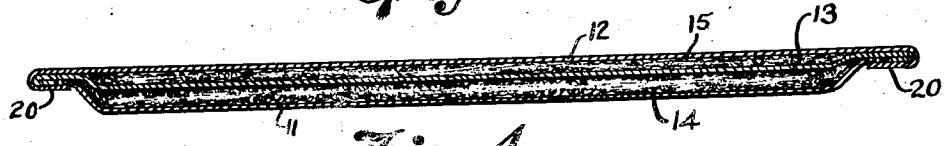


Fig. 4.

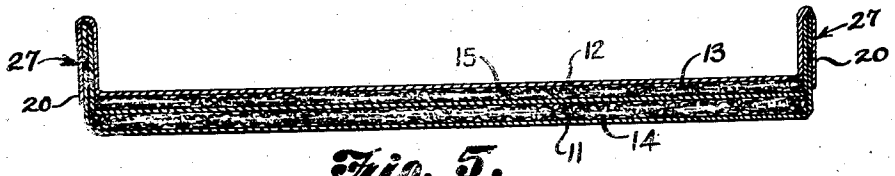


Fig. 5.

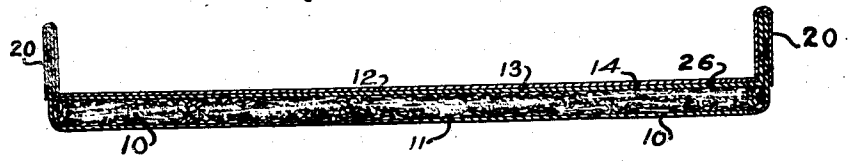


Fig. 6.

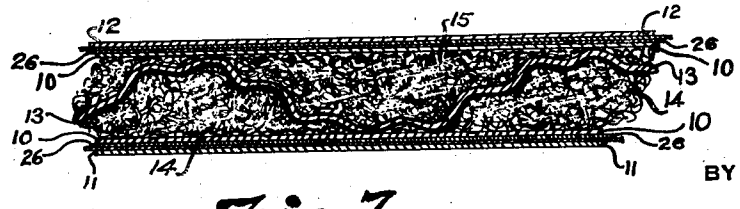


Fig. 7.

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Patented Sept. 3, 1946

2,406,801

UNITED STATES PATENT OFFICE

2,406,801

METHOD OF MAKING INSULATING BLANKETS

William B. Byers, Kansas City, Mo.

Original application August 2, 1940, Serial No. 350,023, now Patent No. 2,342,839, dated February 29, 1944. Divided and this application March 1, 1943, Serial No. 477,609

17 Claims. (Cl. 154—28)

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My invention relates to the method of making insulating blankets, and is a division of my application Serial No. 350,023, filed August 2, 1940, now Patent No. 2,342,839, dated Feb. 29, 1944, on Insulating blanket and method of making the same.

It is a purpose of my invention to provide a method of making a composite insulating blanket comprising loose insulating fibers with covering sheets of paper for holding the fibers in position, in which the fibers are absolutely loose, that is, not secured to each other in any manner, but merely held in position in pockets, the fibers in each pocket being entirely unattached to each other.

It is a further purpose of my invention to provide a method of making an insulating blanket of the above mentioned character, which is provided with means for preventing the shifting of the loose fibers out of position between the cover sheets, and particularly to provide an improved method of making such a blanket rapidly and cheaply.

It is a further purpose of my invention to provide a method of making an insulating blanket of the above mentioned character that is of a flexible character, so that long lengths thereof can be rolled up for transportation purposes and cut to proper length on the job for installation.

It is a particular purpose of my invention to provide a method that avoids 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, and further to provide a method that avoids stitching the sheets together, thus avoiding the making of holes that result from the stitching.

It is a further purpose of my invention to provide a method of making an insulating blanket that is vapor proof, and that is so made that the cover sheets cannot separate further apart than is intended, and a method in which the fiber can be placed in the blanket in a lighter or fluffier form than has heretofore been possible, and particularly one in which such loose fluffy material is made up of a short fiber insulation, such as wood fiber, or wood cotton.

It is still a further purpose of my invention to provide a method of making an insulating blanket that is provided with a series of overlapping pockets, or chambers, in which the loose fiber insulating material is enclosed, the pockets

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being formed around the bodies of loose insulating material placed in the blanket during the process of manufacture thereof.

It is a further purpose of my invention to provide a new and improved method of making an insulating blanket of the above mentioned character, which is inexpensive and simple compared with previously known methods of making such blankets, due to the fact that the wood fiber, or other fiber, used therein does not have to be dried after it is formed into a mat. Also due to the method used, much simpler apparatus can be used for carrying out the method and the completed article can be produced much more rapidly. This is accomplished by providing three layers, or plies, of paper, or similar material, two of which are on the outer sides of the blanket when completed, and the third of which is located between the other two plies, or layers, with batts of fibrous insulating material laid between these.

My method more specifically comprises placing parcels of said fibrous insulating material, of predetermined size and area, transversely on a ply of paper-like covering material in spaced relation to each other longitudinally of the ply, and similarly placing such parcels on an intermediate layer, or ply, of paper-like material, that is corrugated, or similarly pre-formed, to give the same flexibility in length, after said intermediate ply is placed in position over the outer ply that has had the pre-formed parcels of insulating material deposited on the upper side thereof, the parcels being placed so that the spaced pre-formed parcels of fibrous material on the corrugated, or intermediate ply, will be located in staggered relation to the parcels of fibrous insulating material on the outer ply, under the same, then placing another outer ply over the exposed parcels of fibrous insulating material that are positioned on the intermediate ply and securing all these plies to each other, so as to hold the same in predetermined relative position to each other.

It is a further purpose of my invention to lay a loose parcel of said fibrous material on said plies, of a substantially predetermined shape, or area, and press this into shape in the pockets that are formed between the plies after the parcels of insulating material and plies are assembled in predetermined relationship to each other, the spacing of these pre-formed parcels of insulating material being such that these over lap lengthwise of the insulating blanket after the plies are secured together.

It is a further purpose of my invention to provide a method of making an insulating blanket in which the outer plies are first coated, on the sides thereof that will be innermost when the blanket is completed, with a wax having a higher melting point than the asphaltic material used for securing the intermediate ply to the outer ply and then applying the asphaltic material having a lower melting point than said wax, to the same side of the sheet to which the wax has been applied, to thus prevent the asphaltic material from working its way through the paper, or similar sheet material, that forms the outer covering of the blanket.

It is a further purpose of my invention to provide a method of making an insulating blanket comprising applying stripes of asphaltic material, of higher melting point than that used over the major portions of the blanket, for securing the intermediate ply of the blanket 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.

It is a further purpose of my invention to provide a method of forming the bodies of loose fibrous material, which may be referred to as batts, or parcels, of such material, by depositing the same in a loose fluffy condition, in forms, or pockets, removing any excess material that may overlap the pockets, or forms, therefrom by a blowing action, and depositing the material thus collected in the pockets onto the plies of the insulating blanket at the desired points along the length thereof.

Other objects and advantages of my invention will appear as the description of the drawings 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 drawings:

Fig. 1 is a diagrammatc view of an apparatus utilized for manufacturing the insulating blanket, to illustrate the steps of the method of making the same.

Fig. 2 is a diagrammatic view showing the striping of high melting point asphaltic material on a ply of the blanket.

Fig. 3 is a transverse sectional view through the blanket, showing the same in an intermediate step in the manufacture thereof prior to folding the marginal edges thereof.

Fig. 4 is a similar view showing the marginal edges folded.

Fig. 5 is a similar view showing the edge flanges formed on the blanket.

Fig. 6 is a section taken through the blanket at a different point than Fig. 5, and

Fig. 7 is an enlarged fragmentary longitudinal section through the blanket.

My improved insulating blanket comprises covering plies that are made of fibrous sheet material, such as creped paper, and which can be either plain or creped, as may be desired, and an intermediate ply, with alternating bodies of fibrous insulating material lying on opposite sides of the intermediate ply, these overlapping each other longitudinally of the blanket. Each of the bodies of fibrous insulating material extends crosswise the full width of the insulating blanket, except for the folded flange portions provided thereon along opposite margins thereof, the fibrous material being in a loose fluffy condition and being, preferably, made of wood fiber of a character ordinarily known as wood cotton, or of waste paper, or similar material,treated to form a fluffy, fibrous cottony material thereof. The blanket is made by a method that is intended to provide pockets for the loose, fluffy, fibrous insulating material to hold this material in place and to provide overlapping parcels of this material, so that substantially the same thickness of insulating material will be provided throughout the blanket, except at the flanges thereon, from end to end thereof, and in which the fluffy, fibrous insulating material is made up of loose fibers in a fluffy condition, the method utilized keeping these parcels, or bodies, of such fluffy material, in their fluffy condition. Instead of forming the pockets in the blanket and placing the fluffy, fibrous insulating material therein, the pockets are formed around the bodies of such material.

In providing a method for making such an insulating blanket it is necessary that the method be of such a character that the cost of production will not become too great and so that the material can be produced continuously and will be of such a character that it can be readily stored and shipped. In order to accomplish this the blanket is made in such a manner that it will be flexible in character and can be rolled up on itself or on a reel, so as to form bundles thereof wound or rolled on themselves spirally so that any length thereof can be unrolled and cut off to fit into any desired space that is to be insulated.

The intermediate ply in a blanket of this character must follow an undulating path in order to provide the overlapping parcels, or bodies, of insulating material in the blanket, and for this reason said intermediate ply must be considerably longer than the other plies, and in order to carry out the manufacture thereof successfully it has been found necessary that this inner ply be of a corrugated character, or of a similar character that the same can be extended to take care of the difference in length thereof required as compared with the outer or cover plies. The said bodies are shorter than the width of the corrugated ply and are spaced apart distances somewhat less than the width of the bodies to provide the overlap.

The method further contemplates making a blanket of the general character above referred to, that has the marginal edges of the plies thereof folded together to form a strong tight seal, which also forms a nailing strip, or flange, for securing the blanket to frame members, such as studding, for example. My method produces an insulating blanket of the general character above referred to by a continuous process.

In order that the various plies may be secured together in proper relationship to each other, the outer or covering plies are provided with adhesive means for securing the intermediate corrugated ply thereto. Each of the outer, or covering plies, is first coated on one face thereof with a wax which, preferably, has a melting point of about 150° F., and after a coating of this wax has been applied a coating of asphaltic material having a lower melting point than the wax is applied to the same face of the web of kraft paper over the wax coating, at a temperature of about 150° to 200° F. This causes the previously applied wax to melt and drives it into the pores of the paper of the web, where it sets, forming a seal against

further penetration of the asphaltic material through the kraft paper to the other face thereof.

The method can be better understood by reference to the drawings, in which the method is illustrated diagrammatically in Figs. 1 to 5, inclusive. Referring to Fig. 1, the sheet material, such as the kraft paper, is supplied from three different rolls 31, 32 and 33 in continuous webs, which are indicated in Fig. 1 by the numerals 34, 35 and 36. The web 34 is shown as passing around a guide roller 37 and in contact with a waxing roller 38, which waxing roller in turn contacts a drum or roller 39 projecting into a melted wax tank 40, which is heated in any suitable manner, as by means of a burner 41, said web of such material as kraft paper then passing over suitable guiding means, such as a roller 42, to an asphalt applying roller 43, which extends into a tank of melted asphaltic material 44, which is heated to the desired temperature by any suitable means, such as the burner 45. The web 34 then passes over a striping roller 46, which places a plurality of stripes of asphaltic material thereon, said roller extending into a body of asphaltic material in the tank 47, which is heated to the desired temperature by a burner 48.

The melting point of the wax in the tank 40 is, preferably, about 150° F., while that of the asphaltic material in the tank 44 is, preferably, about 120° F., and that of the asphaltic material in the tank 47 about 160° F. After the web of kraft paper 34 has been passed over the striping roller 46 the same passes around suitable guide rollers 49 and 50 to carry the same past a cooling nozzle 51 supplying a spray 52 of cold water and air to the side of the web, or strip, of covering material, such as kraft paper, that has been previously coated with wax and then with the asphaltic material of lower melting point than the wax, and with the stripes of the asphaltic material of higher melting point than the wax.

The web of kraft paper 35 extending from the roller 32 passes around suitable guiding means, such as the guide roller 53, between a roller 54 and a roller 38', which contacts a drum 39' extending into the wax in the tank 40', which is heated by a burner 41' to thus apply a coat of wax to one side of the web, or sheet, 35, after which the web, or sheet, 35 passes over an asphaltic material applying roller 43', similar to the roller 43, extending into the asphaltic material tank 44' and heated by any suitable means, such as the burner 45', the wax applied by the roller 38' being of the same character as that applied to the web, or sheet, of kraft paper 34 by means of the roller 38, and the asphaltic material applied to the web 35 by the roller 43' being the same as that applied to the web 34 by the roller 43. Thus when the web 35 has passed the roller 43' it will have a wax coating applied thereto under an asphaltic coating, which asphaltic coating has a lower melting point than the wax coating. A striping roller 46', similar to the roller 46, and operating in a tank of asphaltic material 47', similar to the tank of asphaltic material 47, and heated by a burner 48', is provided to apply the stripes of asphaltic material having a higher melting point than that applied by the roller 43' to the web, or sheet, 35. After passing over the roller 46' the web, or sheet, 35 passes over a guide roller 55 and under a guide roller 56 to carry the same past a nozzle 51' that supplies a cooling spray 52 of water and air to the

side of the web 35 that has been previously coated with the wax, the lower melting point asphaltic material and the stripes of higher melting point asphaltic material. The cooling nozzles 51 and 51' cool the asphaltic material on the surface of the webs to the point where the same is still tacky, but no longer in a molten condition, the lower melting point asphaltic material being substantially a water proofing material, while the higher melting point asphaltic material is substantially a cementing material, and this cementing material applied in stripes as above referred to will serve to secure the plies together as the steps of the method proceed.

The web 36 of fibrous sheet material, such as kraft paper, is guided by means of suitable rollers 57 between a pair of corrugating rolls 58, becoming a crimped, or corrugated, ply 36' after passing through said rolls. A pair of hoppers 59 and 60 are provided for the loose cottony fibrous insulating material that is used in my improved insulating blanket, any suitable means being provided for maintaining the wooly, or cottony, fibrous material in a loose fluffy condition in said hoppers. Drums 61 and 62 are provided, which are located below the hoppers 59 and 60, respectively, in such a position that the openings 63 and 64 in the lower portions of said hoppers are located directly over the curved surfaces of the drums and near the upper portions of said drums. The drum 61 rotates in a counter-clockwise direction as viewed in Fig. 1, and the drum 62 in a clockwise direction.

The surfaces of both drums are provided with forms, or pockets, 65, which alternate with shallow recesses 66 formed between said forms 65 on the surfaces of said drums. Said forms are merely rectangular pan-like members of suitable curved outline along the end walls thereof, to conform to the curvature of the side walls of the hoppers 59 and 60 at the openings 63 and 64, so as to provide a sufficiently close fit that the fluffy loose fibrous material 67 contained in the hoppers 59 and 60 will be deposited on the surfaces of the drums 61 and 62 and will not escape between the hopper walls and the drums. The forms are of suitable shape to form parcels, or bodies, of the fluffy fibrous insulating material of suitable length and width to occupy the pockets to be formed between the intermediate and outer plies. In order to properly fill these pockets, the forms are made of somewhat greater depth than the pockets that are to be filled. The material will thus be under compression to a sufficient extent that the pockets will be completely filled without there being any air pockets, or voids, therein, as will be explained below. The corrugated ply 36' passes around a portion of the drum 61, substantially a quadrant of the surface of the drum being passed around by the corrugated ply 36', as will be obvious from Fig. 1.

As the spaces 66 between the forms 65 will be filled with the insulating material 67 as the drum surfaces leave the discharge openings under the hoppers 59 and 60, as above described, it is necessary to remove the material 67 that is in the recesses, or spaces, 66 and this is, preferably, done by blowing the material transversely out of these spaces. As the forms, or pockets, 65 have end walls and the spaces 66 do not have any end walls, an air discharge nozzle 68 is provided at one side of each of the drums 61 and 62 adjacent the hoppers, at a point immediately after the surface of the drum leaves the hoppers, to discharge a blast of air endwise into the spaces

66 across the surface of the drum, blowing the material 67 out of the spaces 66, any suitable means for supplying the blast of air to the nozzle 68 being provided, such as the conduit 69 extending from the blower 70. The fluffy fibrous insulating material discharged from these spaces is, of course, collected and returned to the hoppers.

It will be obvious that the corrugated ply 36' passes over the open tops of the forms 65 and these discharge their contents onto the corrugated ply as these travel to an inverted position toward the bottom of the drum, when said corrugated ply will be extending substantially horizontally. The corrugated ply 36' leaves the drum 61 and passes around substantially half of the drum 62 in an opposite direction to that in which it passes around the drum 61. The drums 61 and 62, it will be noted, are so related to each other that the form portions 65 thereof are out of alignment with each other where the same approach each other, intermeshing in a similar manner to gear teeth, that is, the form 65 of the drum align with the spaces 66 of the other drum at the points of closest approach to each other of the drums, the drums being substantially the thickness of the blanket interengaged with each other. After the corrugated ply passes from the one drum to the other, the bodies 14 of the insulating material 67 are located on one side thereof, which is the top side of the corrugated ply at this time. The web 34, which forms the outer ply 11 of the finished blanket passes around a guide roller 71 and then around the drum 62 outside the corrugated ply 36' so that the bodies, or parcels, 14 of the insulating material are mounted between the web 34 that forms the covering ply, and the corrugated ply 36', with the corrugated ply 36' overlying the open tops of the forms 65 on the drum 62. As the two plies move forward at the same rate as the surface of the drum 62, the corrugated ply 36' and the web 34 of the covering material pass around the surface of the drum with the bodies 14 located in spaced relation between these, the corrugated ply 36' being gradually inverted as it passes around said drum. The contents of the pockets 65 of the drum 62 are deposited on top of the corrugated ply 36' as the same leaves the drum at the bottom thereof during the rotation of the drum 62, the bodies, or parcels, 15 being staggered relative to the bodies, or parcels, 14, as will be evident from Fig. 1, and slightly overlapping the same due to the natural tendency of the material to spread as it leaves the pockets. As the web made up of the corrugated and plain web portions and the bodies of fluffy fibrous insulating material passes over the guide roller 56, the web, or ply, 35 is added thereto at the top thereof.

The stripping rollers 46 and 46' apply, preferably, four stripes of the asphaltic material of higher melting point to the side of the web 34 that is uppermost after the drum 62 has been passed and the side of the web 35 that is lowermost after the guide roll 55 has been passed. This is diagrammatically illustrated in Fig. 2, in which the ply, or web, 34 is shown with such stripes 19 applied thereto. Thus these stripes of asphaltic material will be on the sides of the covering plies that are next to the corrugated ply and 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 fourteen and

one-half inches long, being about an inch wide, and two of the stripes being placed adjacent the side edges of the webs 34 and 35 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 cooling nozzles cool the stripes of asphaltic material on the surfaces of the webs 34 and 35 to the point where the same are tacky, but no longer in a molten condition. As a result, if very slight pressure is applied to the assembled webs 34, 35 and 36', with the parcels of insulating material 14 and 15 between the same to contact the corrugated web, or ply, with the outer webs, or plies, these will be united and be fixed relative to each other due to the provision of the stripes of high melting point asphaltic material. Also the parcels 14 and 15 will be somewhat distorted out of the shape that these had due to being deposited from the forms, or pockets, 65 and the corrugated ply will assume the undulating form substantially that shown in Fig. 7, and to the left of the guide roll 56 in Fig. 1, the web portion 35 now becoming the outer ply 12, the web portion 34 now becoming the outer ply 11, and the corrugated web portion 36' becoming the intermediate ply 13, with the parcels 14 and 15 spread so as to overlap each other and completely fill the pockets formed between the plies 11 and 13, and 12 and 13. The corrugated web portion 36' is given an undulating form, as shown in Fig. 1, as it passes between the intermeshing drums 61 and 62, which makes the same follow a longer path than it did before passing therebetween, the corrugations permitting such stretching of the web portion 36' as is necessary to accomplish this by flattening out, the curvature of the corrugations in the finished sheet being somewhat exaggerated in the drawings, as the same are usually flattened out more than shown. A certain amount of tension is created due to the pressure exerted by the contents of the pockets, in the finished blanket, which holds the pockets in proper relative position in the blanket in their overlapped interfitting relation.

A roll 72 may be provided, cooperating with the roll 56 to apply the necessary pressure to the plies to secure the same together in the manner above referred to. These rolls are spaced far enough apart, of course, that the parcels of insulating material will not be compressed to any substantial extent, but only sufficiently to spread the same into all the remote portions of the pocket that is formed.

Upon reference to Fig. 3 it will be seen that the ply 11 is narrower than the corrugated ply 13, and that the ply 12 is still wider than the corrugated ply 13. The portion 74 of the ply 12 that extends beyond the lateral edge of the ply 13 is not coated by the asphaltic material of high melting point, and, of course, the stripes near the edges of the ply 11 are on the side thereof facing the ply 13. Accordingly, when the web made up of the various plies above referred to passes between the sealing rollers 75, the engaging portions of the plies 11, 12 and 13 adjacent their edges are compressed together to be firmly secured to each other by the pressure exerted on the tacky asphaltic material put on by the striping rollers near the edges of the plies 11 and 12. A flat three ply edge portion of the blanket is thus formed, which is to be folded on itself and sealed in folded position, as shown in Fig. 4.

To accomplish this, a striping roller 76 is provided, which extends into the tank 77 having

therein asphaltic material of high melting point, similar to that contained in the tanks 47 and 47', the composite web passing over the striping roller 76 and said roller applying the stripes of the higher melting point asphaltic material to the under side of the ply 12 near, but spaced from the longitudinal side edges thereof and may apply said asphaltic material to the adjacent marginal portions of the ply 12 if desired, the composite web passing through the machine and engaging folding mechanism 78, which turns the striped portion of the ply 12 at each side edge downwardly and back on itself to form the fold, or ply, 20, pressure rollers 79 being provided for similarly pressing the various plies together in the folded position shown in Fig. 4. A folding mechanism 80 for flanging upwardly the flanges 27, which are made up of the various plies folded over each other in the manner described, is then engaged by the web. The insulating blanket is now complete and may pass from the mechanism in any desired manner to be rolled up or otherwise arranged for shipping purposes.

It will be noted that the method of making the insulating blanket thus comprises placing parcels, or formed bodies, of loose fluffy insulating material on a corrugated intermediate ply on opposite sides thereof in staggered relation to each other, enclosing these parcels between a lower covering or outer ply, or web of fibrous material, such as kraft paper, and said corrugated ply, said outer ply having previously been first coated with a wax having a higher melting point and with an asphaltic moisture proofing and sealing material that is next applied thereto, and being lastly coated with stripes of an asphaltic material having a higher melting point than the wax before said web portion is brought into cooperative relation to the corrugated ply and the parcels of loose fluffy insulating material, and that subsequently another web, similarly coated with wax and the two asphaltic materials, is applied to the exposed side of the corrugated ply having spaced parcels of the loose fluffy insulating material thereon. The method constitutes further the steps of applying the loose fluffy insulating material first to the corrugated ply in a loose fluffy condition, the deposit thereof being made by gravity without any appreciable pressure being applied to the material, and the material being left in such loose fluffy condition until all of the plies before mentioned have been placed into proper relative position to each other, whereupon pressure is applied to the whole, sufficient to force the fluffy fibrous material into all portions of the pockets formed between the corrugated ply and the covering plies, at the same time securing the covering plies and corrugated ply in relatively fixed position to each other at spaced points, and extending the corrugated ply so that the same will assume a circuitous path, comprising portions extending substantially parallel to and engaging the outer plies, and portions extending obliquely between these portions that extend parallel to the outer plies, as will be evident from Fig. 7, the pressure applied being such as not to unduly compact the insulating material, so that it will retain nearly all of its original fluffiness, but be under slight compression.

It will be noted that the method further comprises securing together and sealing the overlapping edges of the plies above referred to and folding the same to fold one of the outer plies around the outer edges of the other plies to provide a thick edge, which is completely sealed, and then folding these plies so secured together relative to the body portion of the blanket to form flanges thereon, adhesive asphaltic material being applied to the blanket after the edges thereof have been sealed together and prior to the first folding step, whereby the one ply is folded around the other two plies of the edges thereof, and secured thereto.

The purpose of the stripes 10 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, at a higher temperature than would be possible with the water proofing asphaltic material 26 applied by the rollers 38 and 38'. Even though the asphaltic coatings are cooled with water, by the cooling spray at 52 and 52', no more water can be applied than will evaporate from the sheet before it is incorporated in the blanket, and as a result a final temperature of from 100° F. to 130° 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 10 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° 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 10. 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, helps 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.

The corrugating rolls 58 measure the amount of paper or fibrous material that is fed to form the intermediate ply. As the corrugated ply passes over the lower drum 62 at the same lineal speed as the circumference of the drum is rotating, and as the lower sheet also travels at such same lineal speed, there is considerable excess length in the intermediate ply, or sheet, 36', as the same leaves the drum 62. The crimping, or corrugating, rolls are rotated at a definite ratio to the rotation of the drums 61 and 62, so that the exact amount of excess is determined. The excess is, preferably, just slightly more than sufficient to take care of the change in length of the

web 36' as the pockets are formed for the loose fibrous material at the point of engagement with the rollers 56 and 72, and thus in the finished blanket the corrugations are almost stretched out and only a slight crimping is noticeable. The rim portions of the forms 65 on the drums 61 and 62 act to pull the corrugated ply through between these drums without flattening out the corrugations, as this is done without putting any appreciable tension on the corrugated sheet. The rollers 56 and 72 also act to pull the blanket off the drum 62, said rollers 56 and 72 being so made as to be of less diameter in the portions thereof where the loose fibrous filling material is than at the ends where the same engage the marginal portions of the outer webs 34 and 35, so that said rollers only very slightly compress the fluffy fibrous material to force it completely into all portions of the pockets, but exerting a greater pressure on the marginal portions to secure these firmly together. These rollers remove the blanket from the drum 62 as rapidly as it is deposited at the bottom thereof, so as to keep tension on the outside covering sheets, but none on the corrugated middle sheet, or ply.

While the middle sheet, or ply, 36' 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. In the method of making an insulating blanket, forming loose bodies of fluffy fibrous insulating material, depositing the same in spaced relation on a continuous web of flexible sheet material in slack condition, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said web in slack condition over said bodies, forming other loose bodies of fluffy fibrous insulating material, and depositing the same on said slack continuous web of sheet material in staggered relation to said first mentioned bodies.

2. In the method of making an insulating blanket, forming loose bodies of fluffy fibrous insulating material, depositing the same in spaced relation on a continuous web of corrugated sheet material, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said corrugated web over said bodies, forming other loose bodies of fluffy fibrous insulating material, depositing said last mentioned bodies on said corrugated web in staggered relation to said first mentioned bodies, and placing a continuous web of sheet material in position over said corrugated web.

3. The method of making an insulating blanket comprising forming elongated loose bodies of fluffy fibrous insulating material, depositing the same transversely on a continuous web of corrugated sheet material in equidistantly spaced relation longitudinally of said web, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said web in slack condition over said bodies, forming other elongated loose bodies of fluffy fibrous insulating material, depositing said last mentioned bodies transversely on said corrugated web in spaced staggered relation to said first mentioned bodies, placing a continuous web of sheet material over said corrugated web, and securing said webs together at their points of engagement.

4. In the method of making an insulating blanket, placing loose pre-formed bodies of fluffy compressible insulating material between each of two cover plies and an extensible intermediate ply of sheet material in overlapping staggered relation to each other, to form walls of pockets for said bodies between said plies, and securing said cover plies to said intermediate ply and simultaneously applying pressure to said blanket sufficient to extend said intermediate ply and form said ply around said bodies to form said pockets and force said insulating material into all portions of said pockets without compacting the same.

5. In the method of making an insulating blanket, placing loose pre-formed bodies of fluffy compressible insulating material between each of two flat cover plies and a corrugated intermediate ply of sheet material in overlapping staggered relation to each other, to form walls of alternating pockets for said bodies between said plies, and securing said cover plies to said intermediate ply and simultaneously applying pressure to said blanket sufficient to extend the corrugations of said intermediate ply and form said ply around said bodies to form said pockets and force said insulating material into all portions of said pockets without compacting the same.

6. The method of making an insulating blanket comprising forming loose bodies of fluffy fibrous insulating material, depositing the same in spaced relation on a continuous web of extensible sheet material, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said extensible web over said bodies, forming other loose bodies of fluffy fibrous insulating material, depositing the same on said extensible web in spaced relation over the spaces between said first mentioned bodies, placing a continuous web of sheet material in position over said extensible web, and securing the engaging portions of said webs together.

7. The method of making an insulating blanket comprising forming elongated loose bodies of fluffy fibrous insulating material, depositing the same transversely on a continuous web of corrugated sheet material in equidistantly spaced relation, the spaces between said bodies being less than the widths thereof, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said corrugated web over said bodies, forming other elongated loose bodies of fluffy fibrous insulating material of substantially the same width as said first mentioned bodies, depositing said last mentioned bodies transversely on said corrugated web in spaced staggered relation to said first mentioned bodies, the spaces between said last mentioned bodies being less than the widths thereof, the bodies on opposite sides of said corrugated web overlapping each other lengthwise of said web, placing a continuous web of sheet material in position over said corrugated web, and securing said webs together at their points of engagement.

8. The method of making an insulating blanket comprising forming elongated loose bodies of fluffy fibrous insulating material, depositing the same transversely on a continuous web of corru-

gated sheet material in equidistantly spaced relation, the spaces between said bodies being less than the widths thereof, placing a continuous web of sheet material in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said corrugated web over said bodies, forming other elongated loose bodies of fluffy fibrous insulating material of substantially the same width as said first mentioned bodies, depositing said last mentioned bodies transversely on said corrugated web in spaced staggered relation to said first mentioned bodies, the spaces between said last mentioned bodies being less than the widths thereof, the bodies on opposite sides of said corrugated web overlapping each other lengthwise of said web, said bodies being shorter than the width of said webs and having both ends thereof spaced from the margins of said webs, placing a continuous web of sheet material wider than the length of said bodies in position over said corrugated web, and securing said webs together at their points of engagement.

9. In the method of making an insulating blanket, forming loose bodies of fluffy fibrous insulating material, depositing the same by gravity on a continuous web of corrugated sheet material, placing a continuous web of sheet material wider than the length of said bodies in position over said web having said bodies thereon, inverting said webs with said bodies therebetween to place said corrugated web over said bodies, forming other loose bodies of fluffy fibrous insulating material, depositing said last mentioned bodies on said corrugated web by gravity in staggered relation to said first mentioned bodies, placing a continuous web of sheet material wider than the length of said bodies in position over said corrugated web, and securing said webs together at their points of engagement.

10. In the method of making an insulating blanket, preforming loose bodies of fluffy insulating material, coating continuous webs of sheet material with adhesive water proofing material, applying a plurality of longitudinal stripes of adhesive material of higher melting point than said coating to said webs, inserting a web of corrugated sheet material with bodies of said insulating material on opposite sides thereof between two webs of said sheet material, and pressing adjacent faces of said webs into engagement with each other to cause said stripes to hold webs and bodies in predetermined relationship to each other.

11. In the method of making an insulating blanket, pre-forming loose bodies of fluffy insulating material, coating continuous webs of sheet material with adhesive water proofing material in molten condition, applying a plurality of longitudinal stripes of adhesive material of higher melting point than said coating to said webs in molten condition, inserting a web of corrugated sheet material with bodies of said insulating material on opposite sides thereof between two webs of said sheet material, and pressing adjacent faces of said webs into engagement with each other to cause said stripes to hold said webs and bodies in predetermined relationship to each other.

12. In the method of making an insulating blanket, pre-forming loose bodies of fluffy insulating material, coating continuous webs of sheet material with adhesive water proofing material in molten condition, applying a plurality of longitudinal stripes of adhesive material of higher melting point than said coating to said webs in molten condition, cooling said webs sufficiently to leave said stripes in a tacky condition, inserting a web of corrugated sheet material with bodies of said insulating material on opposite sides thereof between two webs of said sheet material, and pressing adjacent faces of said webs into engagement with each other to cause said stripes to hold said webs and bodies in predetermined relationship to each other.

13. In the method of making an insulating blanket, applying a coating of a wax to one face of a web of fibrous sheet material, applying a coating of asphaltic material having a lower melting point than said wax to said web over said wax coating, applying stripes of an asphaltic material having a higher melting point than said asphaltic coating to said web longitudinally thereof at a temperature above the melting point of said asphaltic coating and immediately spraying a cooling fluid on said web to reduce the temperature of said stripes sufficiently to change the same to a tacky state and set said wax coating.

14. In the method of making an insulating blanket, pre-forming loose bodies of fluffy insulating material, coating continuous webs of sheet material with adhesive water proofing material on one face thereof, applying a plurality of longitudinal stripes of adhesive material of higher melting point than said coating to said webs on the same face thereof, placing bodies of said insulating material in spaced relation in engagement with one face of a web of extensible sheet material, bringing a web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing the face of said web engaged by said bodies of insulating material to confine said bodies of insulating material between said webs, placing other bodies of said insulating material in spaced relation in engagement with the other face of said extensible web, bringing a second web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing said other face of said extensible web, and engaging said webs at the portions thereof exposed to each other to secure said webs together by means of said stripes.

15. In the method of making an insulating blanket, pre-forming loose fluffy bodies of insulating material, applying adhesive coating material to continuous webs of sheet material on one face thereof, placing bodies of said insulating material in spaced relation in engagement with one face of a web of extensible sheet material, bringing a web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing the face of said web engaged by said bodies of insulating material to confine said bodies of insulating material between said webs, placing other bodies of said insulating material in spaced relation in engagement with the other face of said extensible web, bringing a second web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing said other face of said extensible web, and engaging said webs at the portions thereof exposed to each other to secure said webs together.

16. In the method of making an insulating blanket, pre-forming loose fluffy bodies of insulating material, applying adhesive coating material to continuous webs of sheet material on one face thereof, placing bodies of said insulating material in spaced relation in engagement with

one face of a web of extensible sheet material, bringing a web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing the face of said web engaged by said bodies of insulating material to confine said bodies of insulating material between said webs, placing other bodies of said insulating material in spaced relation in engagement with the other face of said extensible web in staggered relation to said first mentioned bodies, bringing a second web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing said other face of said extensible web, and compressing said composite body of webs and bodies of insulating material sufficiently to extend said extensible web to form pockets in cooperation with said coated webs and engage the exposed adjacent portions of said webs with each other to cause the same to adhere to each other and force said insulating material into all portions of said pockets without destroying the fluffiness of said bodies of insulating material.

17. In the method of making an insulating blanket, pre-forming loose bodies of fluffy insulating material, coating continuous webs of sheet material with adhesive water proofing material on one face thereof, applying a plurality of longitudinal stripes of adhesive material of higher melting point than said coating to said webs on the same face thereof, placing bodies of said insulating material in spaced relation in engagement with one face of a web of extensible sheet material, bringing a web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing the face of said web engaged by said bodies of insulating material to confine said bodies of insulating material between said webs, placing other bodies of said insulating material in spaced relation in engagement with the other face of said extensible web in staggered relation to said first mentioned bodies, bringing a second web of said coated sheet material into position in proximity to said extensible web with the coated face thereof facing said other face of said extensible web, and compressing said composite body of webs and bodies of insulating material sufficiently to extend said extensible web to form pockets in cooperation with said coated webs and engage the exposed adjacent portions of said webs with each other to cause the stripes to secure said extensible web to said other webs and force said insulating material into all portions of said pockets without destroying the fluffiness of said bodies of insulating material.

WILLIAM B. BYERS.