



(51) International Patent Classification:
G01N 33/08 (2006.01)

27712 (US). **KENNEDY, Daniel, Lee** [US/US]; 1733
Gracechurch Street, Wake Forest, NC 27587 (US).

(21) International Application Number:
PCT/IB2008/002481

(74) Agent: **FULLER, Grover, F., Jr.**; Pfizer Inc., 150 East
42nd Street, New York, NY 10017 (US).

(22) International Filing Date:
22 September 2008 (22.09.2008)

(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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG,
SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
11/867,996 5 October 2007 (05.10.2007) US
11/947,225 29 November 2007 (29.11.2007) US

(71) Applicant (for all designated States except US): **EM-
BREX, INC.** [US/US]; 1040 Swabia Court, Durham, NC
27703 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **HEBRANK, John,
Hilbert** [US/US]; 216 Jefferson Drive, Durham, NC

(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, HR, HU, IE, IS, IT, LT, LU, LV,

[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR CANDLING EGGS VIA EMBRYO HEARTBEAT DETECTION

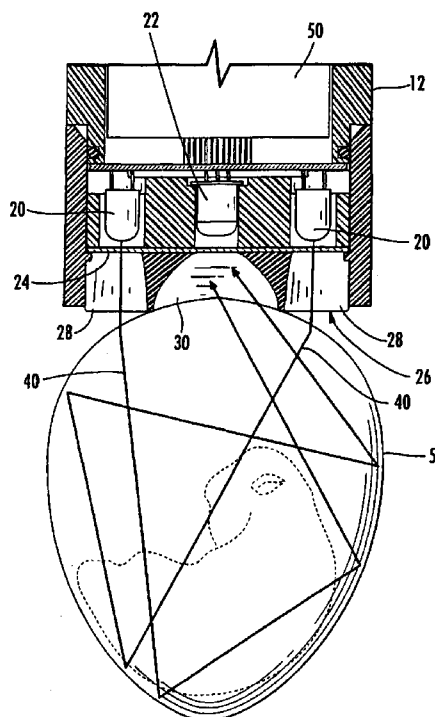


FIG. 3

(57) Abstract: An apparatus for candling eggs includes a waterproof housing having a free end, a light source configured to emit visible light from the housing free end and illuminate an egg positioned adjacent to the housing free end, and a photodetector that generates an output signal corresponding to intensity of light from the light source leaving the egg. The photodetector is shielded from external light and from direct light from the light source. The light source and photodetector are disposed within the waterproof housing, and a replaceable bumper is removably secured to the housing free end. The bumper is configured to engage an egg in contacting relation therewith, and to shield the photodetector from external light and from direct light from the light source. A processor processes output signals from the photodetector to identify cyclical variations in light intensity and/or non-cyclical variations in light intensity.





MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI
(BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG).

— *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))*

Published:

— *with international search report (Art. 21(3))*

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

17 September 2009