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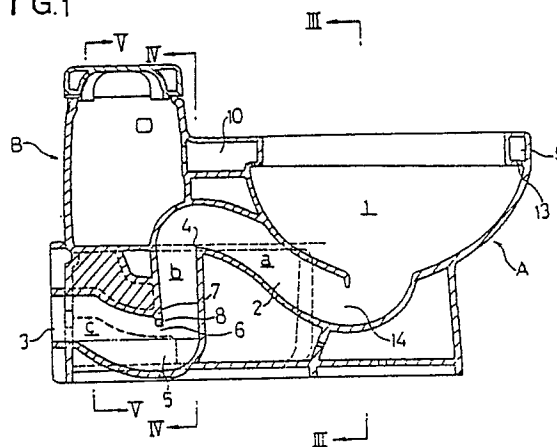
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54 **WATER CLOSET.**

57 A water closet having a drainage port in a position higher than the floor. During a flushing operation, an air vent space is partitioned by a water wall formed by a water flux dropping from a dam and by an increase of the water level in a reservoir, and the air in a trap is pushed out speedily toward the drainage port due to the rapid flow of water to make vacuous the interior of a trap's drainage passage and make it ready to start a siphoning action. When the feeding of water from a tank has been completed, so that the continuous siphoning action approaches the end thereof, a notch is formed in the water wall to permit the air to enter the air vent space immediately. Accordingly, the entry of the air into the air vent space occurs earlier, and the siphoning action terminates speedily.

FIG. 1



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WATER CLOSET

(Industrial Applicability)

The present invention relates to a water closet having a drain hole above a floor.

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(Prior Art)

A one-piece closet of a low silhouette type has been heretofore known (for example, see Japanese Utility Model Application Laid-Open No. 106584/1986).

In a water closet of this kind, a height dimension of a flushing tank is adjusted to a closet body as much as possible so as to provide a united impression.

Therefore, a sufficient water head cannot be obtained, and a feed water momentary flow rate which is a great factor to control a flushing function of a closet is extremely low as compared with that of a closet of the type in which a flushing tank is mounted on a closet body and a closet of the type in which a flush valve is used as a feed device.

Generally, a closet of a wall drain type has a core height of a drain hole set to 100 to 150 mm from a floor surface in terms of execution of a closet and a function of a closet. However, when a one-piece closet of the low silhouette type employs the wall drain type to secure the aforesaid drain hole height, a head from a water surface of a bowl portion to a core of the drain hole decreases and a satisfactory function cannot be exhibited with the aforesaid poor condition attended. Therefore, no one-piece closet of the wall drain type has been present so far.

On the other hand, since a water closet of a one-piece type is handled as a highest-class closet, this one-piece type closet has been desired to be installed in high-class mansions, suite rooms in high-class hotels, and the like,

However, in hotels, mansions and the like, ceiling beams often obstruct drain pipes, and in case of high buildings or the like, the height space is often secured by removal of piping space in the ceiling. Therefore, the conventional one-piece type water closet which employs the floor drain type wherein drain pipes need be installed under floor cannot often cope with the above-described demand of the market.

(Problem to be solved by the invention)

The problem to be solved by the present invention is that a trap drainage is made to be a new

construction in which a siphon tends to occur and a powerful siphon force is obtained, thereby making it possible to provide a wall drain for a one-piece type water closet.

(Means for solving the problem)

According to the technical means provided by the present invention to solve the aforementioned problem, a drain hole of a trap drainage formed continuously to a bowl portion of a closet body, the trap drainage having a sump portion at a downstream of a weir portion and partly narrowing a diameter of the trap drainage between the weir portion and the sump portion, and a partitioning wall is suspended on an upper wall of said sump portion leaving a slight vent space between said upper wall and a water surface of the sump portion, said partitioning wall being provided with a notch.

(Function)

With the above-described arrangement, according to the aforesaid technical means of the present invention, at the time of flushing, the vent space is partitioned in a wall-like manner by a water bundle falling from the weir portion and a rise in a water level of the sump portion, and air within the trap is promptly forced toward the drain hole by a water power so that the pressure in the trap drainage becomes negative pressure.

Accordingly, siphon tends to occur.

Further, when feed from the tank terminates to be about to terminate siphon duration, air is immediately introduced from the notch of the partitioning wall, and therefore, timing of air introduction becomes quickened to promptly disconnect siphon.

(Embodiment)

One embodiment of the present invention will be described hereinafter with reference to the drawings.

In the drawings, reference character (A) designates a closet body, and (B) a flushing tank formed integral with an upper half at the rear thereof, the flushing tank (B) being formed so that a height dimension of the flushing tank (B) is adjusted to the closet body (A) as much as possible to provide a united impression with the closet body (A).

In the closet body (A), a rim water passage (9)

provided along the upper edge of a bowl portion (1) is communicated with an intermediate portion heightwise of the flushing tank (B) through a feed chamber (10) provided at the rear of the bowl portion (1), and a discharge opening (11) bored in the bottom side of the bowl portion (1) is communicated with the bottom of the flushing tank (B) through a water guide passage (12) provided outside the bowl portion (1) so that a part of the flushing water within the tank (B) is supplied along the wall surface of the bowl portion 1 from a water injection hole (13) bored in the lower surface of the rim water passage (9) and the remaining greater part thereof is spirally supplied from the discharge opening (11) to the bottom of the bowl portion (1).

Furthermore, in the close body (A), a trap drainage (2) for discharging flush water supplied to the bowl portion (1) outside the closet together with sewage is provided to be communicated with the bowl portion (1).

In the trap drainage (2), an inlet (14) is opened to the bottom of the bowl (1), and an outlet, that is, a drain hole (3) is opened to a substantially intermediate position between the lower end of the flushing tank (B) and the lower end of the closet body (A) at the back of the closet body (A), both the inlet and drain hole (14, 3) being communicated with each other to form a substantially S-character configuration.

That is, the trap drainage (2) is composed of a portion obliquely and upwardly extending from the inlet (14) opened to the bottom of the bowl portion (1) toward the rear portion of the closet body (A) (hereinafter referred to as a portion a), a portion which is continuous to the upper end of said portion a, substantially vertically downwardly extends and reaches a position lower than a height positions of the inlet (14) and drain hole (3) (hereinafter referred to as a portion b), and a portion which is continuous to said portion b and obliquely and upwardly extends toward the drain hole (3) (hereinafter referred to as a portion c), the bottom wall at the upper end of the portion a forming a weir portion (4).

In the trap drainage (2), a diameter of the portion b to be gradually reduced downwardly to partially narrow the diameter of the drain hole and forms a sump portion (5) from the lower end of the portion b to the halfway portion of the portion c.

Moreover, in the trap drainage (2), a downwardly extending partitioning wall (7) is formed on the upper wall of the sump (5), more specifically, on the upper wall of a boundary portion between the portions b and c so as to leave a slight vent space (6) between the lower end of the partitioning wall and a water surface or level of the sump (5).

The partitioning wall (7) is provided with a notch (8) having a suitable width from the lower

end thereof to the heightwise mid-portion.

The optimum dimension of the vent space (6) is approximately 20 mm in order to induce siphon.

While in the above-described embodiment, the closet of the low silhouette type has been described, it is to be noted that for example, a siphon or siphon-jet closet may be adapted.

(Effect)

The present invention being constructed as described above, there are the following advantages.

(1) The construction is provided in which the vent space is partitioned in a wall-like manner by a water bundle falling from the weir portion and a rise in water level of the sump portion. Therefore, the air within the trap can be quickly forced toward the drain hole to give the interior of the trap negative pressure so that siphon action easily occurs.

Accordingly, the water feed momentary flow rate is materially low as compared with that of a tank closely connected type closet or a closet using a flush valve. In addition, despite the fact that this closet is a one-piece closet of a low silhouette type wherein when, as a wall drain type, a core height of a drain hole is set to secure about 100 mm from a floor surface, a head from a water level of the bowl portion to the core of the drain hole is small, a fully satisfactory sewage discharge function can be obtained as the wall drain type.

Thereby, the closet of the present invention can be installed without any trouble in high buildings, high class mansions, high-class hotels and the like in which the ceiling beams obstruct under-floor piping and often omitting piping spaces in the ceiling, thus making it difficult to install a one-piece closet of a low silhouette type. The closet of the present invention can cope with the demand of markets.

(2) By providing the notch on the partitioning wall, when feed of water from the flushing tank terminates to be about to terminate siphon duration, air can be promptly introduced from the notch into the trap, and therefore, the siphon can be quickly terminated to secure a water level of the bowl portion, and the depth of seal water can be returned to its original state due to the trap seal.

Incidentally, if a notch is not provided in a partitioning wall, siphon termination time remarkably extends due to the rise in water level of the sump portion and the falling water from the weir portion to make it difficult to secure the depth of sealed water.

It is noted that since at the start of siphon, a water film is formed by the water bundle from the weir portion, the aforesaid notch will not influence on siphon start time and strength of siphon.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a sectional view of a water closet showing one embodiment of the present invention;

Fig. 2 is a partly cutaway plan view;

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Fig. 3 is a sectional view taken on line III-III of Fig. 1;

Fig. 4 is a sectional view taken on line IV-IV of Fig. 1; and

Fig. 5 is a sectional view taken on line V-V of Fig. 1.

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A : closet body

B : flushing tank

1 : bowl portion

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2 : trap drainage

3 : drain hole

4 : weir portion

5 : sump portion

6 : vent space

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7 : partitioning wall

8 : notch

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Claims

1. A water closet in which a flushing tank is formed integral with a closet body, characterized in that a drain hole of a trap drainage formed continuously to a bowl portion of the closet body is provided in a side peripheral surface of the closet body.

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2. A water closet having a drain hole above a floor, characterized in that a drain hole of a trap drainage formed continuously to a bowl portion of a closet body is bored in a side peripheral surface of the closet body, the trap drainage having a sump portion at a downstream of a weir portion and partly narrowing a diameter of the trap drainage between the weir portion and the sump portion, and a partitioning wall is suspended on an upper wall of said sump portion leaving a slight vent space between said upper wall and a water surface of the sump portion, said partitioning wall being provided with a notch.

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FIG. 1

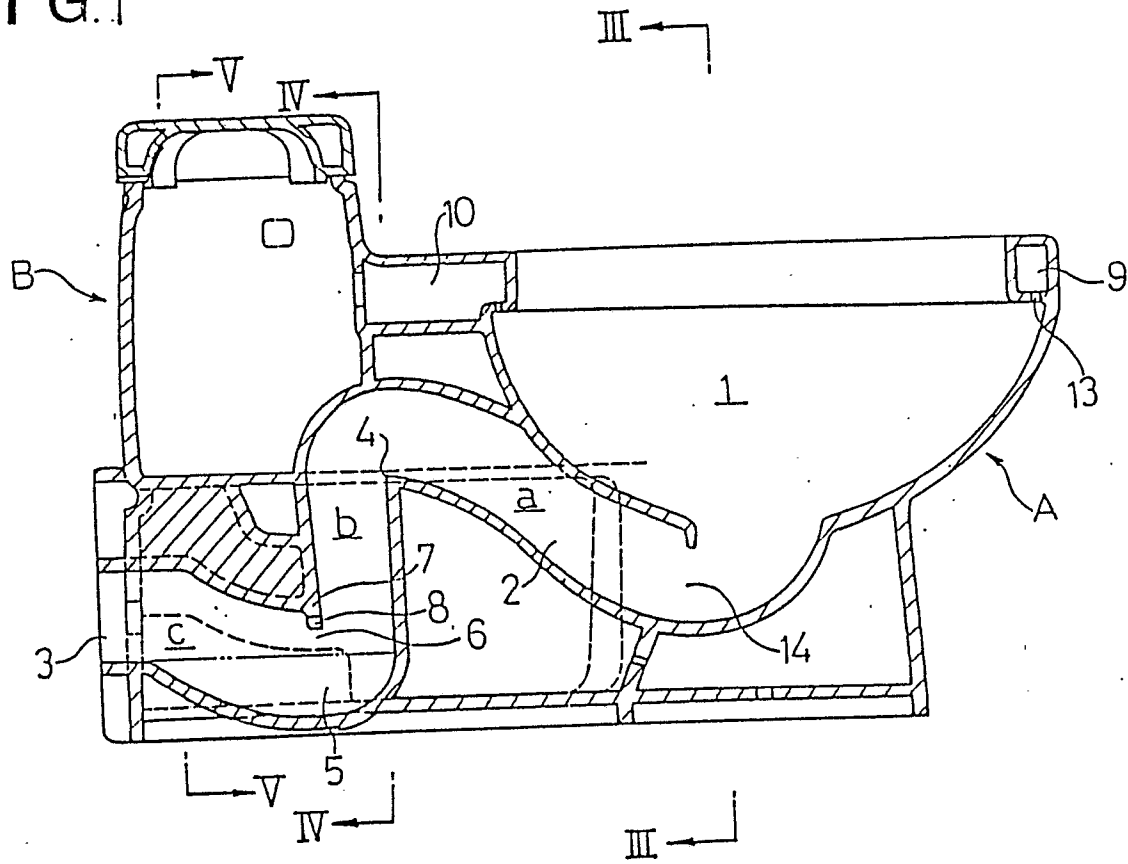


FIG. 2

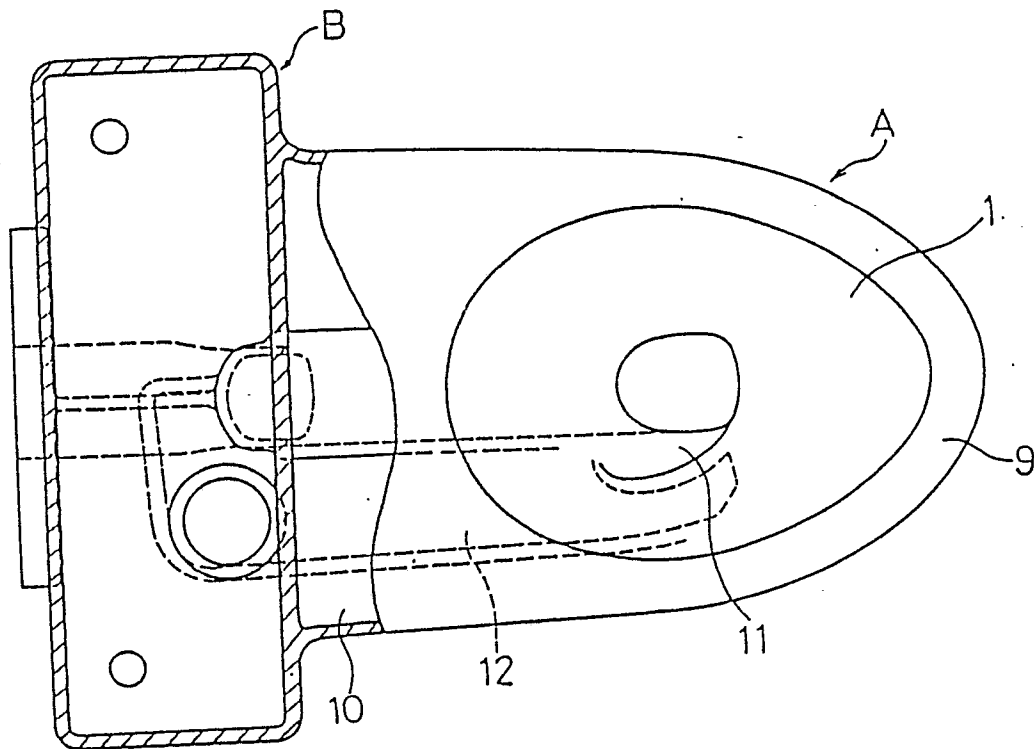


FIG.3

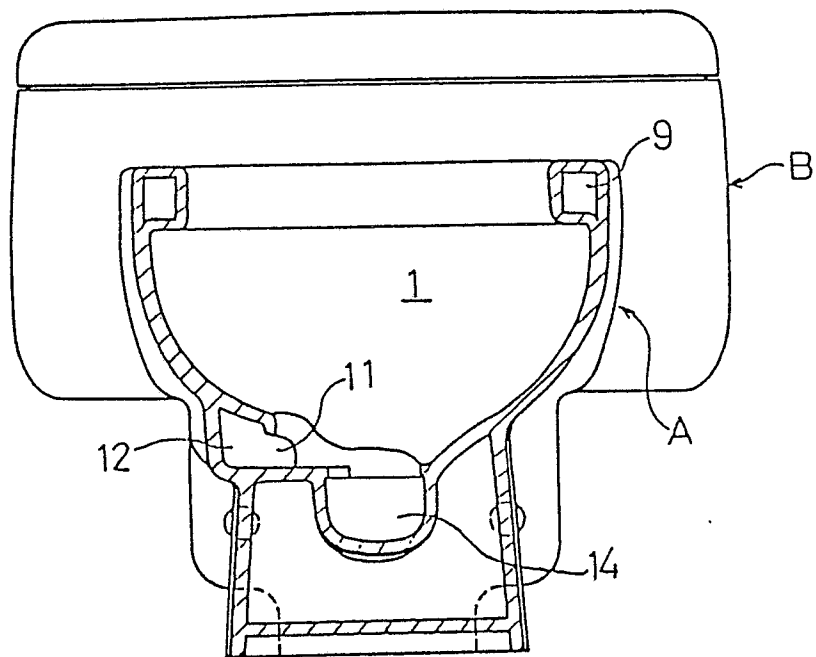


FIG.4

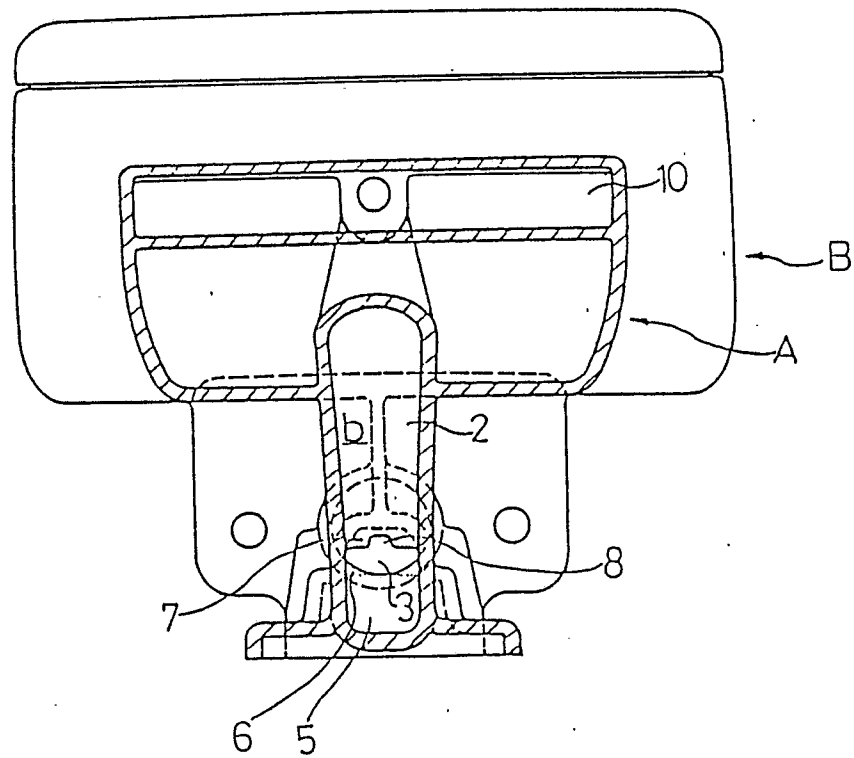
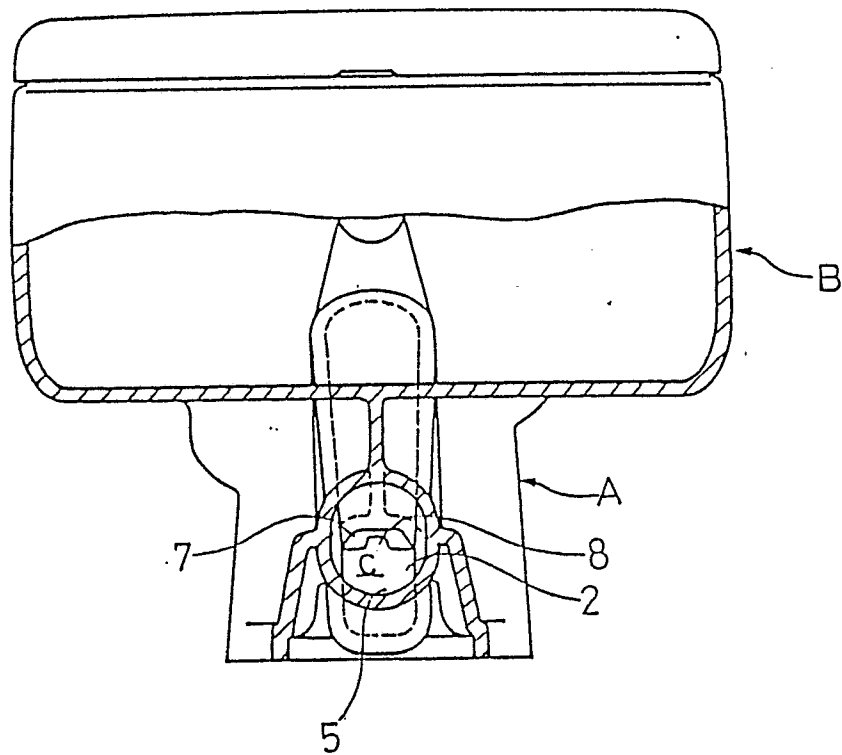


FIG. 5



INTERNATIONAL SEARCH REPORT

International Application No PCT/JP88/00944

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. ⁴	E03D11/02	
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC	E03D11/13, 11/18, 11/02	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
Jitsuyo Shinan Koho		1926 - 1987
Kokai Jitsuyo Shinan Koho		1971 - 1987
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category [*]	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	GB, A, 1,099,707 (John Steventon & Sons Ltd.) 8 November 1966 (08. 11. 66) Page 1, lines 78 to 83	1
X	Utility Model Application No. 10914/1982 (Utility Model Laid-Open No. 115587/1983) no Gansho ni tenpushita Specification and Drawing no naiyo o satsueishita Microfilm (Ina Seito Kaisha, Ltd.) 6 August 1983 (06. 08. 83) Page 3, lines 7 to 10, page 4, lines 8 to 9 (Family: none)	1
A	Utility Model Application No. 111395/1985 (Utility Model Laid-Open No. 21180/1987) no Gansho ni tenpushita Specification and Drawing no naiyo o satsueishita Microfilm (INAX Corporation) 7 February 1987 (07. 02. 87) Page 6, line 16 to page 7, line 9 (Family: none)	2
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"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</p> <p>"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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</p> <p>"Z" document member of the same patent family</p> </div> </div>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
December 5, 1988 (05. 12. 88)	December 19, 1988 (19. 12. 88)	
International Searching Authority	Signature of Authorized Officer	
Japanese Patent Office		