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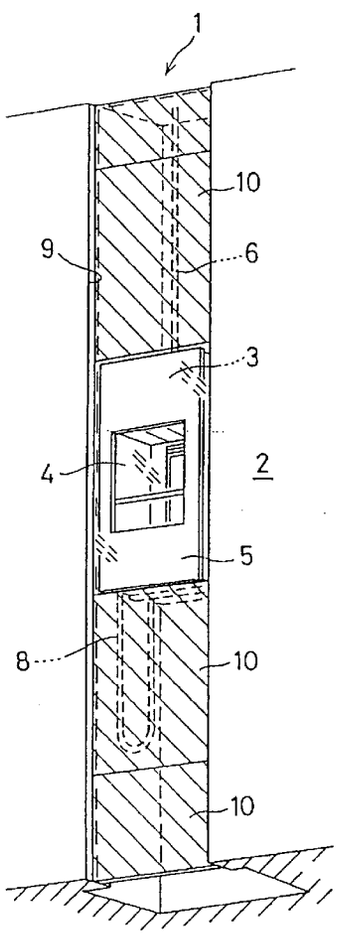
(54) Hoistway for a facade elevator.

(57) A hoistway (1) for an elevator cage (3) having an observation window (4) for viewing outside of the hoistway and drive apparatus (6) to effect motion of the cage, wherein a portion of the hoistway is constructed of a light adjusting medium (10), e.g. liquid crystals and including means for maintaining the said medium in a transparent state when in register with the window so as to permit observation through the medium and the window as the cage operates, and for maintaining the-medium in an opaque state when not in register with the window so as to hide the said drive apparatus from view from the outside.

FIGURE 1



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The present invention relates to a guideway having a carrier with a window movable therealong, particularly but not exclusively a hoistway for an elevator having an observation window.

An observation elevator is known which is provided on a side of the outer wall 101 of a building, as illustrated in Figure 6 of the accompanying drawings. Transparent glass 104 extends over the opening 103 on the outside of the hoistway 102. The cab 105 movable in the hoistway 102 has an observation window 106, and passengers can observe the outside scenery through this window and the glass 104. A conventionally driven rope 107 is attached to the top of the cage 105, and a travelling cable 108 for supplying power to the cage is connected to the bottom of the cage.

Such a hoistway for an observation elevator, however, tends to impair the buildings appearance, because the rope 107, the travelling cable 108, and possibly a counterweight or the like are all visible from outside, by way of the transparent glass 104.

According to the present invention there is provided a guideway having a carrier movable therealong, said carrier having a window, said guideway including a light-adjusting medium having a see-through state and a non-see-through state, and means for maintaining said medium in said see-through state when in register with said window, so as to permit observation through said medium and said window as said carrier operates, and for maintaining said medium in said non-see-through state when not in register with said window.

Preferably the said light-adjusting medium comprises liquid crystal glass having a coating to protect it from degradation by external light.

When the invention is applied to an observation elevator, the said guideway is of course the elevator hoistway and the carrier is the elevator cage. Then, in a preferred form of the invention, when the cage is moving vertically and an alternating current power source is turned ON by means of the cage, a liquid crystal light adjusting glass in a location corresponding to the observation window of the cage will be in a transparent state. When the cage moves further, the alternating current power source is turned OFF, and the liquid crystal light adjusting glass in a location where the cage is not present will be in a milky white opaque state. Thus, a drive cable fastened to the cage, and a travelling cable also attached to it, and the like, are no longer visible from the exterior of the building, thereby improving the building's appearance.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

Figure 1 is a perspective view of a hoistway for an observation elevator, according to this invention;

Figure 2 is a horizontal selectional view of the hoistway;

Figure 3 is an enlarged sectional view of a liquid crystal light adjusting glass;

Figure 4 is a sectional view illustrating the function of the liquid crystal light adjusting glass;

Figure 5 is an enlarged view of the part indicated by the arrow A in Figure 2; and

Figure 6 is a perspective view of a prior art hoistway having an observation elevator.

Referring first to Figure 1, a hoistway 1 is provided in the side of the outer wall 2 of a building, and an elevator cage 3 is installed in the hoistway. An observation window 4, through which passengers can observe the outside scenery, is provided on the outer side of the cage 3 (see also Figure 2). A plate 5 is attached to the cage to cover and hide the machinery and apparatus provided on the outer surface of the same, as is conventional.

A rope 6 is attached to the top of the cage 3. This rope, after running around the driving pulley of the hoist (not shown) located at the top of the hoistway 1, is attached to a counterweight 7 to balance the weight of the cage 3. This counterweight 7 is arranged in the hoistway 1 so as to be positioned next to the door 3a of the cage 3. Thus the counterweight is hidden by the outer wall 2, and is not visible from the outside. A travelling cable 8 is provided to supply electrical power to the cage.

An opening 9 is defined vertically at the outer side of the hoistway 1. Substantially rectangular plates of liquid crystal light adjusting glass 10 are installed in this opening 9.

The liquid crystal light adjusting glass 10 is, as illustrated in Figure 3 and as known in the art, composed of a mixture of resin 11 and liquid crystal 12, a pair of transparent polyester films 13, 14 with an electrically conductive film containing this mixture, and sheets of tempered glass 15 and 16 on the outside of the polyester films 13 and 14. The surface of the tempered glass 16 on the external side is coated with a UV filter 17 for the purpose of intercepting ultraviolet rays.

When 100 v of alternating current is turned ON to the polyester films 13 and 14, the liquid crystal 12 will be in an aligned state, and light is transmitted. Thus the liquid crystal light adjusting glass 10 will be in a transparent, i.e. see-through, state. If the alternating current power is turned OFF, the liquid crystal 12 will be in an irregular arrangement as illustrated in Figure 4, and the light-will be scattered. Then, the liquid crystal light adjusting glass 10 will be in a milky white opaque, i.e. non-see-through, state.

Liquid crystal 12 is subject to deterioration by the ultraviolet rays contained in sunlight. This deterioration is prevented by coating the tempered glass 16 with the UV filter 17.

Referring again to Figure 2, the cage 3 is guided vertically by a pair of guide rails 18 and 19 fixed vert-

ically in the hoistway 1, via guide shoes 20 and 21. As illustrated in Figure 5, the guide rail 19 carries a series of photoelectric switches 23 connected to respective ones of the liquid crystal light adjusting glasses 10, via brackets 22. Each photoelectric switch 23 has a light projecting section 23a consisting of a light emitting diode or the like, and a light receiving section 23b consisting of a phototransistor or the like. A blade member 24 mounted on the cage 3 can locate between the light projection section 23a and the light receiving section 23b. If the blade member 24 is located in the optical path between the light projecting section 23a and the light intercepting section 23b, the photoelectric switch 23 will be in an ON state.

As the cage 3 moves vertically, a photoelectric switch 23 adjacent to it is turned ON by the blade member 24 mounted on the cage, and as a result the liquid crystal light adjusting glass 10 which is in line with the observation window 4 of the car will be in a transparent state. When the cage 3 moves further on, the photoelectric switch 23 in question is turned OFF, and the liquid crystal light adjusting glass 10 which the cage has now passed will be in a milky white opaque state.

In this manner, as only the liquid crystal light adjusting glass or glasses 10 in a location corresponding to the observation window 4 of the moving case 3 will be in a transparent state, and the other liquid crystal light adjusting glasses are in a milky white opaque state, the rope 6 attached to the cage, and the travelling cable 8 connected to it, and the like, will not be visible from outside of the building. Thus the appearance of the installation can be improved.

Also, as only the liquid crystal light adjusting glasses 10 in a location corresponding to the observation window 4 are in a transparent state, and the other liquid crystal light adjusting glasses are in an opaque state, the quantity of direct sunlight entering the hoistway 1 is reduced considerably. Thus the cost of air-conditioning the interior of the cage 3 in the summer can be reduced.

The invention can also be applied to other types of elevator such as hydraulic elevators and linear motor type elevators.

Claims

1. A guideway (1) having a carrier (3) movable therealong, said carrier having a window (4), said guideway including a light-adjusting medium (10) having a see-through state and a non-see-through state, and means for maintaining said medium in said see-through state when in register with said window, so as to permit observation through said medium and said window as said carrier operates, and for maintaining said medium in said non-see-through state when not in register with said window.

2. Apparatus as claimed in claim 1, wherein said light-adjusting medium (10) comprises liquid crystal glass having a coating (17) to protect it from degradation by external light.

3. Apparatus as claimed in claim 1 or 2, wherein the said guideway (1) is an elevator hoistway and the said carrier (3) is an elevator cage having an observation window (4) for viewing outwardly of said hoistway.

FIGURE 1

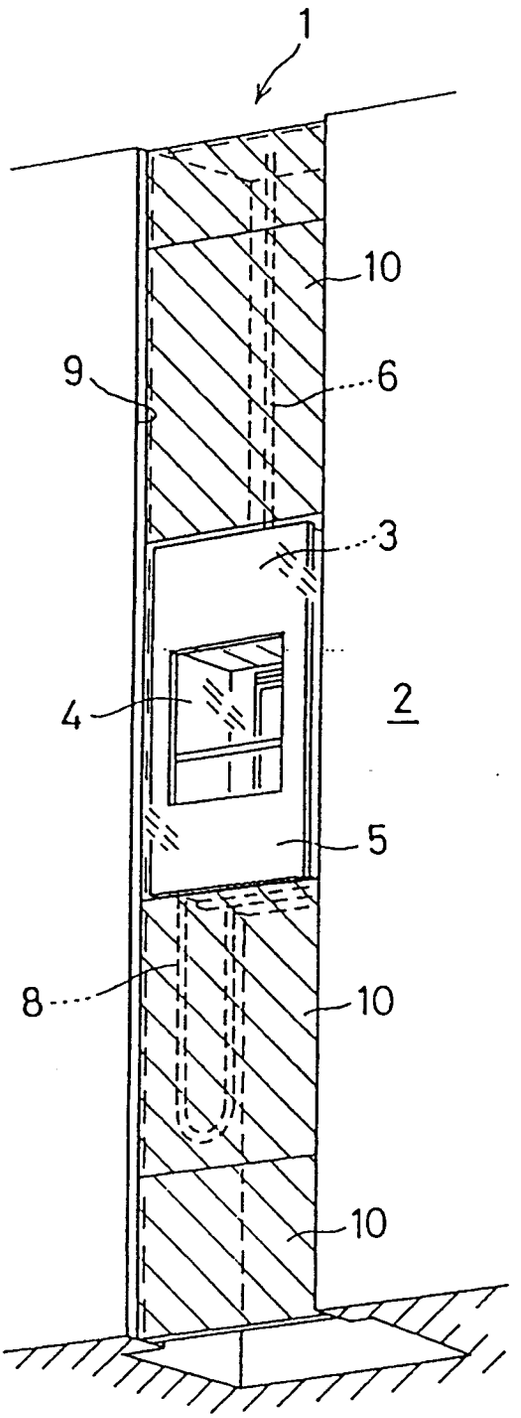


FIGURE 2

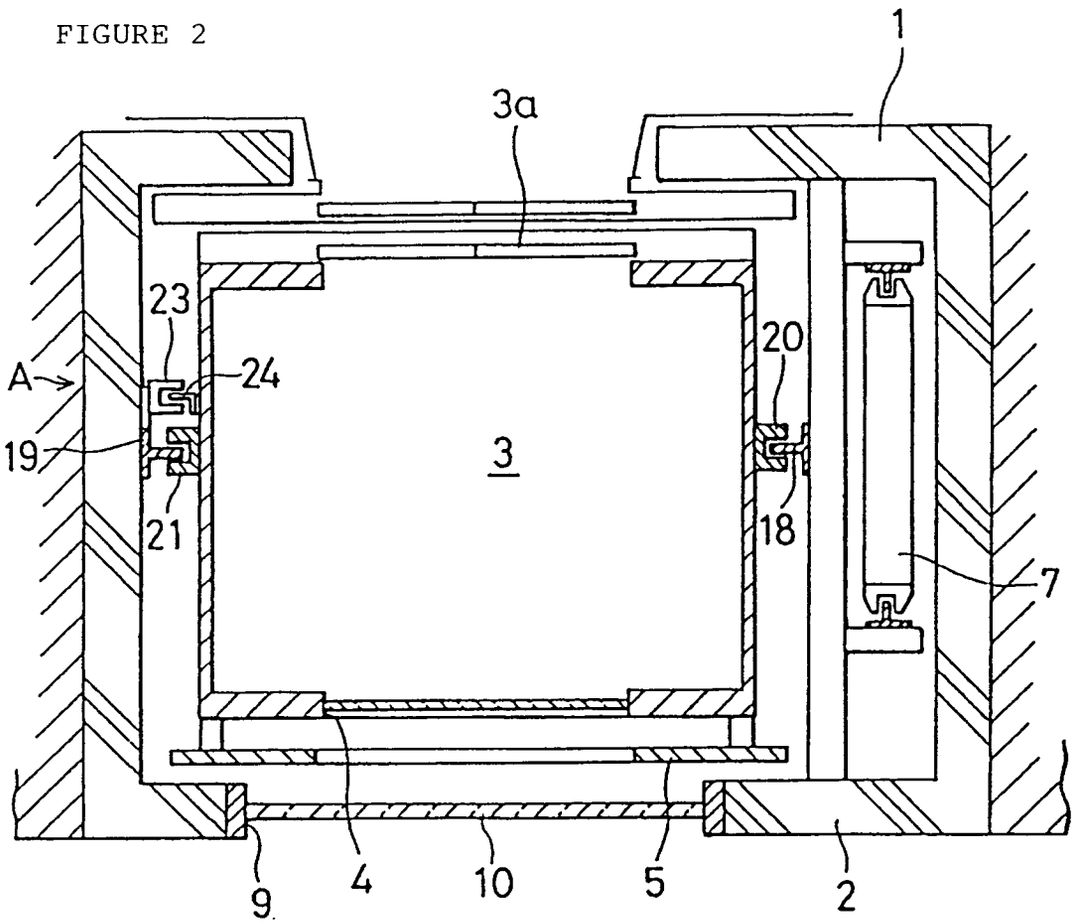


FIGURE 3

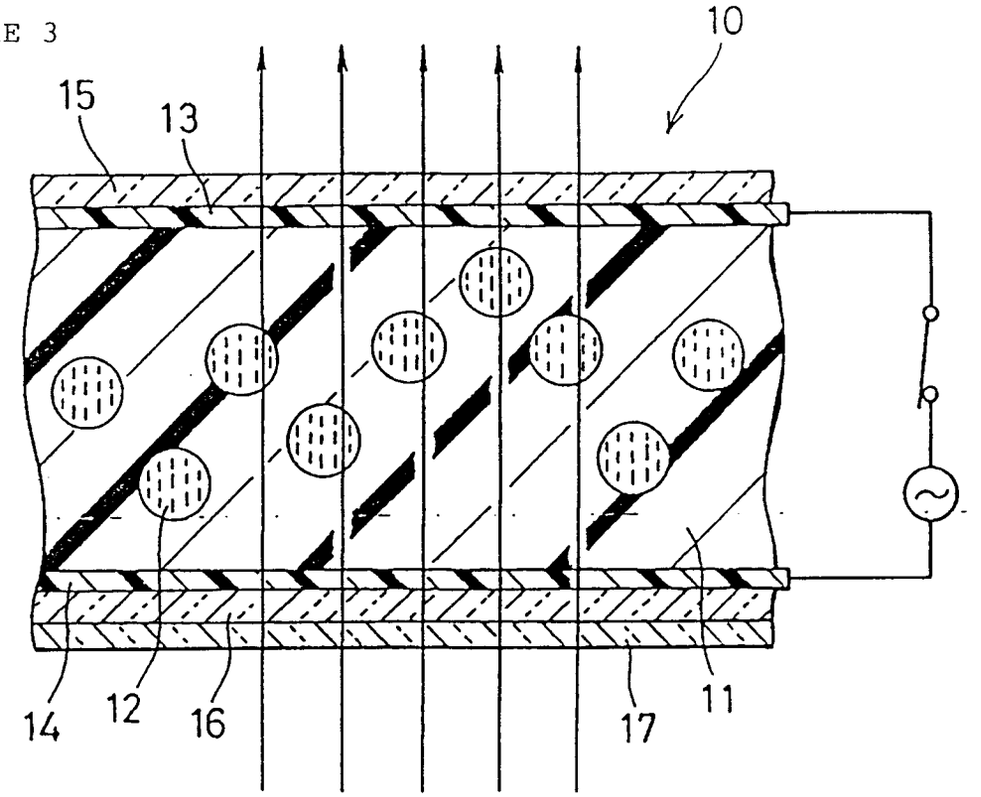


FIGURE 4

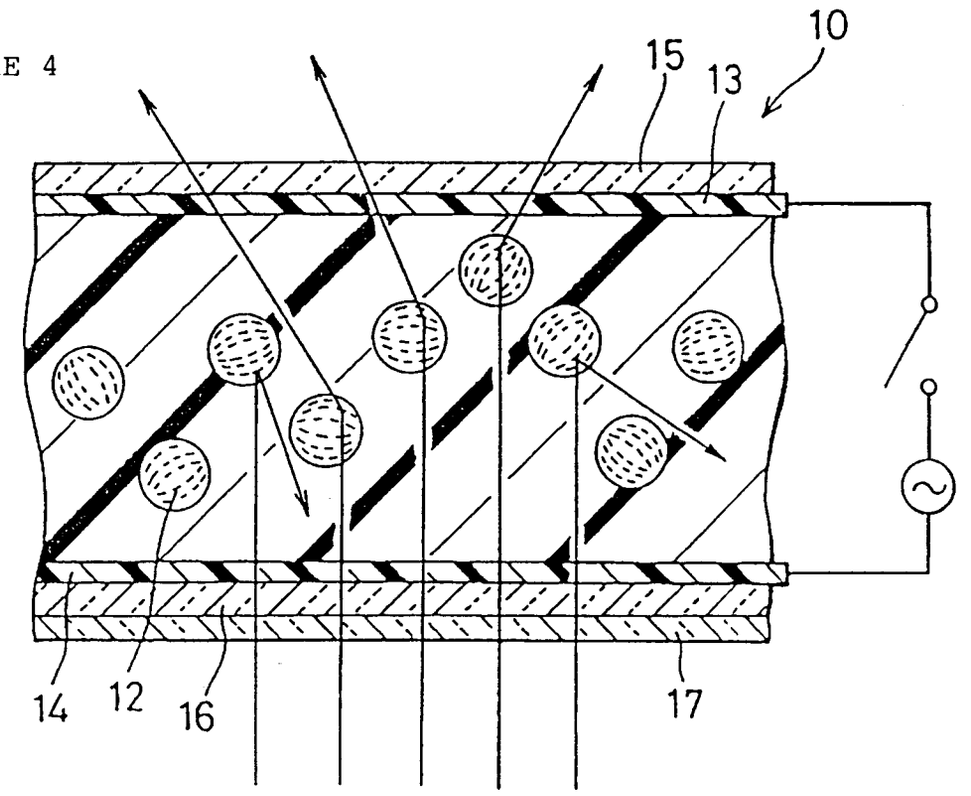


FIGURE 5

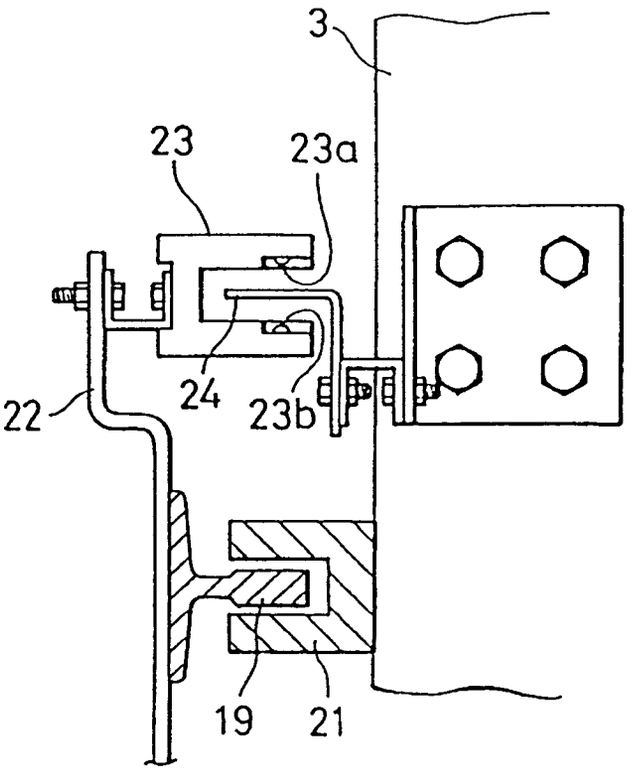
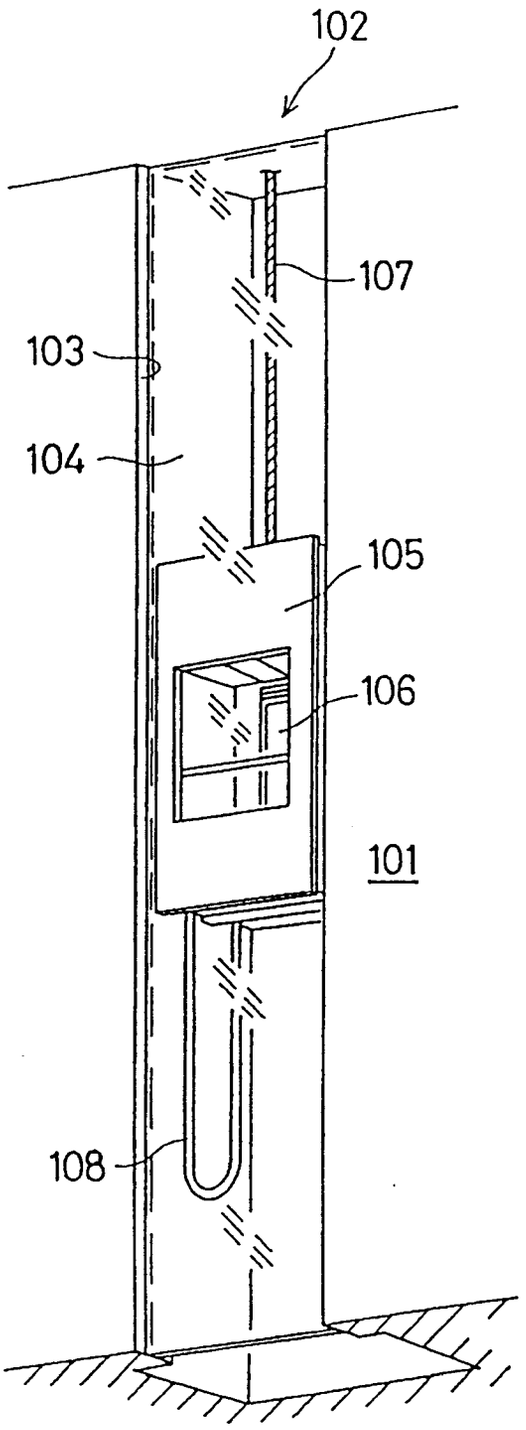


FIGURE 6



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EUROPEAN SEARCH REPORT

Application Number
EP 93 30 6770

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.5)
X	PATENT ABSTRACTS OF JAPAN vol. 13, no. 588 (M-912)25 December 1989 & JP-A-12 047 386 (TOSHIBA CORP) 3 October 1989 * the whole document *	1,3	B66B9/00 B66B11/02 E04B1/34
Y	---	2	
Y	DE-A-33 24 691 (MERCK PATENT GMBH) * page 3, line 9 - page 4, line 26; claim 1 *	2	

A	PATENT ABSTRACTS OF JAPAN vol. 14, no. 243 (M-977)23 May 1990 & JP-A-20 066 090 (TOSHIBA CORP) 6 March 1990 * the whole document *	1-3	

A	PATENT ABSTRACTS OF JAPAN vol. 15, no. 286 (M-1138)19 July 1991 & JP-A-31 002 088 (TOSHIBA CORP) 26 April 1991 * abstract *		TECHNICAL FIELDS SEARCHED (Int.Cl.5)

A	DE-U-92 00 004 (DIVEG DEUTSCHE HOTEL-INVESTITIONGESELLSCHAFT GMBH)		B66B E04F E04B G02F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	16 November 1993	SAEAEW, J

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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