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2,304,852

FABRIC PATCHING AND REINFORCING DEVICE

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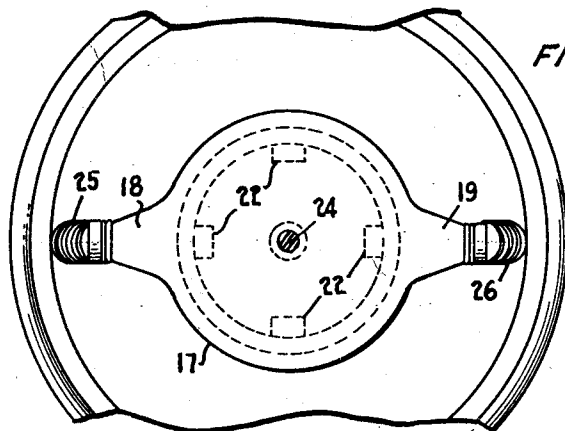


FIG. 2

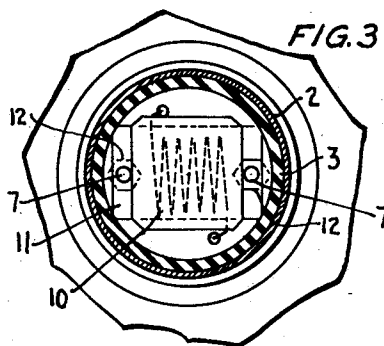


FIG. 3

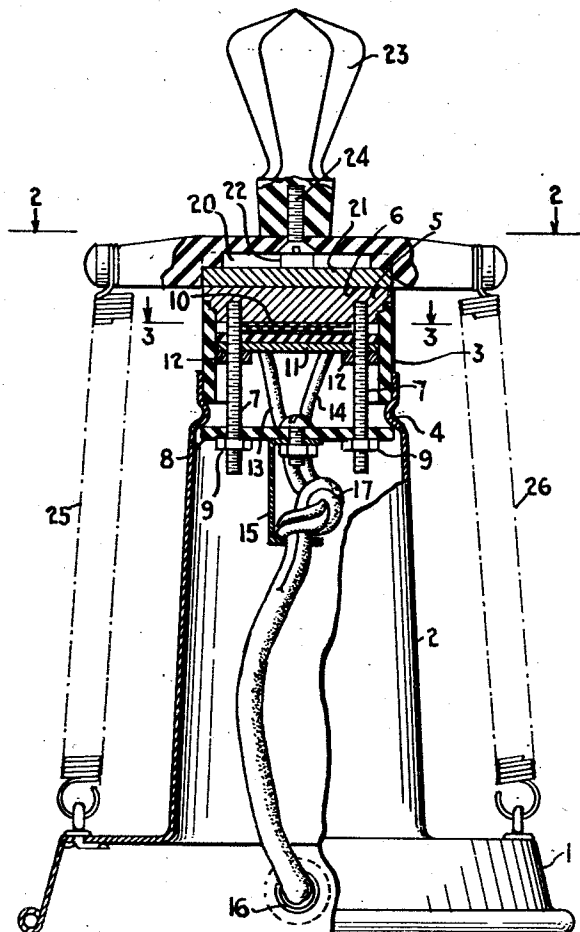


FIG. 1

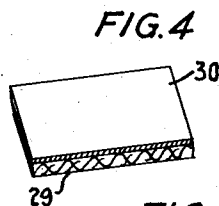


FIG. 4

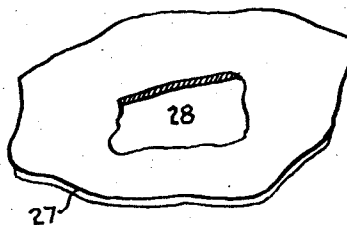


FIG. 5

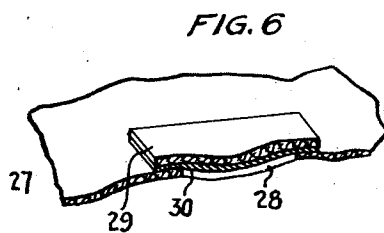


FIG. 6

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FABRIC PATCHING AND REINFORCING
DEVICEArthur E. Sharples, Astoria, N. Y., assignor to
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8 Claims. (Cl. 154—42)

This invention relates to patching and reinforcing textile fabrics, and one of its objects is to provide a simple device for effectively patching stockings and the like and which device may be applied in the home or factory, requiring very little skill for its manipulation.

Another object is to provide a fabric patching and reinforcing device which is provided with an electric heating element adapted to be connected to the electric light current.

A further object is to provide a vertically placed housing for retaining the heating element and for maintaining the maximum degrees of heat near that surface where the patching of the fabric is being performed.

Another object is to provide novel means of pressing the fabric and its patch against the heated surface of the housing.

A further object of the invention is to provide an improved method of patching or reinforcing a textile fabric.

A further object is to provide an improved patched or reinforced textile fabric.

A further and more specific object of the invention is to provide a patched or reinforced textile fabric involving thermo-plastic material whereof the patch will not be deleteriously effected by subjection to the temperatures or chemicals to which articles of apparel are subjected in the laundry or at other times.

Other and ancillary objects of the invention will appear hereinafter.

In the accompanying drawing which illustrates the invention:

Fig. 1 is a view, partly in side elevation and broken away to show an axial section, of a patching device involving the invention;

Fig. 2 is a section on the line 2—2 of Fig. 1, partly broken away;

Fig. 3 is a section on the line 3—3 of Fig. 1, partly broken away;

Fig. 4 is a perspective view of a patch adapted for use with the device of Figs. 1 to 3, inclusive;

Fig. 5 is a perspective view of a fragment of textile fabric having a hole to be patched; and

Fig. 6 is a perspective view, partly in section, showing the patch in patching position ready to be secured to the fabric to be patched.

Referring to the drawing, and first to Figs. 1, 2 and 3, the apparatus therein shown comprises a pedestal of thin sheet metal, desirably aluminum, including the hollow base 1, with the hollow central column 2 of less diameter integral therewith. There is telescoped within

the top of the column 2 a sleeve 3 of insulating material, such as insulating fibre, which sleeve rests upon the circumferential bead 4 formed in the column 2. In the top of the sleeve 3 is a block of metal 5 having the horizontal plane patching surface 6. It will be observed that the block 5 is insulated from loss of heat by the heat-insulating sleeve 3. The block 5 is secured in place by the rods 7 having a screw-threaded engagement with the block 5 and passing through a flat bar 8 which, when the nuts 9 are screwed up on the rod 7, is forced against the bead 4 and the block 5 securely fastened in position. The bar 8 is of heat-insulating material so as to prevent conduction of heat away from the block 5 through the rods 7.

Electrically insulated, but in close heat-conducting relation with the metal block 5, is the electric resistor 10, acting as a heater for the block 5. This is supported by the plate 11, through which pass the rods 7, supported to firmly clamp the heater against the block 5 by means of nuts 12. Electric current is supplied to the heater by insulated conductors 13 and 14 which are connected to its terminals. These conductors pass downwardly through a hole in the hanger 15 secured to the plate 8 and thence pass downwardly through the column 2, pass out through a hole 16 in the base 1 to a suitable source of current. Just above the hole in the hanger a knot 17 is formed in the conductors 13 and 14 which will not pass through the hole. This results in the hanger resisting any pull upon the wires and prevents the pull from being transmitted to the resistor or its connections.

A cover is provided which comprises a body of heat insulating material, which may be Bakelite, including a central substantially circular portion 17 having the outwardly extending arms 18 and 19 at opposite ends of a diameter. A central recess 20 is provided in this insulating body in which is secured a metal body 21 resting upon the lugs 22 of insulation and formed integral with the insulating body and which serve to space the metal body 21 from the side of the recess. Secured to the insulating body referred to is a handle 23 which may also be of Bakelite and secured by a screw 24.

It will now be seen that the cover comprising the metal body 21 may be placed in position above the patching block 5 as shown in Fig. 1, when the springs 25 and 26 will forcibly draw the two metal bodies toward each other. The cover may be removed from above the patching block

5, so that the work may be placed on or removed from the patching block 5. The work having been placed on the block 5, the cover may then be adjusted so that the metal body 21 is above the metal body 5 when the springs 25 and 26 will force the bodies 21 and 5 together compressing the work between them. When desired the metal plate 21 may be adjusted above and drawn against the block 5 without any work interposed, when the heating of the body 5 by the electric heater will conduct the heat to and raise the temperature of the metal 21, the metal bodies 5 and 21 being in intimate direct contact. This is for the purpose of pre-heating the metal body 21 as will be hereinafter referred to.

The heat insulating handle 23 and the protection of all heated metal parts as provided for in the construction referred to, effectually prevents all danger of burning of the operator in manipulating the device.

Referring to Fig. 5, the textile fabric 27 has a hole 28 to be patched. It will be understood that instead of an actual hole at 28 the fabric might be worn so thin as to require reinforcement. The patch (see Fig. 4) comprises a textile fabric 29 to one face of which is attached a thermo-plastic substance 30. To effect the patching the patch is laid over the hole 28 with its edges over-lapping the edges of the hole and the thermo-plastic material against the fabric 27 to be patched. The parts being in the position as shown in Fig. 6, the patch and the worn fabric 27 are placed upon the patching surface 6 of the metal block 5 (the spring-pressed cover having been removed). The spring-pressed cover is then placed with the metal body 21 above the patch and fabric to be mended. When released the metal body 21 will force the patch and fabric to be mended against the surface 6 whereby the patch and fabric to be mended are pressed tightly together. Application of heat by the electric heater will then cause the softening or fusing of the thermo-plastic material when it will flow into or impregnate the fabric to be mended, and the fabric of the patch, the heat being applied while the patched fabric and fabric to be mended are pressed together between the plates 5 and 21 as described. When this softening and impregnation has been carried on to the desired extent, care being taken that the fabrics are not charred or injured in the operation, the cover is removed and the patched fabric removed from the patching block. Upon cooling of the thermo-plastic material it will congeal and the fabric of the patch and the fabric to be mended will be found to be thoroughly and strongly patched. In the case of stockings, in the patching of holes in which it is contemplated that the invention will find frequent use, the fabric of the patch should be comparatively flexible so as to be comfortable for the wearer, and at all times the quality of the patching fabric should be adapted to the use in hand.

For some purposes the thermo-plastic substance may be of a low fusing temperature in which case it may be immaterial on which side of the fabric to be mended the thermo-plastically coated patch is located or upon which side of the patch (with relation to the fabric to be mended) the thermo-plastic material is located, the low fusion material flowing throughout the fabrics and accomplishing its purpose of uniting them, whatever may be its position with relation to them. It is also to be observed that the thermo-plastic material may be, in the first instance,

applied either to the patching fabric or the fabric to be mended. However, it is preferable that the thermo-plastic material shall, in the first instance, be between the patching fabric and the fabric to be mended. It is also preferable that it be applied in the first instance to the fabric of the patch.

In the case of patched articles, such as stockings, required to pass through laundering operations where high temperatures and acids or other chemicals used for cleansing purposes are employed, the thermo-plastic material should be capable of resisting the usual laundry chemicals and should not fuse or soften to any extent deteriorating to the patch. It has been found that a material capable of withstanding a temperature of approximately 300° F. without materially fusing or softening will pass through the temperatures of the usual laundry operations.

While any suitable thermo-plastic composition may be employed, one such composition which has been found to have the properties of producing a strong and durable patch, and also the properties of not materially fusing or softening at temperatures below 300° F. and also resisting the usual laundry chemicals, is as follows:

	Percent
Vinyl resin.....	29.0
Butyl acetate.....	5.4
Toluene.....	7.1
Di-butylphthalate.....	4.5
Paraffin oil.....	3
Acetone.....	51.0

With the lower fusing thermo-plastic materials it may be immaterial on which side of the fabric to be patched, the patch with the thermo-plastic material, is placed with relation to the electrically heated metal block 5, because sufficient heat may, in any event, be applied to the thermo-plastic material to sufficiently fuse it. However, with the higher fusing thermo-plastic materials, it is of advantage to place the patch with the thermo-plastic material next to the heated block 5 and the fabric to be mended outside of the patch and thermo-plastic material. This causes less heat insulating fabric to be between the thermo-plastic material and the heated metal block 5, so that the necessary fusing heat can be transmitted to the thermo-plastic material and without danger of over-heating or charring the fabric.

The operation of patching may be facilitated, particularly in the case of high fusing thermo-plastic materials, and the operation is improved even in the case of lower fusing thermo-plastic materials, if the metal plate 21 is heated prior to the patching operation. This may be accomplished by bringing the plate 21 into position against the heated plate 5, as shown in Fig. 1, whereby the metal body 21, in direct contact with the heated metal body 5, may be heated to any desired temperature up to approximately that of the heated body 5. This heating of the plate 21 having been accomplished, the cover is removed thereby removing the plate 22 from above the heated plate 5, the work is placed upon the surface 6 and the cover replaced, with the metal plate 21 still hot, outside of the work. The heat retained in the thoroughly heat-insulated body 21 will then pass to the thermo-plastic material from one side of the work while heat from the heated body 5 will pass to such material from the other side of the work. The result is that the

thermo-plastic material is more efficiently heated, especially to high temperatures without danger of injury to the fabric. This operation of having the heated metal plate outside the work, that is on the opposite side from the electrically heated plate, is not only of advantage in connection with the use of high fusing thermo-plastic material, but also increases the efficiency in connection with low fusing thermo-plastic material, by tending to a more uniformly and thoroughly fused thermo-plastic material at all points.

While the invention of patching or reinforcing apparatus has been illustrated in what is considered its best application it may have other embodiments without departing from its spirit and is not, therefore, limited to the structure shown in the drawings; nor is the invention of patch limited to the illustrative form of patch as shown in the drawings and the precise details as described as such may be varied in numerous ways without departing from the invention; nor is the invention of method limited to the precise details as recited.

What I claim is:

1. A device for patching and reinforcing textile fabrics comprising a tubular housing having its axis vertical, an electric heating element therein, a patching surface at the top of said housing, a cover movable laterally with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, a handle for positioning said cover above said patching surface and means for resiliently drawing said cover and surface together whereby to force a thermo-plastic patch and a fabric against each other while they are heated by said heating element.

2. A device for patching and reinforcing textile fabrics comprising a base, a vertically placed hollow column fast to said base, a heating element located at the upper end of said column, electric wires passing from said base through said column to said element, an insulating housing and means for removably maintaining said housing at the top end of said column, a patching surface carried by said housing at the top of said column, a cover movable laterally with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, said cover having an inner patching surface and means for resiliently drawing said cover toward said first mentioned patching surface whereby to force a thermo-plastic patch and a textile fabric against each other while being heated.

3. In a device for thermo-plastically patching and reinforcing textile fabrics comprising in combination a pedestal supporting a heat-insulated metal patching surface, an electric heater for heating said surface, a cover laterally movable with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, means for forcing said cover toward said surface, when above the same, to press the patch, the textile fabric, to be patched or reinforced, and a thermo-plastic substance together to secure said patch and fabric together.

4. In a device for thermo-plastically patching and reinforcing textile fabrics comprising in combination a pedestal supporting a heat-insulated metal patching surface, an electric heater for heating said surface, a cover movable laterally with relation to said surface to a position

laterally outside said surface whereby said surface will be uncovered by said cover, means for forcing said cover toward said surface, when above the same, to press the patch, the textile fabrics, to be patched or reinforced, and a thermo-plastic substance together to secure said patch and fabric together, said cover comprising a metal body adapted to be pressed against said metal patching surface to heat said metal body in said cover.

5. In a device for thermo-plastically patching and reinforcing textile fabrics comprising in combination a pedestal supporting a heat-insulated metal patching surface, an electric heater for heating said surface, a cover movable laterally with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, means for forcing said cover toward said surface, when above the same, to press the patch, a textile fabric, to be patched or reinforced, and a thermo-plastic substance together to secure said patch and fabric together, said cover comprising heat-insulating material and a metal body mounted in said heat-insulating material, said metal body being adapted to be pressed against said metal patching surface to heat said metal body in said cover.

6. In a device for thermo-plastically patching and reinforcing textile fabrics comprising in combination a pedestal supporting a heat-insulated metal patching surface, an electric heater for heating said surface, a cover movable laterally with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, means for forcing said cover toward said surface, when above the same, to press the patch, a textile fabric, to be patched or reinforced, and a thermo-plastic substance together to secure said patch and fabric together, said cover comprising heat-insulating material, and a metal body mounted in said heat-insulating material, said metal body being adapted to be pressed against said metal patching surface to heat said metal body in said cover, and a heat-insulated handle secured to said cover.

7. In a device for thermo-plastically patching and reinforcing textile fabrics comprising in combination a metal pedestal comprising a hollow base and a hollow metal column of less diameter than said base and centrally arranged thereon, a heat insulating sleeve mounted at the upper end of said column, a metal patching block mounted on said sleeve, an electric heater for heating said block, a cover of heat insulating material, a metal body mounted in said cover and adapted to be drawn toward said metal block to press the patch and reinforced or patched fabric together with a thermo-plastic substance, between the said block and body while the said substance is heated, springs for drawing said block and body together, said springs being on opposite sides of said column and each secured to said base and said cover respectively, and a handle secured to said cover but heat insulated from said metal body mounted in said cover.

8. A device for patching and reinforcing textile fabrics comprising a base, a vertically placed hollow column fast to said base, a heating element located at the upper end of said column, electric wires passing from said base through said column to said element, an insulating housing and means for removably maintaining said housing at the top end of said column, a patch-

ing surface carried by said housing at the top of said column, a cover movable laterally with relation to said surface to a position laterally outside said surface whereby said surface will be uncovered by said cover, and having an inner patching surface and comprising a heat insulator maintaining said inner patching surface, a han-

dle fast to said insulator and tension springs connected to said insulator and said base for pressing said cover toward said column whereby to force a thermoplastic patch and a textile fabric against each other.

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