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Barmichev et al.

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(54) **MID-WING AIRPLANE**

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CPC ... ***B64C 1/00*** (2013.01); ***B64C 1/26*** (2013.01); ***B64C 25/12*** (2013.01); ***B64D 11/00*** (2013.01); *B64C 2001/0027* (2013.01); *B64C 2025/125* (2013.01); *Y02T 50/46* (2013.01)

USPC **244/119**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

1,859,807	A	5/1932	Stout	
D92,189	S	7/1933	Minshall et al.	
2,236,482	A *	3/1941	Zindel	244/119
2,500,015	A *	3/1950	Tweney et al.	244/119
2,967,034	A *	1/1961	Eyre	244/119
3,948,469	A	4/1976	Brown	
4,641,796	A	2/1987	Feifel	
5,086,996	A *	2/1992	Roeder et al.	244/119
5,893,535	A *	4/1999	Hawley	244/119
5,992,797	A	11/1999	Seidel et al.	
6,047,923	A *	4/2000	Lafferty	244/15
6,478,253	B1	11/2002	Seidel	

(Continued)

FOREIGN PATENT DOCUMENTS

FR	868162	12/1941
WO	WO 2006/005550 A1	1/2006

(Continued)

OTHER PUBLICATIONS

The AC—120 The Advanced Commercial Transport Preliminary Design of a 100 to 150 Passenger Commercial Transport Presented to: Professor Robert van't Riet Aeronautical Engineering Department California Polytechnic State University San Luis Obispo, CA May 14, 1993.

(Continued)

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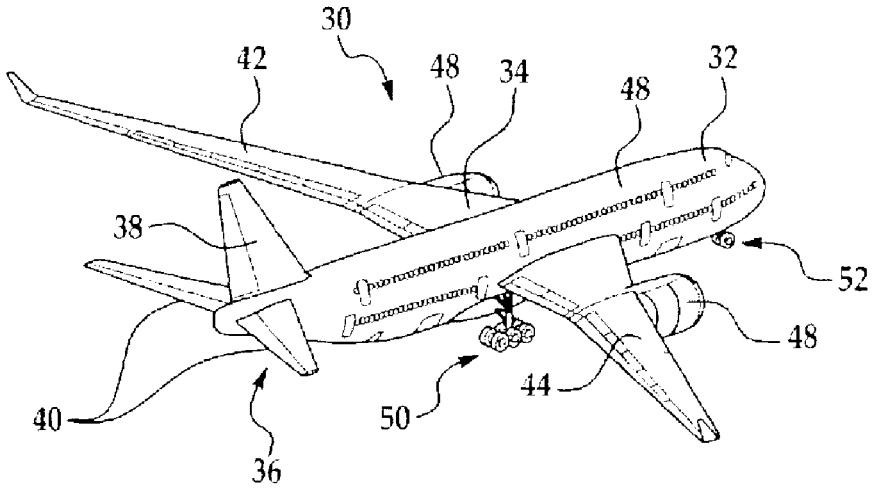
(57) **ABSTRACT**

An airplane includes a wing mounted mid-level on a tubular fuselage. The wing includes carry-through that passes transversely through the fuselage and divides a cabin deck into fore and aft sections. At least one longitudinal passageway in the carry-through structure allows passenger/crew walk-through between the fore and aft sections of the deck.

20 Claims, 13 Drawing Sheets