Aug. 17, 1971 UMI TOSAKA ET AL 3,600,256

HOT STAMPING LEAF FOR CONCEALING INDICIA AND METHOD OF USING

Filed April 18, 1968

FIG. 1

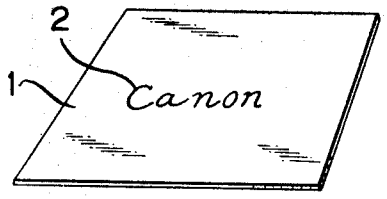


FIG. 2

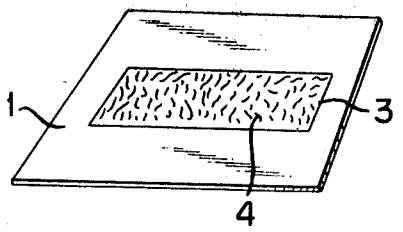


FIG. 3

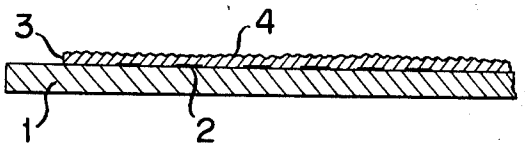


FIG. 4

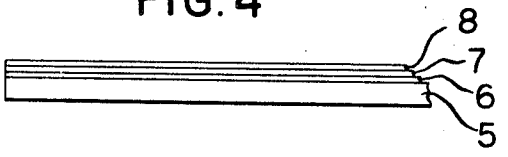


FIG. 5

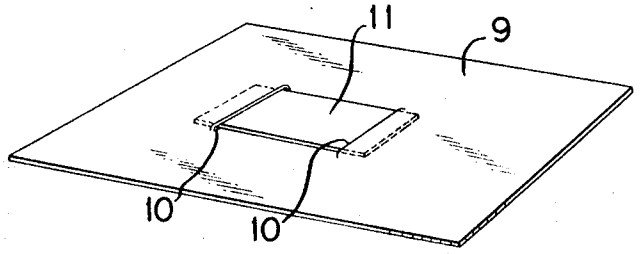
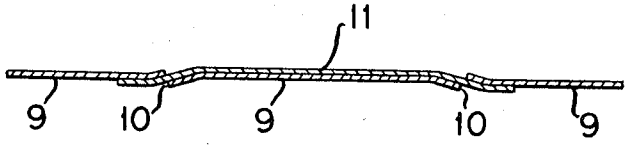


FIG. 6



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HOT STAMPING LEAF FOR CONCEALING INDICIA AND METHOD OF USING

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U.S. Cl. 161—3.5

16 Claims

ABSTRACT OF THE DISCLOSURE

A hot stamping leaf for concealing letters and signs which comprises a base film and a colored coating layer containing a material which near infrared ray and infrared ray can pass through, but visible ray cannot pass through. The colored coating layer may be mainly made of polyvinyl butyral resin and, if desired, another resin having average molecular weight of less than 10,000. The hot stamping leaf may have unevenness on the surface. Further, two ends of the hot stamping leaf may be inserted to two cuts provided on a base paper at a certain interval, respectively. The hot stamping leaf may be composed of a thermosensitive adhesive layer, a colored coating layer and a peelable layer successively provided on a base film.

This invention relates to hot stamping leaf for concealing codes or patterns.

Of recent, there is a big demand for quick-handling the informations consisting of codes or patterns and the maintenance of secrecy especially in the transfer of test data, the statement of main performance, or signatures.

In identifying the depositor of the deposit-note in bank-business, there is no other means to identify the depositor except for relying on the identification of stamps or signatures, and therefore if a malicious third party should pick up the deposit-note, and should forge the stamp or the signature on the deposit-note, the deposit could be easily drawn.

Therefore, in order to protect the depositors effectively there has been proposed such a method as to rely on the pictures or finger-prints of the depositors without having the stamps of the depositors on the deposit-notes.

However, in accordance with such a method as above, the handling thereof is very complicated, and therefore there has recently been proposed such a method as to retain the stamps, or signatures of the depositors in such a manner that the stamps or signatures cannot be easily read, i.e., they are put in a concealed state.

In accordance with the above mentioned system, the signatures or stamps of the depositors are handed to the depositors in such a state that the signatures and stamps cannot be recognized by a third party, and in depositing or refunding the same signatures or the same stamps are requested and are compared with the signatures or stamps in the concealed state, and the depositors can be identified.

Even if a malicious third party should pick up the deposit-note, when the above mentioned conditions are not satisfied, it is possible for a banker to reject the refund, and it makes easy to confirm the depositors themselves, and thus it is possible to effectively protect the depositors.

It is needless to cite the example of the bank business as above, but there is recently a big demand for concealing the informations such as signs or patterns to protect the secrecy of informations, and for quickly handling the same.

There have hitherto been proposed a number of methods for concealing signs and patterns, and for detecting the same when required.

For example, the structure and arrangement of the original image such as sign or pattern are modulated to conceal the sign and pattern by using fiber, random prism, etc. and when the modified sign and pattern is detected, the modified image is restored to the original image by using a decoder having the same modulating effect.

In the above given example, sign or pattern is used as the original image, and from the original sign or pattern the decodable modulated image is produced, and the original image is concealed. However, there are proposed various kinds of methods for concealing signs and patterns without producing the modulated images from the original image.

For example, in accordance with the method proposed by the inventors of this invention, signatures and patterns can be concealed and detected in the following manner. A signature or pattern is written by using an ink which infrared ray cannot pass through, such as an ink containing at least one of carbon black, metal powder such as aluminum powder, ferrous compound, etc., and a thin film layer which visible ray cannot pass, but infrared ray can pass, is adhered thereon to conceal the sign or pattern, and when the concealed sign or pattern is desired to be detected, a fluorescent plate is overlaid in front of the concealing film layer, and ultraviolet ray is irradiated from the front side to generate fluorescent light, and at the same time infrared ray is projected from behind the paper bearing said sign or pattern. The infrared ray does not pass through the portion where said concealed sign or pattern is written, but passes the portions other than the sign or pattern bearing portion. The illuminating fluorescent plate is irradiated by the infrared ray which has passed through the portions and the concealed sign or pattern on the paper can be produced on the fluorescent plate by the quenching effect of infrared ray.

This invention provides hot stamping leaf which is used in carrying out hot stamping (foil stamping carried out by hot mould) to the concealing film layer for concealing the sign or pattern.

The conventional hot stamping leaf is produced in such a manner that a peelable film layer, colored film layer, and thermosensitive adhesive layer are provided on a thin base film made of polyester film and the like, and the hot stamping leaf thus prepared is laid over the surface to be printed, and hot-pressing is carried out by using a die to adhere the colored film layer of the portion of die onto the surface to be printed with the layer of adhesive agent, and thereafter the base film is peeled out.

The hot stamping leaf of this invention is not used for printing as in the conventional methods, but the hot stamping leaf of this invention is characterized in that the hot stamping leaf of this invention is used for concealing the sign or pattern on a sheet. The gist of this invention resides in that the material having such a property that near infrared ray and infrared ray can pass the material, but visible ray cannot, for example, dyestuffs, pigments (except carbon black, aluminum metal powder, ferrous compounds and such like powders), is contained in the film layer formed in the leaf.

The layer containing a material which visible ray cannot pass through, but near infrared ray and infrared ray can pass, may be any of the peelable film layer, the colored film layer, the thermosensitive adhesive layer and the base film itself in a conventional hot stamping leaf. In other words, it is necessary to incorporate the material in at least one of those layers including the base film layer.

Important points in the hot stamping leaf for concealment of this invention are as follows.

(1) The base film can be easily peeled off after stamping, and it is not deteriorated with the lapse of time.

(2) The film of the colored layer can be clearly cut off along the border line between the stamped portion and unstamped portion.

(3) The sign or stamp can be perfectly concealed, and it is completely impossible to read the same as it is in the concealed state, and the concealed state thereof is not deteriorated with lapse of time.

(4) No curling occurs, and the adhesion onto the surface of a paper is excellent and the coating is uniform and the production thereof is easy and, furthermore, the cost of production is low.

The above are requirements for a hot-stamping leaf.

The inventors of this invention carried out a number of experiments for the above given requirements, they have successfully obtained excellent product and arrived at an excellent result.

Namely, according to another aspect of this invention, it is not required that the hot stamping leaf for concealment of this invention has a peelable film layer on the base film, but one layer containing both a coloring matter which near infrared ray and infrared ray can pass through, but no visible ray can pass through, and a thermosensitive adhesive is formed on a base film.

The hot stamping leaf of the above described structure is, in particular, mainly composed of polyvinyl butyral resin, and along with 3 to 25% of the coloring matter which near infrared ray and infrared ray can pass through, but no visible ray can pass through, on the basis of the amount of polyvinyl butyral resin. The polyvinyl butyral resin and the coloring matter are dissolved in an organic solvent, and the obtained solution is coated on a high polymer base film in such a manner that the thickness of the coating may become from 10 to 30μ after having dried the same, and thereafter the obtained leaf is dried.

The hot stamping leaf thus prepared can sufficiently satisfy the above given requirements from 1 to 4.

The hot stamping leaf thus obtained can produce excellent result, and the reason for this is that first of all the best peeling effect can be attained when polyvinyl butyral is used as the main component, and the peeling off of the thus prepared hot stamping leaf does not become remarkably difficult with the lapse of time.

For example when the copolymer of vinyl chloride and vinyl acetate which is generally known as a resin for paint, is used in place of polyvinyl butyral, it is easy to peel off the base film immediately after it is produced, but one month after the production thereof, the peeling becomes remarkably difficult, and the similar results can be observed when a number of other thermoplastic resins are used. On the contrary, when polyvinyl butyral is used, there is no such change with the lapse of time, and it is possible to obtain excellent state from the beginning and the excellent result can last for a long time.

In the conventional hot stamping leaves, a peelable layer is generally provided between the base film and colored coating film layer, but in accordance with the hot stamping leaf of this invention, it is not necessary to provide a peelable layer, and it is possible to attain satisfactory peeling effect.

On the other hand, when polyvinyl butyral is used, in concealing the sign or pattern on a sheet there is an advantage that the colored layer of the hot stamping leaf can be easily adhered on the sheet whose sign or pattern is to be concealed, by pressing hot stamp from behind the hot stamping leaf, and in peeling off the base film the colored layer can be clearly cut off on the border line between the stamped portion and the unstamped portion of the sheet.

In regard to other respect, the strength of the coating to the base film is excellent when polyvinyl butyral resin is used.

When a resin of relatively lower molecular weight below 10,000 having mutual solubility with polyvinyl butyral is added besides polyvinyl butyral to the resin of the colored layer in the above given modification, it is possible to increase the above mentioned advantages, and a remarkable improvement in the property that the colored layer can be clearly cut on the border line between the stamped portion and the unstamped portion when the base film is peeled off, can be obtained.

The colored coating film layer mainly composed of polyvinyl butyral has an adherability onto a paper, and at the same time it is also possible to form the adhesive layer as in the conventional stamping leaves by coating a resin of low thermally softening property, and thereby it is possible to lower the heating temperature of the stamp in adhering the colored film layer onto the sheet bearing sign or pattern to be concealed by using a hot stamp.

This invention provides other modifications of hot stamping leaf for concealment satisfying sufficiently the requirement No. 3.

In general, the sign or pattern to be concealed give a pressure onto the sheet bearing the same when said sign or pattern is given onto the sheet, and in accordance with the pattern, concaved portion is produced by the pressure, or on the contrary the pattern is convexed by the printing ink coated in accordance with the pattern, or such like changes ar brought about, and there is difference in the affinity of the ink of the pattern and the sheet and the difference in the surface reflection or lustre of the concealed layer is changed in accordance with the inside pattern, and thereby the concealed pattern can be easily read, and the object of concealment cannot be attained.

In accordance with the hot stamping leaf based on a modification of this invention, the concealment film layer for covering the pattern on the sheet to be concealed is provided, and a number of fine concaves and convexes, i.e. unevenness, are provided on the concealment layer.

As the means for providing said fine concaves and convexes, in concealing the sign or pattern on the sheet, and in pressing hot stamp through hot stamping leaf, concaves and convexes are provided on the pressing surface of said stamp, and fine concaves and convexes can be given onto the sheet without fail.

When hot stamping leaf is left out naked, it is remarkably difficult to tell which is the right surface and which is the reverse side, and therefore the wrong side is placed, such mistake is often made. When leaf is too small, it is difficult to place the same on the right position when hot stamp is pressed thereon in carrying out the concealing operation, or when pressure is given onto the whole periphery of the hot stamp, it is very difficult to peel off the base film in the next process, and the operationability becomes poor.

The hot stamping leaf of this invention has such a form in order to remove the above mentioned drawbacks of the conventional hot stamping leaves, that two linear cuts

are provided with an appropriate interval between them on a strong base, and said leaf is inserted into such grooves.

When such a structure as above is employed, the position of the hot stamping leaf can be determined by the cut grooves, and therefore in carrying out the operation for concealing sign or pattern by carrying out hot stamping, the leaf with the base is laid over the surface of the material to be printed, and the hot stamp is pressed from behind the base paper, and after having pressed, the base paper is pulled up, and while pulling up the base paper, the base film of the leaf is peeled out.

Therefore, there is no fear that the right and wrong side of the leaf should be mistaken in carrying out the stamping operation, and when the size of the base paper is adjusted to be the same with the material to be printed, it is possible to correctly place a small naked leaf only by overlaying the same, and it is possible to easily peel off the base film by peeling off the base paper.

The object of this invention is to provide the stamping leaf for concealing the signatures and patterns.

Another object of this invention is to provide the hot stamping leaf for concealing signatures or patterns which comprises existing a material which near infrared ray and infrared ray can pass through, but no visible ray can pass through, for example, dye-stuff, pigment or metal powder, in the colored layer formed on the base film.

Another object of this invention is to provide the hot stamping leaf for concealment which comprises coating the colored layer containing a material which near infrared ray and infrared ray can pass through, but no visible ray can pass through, on the base film in such a manner that the thickness of the colored layer coating may become from 10 to 30μ.

Another object of this invention is to provide the hot stamping leaf for concealment having excellent operationability for concealment such as easy determination of the position for placing the leaf correctly onto the signs or patterns to be concealed.

Another object of this invention is to provide the hot stamping leaf for concealment, the structure thereof being simple, the production thereof being easy, and the cost of production thereof being economical.

Another object of this invention is to provide the hot stamping leaf for concealment having excellent concealing effect.

Other objects and characteristics and advantages of this invention will be clarified from the embodiments which are explained in accordance with the attached diagrams.

The embodiments shown by the attached diagrams are simple examples given for explaining this invention, and the following embodiments do never restrict the scope of this invention.

This invention is explained briefly in accordance with the attached diagrams.

FIG. 1 is an aslant view of the sheet bearing letters to be concealed before the hot stamping leaf of this invention is used for concealing the letters;

FIG. 2 is an aslant view of the sheet showing the state of the letters on the sheet concealed by forming the concealment film layer on the sheet bearing letter to be concealed by using the hot stamping leaf of this invention;

FIG. 3 is an enlarged vertical cross sectional side view of FIG. 2;

FIG. 4 is an enlarged side view showing the form of the hot stamping leaf for concealment of this invention;

FIG. 5 is an aslant view showing another embodiment of the hot stamping leaf of this invention;

FIG. 6 is a vertical side view of the hot stamping leaf of FIG. 5.

Referring FIG. 1 through FIG. 3, the method for concealing the letters written on the sheet by using the hot stamping leaf of this invention, is explained in the following paragraphs.

FIG. 1 shows a sheet **1** of paper or thin plastic plate bearing the sign to be concealed, reading "Canon" written in the ink mainly composed of carbon black, etc.

Next, the hot stamping leaf, about which it is described hereinafter, is placed on said sheet **1**, and the hot stamp (not shown) having a plane surface covering the whole surface of the portion **2** of "Canon" as is shown in FIG. 2 and is required to be concealed, is pressed from behind the hot stamping leaf, and the colored coating film **3** formed on the hot stamping leaf in the form of layer, is transferred onto the sheet **1**, and the coating film **3** is closely adhered on the sheet by the heat of the stamp.

In such a state as above, the colored coating film formed on the sheet has the property that near infrared ray and infrared ray can pass through the film, but no visible ray can pass through, and therefore the letters **2** which is written on the sheet and is required to be concealed, can be made unreadable and concealed.

In the above given embodiment, when a great number of fine concaves and convexes i.e. unevenness are provided on the surface of the stamp to be press-contacted against the hot stamping leaf, fine concaves and convexes can be formed on the colored coating film layer provided on the sheet **1** in accordance with the concaves and convexes of the stamp.

The unevenness, that is, fine concaves and convexes, are provided for the purpose of preventing the fear that the concealed letters can be read since the portion corresponding to the letters on the film layer **3** is embossed when the letters are written with a printing ink and the ink is embossed, even if the concealment film layer, i.e., the colored coating film layer **3**, is formed on the sheet.

Such unevenness as above improves the concealability, and in addition to that, the fine concaves and convexes are effective when concaves are formed on the sheet **1** in accordance with the letter **2** to be concealed when said letter is written on the sheet and strong pressure is given to the sheet **1**.

Further, the difference of surface reflection or lustre on the concealment layer, i.e., the colored coating layer **3**, caused by the difference in affinity with the concealment layer of the ink of the letter **2** and the sheet **1**, is changed in accordance with the inside pattern, and thereby the concealed pattern can become readable. The uneveness can prevent such undesirable matter.

In general, ordinary papers for writing or printing have poor visible ray permeating property, but can pass infrared ray.

The ink mainly composed of carbon black has the strong effect to prevent infrared ray as well as visible ray.

Therefore, when the sheet is irradiated from behind the concealed sheet **1** by using the infrared ray source or the infrared ray source combined with the filter for passing only infrared ray and the light source, the portion on the sheet **1** other than the portion bearing the letter **2** can pass infrared ray, but since there is the effect to prevent infrared ray on the letter portion **2**, it is possible to obtain the infrared ray having passed through the portion other than the letter portion **2** in the front surface of the sheet **1**.

The concealment layer, i.e., the colored coating film layer **3**, formed on the sheet **1**, has such a property that infrared ray can pass through and no visible ray can pass through as described below, and therefore when the colored coating film layer **3** is closely contacted on the sheet, it is possible to obtain infrared ray having passed through the portions other than the letter portion **2** from the upper surface of the sheet **1**.

Since the sheet has such a property as above, the concealed letter can be detected in the following manner.

Namely, a fluorescent plate of the same size as the sheet **1** is laid over the upper surface of the sheet **1**, and ultraviolet ray is irradiated all over the fluorescent plate by using the ultraviolet ray source from the front surface

of the fluorescent plate, to carry out the ultraviolet ray stimulation and fluorescence is generated on the whole surface of the fluorescent plate.

Thereafter, infrared ray is irradiated from behind the sheet **1**, and the infrared ray passes through the portion other than the letter portion **2**, and the infrared ray image other than the letter portion is produced on the fluorescent surface, and the portion of the fluorescent plate where the infrared ray image is produced can be quenched by the quenching effect on the fluorescent plate, and the portion of the fluorescent plate corresponding to the letter portion **2** retains the illumination. As a result, the letter image of the letter portion **2** can be formed as a visible image, and thereby the letter written on the sheet can be detected.

Next, the following is an explanation about the hot stamping leaf in which the contact concealment layer, i.e., the colored coating film layer, for concealing the letters written on the sheet, is formed.

FIG. 2 is an enlarged side view of an embodiment showing a modification of the conventional hot stamping leaf to be used for concealment, which is characterized in that the peelable layer **6**, the colored coating film layer **7**, the thermosensitive adhesive film layer **8** are provided in the form of layer on the base film **5**, and in particular, a colored coating film layer **3** containing the dye-stuff having such a property as to pass near infrared ray and no visible ray is used.

As the dye-stuffs having such properties, such dye-stuffs as C.I. 26150, 26300, 26370, 50415, 50420, etc., or a mixture of C.I. 61705, 61565, 12700 can be appropriately used.

The dye-stuffs may be dispersed into the peelable layer **6**, or the adhesive layer, **8** and the adhesive layer **8** may be provided on the surface of the material to be adhered.

In place of the dye-stuffs above, the pigments, or metal powder, or ferrous compounds having the property as to pass infrared ray and no visible ray may be used.

In order to carry out the concealing operation by using such hot stamping leaf as above, the surface of the adhesive layer **8** of the leaf is laid over the surface of the sheet bearing the letter **2**, and hot pressing is carried out by using the stamp (dies), and the colored coating film layer is closely contacted to the surface of the sheet by means of adhesive layer, and then the base film is peeled off, and the colored coating film layer **3** for concealing the letter portion **2** on the surface of the sheet **1**, is formed closely to carry out the concealing operation.

Next, the second embodiment of the hot stamping leaf is explained.

The hot stamping leaf for concealment may be prepared by laying successively the peelable film layer, the colored coating film layer, and adhesive film layer on the base film as mentioned above. Further, it may be prepared by forming said three layers into one layer.

In other words, about 10 to 50μ thick base film of polyester, polypropylene and such like high polymer film is selected, and the solution prepared by dissolving the mixture of polyvinyl butyral resin and 3 to 25% of coloring matter having the property as to pass infrared ray and no visible ray, such as the dye-stuff (produced by Ciba Co. Ltd. under the trademark of Orasol BV) into an organic solvent, is coated on the base film in such a manner that the thickness of the coating can become from 10 to 30μ after drying the same.

As a resin for forming said colored layer, in addition to polyvinyl butyral, a resin which is mutually soluble in polyvinyl butyral and whose molecular weight is below 10,000 may be added to polyvinyl butyral at the amount of below 50%.

As the examples of the resin to be added to the polyvinyl butyral, phenyl resin, urea resin, melamine resin, alkyd resin, sulfonamide resin, maleic acid resin, or ester gum may be given.

The best result is expected when the thickness of the colored layer is from 10 to 30μ.

The reason for this is that when the thickness of the colored layers formed on the sheet, is below 10μ, it is easy to read the signature or stamp directly, and when the thickness of the colored layer is above 30μ, the formation of the coating film is difficult and at the same time it is easy to bring about embossment or cracking from the base film as has been confirmed by experiments.

On the other hand, the reason why the mixture rate of the coloring agent to the resin is set to be from 3 to 25%, is that when the amount of the coloring agent is below 3%, the signatures and stamps are readable and when the amount of the coloring agent is above 25%, the coating of the colored layer becomes remarkably brittle, and the embossment or cracking from the base film can be easily brought about.

In particular, as mentioned above, when the resins of relatively lower molecular weight below 10,000 having the mutual solubility with polyvinyl butyral is added in addition to polyvinyl butyral, it is possible to increase the strong point.

Especially, remarkable improvement can be attained in the property that the colored layer can be clearly cut off on the border line between the stamped portion and unstamped portion.

However, when the amount of the coloring agent becomes above 50%, the property peculiar to the resin to be added becomes too strong, and the above mentioned excellent properties of polyvinyl butyral resin is lost.

The colored layer mainly composed of polyvinyl butyral resin has excellent adherability to the surface of paper, and it is not necessary to especially provide the adhesive film layer as in the hot stamping leaf formed on the base film as mentioned above, but it is possible to form the adhesive film layer as mentioned above by coating the resin of low thermally softening property on polyvinyl butyral resin. As the examples of such resin, butyl methacrylate polymer, a copolymer of vinyl chloride and vinyl acetate, polyvinyl acetate, hydrogenated resin, or pitch can be given.

The thickness of the coating film of below 5μ may be satisfactory.

The following are the concrete examples of this invention.

EXAMPLE 1

10 g. of polyvinyl butyral resin, the average degree of polymerization thereof being from 300 to 400, the acetalizing degree thereof being above 67 (produced by Sekisui Chemical Industry Co., Ltd. under the trademark of S-lec BLS) and 1.5 g. of the dye-stuff (produced by Ciba Co., Ltd. under the trademark of Orasol BV), and an appropriate amount of methyl ethyl ketone were mix-dissolved, and the mixture thus obtained was coated on a polyester film whose thickness is 25μ by using a wire bar coating process in such a manner that the thickness of the coating could become 12 to 25μ and the coated polyester film was dried at 70° C. in a drier for 10 minutes, and the hot stamping leaf was obtained.

Thus obtained hot stamping leaf was pressed on a sheet for 5 seconds by using a hot die (stamp) at 140° C. in carrying out the concealment, and the colored layer for concealment was formed on the sheet.

EXAMPLE 2

The solution obtained by dissolving methacrylic acid butyl resin (produced by Fujikura Kasei Co., Ltd., under the trademark of Acrybase LS-2003E) into methyl ethyl ketone, was coated on the hot stamping leaf obtained in Example 1, and then the hot stamping leaf was dried. Thus prepared hot stamping leaf produced an excellent result when the stamping operation was carried out at the dies temperature of about 100° C.

EXAMPLE 3

1 g. of maleic acid resin (produced by Nippon Reichhold Chemicals, Inc. under the trademark of Beckacite

1111; the average molecular weight thereof being below 10,000) was added along with the polyvinyl butyral resin of Example 1, and 1 g. of the dye-stuff "Orasol" was added.

The operation was carried out in the same manner as in Example 1 except for the above, and the obtained coating layer could be easily cracked when bent, and therefore the property thereof that the coating layer can be clearly cut on the border line between the stamped portion and the unstamped portion is remarkably excellent.

In this example, in place of Beckacite 1111, Superbeckacite 1001 (phenol resin), Beckamine P138 (urea resin), and Superbeckamine J820 (melamine resin) produced by the same company were used, and the same result could be obtained.

In Example 3, the amount of Beckacite 1111 was changed systematically through 0.25 g., 0.5 g., 1 g., 2 g., 4 g., 8 g. and 16 g. to 10 g. of polyvinyl butyral resin, to study the property of the coating, and it was found out that the brittleness of coating is increased as the amount of Beckacite 1111 is increased, and when the amount of Beckacite 1111 is below 4 g., practically excellent result is obtained, and when it goes beyond 4 g., crack is produced naturally.

In Example 1, the amount of Orasol dye was changed systematically through 0.5 g., 1 g., 1.5 g., 2 g., and 2.5 g. to the amount of polyvinyl butyral resin, and the concealability thereof to conceal a signature or stamp was checked, and as a result, when the amount was 0.5 g., it was readable and when it was 2.5 g., the coating was very brittle and it was difficult to coat uniformly.

Further, the thickness of the colored layer in Example 1 was systematically changed through 5μ, 10μ, 15μ, 20μ, 25μ, 30μ, 35μ, and 40μ, and as a result, when the thickness of the colored layer was below 10μ, signature or stamp could be read, and when it was above 30μ, it was easy to bring about the embossment from the base film or cracks, and coating operation became difficult.

The following is an explanation about the hot stamping leaf which can produce remarkably excellent result in concealing operation in accordance with FIG. 5 and FIG. 6.

As is shown in FIG. 5, the stamping leaf of this modification, can be prepared in such a manner that two linear form cuts **10** are provided with a predetermined interval on the base paper **9** which is thin and strong, and both ends of the naked stamping leaf **11** are inserted into said two cuts **10**.

FIG. 6 shows the cross sectional view of the stamping leaf.

In order to carry out the concealing operation by means of the stamping leaf through hot stamping, the surface of the leaf **11** with the base paper **9** adhered thereto is placed on the sheet bearing the letters to be concealed, and hot stamping is carried out from behind the base paper, and the pressing operation is carried out, and after the pressing operation, the base film of the leaf is peeled off while pulling up the base paper.

In such a leaf as above, the naked leaf is provided on the surface of the base paper from the beginning, and therefore there is no fear that the right and wrong side of the leaf should be mistaken in carrying out the stamping operation (concealing operation), and at the same time when the size of the base paper is adjusted to be the same with the size of the sheet surface, it is easy to place a small leaf on a predetermined position only by overlaying these, and when the pressure is desired to be given on the whole periphery of the naked leaf, it is easy to carry out the peeling off the base film only by peeling off the base paper in spite of the fact that the whole surface of the leaf is stamped since both the ends of the naked leaf coming out of the cuts **10** are adhered on the base paper **9**, and thus there is advantage that the stamping on the whole surface of the leaf can also be carried out efficiently, and the concealing operation can be remarkably effectively carried out. The base paper **9** is not restricted to paper, but it may be any heat resistant base support.

What is claimed is:

1. An article containing a concealed sign, pattern, signature or the like which infrared ray cannot pass comprising a colored coating layer comprising a polyvinyl butyral resin with up to below 50% of an additional resin mutually soluble in said polyvinyl butyral resin and having a molecular weight below 10,000 said layer containing from 3%–35% of a material which near infrared ray and infrared ray can pass through but visible ray cannot pass through and having a thickness of from 10μ to 30μ being closely adhered to a sheet containing said sign, pattern, signature or the like, the latter being disposed on the surface of said sheet in contact with said colored coating layer.

2. An article according to claim **1**, wherein said resin comprises polyvinyl butyral.

3. An article according to claim **2**, wherein said additional resin is of the class consisting of phenol resin, urea resin, melamine resin, alkyd resin, sulfonamide resin, maleic acid resin and ester gum.

4. An article according to claim **1**, wherein said material is of the class consisting of dyestuffs and pigments.

5. An article according to claim **1**, wherein said colored coating layer and such sheet are joined through an intermediate adhesive film layer.

6. An article according to claim **5**, wherein said adhesive film layer is of the class consisting of butyl methacrylate polymer, a copolymer of vinyl chloride and invyl acetate, polyvinyl acetate, hydrogenated resin and pitch.

7. An article according to claim **6**, wherein said colored coating layer is attached to a peelable layer, the latter in turn being attached to a base film.

8. An article according to claim **7**, wherein the base film at the middle part of the article faces the base support and the ends of the article are inserted to cuts at an interval in the base support.

9. An article according to claim **1**, wherein the surface of said colored coating layer is uneven containing a number of fine concaves and convexes.

10. An article according to claim **7**, wherein the surface of said colored coating layer is uneven containing a number of fine concaves and convexes.

11. A process for forming an article containing a concealed sign, pattern, signature or the like which infrared ray cannot pass, said process comprising hot pressing onto the design, pattern, signature or the like-bearing surface of a sheet a colored coating layer comprising a polyvinyl butyral resin with up to below 50% of an additional resin mutually soluble in said polyvinyl butyral resin and having a molecular weight below 10,000 said layer containing from 3% to 25% of a material which near infrared ray and infrared ray can pass through but visible ray cannot pass through and having a thickness of from 10μ–30μ said colored layer being coated upon a base film, whereby said colored coating layer becomes closely adhered to said sheet.

12. A process according to claim **11**, wherein said resin comprises polyvinyl butyral.

13. A process according to claim **11**, wherein said additional resin is of the class consisting of phenol resin, urea resin, melamine resin, alkyd resin, sulfonamide resin, maleic acid resin and ester gum.

14. A process according to claim **11**, wherein said material is of the class consisting of dyestuffs and pigments.

15. A process according to claim **11**, wherein said colored coating layer contacts said sheet surface through an intermediate adhesive film layer coated upon said colored coating layer, and wherein a further peelable layer is disposed between said colored coating layer and said base film.

16. A process according to claim **15**, wherein said adhesive layer comprises a resin of the class consisting of

butyl methacrylate polymer, a copolymer of vinyl chloride and vinyl acetate, polyvinyl acetate, hydrogenated resin and pitch.

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