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(54) **CLEANING DEVICE FOR CLEANING OF METAL STRINGS OF MUSICAL INSTRUMENTS**

REINIGUNGSVORRICHTUNG ZUM REINIGEN VON METALLISCHEN SAITEN VON MUSIKINSTRUMENTEN

DISPOSITIF DE NETTOYAGE POUR LE NETTOYAGE DE CORDES METALLIQUES D'INSTRUMENTS DE MUSIQUE

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Description

[0001] This invention relates to a cleaning device and more particularly to a device for cleaning the metal strings of a stringed musical instrument.

[0002] Many types of instruments are strung with metal strings of steel or phosphor bronze including 6 and 12 stringed guitars (electric and acoustic) and banjos. Such strings are known to be prone to a rapid build up of dirt and sweat both on the top of the strings where the fingers actually touch them but, more especially, underneath the strings. The dirt derives not only from particles carried to the strings by the player's fingers but also from particles that are worn off from the fret board during playing.

[0003] The primary effects of this string contamination are to cause the string to rapidly lose its tone becoming less bright and "flat" sounding over a timescale of a few hours, typically, and to corrode eventually leading to the need for string replacement. A corroded metal string is also more abrasive than a new string so increasing the rate of wear of the frets by the strings.

[0004] It is usual for a player to wipe over the top of the strings from time to time with a handkerchief or the like which can remove some sweat and dirt but this leaves the underneath of the string uncleaned which, as a practical matter, is inaccessible to a cloth cleaner due to the small distances between the frets and the strings. This is particularly the case towards the neck of the instrument where attempts to wipe the underside of the strings will generally stretch the string, putting it out of tune. Also such cleaning methods do not address the corrosion issue.

[0005] Devices for in-situ cleaning of the strings of musical instruments are known from documents US-A-4 528 889, DE-A- 3 003 402 and GB-A-2 222 298.

[0006] The present invention, in a first aspect, provides a cleaning device for in-situ cleaning of metal strings on a stringed musical instrument comprising a manually bendable, resilient laminate having a first planar portion and an end portion extending out of the plane of the first portion, the laminate comprising a layer of plastics material sandwiched between two layers of plastics micro-fibre fabric.

[0007] The plastics micro-fibre fabric can absorb moisture as well as being sufficiently hard-wearing to wipe dirt and corrosion from the strings. The shape of the device allows insertion of the end portion underneath a string while holding the guitar, for example, in the playing position. Being bendable it can adapt to the contours of the strings across the neck as it is moved up and down between the strings and the frets. This also allows the device to be pressed to touch all the tops of all the strings simultaneously for rapid cleaning of the top surfaces. Being resilient the device adopts its original shape on completion of cleaning.

[0008] The fabric may be a mixture of polyester and nylon, for example a mixture of 76% by weight polyester and 24% by weight nylon.

[0009] The end portion may be curved outwardly from the first planar portion, or it may be planar, and meet the planar first portion at a straight edge. In this case the first planar portion and end planar portion may meet at an angle of between about 135° and 160° although 150° has been found to be most convenient to use, the end portion extending outwardly from the first portion about 10mm and extending to about 5mm out of plane from the first planar portion. Preferably the corners of the device are rounded.

[0010] The fabric preferably covers all of each side of the plastics layer.

[0011] The two layers of fabric may be part of a continuous piece of fabric which also covers the end of the plastics layer along the extended edge of the end portion.

[0012] The laminate should ideally be no more than about 1mm thick. The thickness is not critical but the thinner the better for ease of use and the more resilient the plastics material the thinner the device can be while allowing ready manual bending and shape restoration after bending.

[0013] The present invention, in a second aspect, provides a method of making the device of the present invention and comprises forming a laminate by securing a layer of micro-fibre material to each side of a planar, manually bendable, resilient plastics substrate to form a laminate and then deforming an end portion of said laminate out of plane from the remainder of the laminate.

[0014] The fabric layers may be secured to the substrate by adhesive or any other suitable method.

[0015] A single piece of fabric may be looped around an end of the substrate prior to securing to the substrate to form the laminate. The edges of the laminate having an edge of the substrate exposed after forming the laminate may be heat-sealed or the edges of the fabric stitched to the plastics layer to help resist the fabric fraying.

[0016] The end portion may be deformed out of the plane of the remainder of the laminate by heating the end portion, bending the edge to a desired shape and orientation and allowing the laminate to cool with the end portion in the desired shape and position.

[0017] An embodiment of the cleaning device and one method of its manufacture will now be described, by way of examples only, with reference to the accompanying drawings, of which:

Figure 1 is a diagrammatic end view of an embodiment of the present invention;

Figure 2 is a diagrammatic plan of the embodiment of Figure 1.

Figure 3 is a diagrammatic part sectional view of the embodiment of Figures 1 and 2 viewed in the direction III-III of Figure 2.

Figure 4 is a diagrammatic part sectional view of the

embodiment of Figures 1 and 2 viewed in the direction IV-IV of Figure 2; and

Figures 5 to 8 are diagrammatic views illustrating methods of using the embodiment of Figures 1 and 2.

[0018] Referring to Figures 1 to 4, a cleaning device 2 according to the present invention has been formed from a laminate having a thin plastics layer 4 sandwiched between a first layer of micro-fibre fabric 6 and a second layer of micro-fibre fabric 8. The laminate has a first planar portion 10 and an upturned end portion 12 which meet at a fold line 14. The end portion is planar in this embodiment but could be curved as viewed from the side of Figure 1, for example.

[0019] In this particular embodiment the plastics layer 4 is about 0.7mm thick and of a resilient, manually bendable plastics material so as to allow the laminate to bend under manual pressure and restore to its original shape when the pressure is released. The fabric layers 6 and 8 are of a plastics micro-fibre fabric of 76 % polyester and 24% nylon (by weight). The fabric layers are part of a single piece of fabric which is turned over the edge 14 of the end portion 12 to form fabric fold 16 (as best seen in Figure 3). The total thickness of the device is less than about 1.0mm.

[0020] The cleaning device 2 is, in this case, generally rectangular in plan view with corners 20 rounded off. The sides of the laminate other than the fold 16 are melted to seal the edges of the fabric against fraying but could be stitched either alone or additionally to the heat sealing.

[0021] The illustrated cleaning device measures 57mm wide (parallel to fold 14) with the first portion 10 being 77mm long and the end portion 10mm deep rising to be 5mm out of the plane of the first portion 10, as shown in Figure 1.

[0022] The dimensions are not critical but should be selected so the end portion 12 will not span two strings of the instrument to be cleaned by the device and the length of the laminate of the first portion should be long enough to span all the strings of the instrument. The illustrated device meets these requirements for a standard 6 string guitar whilst being of convenient size to carry in a pocket or wallet so being ideal for stage use or travelling musicians.

[0023] The illustrated device 2 was manufactured by taking a credit card sized rectangular plastics substrate, applying an adhesive to the plastics substrate, and once tacky, a layer of plastics micro-fibre fabric was applied to the substrate to cover both sides of the substrate the layers being pressed together to form the laminate. The laminate corners were then rounded off and all exposed edges of fabric/substrate laminate heated to melt and seal these edges. The end of the laminate by the folded end 16 of the fabric was then heated and bent out of plane to form the angled end portion and allowed to cool in this position.

[0024] The device 2 may be used, as will now be described with reference to Figures 5 to 8, to clean the metal strings 50 of a guitar 52 and the frets 54 of a fret board 56.

[0025] Referring to Figure 5, the cleaning device 2 is inserted between a pair of strings so the fold 14 of the device lies under a string. The device 2 can then be moved up and down the length of the guitar neck to absorb sweat, clean off dirt and abrade corrosion to polish the string, that may be present on the underside of the string being cleaned. The device will also, simultaneously, clean the fret wires underneath the string. This cleaning operation can be carried out by the player while the guitar is in the playing position.

[0026] Figure 6 and 7 illustrate a further cleaning mode in which the first portion 10 of the device 2 is inserted beneath all the strings 50 which can then be cleaned along with the frets 5 by moving the device 2 up and down the neck of the guitar 52.

[0027] Figure 8 illustrates a further cleaning mode in which the first portion 12 is laid across the top of the strings 50 and the tops of the strings 50 are cleaned by moving the device up and down the neck of the guitar while exerting the downward pressure.

[0028] The bendable, ie. flexible, nature of the device allows it to be extracted even if beneath the strings at the top of the neck of the guitar without straining and detuning the strings.

Claims

1. A cleaning device for in-situ cleaning of metal strings on a stringed musical instrument comprising a manually bendable, resilient laminate having a first planar portion (10) and an end portion (12) extending out of the plane of the first portion, the laminate comprising a layer (4) of plastics material sandwiched between two layers (6,8) of plastics micro-fibre fabric.

2. A device as claimed in claim 1, in which the fabric is a mixture of polyester and nylon.

3. A device as claimed in claim 2 in which the mixture is 76% by weight polyester and 24% by weight nylon.

4. A device as claimed in any preceding claim, in which the end portion is curved outwardly from the first planar portion and which meets the planar first portion at a straight edge (14).

5. A device as claimed in any one of claims 1 to 4, in which the end portion is planar and which meets the planar first portion at a straight edge (14), and/or the corners (20) of the laminate are rounded, and/or the fabric covers all of each side of the plastics layer, and/or the two layers of fabric are part of a continuous piece of fabric which also covers the end of the plastics layer along the extended edge of the end portion (12).

6. A device as claimed in claim 4, in which the first planar portion and the end planar portion meet at an angle of between 135° and 160°, preferably 150°, and, optionally in which the end portion extends outwardly from the first portion about 10mm, and, further optionally, the end portion extends to about 5mm out of the plane of the first planar portion.

7. A device as claimed in any preceding claim, in which the laminate is no more than 1.0mm thick.

8. A method of making the device of claim 1, comprising forming a laminate by securing a layer (6,8) of microfibre material to each side of a planar, manually bendable, resilient plastics substrate (4) to form a laminate and then deforming an end portion (12) of said laminate out of plane from the remainder of the laminate.

9. A method as claimed in claim 8, in which the method further includes any combination of

a) the fabric layers are secured to the substrate by adhesive.
b) a single piece of fabric is looped around an end of the substrate prior to securing the fabric to the substrate to form the laminate;
c) in which the edges of the laminate having an edge of the substrate exposed after forming the laminate are either heat-sealed and/or are stitched;
d) the corners (20) of the laminate are rounded off; and
e) the end portion is deformed out of the plane of the remainder of the laminate by heating the end portion, bending the edge to a desired shape and orientation and allowing the laminate to cool with the end portion in the desired shape and position.

Patentansprüche

1. Reinigungsvorrichtung für die in-situ Reinigung von metallischen Saiten von mit Saiten versehenden Musikinstrumenten, aufweisend ein manuell biegbare, federndes Laminat mit einem ersten ebenen. Bereich (10) und einem Endbereich (12), der sich aus der Ebene des ersten Bereichs erstreckt, wobei das Laminat eine Schicht (4) aus Plastikmaterial aufweist, das zwischen zwei Schichten (6,8) eines Mikrofasertuchs aus Plastik sandwichformig angeordnet ist.

2. Vorrichtung nach Anspruch 1, in der das Tuch ein Gemisch von Polyester und Nylon ist.

3. Vorrichtung nach Anspruch 2, in der das Gemisch 76 Gew.% Polyester und 24 Gew.-% Nylon aufweist.

4. Vorrichtung nach jedem vorstehenden Anspruch, wobei der Endbereich nach außen von dem ersten ebenen Bereich abgebogen ist und den ersten ebenen Bereich an einer geraden Kante (14) trifft.

5. Vorrichtung nach jedem der Ansprüche 1-4, wobei der Endbereich eben ist und den ebenen ersten Bereich an einer geraden Kante (14) trifft und/oder die Ecken (20) des Laminats gerundet sind und/oder das Tuch insgesamt jede Seite der Plastikschicht bedeckt und/oder die zwei Schichten des Tuchs Teil eines kontinuierlichen Stück Tuchs sind, das ebenfalls das Ende der Plastikschicht entlang der ausgezogenen Kanten des Endbereichs (12) abdeckt.

6. Vorrichtung nach Anspruch 4, bei der der erste ebene Bereich und der ebene Endbereich mit einem: Winkel zwischen 135° und 160°, vorzugsweise 150° aufeinander treffen und gegebenenfalls der Endbereich sich nach außen vom ersten Bereich um etwa 10 mm weg erstreckt und weiterhin gegebenenfalls der Endbereich sich um etwa 5 mm aus der Ebene des ersten Ebenenbereichs heraus erstreckt.

7. Vorrichtung nach jedem vorhergehenden Anspruch, in der das Laminat nicht mehr als 1,0mm dick ist.

8. Verfahren zur Herstellung der Vorrichtung in Anspruch 1, bei dem man ein Laminat **dadurch** bildet, dass man eine Schicht (6,8) eines Mikrofasermaterials an jeder Seite eines ebenen manuell biegbaren, federnden Plastiksubstrats (4) unter Bildung eines Laminats befestigt und anschließend einen Endbereich (12) des Laminats aus der Ebene des restlichen Laminats heraus formt.

9. Verfabren nach Anspruch 8, wobei das Verfahren jede Kombination umfasst, nämlich dass

a) die Tuchlagen an dem Substrat durch einen Klebstoff befestigt werden,
b) ein einzelnes Stück Tuch um ein Ende des Substrats vor der Befestigung des Tuchs am Substrat unter Bildung des Laminats herumgelegt wird,
c) die Kanten des Laminats mit einer freigelegten Kante des Substrats nach der Herstellung des Laminats entweder hitze-gesiegelt und/oder vernäht werden;
d) die Ecken (20) des Laminats abgerundet werden; und
e) der Endbereich aus der Ebene des restlichen Laminats heraus **dadurch** verformt wird, dass man den Endbereich erwärmt, die Kante zu einer gewünschten Form und Ausrichtung biegt und das Laminat abkühlen lässt, wobei der End-

bereich in der gewünschten Form und Position erhalten wird.

Revendications

1. Dispositif de nettoyage pour le nettoyage sur place de cordes métalliques sur un instrument de musique à cordes comprenant un stratifié élastique pliable manuellement ayant une première partie plane (10) et une partie terminale (12) s'étendant hors du plan de la première partie, le stratifié comprenant une couche (4) de matière plastique prise en sandwich entre deux couches (6, 8) de tissu de microfibre plastique.

2. Dispositif selon la revendication 1, dans lequel le tissu est un mélange de polyester et nylon.

3. Dispositif selon la revendication 2, dans lequel le mélange de 76% en poids de polyester et 24% en poids de nylon.

4. Dispositif selon l'une quelconque des revendications précédentes, dans lequel la partie terminale est courbée vers l'extérieur à partir de la première partie plane et s'unit à la première partie plane au niveau d'un bord droit (14).

5. Dispositif selon l'une quelconque des revendications 1 à 4, dans lequel la partie terminale est plane et s'unit à la première partie plane au niveau d'un bord droit (14), et/ou les coins (20) du stratifié sont arrondis, et/ou les coins du tissu recouvrent la totalité de chaque côté de la couche plastique, et/ou les deux couches de tissu font partie d'un morceau de tissu continu qui recouvre également l'extrémité de la couche plastique suivant le bord allongé de la partie terminale (12).

6. Dispositif selon la revendication 4, dans lequel la première partie plane et la partie plane terminale s'unissent en formant un angle entre 135° et 160°, de préférence 150°, et, en option, dans lequel la partie terminale s'étend vers l'extérieur à partir de la première partie d'environ 10 mm, et, ultérieurement en option, dans lequel la partie terminale s'étend de 5 mm hors du plan de la première partie plane.

7. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le stratifié à une épaisseur non supérieure à 1,0 mm.

8. Procédé pour réaliser le dispositif selon la revendication 1, comprenant la formation d'un stratifié en fixant une couche (6, 8) de tissu de microfibre plastique sur chaque côté d'un substrat plastique plan élastique pliable manuellement (4) pour former un stratifié et ensuite la déformation d'une partie terminale (12) dudit stratifié hors du plan du reste du stratifié.

9. Procédé selon la revendication 8, dans lequel le procédé comprend n'importe quelle combinaison de

   a) les couches de tissu sont fixées sur le stratifié par une colle;
   b) un unique morceau de tissu est enroulé autour d'une extrémité du substrat avant de fixer le tissu au substrat pour former le stratifié;
   c) les bords du stratifié ayant un bord du substrat exposé après la formation du stratifié sont soudés à chaud et/ou cousus ;
   d) les coins (20) du stratifié sont arrondis ; et
   e) la partie terminale est déformée hors du plan du reste du stratifié en chauffant la partie terminale, en pliant le bord avec une forme et une orientation désirées et en laissant le stratifié refroidir avec la partie terminale dans la forme et l'orientation désirées.

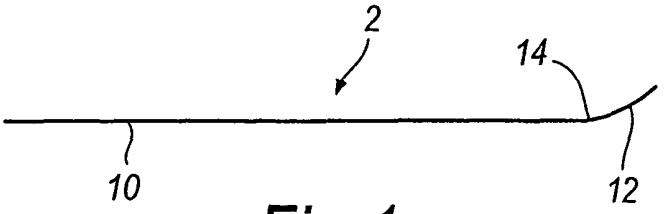

Fig.1

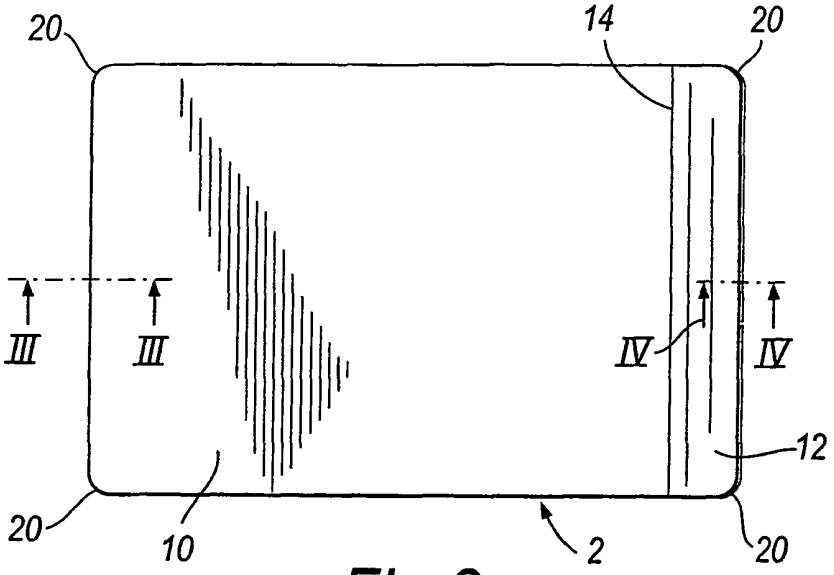

Fig.2

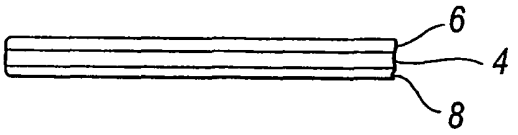

Fig.3

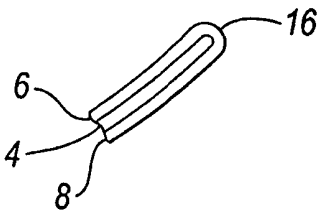

Fig.4

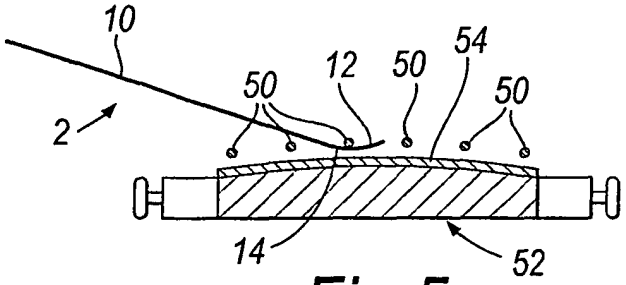

Fig.5

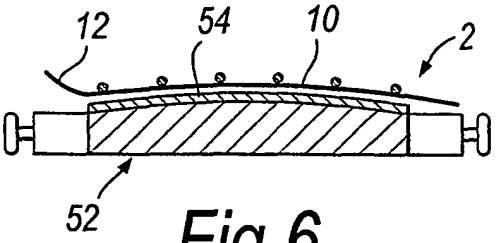

Fig.6

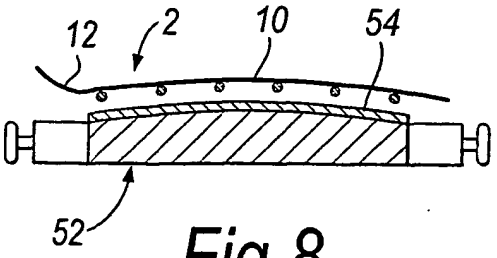

Fig.8

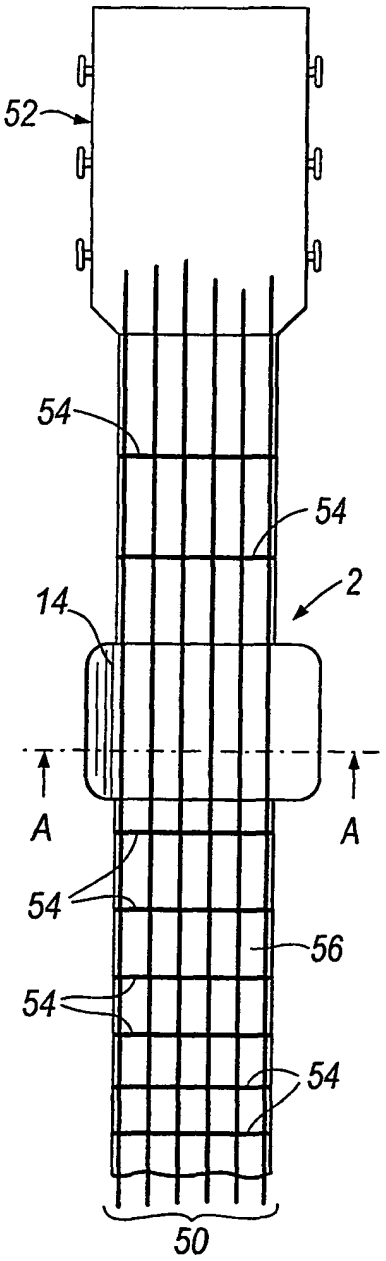

Fig.7

REFERENCES CITED IN THE DESCRIPTION

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