MODULE *Turnstile*

EXTENDS *Sequences*, *Integers*
VARIABLE *state*

Example of a very simple 'Turnstile' finite state machine.

$TypeOK \triangleq state \in \{\text{“locked”}, \text{“unlocked”}\}$

$Init \triangleq state = \text{“locked”}$

We now define the actions that may be performed by turnstile users.

$$CoinFromLocked \triangleq \land state = \text{“locked”} \land state' = \text{“unlocked”}$$

$$CoinFromUnlocked \triangleq \land state = \text{“unlocked”} \land state' = \text{“unlocked”}$$

$$PushFromLocked \triangleq \land state = \text{“locked”} \land state' = \text{“locked”}$$

$$PushFromUnlocked \triangleq \land state = \text{“unlocked”} \land state' = \text{“locked”}$$

The next-state action.

$$Next \triangleq \lor CoinFromLocked \lor CoinFromUnlocked \lor PushFromLocked \lor PushFromUnlocked$$

The complete specification of the system.

$Spec \triangleq Init \land \Box[Next]_{state}$

Asserts that *TypeOK* is an invariant of the system.

THEOREM $Spec \Rightarrow \Box(TypeOK)$

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