



(51) International Patent Classification:

F16P 3/14 (2006.01) *G06T 7/00* (2006.01)
G06K 9/00 (2006.01)

(21) International Application Number:

PCT/US2011/030863

(22) International Filing Date:

1 April 2011 (01.04.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/341,654 1 April 2010 (01.04.2010) US
12/928,361 9 December 2010 (09.12.2010) US

(71) Applicant (for all designated States except US):
SEALED AIR CORPORATION (US) [US/US]; 200
Riverfront Boulevard, Elmwood Park, NJ 07407 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DELUCA, Nicholas**
[US/—]; 103 Calle Tetuan, San Juan, 00901 (PR).
SOTO, Koichi [JP/US]; 18564 Paseo Lado, Saratoga, CA
95070 (US).

(74) Agents: **HURLEY, Rubert, B. Jr.** et al.; Cryovac, Inc.,
Sealed Air Corporation, Post Office Box 464, 100 Rogers
Bridge Rd., Duncan, SC 29334 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT,
HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG,
ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ,
TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

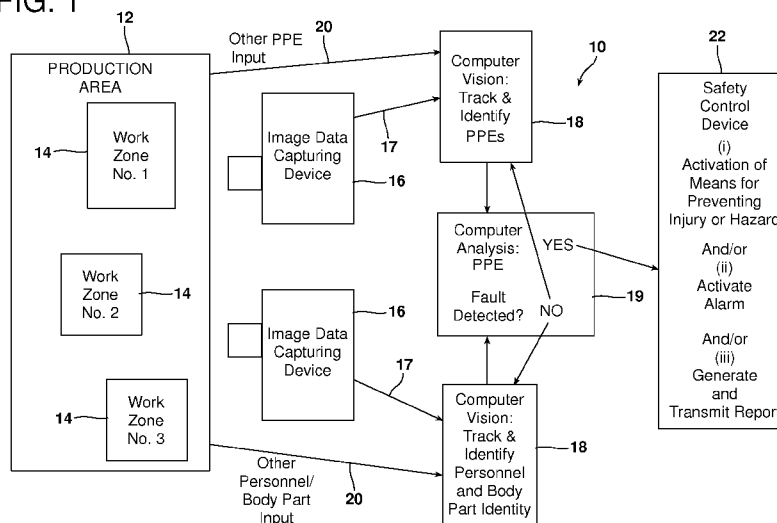
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

24 November 2011

(54) Title: AUTOMATED MONITORING AND CONTROL OF SAFETY IN A PRODUCTION AREA

FIG. 1



(57) Abstract: A machine vision process (18) monitors and controls safe working practice in a production area (12) by capturing and processing image data relative to personal protective equipment (PPE) worn by individuals, movement of various articles, and movement - related conformations of individuals and other objects in the production area. The data is analyzed to determine whether there is a violation of a predetermined minimum threshold image, movement, or conformation value for a predetermined threshold period of time. The determination of a safety violation triggers computer activation of a safety control device. The process is carried out using a system including an image data capturing device (16), a computer (18) and computer- readable program code, and a safety control device (22).

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/030863

A. CLASSIFICATION OF SUBJECT MATTER
 INV. F16P3/14 G06K9/00 G06T7/00
 ADD.

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)

F16P G06K G06T

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/161918 A1 (HELLER JEFFREY R [US] ET AL) 25 June 2009 (2009-06-25) figures 1,2,6 paragraph [0016] - paragraph [0018] paragraph [0021] - paragraph [0022] paragraph [0034] - paragraph [0038] -----	1-9, 32-36
X	US 2008/189142 A1 (BROWN TOM [US] ET AL) 7 August 2008 (2008-08-07) paragraph [0066] - paragraph [0068] figures 4,5 -----	1-9,32, 35
X	KR 100 789 721 B1 (NAVELTECH CO LTD [KR]) 2 January 2008 (2008-01-02) paragraph [0047] - paragraph [0058] paragraph [0132] - paragraph [0133] ----- -/-	1-4,6,32



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

1 July 2011

Date of mailing of the international search report

05/10/2011

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2
 NL - 2280 HV Rijswijk
 Tel. (+31-70) 340-2040,
 Fax: (+31-70) 340-3016

Authorized officer

Terrier de la Chaise

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2011/030863

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/247609 A1 (FERIS ROGERIO [US] ET AL) 9 October 2008 (2008-10-09) figure 3 paragraph [0035] - paragraph [0038] -----	32
A	US 2005/027618 A1 (ZUCKER JEFFREY MARK [US] ET AL) 3 February 2005 (2005-02-03) figure 2 -----	1,32-34
A	US 2006/268482 A1 (LIN JUNG-CHENG [TW] ET AL) 30 November 2006 (2006-11-30) paragraph [0015] - paragraph [0016] figures 1,4 -----	1-4,6,7, 9,32,34, 35

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2011/030863

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9, 32-36

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9, 32-36

Process and system to control if personal protective equipment is properly positioned on an individual.

2. claims: 10-21, 37-41

Process and system to control if movement is outside safe movement range.

3. claims: 22-31, 42

Process and system to control if the conformation value of one member satisfies the unsafe threshold value.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2011/030863

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009161918 A1	25-06-2009	EP 2232440 A2 WO 2009081340 A2	29-09-2010 02-07-2009
US 2008189142 A1	07-08-2008	US 2011022421 A1 WO 2008097499 A1	27-01-2011 14-08-2008
KR 100789721 B1	02-01-2008	KR 20070096409 A	02-10-2007
US 2008247609 A1	09-10-2008	NONE	
US 2005027618 A1	03-02-2005	US 2005027617 A1 US 2005114218 A1 US 2005033659 A1	03-02-2005 26-05-2005 10-02-2005
US 2006268482 A1	30-11-2006	TW I280009 B	21-04-2007