

SHIPPING CASSETTE LID AND UNLID AUTOMATION

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ABSTRACT

Apparatus for placing covers (5, 8) on a cassette (1) and taking covers (5, 8) off a cassette (1) comprises an upper cover removal structure (100U), a
10 lower cover removal structure (100L), and means for holding the cassette in place (170-176). The upper cover removal structure (100U) includes a central body portion (102), a pair of arms (104, 106) rotatably mounted at the end of the central body portion, and
15 fingers (112, 114) located at the end of the arms (104, 106). The fingers (112, 114) can be moved up and down in a direction parallel to the main axis of the arms. The upper cover removal structure (100U) includes means for moving the upper cover removal structure (100U)
20 toward or away from the cassette (1). The lower cover removal structure (100L) includes a central body portion and a pair of arms 156, 158 having fingers (190, 192) at the ends thereof. The arms can move inwardly or outwardly to grasp the bottom cover (8).
25 Also included are means (154) for moving the lower cover removal unit (100L) toward or away from the cassette. The apparatus is designed to minimize generation of particulate contamination. For example, during use, arms (104, 106) and fingers (112, 114) pull
30 tongues (20) of top cover (5) outwardly so that catches (23) on tongues (20) do not snap over rims on the cassettes and generate particulate contamination.

