fischer-inv[11,40]

$$
\begin{array}{l}
\text{fischer-inv}\{\text{i:l},\\
\qquad \$\text{x:ut2},\\
\qquad \$\text{try:ut2},\\
\qquad \$\text{taken:ut2},\\
\qquad \$\text{contending:ut2},\\
\qquad \$\text{free:ut2},\\
\qquad \$\text{mine:ut2},\\
\qquad \$\text{wanted:ut2},\\
\qquad \$\text{z:ut2}\}\\
\qquad (es;\ L;\ del;\ e)\\
\equiv_{\text{def}}\ ((\text{es-after}(es;\ \text{mkid}\{\$\text{x:ut2}\};\ e) = \text{mkid}\{\$\text{mine:ut2}\})\\
\qquad \Rightarrow (\text{l\_all}(L;\\
\qquad\qquad \text{Id};\\
\qquad\qquad j.((\neg(j = \text{loc}(e)))\\
\qquad\qquad \Rightarrow \exists e'@j.\text{f-event}\{\$\text{x:ut2}\}\\
\qquad\qquad\qquad\qquad (es;\ L;\ e')\\
\qquad\qquad\qquad \wedge (\text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\ \text{mkid}\{\$\text{free:ut2}\};\ es;\ e')\\
\qquad\qquad\qquad\qquad =\\
\qquad\qquad\qquad\qquad \text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\ \text{mkid}\{\$\text{free:ut2}\};\ es;\ e))\\
\qquad\qquad\qquad \wedge (\text{es-after}(es;\ \text{mkid}\{\$\text{x:ut2}\};\ e') = \text{mkid}\{\$\text{taken:ut2}\})\\
\qquad\qquad\qquad \wedge \text{alle-at}(es;\\
\qquad\qquad\qquad\qquad\qquad j;\\
\qquad\qquad\qquad\qquad\qquad e''.((\text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\ \text{mkid}\{\$\text{free:ut2}\};\ es;\ e''\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad)\leq \text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{mkid}\{\$\text{free:ut2}\};\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad es;\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad e'))\\
\qquad\qquad\qquad\qquad\qquad \Rightarrow \text{es-le}(es;\ e'';\ e')))))\\
\qquad\qquad \wedge (\forall e'{:}\text{es-E}(es).\\
\qquad\qquad\qquad \text{f-event}\{\$\text{x:ut2}\}\\
\qquad\qquad\qquad\qquad (es;\ L;\ e')\\
\qquad\qquad\qquad \Rightarrow (\text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\ \text{mkid}\{\$\text{free:ut2}\};\ es;\ e') \leq \text{f-round}\{\text{i:l}\}\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad (\text{mkid}\{\$\text{x:ut2}\};\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{mkid}\{\$\text{free:ut2}\};\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad es;\\
\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad e))\\
\qquad\qquad\qquad \Rightarrow (\text{qle}((\text{es-time}(es;\ e') + del);\ \text{es-time}(es;\ e)) \vee (e' = e)))))
\end{array}
$$

$\wedge$ (f-newround{\$x:ut2, \$free:ut2, \$mine:ut2}
(es; L; e)
$\Rightarrow$ ($\forall e'$:es-E(es).
(loc(e') $\in$ L)
$\Rightarrow$ @e'(mkid{\$x:ut2}$\rightarrow$mkid{\$free:ut2})
$\Rightarrow$ ($\neg$(loc(e') = loc(e)))
$\Rightarrow$ ($\uparrow$es-isrcv(es; e'))
$\Rightarrow$ (es-tag(es; e') = mkid{\$free:ut2})
$\Rightarrow$ (es-lnk(es; e') = <loc(e), loc(e'), mkid{\$z:ut2}>)
$\Rightarrow$ (es-sender(es; e') = e)
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e))))
$\wedge$ (@e(mkid{\$x:ut2}$\rightarrow$mkid{\$try:ut2})
$\Rightarrow$ ($\forall e'$:es-E(es).
($\neg$(loc(e') = loc(e)))
$\Rightarrow$ ($\uparrow$es-isrcv(es; e'))
$\Rightarrow$ (es-tag(es; e') = mkid{\$wanted:ut2})
$\Rightarrow$ (es-lnk(es; e') = <loc(e), loc(e'), mkid{\$z:ut2}>)
$\Rightarrow$ (es-sender(es; e') = e)
$\Rightarrow$ ((@e'(mkid{\$x:ut2}$\rightarrow$mkid{\$taken:ut2})
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e)))
$\wedge$ (@e'(mkid{\$x:ut2}$\rightarrow$mkid{\$contending:ut2})
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
inc-snd(f-rank{i:l}(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e)))))))
$\wedge$ ($\forall e'$:es-E(es).
f-event{\$x:ut2}
(es; L; e')
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e))
$\Rightarrow$ qle(qdist(es-time(es; e); es-time(es; e')); del))

clarification:

fischer-inv{i:l,

$x:ut2,
$try:ut2,
$taken:ut2,
$contending:ut2,
$free:ut2,
$mine:ut2,
$wanted:ut2,
$z:ut2}
(es; L; del; e)

$\equiv_{\text{def}}$ ((es-after(es; mkid{$x:ut2}; e) = mkid{$mine:ut2} $\in$ Id)
$\Rightarrow$ (l_all(L;
Id;
j.(($\neg$(j = es-loc(es; e) $\in$ Id))
$\Rightarrow$ existse-at(es;
j;
e'.(f-event{$x:ut2}
(es; L; e')
$\wedge$ (f-round{i:l}
(mkid{$x:ut2}; mkid{$free:ut2}; es; e')
=
f-round{i:l}
(mkid{$x:ut2}; mkid{$free:ut2}; es; e)
$\in \mathbb{N}$)
$\wedge$ (es-after(es; mkid{$x:ut2}; e') = mkid{$taken:ut2} $\in$ Id)
$\wedge$ alle-at(es;
j;
e''.((f-round{i:l}
(mkid{$x:ut2};
mkid{$free:ut2};
es;
e'') $\leq$ f-round{i:l}
(mkid{$x:ut2};
mkid{$free:ut2};
es;
e'))
$\Rightarrow$ es-le(es; e''; e')))))))
$\wedge$ ($\forall e'$:es-E(es).
f-event{$x:ut2}
(es; L; e')
$\Rightarrow$ (f-round{i:l}
(mkid{$x:ut2}; mkid{$free:ut2}; es; e') $\leq$ f-round{i:l}
(mkid{$x:ut2};
mkid{$free:ut2};
es;
e))
$\Rightarrow$ (qle((es-time(es; e') + del); es-time(es; e)) $\vee$ ($e' = e \in$ es-E(es))))))

$\wedge$ (f-newround{\$x:ut2, \$free:ut2, \$mine:ut2}
(es; L; e)
$\Rightarrow$ ($\forall e'$:es-E(es).
(es-loc(es; e') $\in$ L $\in$ Id)
$\Rightarrow$ es-change-to(es;Id;mkid{\$x:ut2};e';mkid{\$free:ut2})
$\Rightarrow$ ($\neg$(es-loc(es; e') = es-loc(es; e) $\in$ Id))
$\Rightarrow$ ($\uparrow$es-isrcv(es; e'))
$\Rightarrow$ (es-tag(es; e') = mkid{\$free:ut2} $\in$ Id)
$\Rightarrow$ (es-lnk(es; e') = <es-loc(es; e), es-loc(es; e'), mkid{\$z:ut2}> $\in$ IdLnk)
$\Rightarrow$ (es-sender(es; e') = e $\in$ es-E(es))
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e)
$\in$ (:$\mathbb{N}$ $\times$ $\mathbb{N}$))))
$\wedge$ (es-change-to(es;Id;mkid{\$x:ut2};e;mkid{\$try:ut2})
$\Rightarrow$ ($\forall e'$:es-E(es).
($\neg$(es-loc(es; e') = es-loc(es; e) $\in$ Id))
$\Rightarrow$ ($\uparrow$es-isrcv(es; e'))
$\Rightarrow$ (es-tag(es; e') = mkid{\$wanted:ut2} $\in$ Id)
$\Rightarrow$ (es-lnk(es; e') = <es-loc(es; e), es-loc(es; e'), mkid{\$z:ut2}> $\in$ IdLnk)
$\Rightarrow$ (es-sender(es; e') = e $\in$ es-E(es))
$\Rightarrow$ ((es-change-to(es;Id;mkid{\$x:ut2};e';mkid{\$taken:ut2})
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e)
$\in$ (:$\mathbb{N}$ $\times$ $\mathbb{N}$)))
$\wedge$ (es-change-to(es;Id;mkid{\$x:ut2};e';mkid{\$contending:ut2})
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
inc-snd(f-rank{i:l}(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e))
$\in$ (:$\mathbb{N}$ $\times$ $\mathbb{N}$))))))
$\wedge$ ($\forall e'$:es-E(es).
f-event{\$x:ut2}
(es; L; e')
$\Rightarrow$ (f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e')
=
f-rank{i:l}
(mkid{\$x:ut2}; mkid{\$free:ut2}; es; e)
$\in$ (:$\mathbb{N}$ $\times$ $\mathbb{N}$))
$\Rightarrow$ qle(qdist(es-time(es; e); es-time(es; e')); del))

http://www.nuprl.org/FDLcontent/p0_963683_/p74_433552_{fischer-inv}.html