

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 May 2006 (11.05.2006)

PCT

(10) International Publication Number
WO 2006/048739 A1

(51) International Patent Classification:
F41J 5/14 (2006.01)

(21) International Application Number:
PCT/IB2005/003285

(22) International Filing Date: 27 October 2005 (27.10.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
01825/04 5 November 2004 (05.11.2004) CH

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(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV,
LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,
SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US,
UZ, VC, VN, YU, ZA, ZM, ZW.

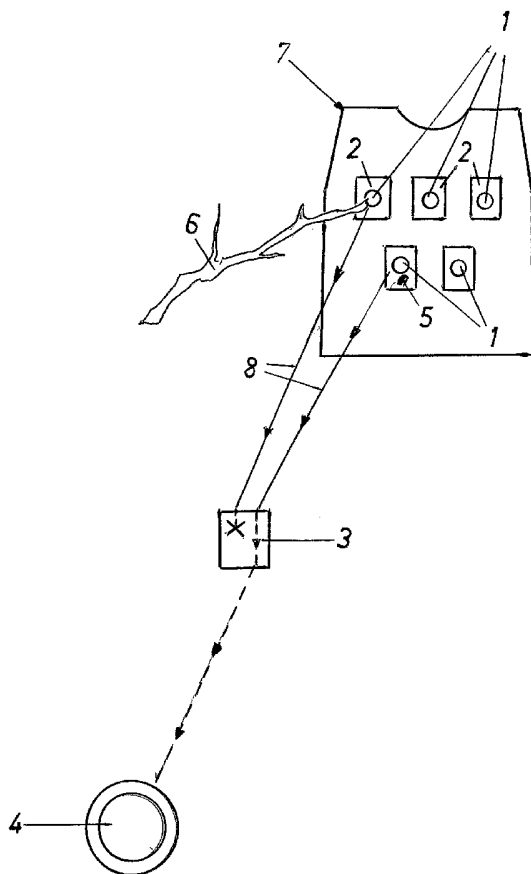
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: IMPACT IDENTIFICATION SENSOR



(57) Abstract: Sensor (1) able to perform identification of an im-
pact acting on a support and resonance plate (2) and send a signal
to a measuring and recording station (4). The sensor (1) accord-
ing to the invention is provided with an intermediate apparatus (3)
which, after analysing the characteristics of the effects produced
by the abovementioned impact and comparing them with the char-
acteristics produced by the impact of a non-lethal projectile, sends
the abovementioned signal to the said measuring and recording
station (4) only in the case where these characteristics coincide
substantially.

Impact identification sensor.

The present invention relates to the sector of
5 military and law enforcement training systems involving
simulated combats during which non-lethal projectiles
are fired. These systems are composed of several
impact sensors which are distributed over the body of
the combatants, being fixed onto special clothing
10 (protective vests, jackets and the like). These
sensors are usually mounted on larger-size support
bases and detect the effects produced by the impact of
a non-lethal projectile on them, sending subsequently a
signal to a measuring and recording receiver station
15 which has the function of monitoring and checking the
progress of the simulated combats.

Such a type of system and the various components
which form the system are, for example, described in
patent application PCT/IB04/001529 in the name of the
20 same Applicant.

The effectiveness of these systems and the
reliability of the recordings made by the already
mentioned receiver station (generally consisting of a
suitably programmed computer) during the course of a
25 simulated combat, however, are frequently hampered by
the fact that the sensors are struck not only by the
non-lethal projectiles but also by foreign bodies
(branches, fixed obstacles, etc.) and in this case emit
a signal which, being sent to the receiver station,
30 creates confusion as to the actual progress of the
combat, which is difficult to eliminate. The inventor
of the subject of the present application has come up
with the idea that, in order to overcome this major
drawback, it would be possible to provide each sensor
35 with the capacity to identify clearly the effects of
the shock wave produced by the impact of a non-lethal
projectile, so as to be able to distinguish them
accurately and reliably from those produced by
accidental events and send only the relevant signals to

the receiver station.

The inventor has therefore devised the sensor according to the present invention, which is provided with an intermediate apparatus which acts as a "filter" for the signals which it sends and which, after comparing their characteristics with the corresponding ones produced by the impact of a non-lethal projectile, forward them to the receiver station only if these characteristics substantially coincide.

The abovementioned intermediate apparatus may advantageously be designed so that it comprises special software equipped with a memory in which the characteristics of the non-lethal projectile impacts are recorded and with a program able to compare them with those of the impact acting on the sensor and enable sending of a signal to the receiver station only in the cases where, as mentioned, these characteristics substantially coincide.

The sensor according to the invention is thus equipped with an intermediate "filter" which reliably prevents it from sending directly to the receiver station unrelated signals which must not be taken into consideration when evaluating the progress of a simulated combat.

It is obvious that the sensor is able to transmit to the intermediate apparatus the characteristics produced on it by an impact in analogue, analogue/digital or digital form, by means of wiring or radio waves.

It should also be noted that, depending on its structure and the software program with which it is equipped, a same intermediate apparatus may also be used for several sensors. Said apparatus may be housed inside a small anti-impact container which is situated inside a pocket of one of the clothes worn by a combatant and may obviously be connected only to the sensors which are fixed onto the body of this combatant.

The object of the present invention is therefore

to provide a sensor as described in the accompanying Claim 1.

A preferred example of embodiment of a sensor according to the invention will now be described in more detail, with reference also to the accompanying figure which is a block diagram illustrating operation thereof in the case of a wire connection between one or more sensors and the abovementioned intermediate apparatus.

As can be seen in the drawing, several sensors 1 according to the invention are mounted on support and resonance plates 2 of the known type fixed onto a vest 7 and are connected by means of wiring 8 to a single intermediate apparatus 3 which, owing to the suitably programmed software already described above, receives from the sensors 1 the characteristics produced by all the impacts acting on the support and resonance plates 2.

After analysing and comparing them with those which are produced by the impact of a non-lethal projectile and stored in its memory, the said intermediate apparatus 3 sends a signal to the receiver station 4 only when these characteristics substantially coincide with those of an impact of a non-lethal projectile 5, but does not send any signal to the receiver station 4 when these characteristics are of a different nature (for example produced by the impact against a branch 6).

With the use of one or more sensors designed in accordance with the invention, the predefined object of the inventor is achieved, namely that of ensuring accurate and reliable monitoring of a simulated combat by a measuring and recording station.

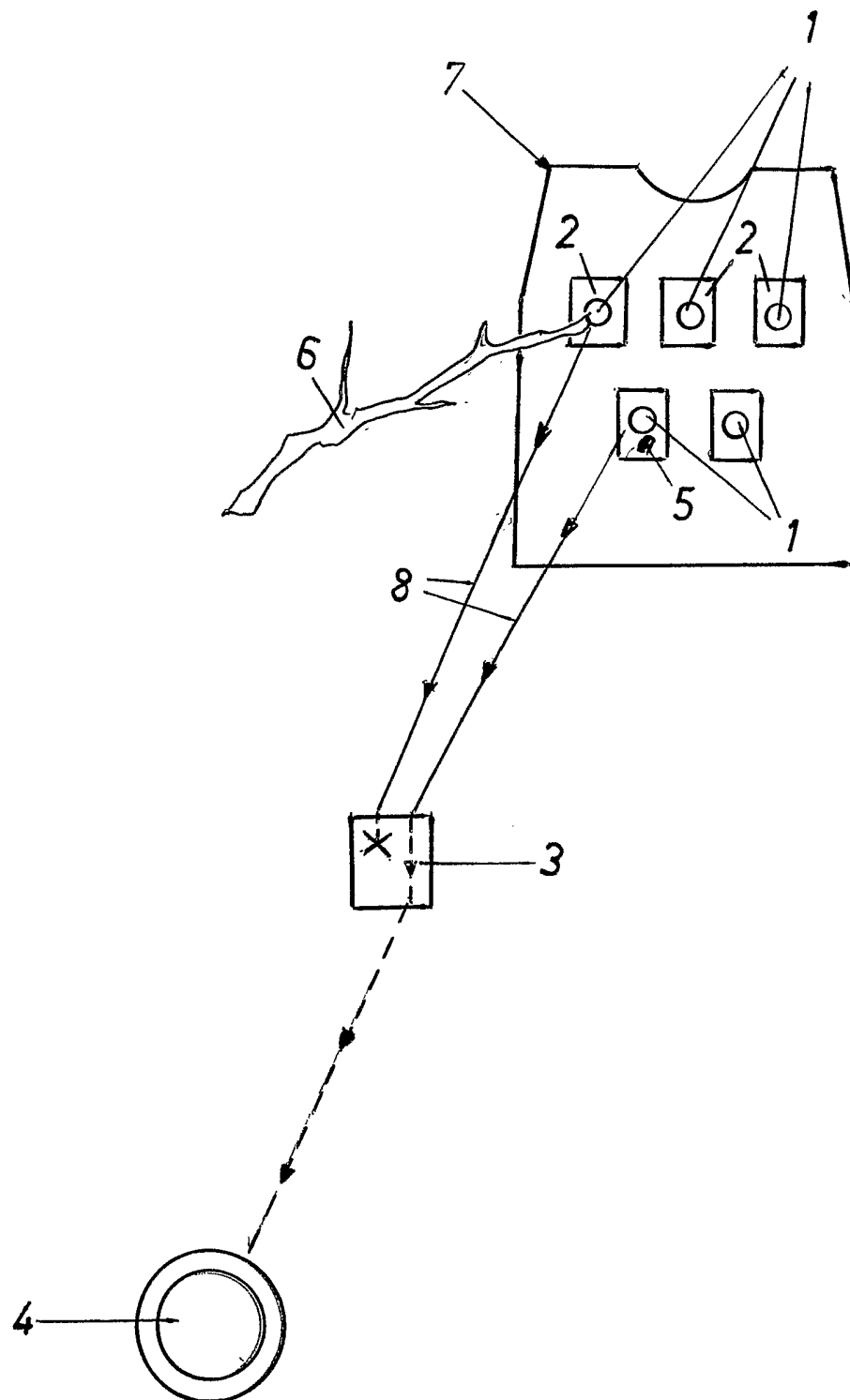
In the accompanying drawing both the intermediate apparatus 3 and the measuring and recording station 4 have been shown in schematic form, in view of the numerous embodiments from among which a person skilled in the art can easily choose.

Claims

1. Sensor (1) able to perform identification of an impact acting on a support and resonance plate (2) and send a signal to a measuring and recording station (4),
5 characterized in that it is provided with an intermediate apparatus (3) which, after analysing the characteristics of the effects produced by the abovementioned impact and comparing them with the characteristics produced by the impact of a non-lethal
10 projectile, sends the abovementioned signal to the said measuring and recording station (3) only in the case where these characteristics coincide substantially.

2. Sensor according to Claim 1, characterized in that it transmits the characteristics of the effects
15 produced by an impact by means of wiring (8) which connects it to the said intermediate apparatus (3).

3. Sensor according to Claim 1, characterized in that it transmits the characteristics of the effects produced by an impact to the said intermediate
20 apparatus (3) in the form of radio signals.



INTERNATIONAL SEARCH REPORT

IB2005/003285

A. CLASSIFICATION OF SUBJECT MATTER
F41J5/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHEDMinimum documentation searched (classification system followed by classification symbols)
F41A F41J

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

Electronic data base consulted during the international search (name of data base and, where practical, 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	US 5 354 057 A (PRUITT ET AL) 11 October 1994 (1994-10-11) abstract column 5, lines 33-51 column 8, lines 1-6, 37-63 column 9, lines 25-66 column 10, lines 8-63 column 11, lines 9-12 column 11, line 61 - column 12, line 2 column 12, lines 44-46 column 13, line 8 - column 14, line 3 figures 6-8 ----- -/--	1-3

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

19 January 2006

Date of mailing of the international search report

06/02/2006

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INTERNATIONAL SEARCH REPORT

IB2005/003285

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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X	US 5 788 500 A (GERBER ET AL) 4 August 1998 (1998-08-04) abstract column 9, line 35 - column 10, line 66 column 12, line 55 - column 13, line 3 column 17, lines 48-61 figures 1-4 -----	1-3
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X	WO 99/10700 A (BEAMHIT, L.L.C; SHECHTER; ROSA) 4 March 1999 (1999-03-04) abstract page 20, lines 5-16 page 22, lines 8-13 page 23, line 15 - page 24, line 17 page 27, line 22 - page 28, line 17 figures 3-5 -----	1-3

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