Proof. Since a URD is an HCF domain, and we have mentioned before that an atom in an HCF domain is a prime. Moreover if R is an HCF domain then so is R[x].

Now consider an arbitrary non zero non unit

$$y = \sum_{i=0}^{n} r_i x^i \quad ; \; r_i \in R.$$

Let d be the highest common factor of $r_0, r_1, r_2, \ldots r_n$ then

$y = d(\sum_{i=0}^{n} r_i' x^i)$; the expression in braces is a primitive polynomial in x, and since every non unit factor of the expression in braces is of degree greater than zero in x, it has only a finite number of factors. I.e. $\Sigma r' x^i$ is a product of atoms and hence of primes and since a prime power is a packet; $\Sigma r_i' x^i$ is a product of a finite number of mutually co-prime packets.

Finally it can be verified that $(d, \Sigma r_i' x^i) = 1$. And since d is in R (and so is a product of mutually co-prime packets if it is a non unit)

$y = d(\Sigma r_i' x^i) = \sum_{0}^{n} r_i x^i$ is a product of a finite number of mutually co-prime packets. Since y is arbitrary the result follows.

Since a prime power is a rigid element we can state the

Corollary 3. If R is a Semirigid domain and x is an indeterminate over R, then R[x] is a Semirigid domain.

Further let R be a URD, S a multiplicative and saturated set of R and let x be a packet in R then we claim that if x is not a unit in R_S then it is a packet in R_S. For if not let $x = x_1 x_2$; where x_i are non units in R_S such that $(x_1, x_2) = 1$ in R_S. Now if $x_1 = u_1/v_1$, $x_2 = u_2/v_2$;(since R is an HCF domain we can take $(u_i, v_i) = 1$, $i = 1,2.$) then $x = (u_1/v_1)(u_2/v_2)$ implies that $v_2 | u_1$ and $v_1 | u_2$ i.e. $u_1 = u_1' v_2$, $u_2 = u_2' v_1$ and $x = u_1' u_2'$ where $u_1', u_2' \in R$ and