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(54) **CRUSH BARRIER**

(57) Crush barrier, particularly for preventing people to pass on to a predefined location, comprising a frame (1) with staves, rods or bars (7) mounted in the frame, and legs (2) mounted at a lower part of the frame and extending to different sides of the frame for placing and maintaining the barrier in an upright position. The legs are pivotably mounted on the frame by arranging the frame with a tube (5) at the lower part of the frame, and providing the legs with a pivoting mechanism (6) with which the legs are mounted on the tube.

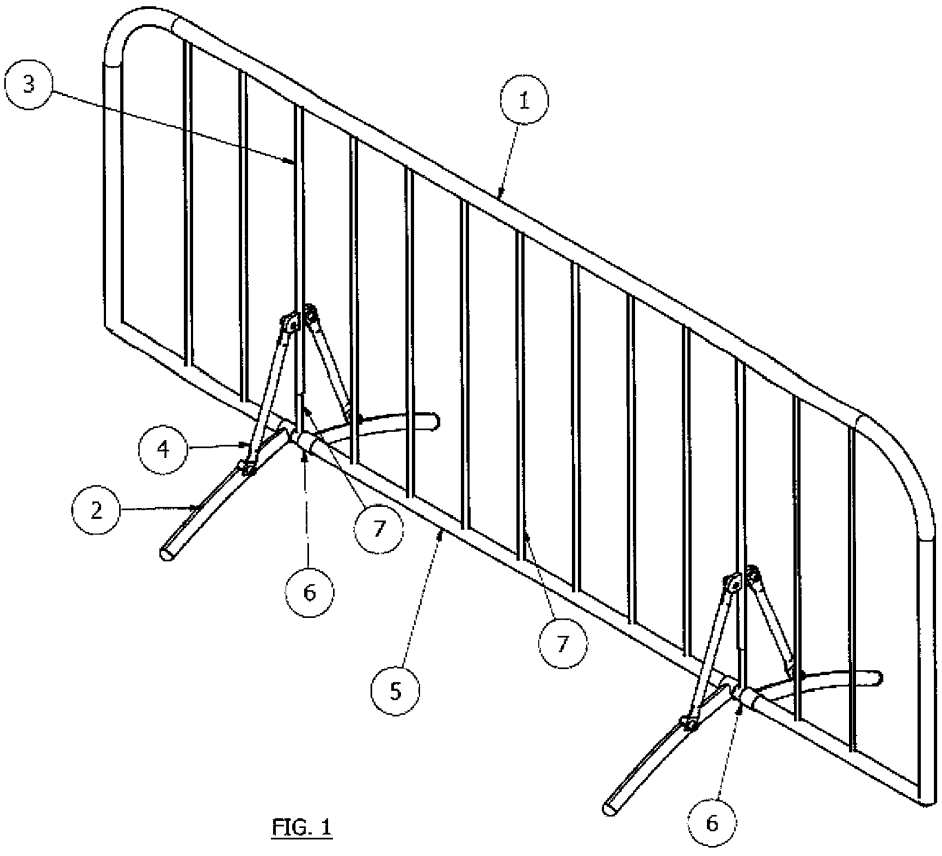

FIG. 1

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Description

[0001] The invention relates to a crush barrier, particularly for preventing people to pass on to a predefined location, comprising a frame with staves, rods or bars mounted in the frame, and legs mounted at a lower part of the frame and extending to different sides of the frame for placing and maintaining the barrier in an upright position.

[0002] Such a crush barrier is commonly known and used at events where large crowds of people have to be controlled and kept in a predefined area. Normally such a known crush barrier can be safely used, but problems can occur when panic arrives and the crowd of people develops an amount of force that overturns the crush barrier. A turned over crush barrier is unsafe, particularly because the known crush barrier lies oblique on the ground which makes that the lower part of the frame, which is then elevated from the ground because of the sideways extending legs, may cause stumbling people to hurt themselves or even break their shin.

[0003] It is an object of the invention to provide a solution for this problem.

[0004] It is another object of the invention to make storing of the crush barrier simpler and more cost-effective because of lesser use of space.

[0005] It is still another object of the invention to make handling of the crush barrier easier.

[0006] The crush barrier of the invention is provided with one or more features of the appended claims.

[0007] In a first aspect the crush barrier of the invention is provided with the feature that the legs are pivotably mounted on the frame. This arrangement of the legs makes possible to either have the legs extend sideways from the frame and to provide the barrier with a stable upstanding position, or to extend the legs in the plane of or parallel to the frame which makes storing easy and makes the crush barrier require only a little amount of storing space.

[0008] A suitable way of mounting the legs to the frame is to arrange that the frame comprises a tube at the lower part of the frame, and to provide each of the legs with a pivoting mechanism with which the legs are mounted on the tube of the frame.

[0009] In a preferable embodiment of the crush barrier of the invention each leg is connected with a slider that is provided on a selected stave, rod or bar of the frame so as to arrange that a pivoting movement of the legs with reference to the frame corresponds and is directly linked to a sliding movement of the slider along the concerning stave, rod or bar of the frame. This makes converting between a storage position and an erect position of the crush barrier of the invention easy by simple manipulation of the slider, because the slider now directly links to the position or orientation of the legs with reference to the frame of the barrier. Appropriate movement of the slider suffices for bringing the legs into the desired orientation with reference to the frame.

[0010] The feature mentioned in the previous paragraph also provides the possibility that a pair of oppositely extending legs are connected to the same slider, which promotes safety of the crush barrier of the invention since an overturning of the crush barrier will make gravity cause pivoting of the legs still resting on the ground until reaching an extended position with reference to the frame. Because of these lower legs' connection with the same slider that connects to the oppositely and immediately upon overturning upwardly extending legs, these latter legs will automatically also pivot to the extended position with reference to the frame and not extend upwards anymore. The tube on which the legs are mounted will accordingly then also reach a lowermost position close to the ground. Thus the overturning of the crush barrier will result in that it reaches a safe configuration in which it will be unlikely that people will hurt themselves when stumbling over the crush barrier.

[0011] Suitably each leg is connected with a slider via an abutment rod which has pivots at its extremities that connect the abutment rod to the leg and the slider respectively. This is an effective and non-costly way of connecting each leg with a corresponding slider.

[0012] Preferably the slider has a preselected length and connects to the abutment rod at a preselected position of the slider so as to arrange that when the barrier is in the upright position with the legs extending sideways, the slider abuts the frame adjacent to where the stave, rod or bar ends so as to define a farthest extension of the legs for supporting the frame. This secures a stable positioning of the crush barrier in the upright position.

[0013] Desirably further the length of the slider is selected to enable the slider to move along the staves, rods or bars of the frame when the legs are moved from a sideways extending position into a position substantially in or parallel to the plane of the frame, wherein the legs approximately lie in or are parallel to the extended direction of the staves, rods or bars of the frame.

[0014] The invention will hereinafter be further elucidated with reference to the drawing of an exemplary embodiment of an apparatus according to the invention that is not limiting as to the appended claims.

[0015] In the drawing:

- figure 1 shows a crush barrier according to the invention in an upstanding position; and
- figure 2 shows the crush barrier according to the invention in a lying position.

[0016] Whenever in the figures the same reference numerals are applied, these numerals refer to the same parts.

[0017] Making reference to both figure 1 and figure 2 it shows a crush barrier in an upright and in a lying position respectively. Such a crush barrier is commonly known and used to prevent people to pass on to a predefined location.

[0018] The crush barrier is shown to comprise a frame

1 with staves, rods or bars 7 mounted in the frame 1, and legs 2 mounted at a lower part of the frame 1 and extending to different sides of the frame 1 for placing and maintaining the barrier in an upright stable position as shown in figure 1.

[0019] According to the invention the legs 2 are pivotably mounted on the frame 1.

[0020] According to the invention it is in particular proposed that the frame 1 comprises a tube 5 at the lower part of the frame 1, and that the legs 2 are each provided with a pivoting mechanism 6 with which the legs 2 are mounted on the tube 5 of the frame 1.

[0021] Further it is preferred that each leg 2 is connected with a slider 3 that is provided on a selected stave, rod or bar 7 of the frame 1 so as to arrange that a pivoting movement of the legs 2 with reference to the frame 1 corresponds and is directly linked to a sliding movement of the slider 3 along the stave, rod or bar 7 of the frame 1.

[0022] Figure 1 shows that oppositely extending legs 2 are connected to the same slider 3. This is a beneficial feature because turning over of the barrier from the upstanding position in figure 1 to the lying position shown in figure 2 has the result that the lower legs 2' of the overturned barrier that are still resting on the ground will pivot until reaching an extended position with reference to the frame 1. Because of their connection with the same slider 3 that connects to the oppositely extending legs 2" at the upper side of the barrier, these latter legs 2" will automatically also pivot to the extended position which is approximately parallel to the plane of the frame 1.

[0023] Figure 1 and figure 2 show the preferable arrangement wherein each leg 2, 2', 2" is connected with a slider 3 via an abutment rod 4 which has pivots at its extremities that connect the abutment rod 4 to the leg 2, 2', 2" and the slider 3 respectively.

[0024] It is further remarked that preferably the slider 3 has a preselected length and connects to the abutment rod 4 at a preselected position of the slider 3 so as to arrange that when the barrier is in the upright position with the legs 2 extending sideways as shown in figure 1, the slider 3 abuts the frame 1 adjacent to where the stave, rod or bar 7 ends so as to define a farthest extension of the legs 2 for stably supporting the frame 1.

[0025] Conversely the length of the slider is preferably selected also at a value to enable the slider 3 to move along the staves, rods or bars 7 of the frame 1 when the legs are moved from a sideways extending position as shown in figure 1 into a position as shown in figure 2 wherein the legs 2 are substantially in the plane of or parallel to the frame 1, and wherein the legs approximately lie in the extended direction of the staves, rods or bars 7 of the frame 1.

[0026] Although the invention has been discussed in the foregoing with reference to an exemplary embodiment of the crush barrier of the invention, the invention is not restricted to this particular embodiment which can be varied in many ways without departing from the invention. The discussed exemplary embodiment shall therefore not be used to construe the appended claims strictly in accordance therewith. On the contrary the embodiment is merely intended to explain the wording of the appended claims without intent to limit the claims to this exemplary embodiment. The scope of protection of the invention shall therefore be construed in accordance with the appended claims only, wherein a possible ambiguity in the wording of the claims shall be resolved using this exemplary embodiment.

Claims

1. Crush barrier, particularly for preventing people to pass on to a predefined location, comprising a frame (1) with staves, rods or bars (7) mounted in the frame (1), and legs (2) mounted at a lower part of the frame (1) and extending to different sides of the frame (1) for placing and maintaining the barrier in an upright position, **characterized in that** the legs (2) are pivotably mounted on the frame (1).

2. Crush barrier according to claim 1, **characterized in that** the frame comprises a tube (5) at the lower part of the frame (1), and the legs (2) are each provided with a pivoting mechanism (6) with which the legs (2) are mounted on the tube (5).

3. Crush barrier according to claim 1 or 2, **characterized in that** each leg (2) is connected with a slider (3) that is provided on a selected stave, rod or bar (7) of the frame (1) so as to arrange that a pivoting movement of the legs (2) with reference to the frame (1) corresponds and is directly linked to a sliding movement of the slider (3) along the stave, rod or bar (7) of the frame (1).

4. Crush barrier according to claim 3, **characterized in that** oppositely extending legs (2) are connected to the same slider (3).

5. Crush barrier according to claim 3 or 4, **characterized in that** each leg (2) is connected with a slider (3) via an abutment rod (4) which has pivots at its extremities that connect the abutment rod (4) to the leg (2) and the slider (3) respectively.

6. Crush barrier according to claim 3, 4 or 5, **characterized in that** the slider (3) has a preselected length and connects to the abutment rod (4) at a preselected position of the slider (3) so as to arrange that when the barrier is in the upright position with the legs (2) extending sideways, the slider (3) abuts the frame (1) adjacent to where the stave, rod or bar (7) ends so as to define a farthest extension of the legs (2) for supporting the frame (1).

7. Crush barrier according to claim 6, **characterized**

in that the length of the slider (3) is selected to enable the slider (3) to move along the staves, rods or bars (7) of the frame (1) when the legs (2) are moved from a sideways extending position into a position substantially in or parallel to the plane of the frame (1), wherein the legs (2) approximately lie in or parallel to the extended direction of the staves, rods or bars (7) of the frame (1).

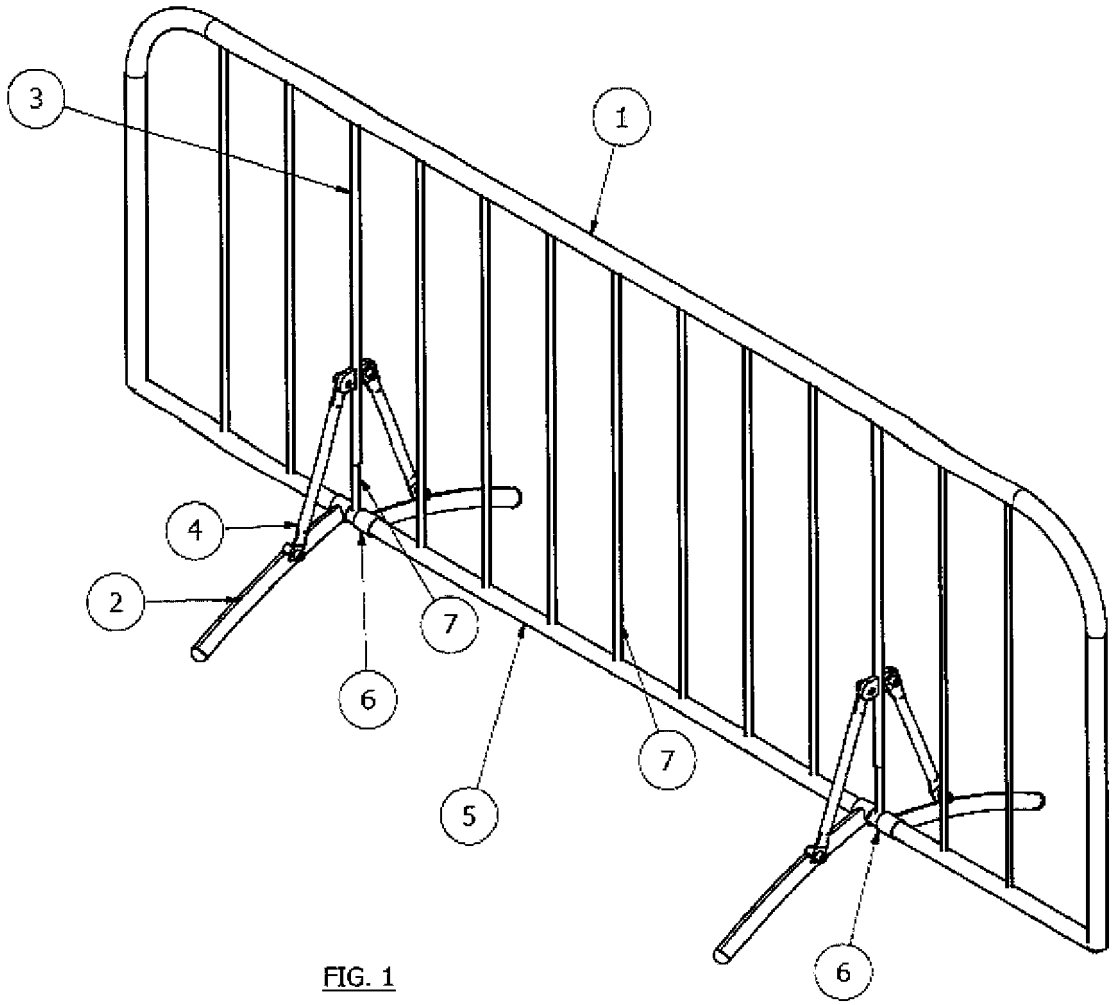

FIG. 1

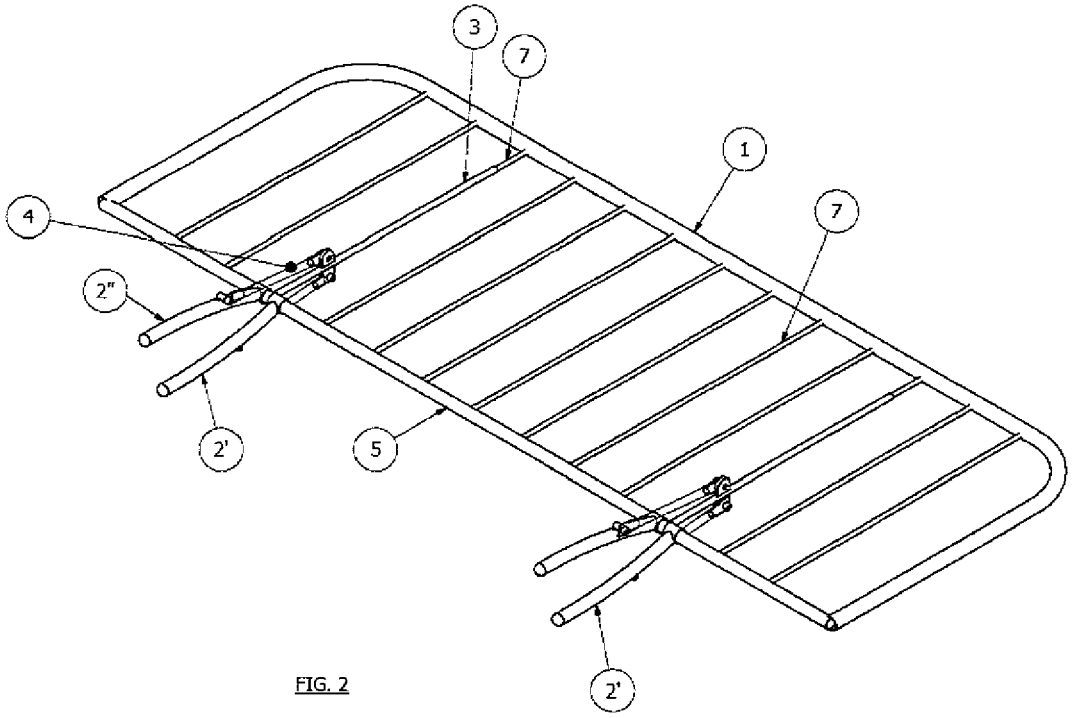

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 18 20 1201

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 20 2010 001086 U1 (B & F BAUMASCHINEN UND FACTORI [CH]) 1 April 2010 (2010-04-01)	1,2	INV. E01F13/02
A	* paragraphs [0001] - [0033], [0049] - [0061]; figures 1-3 *	3-7	
X	US 6 199 833 B1 (BILBY MURRAY [US] ET AL) 13 March 2001 (2001-03-13) * column 3, lines 9-51; figures 1-12 *	1	
A	DE 297 14 769 U1 (KWASNY SIEGFRIED [DE]) 9 October 1997 (1997-10-09) * page 3, lines 11-31; figures 1,2 *	1,2	
			TECHNICAL FIELDS SEARCHED (IPC)
			E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	8 February 2019	Flores Hokkanen, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
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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

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EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 18 20 1201

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
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08-02-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE 202010001086 U1	01-04-2010	NONE	
US 6199833 B1	13-03-2001	NONE	
DE 29714769 U1	09-10-1997	NONE	

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