

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 1 122 383 A1

(12)

## EUROPEAN PATENT APPLICATION

(43) Date of publication:  
08.08.2001 Bulletin 2001/32

(51) Int Cl. 7: E04H 17/00

(21) Application number: 00870015.5

(22) Date of filing: 04.02.2000

(84) Designated Contracting States:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE  
Designated Extension States:  
AL LT LV MK RO SI

(71) Applicant: NV Ter Linden  
8200 Brugge (BE)

(72) Inventor: Jonckheere, Amand Alfons Adhemar  
8200 Brugge (BE)

(74) Representative: Van Malderen, Joelle et al  
Office Van Malderen,  
Place Reine Fabiola 6/1  
1083 Bruxelles (BE)

### (54) Safety barrier

(57) The present invention describes a safety barrier, to be used for instance in sports stadiums or event halls, for preventing persons from accessing certain areas during public events such as sports events or concerts. The barrier according to the invention comprises at least one pair of lateral structures (1), which are linked together by way of several longitudinal connections (2), such as metal chains or cables, forming in this way a

preferably horizontal cylinder-like structure. The lateral structures (1) are installed on standards in such a way that they can freely rotate around a longitudinal axis (3). Preferably, a barrier is formed by placing several of said cylinder-like structures in a horizontal row. The barrier is high enough to prevent persons from jumping over it, while its rotating movement renders it impossible for persons to climb over the barrier in any direction.

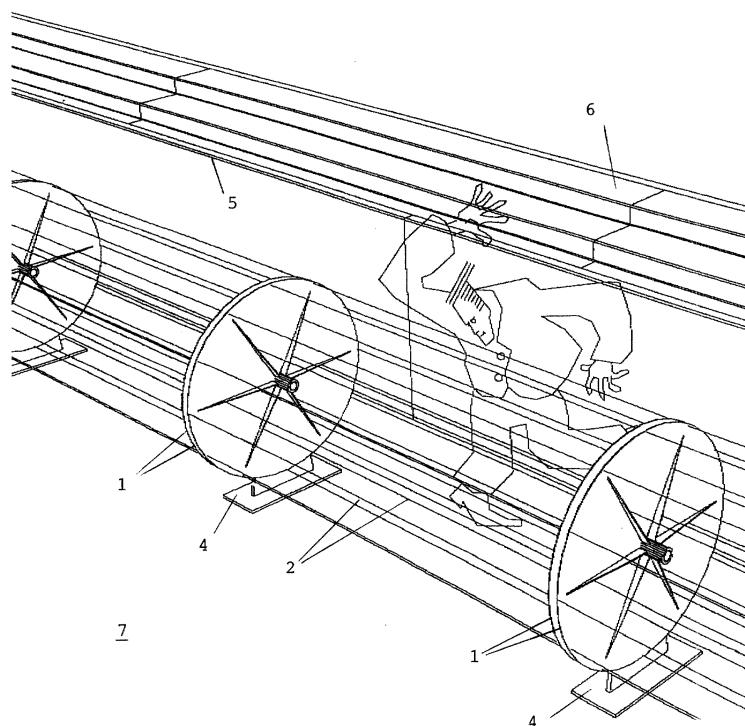


FIG. 1

**Description****Field of the invention**

**[0001]** The present invention relates to a new type of safety barrier, to be used during public events, both outdoors and indoors, e.g. in sports stadiums or event halls, to prevent persons attending or participating in these events from accessing certain areas such as the sports grounds or arena.

**Background of the invention**

**[0002]** In the state of the art, many barriers exist which are meant to block the access of persons to certain areas. During events attended by large crowds, like sports matches or concerts, it is often necessary to prevent the public from entering onto the sports grounds or stage area. Many sports stadiums have fences, sometimes installed on a parapet in front of the stands. Such fences are high and have a top part which is inclined towards the public in order to prevent people from climbing over.

**[0003]** A disadvantage of such fences is the fact that the public's view of the event is obstructed and that people may experience a feeling of being locked up, which may provoke aggressive reactions. Another disadvantage is formed by the difficult evacuation, for example in case of fire or rioting. When panic breaks out, there is a serious risk of people being crushed against such fences.

**[0004]** Finally, as was already indicated above, this type of fence is mainly designed to obstruct the passage from the public to the sports ground or arena, by way of an inclined part at the top. In some cases, it may be desirable to prevent also the passage of people from the sports ground to the public stands. Another disadvantage of these existing types of fences is therefore that the degree of obstruction is not equal in both directions.

**[0005]** Another known type of barrier is a moat between the public stands and the sports grounds. A typical depth of such a moat is 2 meters. A disadvantage of this barrier is the fact that rails of about 1 meter in height have to be installed along both sides of such a moat, obstructing in this way the view of the public seated in the first rows.

**[0006]** The most important disadvantage of such a moat is the difficulty to implement it in an existing stadium, as not enough space is available in most cases. Also, the construction of the moat may interfere with underground piping systems of drainage, irrigation or heating facilities.

**[0007]** Smaller types of barriers are implementing aggressive techniques, such as barbed wire, glass splinters or knives to prevent access. These types of barriers are obviously unsuitable for sport stadiums or concerts as they provoke aggressive behaviour and represent a considerable safety risk for the public as well as for the security forces present at such events.

**Aims of the invention**

**[0008]** The aim of the present invention is to present a new type of safety barrier, preferably for use in sports stadiums or event halls during massive public events such as sports or musical events, in order to prevent persons from entering certain forbidden areas, without obstructing the view of the public attending the event. Another aim of the present invention is to provide a safety barrier which does not provoke aggressive reactions from any persons present at the event and which represents no physical danger to any such persons.

**[0009]** Another aim of the invention is to provide a safety barrier which assures an equal degree of obstruction in both directions.

**Main characteristics of the invention**

**[0010]** The present invention is related to a barrier for preventing persons from accessing certain areas, preferably during public events such as sports events or concerts, said barrier being characterised in that it comprises at least one pair of lateral structures which are linked together by way of several longitudinal connections so as to form a structure resembling a preferably horizontal cylinder, and which are installed in such a way that said lateral structures can freely rotate around a longitudinal axis, said axis being preferably not present in material form.

**[0011]** In a preferred embodiment of the present invention, the barrier consists of a horizontal row of several of said cylinder-like structures.

**[0012]** In a preferred embodiment of the barrier according to the present invention, said lateral structures are vertically placed, identical and of a regular shape, like a circle or a polygon, and said axis comprises the centres of gravity of said two lateral structures.

**[0013]** According to a preferred embodiment of the invention, said connections are preferably attached at regular intervals along the perimeter of said lateral structures.

**[0014]** Said connections are chosen from a group comprising metal, glass fibre or synthetic chains, cables, cords or bars.

**[0015]** In the preferred embodiment of the invention the lateral structures are installed on standards in such a way that said lateral structures can rotate freely and that no persons are able to crawl under said barrier.

**[0016]** The height of the barrier according to the invention is at least 1m and should be such that any person is unable to jump over the barrier.

**[0017]** Persons attempting to climb over the barrier according to the present invention in either direction, by stepping on one of the connections, are prevented from doing so by the rotating movement of the cylinder-like structures towards them, caused by the placing of their weight on said connections. This way, the access is prevented to an equal degree in both directions.

**[0018]** The barrier according to the present invention does not provoke any feeling of being locked up, as it is preferably placed behind the parapet in front of the public stands (from the public's point of view), nor does it present any danger of injury for persons approaching it. The barrier according to the invention can be easily installed in any existing sports stadium or event hall or other accommodation, without interfering with any existing installations. It can also be easily integrated in newly built accommodations.

**[0019]** The barrier can also easily be installed in such a way that the public's view of the events is unobstructed.

#### Short description of the drawings

**[0020]** Figure 1 represents a perspective view of the barrier according to the present invention.

**[0021]** Figure 2 represents a cross section of the barrier according to the present invention.

**[0022]** Figure 3 represents a frontal view of the barrier according to the present invention.

**[0023]** Figure 4 represents an illustration of the fact that the barrier according to the present invention does not obstruct the public's view of the sports grounds.

#### Detailed description of the invention

**[0024]** The following description is based on the accompanying drawings. This description and these drawings shall not limit the scope of the invention, as it is described in the claims.

**[0025]** The present invention is related to a barrier, of which one embodiment is shown in figures 1 to 4. In this embodiment, the barrier has a longitudinal axis 3 which is horizontal and parallel to the row of public stands 6 on one side of it. This axis is not present in material form. Said barrier comprises a row of closely adjacent cylinder-like structures, whose central axis coincides with said axis 3 of the barrier. In the case of figures 1, 2 and 3, these cylinder-like structures are actual geometric cylinders. Each cylinder is made of two lateral structures 1 which are linked by several longitudinal connections 2 and which are installed on standards 4, in such a way that these lateral structures can freely rotate around the axis 3. The rotation can occur in both directions, as indicated by the arrows in figure 2. The connections 2 will then cause each cylinder to be rotatable as a whole.

**[0026]** The connections 2 are attached at regular intervals along the perimeter of the lateral structures 1. There may be additional connections inside the cylinder.

**[0027]** Said two lateral structures are preferably vertically placed, identical, regularly shaped and symmetrical with respect to the barrier's axis 3. They may be circular, as in the embodiment of the drawings 1 to 4, or polygonal. The length of the cylinders may be adapted to the particular accommodations. The connections between said lateral structures may consist of bars or

cords, which may be fabricated from various materials. Preferably, they consist of metal chains or cables. Glass fibre or synthetics may also be used to fabricate such chains or cables. Said chain or cable should preferably not be taut between said lateral structures, but hanging down slightly, in order to make it virtually impossible for persons to stand on them. Said chains or cables should however not be hanging down too much, to prevent the possibility of a large rotation of both lateral structures relative to each other.

**[0028]** Said lateral structures are installed on standards 4, which are in turn fixed on a flat reinforced concrete slab (not shown on the drawings). The standards may also be fixed on a vertical wall, such as the parapet

5 in front of the public stands. These standards determine the eventual height of the barrier and the exact position of the cylinders with respect to the public stands 6 and the grounds 7. When installed on said standards, the cylinders do not assume a preferential position. Preferably, the adjacent lateral structures of two adjacent cylinders are installed on the same standard, as is shown in figures 1 and 3.

**[0029]** The diameter of the lateral structures 1 is such that the height of the barrier is at least 1 meter. This diameter may be adjusted to the existing circumstances (e.g. the height of the front parapet). The distance between the cylinder and the ground should be sufficiently small so that no persons can crawl under the barrier.

The eventual height of the barrier must be sufficient to prevent a person from jumping over the barrier. If the barrier is installed in front of a parapet 5, the height of the barrier and the distance between the barrier and said parapet should be such that a person jumping from said parapet cannot reach the rotational axis 3 of the barrier.

**[0030]** All materials used in the fabrication of the barrier according to the invention are fireproof or fire-inhibiting. Their surfaces may be treated, e.g. galvanised, painted or coated.

**[0031]** In order to comply with security regulations, the barrier may be interrupted to allow the presence of emergency exit doors and access routes for vehicles or medical and security personnel.

**[0032]** The functioning of the barrier can be described as follows : a person attempting to jump onto the sports grounds, for example by jumping from the parapet 5, will not reach the central axis 3. By landing on the chains or cables 2 before the axis, he will cause the barrier to rotate towards the wall, so that this person becomes enclosed in the space 8 between the barrier and the parapet.

**[0033]** Anyone standing next to the barrier, and attempting to climb over it by stepping or jumping on the chains or cables 2, will automatically exert a force on the cylinder, causing it to rotate towards himself, thereby making it impossible to climb over it. It is easily observed that this difficulty is independent of the direction in which such a person attempts to climb over the barrier.

**[0034]** Figure 4 represents a realistic installation of

the barrier, wherein it is installed between the parapet 5  
in front of the public stands and a row 9 of publicity pan-  
els. This figure clearly illustrates that the public's view  
of the sports grounds 7 is not obstructed by the barrier  
according to the invention.

5

## Claims

1. A barrier for preventing persons from accessing certain areas, preferably during public events such as sports events or concerts, said barrier being characterised in, that it comprises at least one pair of lateral structures (1) which are linked together by several longitudinal connections (2), so as to form a preferably horizontal cylinder-like structure, and which are installed in such a way that said lateral structures can freely rotate around a longitudinal axis (3). 10
2. A barrier according to claim 1, wherein said axis (3) is not present in material form. 20
3. A barrier according to claims 1 or 2, wherein said barrier is formed by a horizontal row of several of said cylinder-like structures. 25
4. A barrier according to any one of claims 1 to 3, wherein said lateral structures (1) are vertically placed, identical and of a regular shape, like a circle or a polygon, and wherein said axis (3) comprises the centres of gravity of said two lateral structures. 30
5. A barrier according to any one of claims 1 to 4, wherein several of said longitudinal connections (2) are attached at regular intervals along the perimeter of said lateral structures (1). 35
6. A barrier according to any one of claims 1 to 5, wherein several longitudinal connections (2) are present inside said cylinder-like structure. 40
7. A barrier according to any one of claims 1 to 6, wherein said longitudinal connections (2) are chosen from a group comprising metal, glass fibre or synthetic chains, cables, cords or bars. 45
8. A barrier according to any one of claims 1 to 7, wherein the lateral structures (1) are installed on standards (4), in such a way that no persons are able to crawl under said barrier. 50
9. A barrier according to any one of claims 1 to 8, wherein the height of said barrier is at least 1 meter. 55

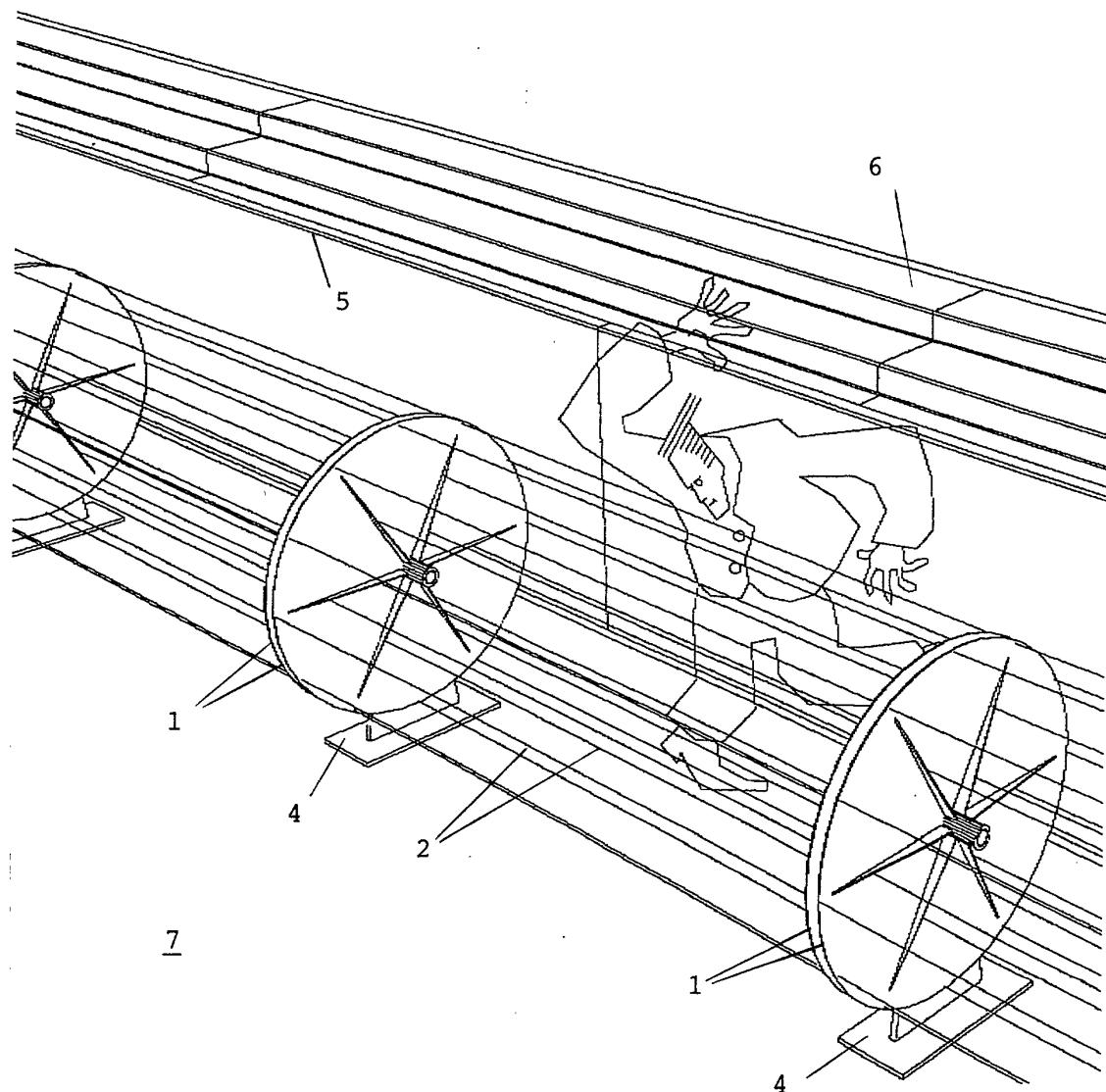


FIG. 1

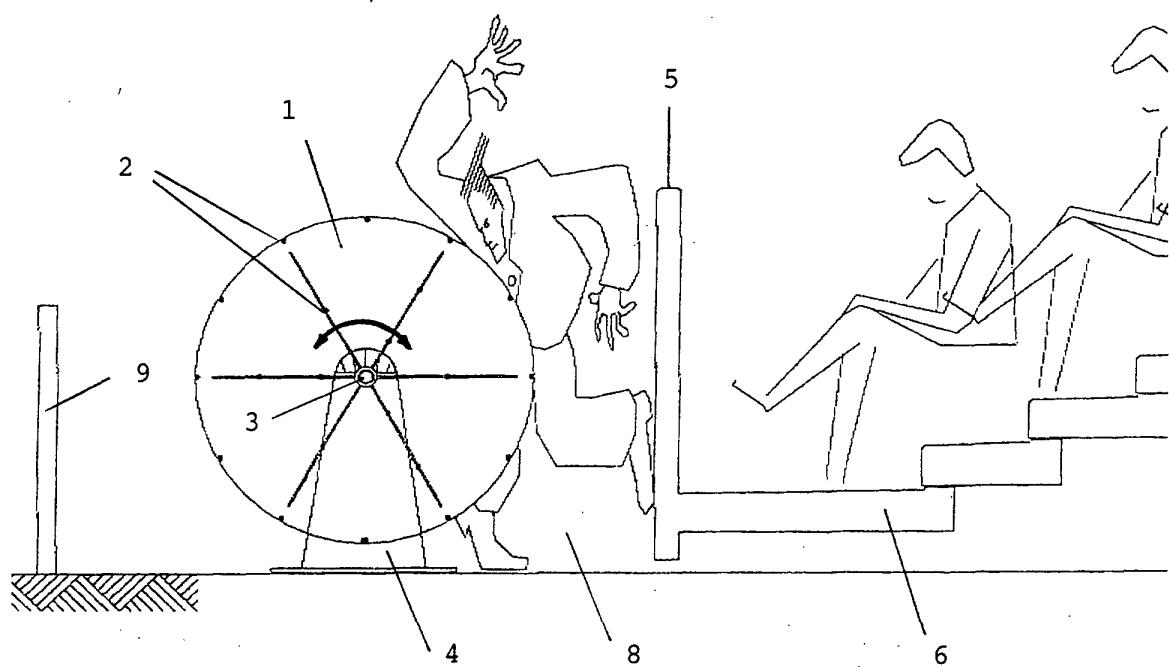


FIG. 2

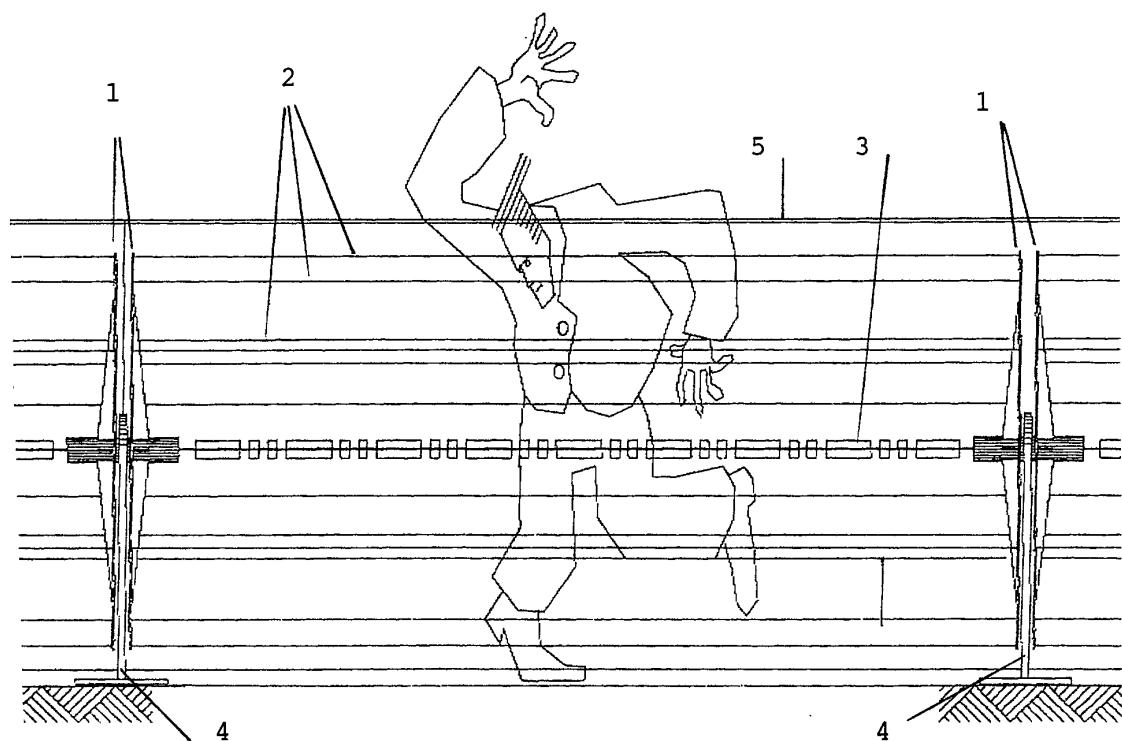


FIG. 3

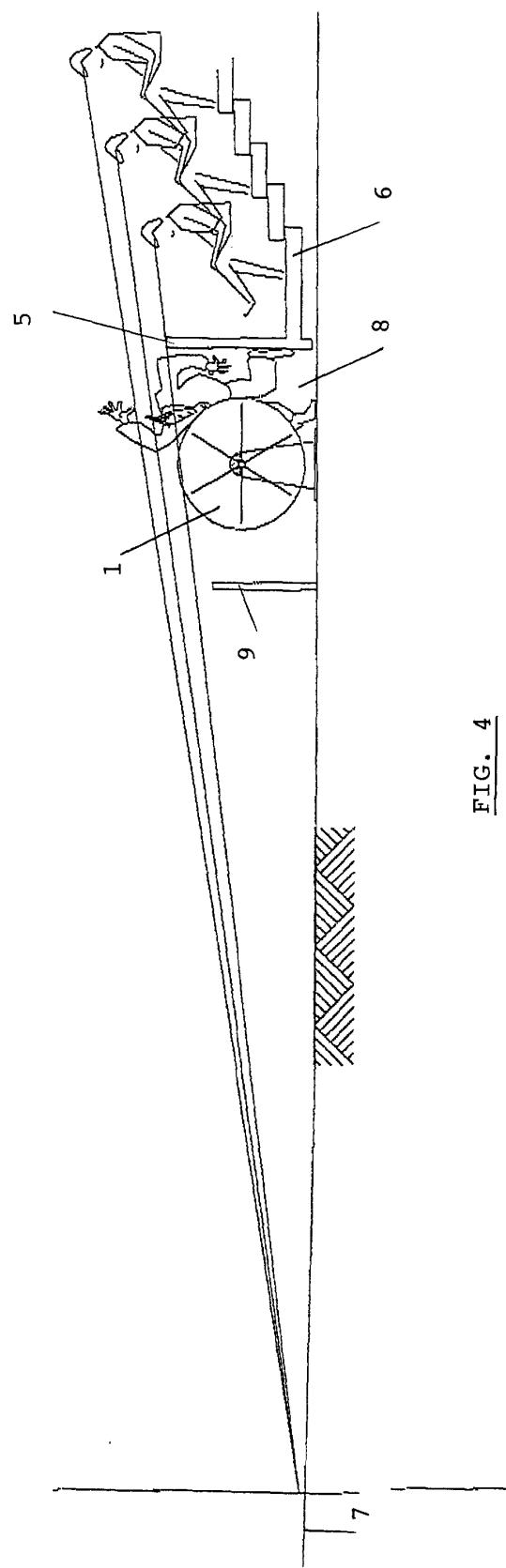


FIG. 4



European Patent  
Office

## EUROPEAN SEARCH REPORT

Application Number  
EP 00 87 0015

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	GB 612 265 A (T. SINCLAIR) 9 December 1948 (1948-12-09) * page 1, line 76 - line 113; figures *	1-5, 7, 8	E04H17/00
Y	---	6	
X	GB 102 765 A (A. & J. MAIN) 18 January 1917 (1917-01-18) * page 2, line 42 - page 3, line 10; figures 1-4 *	1-3, 7, 8	
Y	DE 86 24 656 U (H. LOEVEN) 22 January 1987 (1987-01-22) * page 4, line 1 - line 6; figures 3,4 *	6	
	---		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			E04H
<p>The present search report has been drawn up for all claims</p>			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	16 June 2000	Kriekoukis, S	
CATEGORY OF CITED DOCUMENTS		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	
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			

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

EP 00 87 0015

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-06-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 612265 A		NONE	
GB 102765 A		NONE	
DE 8624656 U	22-01-1987	NONE	

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82