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⑤④ **Silicone art restoration system.**

⑤⑦ Works of art can be restored and preserved with direct deposition or transfer adhesive techniques wherein reinforcing substrates can be laminated to the reverse side of a painting. Either dimethylsiloxane based gums and methylphenyl siloxane based gums can form the basis of silicone pressure sensitive adhesives used in these techniques. The obverse side of a painting can also be preserved by the application of a zero-tack silicone adhesive having a high MQ silicone resin to gum ratio.

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SILICONE ART RESTORATION SYSTEM

The present invention provides a system utilizing silicone compositions for restoring and preserving works of art. Both the reverse and the face of a painting can be restored by utilizing reinforcing materials as well as silicone release coatings and pressure sensitive adhesives.

Paintings are in continuous need of repair. Since the early 15th century many great artists have chosen canvas as the surface to receive the paint which they formulated from linseed oil. The canvas and oil are sensitive to all environmental conditions and the exposure of canvas, especially to light, results in cumulative decay, weakening, and embrittlement of the cellulose material. Being hygroscopic, the canvas has poor dimensional stability. Variations in humidity put great stress on the canvas and the paintings. At high storage temperatures, the loss of oil from the paint is accelerated, thereby reducing the life of the art work. Oils are lost even under controlled conditions, but, much slower. The end result of the loss of oils is cracking, crazing, lifting, cupping and flaking of the paint.

Conservators of the early 15th century, until the present, have continuously sought better materials and methods for restoring and conserving priceless works of art. All of the past and current methods for applying adhesive materials to bond and flatten loose and cupped paint and to reinforce the canvas has resulted in some form of destruction of the art work. Heat and pressure irreversibly damage the painting by flattening the paint, thereby creating a poster-like effect. Vacuum pressures cause imprinting of the backing on the face of the painting. The end result is a board-like and lifeless finish which is significantly distorted.

A current method of restoration of deteriorated canvas and

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loosened flaking paint is to force beeswax into the art work with a hot flat iron. The use of heat and pressure, however, distorts the painting and flattens the original perspective, thereby resulting in the board-like effect discussed above. Some paintings that have
5 been restored in this manner have thereafter been subjected to heat when they are on display, causing the beeswax to flow and puddles and drips to form on and below the painting.

One of the most beautiful effects in a painting is the textural quality that results from the particular canvas surface chosen by the
10 artist, combined with the special way that each artist handles the brushes and paints. Delicately modeled features are highly vulnerable to many of the procedures intended to repair and preserve paintings. For example, attaching a new lining to the back and flattening the cupped paint and mending other areas traditionally
15 involve the use of organic adhesives such as pastes or glue or wax resin mixtures and require the combined use of heat and pressure upon the surface of the painting. Inevitably, the artistic textures become damaged or completely lost and paintings become so flat that they are almost indistinguishable from a print. Many great
20 works of art have, as a result of traditional methods, suffered more from restoration from the effects of time.

Now through the use of modern synthetic silicone pressure sensitive adhesives and release coatings, priceless works of art can be restored by the methods of the present invention without
25 destructive mechanical force or heating.

Silicones are man made materials in which organic and inorganic substances are chemically combined. The element silicon is present in sufficient amount to affect the properties of the material and provide desirable characteristics unavailable from
30 organic materials. Silicones offer outstanding resistance to heat, cold, chemicals and weathering.

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Silicone Pressure Sensitive Adhesives are made from inert high molecular weight silicone gum and a silicone resin. The mixture of gum and resin is condensed under controlled conditions to develop cohesive strength in the adhesive. The finished product being highly condensed has very low reactivity and is chemically neutral. The condensed adhesive will go through further chemical cleavage only through the use of a very strong catalyst and or high temperature (300-350F) in the presence of a peroxide.

When applied from a high solids solution the gelatinous property of silicone pressure sensitive adhesives prevents migration of the adhesive into porous materials, e.g., glass cloth, canvas teflon coated fabric. To obtain penetration it is necessary to thin the adhesive to a low solids concentration and viscosity with an aromatic solvent. Thinned adhesives are used to reinforce fabrics and for heat and pressure laminating.

Silicone adhesives are resistant to weather, radiation, bacteria, fungi and time. They do not become brittle at temperatures of plus 500° F. In a non-cured cross-linked state the adhesive can always be resolubilized with aromatic solvents or softened (swelled) with aliphatic solvents. When the solvent is removed the adhesive will return to its original form. When cross-linked with a catalyst the adhesive will not solubilize in solvents, but is affected by swelling and softening. When the solvent is evaporated from the cured adhesive it also will regain its original adhesive properties.

The ratio of gum and resin used allows for making silicone adhesives having a wide range of tackiness and physical properties. High gum content adhesives are very sticky and are used for making pressure sensitive masking and electrical insulation tapes. High resin content adhesives are non-sticky when the solvent is evaporated. They develop very high bond strength when applied from the solvent solution of when heat activated after solvent removal.

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Silicone pressure sensitive adhesives bond to both high energy and low energy surfaces, e.g., silicone rubber, etched teflon, polyester, kapton, glass cloth and silicone release coated paper. No heat or destructive mechanical methods are needed for restoring paintings with silicone adhesives. A tacky pressure sensitive adhesive is applied to the new reinforcing backing material by a transfer or direct deposition method. The adhesive is protected from dirt contamination with easy to remove silicone release coated paper until it is ready for use. It has been found that teflon coated glass fabric makes excellent backing material for strengthening of the canvas. An electrostatic hot table, which replaces the formerly used vacuum hot table is used as the means for leveling deformities in a painting. By utilizing electrostatics at low heat, e.g. 100°F, warped, cupped, and deformed paint, and also flaking or "tented" paint can be returned to their relatively flat plane before attachment to the new backing medium. The need for damaging surface pressure and previously necessary high heat levels, e.g. 160°F, has been eliminated.

The electrostatic table, with a variably controlled electronic static attraction and heating function built in beneath the table top, provides the necessary source of low warmth for some treatments, and a steady-state attraction function that evenly and firmly holds paintings, linings, or any other type of sheet material against the table top. After the flattening process, adhesion of the painting to the silicone coated backing takes place. Because the silicone is "pressure sensitive" (adhering on contact), adhesion is achieved immediately without heat or destructive pressure. However, the lining remains removable at any future time upon application of solvent naphtha, allowing stress-free peel off. In this type of lining the painting remains completely pristine and uncontaminated by any foreign material.

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If a painting is actually coming apart, that is, if paint is peeling off the obverse or face of the canvas, or if the canvas is rotting, it then becomes necessary to hold paint onto canvas or hold the canvas weave together. Often this condition is caused by
5 contact with water, either by accident, e.g. excessively damp conditions; or even merely the moisture from traditional lining
glues is sufficient to cause damage. These and other special problems require an adhesive capable of thoroughly penetrating
without causing alteration of artistic effects that usually remain
10 fully intact regardless of the severity of a problem. In the method of the present invention, a liquid silicone adhesive is employed that also does not require heat or pressure.

This silicone adhesive in a solvent solution is made to thoroughly penetrate the surface, front to back, by electrostatic
15 deposition, a process which forces the adhesive through and around the paint particles and canvas fibers. Through electric charging of the silicone adhesive, it can be applied over a wide area or to a specific repair area with ease. Excess silicone is removed with solvent after the paint particles have been flattened and reattached.
20 The teflon or other reinforcing lining can then follow as usual.

Tears and punctures in a canvas can be mended using a temporary silicone coated reinforcing tissue or fabric. Applied to a tear in a painting, it holds the edges together until it can be permanently joined. This temporary reinforcement can be left on
25 canvases with no ill effects, then removed with naphtha after permanent repairs are made.

Thus, the old method of saturating a painting with ordinary adhesives and subjecting it to heat and pressure while applying a lining, is eliminated. One can repair paintings without spoiling
30 their aesthetic qualities. The conservator never needs to introduce hazard to the painting. Furthermore, this method is particularly important in the treatment of modern works, many of which cannot be treated by any traditional method.

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The present invention provides processes for restoring works of art. In one aspect of the present invention, the reverse side of a work of art can be restored and preserved by applying a pressure sensitive silicone adhesive coating to a substrate which is suitable for reinforcing the back of the work of art. Such a substrate can desirably be teflon coated glass fabric as well as any synthetic fabric having a life expectancy greater than the canvas backing or other surface of the work of art or painting to be restored.

Once the silicone adhesive is coated on the reinforcing substrate, it is cured in place upon the substrate by well-known means. Next, the adhesive coated reinforcing substrate can be laminated to the work of art by utilizing a moderate amount of non-destructive pressure which activates the pressure sensitive silicone adhesive properties of the coating composition. This can be accomplished through the use of a light roller or similar pressure applicator.

It is desired to coat and cure the pressure sensitive adhesive on the reinforcing substrate at a time remote from the time for restoring a work of art, it is possible to preserve and protect the adhesive coating with a relatively less adherent inner liner facing which desirably can be selected from release coated supercalendared kraft paper, or other coated hard surfaces paper, as well as teflon, polyester films, plastic coated crepe paper and metal foils, etc., whereupon to later restore and reinforce the reverse side of the work of art it is merely necessary to peel or separate the inner liner facing from the silicone adhesive in much the same manner that a paper backing is removed from a gummed label, and the adhesive coated reinforcing substrate can then be laminated to the work of art. Of course, those skilled in the art will recognize that an inner lining is not necessary in those cases where the backing of a reinforcing substrate is itself relatively

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less adherent to the aggressive silicone adhesive, in which case it is possible to roll up the silicone adhesive coated substrate for later use.

5 An alternative process for restoring the reverse side of the work of art utilizes a transfer adhesive system. In such a system a first substrate, which ordinarily may be any kind of non-porous film or hard surfaced paper, and preferably will be super-calendered kraft paper, is coated with an MQ resin modified solventless silicone release coating (later described as Release Coating B) 10 which is capable of releasing an aggressive high-phenyl content silicone pressure sensitive adhesive which is also later described. Release Coating B is cured upon the first substrate by well-known means. Next, the high-phenyl content silicone pressure sensitive adhesive is applied upon the release coating and is cured in place 15 such that the first substrate now has two coatings upon it, namely, the silicone Release Coating B and the high-phenyl silicone adhesive. This doubly coated first substrate is then laminated to a second substrate, which is suitable for reinforcing and preserving the work of art. This second substrate is the same or similar to 20 those reinforcing substrates described above such as teflon coated glass fabric and others. Upon completion of this lamination step, one is left with a transfer adhesive system suitable for reinforcing the reverse side of a work of art at any desired future point in time. The restoration takes place merely by separating the first substrate 25 with its Release Coating B from the second substrate which retains the high-phenyl silicone pressure sensitive adhesive, since the aggressive adhesive is much more adherent to the second substrate than it is to the release coating to which it was in contact. Thus, one is left with the reinforcing, second substrate which is now 30 coated with the high-phenyl content silicone pressure sensitive adhesive which may be laminated to the work of art. Such lamination ordinarily will take place with moderate non-destructive

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pressure, as from a roller, which is effective for activating the desirable pressure sensitive adhesive properties of the coating.

5 The first substrate, which is coated with the silicone Release Coating B can be selected from the above-described hard surfaced papers as well as the teflon and polyester films, and plastic crepe, etc.

10 In a third aspect of the art restoration process of the present invention, the obverse side of a work of art, that is to say the artistic or painting side, can be restored and preserved by first pre-treating the obverse side with any means which compensate for deterioration suffered by the work of art to date. This deterioration would ordinarily take the form of chipped, flaked, cracked, cupped or crazed paint or particles of paint and the pre-treating can be accomplished by any of several means well-
15 known in the art restoration such as utilizing heat to soften the chips and flakes and moderate stretching of the canvas, or electrostatic forces applied to the surface of a painting and combinations thereof. Once the obverse side of a painting is so pre-treated, it is then possible to apply a zero-tack silicone adhesive (which is later
20 described as Silicone PSA-B) to the pre-treated obverse side or any portion thereof. The silicone adhesive can be applied directly or it may be carried by an effective amount of non-destructive solvent. The zero-tack silicone adhesive is brought into intimate contact with the chipped, flaked and cupped particles of paint and
25 this may be accomplished by utilizing a light brush or squeegee or electrostatic forces or combinations thereof, at which time the adhesive completely surrounds the particles of paint and fixes them to the canvas. Once the adhesive dries the painting is in a restored state. If a solvent is used with the zero-tack adhesive a
30 further step in the process, of course, would be the removal of any excess solvent.

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By zero-tack adhesive, it is meant that a particular silicone adhesive utilized in this aspect of the invention does not show any adhesive properties at room temperature after it has been air dried. This offers the advantage of allowing the painting to remain clean
5 by not picking up dirt and other particles, which would mar and detract from the restored painting.

One of the premier advantages of this aspect of the present invention is the possibility that any work of art so restored can be further restored again at any later time. This is possible because
10 any excess adhesive as well as the adhesive which actually fixes the particles of paint can easily be removed with a non-destructive, mild solvent rinse. These solvents can especially be aromatic solvents like naphtha, etc. It is thus possible to restore entire works of art or portions thereof over and over again at any desired
15 later time and there are no deleterious effects from removing the silicone adhesive from the canvas and fixed paint particles with such mild solvents.

The silicone materials which are particularly well-suited for the art restoration processes of the present invention are any of
20 various chemical compositions which characteristically have a plurality silicon to oxygen bonds in a chain or lattice framework. Silicon has a valence of four but when there are less than four oxygen atoms attached to the silicon, the remaining valences are ordinarily filled with substituted or unsubstituted organo groups.
25 Depending upon the particular combination of silicon, oxygen and organo substituents, a wide range of silicone fluids and resins can be produced, each of which has different desirable properties. Thus, there are an extremely large number of silicone compositions, some of which are available from several manufacturers and some
30 of which are proprietary with a single manufacturer.

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For example, one of the silicone compositions utilized by the present invention is denoted as a release coating. A release coating is a silicone composition which can be coated on a substrate (ordinarily paper) and when cured thereon it will adhere vigorously.

5 However, the exposed surface of the cured release coating can be coated or contacted with an adhesive or an adhesive coated second substrate yet will not aggressively adhere thereto. Thus, the release coated first substrate can be peeled away from the adhesive coated second substrate, leaving the adhesive intact on the second
10 substrate. By this means it would be an easy matter to laminate an adhesive coated reinforcing substrate to the back of a painting or other work of art.

One example of a silicone release coating is that described by Eckberg in U.S. Patent Application S.N. 40,015 filed May 17, 1979,
15 and which is hereby incorporated by reference. Eckberg's silicone release coating is basically a combination of (a) diorganopolysiloxane base polymer having up to approximately 20% by weight alkenyl or silanol functional groups and having a viscosity ranging from approximately 50 to approximately 100,000 centipoise at 25°C;
20 (b) a polymethylhydrogen siloxane fluid cross-linking agent having up to approximately 100% by weight SiH groups and having a viscosity in the range of approximately 25 to approximately 1000 centipoise at 25°C; (c) an effective amount of precious metal catalyst for facilitating an addition cure hydrosilation reaction between said
25 base polymer and said cross-linking agent; and (d) an amount of dialkyl carboxylic ester effective to inhibit the precious metal catalyzed hydrosilation cure reaction of said silicone composition at temperatures below the heat cure temperature of said silicone composition.

30 A more specific example of a silicone release coating which can be used in the present invention is one which contains (a) a vinyl chain-stopped polydimethyl-methylvinyl siloxane gum

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containing approximately 20% by weight vinyl groups and having a viscosity of approximately 100,000 centipoise at 25°C; (b) a trimethyl chain-stopped polymethyl hydrogen siloxane cross-linking fluid having approximately 10 to 100% by weight SiH groups and a
5 viscosity of approximately 25 to 1000 centipoise at 25°C; (c) approximately 10 to 500 ppm platinum in the form of a platinum complex catalyst; and (d) approximately 0.1% to 0.5% by weight diallyl maleate.

This silicone release coating is representative of a number of
10 such release coatings known in the art. It is available from the Silicone Products Division of the General Electric Company, and for the sale of convenience it will hereinafter be referred to as Release Coating A.

This release coating can be modified in order to provide
15 different properties. For example, when one wishes to use an aggressive silicone adhesive having a high-phenyl content as will hereinafter be described, it is desirable to modify the Release Coating A with an additional amount of MQ silicone resin effective for releasing the particular adhesive. In the silicone art, an MQ
20 resin refers to a polysiloxane product having primarily monofunctional and quadri- or tetra-functional structural units. For a general discussion, see Chapter One of Noll, Chemistry and Technology of Silicones, 2nd ed. 1968.

The MQ resin is obtained from condensed waterglass or sodium
25 silicate and is made up of M units ($R_3SiO_{1/2}$) and Q units (SiO_2) having an M to Q ratio of approximately 0.5 to 1.0 and preferably about 0.65. The R group denotes monovalent hydrocarbon radicals, especially lower alkyl groups like methyl.

When Release Coating A is modified with approximately 2.0 to
30 10 parts by weight of the above-described MQ resin it becomes particularly effective for releasing a high-phenyl content silicone adhesive which will hereinafter be described. This MQ modified

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version of Release Coating A will be referred to as Release Coating B.

There are a number of silicone adhesives available today, many of which are useful with the process of the present invention, especially silicone pressure sensitive adhesives. For an example
5 of a silicone pressure sensitive adhesive, see U.S. Patent 3,929,704 - Horning, which is hereby incorporated by reference. Such adhesives can have various substituent ingredients in order to provide desirable properties for different application. It is
10 well-known, for example, that many silicone products have excellent wide range temperature flexibilities. These adhesives will ordinarily contain a silicone resin, a silicone gum and a catalytic amount of curing agent. Various peroxides are well-known catalysts for these systems. Additionally, there may be
15 included plasticizers, extending fillers and process aids. These adhesives can be coated and cured on a substrate by well-known means and will become effective adhesives when sufficient activating pressure is applied.

Silicone pressure sensitive adhesives are ordinarily made up
20 of a high viscosity polydimethylsiloxane gum in combination with a triorgano-chain-stopped MQ silicone resin. For example, 100 parts by weight of a silanol chain-stopped polydimethyl siloxane gum having a viscosity ranging from approximately 100,000 to 100 million can be combined with approximately 50 to 200 parts by
25 weight based on the gum of an MQ resin as hereinbelow described, to form the basis of a silicone pressure sensitive adhesive having a viscosity determined by the gum. The ratio of resin to gum will also determine the adhesive's ultimate tack, peel, adhesion and dryness properties. Any of several catalyst systems can be
30 utilized, for example, the peroxides and amines. Especially useful are benzoyl peroxide and 2,4 dichloro benzoyl peroxide.

A so-called high-phenyl content silicone pressure sensitive

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adhesive can be provided in accordance with the methods taught by O'Malley in U.S. Patent 4,039,707 which is hereby incorporated by reference. The expression "high-phenyl content" refers to the fact that these adhesives have, in addition to the polydimethyl
5 siloxane gum described above, significant amounts of alkylaryl-polysiloxane gum. The adhesive may be obtained as the intercondensation product of a mixture of organopolysiloxane resin and at least one alkylaryl polysiloxane gum.

More specifically, a suitable high-phenyl content silicone
10 pressure sensitive adhesive is the intercondensation product of a mixture containing an organopolysiloxane resin comprised of SiO_2 units and $(\text{CH}_3)_3\text{SiO}_{1/2}$ units, and a silanol-stopped polysiloxane copolymer gum having a viscosity from about 200,000 to 15,000,000 centipoise at 25°C wherein the gum is comprised of diphenyl-
15 siloxane and dimethylsiloxane units, there being up to approximately 75% silicon-phenyl linkages of the total silicon-organic linkages.

The following examples demonstrate how the processes of the present invention can be used to restore and preserve works of art such as paintings.

20 Another adhesive useful in the practice of the present invention as denoted as a zero-tack silicone pressure sensitive adhesive. Zero-tack refers to the property of the adhesive that allows it to become tack-free or non-sticky when it has dried. This is a useful property for treating the obverse or face side of a painting.
25 Like many silicone PSA's, this adhesive is made from a base containing a mixture of dimethylpolysiloxane gum plus MQ silicone resin. However, in order to provide the tack-free properties there is an extraordinarily high MQ to gum ratio. For example, a 2 to 1 MQ to gum ratio will deliver satisfactory zero-tack
30 properties. The adhesive can be applied by itself or may be carried by a solvent, and when it dries there remains a tack-free adhesive bond between a substrate such as a canvas and the adhered moieties, such as paint particles.

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Example 1

A portion of super-calendared kraft paper had cured upon it a coating of a silicone Release Coating B which was modified with 5 parts by weight silicone MQ resin. Such a release coating is available from the General Electric Company. To this coated paper was applied a coating of a high-phenyl content silicone pressure sensitive adhesive having 75% phenyl-silicon linkages, which is also available from the General Electric Company. The exposed adhesive was then contacted with a teflon coated glass fabric, which is suitable for reinforcing the reverse side of a work of art. Since the bond to the teflon was stronger than to the release surface, when the kraft paper was removed the adhesive remained transferred upon the teflon coated glass fabric. The glass fabric was then laminated to the canvas backing of the work of art with the use of light roller pressure.

Note that it would have been a simple matter to apply the high-phenyl content adhesive directly to the glass fabric which then could be protected with an inner liner whereupon it would be used directly on the work of art rather than through the above-described transfer system.

Example 2

Several samples of various pressure sensitive silicone adhesives were applied directly to teflon coated fabric and cured thereon. Sample A was a high viscosity aggressive silicone adhesive having vinyl and phenyl gum constituents which is ordinarily useful for high temperature and electrical tape applications. Sample B was a silicone pressure sensitive adhesive made primarily from MQ resin and methyl gum, which was suitable for various tape applications and having moderate tack and cohesive and adhesive strengths. The adhesive also contained a small amount of rare earth octoate as a heat stabilizer. Both of these adhesives were coated and cured upon the teflon fabric whereupon

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they were laminated to the reverse side of works of art with moderate amounts of non-destructive pressure effective for initiating their pressure sensitive adhesive characteristics. Both samples were demonstrated to be suitable for reinforcing canvas backed paintings.

Example 3

The obverse side of a work of art was pre-treated with mild heat and moderate stretching in order to prepare the particles of flaked, chipped and cupped paint for re-attachment to the surface of the canvas. Once the paint particles were sufficiently flattened, a zero-tack silicone adhesive having an MQ resin to methyl gum ratio of approximately 2 to 1 and which had been thinned with toluene to a concentration of approximately 20% solids was lightly squeegeed against the entire surface of the painting in order to bring the adhesive into intimate contact with the paint particles and the canvas substrate. A moderate electrostatic charge was applied to assist the contacting of the adhesive with the particles. The excess solvent was removed and the adhesive was allowed to dry, thereby forming a zero-tack adhesive bond between the paint particles and the canvas.

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CLAIMS

1. A process for restoring the reverse side of a work of art, comprising the steps of: (A) applying a pressure sensitive silicon adhesive coating to a substrate suitable for reinforcing said work of art wherein said substrate suitable for reinforcing is a glass or synthetic fabric having a life expectancy greater than said work of art upon which it is to be laminated, and curing said adhesive coating on said substrate; and (B) laminating said adhesive coated substrate to said work of art with an amount of moderate, non-destructive pressure effective for activating said pressure sensitive adhesive.
2. A process as claimed in claim 1 wherein said reinforcing substrate is teflon coated glass fabric.
3. A process as claimed in claim 1 or claim 2 further comprising the steps of preserving said pressure sensitive silicone adhesive coating with a relatively less-adherent inner liner facing and separating said inner liner facing prior to laminating upon said work of art.
4. A process as claimed in claim 3, wherein said inner liner facing is selected from release coated hard surfaced paper, release coated super calendared

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kraft paper, teflon, and polyester films, plastic crepe, plastic coated crepe paper and metal foils.

5. A process for restoring the reverse side of a work of art, comprising the steps of:

(A) coating a first substrate with a silicone release coating capable of releasing a high-phenyl content silicone pressure sensitive adhesive wherein said silicone release coating is comprised of:

(i) 100 parts by weight of a silicone composition comprising,

(a) a diorganopolysiloxane base polymer having up to 20% by weight alkenyl or silanol functional groups having a viscosity ranging from 50 to 100,000 centipoise at 25°C;

(b) a polymethylhydrogen siloxane fluid cross-linking agent having up to 100% by weight SiH groups and having a viscosity in the range of 25 to 1000 centipoise at 25°C;

(c) an effective amount of precious metal catalyst for facilitating an addition cure hydrosilation reaction between said base polymer and said cross-linking agent; and

(d) an amount of dialkyl carboxylic ester effective to inhibit the precious metal catalyzed hydrosilation cure reaction of said silicone composition at temperatures below the heat cure temperature of said silicone composition, and



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(ii) 2.0 to 10 parts by weight of an MQ silicone resin having an M to Q ratio of 0.5 to 1.0 wherein M represents $(R_3SiO_{1/2})$ units and Q represents (SiO_2) units and R denotes a monovalent hydrocarbon radical; and curing said release coating on said first substrate;

(B) applying to said release coating a coating of a high-phenyl content silicone pressure sensitive adhesive wherein said adhesive is the intercondensation product of a mixture an organopolysiloxane resin and at least one alkylaryl polysiloxane gum; and curing said adhesive;

(C) laminating said doubly coated first substrate to a second substrate suitable for reinforcing said work of art;

(D) separating said release coated first substrate from said second substrate thereby transferring said high-phenyl content silicone pressure sensitive adhesive to said second substrate; and

(E) laminating said coated second substrate to said work of art.

6. A process as claimed in claim 5 wherein said silicone adhesive is the intercondensation product of a mixture containing an organopolysiloxane resin comprised of SiO_2 units and $(CH_3)_3SiO_{1/2}$ units, a

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silanol-stopped polysiloxane copolymer gum having a viscosity from 200,000 to 15,000,000 centipoise at 25°C comprising diphenylsiloxane and dimethylsiloxane, there being up to 75% silicon-phenyl linkages of the total silicon-organic linkages.

7. A process as claimed in claim 5 or claim 6 wherein said silicon release coating contains (A) a vinyl chain-stopped dimethyl methylvinyl polysiloxane gum containing approximately 20% by weight vinyl groups and having a viscosity of approximately 100,000 centipoise at 25°C; (B) a trimethyl chain-stopped methyl hydrogen polysiloxane cross-linking fluid having 10 to 100% by weight Si-H groups and a viscosity of 25 to 1000 centipoise at 25°C; (C) 10 to 300 ppm platinum catalyst; and (D) 0.1% to 0.5% by weight diallyl maleate.

8. A process as claimed in any one of claims 5 to 7 wherein said first substrate is selected from hard surfaced paper, super-calendared kraft paper, teflon, polyester films, plastic crepe, plastic coated crepe paper and metal foils.

9. A process as claimed in any one of claims 5 to 8 wherein said second substrate is a glass or synthetic fabric having a life expectancy greater than said work of art upon which it is to be laminated.

10. A process as claimed in claim 9 wherein said second substrate is teflon coated glass fabric.

11. A process as claimed in any one of claims 5 to 10 wherein said laminating step is accomplished through moderate, non-destructive pressure.

12. A process for restoring the obverse side of a work of art, comprising the steps of: (A) pretreating said obverse side with means to compensate for deterioration; (B) applying to said pretreated obverse side a zero-tack silicone adhesive comprising a mixture of dimethylpolysiloxane gum and MQ silicone resin wherein the resin to gum ratio is approximately 2 to 1, and wherein the silicone adhesive may desirably be carried by an effective amount of non-destructive solvent; (C) applying moderate non-destructive pressure to fix paint particles; and (D) allowing said silicone adhesive to air dry to a zero-tack finish.

13. A process as claimed in claim 12, wherein said means to compensate for deterioration include treating paint cracks, chips, flakes and cups with mild heat, moderate stretching, electrostatic force or combinations thereof.

14. A process as claimed in claim 12 or claim 13 wherein said zero-tack silicone adhesive is applied by brush, squeegee or electrostatic force.

15. A process as claimed in any one of claims 12 to 14 further comprising the step of removing any excess solvent.

16. A process as claimed in any one of claims 12 to 15 further comprising the step of removing any excess adhesive.

17. A product restored by a process as claimed in any one of the preceding claims.





European Patent
Office

EUROPEAN SEARCH REPORT

0033193

Application number

EP 81 30 0080

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
	<u>US - A - 4 156 399 (R.E. FIEUX)</u> * Column 3, line 29 - column 4, line 60; column 5, line 40 - column 6, line 14 * --	1,9,13	B 44 D 7/00
	<u>GB - A - 1 531 248 (THURMAN LTD)</u> * Page 2, lines 25-40 * --	3,4	
D	<u>US - A - 4 039 707 (W.J.O'MALLEY)</u> * Claims * --	5-8	TECHNICAL FIELDS SEARCHED (Int. Cl.)
P	<u>GB - A - 2 048 915 (GENERAL ELECTRIC)(Priority no. 40015 17-05-1979 US)</u> * Claims * --	7,8	B 44 D 7/00
A	<u>US - A - 3 258 376 (G.D. KLIMANN)</u>		CATEGORY OF CITED DOCUMENTS
A	<u>US - A - 3 096 194 (G.D. KLIMANN)</u>		
A	<u>US - A - 4 067 737 (A.V. LEWIS)</u>		
A	<u>DE - A - 2 518 218 (V.J. MEHRA)</u>		
AD	<u>US - A - 3 929 704 (A.E. HORNING)</u> ----		
☒ The present search report has been drawn up for all claims			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons &: member of the same patent family, corresponding document
Place of search		Date of completion of the search	Examiner
The Hague		22-04-1981	FRIDEN