ecl-es-halt[11,40]

ecl-es-halt(es; x)
$\equiv_{\text{def}}$ ecl_ind(x;
k,$test$.(λn,e_1,e_2. if ($n =_0 0$)
then e_2 =
first $e \geq e_1$.(es-kind(es; e) = k)
c$\wedge$ ($\uparrow$($test$(es-state-when(es; e),es-val(es; e))))
else False
fi);
a,b,ha,hb.(λn,e_1,e_2. if ($n =_0 0$) then False else ha(n,e_1,e_2) fi
$\vee$ $\exists e \in (e_1,e_2]$.(ha(0,e_1,es-pred(es; e))) $\wedge$ (hb(n,e,e_2)));
a,b,ha,hb.(λn,e_1,e_2. if ($n =_0 0$)
then ((ha(0,e_1,e_2)) $\wedge$ $\exists e \in [e_1,e_2]$.hb(0,e_1,e))
$\vee$ ((hb(0,e_1,e_2)) $\wedge$ $\exists e \in [e_1,e_2]$.ha(0,e_1,e))
else ((ha(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(b));
m.if $n \leq$z m
then $\forall e \in [e_1,e_2)$.$\neg$(hb(m,e_1,e))
else $\forall e \in [e_1,e_2]$.$\neg$(hb(m,e_1,e))
fi))
$\vee$ ((hb(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(a));
m.if $n \leq$z m
then $\forall e \in [e_1,e_2)$.$\neg$(ha(m,e_1,e))
else $\forall e \in [e_1,e_2]$.$\neg$(ha(m,e_1,e))
fi))
fi);
a,b,ha,hb.(λn,e_1,e_2. ((ha(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(b));
m.if $n \leq$z m
then $\forall e \in [e_1,e_2)$.$\neg$(hb(m,e_1,e))
else $\forall e \in [e_1,e_2]$.$\neg$(hb(m,e_1,e))
fi))
$\vee$ ((hb(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(a));
m.if $n \leq$z m
then $\forall e \in [e_1,e_2)$.$\neg$(ha(m,e_1,e))
else $\forall e \in [e_1,e_2]$.$\neg$(ha(m,e_1,e))
fi)));
a,ha.(λn,e_1,e_2. if ($n =_0 0$)
then False
else $[e_1;e_2]\sim([x,y].ha(0,x,y))*[x,y].ha(n,x,y)$
fi);

a,m,ha.ha;
a,m,ha.(λn,e_1,e_2. if ($n =_0 0$) then False else ha(n,e_1,e_2) fi
$\vee$ if ($n =_0 m$) then ha(0,e_1,e_2) else False fi);
a,l,ha.(λn,e_1,e_2. ((ha(n,e_1,e_2)) $\wedge$ ($\neg$($n \in l$)))
$\vee$ if ($n =_0 0$) then l_exists(l; $\mathbb{N}$; m.(ha(m,e_1,e_2))) else False fi))

clarification:

ecl-es-halt(es; x)
$\equiv_{\text{def}}$ ecl_ind(x;
k,$test$.(λn,e_1,e_2. if ($n =_0 0$)
then es-first-since(es;e.(es-kind(es; e) = $k \in$ Knd)
c$\wedge$ ($\uparrow$($test$(es-state-when(es; e),es-val(es; e))));e_1;e_2)
else False
fi);
a,b,ha,hb.(λn,e_1,e_2. if ($n =_0 0$) then False else ha(n,e_1,e_2) fi
$\vee$ existse-between3(es;e_1;e_2;e.(ha(0,e_1,es-pred(es; e))) $\wedge$ (hb(n,e,e_2))));
a,b,ha,hb.(λn,e_1,e_2. if ($n =_0 0$)
then ((ha(0,e_1,e_2)) $\wedge$ existse-between2(es;e_1;e_2;e.hb(0,e_1,e)))
$\vee$ ((hb(0,e_1,e_2)) $\wedge$ existse-between2(es;e_1;e_2;e.ha(0,e_1,e)))
else ((ha(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(b));
m.if $n \leq$z m
then all$e$ from es in [e_1;e_2).$\neg$(hb(m,e_1,e))
else alle-between2(es;e_1;e_2;e.$\neg$(hb(m,e_1,e)))
fi))
$\vee$ ((hb(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(a));
m.if $n \leq$z m
then all$e$ from es in [e_1;e_2).$\neg$(ha(m,e_1,e))
else alle-between2(es;e_1;e_2;e.$\neg$(ha(m,e_1,e)))
fi))
fi);
a,b,ha,hb.(λn,e_1,e_2. ((ha(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(b));
m.if $n \leq$z m
then all$e$ from es in [e_1;e_2).$\neg$(hb(m,e_1,e))
else alle-between2(es;e_1;e_2;e.$\neg$(hb(m,e_1,e)))
fi))
$\vee$ ((hb(n,e_1,e_2))
$\wedge$ l-all(cons(0; ecl-ex(a));
m.if $n \leq$z m
then all$e$ from es in [e_1;e_2).$\neg$(ha(m,e_1,e))
else alle-between2(es;e_1;e_2;e.$\neg$(ha(m,e_1,e)))
fi)));
a,ha.(λn,e_1,e_2. if ($n =_0 0$)

then False
else es-pstar-q(es;x,y.ha(0,x,y);x,y.ha(n,x,y);e_1;e_2)
fi);
a,m,ha.ha;
a,m,ha.(λn,e_1,e_2. if ($n =_0 0$) then False else ha(n,e_1,e_2) fi
$\vee$ if ($n =_0 m$) then ha(0,e_1,e_2) else False fi);
a,l,ha.(λn,e_1,e_2. ((ha(n,e_1,e_2)) $\wedge$ ($\neg$($n \in l \in \mathbb{N}$)))
$\vee$ if ($n =_0 0$) then l_exists(l; $\mathbb{N}$; m.(ha(m,e_1,e_2))) else False fi))