```
decidable__equal_union  THM

⊢  ∀A,B:Type, x,y:A+B.
|  (∀a1,a2:A. Dec(a1 = a2)) ⇒ (∀b1,b2:B. Dec(b1 = b2)) ⇒ Dec(x = y)
| by (Unfold `decidable` 0) THEN (Analyze 3) THEN (Analyze 4)
|    THEN
|    (AllHyps
|     (λh.
|      ((InstHyp [x1;x] h) THENA (Complete Auto)) THEN (ParallelOp -1)
|      THEN
|      (ObviousFrom [-1])))
|    THEN
|    (AllHyps
|     (λh.
|      ((InstHyp [y1;y2] h) THENA (Complete Auto))
|      THEN
|      (ParallelOp -1)))
|
|\
| 1. A : Type
| 2. B : Type
| 3. x1 : A
| 4. y1 : B
| 5. ∀a1,a2:A. a1 = a2 ∨ ¬a1 = a2
| 6. ∀b1,b2:B. b1 = b2 ∨ ¬b1 = b2
| ⊢  inl(x1) = inr(y1) ∨ ¬inl(x1) = inr(y1)  by ObviousFrom [-1]
|
|\
| 1. A : Type
| 2. B : Type
| 3. y1 : B
| 4. x : A
| 5. ∀a1,a2:A. a1 = a2 ∨ ¬a1 = a2
| 6. ∀b1,b2:B. b1 = b2 ∨ ¬b1 = b2
| ⊢  inr(y1) = inl(x) ∨ ¬inr(y1) = inl(x)  by ObviousFrom [-1]
|
|\
| 1. A : Type
| 2. B : Type
| 3. y1 : B
| 4. y2 : B
| 5. ∀a1,a2:A. a1 = a2 ∨ ¬a1 = a2
| 6. ∀b1,b2:B. b1 = b2 ∨ ¬b1 = b2
| 7. y1 = y2
| ⊢  inr(y1) = inr(y2)  by ObviousFrom [-1]
|
.\
. 1. A : Type
. 2. B : Type
. 3. y1 : B
. 4. y2 : B
. 5. ∀a1,a2:A. a1 = a2 ∨ ¬a1 = a2
. 6. ∀b1,b2:B. b1 = b2 ∨ ¬b1 = b2
. 7. ¬y1 = y2
. ⊢  ¬inr(y1) = inr(y2)  by ObviousFrom [-1]
```

```
END
```