(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 238 596 A1

(12) EUROPEAN PATENT APPLICATION
published in accordance with Art. 158(3) EPC

(43) Date of publication:
**11.09.2002 Bulletin 2002/37**

(21) Application number: **99929874.8**

(22) Date of filing: **16.07.1999**

(51) Int Cl.[7]: **A41G 1/00**

(86) International application number:
**PCT/JP99/03849**

(87) International publication number:
**WO 00/038549 (06.07.2000 Gazette 2000/27)**

(84) Designated Contracting States:
**DE FR GB IT**

(30) Priority: **24.12.1998 JP 37624898**

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# (54) INTERIOR ARTIFICIAL PLANT

(57) The invention relates to an interior artificial plant (1) having an appearance (texture) and a strength (flexibility) which are close to those of a natural plant and provided with artificial leaves (2) and/or flowers having a strong bonding force between leaves (2) and twigs (7)/framework (6); specifically an interior artificial plant (1) having artificial leaves (2) which are obtained by providing a plastic film having a thickness and a flexibility close to those of a natural leaf and flower, applying a paint to a leaf base material to give leaf color and pattern, cutting the film into a leaf-form, forming unevenness on a leaf surface by embossing and attaching a twigs (7)/framework (6) to the leaf, wherein a plastic film is used as a leaf and/or flower base material and, preferably, a polypropylene film or a polyethylene film is used as the base material.

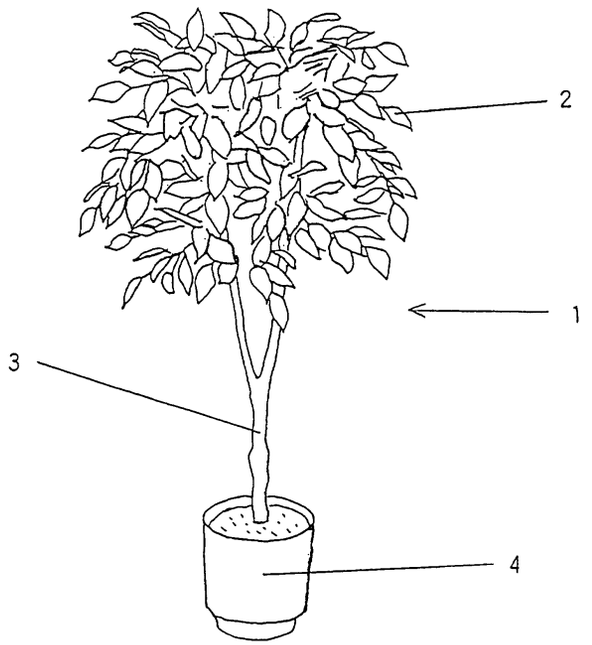


FIG. 1

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## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to an interior artificial plant, and more particularly pertains to an interior artificial plant having artificial leaves and/or flowers made from plastic films used as a base material.

### BACKGROUND ART

**[0002]** Interior artificial plants are often placed in a hotel, a hospital, an office, an exhibition hall, a house or the like instead of natural plants. The artificial plants may be positioned at a sunless place or at the place where maintenance such as watering plants is difficult to do. Such artificial plants are generally made by attaching artificial leaves and/or flowers to artificial stems, and sometimes made by attaching artificial leaves and/or flowers to a natural trunk or branch. Thus, it is necessary to manufacture artificial leaves and flowers with appearance and flexibility which are close to those of a natural leaf and flower.

**[0003]** In prior art, artificial leaves and flowers are made from synthetic fiber woven cloth used as a leaf and flower base material. Actually, for most of the artificial leaves, polyester pongee woven cloth with thickness of about 100 microns has been used.

**[0004]** In the case that polyester woven cloth is used as a leaf bases material, the process of manufacturing an artificial leaf is as follows:

(1) cutting a polyester woven cloth into cloth sheets of suitable size for printing;
(2) making a silk printing with ink composed of pigment, binder and volatile lubricant to give leaf color and pattern;
(3) overcoating the printed surface with urethane resin to give appearance and texture of a natural leaf surface;
(4) piling scores of the sheets and cutting them into a leaf-shape;
(5) setting the leaf-shaped sheet in a mold and forming unevenness on a leaf surface by embossing under heating; and
(6) setting it in a mold for polyethylene injection to form and attach a framework and a twig (or stem) to the leaf.

**[0005]** However, when a synthetic fiber woven cloth, such as polyester woven cloth, is used as a leaf base material, the following problems exist.

(i) The stiffness or flexibility of a woven cloth cannot be finely adjusted because it depends on the sizing process for white cloth, and the variety of leaves is restricted because the thickness depends on the diameter of the fiber of woven cloth. A variety of materials having thickness and flexibility which are close to those of natural plants are required, in view of the variety of natural plants.
(ii) Plenty of ink is absorbed into a woven cloth during silk printing because of the high susceptibility to water, which leads to bad printing.
(iii) Since the bonding force between leaves and twigs/frameworks in their attaching step is weak, the plant cannot be used in a windy place near an air-conditioner or an exterior site.
(iv) Because of woven cloth, the appearance, flexibility and texture of the finished leaf are different from those of a natural leaf.

### DISCLOSURE OF THE INVENTION

**[0006]** The above problems are solved by the present invention. Thus, the objective of the present invention is to provide an interior artificial plant having artificial leaves with appearance, texture and flexibility which are close to those of a natural leaf, said artificial leaves having a strong bonding force between the leaves and the twigs/frameworks in comparison with a conventional artificial plant using synthetic fiber woven cloth as a leaf base material.

**[0007]** In order to achieve the objective, the present invention provides an interior artificial plant having artificial leaves that are obtained by applying a paint to a leaf base material to give leaf color and pattern, cutting the base material into a leaf-shape, forming unevenness on a leaf surface by embossing, and attaching a framework and a twig to the leaf, characterized in that a plastic film is used as the leaf base material. In the present invention, a plastic film suitable for individual goods may be selected among a plurality of plastic films different in thickness and flexibility.

**[0008]** Said plastic films can be made of any conventional thermoplastic resin. In fact, polyethylene, polypropylene, polyacetal, nylon resin, polyester, polyvinyl chloride, polystyrene, fluorocarbon resin, polycarbonate, thermoplastic polyurethane or the like can be used. Preferably, a polypropylene film or a polyethylene film is used because they are easily available and cheap.

**[0009]** Although the above artificial plant has artificial leaves, it may be provided with artificial flowers or both of artificial leaves and flowers. In the case of the artificial flower, a polypropylene film or a polyethylene film is preferably used as a flower base material.

### BRIEF DESCRIPTION OF THE DRAWINGS

**[0010]** Preferred embodiments of the invention are described by way of example with reference to the accompanying drawings in which:

FIG. 1 is a schematic illustration of an interior artificial plant according to the present invention;
FIG. 2 is a schematic illustration of an artificial leaf

to be attached to the interior artificial plant of the present invention;

FIG. 3 is a schematic illustration of another interior artificial plant according to the present invention; and

FIG. 4 is a flowchart of a process of manufacturing the artificial leaf of the present invention.

## MODES OF CARRYING OUT THE INVENTION

**[0011]** The embodiments of the present invention are described below with reference to the drawings.

**[0012]** FIG. 1 schematically illustrates an interior artificial plant embodying the present invention. A natural trunk 3 is anchored to a bowl 4, and artificial leaves 2 are attached to branches of the trunk 3. A special processing may be done for the natural trunk 3, if necessary. An artificial trunk may be also used instead of the natural trunk.

**[0013]** FIG. 2 schematically illustrates an artificial leaf 2 to be attached to the artificial plant 1 of the present invention. Through the process mentioned below, a leaf body 5 is made from a leaf base material made of a plastic film, and an artificial framework 6 and a twig 7 are attached to the leaf body 5 to form the artificial leaf 2.

**[0014]** FIG. 3 schematically illustrates another interior artificial plant embodying the present invention. Natural stems 13 are anchored to a small bowl 14, and artificial leaves 12 are attached to the ends of the stems 13.

**[0015]** FIG. 4 is a flowchart of a process of manufacturing the artificial leaf 2 to be attached to the interior artificial plant of the present invention. A plastic film is used as a leaf base material in the manufacturing process, each step of which is described below.

(1) A flexible plastic film obtained by sheet molding with polymer resin is cut into sheets of suitable size for the next printing process. The plastic film may have a thickness of, for example, 20-500 microns.

(2) Silk printing is done with ink composed of pigment, binder and volatile lubricant to give leaf color and pattern on the plastic film. Offset printing may be also made because the plastic film has low susceptibility to water.

(3) The printed surface of the plastic film may be coated with urethane resin to give appearance and texture which are close to those of a natural leaf surface. But this step can be omitted depending on the kinds of plants, because the plastic film in itself has appearance and texture which are, to some extent, close to those of a natural leaf.

(4) Several sheets (e.g. 100 sheets) of the films are piled and cut into a leaf-shape.

(5) The leaf-shaped film is set in a mold, and unevenness is formed on a leaf surface by embossing under heating to make a leaf body. The heating temperature depends on the kind of the used polymer resin. Thus, the heating temperature may be lowered by properly selecting the kind of the polymer resin. For example, in the case of a polyethylene plastic film, the heating temperature is 40-60 °C.

(6) An artificial framework and twig, which are made of the same polymer resin as that used for the plastic film, are attached to the leaf body by injection molding, thermo compression bonding, adhesive, high frequency bonding, ultrasonic bonding or the like.

## INDUSTRIAL APPLICABILITY

**[0016]** The present invention has the following advantages in comparison with the prior art using polyethylene woven cloth.

(i) Various plastic films with any thickness and flexibility can be made, by contrast with woven cloth; thus, a suitable film having appearance and texture which are close to those of a natural leaf can be selected among them.

(ii) The paint absorption is reduced during printing because of the low susceptibility to water, leading to good quality of printing. Thus, offset printing may be also done.

(iii) The step of coating with urethane resin can be omitted, because the plastic film in itself has appearance and texture which are close to those of a natural leaf.

(iv) The heating temperature during embossing may be lowered depending on the kind of the plastic resin.

(v) The framework and twig may be made of the same plastic resin as that of the plastic film, which results in a strong bonding strength. For bonding, a suitable method such as injection molding, thermo compression bonding, adhesive and fusion may be used.

**[0017]** As the result, an interior artificial plant can be obtained having artificial leaves with texture, gloss, stiffness and flexibility which are well closer to those of a natural leaf and having a strong bonding between the leaves and twigs/frameworks, in comparison with a conventional plant using synthetic fiber woven cloth as a leaf base material.

**[0018]** Although the above description mainly relates to an artificial leaf to be attached to the artificial plant as shown in FIG. 1, an artificial flower may be obtained similarly. In the case of artificial flower, the leaf base material in the above description corresponds to a flower base material. Further, the above description may be applicable to the artificial plant as shown in FIG. 3 similarly. In this case, a trunk and a twig correspond to a stem and a stem end, respectively. Thus, in the above description, the technical terms, "trunk" and "twig" include "stem" and "stem end", respectively.

## Claims

1. An interior artificial plant having artificial leaves that are obtained by applying a paint to a leaf base material to give leaf color and pattern, cutting the base material into a leaf-shape, forming unevenness on a leaf surface by embossing, and attaching a framework and a twig to the leaf, **characterized in that** a plastic film is used as the leaf base material.

2. The interior artificial plant according to claim 1, **characterized in that** a polypropylene film is used as the leaf base material.

3. The interior artificial plant according to claim 1, **characterized in that** a polyethylene film is used as the leaf base material.

4. An interior artificial plant having artificial flowers that are obtained by applying a paint to a flower base material to give flower color and pattern, cutting the base material into a flower-shape, and forming unevenness on a flower surface by embossing, **characterized in that** a plastic film is used as the flower base material.

5. The interior artificial plant according to claim 4, **characterized in that** a polypropylene film is used as the flower base material.

6. The interior artificial plant according to claim 4, **characterized in that** a polyethylene film is used as the flower base material.

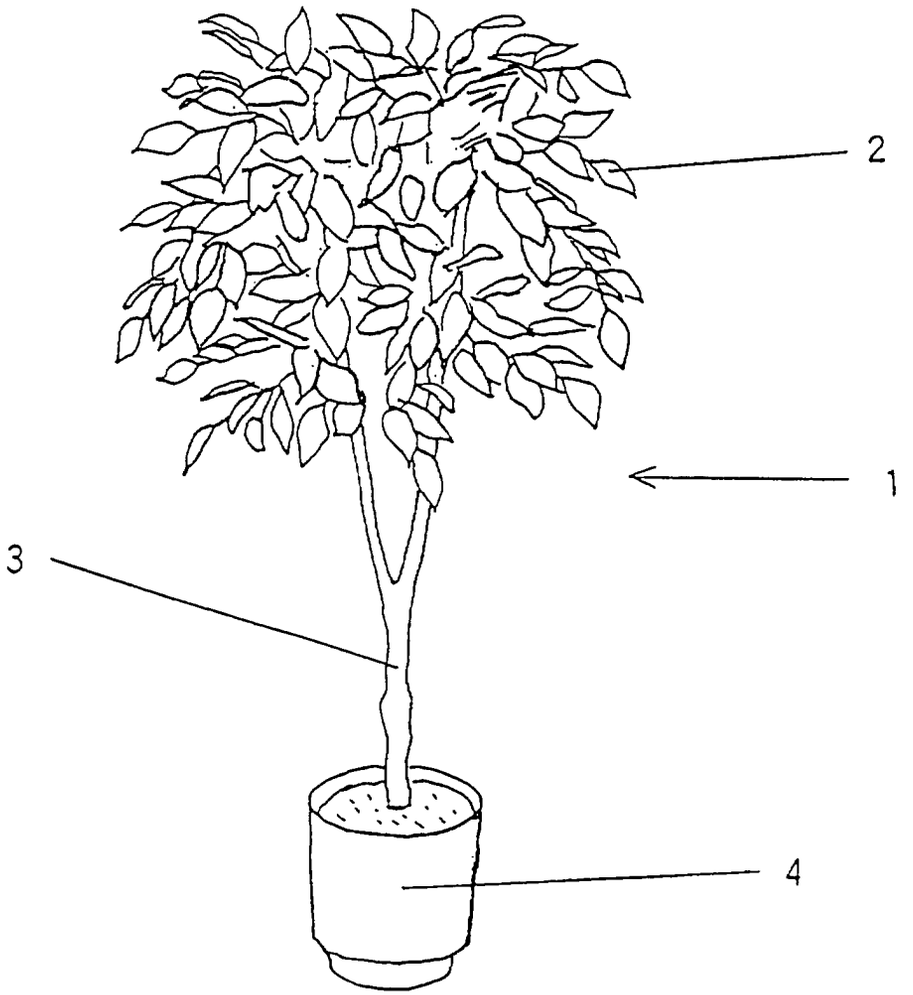


FIG. 1

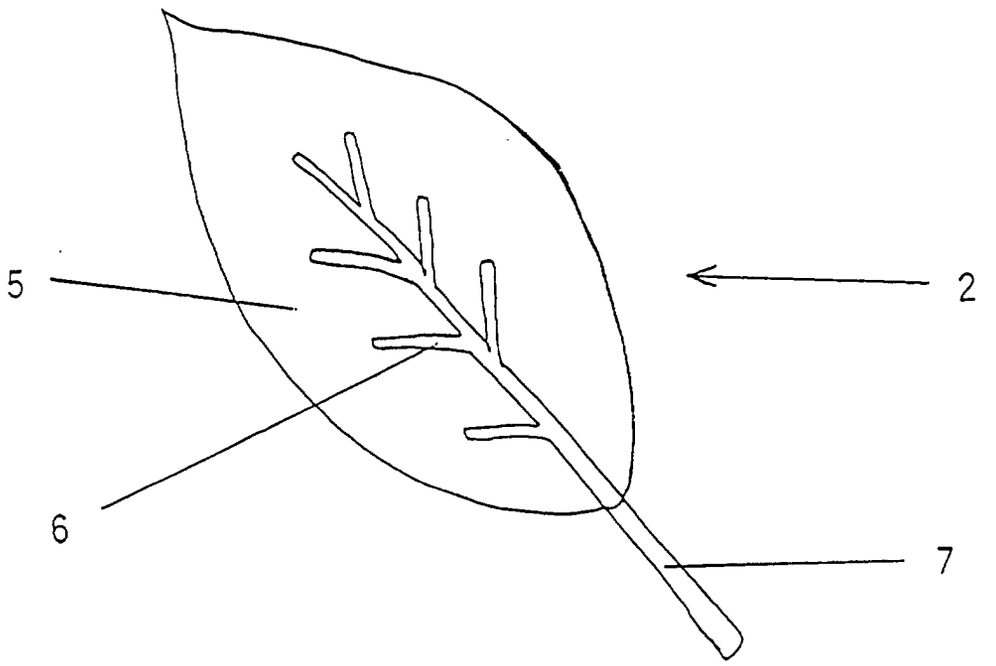


FIG. 2

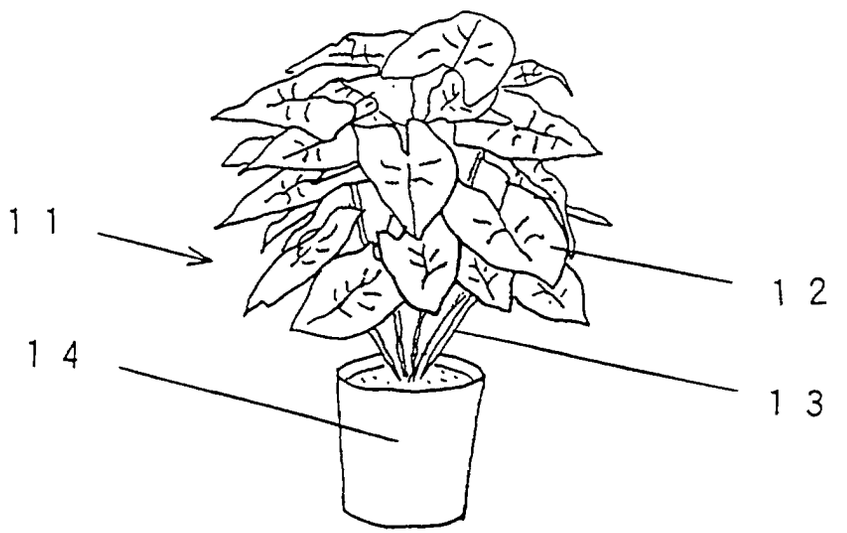


FIG. 3

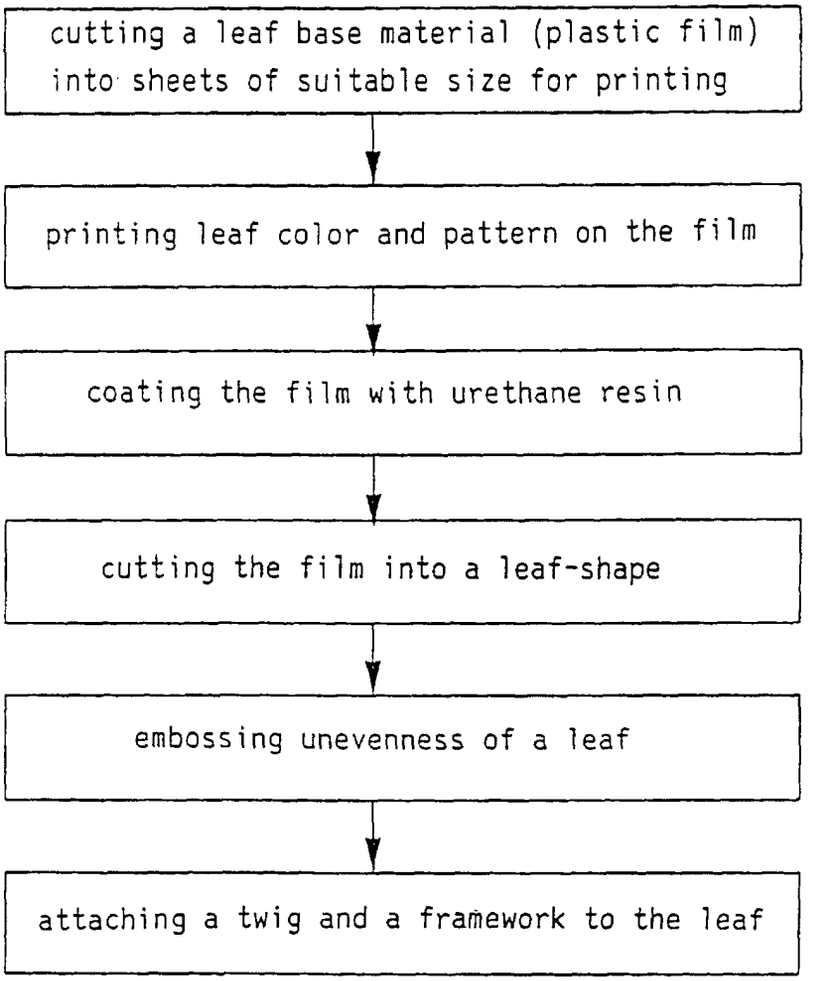
cutting a leaf base material (plastic film) into sheets of suitable size for printing
printing leaf color and pattern on the film
coating the film with urethane resin
cutting the film into a leaf-shape
embossing unevenness of a leaf
attaching a twig and a framework to the leaf

FIG. 4

## INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP99/03849

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl[6] A41G1/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl[6] A41G1/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1926-1999 Toroku Jitsuyo Shinan Koho 1994-1999
Kokai Jitsuyo Shinan Koho 1971-1999

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| Y | Microfilm of the specification and drawings first annexed to the request of Japanese Utility Model Application No. 52-97742 (Laid-open No. 54-25192) (Youko Satou), 21 July, 1977 (21. 07. 77), Page 4, lines 1 to 19 ; Fig. 3 (Family: none) | 1-6 |
| Y | Microfilm of the specification and drawings first annexed to the request of Japanese Utility Model Application No. 57-22187 (Laid-open No. 58-125100) (K.K. Yuuzen Marubishi), 25 August, 1983 (25. 08. 83), Page 1, lines 5 to 10 (Family: none) | 1-6 |
| Y | Microfilm of the specification and drawings first annexed to the request of Japanese Utility Model Application No. 52-43475 (Laid-open No. 53-139387) (Tetsuo Konno), 7 April, 1977 (07. 04. 77), Page 1, lines 5 to 7 ; Fig. 3 (Family: none) | 1-6 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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| Date of the actual completion of the international search | Date of mailing of the international search report |
|---|---|
| 12 October, 1999 (12. 10. 99) | 26 October, 1999 (26. 10. 99) |
| Name and mailing address of the ISA/ Japanese Patent Office | Authorized officer |
| Facsimile No. | Telephone No. |

Form PCT/ISA/210 (second sheet) (July 1992)