We note that the expressions within the braces in both cases being elements of $K[x]$ are products of powers of primes and hence of mutually co-prime packets.

In case $(\beta)$ $0 \neq r_0 \in R$ is the product of a finite number of mutually co-prime packets (provided it is a non unit) and $(r_0, 1 + \sum_{i=1}^{n} a_i' x^i) = 1$ that is y is a product of a finite number of mutually co-prime packets . And in case $(\alpha)$ obviously $( bx^s, 1 + \sum_{j=1}^{n} a_j' x^j ) = 1$ ; $b \in K$, and $bx^s$ is a packet itself (cf Example 1, this chapter). Consequently y is a product of a finite number of mutually co-prime packets in case $(\alpha)$ as well, and this completes the proof.

Remark 1 . Thoerem 6, marks the basic difference of the concepts of Unique Factorization and Unique Representation, because the almost integral closure of a UFD is not completely integrally closed and hence cannot be a UFD.

We have hitherto mentioned different classes of integral domains, one generalizing the other; that is if we take $\triangleright$ to mean <u>generalize</u> we have

URD's $\triangleright$ HCF rings of Krull type $\triangleright$ Semirigid Domains $\triangleright$ GUFD's $\triangleright$ ~~URD's~~ UFD's.

We have shown by Example 7, of Chapter 1, that there exists a GUFD which is not a UFD. Similarly Example 1 of Chapte 2, ensures the existence of a Semirigid Domain which is not a GUFD. We have also shown, with Example 1, of this chapter, that there exists a URD which is not an HCF ring of Krull type and finally it remains to show that there exists an HCF ring of Krull type which is not a Semirigid Domain