Feb. 6, 1940. R. F. HLAVATY 2,189,067

METHOD OF MAKING A SEWN AND CEMENTED ARTICLE

Filed July 10, 1937

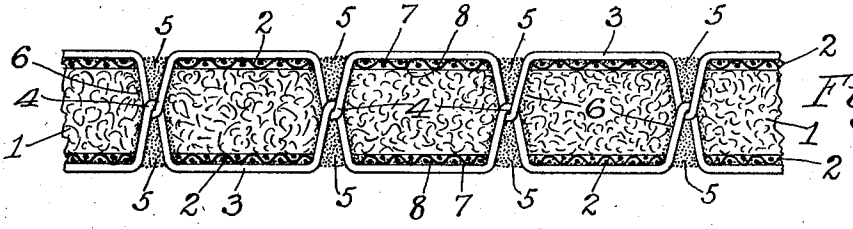


Fig. 1.

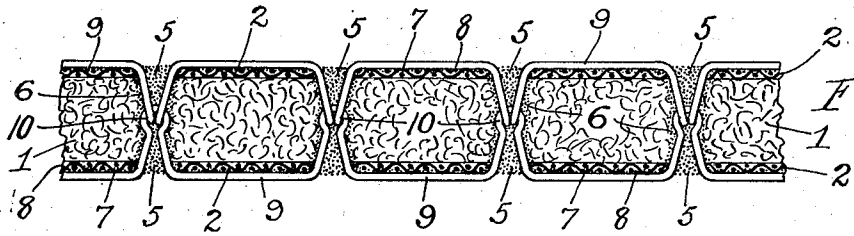


Fig. 2.

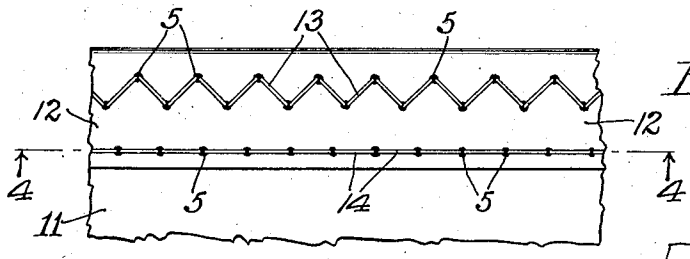


Fig. 3.

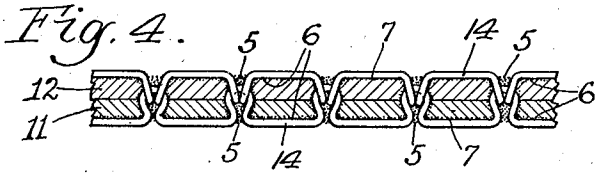


Fig. 4.

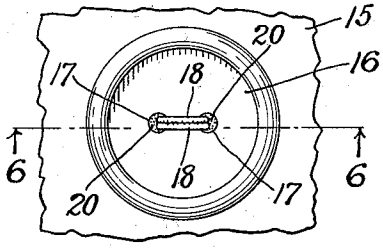


Fig. 5.

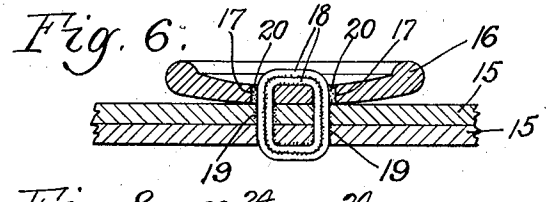


Fig. 6.

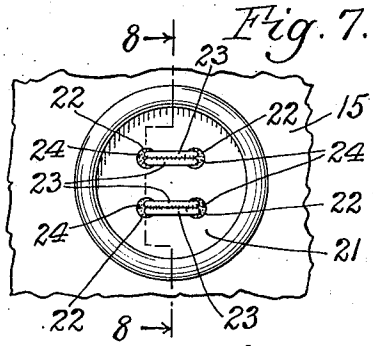


Fig. 7.

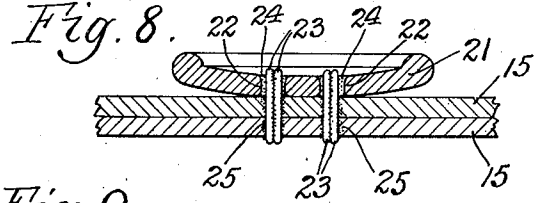


Fig. 8.

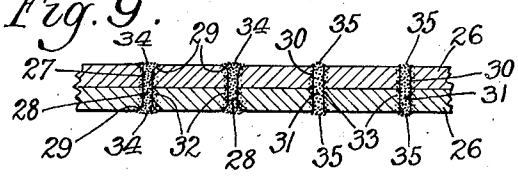


Fig. 9.

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METHOD OF MAKING A SEWN AND CEMENTED ARTICLE

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Application July 10, 1937, Serial No. 152,911

2 Claims. (Cl. 112—262)

This invention relates to an article and to a process of making it.

It has for one object to provide an article in which separate pieces of material are sewn and cemented together. Another object is to provide a process for securing together by sewing a plurality of pieces of material and for cementing the material together and for simultaneously cementing the sewing to the material and for cementing the stitches and contacting threads to each other and to the material.

In one form the invention comprises an article and a process of making it in which a plurality of pieces of material are sewn together and simultaneously with the sewing are cemented. In another form the invention has for an object the provision of a process by means of which non-fabric articles, such as buttons and their equivalents are sewn and simultaneously cemented to fabric articles such as cloth and its equivalents.

It is, therefore, within the objects of the present invention to produce the articles suggested and to carry out the methods described.

Other objects will appear from time to time in the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawing, wherein—

Figure 1 is a section through a completed article formed by stitching together a plurality of sheets of material;

Figure 2 is a similar section showing a modified form of stitch;

Figure 3 is a plan view of a sewn article indicating two types of stitching;

Figure 4 is a longitudinal sectional detail taken at line 4—4 of Figure 3 on an enlarged scale;

Figure 5 is a plan view of one form of button sewn in place;

Figure 6 is a transverse section taken at line 6—6 of Figure 5, showing the button and material to which it is stitched;

Figure 7 is a plan view showing another form of button;

Figure 8 is a transverse section taken at line 8—8 of Figure 7, showing the stitching of Figure 7; and

Figure 9 is a section generally similar to Figures 1, 2 and 4, showing a modified form of construction in which the cement itself forms the attaching means.

Like parts are indicated by like numerals throughout the specification and drawing.

As shown in Figures 1 and 2, the device might be considered as a quilt. It is formed in general of relatively loosely compacted material 1 to one or both faces of which may be applied a sheet of material 2, 2. In another application of the invention this may be cloth, paper or their equivalents, while the material 1 might be wool, hair, cotton batting, kapok or their equivalents.

In the form of Figure 1, the parts are sewn together by threads 3, 3, which interlock as at 4. It will be understood that when the needle is forced through the fabric holes are formed and into these holes the thread is pulled. The scale and proportions of Figures 1 and 2 have been exaggerated to illustrate this effect.

During the process of stitching or sewing, cement, preferably water proof and of any desired nature, is applied to the thread. It may be applied by the machine at any stage during the passage of the thread through the machine or it might be applied before the thread reaches the machine or after it leaves the machine, so long as the cement remains plastic until the time when the thread is sewn or stitched into the fabric. After the thread has been stitched into the fabric to form, for example, the articles of Figures 1 and 2, the cement hardens. Hardened cement is shown as at 5, 5 filling the unoccupied parts of the perforations or depressions formed by the stitching operation. This cement not only fills these depressions or perforations but also coats, and it may be in cases impregnates, the thread itself, thus cementing the threads to each other where they cross or contact each other, and thus cementing together the parts or knots of thread if any are made during the stitching. To some degree the cement permeates the material 1 as indicated in Figures 1 and 2 by the numeral 6. The cement also causes the threads to adhere to the material 2 where the thread contacts the material, for example, through the area or distance 7. To some degree also the cement may permeate the fabric 2 as at 8. In general the result of the method by means of which the article shown in Figures 1 and 2 is produced, is that the threads are cemented to the fabric wherever they contact it, the threads are cemented to each other wherever they contact each other and the perforations or depressions formed by the stitching operation are filled with the cement and thus the several component parts of the final article are cemented together. The structure or article is increased in strength and the threads and the

adjacent portions of the article are made water proof, where water proof cement is used.

Any kind of cement desired may be used and the invention is not limited either as to the article or the process disclosed to the use of any particular cement and the word "cement" is to be understood broadly as meaning an adhesive, whether or not it is water proof. For general purposes it is preferable that a water proof cement is used. For certain classes of article which are to be washed or subjected to moisture, water proof cement will always be used. Where, however, the article is not to be subjected to moisture, other forms of cement may be used. One important form of device made by the method of this invention is that in which the article is to be used as heat insulation, for example, in refrigerators or otherwise, and for that use asphalt cement is particularly adaptable though other cements may be used. Where it is to be subjected to heat, a cement which vulcanizes or undergoes other definite chemical and physical changes as the result of the application of heat may be used, and my invention contemplates the use of any and all types of cement or adhesives and not merely those enumerated above.

The form of the invention shown in Figure 2 is generally the same as that of Figure 1 except that instead of the lock stitch shown in Figure 1 a chain stitch is shown in which a thread 9 is used, the threads crossing and contacting each other as at 10.

Figure 3 illustrates an article in which the main body is indicated as at 11 and a binding 12 has been applied. Two arrangements of stitching have been used. Thus an angular arrangement of stitches is accomplished by the thread or threads 13, the perforations or depressions being sealed by portions of cement 5 as in the case of Figs. 1 and 2, and the thread 13 is cemented to the surface of the binding 12 as described in connection with Figs. 1 and 2 and illustrated in particular at 7 in those figures. In addition a straight line stitching 14 is shown in Fig. 3 serving to secure the border or binding additionally to the body 11. Here again cementing occurs as at 5 in the depressions or perforations and at other points where the thread contacts the surface or other parts of the article.

As illustrated in Figure 4, the stitching of the thread 14 is cemented generally in the same manner illustrated in detail and on a larger scale in Figures 1 and 2.

Many articles such as buttons and their equivalents may be sewn in place to fabric or other articles to which it is desired to attach such fastenings. Thus in Figure 5 a section of cloth 15 is shown which, as shown in Figure 6, may be double, comprising two thicknesses of cloth 15. A button 16 having two perforations 17 is sewn to the cloth by one or more threads 18. These threads are cemented together and to some degree the cement will ordinarily permeate the fabric 15 as shown at 19, thus cementing the threads to the fabric and if double thicknesses of fabric are used, cementing them to each other adjacent the perforations through which the threads pass. A certain quantity of the cement may also collect in the perforations 17 of the button as at 20. When this occurs the button is additionally cemented to the threads and to some degree is cemented directly to the cloth by cement which is carried through the perforations by the thread or otherwise. The composite article thus includes a button, a support to which it is stitched, and threads which engage both the button and the support and these parts are cemented to each other wholly or in part. In the main, of course, it is the threads which serve to hold the button to the support but a certain amount of direct cementing of the button to the support may take place. The threads, if more than one is used, are cemented to each other and this gives the effect of a double or plural thread where more than one is used, and the cementing of adjacent strands of thread occurs.

As shown in Figures 7 and 8, the support 15 appears again and a button 21 having four holes 22 is stitched to the support by threads 23. Cement 24 fills wholly or partially the perforations in the buttons. As in the case of the form of Figures 5 and 6, cement carried by the threads 23 may permeate the member or members 15 as shown at 25, to cement the threads to the support members 15 and where more than one of these is used, to cement them to each other.

The sewing has been illustrated in chain stitch and lock stitch and two different types of button sewing may be used. It is to be understood that the invention is not limited in any way to any particular type of stitching either for fastening sheet members together or for fastening buttons or their equivalents to supporting parts. In general the method may be applied to any sewing or tacking operation, whether mechanical or by hand, and the articles may be made by machine or by hand but in each case the material with which the stitches are made has applied to it a cement which remains sufficiently soft until after the stitching material is in place so that it is carried in and thereafter hardens sufficiently to cement the stitching material to the article which is stitched and to cement threads or the like to each other and to the material through which they pass or with which they have any contact, wherever that contact occurs.

Where in the claims and specification I have used the word "thread" I mean any thread or thread-like fastening member or its equivalent, which may be used in sewing or tacking. It might be a single strand or a cord of any material, wire, gut, or any other material of similar or analogous usefulness.

In the modified form of Figure 9, two or more sheets of material 26 are secured together, but in this form stitching, thread or sewing is not used. Holes are punched in the material in any desired manner and they are secured together by what is now sometimes referred to in the trade as "tacking". While it is ordinarily convenient to form the holes in the several sheets which are to be attached together at the same time, each sheet might be treated separately and the holes formed and then perforated sheets associated together with the holes in register or sheets of material which is perforated in itself might be associated together with the holes in register and the cementing operation which is described below carried out. The holes are indicated at 27 and they may be formed in any way, but one convenient way is to form them by a needle or punch operating in a punching, sewing or tacking machine but without thread. The holes might, of course, be formed by hand or otherwise. It is preferable as the holes are formed to fill them with cement. If a punching, sewing or tacking machine is used with a punching, sewing or tacking needle but without thread, the cement is preferably applied to the needle during operation so that the needle

is constantly or periodically supplied with the cement and as the perforation is made or immediately thereafter, the cement is carried directly or flows into the perforation. Such cement is indicated at 28 in the two left hand perforations of Figure 9. As shown in those perforations the corners of the perforations are rounded as at 29. This may or may not occur, depending on the shape of the punching, sewing or tacking needle and upon other factors. The invention is not limited to a rounded perforation and the two right hand perforations 30 of Figure 9 are shown without such rounded or tapered ends. They are shown with cement 31 filling them. The cement ordinarily permeates the material around the perforation to some degree. This is indicated at 32 and 33 in the perforations 27 and 30, respectively. When the cement dries it forms in effect a cement rivet, filling the perforations and in some cases penetrating into the material or between the sheets of material or between the fibers of the material and this cement or rubber rivet or its equivalent holds the sheets together without thread. It will ordinarily permeate the material and forms not merely a rivet but a joining means which engages the walls of the opening through the material. Ordinarily there will be a certain amount of overflow or spreading of the cement plug or rivet as indicated at 34 and 35 which fills the perforations 27 and 30, respectively.

The device of Figure 9 is useful in many places and while it may have less structural strength than that present in the devices in which threading or stitching material is used, for many purposes its structural strength is adequate and the method of producing it is in a sense broadly the same as the method of producing the other forms of the device, namely, the association together of sheets of material, forming perforations in them and filling those perforations with cement, glue or their equivalent, preferably at the time that the perforation is made and preferably by means of the member which forms the perforation, although the cement might be otherwise introduced and at another time.

While only two sheets of material are shown as being fastened together in Figure 9, almost any number might be fastened together and this is true also of the earlier shown forms of the device. The invention is not limited to the securing together of any particular number of parts or sheets of material.

In all of the forms of the invention it is to be understood that almost any fabric may be secured together. Woven cloth, felt, wadding, loose fiber or anything else which it is useful to secure together, may be secured by any of the means disclosed herewith.

While the form of Figure 9 has been described as having in effect a cement or rubber rivet, it is clear that the cement 5 which fills the perforations in the earlier described forms of the invention also acts as a cement or rubber rivet or its equivalent and differs from the form of Figure 9 mainly by the fact that in addition to the rubber rivet some form of thread or stitching is used.

I claim:

1. The method of joining a plurality of sheets of fibrous textile material which includes positioning a plurality of such sheets together for attachment by sewing, applying an unsolidified liquid cement to a fibrous thread, drawing the cemented thread through the sheets prior to the solidification of the applied liquid cement, and thereby drawing said cement with the thread through the apertures formed in the course of the sewing operation and impregnating not only the thread but the adjacent portions of the sheets with said cement, all prior to the solidification of the cement.

2. The method of making a sewn and cemented article which includes placing a plurality of fibrous textile material at opposite sides of a loose fibrous filler, applying an unsolidified liquid cement to a fibrous thread, drawing the cemented thread through the sheets and filler prior to the solidification of the applied liquid cement, and thereby drawing said cement with the thread through the apertures formed in the course of the sewing operation and impregnating not only the thread but the adjacent portions of the sheets and filler with said cement, all prior to the solidification of the cement.

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