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(54) Composite sheet or ribbon, particularly for printing with thermal sublimation dyes

(57) A composite sheet or ribbon, particularly for printing with thermal sublimation dyes, comprising a supporting layer (11) onto which, at least on one side, a bonded paper-aluminum element (13) is glued by using an adhesive (12) with the paper side facing outwards, the paper side being printed with thermal sublimation dyes, the melting temperature of the adhesive (12) being lower than the sublimation temperature of the dyes.

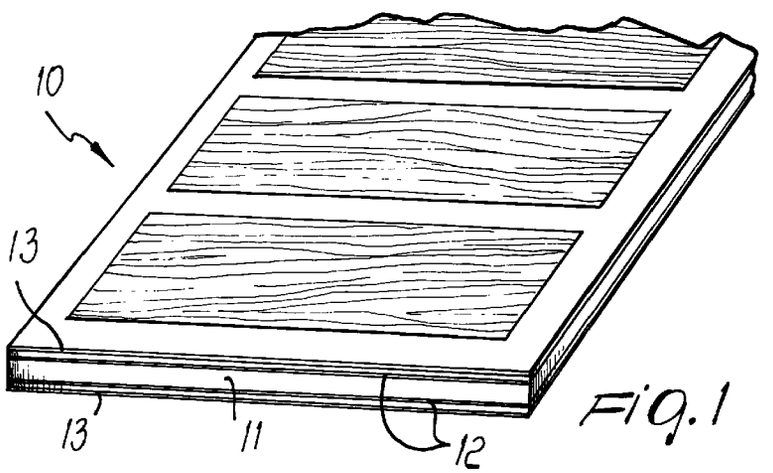

Fig. 1

EP 0 749 846 A2

Description

The present invention relates to a composite sheet or ribbon, particularly for printing with thermal sublimation dyes.

Printing with thermal sublimation dyes is currently increasingly used to produce particular aesthetic effects on various products or to reproduce images on objects of various kinds.

The production of plastic surfaces printed so as to imitate wood or marble, as well as spectacle frames on which various and sometimes very complex color effects are obtained which reproduce for example ribbing or particularly ornamental patterns are mentioned merely by way of example.

These productions are indeed currently obtained by using thermal sublimation dyes that are deposited on a backing sheet arranged so as to cover the parts to be treated.

The main problem of the transfer of said sublimating dyes from the backing to the object resides in the fact that said backing wraps with a certain difficulty and approximation when the objects printing whereof is to be performed have rather complex surfaces.

In order to solve this problem, backings have been used which are made of a paper-aluminum bonding, in which the paper is tissue-paper thin; due to its known plastic adaptability characteristics, said bonding allows to produce far better wrappings even on rather complex surfaces.

With reference to the methods for printing the backing, it is possible to use printing with the offset method, which currently provides the highest quality levels, especially in relation to the image definition and formation.

Offset printing, however, requires a backing having good mechanical resistance to folding and dimensional stability, due to the several roller guides that are present in the machines that perform offset printing.

This mechanical resistance is not achieved by the backing constituted by the paper-aluminum bonding, which forces the use of printing methods such as screen printing or flexography, which on one hand do not require particular mechanical characteristics but on the other hand are limited, with respect to the offset method, in image definition and formation.

A principal aim of the present invention is to provide a sheet or ribbon having at the same time good mechanical resistance to folding, such as to allow offset printing with a cut-sheet printing machine, and a good ability to wrap even around objects having a complicated surface.

Accordingly, an object of the present invention is to provide a sheet or ribbon the production, printing, and application process whereof has times and costs that are competitive with respect to conventional processes.

Another object of the present invention is to provide a sheet or ribbon the cost whereof in terms of component materials is competitive with paper backings and bonded paper-aluminum backings.

Another object of the present invention is to provide a sheet or ribbon that can be produced with known technologies and entails no limitation as to the execution of high definitions and the formation of images.

Another object of the present invention is to provide a sheet or ribbon that can adapt to the most disparate fields of utilization, including in particular the eyewear industry, in which dye-sublimation printing can be applied.

This aim, these objects, and others which will become apparent hereinafter are achieved by a composite sheet or ribbon, particularly for printing with thermal sublimation dyes, characterized in that it comprises a supporting layer onto which, at least on one side, a bonded paper-aluminum element is glued by means of an adhesive with the paper side facing outwards, said paper side being printed with sublimating dyes, the melting temperature of said adhesive being lower than the sublimation temperature of said sublimating dyes.

Advantageously, the bonded paper-aluminum parts are disconnected from the sheet or ribbon for thermal sublimation printing.

Further characteristics and advantages of the present invention will become apparent from the following detailed description of an embodiment thereof and of its process for printing and application during production, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is an axonometric view of a composite sheet or ribbon according to the invention;
figure 2 is a sectional view of the composite sheet or ribbon of figure 1, shown during production;
figure 3 is an axonometric view of the composite sheet or ribbon, shown in an application step.

With particular reference to figures 1 and 3, a composite sheet or ribbon, particularly for offset lithography with thermal sublimation dyes, according to the invention, is generally designated by the reference numeral 10.

The sheet or ribbon 10, in this case, comprises a supporting layer 11 made of paper-like material of good consistency, such as card, on both faces whereof two bonded aluminum-paper elements 13 are respectively glued by means of a per se known adhesive, which has a melting temperature that is lower than the sublimation temperature of the dyes and is represented in the figures by two layers 12; the paper part of said bonded elements has the consistency of tissue paper, is directed outwards, and is printed with said thermal sublimation dyes.

Merely by way of example, it is possible to use paraffins and/or microcrystalline waxes as adhesives, both having a melting temperature that lies between 60° and 90° Celsius and is therefore distinctly lower than the sublimation temperature of the dyes, which usually ranges between 140° and 220° Celsius.

The method for producing, printing, and applying the composite sheet or ribbon 10 described above is described hereinafter.

The method consists in: gluing, in this case at both faces of the supporting layer 11, by means of the adhesive 12, the corresponding bonded aluminum-paper elements 13, with the paper part facing outwards.

The composite sheet or ribbon 10, once assembled, is inserted in a per se known machine that performs offset or rotary offset printing, in which the thermal sublimation dyes are deposited on the paper part of the bonded element 13, first on one face and then on the other one.

Once printing has ended, if the process is discontinuous, or at the output of the machine, if the process is continuous, the composite sheet or ribbon 10 is brought to the melting temperature of the adhesive and the supporting layer 11 is separated from both of the bonded aluminum-paper elements 13 by mechanical means.

The bonded aluminum-paper elements 13 thus released from the supporting layer 11 can be usefully used to wrap, by using the plastic adaptability characteristics of aluminum, the object onto which the dyes are to be sublimed.

Said object, once it has been wrapped by the corresponding bonded aluminum-paper element 13, must be brought to the sublimation temperature, which as mentioned is around 140° and 220° Celsius.

In practice it has been observed that the present invention has solved the above-described drawbacks of conventional products and processes; in particular, it should be noted that the composite sheet or ribbon can be offset printed, providing the maximum definition and image creation that is currently possible, without at the same time losing the plastic adaptability characteristics that are typical of the aluminum part of the bonded aluminum-paper element that is separated from the composite sheet or ribbon for use.

The adhesive, which has a melting temperature that is lower than the sublimation temperature, in fact allows to associate, within the composite sheet or ribbon according to the invention, a part having a purely structural backing function and another part with functions that are purely dedicated to printing and wrapping.

It should be noted that the composite sheet or ribbon according to the invention does not affect a possible continuous process in any way.

It should also be noted that since the materials are substantially the same ones used in conventional applications, the costs of the sheet or ribbon according to the invention, as well as its production, printing, and application method, are competitive with respect to known processes also in relation to the fact that the composite sheet or ribbon according to the invention allows very easy wrapping.

The present invention is susceptible of numerous modifications and variations, all of which are within the scope of the inventive concept.

All the details may furthermore be replaced with other technically equivalent elements.

The dimensions as well as the materials may be any according to the requirements.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. A composite sheet or ribbon, particularly for printing with thermal sublimation dyes, characterized in that it comprises a supporting layer onto which, at least on one side, a bonded paper-aluminum element is glued by means of an adhesive with the paper side facing outwards, said paper side being printed with sublimating dyes, the melting temperature of said adhesive being lower than the sublimation temperature of said dyes.

2. A composite sheet or ribbon according to claim 1, characterized in that it comprises two bonded aluminum-paper elements, each one being glued on a corresponding face of said supporting layer.

3. A composite sheet or ribbon according to claim 1, characterized in that said supporting layer is made of paper-like material.

4. A method for producing a composite sheet or ribbon as defined in claim 1, comprising the steps of:

   -- gluing, on at least one of the faces of a supporting layer, by means of an adhesive, a bonded aluminum-paper element with the paper part thereof facing outwards; and
   -- printing, by offset or rotary offset, the paper part of said bonded aluminum-paper element joined to said supporting layer.

5. Bonded aluminum-paper elements obtained from the composite sheet or ribbon according to claim 1, characterized in that the paper part is offset printed with thermal sublimation dyes.

6. A method for printing with a composite sheet or ribbon comprising a supporting layer and a bonded aluminum-paper element glued, by means of an adhesive, to said supporting layer, as defined in claim 1, the method comprising the steps of:

   -- bringing the composite sheet or ribbon to the melting temperature of said adhesive;
   -- mechanically separating said supporting layer from said bonded aluminum-paper element;

-- wrapping said bonded aluminum-paper element on an object to be covered, using the plastic adaptability characteristics of the aluminum part of said bonded aluminum-paper element; and

-- printing dyes on said object by heating the bonded aluminum-paper element and the object to the dye sublimation temperature of said dyes.

7. Objects printed with the method according to claim 6, characterized in that the printing on their treated surface has the sharpness and definition of offset printing.

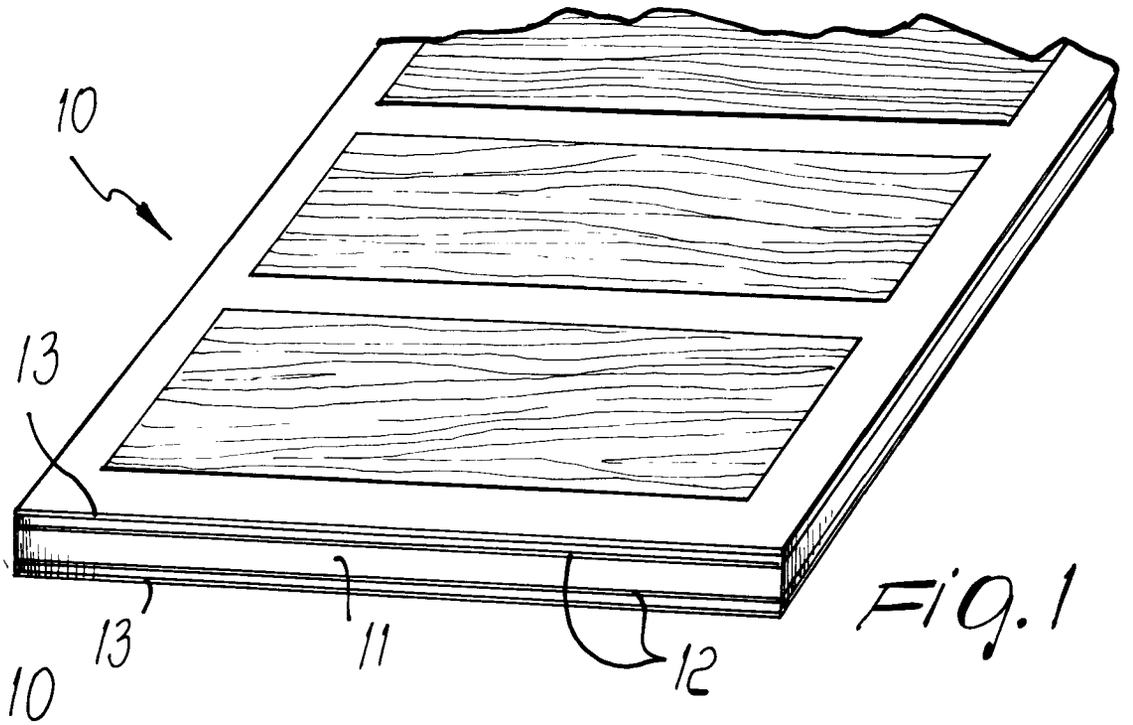

Fig. 1

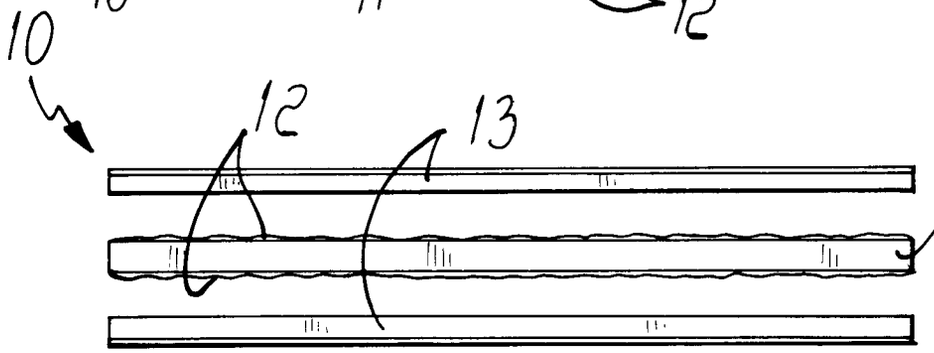

Fig. 2

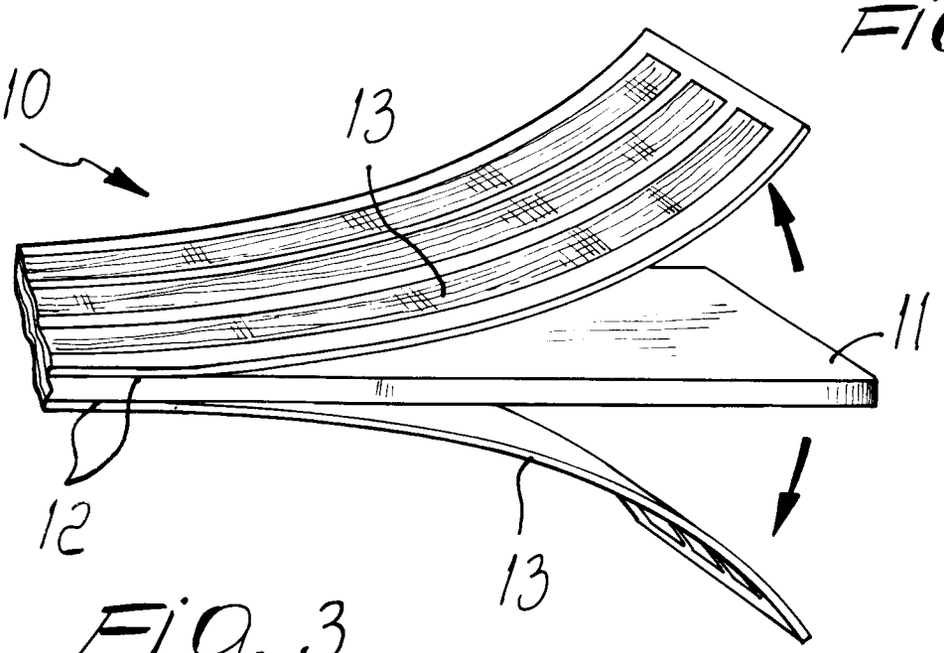

Fig. 3