MODULE *Euclid*

EXTENDS *Integers*, *GCD*, *TLC*

CONSTANTS M, N

ASSUME $\land M \in Nat \setminus \{0\}$
$\land N \in Nat \setminus \{0\}$

****

--fair algorithm *Euclid***{**
variables $x = M$, $y = N$ **;**
{ *abc*: **while (** $x \neq y$ **) {** *d*: **if (** $x < y$ **) {** $y := y - x$ **}**
else { $x := x - y$ **}**
} ;
}
}

****

BEGIN TRANSLATION

VARIABLES x, y, pc

$vars \triangleq \langle x, y, pc \rangle$

$Init \triangleq$ Global variables
$\land x = M$
$\land y = N$
$\land pc =$ "abc"

$abc \triangleq \land pc =$ "abc"
$\land$ IF $x \neq y$
THEN $\land pc' =$ "d"
ELSE $\land pc' =$ "Done"
$\land$ UNCHANGED $\langle x, y \rangle$

$d \triangleq \land pc =$ "d"
$\land$ IF $x < y$
THEN $\land y' = y - x$
$\land x' = x$
ELSE $\land x' = x - y$
$\land y' = y$
$\land pc' =$ "abc"

$Next \triangleq abc \lor d$
$\lor$ Disjunct to prevent deadlock on termination
$(pc =$ "Done" $\land$ UNCHANGED $vars)$

$Spec \triangleq \land Init \land \Box[Next]_{vars}$
$\land \mathrm{WF}_{vars}(Next)$

$Termination \triangleq \Diamond(pc =$ "Done"$)$

END TRANSLATION

* Modification History
* Last modified *Tue Jun* 03 16:21:26 *CST* 2014 by *yaojingguo*
* Last modified *Tue Jun* 03 11:00:10 *CST* 2014 by *yaojingguo*
* Last modified Sat May 31 17:16:19 *CST* 2014 by *jing*
* Created Sat May 31 16:03:52 *CST* 2014 by *jing*