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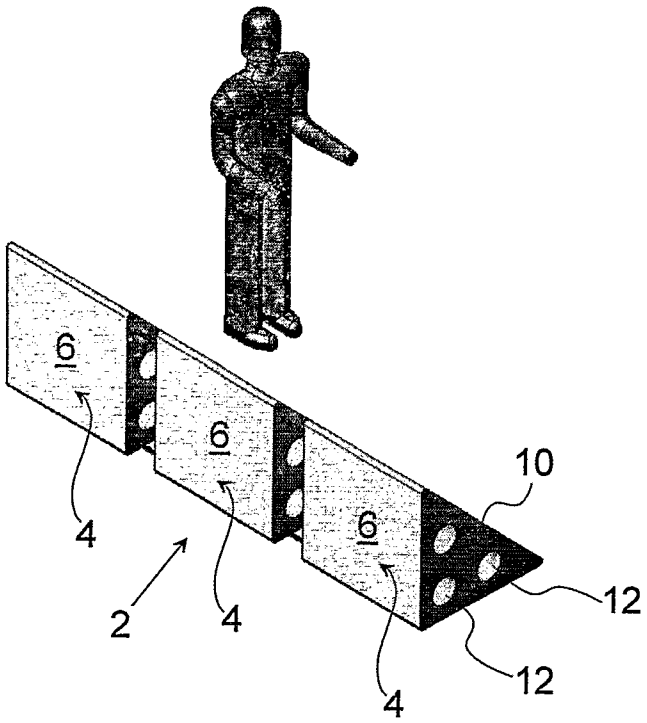
(54) **Title:** DEVICE FOR BRAKING VEHICLES



(57) **Abstract:** A device for decelerating vehicles, in particular a so-called safety buffer, consisting of a number of mutually connected block-shaped bodies (4), which are made of a somewhat elastic material, where each of the bodies (4) are designed with a mainly plane front (6) and a substantially plane support face (8), and that each of the bodies (4) are designed with a number of through-going connecting means (14) opening into a mainly plane side of the body (4) and adapted to be connected with a correspondingly shaped adjacent body (4).

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Device for braking Vehicles

Field of the Invention

The present invention relates to a device, or a so-called safety buffer, for decelerating vehicles and of the kind stated in the preamble of claim 1.

Background of the Invention

In case of maintenance works on and around roads, for protecting repair and construction workers it is commonly known to use safety buffers for decelerating vehicles inadvertently going astray. The safety buffer used the most for this purpose is made up of stacks of car tyres, e.g. lorry tyres, arranged in stacks of e.g. three lorry tyres which are clamped by means of vertical stay bolts in the stack, and which between the stacks are held together by means of a system of steel wires passed through the centremost tyre in the stack, and which simultaneously is passed around the vertical stay bolts. Furthermore, it is prior art to fill the vertical stacks of lorry tyres with a heavy ballast material, e.g. tyre walls, imbedded rubber/plastic granulate or similar.

In practice, however, it has anyway appeared to be associated with several disadvantages using the described safety buffers in the form of stacks of tyres, since these by juxtaposition form a front profile with an unfavourable wavy line which can be the cause of inadvertent injuries to passengers in cars hitting the safety buffer. Also, the ratio between height and width of safety buffers made of stacks of lorry tyres can be disadvantageous as the stacks may tend to overturn in case of collision, whereby there is a risk of the vehicle continuing across an overturned safety buffer of this type.

This type of safety buffers consisting of stacks of car tyres are moreover used very widely in connection with motor-car racing where long safety barriers are often seen, and which are made up of stacks of car tyres held together in one or another way, but which are anyway arranged so that the safety barrier can be opened at some points by swinging a number of car tyre stacks like a gate or by pulling them aside, so that salvage and rescue personnel can get access to crashed vehicles.

Object of the Invention

On this background it is the object of the invention to indicate an improved device of the kind indicated in the introduction, and which in a simple way may contribute to improving the safety when using safety buffers for decelerating vehicles going astray.

Description of the Invention

The device according to the invention is characterised in that where each of the bodies are designed with a mainly plane front and a substantially plane support face, and that each of the bodies are designed with a number of through-going connecting means opening into a mainly plane side of the body and adapted to be connected with a correspondingly shaped adjacent body. Hereby is achieved a device, in particular a so-called safety buffer which in a simple way may contribute to improving the safety when maintaining and constructing roads by using safety buffers of the kind indicated for decelerating vehicles going astray. In practice, respective block-shaped bodies of the device will e.g. be made of rubber granulate, preferably of the type provided by recycling used car tyres. I.e. the indicated bodies of the device have a certain elasticity.

With the object of making the respective block-shaped bodies of the device more elastic, it may be advantageous if the device according to the invention is formed so that each of the bodies is designed with a number of transverse ducts running substantially in parallel with the substantially plane front side and the substantially plane support face.

Respective block-shaped bodies of the device according to the invention are designed so that the height of the front side and the depth of the support face are of the same magnitude 700-1000 mm, preferably 850 mm, and that the width of the body is of corresponding magnitude 700-1000 mm, preferably 800 mm.

Respective block-shaped bodies of the device according to the invention may, as seen from the side, have varying cross-sectional shapes according to wish and need, as specified in claims 4-6.

In order to ensure an extraordinarily solid mutual connection between respective bodies, the device according to the invention is preferably so designed that the through-going connecting means e.g. include a number of substantially horizontal steel wires or chains which are imbedded in the body with mutual spacing, and which is preferably continuous through several adjacent bodies.

Alternatively, respective bodies in opposing sidewalls may include mutually connected imbedded eyelets adapted to be connected with a corresponding eyelet of an adjacent body, e.g. by means of a shackle or similar connecting means.

Suitably, the device is designed so that the substantially horizontal steel wires or chains are disposed at a distance behind the front side of the bodies.

With the intention of enabling to arrange the device according to the invention in such a way that respective adjoining elements can be angled in relation to each other, it may be advantageous that the mutual lateral distance between each of the bodies are preferably of the magnitude 200 mm.

The device according to the invention may of course be any total width, as it may consist of any desired number of mutually connected block-shaped bodies, but the device consists preferably of three or more bodies having the same shape.

Description of the Drawing

The invention is explained more closely in the following with reference to the drawing, on which:

Fig. 1A shows a perspective view of a preferred embodiment of a device with three bodies according to the invention,

Fig. 1B shows a plan view of the device shown in Fig. 1A, as seen from one end;

Fig. 1C shows a plan view of the device shown in Fig. 1A, as seen from the front;

Fig. 1D shows a plan view of the device shown in Fig. 1A, as seen from above;

Fig. 2 shows a perspective view of a second embodiment of a body for a device according to the invention;

Fig. 3 shows a perspective view of a modified embodiment of a body for a device according to the invention;

Fig. 4 shows a perspective view of yet an embodiment of a body for a device according to the invention;

Fig. 5 shows a perspective view of yet an embodiment of a body for a device according to the invention;

Fig. 6 shows a perspective view of yet an embodiment of a body for a device according to the invention; and

Fig. 7 shows a perspective view of yet an embodiment of a body for a device according to the invention.

Detailed Description of the Invention

The device or safety buffer 2 shown in Figs. 1A-1D consists of three identical block-shaped bodies 4 that have an overall triangular cross-section with a plane rectangular front side 6, a likewise plane rectangular support face 8 and a plane inclining rear side 10. In Figs. 1A and 1B it appears how the body 4 is designed with three transverse ducts 12 and with two similarly transverse steel wires 14 which in this embodiment continues unbroken between the three block-shaped bodies 4.

In the embodiment shown in Figs. 1A-1D, the front side 6 of the body 4 has a height of 850 mm and the depth of the support face 8 is also 850 mm, while the width of the body 4 is 800 mm. The mutual distance between the bodies 4 is about 200 mm, enabling mutually angled arrangement of the bodies 4 on the support faces 8.

In Fig. 2 appears a body 16 for a buffer device according to the invention with a slightly different cross-section, as there are short plane surfaces 20 at the transition between the front side 6 and the support face 8 to an inclining rear side 18.

In Fig. 3 appears yet a body 22 for a safety buffer according to the invention, where a front side 24 at the bottom has a notch 26, where at the top, between the front side 24 and an inclining rear side 28 there is a short transversely disposed surface 30, and where at the bottom at the rear side 28 there is formed a transverse nose with a narrow top side part 32 and a rear side edge 34.

In Fig. 4 appears yet an embodiment of a body 36 for a safety buffer according to the invention, where between a plane front side 6 and a support face 8 there is formed a curved rear side 38.

In Fig. 5 appears yet an embodiment of a block-shaped body 40 which largely has the shape of a cube with a plane front side 6, a plane support face 8, a rear side 42 extending in parallel with the front side 6 and a top side 44 extending in parallel with the support face 8.

In Fig. 6 appears yet an embodiment of a block-shaped body 46 with a forward inclining front side 48 and a rear side 50 in parallel therewith. The body 46 has a support face 52 and a top side 54 which are mutually parallel.

An alternative embodiment of a body 56 for a safety buffer according to the invention is shown in Fig. 7, where between a front side edge 58 of a plane support face 60 a curving wall section 62 extends over to the opposite rear side edge 64 of the support face 60.

All the bodies shown and described here are formed with three tranversely disposed ducts 12 which have the purpose of providing increased elasticity to the bodies.

The bodies of the traffic buffer device are e.g. made in the following way:

The bodies are preferably made in vertical tubular moulds with desired cross-section, cf. e.g. Figs. 1A-1D and with a height which is approximately twice as high as the finished width of the bodies. In a lower mould gable, thin upright pipes are possibly fastened for possible subsequent passing through of steel wires 14 (alternatively, already at the moulding of the bodies through-going steel chains are arranged by moulding/imbedding them into the bodies) and larger upright pipes for forming the ducts 12.

Then a moulding mass consisting of a mixture of a suitable binder, e.g. polyurethane, and rubber granulate is filled in the mould, whereafter a lid plate fitting tightly internally of the mould and having holes for the said upright pipes is passed down on the pipes for compressing the moulding mass until a desired compactness and height (width) of the bodies are attained. After setting, the lid plate is lifted up, whereafter the moulded body can be lifted out of the moulds, e.g. by means of a crane with a lifting yoke with hook member engaging one or more of the ducts 12.

Alternatively, the bodies can be produced in moulds including one or more movable walls and gables, so that the actual shape and size of the bodies may be optimised more readily according to customer specific needs.

CLAIMS

1. A device for decelerating vehicles, in particular a so-called safety buffer, consisting of a number of interconnected block-shaped bodies (4, 16, 22, 36, 40, 46) which are made of a somewhat elastic material, **characterised in that** each of the bodies (4, 16, 22, 36, 40, 46) are designed with a substantially plane front side (6) and a substantially plane support face (8), and that each of the bodies (4, 16, 22, 36, 40, 46) are designed with a number of through-going connecting means (14) opening into a mainly plane side of the body (4, 16, 22, 36, 40, 46) and adapted to be connected with a correspondingly shaped adjacent body (4, 16, 22, 36, 40, 46).

2. Device according to claim 1, **characterised in that** each of the bodies (4, 16, 22, 36, 40, 46) is designed with a number of transverse ducts (12) running substantially in parallel with the substantially plane front side (6) and the substantially plane support face (8).

3. Device according to claim 1, **characterised in that** the height of the front side (6) and the depth of the support face (8) are of the same magnitude, e.g. 700-1000 mm, preferably 850 mm, and that the width of the body (4, 16, 22, 36, 40, 46) is of corresponding magnitude, e.g. 700-1000 mm, preferably 800 mm.

4. Device according to claim 1, **characterised in that** each of the bodies (4, 16, 22) has substantially triangular shape as viewed from the side.

5. Device according to claim 1, **characterised in that** each of the bodies (40, 46) has substantially four-sided shape as viewed from the side.

6. Device according to claim 1, **characterised in that** each of the bodies (36) has substantially curved rear side (38) as viewed from the side.

7. Device according to claim 1, **characterised in that** through-going connecting means are constituted by a number of substantially horizontal steel wires (14) or chains which are imbedded in the body (4, 16, 22, 36, 40, 46) with mutual spacing and

which continue preferably continuously through an adjacent body (4, 16, 22, 36, 40, 46).

8. Device according to claim 1 and 7, **characterised in that** the substantially horizontal steel wires (14) or chains are disposed at a distance behind the front side (6) of the bodies (4, 16, 22, 36, 40, 46).

9. Device according to claim 1, 7 and 8, **characterised in that** the mutual lateral spacing between each of the bodies (4, 16, 22, 36, 40, 46) preferably is of the magnitude 200 mm.

10. Device according to any preceding claim, **characterised in that** it consists of one or more bodies (4, 16, 22, 36, 40, 46), preferably three bodies having substantially identical shape.

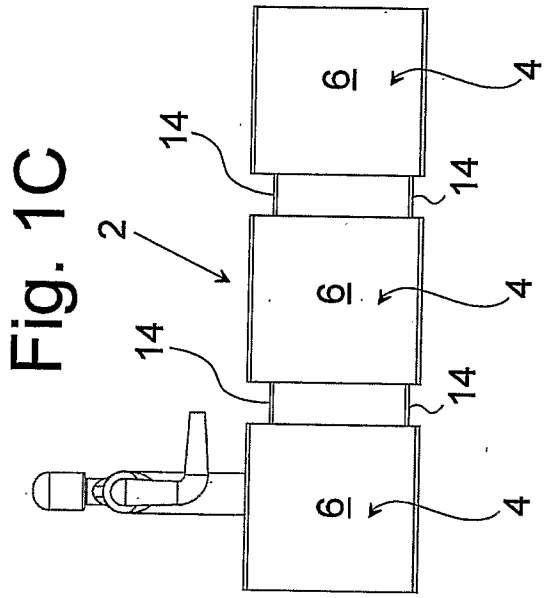


Fig. 1C

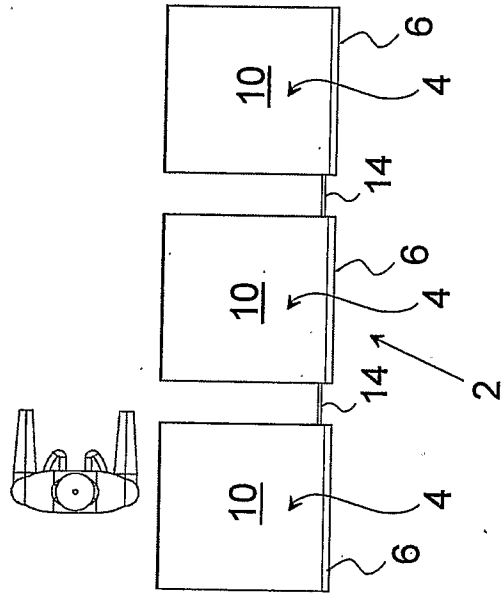


Fig. 1D

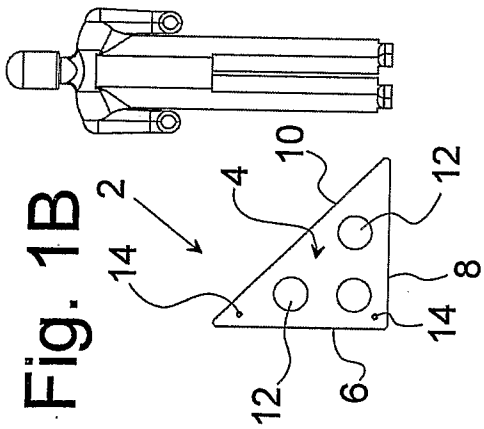


Fig. 1B

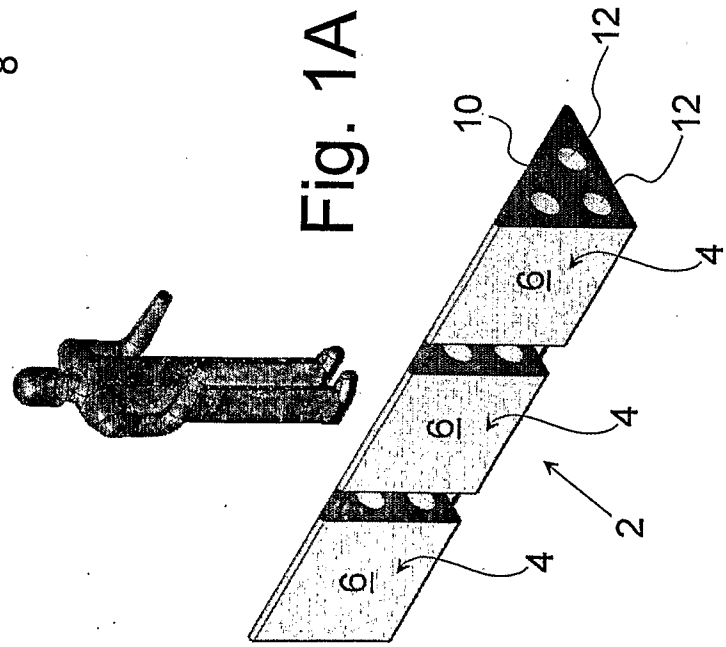


Fig. 1A

Fig. 2

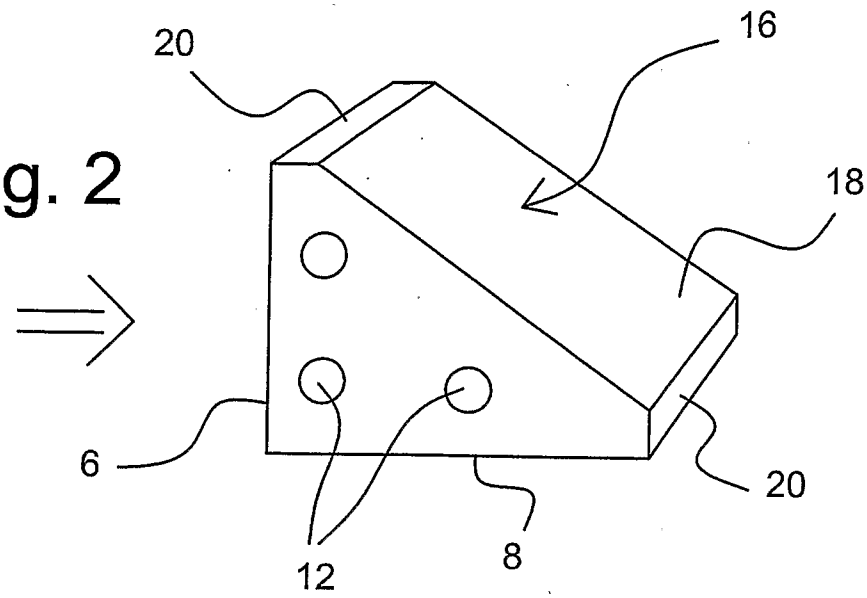
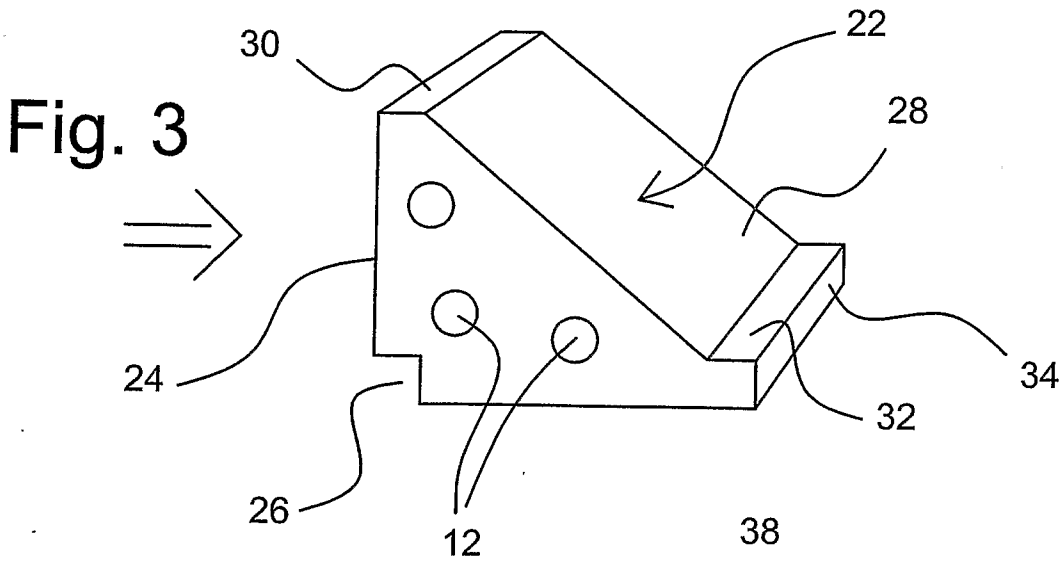


Fig. 3



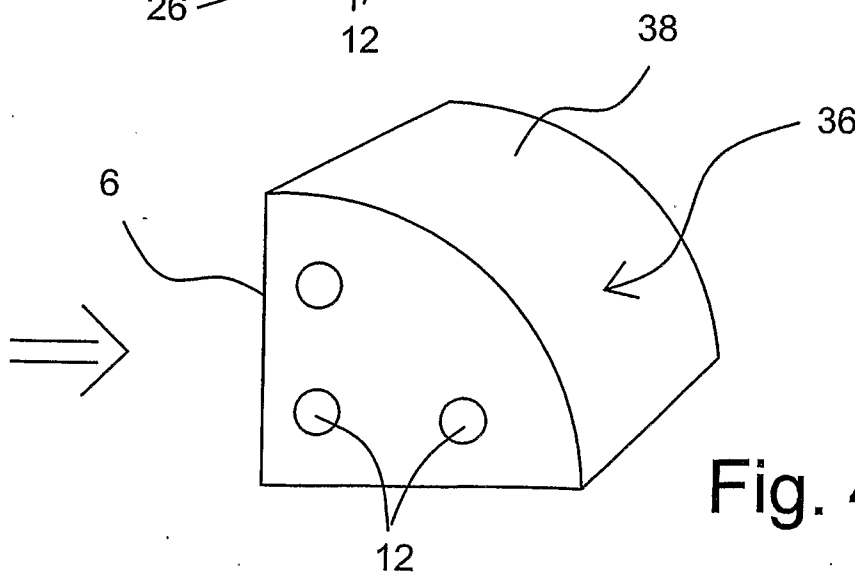


Fig. 4

Fig. 5

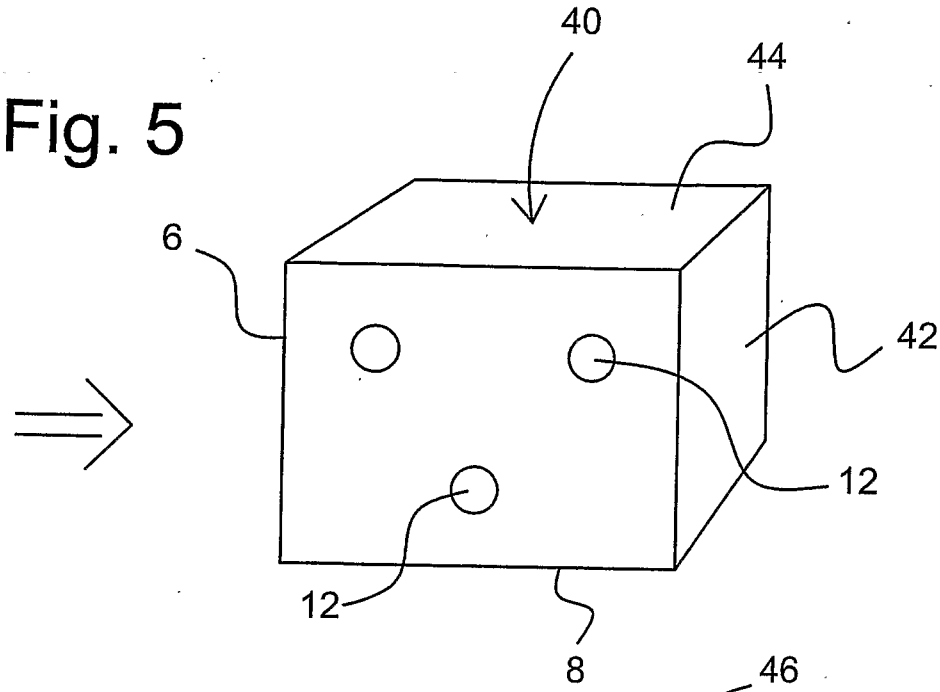


Fig. 6

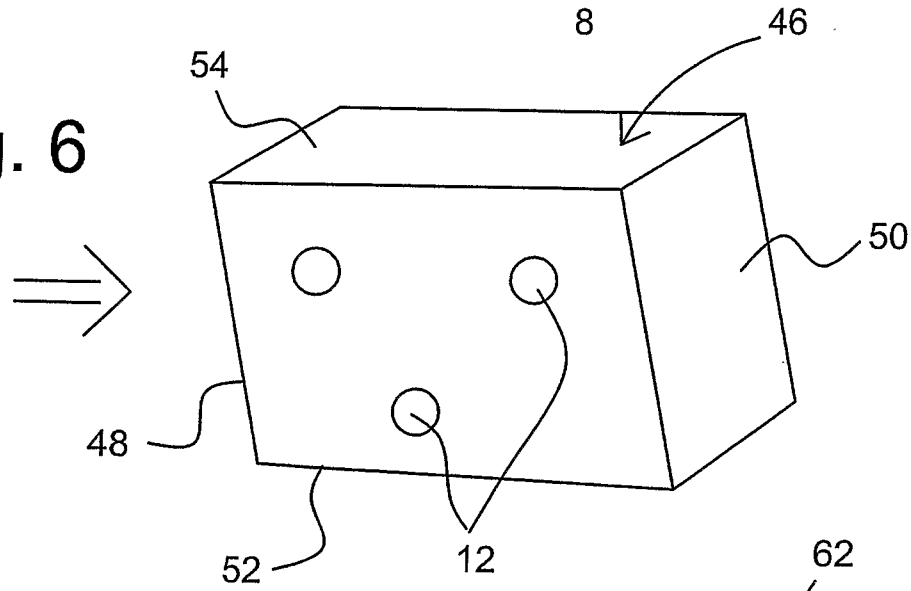
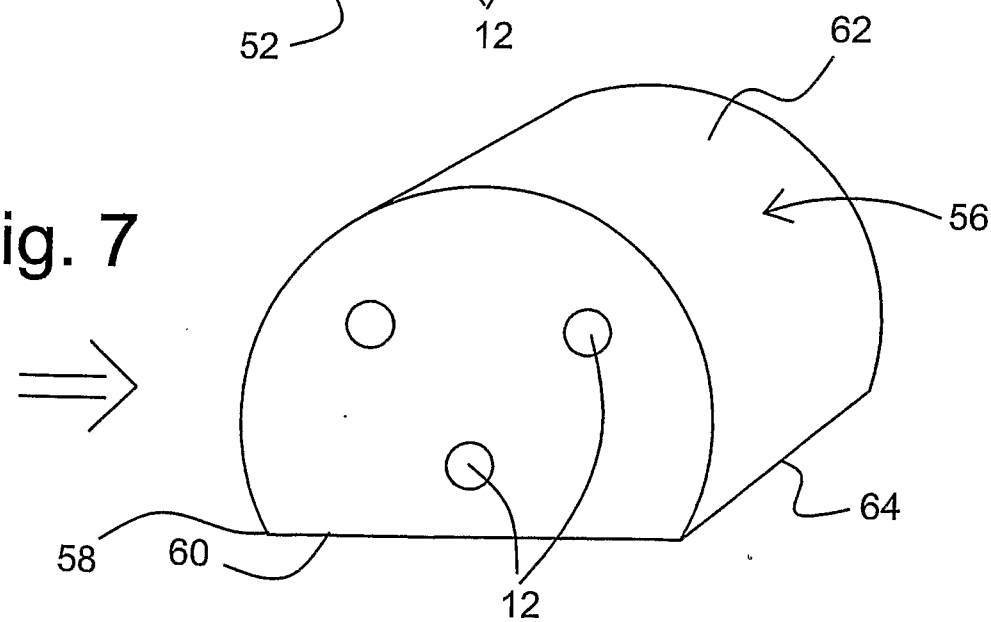


Fig. 7



INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2005/000138

A. CLASSIFICATION OF SUBJECT MATTER

IPC: see extra sheet
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: E01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-INTERNAL, WPI DATA, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 3243842 A1 (MüHLENWEG, B.-R. ET AL), 30 May 1984 (30.05.1984), figures 5,6	1,2,4,10
Y	--	3,5-9
Y	FR 2598484 A1 (CHADOURNE, R.J.), 13 November 1987 (13.11.1987), page 2 - page 3, figure 1	7,8
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A	FR 2777304 A1 (HELLIO, J.L. ET AL), 15 October 1999 (15.10.1999)	1-10
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A	US 20020025221 A1 (J. JOHNSON), 28 February 2002 (28.02.2002)	1-10
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Date of the actual completion of the international search	Date of mailing of the international search report
17 October 2006	17 -10- 2006
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Christer Bäcknert / MRo Telephone No. +46 8 782 25 00

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Cited literature, if any, will be enclosed in paper form.

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