─────── MODULE *BrazoMecanico* ───────

EXTENDS timer
CONSTANTS $tIr, tDet, tExt$
ASSUME $\land tIr \in Nat$
$\land tIr > 0$
$\land tDet \in Nat$
$\land tDet > 0$
$\land tExt \in Nat$
$\land tExt > 0$

VARIABLES $direccion, pos, bRunning$, $timeElapsed$

$vr \triangleq \langle direccion, pos, bRunning \rangle$, $timeElapsed \rangle$
$ar \triangleq \langle pos, direccion \rangle$

$TypeInv \triangleq \land direccion \in \{\text{"izq"}, \text{"der"}\}$
$\land pos \in \{\text{"izq"}, \text{"der"}, \text{"mid"}\}$
$\land bRunning \in \{\text{"yes"}, \text{"no"}\}$

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$Init \triangleq \land TypeInv$
$\land direccion = \text{"izq"}$
$\land pos = \text{"izq"}$
$\land bRunning = \text{"no"}$

$MoveTo(p) \triangleq \land direccion \neq p$
$\land bRunning = \text{"no"}$
$\land bRunning' = \text{"yes"}$
$\land direccion' = p$
$\land pos' = \text{"mid"}$

$Extremo(p) \triangleq \land pos = \text{"mid"}$
$\land direccion = p$
$\land bRunning = \text{"yes"}$
$\land bRunning' = \text{"no"}$
$\land pos' = p$
$\land direccion' = \text{CHOOSE } x \in \{\text{"izq"}, \text{"der"}\} : x \neq p$

$StopMid \triangleq \land pos = \text{"mid"}$
$\land bRunning = \text{"yes"}$
$\land bRunning' = \text{"no"}$
$\land \text{UNCHANGED } ar$

$Reanudar \triangleq \land pos = \text{"mid"}$
$\land bRunning = \text{"no"}$
$\land bRunning' = \text{"yes"}$
$\land \text{UNCHANGED } ar$

$BStop \triangleq StopMid \lor Extremo(direccion)$

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$Boton \;\triangleq\; BStop \lor Reanudar$

$Next \;\triangleq\; Boton \lor (\exists\, p \in \{\,\text{``izq''},\; \text{``der''}\,\} : MoveTo(p) \lor Extremo(p))$

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

THEOREM $Spec \Rightarrow \Box\, TypeInv$

\ * Modification History
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