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# United States Patent [19] Collins

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[54] **METHOD AND APPARATUS FOR MERGING SHINGLED SIGNATURE STREAMS**

5,503,382 4/1996 Hansen et al. .... 271/9.01  
5,584,472 12/1996 Hidding et al. .... 271/3.06

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[57] **ABSTRACT**

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[52] **U.S. Cl.** ..... **414/801**; 414/789.6; 414/901;  
271/9.01; 271/9.13

[58] **Field of Search** ..... 235/475, 479,  
235/486; 414/789.6, 789.9, 789.8, 790.7,  
791.2, 901, 271, 198, 801; 271/9.01, 9.13,  
151, 216; 198/460.1, 460.3

Two shingled streams of signatures are stacked independently of each other in separate stacking bins that are aligned vertically one above the other and also vertically aligned with the collection bin of a re-feeder. The collection bin is replenished periodically by stopping the shingled streams and unloading the contents of the lower and upper stacking bins to form a combined stack of signatures in the re-feeder collection bin. Signatures in the re-feeder collection bin are delivered by an out-feed conveyor belt in a single reshingled stream of signatures to an in-line processing station. In an alternative embodiment, the stacking bins are laterally separated with respect to each other for separately stacking signatures from two incoming shingled streams that are being output from separate web presses or other independent sources. The incoming signatures are separately stacked and the stacks are periodically unloaded onto separate stacking tables on laterally opposite sides of a common re-feeder. The signature stacks are separately delivered at different times into the re-feeder collection bin, thereby forming a combined stack of signatures that are subsequently reshingled into a single running stream.

[56] **References Cited**

**U.S. PATENT DOCUMENTS**

2,548,767	4/1951	Brest	414/789.9
3,698,707	10/1972	Lucas	414/789.8
3,880,421	4/1975	Muller	414/791.2
3,924,845	12/1975	Wise et al.	270/54
3,978,571	9/1976	Orlando et al.	414/789.6
4,311,475	1/1982	Imai	414/901
4,684,116	8/1987	Hansch	270/54
4,696,464	9/1987	Gammerler	271/202
5,022,644	6/1991	Burge	198/460.3
5,028,192	7/1991	Lindsay et al.	412/1
5,098,075	3/1992	Lindblom	270/54
5,292,110	3/1994	Honegger	270/55

**11 Claims, 7 Drawing Sheets**

