```
1  ---------- MODULE LedgerSpec ----------
   High level specification of DLT Ledger Single state machine and no MVCC
6  EXTENDS Sequences, Integers

8  CONSTANTS State, InitState
9  VARIABLES state, transactions

11 ASSUME InitState ∈ State
12 ASSUME ∀ f, s0 : ∃ s1 : s1 ∈ f[s0]   f is total

14 Init ≜
15     ∧ state = InitState
16     ∧ transactions = ⟨⟩

   Actions

22 SubmitTx(tx) ≜ transactions' = Append(transactions, [tx ↦ tx, processed ↦ FALSE])

24 commitSub(idx) ≜
25     LET
26         tx ≜ transactions[idx]
27         f ≜ tx.f
28     IN
29         ∧ transactions' = [transactions EXCEPT ![idx].processed = TRUE]
30         ∧
31             ∨ state' = CHOOSE s : f[state]
32             ∨ UNCHANGED state

34 CommitTx ≜ ∃ idx :
35     ∧ ∀ j ∈ 1 .. idx − 1 : transactions[j].processed = TRUE
36     ∧ ∀ j ∈ idx .. Len(transactions) : transactions[j].processed = FALSE
37     ∧ commitSub(idx)

40 Next ≜ (∃ tx : SubmitTx(tx)) ∨ CommitTx

   Specification

46 Spec ≜ Init ∧ □[Next]⟨state, transactions⟩

48 ---------------------------------------
   Invariants

53 Invariant ≜
54     ∧ state ∈ State

56 THEOREM Spec ⇒ □Invariant
57 =======================================
```

\ * Modification History
\ * Last modified *Fri Jun* 07 12:44:09 *JST* 2019 by *shinsa*
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