June 24, 1924. 1,498,545

O. E. FOX ET AL

LEATHER PATCHING METHOD AND ITS PRODUCT WITH THE PATCH INVISIBLE ON THE FINISHED SIDE

Filed Sept. 27, 1923 2 Sheets-Sheet 1

Fig. 1.

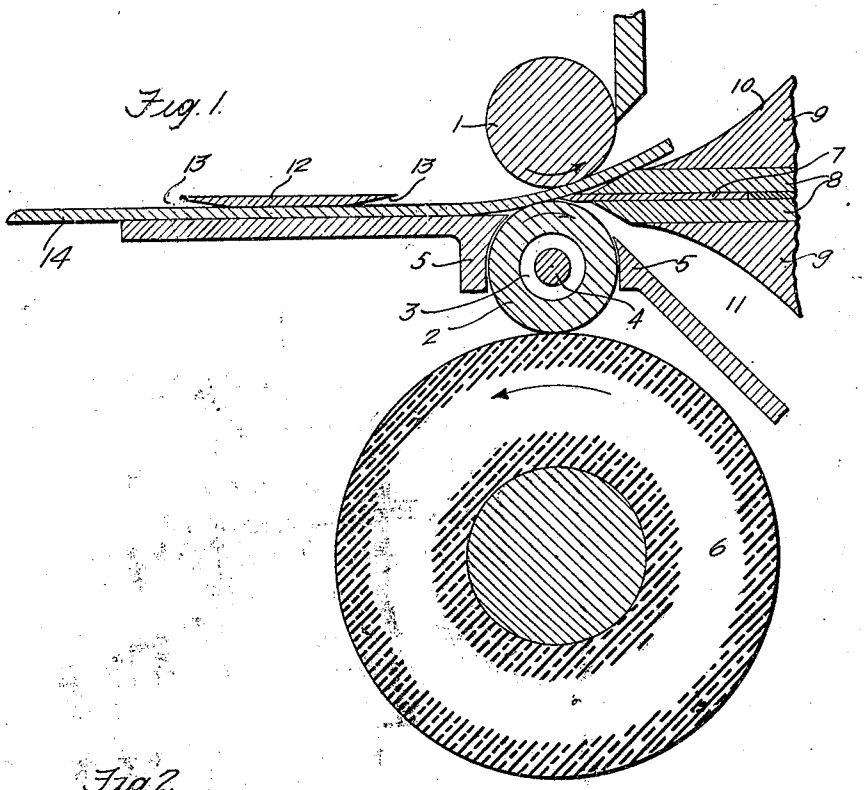


Fig. 2.

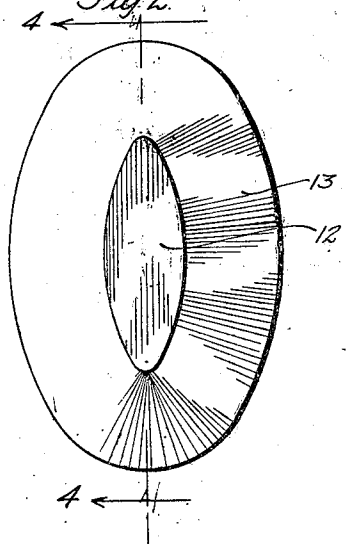
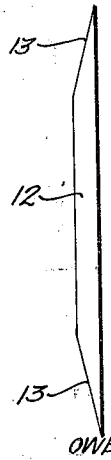


Fig. 3.



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Fig. 4.

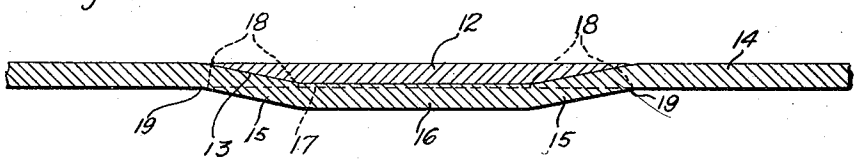


Fig. 5.

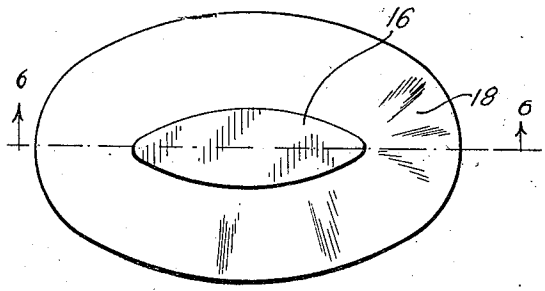


Fig. 7.

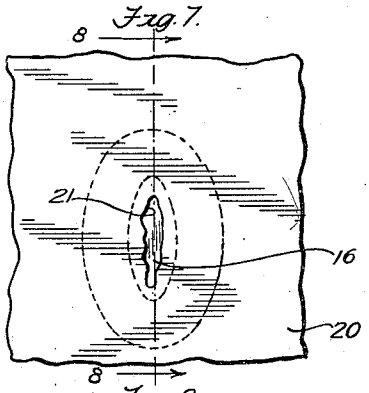


Fig. 6.

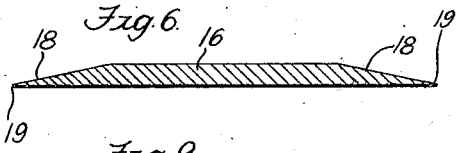


Fig. 8.

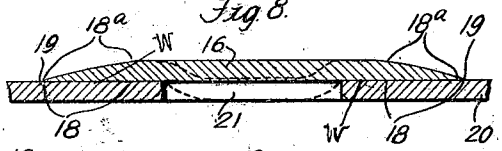


Fig. 9.

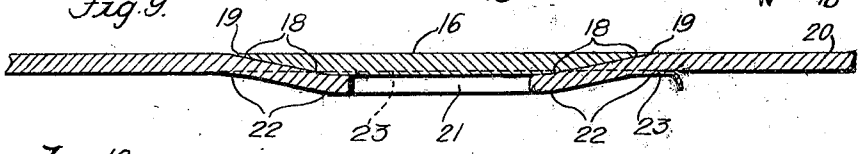


Fig. 10.

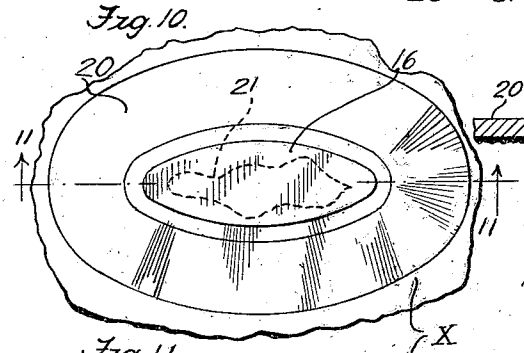


Fig. 12.

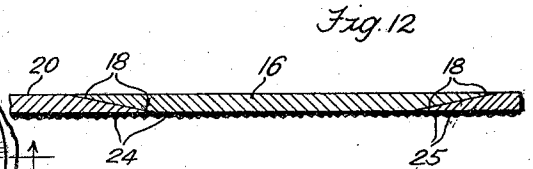


Fig. 13.

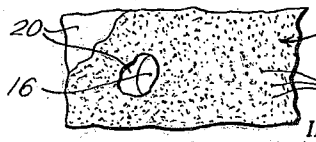
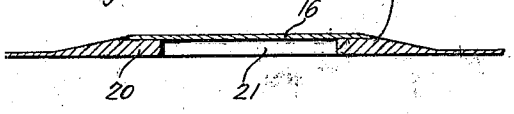


Fig. 11



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UNITED STATES PATENT OFFICE.

OWEN EUGENE FOX, OF NEWARK, FREDERICK WILLIAM RADEL, OF SOUTH ORANGE, AND FRANK JOSEPH RADEL, OF MAPLEWOOD, NEW JERSEY, ASSIGNORS TO RADEL LEATHER MANUFACTURING COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LEATHER-PATCHING METHOD AND ITS PRODUCT WITH THE PATCH INVISIBLE ON THE FINISHED SIDE.

Application filed September 27, 1923. Serial No. 665,105.

To all whom it may concern:

Be it known that OWEN EUGENE FOX and FREDERICK WILLIAM RADEL and FRANK JOSEPH RADEL, citizens of the United States, and residents, respectively, of Newark, in the county of Essex and State of New Jersey, and of South Orange, in the county of Essex and State of New Jersey, and of Maplewood, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in a Leather-Patching Method and its Product with the Patch Invisible on the Finished Side, of which the following is a specification.

This invention relates to a leather patching method and its invisibly patched, finished product.

The main object of this invention is to produce finished, leather patched, upholstery leather in which the patches are invisible on the finished side and firmly fixed in place.

Upholstery leather is commonly, if not exclusively, a split skin, commonly, if not exclusively, coat-finished on its grain or naturally outward side. For commercially satisfactory results it is important that each patch be so broadly bonded to the margin of a cavity in the pre-split skin or leather to be patched that the opposed, cementitiously jointed, contacting margins will be freely bendable, as over seat corners or the like, and will not be squeezed or forced out of place by flexure of the patched portion of the leather during the wear and strains of use. In the practice of our invention, we form the leather patch of any desired size or shape with a smooth, even, beveled marginal surface extending continuously around the middle portion of the patch the opposed surfaces of which are parallel. The beveled margin is formed by a mechanical skiving operation that insures a smooth, even surface and effects a knife or feather edge of the beveled surface that is free from indentations or irregularities. This is important in order that the beveled margin of the patch may be cementitiously bonded to a margin of a cavity with uniformity of bonded condition throughout the joint. It is important that the edge of the patch be thin and regular or free from irregularities, because if they are present pits or trough-like conditions will be present at the junction of the edge with the skin and thereby form depressions around the patch in whole or in part with the result that very frequently a graining board used in grain finishing operations will pull the patch out of place. As illustrated and hereinafter described, the larger surface of the patch in the finished product is on the back, unfinished side of the patched leather or pre-split skin and the smaller surface of the patch is in a plane coincident with the plane of the front finishable or finished surface of the patched, pre-split skin. And it will be observed from the illustrations and following description that the front surface of the patch in the finished product is a split surface enclosed by an immediately adjacent split front surface of the pre-split skin, opposed to the back margin of the patch; such patch-enclosing, split, front surface of the pre-split skin, immediately adjacent the front surface of the patch and in the plane thereof, being enclosed by an unpatched, front surface of the pre-split skin and which unpatched, front surface of the pre-split skin is not split in the practice of our method, but is of its full, normal thickness, weight and strength. By our method, the resultant waste of leather is confined to a very thin skiving taken from the front surface portion of the patch and from an immediately adjacent portion of the pre-split skin enclosing a cavity and having a maximum area approximately that of the back, larger side of the patch. By our invention, we customarily and preferably make the skived or beveled margins of the patches about three-quarters of an inch in width and preserve substantially the full width of this skived margin in the bonded joint of the finished product; the bonded, contacting portions of the skin and patch being freely flexible, as stated. The beveled margin of the patch in its relation to the opposed, flat margin of the patch has a very flat angle.

The cavities referred to are depressions, imperfections, butcher knife cuts and the like through the leather.

In the accompanying drawings, the leather pieces are shown, for better illustration of the invention, very much thicker than the corresponding pieces are in practice; where-

as in practice the pieces are not only very much thinner than shown, but also are freely flexible.

Fig. 1 is, in part, a vertical, sectional view through the rolls, knife, and adjacent parts of a well-known belt-knife, leather splitting machine; and in part a sectional view through a piece of leather out of which a marginally skived patch is formed and through a separable patch pattern superposed on the patch forming leather in advance of the feed rolls.

Fig. 2 is a plan view of the marginally beveled side of one shape of our separable patch pattern. Fig. 3 is an edge view of what is shown in Fig. 2.

Fig. 4 is a diagrammatic, sectional view at a line corresponding to line 4—4 of Fig. 2 of an entire patch pattern superposed on a patch forming piece of leather. This view shows the patch pattern and a thereto opposed portion of the leather projected downwardly below the under and otherwise continuously flat surface of the leather. The figure also shows the pattern and the leather as if they were simultaneously compressed into the shape shown instead of being, according to the fact, progressively so shaped by the passage of the parts through the apparatus shown in Fig. 1.

Fig. 5 is a plan view of a leather patch resulting from our method.

Fig. 6 is a sectional view of the patch at line 6—6 of Fig. 5.

Fig. 7 is a plan view looking at the finishable front side of a piece of leather to be patched and shows a patch applied to the back side of the leather to be patched, wherein a cavity in the form of a hole is shown.

Fig. 8 is a sectional view at line 8—8 of Fig. 7 and shows in full lines a patch cementitiously applied flatwise to the back side of a piece of leather to be patched over a cavity therein and with the upper margin of the patch slanting upwardly and inwardly. This patch is the patch shown in Figs. 5 and 6, but in Fig. 8 such patch has been applied with the upward side of the patch shown in Fig. 6 downward against the back margin of the cavity. Dotted lines show the position of the patch after it has been tamped preparatory to leveling and splitting.

Fig. 9 is a diagrammatic, sectional view on a line corresponding to line 8—8 of Fig. 7 and shows the patch and the thereto opposed portion of the leather to be patched projected downwardly; that is in the direction of the front surface of the patched leather.

Figs. 10 and 11 are respectively, a plan view and a lengthwise sectional view at line 11—11 of Fig. 10 of waste or scrap, resulting from a splitting operation performed progressively on the assemblage indicated in Fig. 9.

Fig. 12 is a sectional view of our new finished product in which the coat finish is partially broken away to indicate the front joint line in the patched leather concealed by the coat finish. Fig. 13 is a view of a piece of patched leather coat-finished on its front side, the coat-finish being broken away to show the unpatched portion of the pre-split skin and also to show the smaller front, split surface of the patch and a part of the immediately enclosing split surface of the pre-split skin.

In Fig. 1, 1 is the upper feed roll of a well-known, leather splitting machine; 2 the under floating and idler feed roll which is spaced apart at 3 from its shaft 4 and has vertical movement between its back and front roll guides 5. This under feed roll 2 is peripherally supported on its under side by an elastic roll 6. The belt-knife 7 is held between cheek pieces 8 that are mounted between upper and under members 9. When used for ordinary splitting operations, an upper split is fed upwardly and rearwardly over the upper surface 10 of the upper member 9 and the under split is fed into a space 11 between the under member 9 and the belt-knife 7. The front guide 5 has a forward, horizontal extension forming a feed table in front of the upper and under feed rolls.

The machine or apparatus indicated is usable without any change whatsoever, not only in making our new leather patches, but also for feeding the patched leather to the splitting knife. Apart from our separable patterns, no new mechanism is required for practising our invention and this fact is one of its advantages.

In working our method, we use separable skiving patterns 12 of any desired superficies and skived margin contour. One side margin of the pattern is beveled at 13. These patterns may be made of any suitable material and die pressed in shape. We make them of flexible celluloid.

The pattern 12 is shown a little thinner than the leather 14 out of which a patch is to be formed. The pattern 12 is superposed on the leather 14 in front of the feed rolls, either side up. When the superposed pattern and leather are fed between the feed rolls under the feed roll pressure and the usual proper adjustment of the upper roll 1, the superposed parts are progressively projected downwardly as shown in Fig. 4 in consequence of the downward movement of the feed roll 2 against the supporting resilient roll 6. In Fig. 1 the beveled surface 13 of the pattern is shown downwards and it is assumed that Fig. 4 shows the assemblage of Fig. 1 as it would appear after passing through the apparatus of Fig. 1, but without any splitting action. Consequently the projection of the leather is

formed with a central body portion enclosed by an angular portion 15 of the leather around the body portion of the leather 16. As the body portion of the pattern 12 is a little thinner than the leather 14, the under flat surface of the body portion when its upper surface is in line or flush with the upper surface of the leather 14 is slightly above the general level of the under surface of the leather 14 around the projection. The under beveled surface 13 of the pattern effects the angular portion 15 of the leather around its central body portion 16.

With the pattern and leather superposed as in Fig. 1, the relative relation thereof, as indicated in Fig. 4, is progressively effected; and the under surface of the leather 14 is fed against the knife with the cutting edge thereof at the level of the under side of the leather and splits the angularly disposed portion 15 of the projection and its thicker body portion 16 from the main body of the leather 14 along the line 17, resulting in a marginally skived patch having a relatively thick central portion 16 enclosed by a broad skived margin 18.

The edge of the patch is indicated by 19 and the leather to be patched is indicated by 20 wherein is a cavity 21 (Fig. 8). This cavity may be wholly or partially through the leather 20. The skived margin of the patch is placed over a flat back margin of the cavity the margins being cemented together. It is unnecessary by our invention to bevel or skive the back margin of the cavities and this is an advantageous feature of our invention. The patch is manually applied flat-wise with its broad skived margin 18 downwards as indicated in Fig. 8. The broad margin being cemented by suitable waterproof cement at W to the flat margin of the cavity, is manually tamped in place with the result, as indicated in Fig. 8, of inclining the upper margin 18^a, which is opposed to the skived margin 18, upwardly and inwardly. The patched portion 16 of the patch is also tamped downwardly into the cavity as indicated by the dotted lines in Fig. 8. It is noted that the whole width of the margin 18 is in contact with the margin of the cavity so that the cementitious joint or bond is broad and strong. The assemblage of the thus patched leather is now rolled between the feed rolls and subjected to leveling and splitting operations of the apparatus shown in Fig. 1.

As in the case of the formation of the patch, the patched leather portion is downwardly or forwardly projected as illustrated in Fig. 9; that is, progressively; the advancing edge of the patched leather being rolled against the knife so as to split off the under surface of the leather itself and also of the patch in a very thin skiving; and so to knife buff the edge of the granular under portion of the patched leather and form a finishable front surface of the leather and patch. In the deformation thus occurring (Fig. 9), the skived margin 18 becomes opposed to the downwardly and inwardly slanted margin 22 of the leather to be patched; and again the whole width of the margin, preferably about three-quarters of an inch in actual practice, as above stated, is maintained on the now downwardly and inwardly slanting, upper marginal surface around the cavity. By the adjustment of the splitting machine feed rolls the splitting path 23 is through the under portion of the assemblage shown in Fig. 9 and a waste product or skiving X such as shown in Figs. 10 and 11, is split from the under side portion of the patched leather, leaving, as shown in Fig. 9, the full width of the skived margin 18 in its broad cementitious bond with the margin of the cavity. The patches, by our invention, are uniformly in proper position so that no double thickness of leather, or trough or the like, such as above referred to, are present in our patched leather.

This patched leather splitting operation buffs the finishable surface of the patched leather by friction with the knife, removes from the finishable surface of the united patch and leather any substantial imperfections resulting from plumping in the tanning and forms a continuously level front surface.

The finishable front side of the united patch and leather is coated with a finishing composition 24 which obscures the compacted joint line of the patch and leather; and when this coat finished surface has been subjected to the usual embossing or graining operations and pressures so as to give to the finished side of the product what may be called a hill and dale formation 25, the embossing or graining, as the case may be, completely obscures the joint line of the patches and leather and renders the patches invisible on the finished side of the commercial product.

What we claim is:

1. The method of making leather patched leather, consisting in flatwise assembling a separable skiving pattern and leather in sheet form; in compressing them together and during such compression in marginally skiving and peripherally separating from the leather a patch forming portion thereof; in cementing a margin of such patch to a margin of a cavity in a split skin to be patched, and covering the cavity, thereby forming a composite assemblage; in compressibly and progressively rolling said composite assemblage into a composite projection from a surface of the skin; in splitting off said projection in a plane coincident with that plane of the pre-split skin from which the assemblage projects and leaving

the latter, exteriorly of its patched area, undiminished in thickness.

2. The method of making leather patched leather, consisting in assembling a separable skiving pattern and leather in sheet form; in compressing them together and during such compression in marginally skiving and peripherally separating from the leather a patch forming portion thereof having a smooth and even beveled surface and a feather edge substantially free of indentations; in cementing a margin of such patch to a marginal surface around a cavity in a split skin to be patched, and covering the cavity, thereby forming a composite assemblage; in forming said composite assemblage, including a marginal surface portion of the patch, into a composite projection from a surface of the skin; and in splitting off said projection in a plane coincident with that plane of the skin from which the assemblage projects and through the projected surface portion of the patch, thereby forming a surface of the patched skin with a split surface portion immediately surrounding the split surface portion of the patch and leaving the pre-patched skin exteriorly of its patched area in undiminished thickness; and in coat-finishing the patched skin to conceal the patch on the so finished side.

3. The method of leather patching cavity containing, split skins, consisting in cementing a leather patch having a beveled margin to the back margin of a cavity in the pre-split skin, thereby forming a composite portion; in projecting such composite portion beyond the front surface of the unpatched portion of the pre-split skin; and in splitting off said projection in a plane coincident with the plane of the unpatched portion of the patched skin, leaving the unpatched portion of the skin with its preexisting thickness, weight and strength undiminished enclosingly of its patched area; and in coat finishing such front surface of the patched skin to conceal the patch.

4. The method of leather patching cavity containing, split skins, consisting in cementing a broad margin of a broadly beveled leather patch-margin to the back margin of a cavity in the skin; in projecting the so cementitiously assembled, patched portion of the pre-split skin, including the front surface of the patch, forwardly and beyond the normal front surface of the pre-split skin enclosing the patched area; and in splitting off the projection through the front surface portion of the patch in a plane coincident with the plane of the front surface of the pre-split skin exteriorly of its patched area, leaving such unpatched portion of the skin with its normal thickenss, weight and strength and making the jointed portion of the patched skin, between the edge of the beveled margin of the patch and the thereby enclosed portion of the patch freely bendable without dislocation of the patch; and in coat-finishing such front surface to conceal the patch on the coat-finished surface of the patched leather.

5. The method of making leather patched leather, consisting in cementing a broad margin of a broadly beveled patch to a margin of a cavity in leather to be patched, and covering the cavity; in projecting such assemblage beyond a surface of the leather to be patched; and in splitting off said projected assemblage in the plane of the surface from which the assemblage projects, leaving the leather exteriorly of the split surface of the projection of its full normal thickness, weight and strength and with said cementitiously jointed margins broad and freely bendable and resistant to displacement by flexures.

6. As a new article of manufacture, machine patched, split leather having a cavity filled by a cementitiously jointed patch covering the cavity and broadly jointed to the leather by broad, flat-angled, firmly united, inwardly slanting, superposed surfaces, such surfaces being freely bendable and resistant to displacement of the patch by flexure; a patched surface of the leather being coat-finished and comprising a split surface portion of the patch contiguously enclosed by a split surface portion of the split leather opposed to said jointed, slanting surfaces and such latter split surface portion being itself enclosed by a surface of the leather of its full normal thickness; the patch surface under the coat-finish being thereby substantially concealed; the superposed joint forming surfaces having a width many times thicker than the thickness of the patch and of the patched leather and the beveled jointed margins being continuously smooth and the patch margin being continuously feather-edged, and in the joint, flush with the contiguous surface of the leather patched, thereby forming a joint without a depression around the edge of the patch.

Signed at Newark in the county of Essex and State of New Jersey this 17th day of September A. D. 1923.

OWEN EUGENE FOX.
FREDERICK WILLIAM RADEL.
FRANK JOSEPH RADEL.