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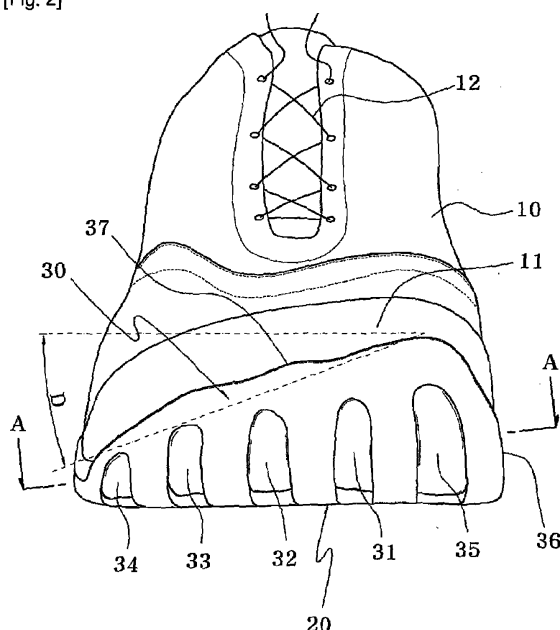
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(54) **TOE CAP FOR FOOTWEAR, AND OUTSOLE INTEGRATED WITH SAME**

(57) The present invention relates to a toe cap for footwear which can improve the wearing feeling and the fitting feeling, and can protect toes from a strong external impact, and an outsole integrated with the same. Disclosed is a toe cap for footwear **characterized by** a first feature, wherein the toe cap for footwear **characterized by** a first feature, wherein the toe cap (10) is highest at a big toe(41) region and gradually slopes downward to-

ward the little toe (45); and a second feature, wherein the top cap has the shape of a circular arc along the outer shape of the toes and first to fourth grooves (31)-(34) are formed at four positions between the five toes (41)-(45), respectively, so as to support each toe. In addition the outsole (20) integrated with the toe cap is **characterized by** having a support groove (21) which is formed at a front upper end surface to accommodate the bottom surface of at least one or more of the toes (41)-(45).

[Fig. 2]



Description

Technical Field

[0001] The present invention relates to a toe cap for footwear and an outsole integrated with the toe cap, more specifically, to a toe cap for footwear and an outsole integrated with the toe cap wherein the toe cap has an inclination in the upper end thereof declining gradually from a big toe to a little toe, and a winding shape corresponding, in shape, to appearance of human toe, and in case of the outsole integrated with the toe cap, the outsole has, adjacent to the front upper end thereof, support groove for supporting each of the toes.

Background Art

[0002] Conventionally, the footwear are produced by covering the last of foot shape with a leather upper forming appearance shape of a shoe, adhering the sole to the bottom of the obtained last, and then removing the last therefrom. As a result, it is possible to obtain a wearable shoe having a space corresponding to the shape of the removed last.

[0003] The sole is roughly classified into three parts such as an outsole which contacts with the ground, an insole which is separably disposed in the footwear to contact with foot sole of human body, and a midsole which is disposed between the outsole and the insole to contact with an upper end of the outsole.

[0004] As a prior art of the outsole related with present invention, for example, US Patent No. 4,294,022 (Reference Material No. 1) discloses a boots with which a toe cap is integrally formed to cover the outsole and the foot toes of human body. Also, Korean Utility Model Registration No. 20-(34)0751 (Reference Material No.2), similar to the reference material 1, discloses a house footwear in which a toe cap is integrated with the sole on the area adjacent the front end of human foot, is extended to the top side of the leather upper, and is closely and firmly secured to the exterior surface of the leather upper.

[0005] The said two reference materials have a common characteristic in that the outsole is integrated with the toe cap covering the toes to be able to protect the toes against a possible external impact.

[0006] However, even if the toe caps of the prior art mentioned above cover and protect the toes, it is impossible to provide good wearing feeling and good feeling because the toe caps of prior art have entirely an arch shape in front ends thereof so that the toe caps merely cover all the toes entirely, not each of the toes individually. Also, the toe caps of prior art cannot have structures enough to safely protect the toes against the external impact.

[0007] Furthermore, since the heights of the toe caps of prior art are evenly the same along with the upper end thereof, the big toe having the relatively bigger than any other toes in both size and height thereof, receives rela-

tively greater pressure than any other toes, thereby occurring the pains, even in worst, some diseases such as plantar fasciitis and interdigital neuroma, whereas the little toe having relatively smaller size than any other toes tends to be easily moved in the footwear, thereby leading to a marked deterioration of the fitting ability.

Detailed Description of the Invention

10 Technical Problem

[0008] In order to solve the problems of prior art as mentioned, it is preferable that the toe cap contacting with the forward ends of the toes has a shape closely similar to that of the toes of human foot. Accordingly, the object of present invention is to provide a toe cap for footwear and an outsole integrated with the toe cap wherein the toe cap has a shape corresponding, in shape, to human toes, based on anatomy of human foot so that it is possible to improve wearing feeling and fitting feeling, and protect the foot or toes against exterior impact.

Solution to problem

[0009] In order to attain the above object, one aspect according to the preferable embodiments of the present invention provides a toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) is highest at a big toe (41) region and gradually slopes downward toward the little toe (45).

[0010] Preferably, an angle (D) of downward inclination of the upper end of the toe cap (30) is within a range between 5° to 25° in the shape of the sloped circular arcs.

[0011] Another aspect according to the preferable embodiments of the present invention provides a toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) has the shape of a circular arc along the outer shape of the toes, and the first to fourth grooves (31) to (34) are formed at four position between the five toes (41) to (45) respectively, so as to support each toe.

[0012] In addition the outsole (20) integrated with the toe cap is characterized by having a support groove (21) which is formed at a front upper end surface to accommodate the bottom surface of at least one or more of the toes (41) to (45).

Advantageous Effects of Invention

[0013] According to the present invention, the toe cap has a winding shape along with the outer shape of human toes, and particular characteristic structure in that the toe cap has a downward inclination of the upper end of the tow cap from the big toe to the little toe so as to support each toes, respectively, thereby being able to provide improved wearing feeling and fitting feeling, and enhancing the activity of foot. Furthermore, the toe cap has higher strength due to uneven structure thereof, so that the

toes can be safely protected against a strong external impact which may occur frequently outside of the footwear.

[0014] Still furthermore, the outsole integrated with the toe cap has support the groove for accommodating the bottom of each toe respectively which provides further improvement for wearing feeling and fitting feeling of the footwear.

Brief Description of Drawings

[0015] Fig. 1 is a perspective view illustrating only a main region of the footwear according to present invention;

[0016] Fig. 2 is a front view illustrating a main region of toe cap of the footwear according to present invention;

[0017] Fig. 3 is a sectional view taken along a line A-A of Fig. 2 illustrating winding shape of the toe cap; and

[0018] Fig. 4 is a partly-longitudinal sectional view illustrating outsole integrated with the toe cap according to present invention.

[0019] <Reference Signs List>

[0020] 10: Leather upper, 11: Middle region of Leather upper

[0021] 12: Footwear string, 20: Outsole

[0022] 21: Toe support groove, 30: Toe cap

[0023] 31, 32, 33, 34, 35, and 36: First to sixth grooves

[0024] 40: Foot

[0025] 41, 42, 43, 44, and 45: Toes

Best Mode for Carrying out of the Invention

[0026] In order to attain the above object, one aspect according to the preferable embodiments of the present invention provides a toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) is highest at a big toe (41) region and gradually slopes downward toward the little toe (45).

[0027] Preferably, an angle (D) of downward inclination of the upper end of the toe cap (30) is within a range between 5° to 25° in the shape of the sloped circular arcs.

[0028] Another aspect according to the preferable embodiments of the present invention provides a toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) has the shape of a circular arc along the outer shape of the toes, and the first to fourth grooves (31) to (34) are formed at four position between the five toes (41) to (45) respectively, so as to support each toe.

[0029] In addition the outsole (20) integrated with the toe cap is characterized by having a support groove (21) which is formed at a front upper end surface to accommodate the bottom surface of at least one or more of the toes (41) to (45).

Preferred Embodiment of the Invention

[0030] Hereinafter, the present invention according to

embodiments will be described in more detail with reference to the insole illustrated in the accompanying drawings.

[0031] Fig. 1 is a perspective view illustrating only a main region of footwear according to present invention, Fig. 2 is a front view illustrating a main region of toe cap of footwear according to present invention, and Fig. 3 is a sectional view taken along a line A-A of Fig. 2 illustrating winding shape of the toe cap.

[0032] As shown in Figs. 1 and 2, the footwear includes leather upper (10) for covering a top side of foot. An outsole (20) is formed on the leather upper (10), and a toe cap (30) for protecting human body's toes is formed on the forward side of footwear.

[0033] Hereinafter, characteristic structure of the toe cap (30) will be described. According to present invention, the toe cap (30) having the characteristic structure may be formed separately or integrally with the outsole (20).

[0034] As shown in Fig. 2 and Fig.3, the toe cap (30) having a shape corresponding to the appearance shapes of five toes (41) to (45). In a front view of the toe cap, the toe cap (30) is highest at a big toe (41) and gradually slopes downward toward the little toe (45) (See Fig. 2).

[0035] The toe cap (30) has the inclination in the upper end because the toes of human foot have sizes decreasing gradually from the big toe of the biggest size (height) to the little toe of the lowest size (height). As mentioned above, the height of the toe cap (30) in upper end is designed to correspond to outer shape of toes, and also the middle region (11) of the leather upper (10) is connected with the upper end of the toe cap (30) to cover a top side of foot.

[0036] As shown in Fig. 2, an inclination angle (D) of the upper end of the toe cap (30) can be varied by adjustment within a range between 5° to 25°. Because the upper end of the toe cap (30) has a curved line, not linear line, the angle (D) of the upper end can be adjusted within the range. More specifically, the upper end of the toe cap has a curve, extending from the highest height of big toe to the lowest height of little toe. The position points of the curve according to the toes have different angles along with the upper end of the toe cap, respectively, so that inclination angles of the position points may be adjusted within the range between 5° to 25°, when the upper end of the toe cap (30) is designed as downwardly inclined.

[0037] As shown in Figs. 2 and 3, the toe cap (30) has, in front end, a circular arc shape along the outer shape of each toe (41) to (45). The circular arc shape of the toe cap has first to fourth grooves (31) to (34) corresponding to four grooves formed between five toes (41) to (45).

[0038] More specifically, the first groove (31) corresponds to, in shape, a groove formed between the big toe (41) and the second toe (42), the second groove (32) corresponds to, in shape, a groove defined between the second toe (42) and third (middle) toe (43), the third groove (33) corresponds to, in shape, a groove defined between the third toe (43) and the fourth toe (44), and

the fourth groove (34) corresponds to, in shape, a groove defined between the fourth toe (44) and the little (fifth) toe (45).

[0039] According to such a structure, since the toes (41) to (45) are supported by the grooves (31) to (34), respectively, the toes are not easily moved in the toe cap such that the fitting feeling is enhanced. For example, a protrusion formed between the first groove (31) and the second groove (32) prevents the second toe (42) from being moved in the lateral direction in the toe cap, and similarly a protrusion formed between the second groove (32) and the third groove (33) prevents the third (middle) toe (43) from being moved in the lateral direction in the toe cap.

[0040] More preferably, as shown in Fig. 3, the toe cap (30) may further include a fifth groove (35) for supporting a forward - inner region (41)' of the big toe (41). In this case, the big toe (41) is located between the first groove (31) and the fifth groove (35), and simultaneously supported in the lateral direction such that the fitting feeling is highly enhanced.

[0041] Also, the toe cap (30) may further include a sixth groove (36) for supporting a side inner region (41)" of the big toe (41). In this case, the toe cap has a shape corresponding closely to the exterior appearance of the entire toes so that it is possible to support entirely the big toe loaded with the biggest impact upon walking, and to very highly enhance both the wearing feeling and the fitting feeling.

[0042] Fig. 4 is a partly-longitudinal sectional view illustrating outsole integrally formed with the toe cap according to present invention.

[0043] As described above, in case that the toe cap (30) is integrated with the outsole (20) supporting a sole of human foot, the outsole (20) may include, adjacent to the front upper end thereof, support groove (21) for supportably accommodating at least one of the toes (41) to (45).

[0044] The support groove (21), as shown in Fig. 4, is formed in the shape of puddles to supportably receive bottoms of the toes prevented from being moved in the lateral direction of the toe cap. As shown in Fig. 3, the support groove (21) may be formed to correspond, in shape, to all of the five toes, or one or more selected from the five toes, if necessary. For example, the support groove (21) may have only one groove for corresponding to the big toe (41), or two grooves for corresponding to the big toe (41) and the second toe (42). In other words, the number of recesses may be variously selected according to use, if necessary.

[0045] It will be apparent to those of ordinary skill in the art that various modifications can be made to the exemplary embodiments of the invention described above. However, as long as modifications fall within the scope of the appended claims and their equivalents, they should not be misconstrued as a departure from the scope of the invention itself.

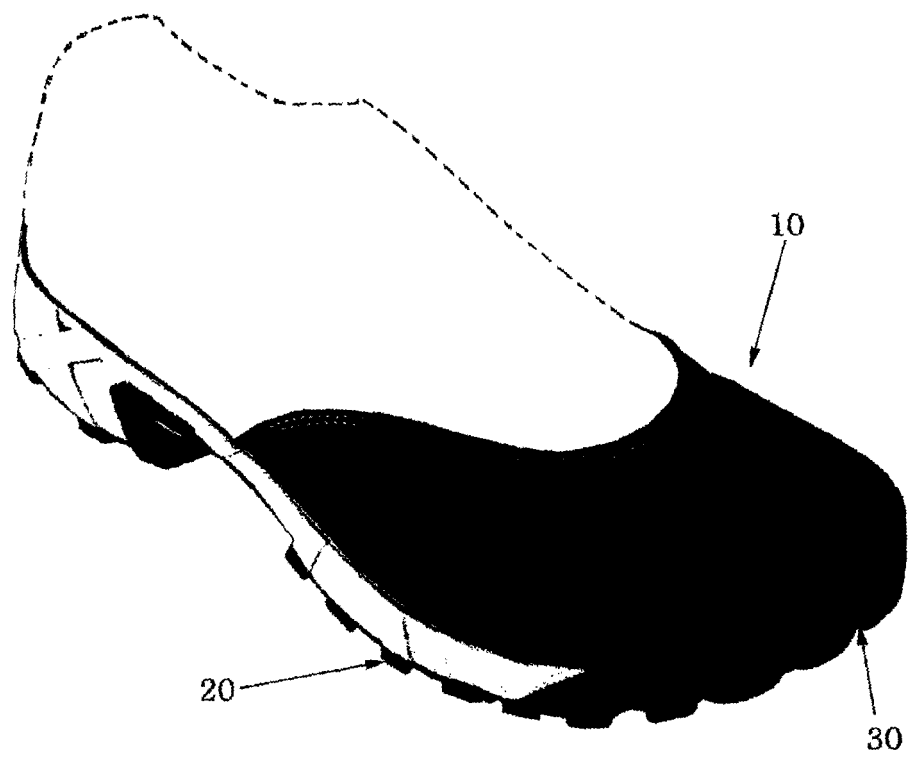
Industrial Applicability

[0046] According to present invention, the toe cap having a shape corresponding, complementarily in shape, to the outer shapes of five toes, and also, the toe cap has an downward inclination in the upper end thereof declining gradually from the big toe of the highest height to the little toe of the lowest height. Because the five toes can be supported, respectively, due to the characteristic structure mentioned above, the wearing feeling and the fitting feeling can be improved to increase activity of foot. Furthermore, the toe cap has uneven structure of surface such that strength of the toe cap can be enhanced to protect human foot even against the impact from the outside.

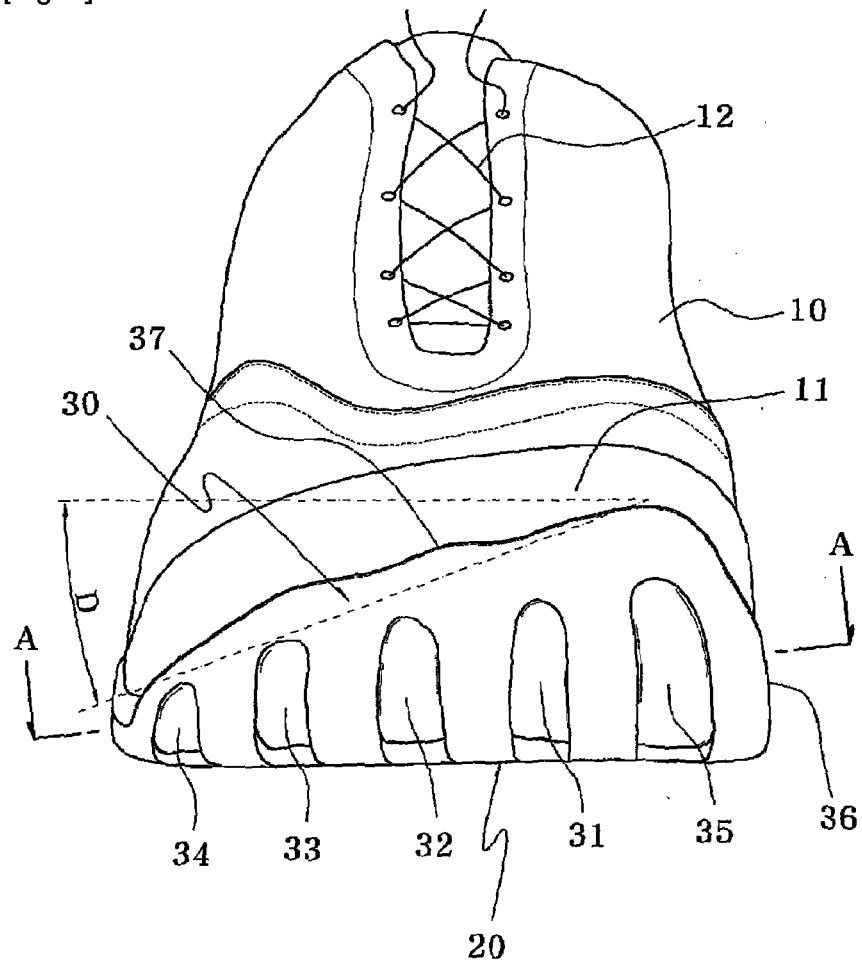
Claims

1. A toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) is highest at a big toe (41) region and gradually slopes downward toward the little toe (45).
2. The toe cap for footwear, according to claim 1, wherein an angle D of downward inclination of the upper end of the toe cap (30) is within a range between 5° to 25° in shape of the sloped circular arcs.
3. A toe cap for footwear, for covering toes of human body, **characterized in that** the toe cap (30) has the shape of a circular arc along the outer shape of the toes, and the first to fourth grooves (31) to (34) are formed at four position between the five toes (41) to (45) respectively, so as to support each toe.
4. The toe cap for footwear, according to claim 3, wherein the toe cap (30) further includes a fifth groove (35) for supporting a forward inner region (41)' of the big toe (41).
5. The toe cap for footwear, according to claim 3, wherein the toe cap (30) further includes a sixth groove (36) for supporting a side inner region (41)" of the big toe (41).
6. An outsole integrated with the insole for footwear according to anyone of claims 1 to 5, wherein the outsole (20) comprises support groove (21) which is formed at a front upper end surface to accommodate the bottom surface of at least one or more of the toes (41) to (45).

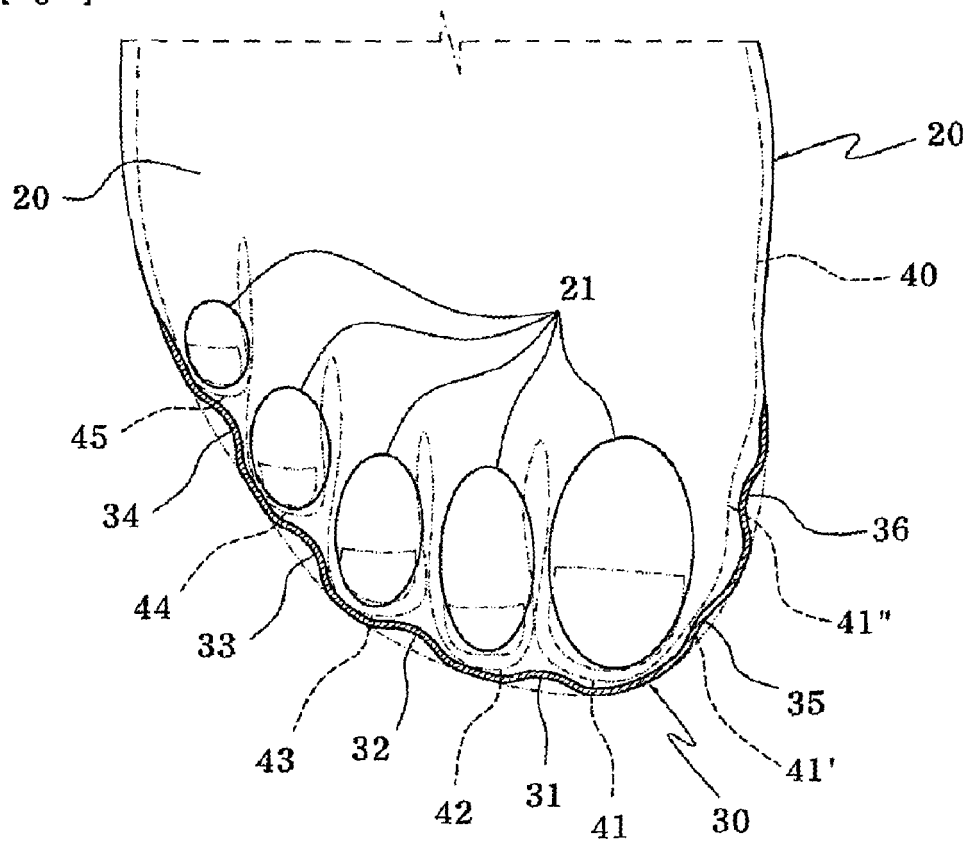
[Fig. 1]



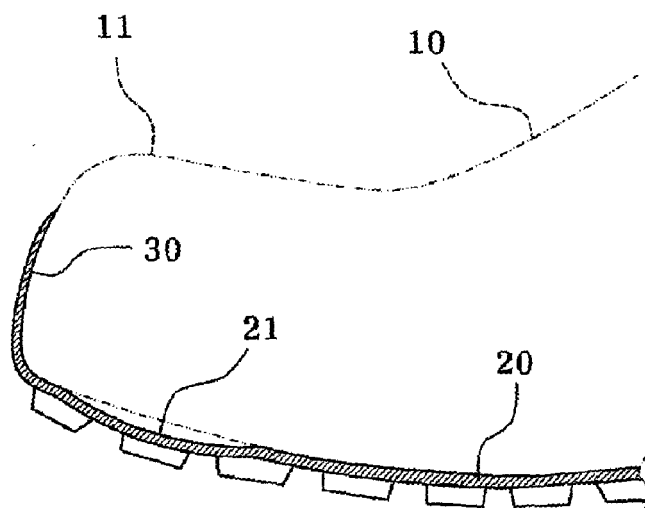
[Fig. 2]



[Fig. 3]



[Fig. 4]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2009/004456**A. CLASSIFICATION OF SUBJECT MATTER****A43B 7/32(2006.01)i**

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)

A43B 7/32; A43B 1/00; A43B 13/04; A43B 23/07; A43B 3/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models: IPC as above

Japanese Utility models and applications for Utility models: IPC as above

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

eKOMPASS (KIPO internal) & Keywords: shoes, toe cap, outsole

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 20-2009-0003012 U (L&T CO., LTD.) 25 March 2009 Claims 1-5 and figures 1-3	1-6
A	KR 10-2002-0026205 A (SIN, BYOUNG MIN) 06 April 2002 Claim 1 and figures 1-3	1-6
A	US 2008-0307670 A1 (DUCLOS GARY PAUL) 18 December 2008 Claims 1-5 and figures 1-4	1-6
A	US 2002-0083617 A1 (JEN-CHIEH TSOU et al.) 04 July 2002 Claims 1-5 and figures 1-2	1-6

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

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Date of the actual completion of the international search

26 JULY 2010 (26.07.2010)

Date of mailing of the international search report

03 AUGUST 2010 (03.08.2010)

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EP 2 454 960 A1

INTERNATIONAL SEARCH REPORT Information on patent family members

International application No.

PCT/KR2009/004456

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 20-2009-0003012 U	25.03.2009	NONE	
KR 10-2002-0026205 A	06.04.2002	NONE	
US 2008-0307670 A1	18.12.2008	EP 2155010 A1 WO 2008-156635 A1	24.02.2010 24.12.2008
US 2002-0083617 A1	04.07.2002	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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- KR 20340751 [0004]