

(21) Application No: **1111210.9**
 (22) Date of Filing: **01.07.2011**

(51) INT CL:
A43B 1/00 (2006.01) **A43B 9/12** (2006.01)
A43B 13/12 (2006.01)

(71) Applicant(s):
Han-Ching Wu
No. 72, Hen Ho Road, San Ho VII, Ta Ya Dist,
Taichung City 428, Taiwan

(56) Documents Cited:
WO 2006/066256 A2 **WO 2006/034807 A1**
CN 201691171 U **FR 002814343 A1**
US 4703533 A **US 2053502 A**

(72) Inventor(s):
Han-Ching Wu

(58) Field of Search:
 INT CL **A43B**
 Other: **Online: WPI, EPODOC**

(74) Agent and/or Address for Service:
Alfred Lei
Suite 152, 23 King Street, CAMBRIDGE, CB1 1AH,
United Kingdom

(54) Title of the Invention: **Improved sole structure**
 Abstract Title: **Sole with recycled filling**

(57) A sole structure comprising a main body 10, an intermediate layer 12, and a decorative strip 14. The main body, being made of fresh rubber material, has a bottom surface provided with anti-slip ribs and a top surface defining a recess 11 having depths for a heel portion and a sole portion. The intermediate layer, being made of a mixture of recycled materials, is shaped to conform to the recess of the main body. The intermediate layer is disposed in the recess of the main body to be heated and pressed to fill the recess of the main body. The intermediate layer may be formed as a meshed structure. Also claimed is a sole having an outsole and a premoulded rubber decorative strip for enveloping a periphery of the outsole, the strip being bonded to the outsole without stitching threads.

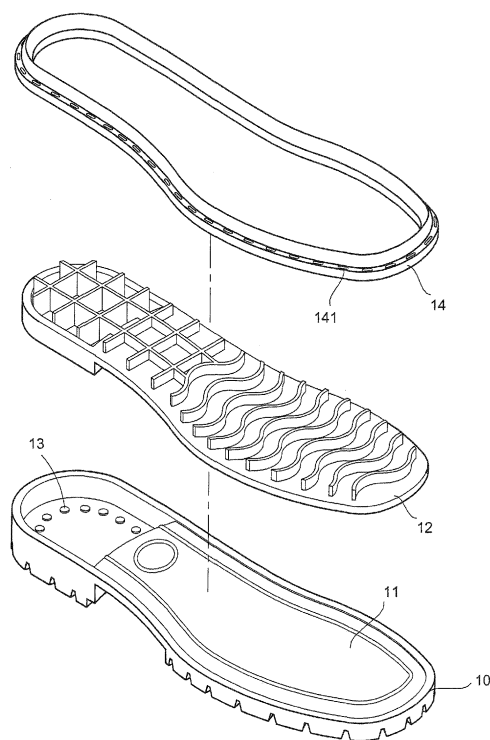


FIG.1

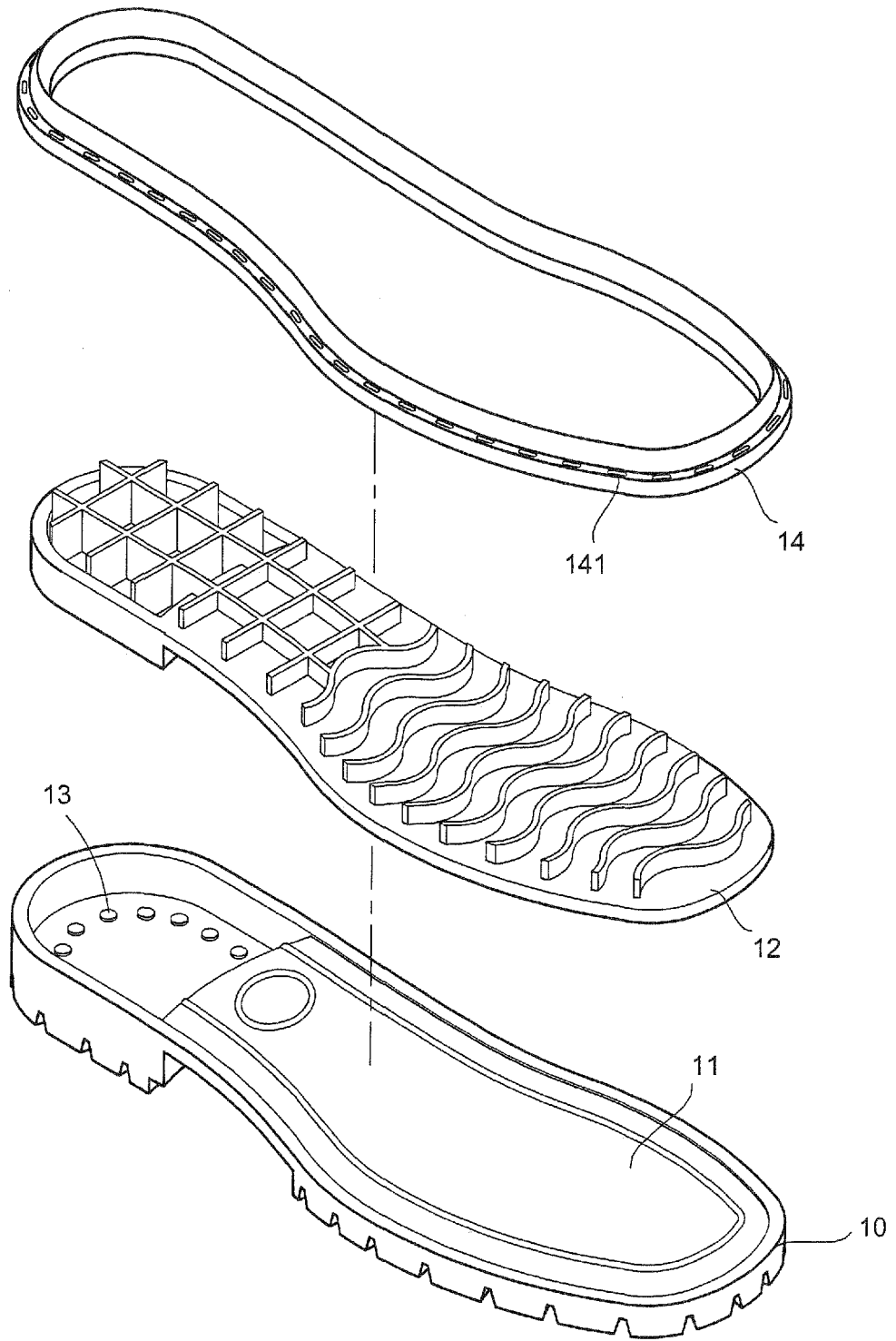


FIG.1

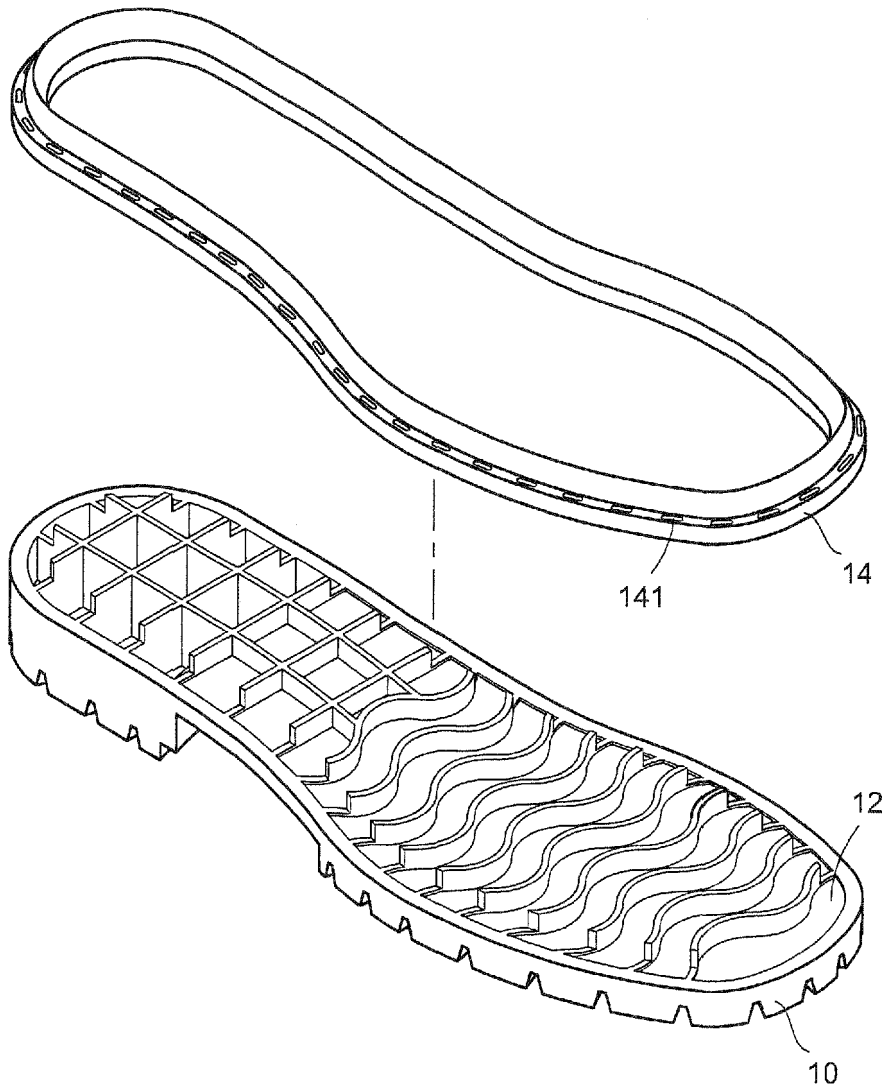


FIG.2

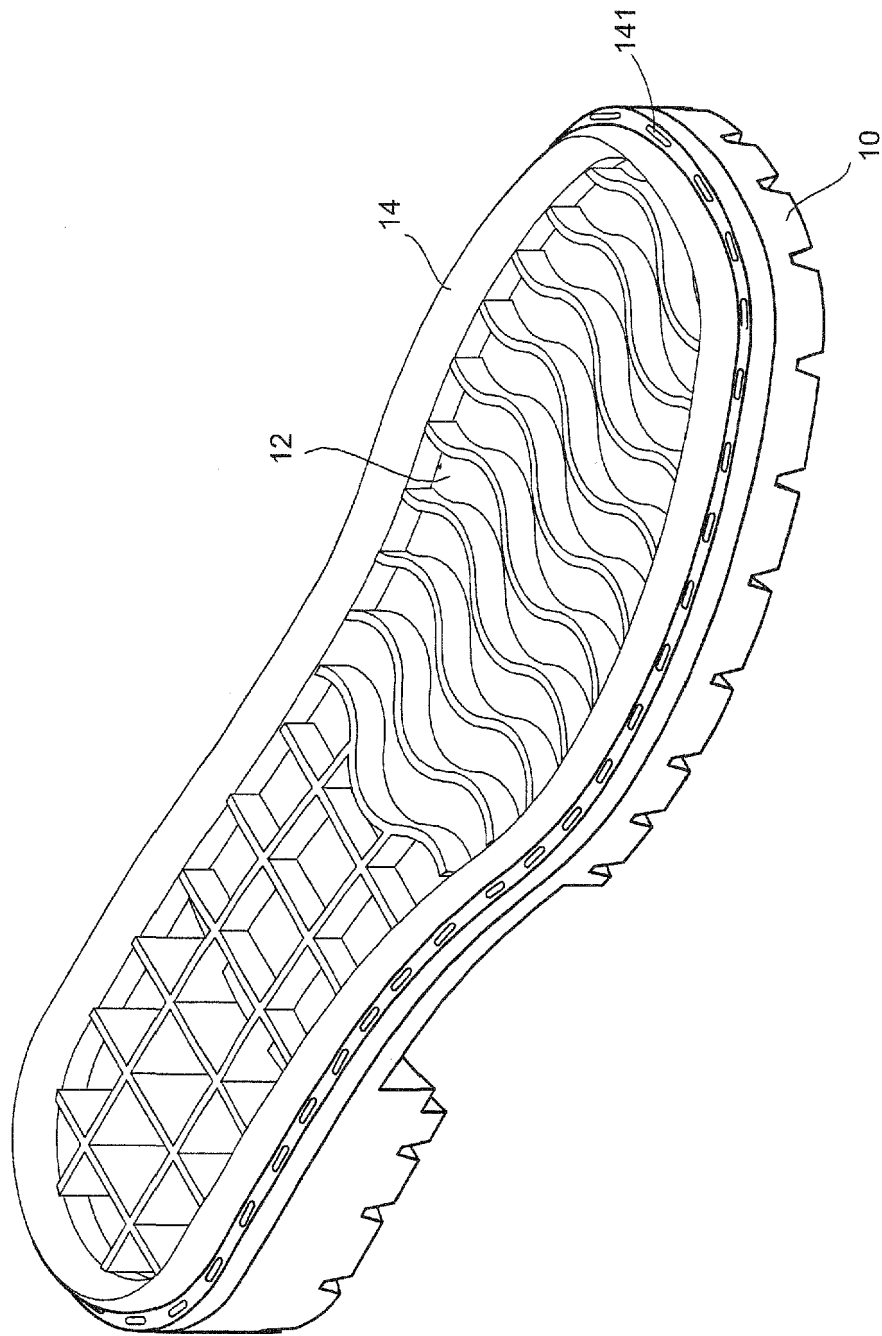


FIG.3

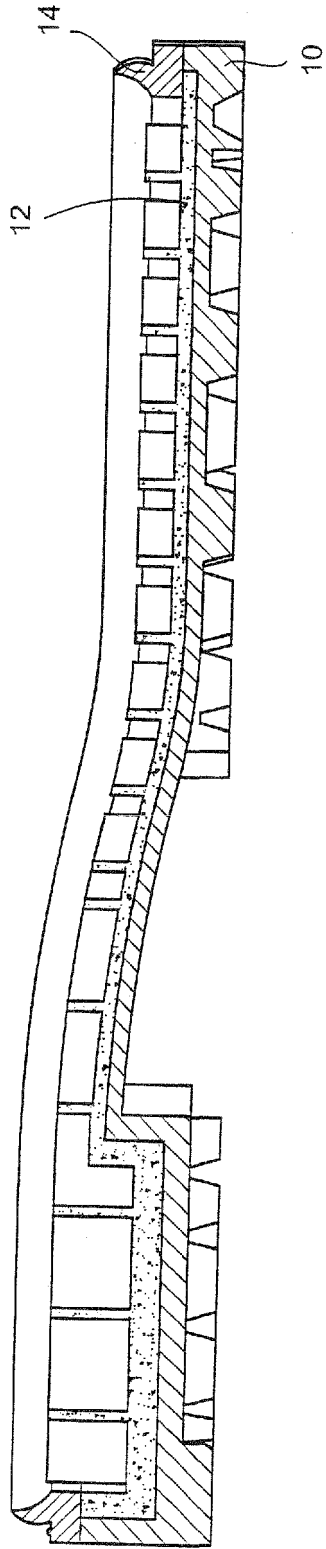


FIG.4

TITLE: Improved Sole Structure

(a) Technical Field of the Invention

The present invention relates to an improved sole structure and, more particularly, to a sole structure that employs a main body made of fresh rubber material to combine an intermediate layer made of recycled materials together with a decorative strip formed individually so as to lower the weight of the sole structure as well as afford an aesthetical appearance, adequate cushioning capacity, and comfort in walking.

(b) Description of the Prior Art

Under the demands of environmental protection, for reducing the cost of a product, recycled materials are usually utilized in its manufacturing process. Conventionally, in manufacturing a sole, recycled materials are often added to fresh rubber material at a proportion to achieve the purpose of cost reduction and environmental protection. However, to prevent the physical properties of the sole product from be significantly effected, there is a proportion limit of adding the recycled materials into the fresh rubber material. If the proportion of the recycled materials is exceeded the limit, defective products may increase. Thus, it is important to conduct a test for the mixtures of fresh rubber and recycled materials before a manufacturing begins.

Also, the recycled materials being added to the fresh rubber material may

result in irregular patterns and/or colors. It is more difficult to control the appearance of the product made of recycled materials, and thus a further treatment, such as additional coloring or wrapping, should be taken to allow the sole product to have a consistent appearance. Furthermore, to manufacture
5 a strip or welt made of recycled material to have aesthetical patterns is not easy. It is required for skilled persons to stitch a strip made of recycled materials to a sole.

In brief, it is infeasible for a conventional sole structure to contain wear resistance, cushioning capacity for providing comfort in walking, as well as an
10 aesthetical appearance at the same time. Thus, there is a need to develop an improved sole structure to contain those characteristics.

To eliminate the drawbacks of conventional sole structures, after constant efforts on the research and development of shoe products, the applicant has contrived an improved sole structure, in which a main body made of fresh
15 rubber material is employed to cooperate with an intermediate layer made of recycled materials together with a decorative strip being individually formed so as to afford the sole structure an aesthetic appearance and cushioning capacity to bring comfort in walking.

SUMMARY OF THE INVENTION

The primary object of the present invention is to provide an improved sole structure that can be manufactured with lower weight in a convenient way, and can afford an aesthetical appearance, adequate cushioning capacity, and
5 more comfort in walking.

According to one aspect of the present invention, the improved sole structure comprises a main body, an intermediate layer, and a decorative strip; in which the main body, being made of rubber material having good physical properties, has a bottom surface provided with anti-slip ribs and a top surface
10 defining a recess having specific depths respectively for a heel portion and a sole portion thereof; the intermediate layer, being made of mixture of recycled materials, is shaped to conform to the recess of the main body, the intermediate layer being disposed in the recess of the main body to be heated and pressed so as to fill the recess of the main body, so that the sole structure
15 has a flat top surface, a wear resistance and anti-slip characteristics, and can provide comfort in walking.

According to another aspect of the present invention, the improved sole structure further comprises a plurality of protrusions formed on a top surface of the recess defined on the main body.

According to still another aspect of the present invention, the intermediate layer is formed into a meshed structure according to a force applied by foot while in walking.

Other objects, advantages, and novel features of the present invention will
5 become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG 1 is an exploded view of an improved sole structure according to the present invention.

FIG 2 is a partially exploded view of the improved sole structure
5 according to the present invention.

FIG 3 is a 3-dimension view of the improved sole structure according to the present invention.

FIG 4 is an assembled plan view of the improved sole structure according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

To allow the features and applicability of the present invention to be easily understood, an embodiment with reference to the accompanying drawings will be detailed in the following paragraphs.

5 As shown in FIGS. 1-4, an improved sole structure of the present invention comprises a main body 10 or outsole, an intermediate layer 12, and a decorative strip 14 for enveloping a periphery of the main body 10, in which the aforementioned components may be preformed or pre-molded before a bonding process begins. The main body 10 is principally made of fresh rubber
10 material having good physical properties, with suitable and necessary additives or fillers for ease of molding. The main body 10 has a bottom surface formed with a pattern of ribs for providing anti-slip function and a top surface defining a recess 11, the depth of which varies along the main body, in which each portion, such as heel portion or sole portion, may have a specific
15 depth.

 An intermediate layer 12, being made of mixtures of recycled materials, is shaped conforming to the recess 11 of the main body 10, so that it can be tightly disposed in the recess 11 of the main body 10. Within the recess 11 is provided a plurality of protrusions 13 or ribs or a rough surface for ease of
20 bonding the intermediate layer 12 to the main body 10 by heat press in a

molding process. Alternatively, the intermediate layer 12 can be provided with protrusions 13 or ribs or a rough surface at a bottom surface thereof to achieve the above purpose. The intermediate layer 12 can be formed into a meshed structure according to a force applied by foot while in walking. Such meshed structure can lower the weight of a sole and provide comfort while in walking.

A decorative strip 14, being made of fresh rubber material, is formed into an integral closed element conforming to the periphery of the main body 10. The decorative strip 14 can be formed with various colors and/or patterns according to aesthetical considerations. Furthermore, the decorative strip 14 can be formed into a curved structure having a decorative pattern thereon.

The primary feature of the present invention is that the main body 10 is formed of fresh rubber material having good physical properties, the intermediate layer 12 is formed of mixtures of recycled materials, which can be bonded to the main body 10 by heat press to form an integral structure, which in turn cooperates with the closed decorative strip 14. Although the sole structure is constructed of different components, in a practical manufacturing process, the main body 10 and the intermediate layer 12 can be heat-pressed on the same mold tools to form an integral structure. The decorative strip 14 can be bonded to the integral structure by heat or glue along the periphery of the main body or outsole without stitching threads and then be trimmed along

the periphery thereof to obtain a neat appearance. Thus, the manufacturing process of soles can be greatly simplified. In addition, a sole can have an aesthetic appearance, a flat top surface, a wear resistance, and anti-slip characteristics according to the present invention, whereby the sole can
5 provide much more comfort in walking.

Furthermore, the intermediate layer 12 is formed into a meshed structure, which allows the sole structure to have cushioning capacity so as to provide much more comfort for a user. In addition, the meshed structure can lower the weight of a sole and thus its manufacturing cost can be reduced.

10 Still furthermore, the decorative strip 14 can be individually designed with various colors and/or patterns to provide an aesthetical appearance. For example, the decorative strip 14 can be designed with bumps or marks 141 being equally spaced, which looks like a stitching thread.

In light of the foregoing, the improved sole structure of the present
15 invention employs a main body 10 of fresh rubber material to cooperate with an intermediate layer 12, made of recycled materials, and a decorative strip 14 to allow the entire sole structure to be manufactured in a convenient way. The present invention not only provides more comfort in walking but also has a more aesthetic appearance. It is believed that the present invention is a creation
20 with novelty and usefulness.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure is made by way of example only and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention hereinafter
5 claimed.

I CLAIM:

1. An improved sole structure of the type including a main body provided with anti-slip ribs and a decorative strip for enveloping a periphery of said main body; the improvement comprising:

5 said main body, being made of rubber material having good physical properties, which has a bottom surface provided with anti-slip ribs and a top surface defining a recess having specific depths respectively for a heel portion and a sole portion thereof;

 an intermediate layer, being made of mixture of recycled materials, which
10 is shaped to conform to said recess of said main body;

 said intermediate layer being disposed in said recess of said main body to be heated and pressed to fill said recess of said main body, so that the sole structure has a flat top surface, a wear resistance and anti-slip characteristics, and can provide comfort in walking.

15 2. An improved sole structure of the type as claimed in claim 1, wherein a plurality of protrusions are formed on a top surface of said recess defined on said main body.

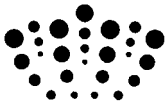
 3. An improved sole structure of the type as claimed in claim 1, wherein said intermediate layer is formed into a meshed structure according to a force
20 applied by foot while in walking.

4. An improved sole structure of the type including a preformed outsole and a decorative strip for enveloping a periphery of the outsole; the improvement comprising: said decorative strip being pre-molded of rubber material to form an integral closed element conforming to the periphery of the outsole, said decorative strip being bonded to the outsole along the periphery of the outsole without stitching threads and then being trimmed along the periphery thereof to have a neat appearance.

5. An improved sole structure of the type as claimed in claim 4, wherein said decorative strip is molded into a curved structure having a decorative pattern thereon.

6. An improved sole structure of the type as claimed in claim 4, further comprising an intermediate layer disposed in a recess of the outsole, said intermediate layer being formed with protrusions, ribs or a rough surface at a bottom surface thereof for ease of bonding said intermediate layer to the outsole.

7. An improved sole structure of the type as claimed in claim 4, wherein said decorative strip is formed with a plurality of bumps or marks being equally spaced, which looks like a stitching thread.



Application No: GB1111210.9

Examiner: Carrie-Ann Williams

Claims searched: 1-3

Date of search: 25 October 2011

Patents Act 1977: Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1	US 2053502 A (TARLOW) whole document relevant
X	1,2	WO 2006/034807 A1 (GAZZONI) see paragraphs [0025] - [0030] and figure
X	1	CN 201691171 U (QUANZHOU) see figures and WPI abstract accession no. 11-C19462/18
X	1	WO 2006/066256 A2 (HOTTINGER) see paragraph [0041] and figures
X	1	US 4703533 A (BARMA) see figures and column 6 line 60 - column 7 line 10 and figures
X	1	FR 2814343 A1 (MARQUET) see figures, page 4 lines 15-18, and WPI abstract accession no. 02-419001/45

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

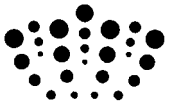
Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^X:

Worldwide search of patent documents classified in the following areas of the IPC

A43B

The following online and other databases have been used in the preparation of this search report

Online: WPI, EPODOC



International Classification:

Subclass	Subgroup	Valid From
A43B	0001/00	01/01/2006
A43B	0009/12	01/01/2006
A43B	0013/12	01/01/2006