```
no_repeats_mapoutl  THM

⊢  ∀A,B:Type, s:(A+B) List.
|  no_repeats(A+B;s) ⇒ no_repeats(A;mapoutl(s))
| by InductionOnList THEN (Unfold `mapoutl` 0)
|    THEN
|    (Unfold `mapfilter` 0)
|    THEN
|    (Reduce 0)
|    THEN
|    (Try
|     (SplitOnConclITE THEN (Reduce 0) THEN (Fold `mapfilter` 0)
|      THEN
|      (Fold `mapoutl` 0)))
|    THEN
|    (Try
|     ((RWO
|       Thm* ∀l:T List, x:T.
|             no_repeats(T;[x / l]) ⟺ no_repeats(T;l) & ¬(x ∈ l)
|       {no_repeats_cons}
|       0)
|      THEN
|      ThinTrivial
|      THEN
|      (Try Trivial)))
|
|\
| 1. A : Type
| 2. B : Type
| 3. (A+B) List
| ⊢  no_repeats(A+B;nil) ⇒ no_repeats(A;nil)  by Obvious
|
.\
. 1. A : Type
. 2. B : Type
. 3. (A+B) List
. 4. u : A+B
. 5. v : (A+B) List
. 6. isl(u)
. 7. no_repeats(A+B;v)
. 8. ¬(u ∈ v)
. 9. no_repeats(A;mapoutl(v))
. ⊢  ¬(outl(u) ∈ mapoutl(v))
. | by (ParallelOp -2)
. |    THEN
. |    (RWO
. |     Thm* ∀s:(A+B) List, x:A.
. |           (x ∈ mapoutl(s))
. |           ⟺
. |           (∃y:A+B. (y ∈ s) & isl(y) & x = outl(y))
. |     {member_mapoutl}
. |     -1)
. |    THEN
. |    ExRepD
. |
```

```
. 1. A : Type
. 2. B : Type
. 3. (A+B) List
. 4. u : A+B
. 5. v : (A+B) List
. 6. isl(u)
. 7. no_repeats(A+B;v)
. 8. no_repeats(A;mapoutl(v))
. 9. y : A+B
. 10. (y ∈ v)
. 11. isl(y)
. 12. outl(u) = outl(y)
. ⊢  (u ∈ v)
.   by (Analyze 4) THEN (All Reduce) THEN (Try Trivial)
.      THEN
.      (Analyze -4)
.      THEN
.      (All Reduce)
.      THEN
.      (Try Trivial)
.      THEN
.      (HypSubst -1 0)
END
```