Contents

CONTEXT MapContext

CONSTANTS

to_block

AXIOMS

axm_1: $to\_block \in \mathbb{N} \rightarrow \mathbb{N}$

axm_2:

$\forall x \cdot \forall y \cdot x \in \mathbb{N} \land y \in \mathbb{N} \land y > 0 \land x \in dom(to\_block) \land x + y \in dom(to\_block)$
$\Rightarrow to\_block(x + y) \geq to\_block(x)$

END

MACHINE Function
SEES MapContext
VARIABLES
coins
counts
bcounts
INVARIANTS
inv_1: $coins \subseteq \mathbb{N}$
inv_2: $counts \in coins \rightarrow \mathbb{N}$
inv_3: $\forall x \cdot x \in coins \Rightarrow x \in dom(counts)$
inv_4: $bcounts \in to\_block[coins] \rightarrow \mathbb{N}$
EVENTS
Initialisation
begin
init_1: $coins := \varnothing$
init_2: $counts := \varnothing$
init_3: $bcounts := \varnothing$
end
Event addNewCoinAndNewBlock ⟨ordinary⟩ $\widehat{=}$
any
c
b
where
grd_1: $c \in \mathbb{N}$
grd_2: $c \notin coins \wedge c \notin dom(counts) \wedge c \in dom(to\_block)$
grd_3: $b = to\_block(c)$
grd_4: $b \notin dom(bcounts)$
then
act_1: $coins := coins \cup \{c\}$
act_2: $counts(c) := 1$
act_3: $bcounts(b) := 1$
end
Event addNewCoinUpdateBlock ⟨ordinary⟩ $\widehat{=}$
any
c
b
bn
where
grd_1: $c \in \mathbb{N}$
grd_2: $c \notin coins \wedge c \notin dom(counts) \wedge c \in dom(to\_block)$
grd_3: $b = to\_block(c)$
grd_4: $b \in dom(bcounts)$
grd_5: $bn = bcounts(b)$
then
act_1: $coins := coins \cup \{c\}$
act_2: $counts(c) := 1$
act_3: $bcounts(b) := bn + 1$
end
Event addMore ⟨ordinary⟩ $\widehat{=}$
any
c
b
n
bn
where
grd_1: $c \in \mathbb{N}$
grd_2: $c \in coins \wedge c \in dom(counts) \wedge c \in dom(to\_block)$

grd_3: $b = to\_block(c)$
grd_4: $n = counts(c)$
grd_5: $b \in dom(bcounts)$
grd_6: $bn = bcounts(b)$

then

act_1: $counts(c) := n + 1$
act_2: $bcounts(b) := bn + 1$

end

END