$\overline{\qquad\qquad}$ MODULE *crackers5* $\overline{\qquad\qquad}$

CONSTANTS *Things*, *People*
VARIABLES *desires*, *holds*

$Init \triangleq \wedge desires = [p \in People \mapsto \{\}]$
$\qquad\quad \wedge holds \ \ = [p \in People \mapsto \{\}]$

$Desire(p) \triangleq \wedge desires[p] = \{\}$
$\qquad\qquad\quad \wedge holds[p] = \{\}$
$\qquad\qquad\quad \wedge \exists\, t \in Things :$
$\qquad\qquad\qquad \wedge desires' = [desires \text{ EXCEPT } ![p] = \{t\}]$
$\qquad\qquad\qquad \wedge \text{UNCHANGED } holds$

$Acquire(p) \triangleq \exists\, t \in desires[p] :$
$\qquad\qquad\qquad \wedge t \notin holds[p]$
$\qquad\qquad\qquad \wedge holds' = [holds \text{ EXCEPT } ![p] = holds[p] \cup \{t\}]$
$\qquad\qquad\qquad \wedge \text{UNCHANGED } desires$

$Satiated(p) \triangleq \wedge desires[p] \neq \{\}$
$\qquad\qquad\qquad \wedge \forall\, t \in desires[p] : t \in holds[p]$
$\qquad\qquad\qquad \wedge desires' = [desires \text{ EXCEPT } ![p] = \{\}]$
$\qquad\qquad\qquad \wedge \text{UNCHANGED } holds$

$TidyUp(p) \triangleq \wedge desires[p] = \{\}$
$\qquad\qquad\qquad \wedge \exists\, t \in holds[p] :$
$\qquad\qquad\qquad\quad \wedge holds' = [holds \text{ EXCEPT } ![p] = holds[p] \setminus \{t\}]$
$\qquad\qquad\qquad\quad \wedge \text{UNCHANGED } desires$

$Next \triangleq \exists\, p \in People :$
$\qquad\quad \vee Desire(p)$
$\qquad\quad \vee Acquire(p)$
$\qquad\quad \vee Satiated(p)$
$\qquad\quad \vee TidyUp(p)$

$TidiesUp \triangleq \neg\exists\, p \in People :$
$\qquad\qquad\quad \wedge desires[p] \neq \{\}$
$\qquad\qquad\quad \wedge \exists\, l \in holds[p] : l \notin desires[p]$

$Exclusivity \triangleq \neg\exists\, p,\, q \in People : p \neq q \wedge (holds[p] \cap holds[q]) \neq \{\}$

$Spec \triangleq Init \wedge \Box[Next]_{\langle desires,\, holds \rangle}$

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