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(54) **A manufacturing system for a polarizing picture.**

(57) A method of manufacturing a die for a picture carrier intended for creating the impression of a movement when the picture is projected or illuminated on at least certain parts of the picture or projection, by making use of a polarizer and/or an analyzer and a picture carrier treated accordingly, whereby use is made of a laser for locally working the die.

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The invention relates to a method of manufacturing a die for a picture carrier intended for creating the impression of a movement when the picture is projected or illuminated on at least certain parts of the picture or projection, by making use of a polarizer or an analyzer and a picture carrier treated accordingly.

US patent No. 3,437,401 describes a light box for animating selected parts of a picture, whereby use is made of a rotating polarizing disc and a light-interrupting foil, which is provided with several picture line patterns impressed on those parts of the foil that constitute the part to be animated. Said picture lines have been impressed on the light-interrupting foil by means of a die or a punch. For the projection use is made in principle of one or more light sources, a polarizing disc rotating in front of said light sources and a picture carrier located in front of said polarizing disc, whereby the picture carrier is locally provided with parts acting as an analyzer. Said parts acting as an analyzer made be made by providing certain tension lines according to a certain pattern, yet oriented in varying directions in the various locations. A suitable selection of the material of the picture carrier or the foil will make it possible, by impressing tension lines, to obtain a polarizing effect, on the basis of the properties of the foil material itself. Furthermore it is possible to provide unevennesses, oriented in certain directions, on a foil of a suitable material and to provide an ink layer containing polarizing crystals on said foil. The orientation of said polarizing crystals will then adapt itself to the orientation of the unevennesses. With such a pre-treated foil it is also possible to provide a, possibly colourless, layer containing polarizing crystals before or after providing the coloured printing inks.

This known method is in particular suitable for producing a large number of identical light-interrupting foils. A large number of intermediate steps are necessary, however, in order to provide the parts, oriented in various directions, of the picture in which a certain polarizing effect is to be effected. Thus it is not unusual to orientate the tension lines and the like in at least nine different directions; it is more common, however, to orientate said tension lines at twenty-four different angles. For each individual direction a separate mask, such as e.g. known from lithography, is to be used.

The drawback of such a method is that it is costly, time-consuming and quite laborious, because of the great accuracy that is required, whilst a very high percentage of rejects will still have to be reckoned with.

It has become apparent that the dies to be used with such a method can be worked locally, by means of laser beams, in a very simple manner. Taking into account the fact that a small deformation already results in the effect desired, it will be easy to realise said local deformations to the desired extent and in the desired orientation by means of a laser beam. In addition to that, the use of a computer for the laser control has made it possible in a simple manner to provide the desired deformations at any desired location.

The use of a die for providing local deformations at various orientations is inter alia described in US patent No. 3,650,625. From this US patent it is clear how complicated and expensive (approximately US $ 7,000) the manufacture of a die described therein is. A further drawback of this known manufacturing system is that the accuracy thereof is not satisfactory in practice, while further additional devices as die-rollers and pressing-rollers have to be used.

According to a further elaboration of the invention it has become apparent that it is possible in a simple manner to provide the desired deformations of a picture carrier or foil, without using a die, but to realise the desired local deformations directly by means of a laser treatment, which acts directly on the foil itself. Of course such a laser will have to be effectively controlled by means of a computer as well, in order to realise the desired deformations with the required accuracy. A film thus treated can realise the effect desired by means of tension lines and an ink containing polarizing crystals. In this way the various structures desired, such as inter alia described in US patent No. 3,437,401, can be realised in a very simple manner and with great accuracy, whereby it is no longer necessary to use a die and it is also possible to provide one or only a few picture carriers with a picture with the desired polarizing effect at very short notice. As a result of this separate polarizing pictures can be realised much faster and at much lower cost than before.

It is noted that besides a light source, in front of which a rotating polarizer is located, use may also be made of light sources of polarized light, whereby care must be taken that the orientation of the polarized light is changed after all, e.g. by means of an analyzer disc. It is possible to irradiate the picture or the picture carrier itself with light, so that the picture itself is directly observed by the observer, in the shape of a light box or a neon sign in a shop window. In the latter case the light source may be placed at some distance. For projection systems, however, the light shining through or being reflected, as is e.g. the case with an overhead projector, will be projected on a viewing screen.

Laser Praxis, October 1990, München Carl Hansen Verlag, pages 125 through 128 ( M. Meyer et al.) describes a system to put numbers, letters and barcodes on organic an anorganic materials while using a laser. However, this document does

not refer to the the creation of small tension lines - thereby orientating the molecules in a direction perpendicular thereto, and ordering the various wavelengths of light - so that an impression of movement is effected using a polarisator and an analysator.

Patent Abstracts of Japan, vol.11, No. 68 (P-553), February 28, 1987, and JP-A-61 231531, October 15, 1986 describe a method for manipulating a video film, for example, with the aid of mirrors. A picture of a film is provided with another background, for example, and this manipulation is recorded on film or videotape.

## Claims

1. A method of manufacturing a die for a picture carrier intended for creating the impression of a movement when the picture is projected or illuminated on at least certain parts of the picture or projection, by making use of a polarizer and/or an analyzer and a picture carrier treated accordingly, characterized in that use is made of a laser for locally working the die.

2. A method of directly treating a picture carrier or a picture-carrying foil intended for creating the impression of a movement when the picture is projected or when at least certain parts of the projected picture or the picture itself are directly illuminated, by making use of a polarizer and/or an analyzer and a picture carrier treated accordingly, characterized in that the picture carrier itself is directly irradiated by means of a laser, so as to locally realise the desired structure.

3. A method according to claim 1 or 2, characterized in that said laser is controlled by means of a computer.

4. A picture carrier obviously manufactured by using a method according to any one of the preceding claims.

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# EUROPEAN SEARCH REPORT

Application Number

EP 91 20 3363

## DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.5) |
|---|---|---|---|
| Y<br>D | US-A-3 650 625 (P.A.HOYTE)<br>* the whole document *<br>--- | 1-4 | G03F7/20<br>B41C1/05<br>B44F1/10 |
| Y | LASER-PRAXIS<br>October 1990, MÜNCHEN Carl Hansen Verlag<br>pages 125 - 128;<br>M.MEIER: 'Laser beschriften fast alles'<br>* the whole document *<br>--- | 1-4 | |
| Y | PATENT ABSTRACTS OF JAPAN<br>vol. 11, no. 68 (P-553)28 February 1987<br>& JP-A-61 231 531 ( CANON INC. ) 15 October 1986<br>* abstract *<br>----- | 1-4 | |

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

G03F
B41C
B44F
B41M

The present search report has been drawn up for all claims

| Place of search | Date of completion of the search | Examiner |
|---|---|---|
| THE HAGUE | 03 JUNE 1992 | RASSCHAERT A. |

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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