(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 031 344 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.03.2009 Bulletin 2009/10

(51) Int Cl.:
F42B 39/00 *(2006.01)*

(21) Application number: **07115387.8**

(22) Date of filing: **31.08.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

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(54) Propellant blast suppressive transportation box

(57) A propellant blast suppressive transportation/ storage box (10) for at least one layer of elongate large-caliber ammunition, such as shells. The box is formed as a parallelepipedic cage (10) of a steel grid structure having a bottom section (20) rigidly integrated with four side wall sections (12, 14, 16, 18) so as to define a storage compartment for snugly receiving said at least one layer of ammunition therein. A cage lid (22) is pivotally attached to an upper reinforcement rim (26) of at least one (12, 16) of the side walls sections.

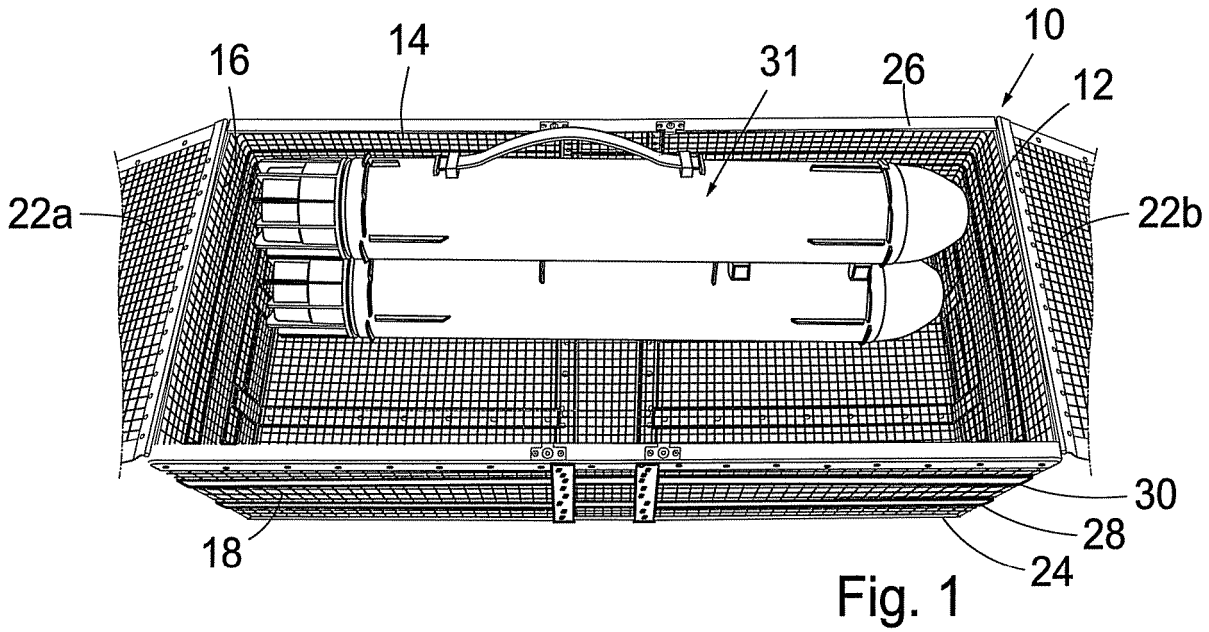

Fig. 1

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Description

BACKGROUND OF THE INVENTION

1. Technical field

[0001] The present invention relates to a propellant blast suppressive transportation/storage box for at least one layer of elongate large-caliber ammunition, such as shells. Such a transportation/storage box is configured to be able to withstand or minimize the damage of an unintentional or accidental blast of the propellant of the ammunition.

2. Description of related art

[0002] A box for transportation and storage of explosive goods is disclosed in DE 202 18 297 U1 and comprises separate grid wall sections which are interconnected mutually and to bottom and top sections of the box by discrete hinge joints in such a manner that all side sections of the box can be folded out or collapse from an upraised condition into a flat condition when the box is not in use. This will make it possible to stack a plurality of boxes together with associated foldable outer transportation cartons in a limited space. The grid structure of the side sections of the box is intended to take up energy released in case of an accidental explosion of the goods packed in the box. In particular, this kind of box is suitable for transportation and storage of explosive articles such as airbags for motor vehicles, where the explosive power of such articles is relatively limited. However, boxes configured in accordance with the teachings of DE 202 18 297 U1 are not suitable for transportation and storage of more powerful explosive products, such as elongate large-caliber ammunition, e.g. shells, in order to take up and suppress the blast of an accidentally ignited propellant charge of the ammunition.

SUMMARY OF THE INVENTION

[0003] It is an object of the present invention to provide an improved storage and transportation box which can withstand and minimize the damage caused by an unintentional or accidental blast of the propellant of the ammunition. To this end the box of the present invention is characterized by the features set forth in the accompanying independent claim 1. Owing to the proposed rigid integration of the four side walls sections, the bottom section and the lid, each of a steel grid structure, a strong blast suppressive box is achieved.

[0004] Further features and advantages of the box according to the present invention will be described more in detail in the following description with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005]

Fig. 1 is a perspective view from above of a blast suppressive transportation/storage box of the invention in an open condition and in which is inserted one twin-case for shells;

Fig. 2 is a perspective view similar to Fig. 1 of an empty box; and

Fig. 3 is a perspective view similar to Fig. 1 and 2 of an empty box in a closed condition.

DESCRIPTION OF A PREFERRED EMBODIMENT OF THE INVENTION

[0006] In Figs 1-3 a box 10 for storage and transportation of shells or similar elongate ammunition is shown. The box 10 comprises four side wall sections 12, 14, 16, 18, a bottom section 20 and a top or lid 22, each of a steel grid structure, so as to form a parallelepipedic cage-like box 10. The side wall sections 12, 14, 16, 18 are preferably formed by one single steel grid element which is bent into a circumferentially closed wall member, the opposing end edges of which being welded together e.g. at a vertical corner of the cage 10. The lower edges of the side wall sections 12, 14, 16, 18 and upwardly bent peripheral edges of the bottom section 20 are fastened by welding to lower circumferential reinforcement steel rims 24, whereas the upper edges of the side wall sections 12-18 are fastened by welding to upper circumferential reinforcement steel rims 26. In the side wall sections 12, 14, 16, 18 steel reinforcement strips 28, 30 extend circumferentially at levels preferably corresponding to a longitudinal, horizontal central plane of each level of the shells being stored in the cage-like box 10 (see Fig. 1). This will strengthen and enhance the ability of the cage 10 to resist forces exerted thereto in case of an accidental blast of the propellant charge of the shells.

[0007] As shown in Fig. 1, a portable case 31 configured to receive two shells therein is fitted snugly in the cage 10, which in this embodiment can receive three such cases 31. Longitudinally extending steel reinforcement strips 32, 34 as well as transversal reinforcement strips 36, 38 (Fig. 2) may also be welded to the bottom section 20 and to the side wall sections 12, 14, 16, 18 of the box cage 10 by upwardly bent portions of the strips 36, 38 which extend at least partially over the height of the side wall sections.

[0008] In order to minimize the space needed for opening and closing the cage 10 the lid 22 preferably comprises two sections 22a, 22b, each of which being pivotally attached to a respective upper short side reinforcement rim 26a, 26b of the cage 10. Yet, the lid 22 may be formed in one single piece, if desired. As shown in Fig. 3, in a closed condition of the cage 10 the adjacent ends

of the lid sections 22a, 22b overlap one another and are releasably locked to the opposite upper long side reinforcement rims 26c and 26d by means of locks 40. This will create a strong fixation of the lid sections 22a, 22b to the cage structure.

The rigid integration of the four side walls sections 12, 14, 16, 18, the bottom section 20 and the lid 22, each of a steel grid structure, creates a strong blast suppressive cage box 10 that is able to withstand or minimize the damage of an unintentional or accidental blast of the propellant of the ammunition. If desired, the cage box 10 may be fitted into an additional, outer box (not shown) for transportation purposes.

Claims

1. Propellant blast suppressive transportation/storage box for at least one layer of elongate large-caliber ammunition, such as shells, **characterized in that** the box is formed as a parallelepipedic cage (10) of a steel grid structure having a bottom section (20) rigidly integrated with four side wall sections (12, 14, 16, 18) so as to define a storage compartment for snugly receiving said at least one layer of ammunition therein, and a cage lid (22) pivotally attached to an upper reinforcement rim (24) of at least one (12, 16) of the side walls sections for securely closing the ammunition storage compartment to a self-supporting, blast suppressive cage during storage and transportation of the ammunition.

2. Blast suppressive box according to claim 1, wherein the four side wall sections (12, 14, 16, 18) of the cage (10) are formed by one single steel grid element bent into a circumferentially closed wall member.

3. Blast suppressive box according to claim 2, wherein all upper and lower edges of the wall member and upwardly bent peripheral edges of the bottom section (20) are fastened by welding to respective circumferential reinforcement steel rims (24, 26).

4. Blast suppressive box according to any one of claims 1-3, wherein the cage (10) is provided with a circumferentially extending reinforcement strip (28, 30) located substantially in level with the center axis of each layer of ammunition.

5. Blast suppressive box according to any one of claims 1-4, wherein the lid (22) consists of two sections (22a, 22b) pivotally attached at one end thereof to opposite upper side rims (26a, 26b) of the cage (10), said lid sections (22a, 22b) overlapping one another at their other ends.

6. Blast suppressive box according to claim 5, wherein the lid sections (22a, 22b) are pivotally attached to a forward and a rearward end wall section (12, 16), respectively, of the cage (10).

7. Blast suppressive box according to any one of claims 1-6, wherein the storage compartment of the cage (10) is dimensioned to snugly receive portable cases (31) for individual storage of the elongate large-caliber ammunition.

8. Blast suppressive box according to any one of claims 1-7, wherein an outer transportation box is configured to snugly receive the cage (10) therein.

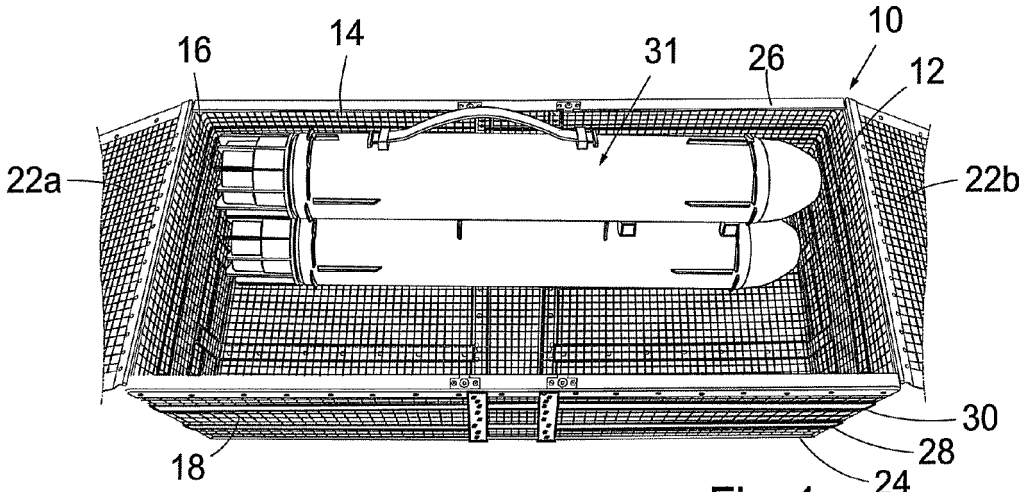

Fig. 1

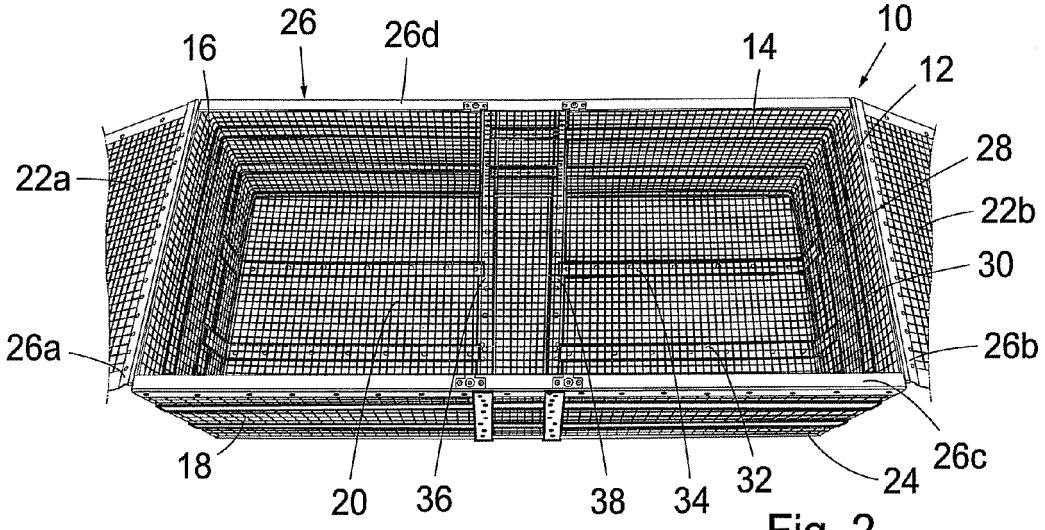

Fig. 2

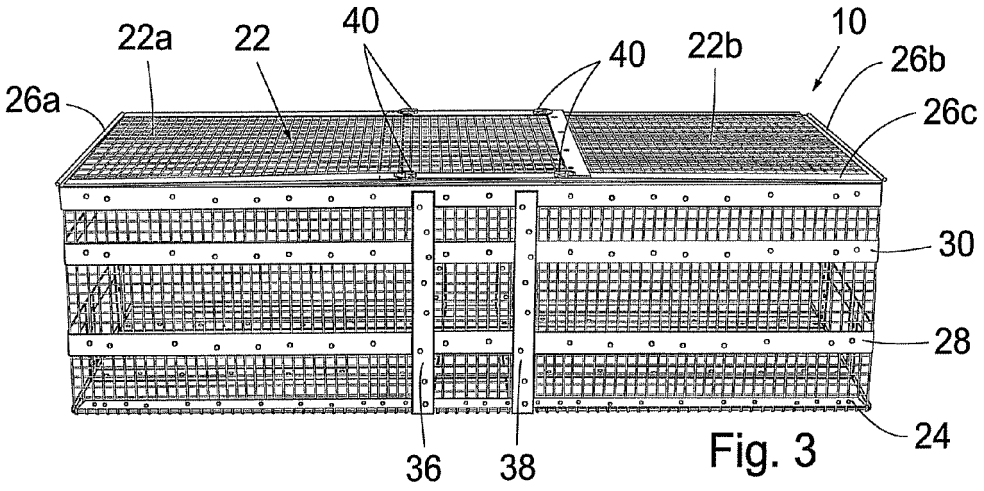

Fig. 3

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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 5387

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	US 4 389 947 A (KING PAUL V ET AL) 28 June 1983 (1983-06-28) * column 5, last paragraph - column 6, line 51; figures 2,7,8 * * column 8, paragraph 2; figure 16 *	1-8	INV. F42B39/00
X,D	DE 202 18 297 U1 (DUROPACK WELLPAPPE ANSBACH GMB [DE]) 20 February 2003 (2003-02-20) * abstract; figures 1,2,5-7 * * page 2, last paragraph - page 7, paragraph 1; claims 1-6,9,11,14 *	1-8	
A	DE 20 2005 011402 U1 (DUROPACK WELLPAPPE ANSBACH GMB [DE]) 20 October 2005 (2005-10-20) * paragraph [0034] - paragraph [0038]; figures 1,2 * * paragraph [0046] - paragraph [0047]; figure 4 *	1-8	TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	1 February 2008	Segerer, Heiko

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 07 11 5387

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01-02-2008

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

REFERENCES CITED IN THE DESCRIPTION

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