



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

(43) Date of publication:
21.02.2007 Bulletin 2007/08

(51) Int Cl.:
A43B 3/30 (2006.01) A43B 13/14 (2006.01)
A43B 13/26 (2006.01)

(21) Application number: **05751302.0**

(86) International application number:
PCT/JP2005/010334

(22) Date of filing: **06.06.2005**

(87) International publication number:
WO 2005/120267 (22.12.2005 Gazette 2005/51)

(84) Designated Contracting States:
FR GB IT

• **TSUNEKA, Yasuhiro**
Minato-ku,
Tokyo 135-0091 (JP)

(30) Priority: **10.06.2004 JP 2004171993**

(71) Applicant: **Aprica Ikujikenkyukai Aprica Kassai Kabushikikaisha**
Osaka-shi,
Osaka 542-0082 (JP)

(74) Representative: **Hofer, Dorothea et al**
Prüfer & Partner GbR
Patentanwälte
Sohnckestrasse 12
81479 München (DE)

(72) Inventors:
• **KASSAI, Kenzou**
Osaka-shi,
Osaka 542-0083 (JP)

(54) **SHOE**

(57) A stabilizer (50) having a predetermined hardness harder than that of a shoe sole (11) is provided at a part corresponding from a metatarsal arch to a lateral tarsal arch of a baby, in the shoe sole (11) of a shoe (10).

FIG. 2A

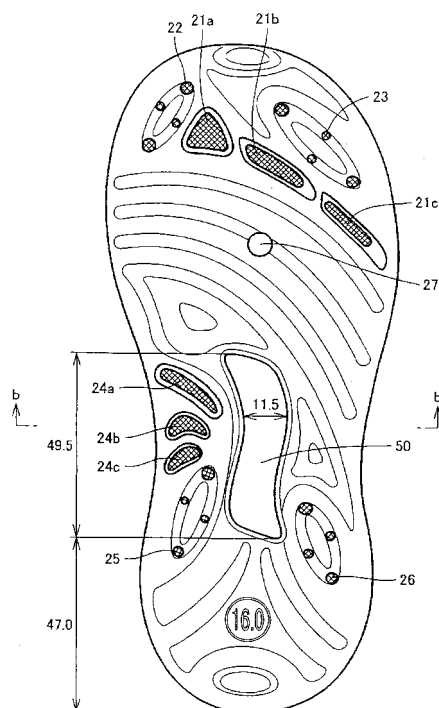
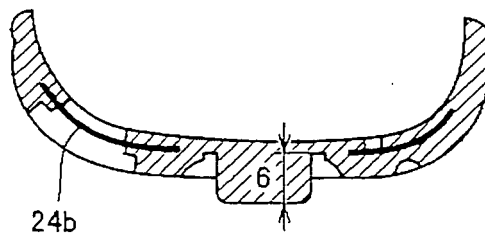


FIG. 2B



Description**TECHNICAL FIELD**

[0001] The present invention relates to a shoe and more particularly, to a shoe that supports the growth of the soft foot of a baby.

BACKGROUND ART

[0002] A conventional shoe in which a shoe sole is reinforced is disclosed in Japanese Unexamined Patent Publication No. 7-163404.

[0003] According to the shoe disclosed in the Japanese Unexamined Patent Publication No. 7-163404, the functions of the shoe sole such as elasticity, bending fatigueproof quality and the like are improved by using a hard plate made of a synthetic resin or a rubber as a material of the shoe sole.

[0004] According to the conventional shoe having the reinforced shoe sole, although the consideration has been given as a shoe for sports, there is no consideration about a shoe for supporting the growth of the bone of a baby.

DISCLOSURE OF THE INVENTION

[0005] It is an object of the present invention to provide a shoe to which consideration is given regarding the growth of the bone of the baby foot taking account of the specific structure of a baby foot without damaging the soft foot of the baby.

[0006] According to a shoe of the present invention, a stabilizer having a predetermined hardness is provided at a part corresponding from a metatarsal arch to a lateral tarsal arch of a baby in a shoe sole.

[0007] Since the stabilizer having the predetermined hardness is provided at the part corresponding from the metatarsal arch to the lateral tarsal arch of the baby in the shoe sole, the shoe is bent at the metatarsal part in accordance with the growth of the foot of the baby. As a result, the shoe promotes walking like a barefoot and supports the growth of the foot of the baby without hindering natural walk.

[0008] Preferably, the stabilizer is formed of a thermoplastic rubber.

[0009] Further preferably, the stabilizer is made of a material harder than that of the shoe sole.

[0010] Further preferably, the stabilizer is in the shape of a band having a predetermined width, and having a curved part extending from the heel to the tip toe and then curving in the inward direction of the shoe.

[0011] Further preferably, the configuration of the stabilizer is symmetric with respect to its central point.

[0012] Further preferably, a plurality of grooves are provided in a region positioned on the tip toe side from the stabilizer in the shoe sole along the curved part.

BRIEF DESCRIPTION OF DRAWINGS**[0013]**

Fig. 1 is a perspective view showing a shoe according to one embodiment of the present invention; Fig. 2A is a external view showing a shoe sole; Fig. 2B is a sectional view taken along line b-b in Fig. 2A;

Fig. 3 is an anatomical view showing foot bones; Fig. 4 is a view showing the track of weight shift at the time of walking in the foot sole of an adult in which the arch of the foot is formed;

Fig. 5A is a view showing one example of the specific configuration of a stabilizer 50; and

Fig. 5B is a view showing another example of the specific configuration of a stabilizer 50.

BEST MODE FOR CARRYING OUT THE INVENTION

[0014] One embodiment of the present invention will be described with reference to the drawings hereinafter. Fig. 1 is a perspective view showing a baby shoe according to one embodiment of the present invention. Referring to Fig. 1, a baby shoe 10 comprises a shoe sole 11 to be positioned under the foot of a baby, an instep part 12 to cover the instep of the baby, a tongue part 13 connected to the instep part 12 to cover the upper part of the instep of the baby, and a side part 14 connected to the instep part 12 to cover each side of the baby foot.

[0015] The baby shoe 10 comprises a connecting band 17 extending from one end of the upper part of one side part 14 to the other side part 14 through a space formed in the tongue part 13. One end of the connecting band 17 is fixed to the one end of the upper part of the one side part 14 and, the other end thereof is fixed to the other side part 14 by a surface fastener 18. Therefore, the foot of the baby can be easily inserted in the shoe 10 by opening the surface fastener 18 on the other side part 14.

[0016] In addition, as shown in Fig. 1, both instep part 12 and side part 14 of the baby shoe 10 are made of a nylon mesh cloth.

[0017] Fig. 2A is a view showing the shoe sole 11 of the baby shoe 10 shown in Fig. 1, and Fig. 2B is a sectional view taken along a line b-b in Fig. 2A. Referring to Figs. 2A and 2B, mesh ventilation parts are provided at a position of the toes of the baby foot, a position of the arch of the foot, a position at the lower part of the arch of the foot and a position opposite to the arch of the foot. Here, a relatively large wire mesh is provided at each of positions 21a to 21c on which toes except for the first toe are put and each of positions 24a to 24c of the arc of the foot, while a plurality of small wire meshes 21 to 26 are provided at a position 22 of the first toe, a tip end 23 of the shoe, a lower part 25 of the arch of the foot and a position 26 opposite to the arch of the foot. In addition, a through hole 27 is provided at a little lower part of the

position on which the toes are put. In addition, the size of the mesh is selected so that a small stone or a small object does not enter.

[0018] Referring to Fig. 2A, each of the wire meshes 21 to 26 is provided in a recessed part surrounded by a projected part in the shoe sole 11 so as not to be in contact with an external part directly (the projected part is shown by lines surrounding the mesh in Fig. 2A)

[0019] In addition, the mesh is not limited to the wire mesh, and it may comprise a reinforced plastic as long as it has a predetermine strength.

[0020] A stabilizer 50 is provided at a position adjacent to the position of the arch of the foot in the center of the shoe sole 11. The shoe sole 11 comprises TPR (thermo-plastic rubber) having hardness of 45. Meanwhile, although the stabilizer 50 comprises the TPR also like the shoe sole 11, its harness is 60 that is higher than that of the shoe sole 11.

[0021] Here, the length of the stabilizer 50 is about 49.5mm when the size of the shoe is 16cm and in this case, the dimension from the end of the stabilizer 50 on the heel side, to the end of the shoe on the heel side is about 47mm and the width thereof is about 11.5mm. In addition, the projected dimension of the stabilizer 50 from the shoe sole is about 6mm.

[0022] Although the major component of TPR of the stabilizer 50 may contain 80% SBS (styrene), 8% PS (polystyrene), 5% calcium carbonate, 5% paraffin oil, 2% stearic acid, the present invention is not limited to this.

[0023] The position of the stabilizer 50 will be described hereinafter. Fig. 3 is an anatomical drawing of foot bones. The foot bones are divided into three main regions, such as a region B of toe bones, a region C of a metatarsus, and a region D of a tarsus. A metatarsal arch 30 positioned in front is the arch of the instep, which is not a constant arch and changed when a load is applied. In the case of an adult, the metatarsal arch 30 is crushed by its own weight at the time of walking. A lateral arch 31 at the tarsus is not changed by its own weight in the case of the adult.

[0024] Since the foot of the baby is soft and fat, the shape of the foot is changed between a case where the foot is in contact with the ground and its own weight is applied to the foot and a case where the foot is spaced from the ground. That is, when its own weight is applied, the width of the foot is increased and the height of the instep is lowered. Meanwhile, when the foot is spaced from the ground, the width of the foot is decreased and the height of the instep is increased.

[0025] When the baby stands up, the baby bends the toes to catch the ground. To promote this movement leads to forming of the arch of the foot. In order to move the toes smoothly, it is necessary to hold the metatarsal arch 30 stably. Since the metatarsal arch 30 is provided at a position where the movement of the toes is not restrained, even when it is stably fixed, the movement of the toes is not affected.

[0026] Thus, according to this embodiment, in order to

fix the metatarsal arch 30 stably, the stabilizer 50 is provided between the metatarsal arch 30 and the lateral tarsal arch 31.

[0027] Thus, when the stabilizer 50 is provided between the metatarsal arch 30 and the lateral tarsal arch 31 in the shoe sole, the heel can be stably held and twisting at the time of walking can be prevented.

[0028] The position of the stabilizer 50 is designed based on a baby medicine and child-care technology. Therefore, when the stabilizer 50 is provided at this position, since the shoe is bent at the metatarsal part in accordance with the growth of the foot of the baby, the shoe promotes the walking like a barefoot without hindering the natural walk and supports the growth of the foot of the baby.

[0029] In addition, although the stabilizer 50 is provided only in the center of the shoe sole 11 in Figs. 2A and 2B, the present invention is not limited to this. The width thereof may be increased.

[0030] The specific configuration of the stabilizer will be described hereinafter. Fig. 4 shows the sole of an adult foot in which the arch of the foot is formed. In Fig. 4, arrows show the track of weight shift during walking. Focusing on the shift of the center of gravity of the adult foot at the time of walking, the center of gravity is grounded at the heel first, moved outside of the foot, shifted from the fifth metatarsal head to the first metatarsal head, and ends at the head of the great toe (the first toe).

[0031] Therefore, it is preferable that the configuration of the stabilizer 50 is provided along the weight shift at the time of walking so as to generate this gravity center movement. Thus, the center gravity is shifted in the foot width direction and a sense of stability can be provided, so that the walking is progressed and the ideal arch of the foot of the baby can be formed.

[0032] Figs. 5A and 5B show specific configurations of the stabilizer 50. Fig. 5A shows a stabilizer 50a shown in Fig. 2A and Fig. 5B shows a variation thereof. Referring to Fig. 5A, the configuration of the stabilizer 50a is in the shape of a band having a predetermined width and having a curved part extending from the heel to the tip toe and then curving in the inward direction of the shoe as shown in an arrow in the drawing. In addition, as shown in Fig. 5A, the configuration of the stabilizer 50a is symmetric with respect to its center point.

[0033] Referring to Fig. 5B, the configuration of a stabilizer 50b according to the variation is similar to the stabilizer 50a on the tip toe side but it is approximately rectangular on the heel side. When the stabilizers have the configurations shown in Figs. 5A and 5B, the growth of the arch of the foot can be promoted as described above.

[0034] In addition, referring to Fig. 2A, a plurality of grooves are provided in a region on the tip toe side from the stabilizer 50 in the shoe sole along the above curved part.

[0035] In addition, although the description has been made of the left baby shoe in the above embodiment, the same is applied to a right baby shoe.

[0036] Although the embodiments of the present invention have been described with reference to the drawings in the above, the present invention is not limited to the above-illustrated embodiments. Various kinds of modifications and variations may be added to the illustrated embodiments within the same or equal scope of the present invention. 5

INDUSTRIAL APPLICABILITY 10

[0037] According to the shoe in the present invention, since the stabilizer having the predetermined harness is provided at the part on which the metatarsus of a baby is to be put in a shoe sole, it can be advantageously applied to a shoe that supports the growth of the foot bone of the baby without damaging the soft foot of the baby. 15

Claims 20

1. A shoe comprising a stabilizer having a predetermined hardness at a part corresponding from a metatarsal arch to a lateral tarsal arch of a baby, in a shoe sole. 25
2. The shoe according to claim 1, wherein said stabilizer is formed of a thermo-plastic rubber.
3. The shoe according to claim 1, wherein said stabilizer comprises a material harder than that of said shoe sole. 30
4. The shoe according to claim 1, wherein said stabilizer is in the shape of a band having a predetermined width, and having a curved part extending from the heel to the tip toe and then curving in the inward direction of the shoe. 35
5. The shoe according to claim 4, wherein the configuration of said stabilizer is symmetric with respect to its central point. 40
6. The shoe according to claim 1, wherein a plurality of grooves are provided in a region positioned on the tip toe side from said stabilizer in the shoe sole along said curved part. 45

50

55

FIG. 1

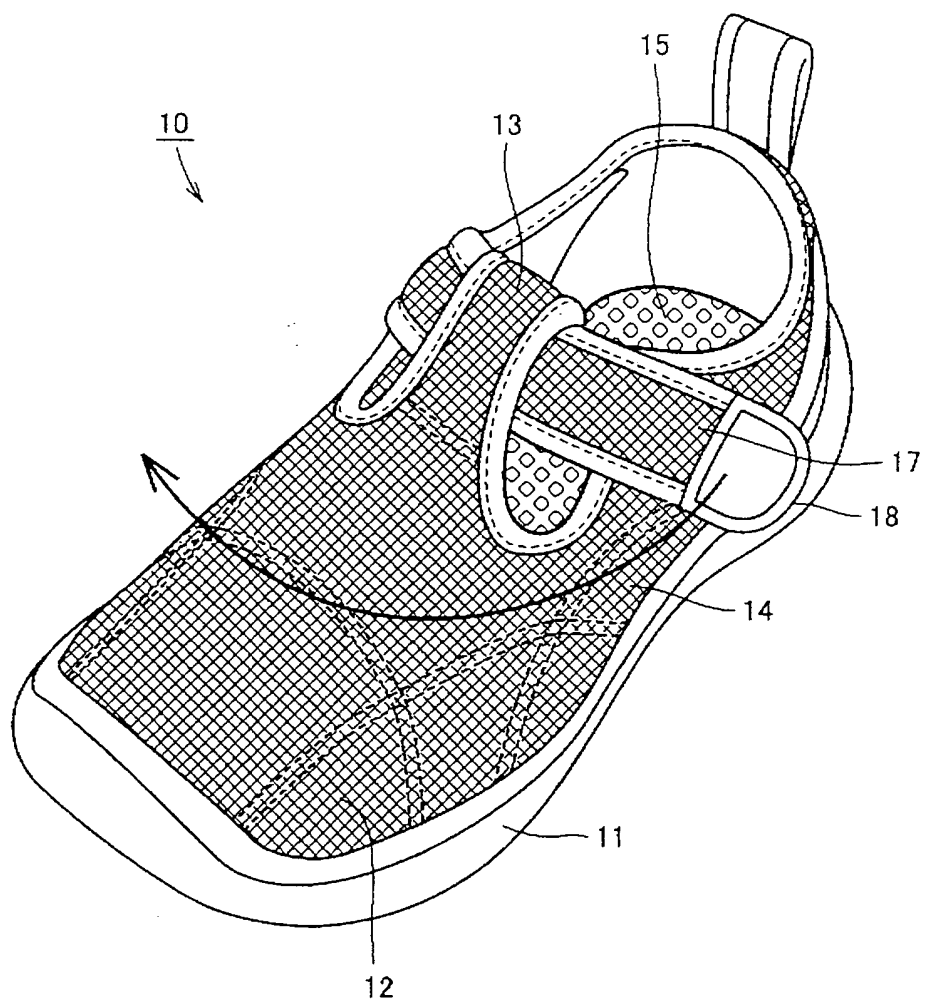


FIG. 2A

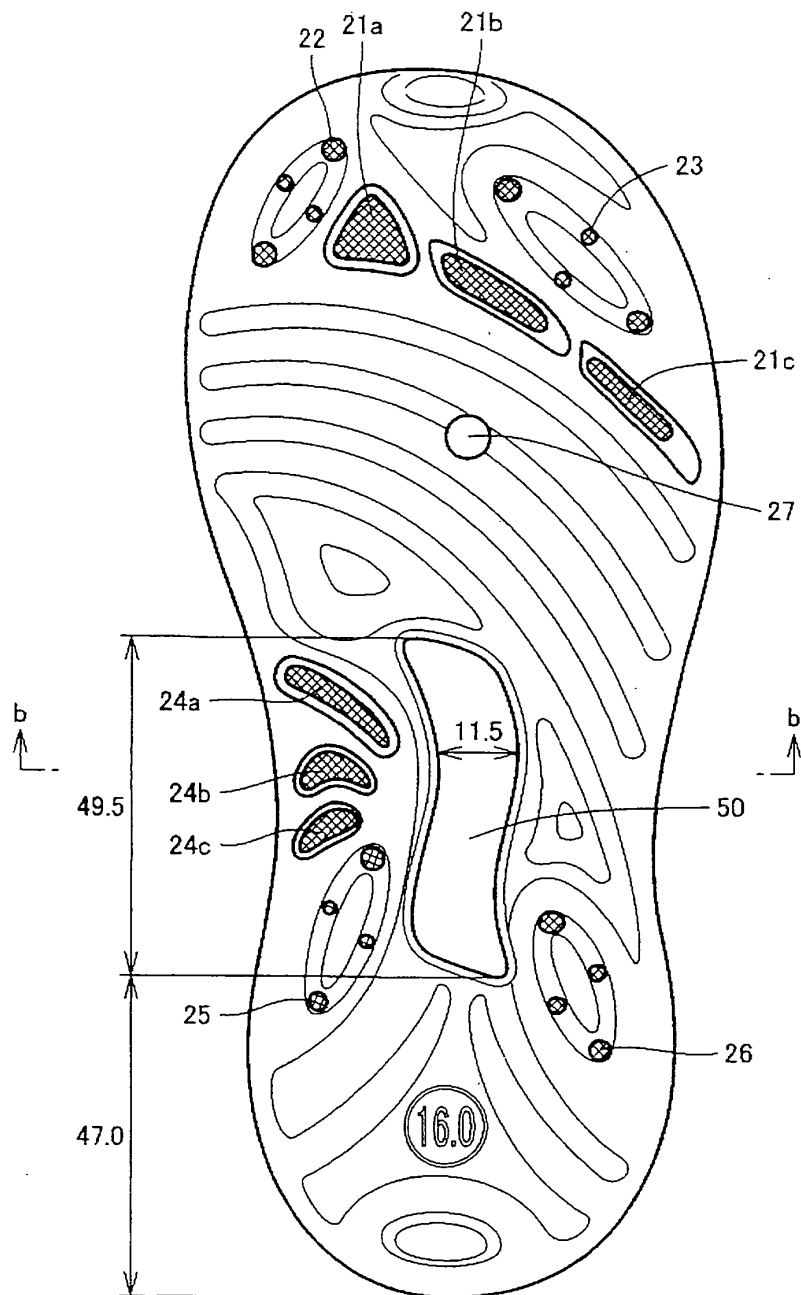


FIG. 2B

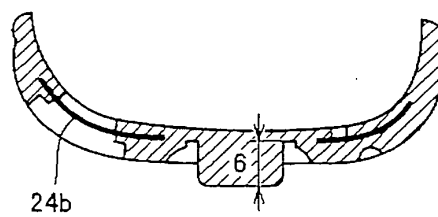


FIG. 3

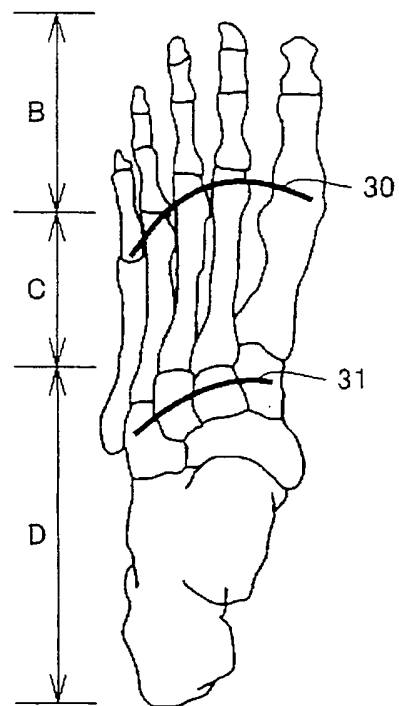


FIG. 4

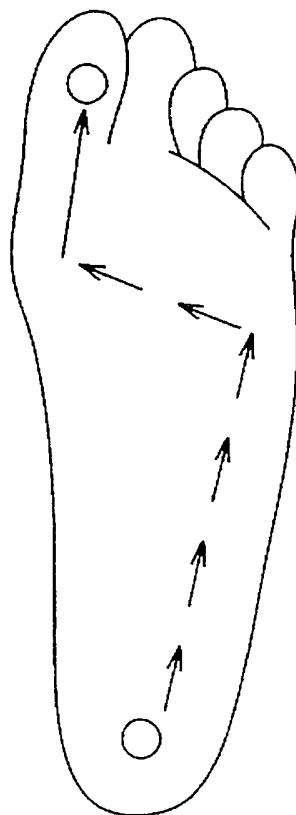


FIG. 5A

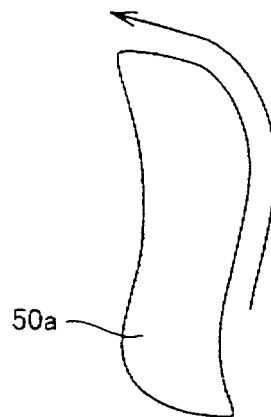
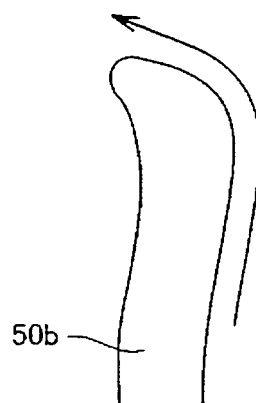


FIG. 5B



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2005/010334

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.⁷ A43B3/30, 13/14, 13/26

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.⁷ A43B3/30, 13/14, 13/26

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2005
Kokai Jitsuyo Shinan Koho	1971-2005	Toroku Jitsuyo Shinan Koho	1994-2005

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.
X Y A	JP 2003-284602 A (Pigeon Corp.), 07 October, 2003 (07.10.03), Par. Nos. [0029], [0038]; Fig. 3 (Family: none)	1, 2, 6 3 4, 5
X Y A	JP 2003-9902 A (Pigeon Corp.), 14 January, 2003 (14.01.03), Par. Nos. [0029], [0038]; Fig. 7 (Family: none)	1, 6 2, 3 4, 5
A	JP 2001-340104 A (Mitsuru FUJIOKA), 11 December, 2001 (11.12.01), Full text; all drawings (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

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
05 September, 2005 (05.09.05)Date of mailing of the international search report
20 September, 2005 (20.09.05)Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- JP 7163404 A [0002] [0003]