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EPC.

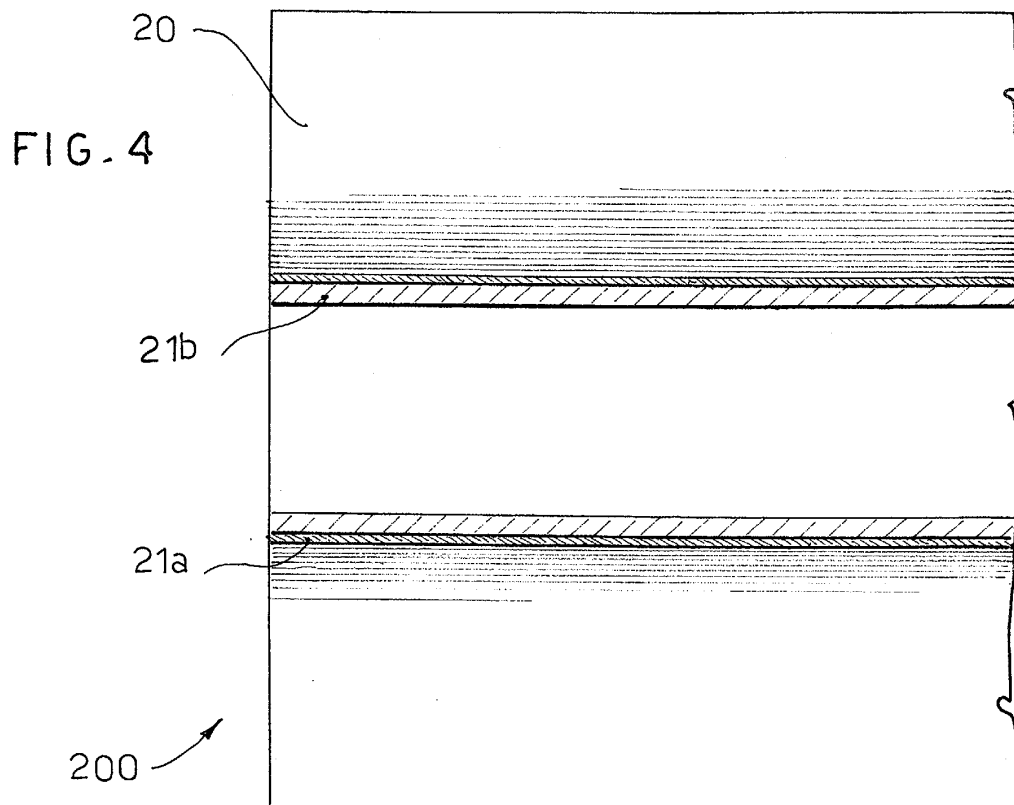
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(54) **Roll of sheet material with double core**

(57) A roll (200) of sheet material (2) wound on a tubular core (21 a) is described. A second core (21b) is disposed removably inside the first core (21a) on which the roll is wound. In this manner the second core (21b)

can be maintained inside the first core (21a) to adapt the roll to a small-diameter spindle of an unwinding support or the second core (21b) can be extracted from the first core (21a) to adapt the roll to a large-diameter spindle of an unwinding support.



Description

[0001] The present invention refers to a roll of sheet material - in particular of paper such as toilet paper, tissue paper, kitchen paper and the like - wound on a tubular core.

[0002] Currently known on the market are industrial rolls consisting of tissue paper wound on a tubular cardboard core. Said industrial rolls are inserted in appropriate unwinding or dispensing supports to be used, for example, in toilets, service areas or public premises. In this manner the user can unwind and detach a sheet of paper from the roll to use it as toilet paper, kitchen paper or for cleaning. Said rolls are generally large to ensure a long duration, for example they have diameters ranging from 15 cm to 50 cm.

[0003] Such industrial rolls are usually wound on two different types of standardised cores, that is to say, a first type of core having a larger inside diameter and a second type of core having a smaller inside diameter.

[0004] As a result, two different types of unwinding supports - provided with two different types of spindles designed to receive the two different types of cores - have been created. That is to say, unwinding supports with large-diameter spindles to receive rolls with cores with a large inside diameter and unwinding supports with small-diameter spindles to receive rolls with cores with a small inside diameter are known to the art.

[0005] Said unwinding supports are installed in the premises where the industrial rolls are to be used. As a result, the user - according to the type of unwinding support owned - must order industrial rolls suitable to be fitted on the spindle of the unwinding support. In fact, if the inside diameter of the core of the roll is smaller than the outside diameter of the spindle, the roll cannot be fitted on the spindle; on the contrary, if the inside diameter of the core of the roll is larger than the outside diameter of the spindle, the roll is fitted on the spindle with too much slack, which prevents correct use thereof.

[0006] Some unwinding supports are provided with an adapter to allow rolls with cores of different inside diameters to be installed. However, these adapters are often eliminated after the first installation, according to the type of roll installed, and the users are often forced therefore to purchase a certain type of roll which adapts to their own unwinding support.

[0007] The object of the present invention is to overcome the drawbacks of the prior art by providing a roll of sheet material wound on a core suitable to adapt to the various types of spindles of the unwinding supports present on the market.

[0008] Another object of the present invention is to provide a roll of sheet material wound on a core that is versatile, practical, cheap and simple to make.

[0009] These objects are achieved, according to the invention, with the characteristics listed in the appended independent claim 1.

[0010] Advantageous embodiments of the invention

are apparent from the dependent claims.

[0011] The roll according to the invention comprises sheet material wound on a tubular core and a second tubular core, which is disposed removably inside the first core on which the sheet material is wound.

[0012] In this manner the second core can be kept inside the first core to fit it on a small-diameter spindle of an unwinding support or else the second core can be extracted from the first core to fit the roll with the first core on a large-diameter spindle of an unwinding support.

[0013] The advantages of the invention are obvious in that it allows to provide for a roll which adapts to various types of spindles of unwinding supports.

[0014] Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplary and therefore non limiting embodiment thereof, illustrated in the appended drawings, in which:

- Figure 1 is a perspective, exploded view, illustrating an unwinding support and a relative roll of sheet material;
- Figures 2A and 2B are partially broken off front views illustrating, respectively, a large-diameter spindle and a small-diameter spindle for roll unwinding supports;
- Figures 3A and 3B are two axial sectional views, partially broken off, illustrating respectively two cores for forming the roll according to the invention;
- Figure 4 is an axial sectional view, partially broken off, illustrating a roll according to the invention.

[0015] Figure 1 illustrates an unwinding support 1 designed to support an industrial roll 2. The unwinding support 1 comprises a support plate 10 intended to be fixed to a wall. The support plate 10 rotatably supports a spindle 11 in the form of a rotatable roller with a horizontal axis.

[0016] The roll 2 comprises a sheet material 20, such as toilet paper, for example, which is wound on a tubular core 21, made of cardboard, for example. The core 21 of the roll is fitted on the spindle 11 of the support plate 10 and the roll is closed by a covering half-shell 12 which has an opening 13 at the bottom from which the toilet paper 20 can be unwound.

[0017] Figures 2A e 2B illustrate respectively a first spindle 11a having a large outside diameter D1 and a second spindle 11b having a small outside diameter D2. By way of example, D1 is equal to about 75 mm and D2 is equal to about 60 mm.

[0018] For the production of the roll according to the invention, denoted with reference numeral 200 and illustrated in Figure 4, the following are used:

- a first tubular core 21a, shown in Figure 3A, having an inside diameter D1' slightly greater than the outside diameter D1 of the spindle with a larger diam-

eter 11a, and

- a second tubular core 21b, shown in Figure 3B, having an inside diameter D2' slightly greater than the outside diameter D2 of the spindle with a smaller diameter 11b and an outside diameter D1" slightly smaller than the inside diameter D1' of the first core 21a.

[0019] The tolerance between D1' e D1" is, for example, smaller than 1 mm to allow the second core 21b to be inserted easily in the first core 21a and at the same time to ensure a minimal slack between them.

[0020] The thickness of the first core 21a is smaller than the thickness of the second core 21b. By way of example, the thickness of the first core 21 a is about 2 mm, whilst the thickness of the second core 21b is equal to $D1'' - D2'[(D1'' - D2')/2]$; translator note], i.e. to about 7 mm.

[0021] The cores 21a and 21b are preferably made of cardboard, in a known manner, with a coiling machine. However they could also be made of another material such as plastic or the like, for example.

[0022] The roll 200 of sheet material is formed in a per se known manner, by means of a rewinding machine, on the large-diameter core 21a, inside which the second core 21b with a smaller diameter is inserted. The roll thus formed, of the desired diameter, is then ready to be put on the market.

[0023] If the user has an unwinding support 1 with a small-diameter spindle 11b, he/she can use the roll 200 as it is, that is with the double core, since the inside core 21b fits perfectly on said spindle.

[0024] If, on the other hand, the user has an unwinding support 1 with a large-diameter spindle 11a, he/she will remove the second core 21b from the first core 21a and will fit the first core 21a on the large-diameter spindle 11a.

[0025] The second core 21b, which is removably inserted inside the first core 21a, thus acts as an adapter which is used to adapt the roll 200 to the small-diameter spindle 11b and which is removed to allow the roll to be applied to the large-diameter spindle 11a.

[0026] Changes and modifications of detail within the reach of a person skilled in the art can be made to the present embodiment of the invention without thereby departing from the scope of the invention as set forth in the appended claims.

Claims

1. A roll (200) of sheet material (2) wound on a tubular core (21a), **characterised in that** it comprises a second core (21b) disposed removably inside the first core (21 a) on which the sheet material is wound.

2. A roll (200) according to claim 1, **characterised in**

that the inside diameter (D1') of said first core (21a) is slightly larger than the outside diameter (D1) of a first type of large-diameter spindle (11a) of an unwinding support (1) and **in that** the inside diameter (D2') of said second core (21b) is slightly larger than the outside diameter (D2) of a second type of small-diameter spindle (11b) of an unwinding support (1).

3. A roll (200) according to claim 1 or 2, **characterised in that** the inside diameter (D1') of said first core (21a) is slightly larger than the outside diameter (D2') [(D1"; translator note] of said second core (21b).

4. A roll (200) according to claim 3, **characterised in that** the tolerance between the inside diameter (D1') of the first core (21a) and the outside diameter (D1") of the second core (21b) is less than 1 mm.

5. A roll (200) according to any one of the preceding claims, **characterised in that** the thickness of the first core (21a) is smaller than the thickness of the second core (21b).

6. A roll (200) according to claim 5, **characterised in that** the thickness of the first core (21a) is about 2mm and **in that** the thickness of the second core (21b) is about 7 mm.

7. A roll (200) according to any one of the preceding claims, **characterised in that** the inside diameter (D1') of the first core is about 75 mm and the inside diameter (D2') of the second core is about 60 mm.

8. A roll (200) according to any one of the preceding claims, **characterised in that** said first and second core (21a, 21b) are made of cardboard by means of a coiling machine.

9. A roll (200) according to any one of the preceding claims, **characterised in that** the sheet material (20) wound on the roll is paper of the tissue type.

Amended claims in accordance with Rule 86(2) EPC.

1. A roll (200) of sheet material (2) wound on a tubular core (21a), comprising a second core (21b) disposed removably inside the first core (21a) on which the sheet material is wound

characterised in that the thickness of said second core (21b) is higher than the thickness of the first core (21a), so that the roll can be adapted to two types of spindles (11a, 11b) of unwinding supports (1), having different diameters.

2. A roll (200) according to claim 1, **characterised**

in that the inside diameter (D1') of said first core (21a) is larger than the outside diameter (D1) of a first type of large-diameter spindle (11a) of an unwinding support (1) and **in that** the inside diameter (D2') of said second core (21b) is larger than the outside diameter (D2) of a second type of small-diameter spindle (11b) of an unwinding support (1). 5

3. A roll (200) according to claim 1 or 2, **characterised in that** the inside diameter (D1') of said first core (21a) is larger than the outside diameter (D1") of said second core (21b). 10

4. A roll (200) according to claim 3, **characterised in that** the tolerance between the inside diameter (D1') of the first core (21a) and the outside diameter (D1") of the second core (21b) is less than 1 mm. 15

5. A roll (200) according to any one of the preceding claims, **characterised in that** the thickness of the first core (21a) is 2mm and **in that** the thickness of the second core (21b) is 7 mm. 20

6. A roll (200) according to any one of the preceding claims, **characterised in that** the inside diameter (D1') of the first core is 75 mm and the inside diameter (D2') of the second core is 60 mm. 25

7. A roll (200) according to any one of the preceding claims, **characterised in that** said first and second core (21a, 21b) are made of cardboard by means of a coiling machine. 30

8. A roll (200) according to any one of the preceding claims, **characterised in that** the sheet material (20) wound on the roll is paper of the tissue type. 35

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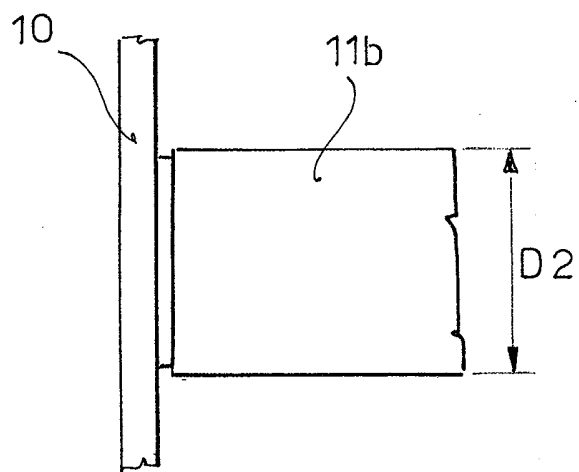
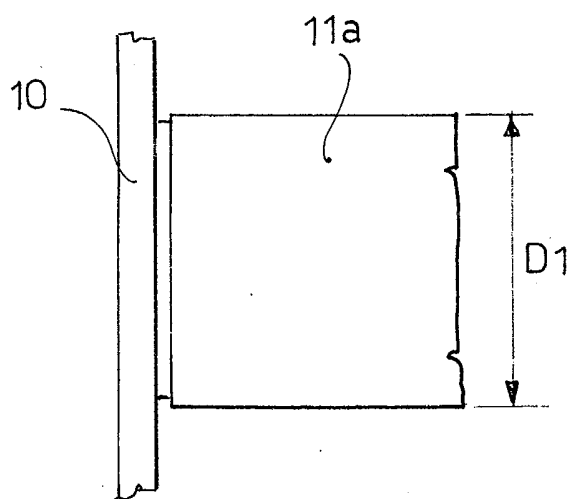
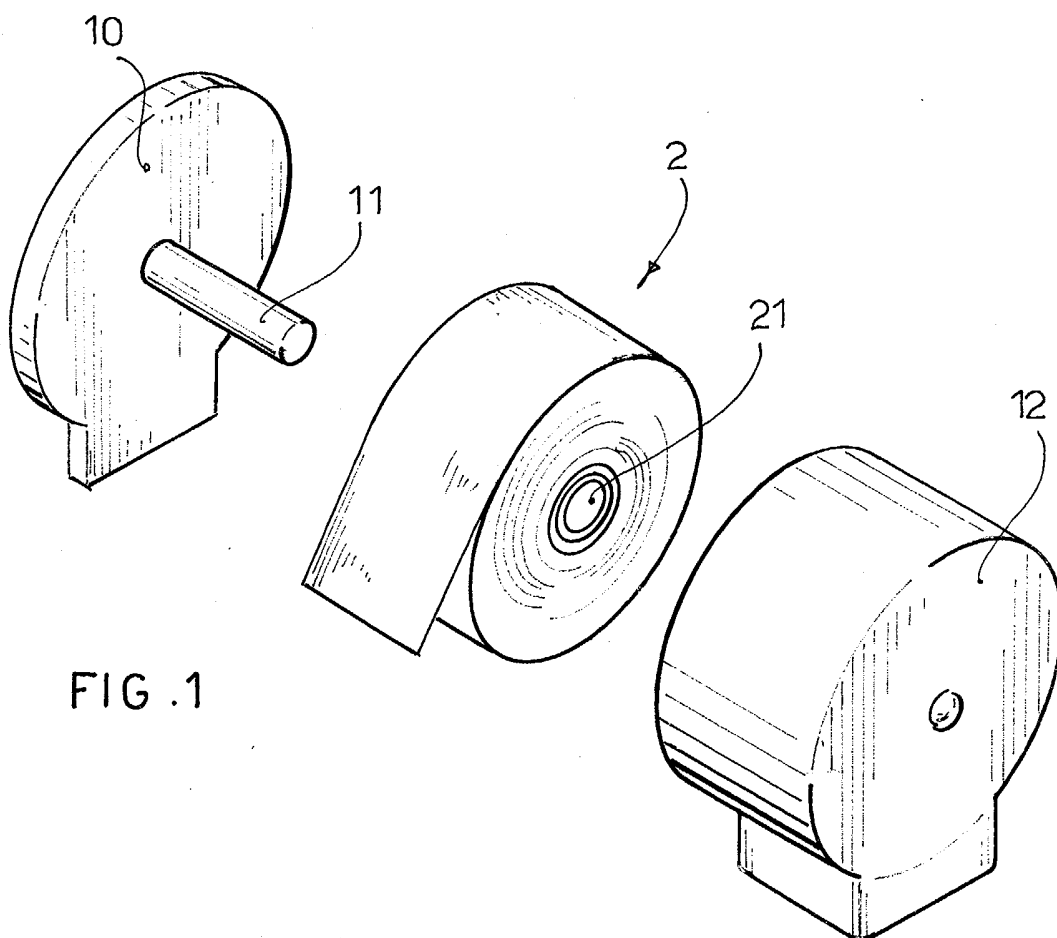


FIG. 3A

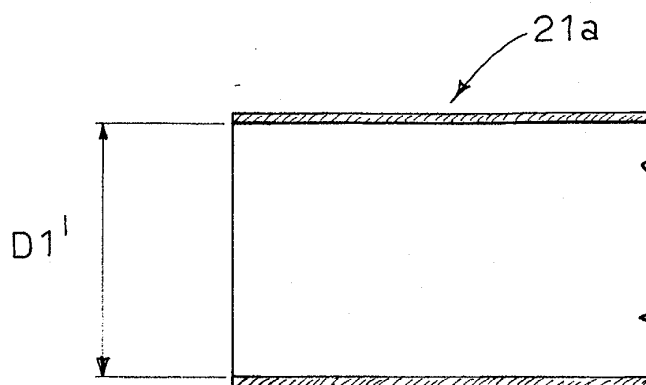


FIG. 3B

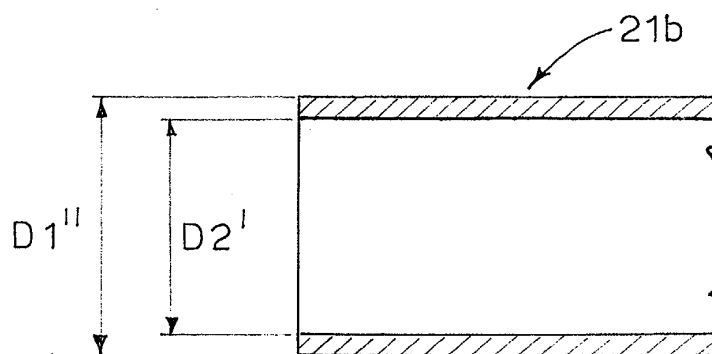
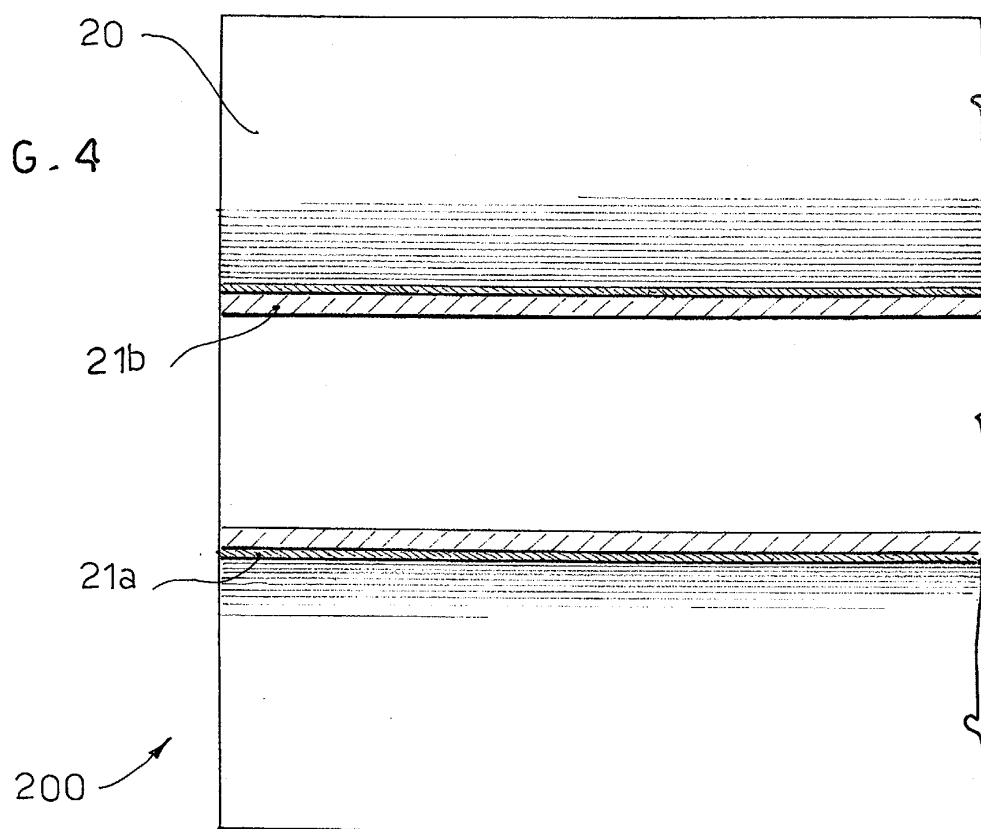


FIG. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 04 42 5103

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	WO 01/21509 A (PUKADE LEANDER) 29 March 2001 (2001-03-29) * the whole document *	1-4,8,9	B65H75/10 B65H18/28
X	GB 2 321 894 A (AMAKANE LTD) 12 August 1998 (1998-08-12) * page 4, line 21 - line 33; figure 1 *	1-3,9	
X	EP 1 211 214 A (SONOCO DEV INC) 5 June 2002 (2002-06-05) * column 3, line 24 - column 4, line 48; figures 1,2,4 *	1,5-7	
X	PATENT ABSTRACTS OF JAPAN vol. 017, no. 682 (M-1528), 14 December 1993 (1993-12-14) & JP 05 229742 A (RICOH CO LTD), 7 September 1993 (1993-09-07) * abstract *	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B65H
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 15 June 2004	Examiner Rupprecht, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 42 5103

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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15-06-2004

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 0121509	A	29-03-2001	DE 29916657 U1	23-12-1999
			AU 7778800 A	24-04-2001
			WO 0121509 A1	29-03-2001

GB 2321894	A	12-08-1998	IE 970080 A2	25-02-1998
			IE 980089 A1	12-08-1998

EP 1211214	A	05-06-2002	US 2002066824 A1	06-06-2002
			CA 2364461 A1	01-06-2002
			EP 1211214 A2	05-06-2002
			JP 2002248697 A	03-09-2002

JP 05229742	A	07-09-1993	NONE	
