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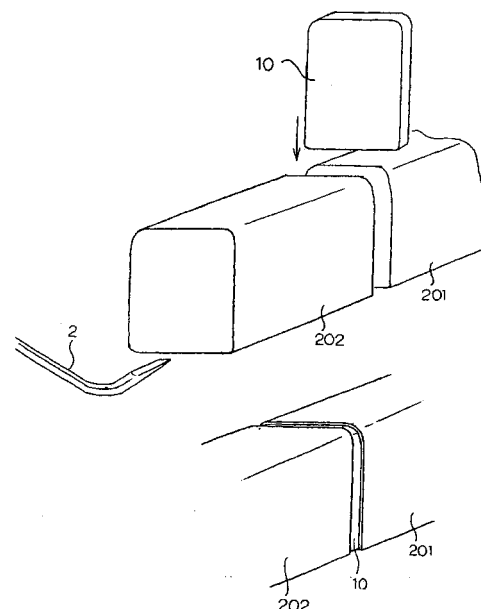
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(54) **MORTAR JOINT BOARD**

(57) The present invention provides a mortar bonding plate, which can be conveniently used for connecting concrete blocks with each other and is helpful in giving unified external appearance, and further, suitably used for modification or repair in case of damage. According to the present invention, a bonding plate is molded from mortar in a planar shape similar to that of connecting surface of each of the concrete blocks, and slightly smaller by the predetermined dimension than the connecting surface, and the bonding plate is placed between the concrete blocks and the blocks are connected. When necessary, recesses where adhesive agent or adhesive mortar is to be coated may be provided on one surface or both surfaces of the bonding plate, or a cushion-type or sponge-like buffer member may be mounted at least on one surface of the bonding plate.

FIG. 1



## Description

### TECHNICAL FIELD

**[0001]** The present invention relates to a mortar bonding plate for connecting concrete blocks to be used for defining the boundary between sidewalk and roadway, for center divider strip of road, or as blocks used to indicate boundary of land estate, as curbstone of flower garden, or used for U-shaped or L-shaped drainage, etc.

### BACKGROUND ART

**[0002]** For instance, a concrete block for sidewalk or concrete block for defining the boundary of land estate is produced by molding it into a concrete block in a standardized size such as 60 cm, 1 m, or 2 m in length, and these concrete blocks are continuously connected with each other and used.

**[0003]** These concrete products vary slightly in dimension from each other due to the conditions during the manufacturing process. Also, the place where these concrete blocks are installed is not necessarily flat. As a result, it is practically difficult to connect these blocks by accurately aligning them in dimension and height. In order to adjust the accuracy in the installation of these blocks, the blocks are placed with a space of about 1 cm between the concrete blocks. Then, mortar is filled into the space, and, using a bonding trowel, this filling is finished to have a shape slightly smaller than the contour of the block, i.e. to form a small shallow recess between the blocks. This is the so-called decorative bonding technique and is now widely used.

**[0004]** However, in order to fill the mortar into the gap, much time and labor are required. Instead of filling the space with the mortar, it is now practiced to attach a sealing member such as rubber tape on both surfaces of the concrete block, and sludge-like mortar is poured from the top end. After it is half-solidified, the sealing member is removed, and finish bonding is performed. However, there are wide variations in the results of the finishing work, bonding width, etc.

**[0005]** Also, the work to fill the mortar into gaps requires much labor and time, and this cannot be performed at the same time as the installation of concrete blocks. Thus, it requires a procedure different from that of the installation of concrete blocks. Because of the nature of mortar, the work cannot be done on rainy day, and the time for drying and hardening differs depending on the conditions such as temperature.

**[0006]** In this connection, a proposal has been made to use a bonding plate partially made of synthetic resin, and this is placed between concrete blocks. However, this decorative bonding technique is originally used for the case where it is difficult to maintain accuracy in installation, which is caused by difference in height between corner of boundary block and ground surface or by dimensional difference of concrete blocks. It is desir-

able that it gives unified external appearance as concrete blocks when concrete blocks are connected with each other. In particular, external appearance of concrete blocks is different between the case where the blocks are wet with rain and the case where the blocks are dried. In this respect, it is necessary to use a bonding plate, which gives harmonious outlook from the viewpoint of the material.

**[0007]** On a road with sharp curving or at a road intersection or at a place where there is much difference in height, it is not possible to maintain the both sides of bonding in parallel, and modification must be made at the construction site using mortar. The mortar bonding must be able to cope, for instance, with a case where concrete blocks are used for sidewalk and a new entrance way must be constructed for a newly installed building or in case the concrete blocks must be repaired to restore from damage.

### DISCLOSURE OF THE INVENTION

**[0008]** To solve the technical problems in mortar filling procedure or in construction technique, it is an object of the present invention to provide a mortar bonding plate, which is conveniently used for connecting the concrete blocks, which can give unified external appearance and is suitable for modification at local site or adaptable for repair in case of damage.

**[0009]** Specifically, the mortar bonding plate of the present invention comprises a planar member in a shape similar to that of the connecting surface of each of the concrete blocks and slightly smaller than the connecting surface by a predetermined dimension. More concretely, it is produced by pouring the mortar into a mold.

**[0010]** In another aspect of the mortar bonding plate of the present invention, recesses are provided on one surface or both surfaces of the planar bonding plate, which is in a shape similar to that of connecting surface of each of the concrete blocks and slightly smaller in dimension, and the recesses are formed and used for coating adhesive agent or adhesive mortar on it.

**[0011]** Further, according to another aspect of the present invention, a cushion-type of sponge-like buffer member is mounted at least on one surface of the bonding plate of claim 1 or 2, wherein this buffer member is compressed and is used to fill partial gaps in case both sides of the filling between the concrete blocks are not running in parallel.

### BRIEF DESCRIPTION OF THE DRAWINGS

#### [0012]

Fig. 1 shows how concrete blocks are connected with each other;

Fig. 2 shows an example of a bonding plate with a groove formed on it;

Fig. 3 shows another example of the bonding plate with recesses formed on it;

Fig. 4 shows still another example of the bonding plate provided with a buffer member;

Fig. 5 shows an example of L-shaped drainage;

Fig. 6 represents a boundary block between land estates; and

Fig. 7 shows an example of a shallow type drainage.

#### MODE FOR CARRYING OUT THE INVENTION

**[0013]** Fig. 1 is a perspective view showing how concrete blocks are connected when blocks for defining the boundary between sidewalk and roadway are connected with each other. First, a first block 201 is installed at a predetermined position by confirming position, height, etc. Next, a secondary block 202 is temporarily installed with a spacing slightly wider than the thickness of the bonding plate, which is about 1 cm in thickness. Then, adhesive agent for concrete block or adhesive mortar is coated on a mortar bonding plate 10 molded from mortar according to the present invention, and this mortar bonding plate is placed between the concrete blocks, and it is attached to end surface of the first block. Using a tool 2 such as a steel bar, the second block is slightly moved by pushing the end surface of the second block to squeeze the bonding plate between the two blocks.

**[0014]** By the same procedure, a third block and subsequent blocks are attached and connected one after another. When a groove 1a or recesses 1b are formed on one surface or on both surfaces of the mortar bonding plate as shown in Fig. 2 and Fig. 3, adhesive agent for concrete product or adhesive mortar can be coated much easier, and this also contributes to the maintenance of the conditions after the installation of blocks. If a cushion type or sponge-like buffer member 1c is attached on one surface of the mortar bonding plate, even when blocks are placed not in parallel to each other, the buffer member is compressed, and this is helpful in filling partial gaps between the blocks.

**[0015]** Other application examples of the mortar bonding plate to other type of concrete blocks are shown in Fig. 5 to Fig. 7. Fig. 5 shows a bonding plate used for L-shaped drainage, Fig. 6 is a bonding plate used for boundary blocks to define the boundary between land estates, and Fig. 7 is a bonding plate for a shallow type drainage.

**[0016]** The mortar bonding plate of the present invention can be produced by mixing and kneading fine aggregate of cement, sand, etc. with water, and by pouring this into a mold and by solidifying and hardening it. If lightweight aggregate is placed in it, total weight can be reduced. This makes the mounting and transport much easier.

#### INDUSTRIAL APPLICABILITY

**[0017]** Because the mortar bonding plate of the

present invention is formed by molding, it can produced and kept in stock well in advance. As a result, bonding procedure at the construction site can be completed at the same time as the installation of concrete blocks.

**[0018]** Because the mortar bonding plate is molded in a form slightly smaller than outer dimension of the concrete blocks, it can be used as a decorative bonding plate, which can eliminate error due to the difference of dimension and height between the concrete blocks.

**[0019]** Also, the material of the bonding plate is the same cement material as the concrete blocks, and unified external appearance can be provided. In particular, when there is parallel gaps between the concrete blocks, which cannot be absorbed by compressive width of cushion-type or sponge-like buffer material mounted on the bonding plate, adjustment can be made using the mortar. Also, repair or restoration using mortar can be carried out easily in case of modification or damage after the completion of construction work.

**[0020]** Further, when the cushion-type or sponge-like buffer member is mounted on the mortar bonding plate, this is helpful in absorbing elongation or shrinking of concrete blocks. The buffer member also serves as an impact-absorbing material when the bonding plates are packed and transported, and this is useful for the prevention of damage on the bonding plate.

#### Claims

1. A mortar bonding plate, formed in a planar member to be inserted between two adjacent concrete blocks to be connected with each other, said planar member is formed in a shape similar to connecting surface of each of the concrete blocks and has a dimension slightly smaller than the dimension of the connecting surface of the concrete blocks.
2. The mortar bonding plate according to claim 1, wherein recesses are formed on one surface or both surfaces of the planar member, said recesses being used for coating with adhesive agent or adhesive mortar.
3. The mortar bonding plate according to claim 1 or 2, wherein a cushion-type buffer member is mounted at least on one surface of the planar member.

FIG. 1

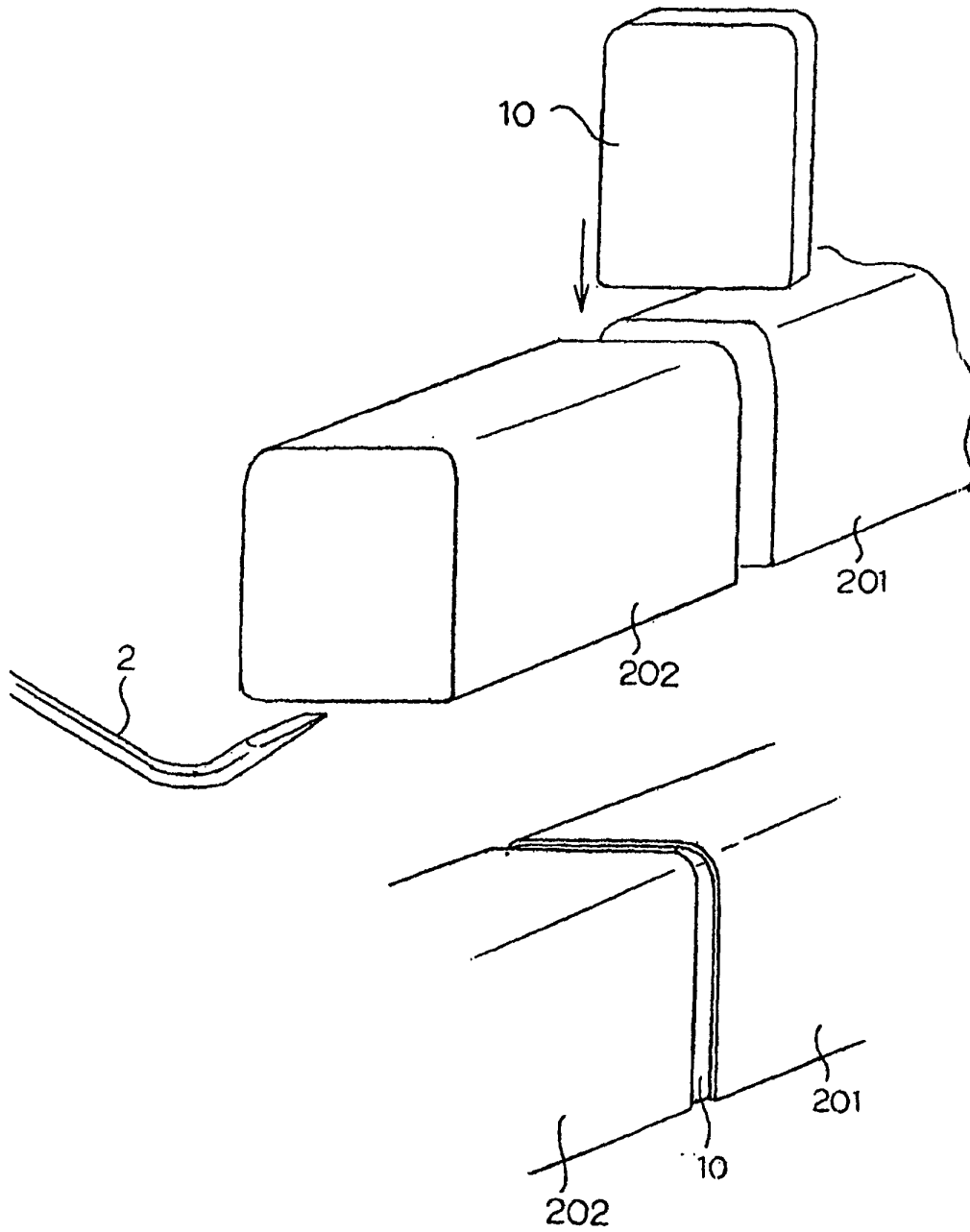


FIG. 2

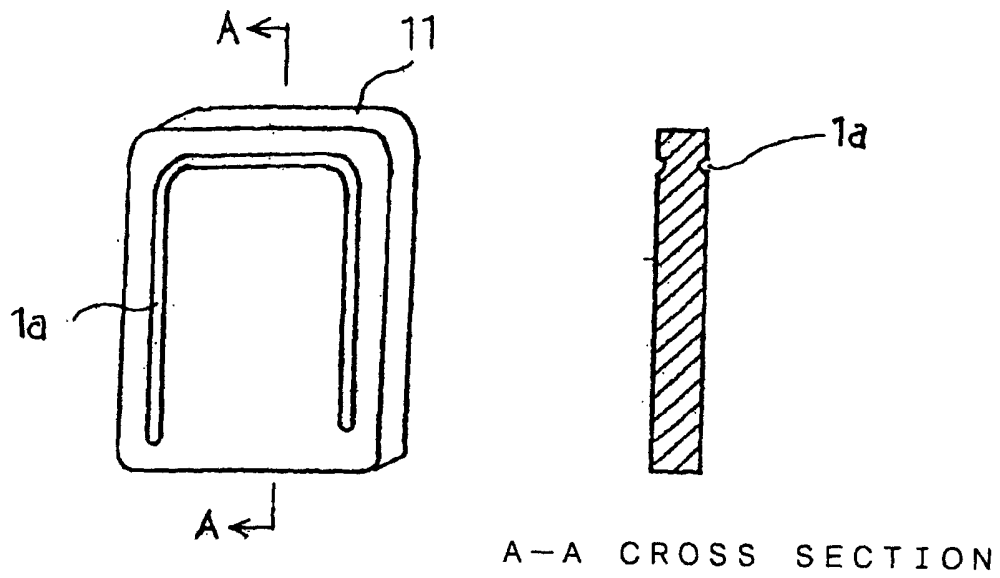


FIG. 3

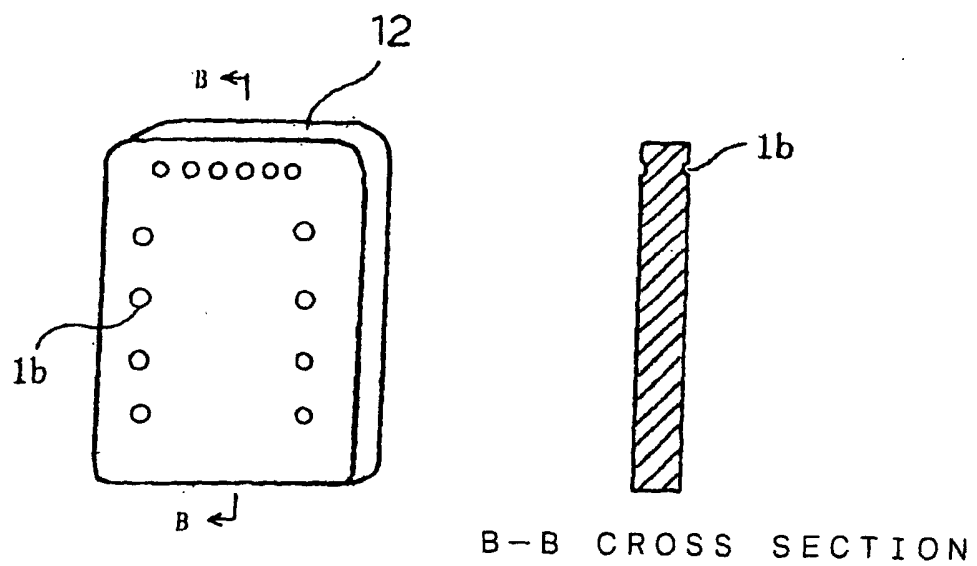


FIG. 4

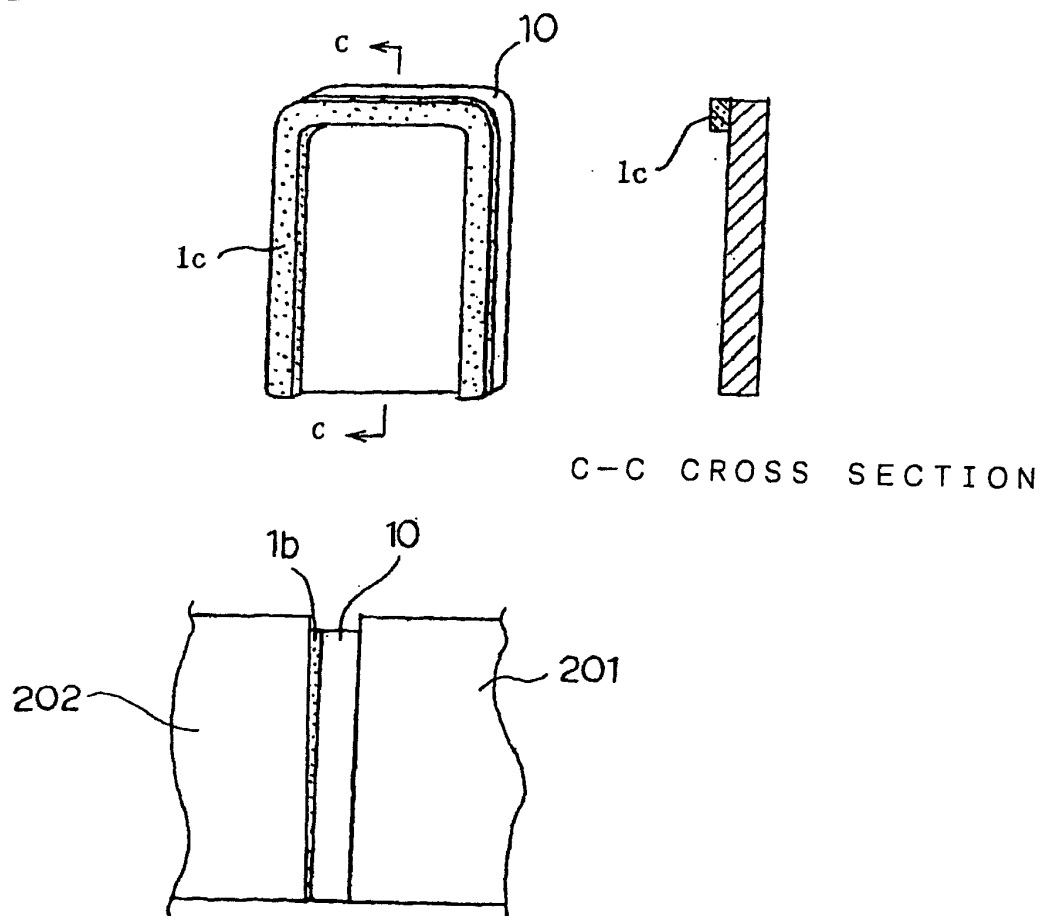


FIG. 5

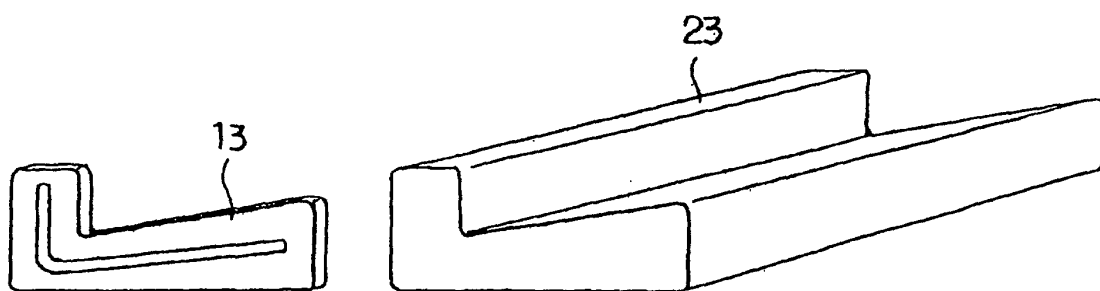


FIG. 6

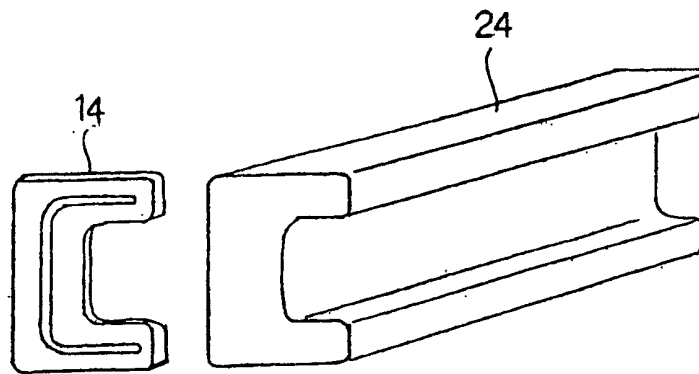
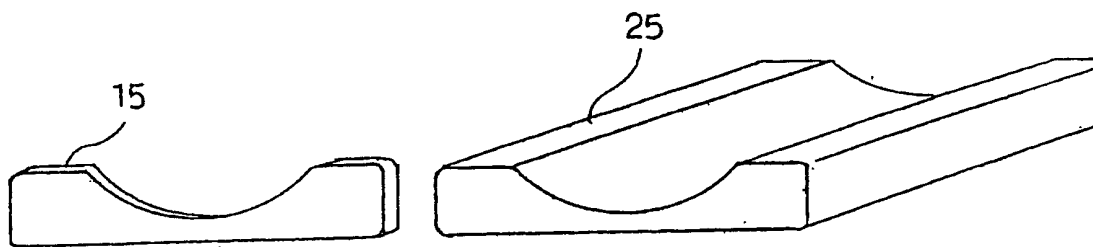


FIG. 7



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP01/09948

A. CLASSIFICATION OF SUBJECT MATTER Int.Cl <sup>7</sup> E01C 11/22		
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 <sup>7</sup> E01C 11/22, E01C 5/12		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Jitsuyo Shinan Koho 1922-1996 Toroku Jitsuyo Shinan Koho 1994-2001 Kokai Jitsuyo Shinan Koho 1971-2001 Jitsuyo Shinan Toroku Koho 1996-2001		
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	JP 3035884 U (Tokai Shiiranto Kogyo K.K.), 16 January, 1997 (16.01.97), page 4, line 15 to page 5, line 11; Figs. 1 to 3 (Family: none)	1-3
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 165323/1984 (Laid-open No. 78918/1986), (Fukumi MORI), 27 May, 1986 (27.05.86), page 5, line 7 to page 6, line 17; Figs. 1 to 3 (Family: none)	1-3
Y	JP 3021320 U (Tokai Shiiranto Kogyo K.K.), 22 November, 1995 (22.11.95), page 4, line 16 to page 5, line 22; Figs. 1 to 4 (Family: none)	2
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> 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 document 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 06 December, 2021 (06.12.21)		Date of mailing of the international search report 25 December, 2001 (25.12.01)
Name and mailing address of the ISA/ Japanese Patent Office		Authorized officer
Facsimile No.		Telephone No.

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP01/09948

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	US 4955172 A (Neil W. Pierson), 11 September, 1990 (11.09.90), Full text; Figs. 1 to 5 (Family: none)	1-3
A	US 4971475 A (Bertin Castonguay, et al.), 20 November, 1990 (20.11.90), Full text; Figs. 1 to 7 & EP 408447 A & CA 1309611 A	1-3
A	US 5261760 A (Bertin Castonguay, et al.), 16 November, 1993 (16.11.93), Full text; Figs. 1 to 7 & EP 560667 A & CA 2062595 A & AU 3513793 A	1-3

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