July 18, 1944. E. J. KING 2,353,960

SEWED CONNECTION

Filed March 24, 1942

Fig. 1

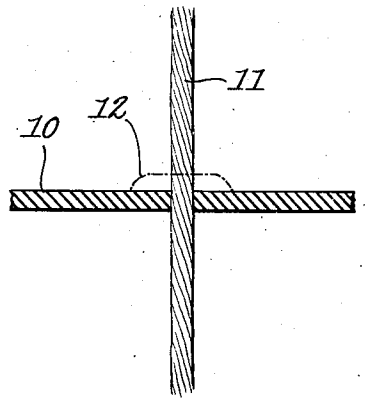
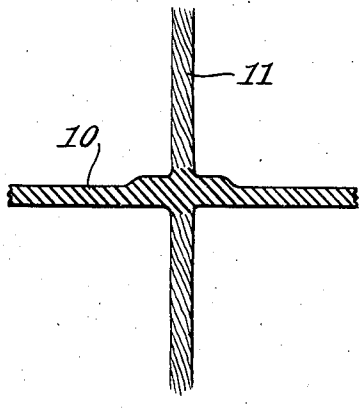


Fig. 2



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Patented July 18, 1944 2,353,960

UNITED STATES PATENT OFFICE

2,353,960

SEWED CONNECTION

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Application March 24, 1942, Serial No. 435,975

2 Claims. (Cl. 2—243)

My invention relates to sewed connections in plastics and more particularly to a method of treating those sections of a plastic material which are connected, as by sewing, to another body.

There are many instances where an article of manufacture comprising sewed connections is used in a watery or oily environment and it is often extremely desirable to waterproof these connections. For example, in galoshes or hat sweat-bands, even if the material thereof is waterproof, water or perspiration may seep in through needle-holes or the thread used may transmit the fluid by means of a capillary or wick action. Accordingly, it is the object of this invention to provide means to waterproof such connections by sealing the needle-holes.

Another object of my invention is to eliminate this capillary action.

Other objects of my invention will be apparent from the following description, it being understood that the above general statements of the objects of my invention are intended to describe and not to limit it in any manner.

In the drawing, for the sake of simplicity, a single sheet of plastic with a thread penetrating it, is illustrated, although, in practice, the plastic sheet will ordinarily be connected by the thread to some other body.

Fig. 1 is a greatly enlarged cross-sectional view of a sheet of plastic with the thread penetrating the same.

Fig. 2 is a similar view after treatment according to this invention.

The term "plastics" has a well defined meaning and generally refers to organic compounds which possess plasticity and can be broadly classified under two headings, the thermoplastic and the thermosetting products. The present invention is particularly concerned with the thermoplastic materials which include cellulose acetate, vinyl, styrol, methacrylic acid derivatives and related materials.

It is well known in the art to produce thread for knitting or sewing which is made from these materials and this type of thread may be called thermoplastic thread.

Accordingly, sheet 10 is preferably of a thermoplastic resin as is thread 11. Inasmuch as it is desirable that the sheet 10 and thread 11 have similar characteristics, the thread and sheet may be of the same plastic material. As will be hereinafter described, however, this invention has definite advantages whether such plastic thread or ordinary cotton or silk thread is used.

In the article shown in Fig. 1, the thread 11 has been sewn through the sheet 10 and, of course, a needle-hole is produced. Water or any other like fluid may seep through this needle-hole and also may be transmitted from one side of the sheet 10 to the other by the capillary or wick action of the thread 11, since, as is known, capillary or wick action is induced by the spongy character of the conductor.

This transmission of moisture may be prevented by applying a solvent of the thermoplastic sheet 10 to the needle-hole or by a simple rapid heat-sealing operation. The solvents adaptable for the particular thermoplastic resin employed are well known to those skilled in the art and in general, acetone, propylene oxide, ethylene dichloride, mesityl oxide, or the higher ketones are satisfactory. A simple heat-sealing operation can be performed with a soldering iron but the use of a solvent solution is preferred. It is also very desirable and efficacious to fortify the solvent with the particular type of plastic used so that the evaporation of the solvent leaves an additional deposit of the plastic at the needle-hole and through the thread, as will be hereinafter described, thus more positively coating the thread and sealing the hole. The solvent does not depend entirely on penetrating the needle-hole but by dissolving the adjacent portion of sheet 10, the material of the sheet is caused to flow so as to effect the sealing of the hole.

A deposit of fortified solvent 12 is therefore applied as shown in the broken lines of Fig. 1. Assuming the thread 11 to be of the thermoplastic resin type, the sheet 10 is caused to flow around the needle-hole and the thread is likewise softened so that the thread 11 and sheet 10 fuse into an integral mass which, when set, will appear as in Fig. 2. In actual practice, the solvent may be applied by brushing it over a line of thread stitching and all the needle-holes will be sealed in the manner described.

Since capillary action is induced by the spongy character of the thread, it is apparent from Fig. 2 herein that such action will be prevented because the thread has fused with the sheet into a solid mass. Tests have demonstrated perfect resistance to the transmission of water both by needle-hole seepage or capillary action.

Very good results are also secured by the use of ordinary cotton or silk thread. When the fortified solvent is applied, it is absorbed by the thread as it dissolves the sheet. The plastic saturated thread therefore fuses with the sheet and has the characteristics of regular thermoplastic thread so that when set, the thread and plastic

sheet likewise fuse into an integral solidified mass wherein the needle-holes are sealed and the capillary action is prevented.

Various embodiments of my invention are possible, the primary concept being the use of a member of plastic material which is sewn and wherein the needle-holes are sealed and the thread is fused with the plastic material by dissolving the area wherein the thread penetrates the member so that the setting of the dissolved area effects a fusion of the thread and material. Instead of using a fortified solvent, a strip of plastic material may be laid over the needle-holes and a solvent in the form of a liquid or heat and pressure may be applied.

I have shown a preferred embodiment of my invention but it is obvious that numerous changes and omissions may be made without departing from its spirit. For example, while I have stressed the use of a thermoplastic base member, it is also possible to use a thermoplastic impregnated fabric or other material. Furthermore, the invention need not be restricted to waterproofing but may be applied where the sewed area is apt to permit the transmission of gas or any other fluid. The degree which the solvent should be fortified is not at all critical or important since a highly fortified solvent will merely leave more of a deposit.

I claim:

1. A method of sewing so as to prevent fluid transmission through the sewed area which comprises sewing a waterproof-thermoplastic resin member with thermoplastic thread, applying a solvent of said thermoplastic member and thread over the resulting needle-hole so as to saturate the portion of said thread adjacent the needle-hole and allowing the thermoplastic member and thread to fuse and set.

2. A method of sewing so as to prevent fluid transmission through the sewed area which comprises sewing a waterproof thermoplastic resin member with thermoplastic thread, applying a thermoplastic fortified solvent of said thermoplastic member and thread over the resulting needle-hole so as to cause the adjacent area of the thermoplastic member and thread to flow and allowing the thermoplastic member and thread to fuse and set.

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