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# United States Patent [19]

[11] Patent Number: **6,081,059**

Hsu

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[54] **OUTER-ROTOR ELECTRIC MOTOR HAVING INNER-STATOR FORMED BY CONCENTRICALLY WRAPPING FLATTENED STATOR ELEMENTS ON STATOR CORE**

4,350,914	9/1982	Searle .....	310/194
4,395,815	8/1983	Stanley et al. ....	29/598
4,712,035	12/1987	Forbes et al. ....	310/269
4,818,911	4/1989	Taguchi et al. ....	310/259
5,642,011	6/1997	Fanning et al. ....	310/216

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[57] **ABSTRACT**

[21] Appl. No.: **09/296,691**

An electric motor of outer-rotor type includes: an inner stator mounted on a stator holder, an outer rotor rotatably circumferentially disposed around the inner stator, a shaft coaxially secured with the outer rotor, and a housing combined with the stator holder for encasing the outer rotor and the inner stator within the housing; with the inner stator including an annular core made of magnetic conductor, a plurality of fin arrays made of magnetic conductors and formed as a fin array assembly concentrically wrapped on the annular core, and a plurality of insulating coil bobbins each coil bobbin pre-wound with the coil windings thereon and jacketed on each fin array, thereby forming an inner stator having a stable construction, a higher winding capacity, higher magnetic flux density and higher output power, as well as a lower production cost.

[22] Filed: **Apr. 21, 1999**

[51] Int. Cl.<sup>7</sup> ..... **H02K 1/12; H02K 15/02**

[52] U.S. Cl. .... **310/179; 310/216; 310/218; 310/259; 310/269; 29/596; 29/597; 29/598**

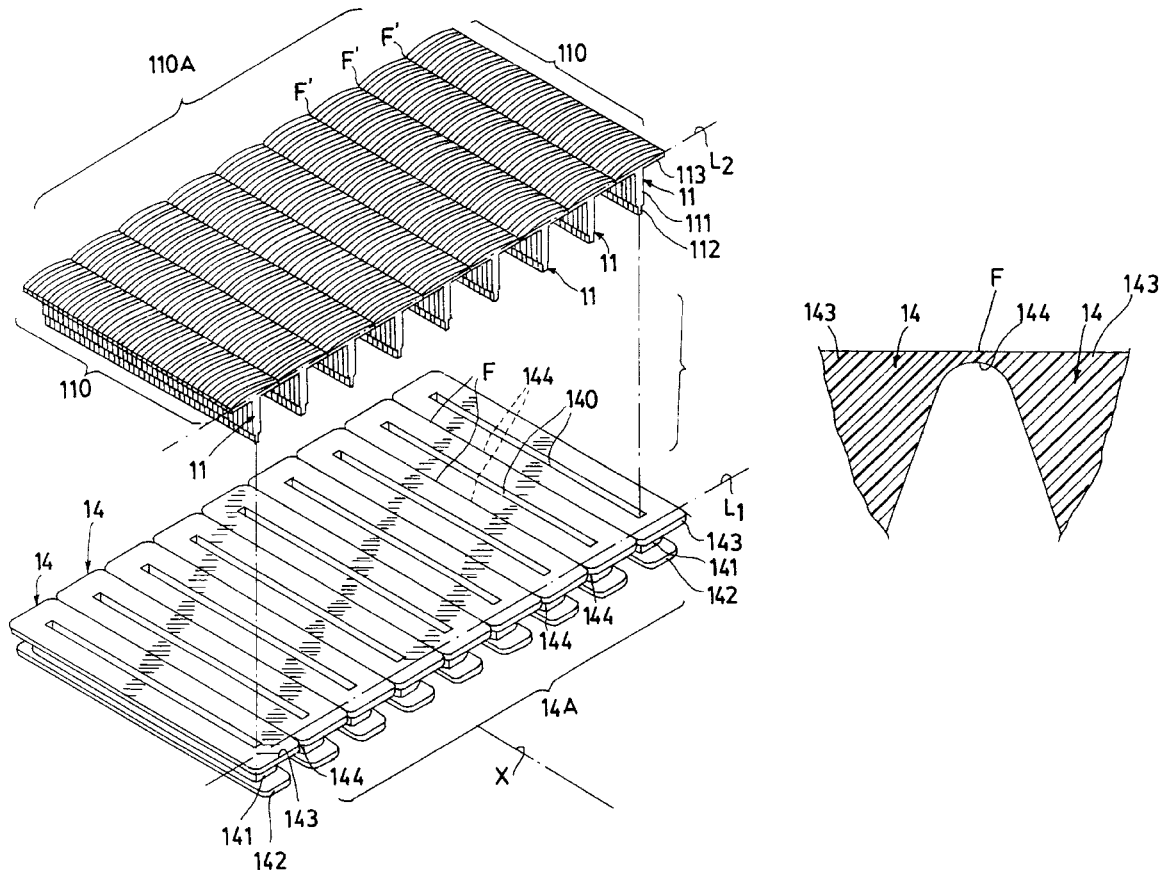
[58] Field of Search ..... 310/254, 259, 310/41, 216, 218, 269, 156, 194; 29/596, 597, 598, 609, 605

[56] **References Cited**

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**11 Claims, 8 Drawing Sheets**



Intellectual Ventures Exhibit 2002

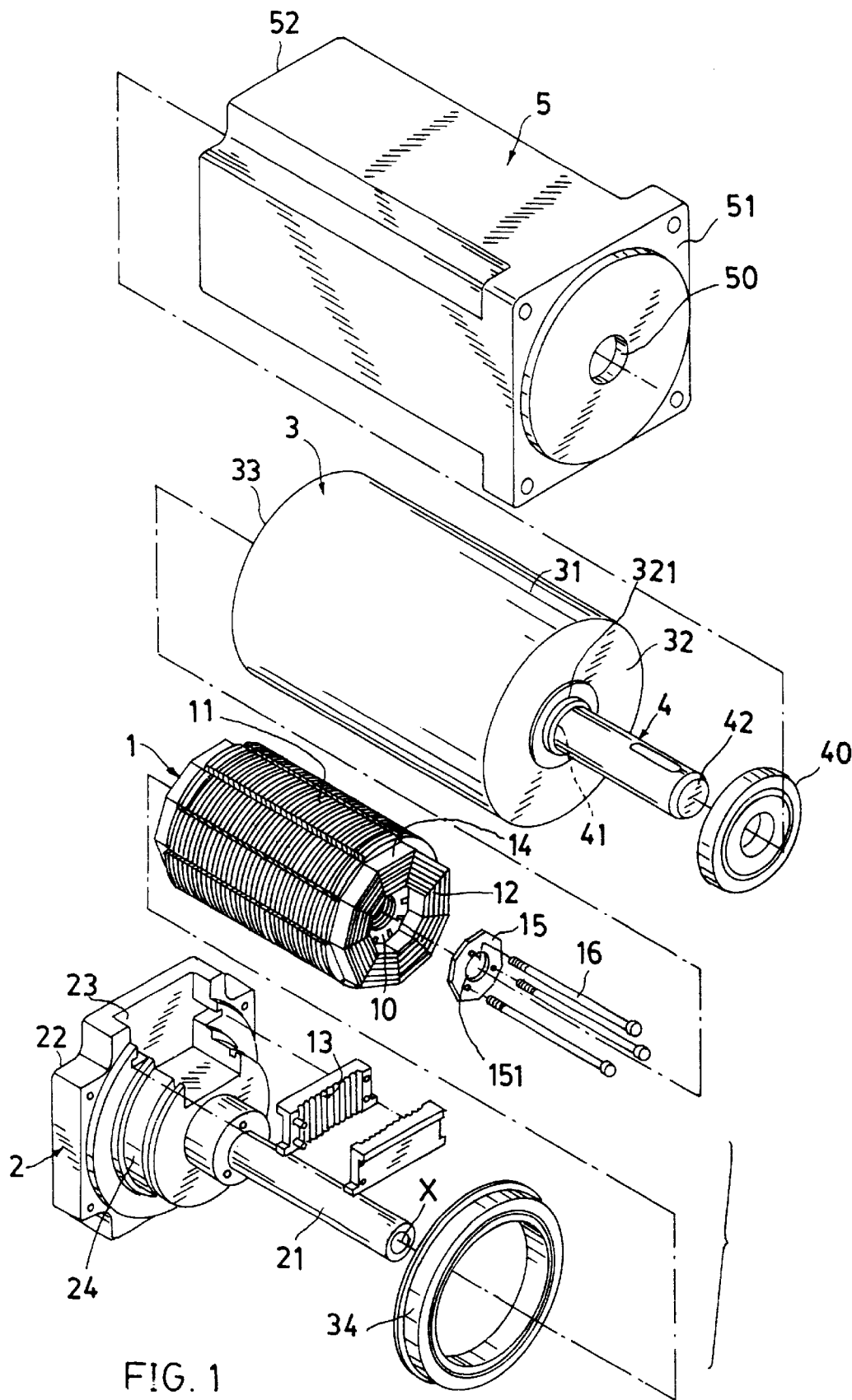


FIG. 1

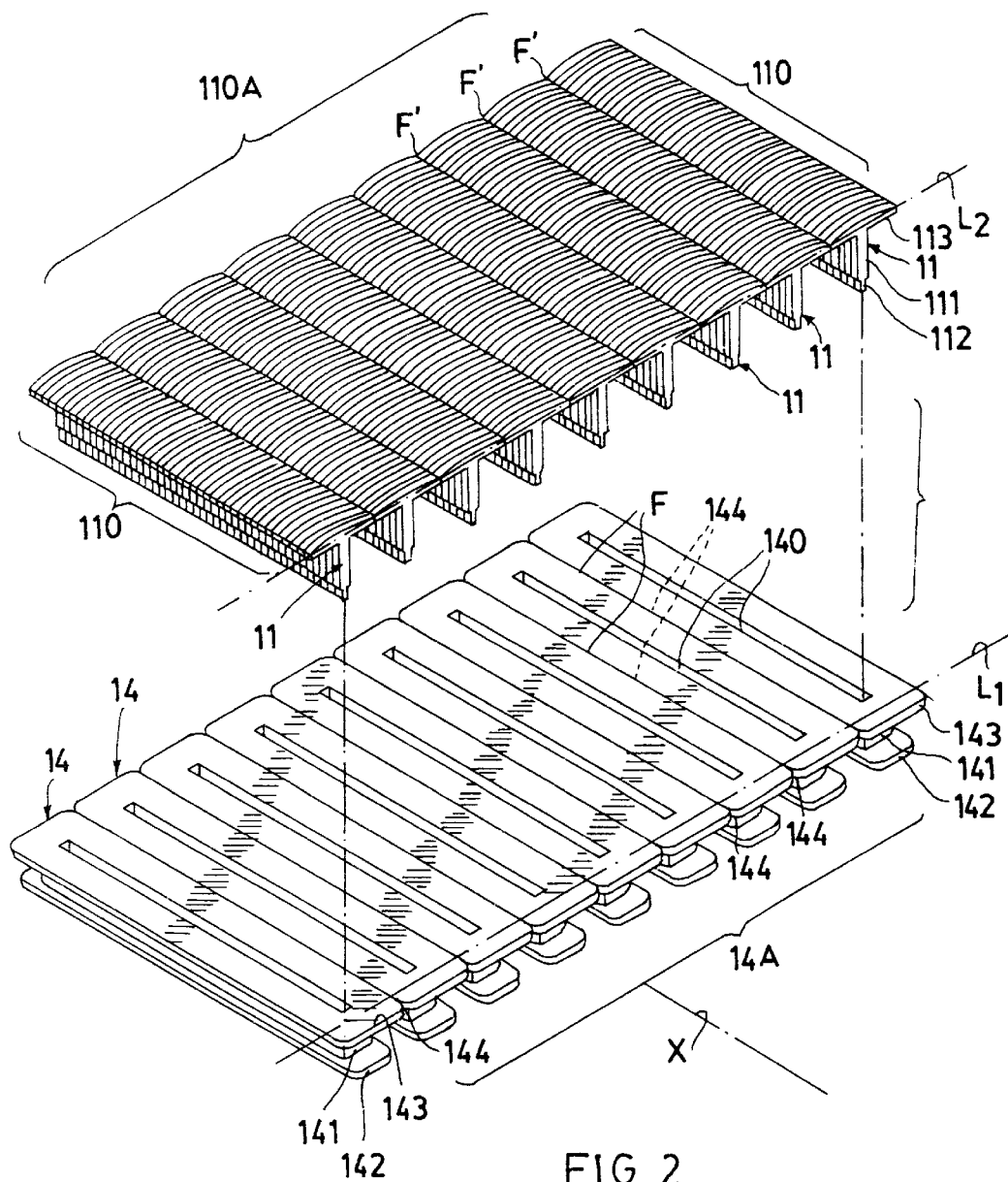


FIG. 2

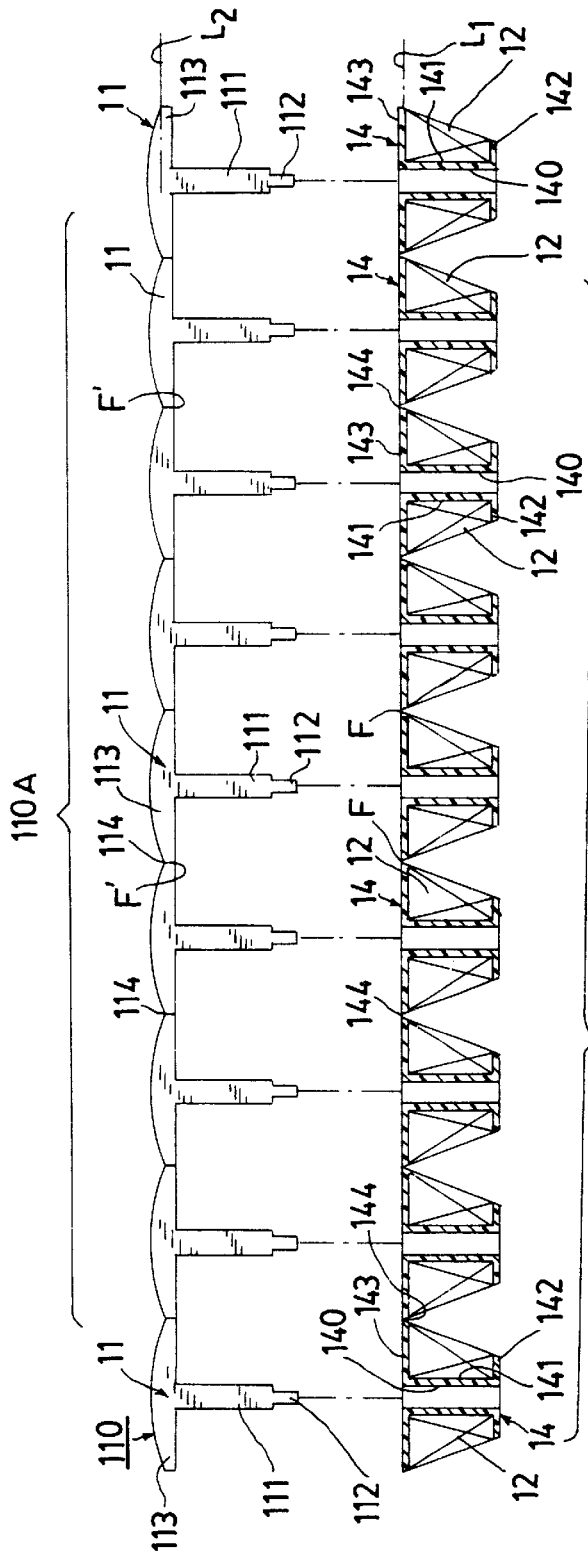


FIG. 3

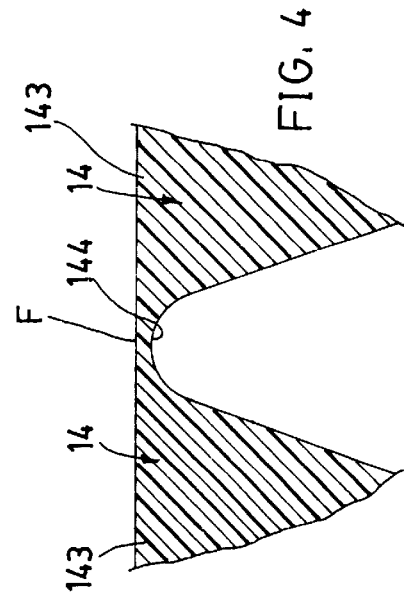


FIG. 4

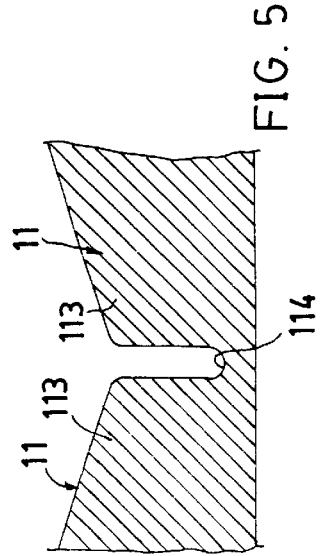


FIG. 5

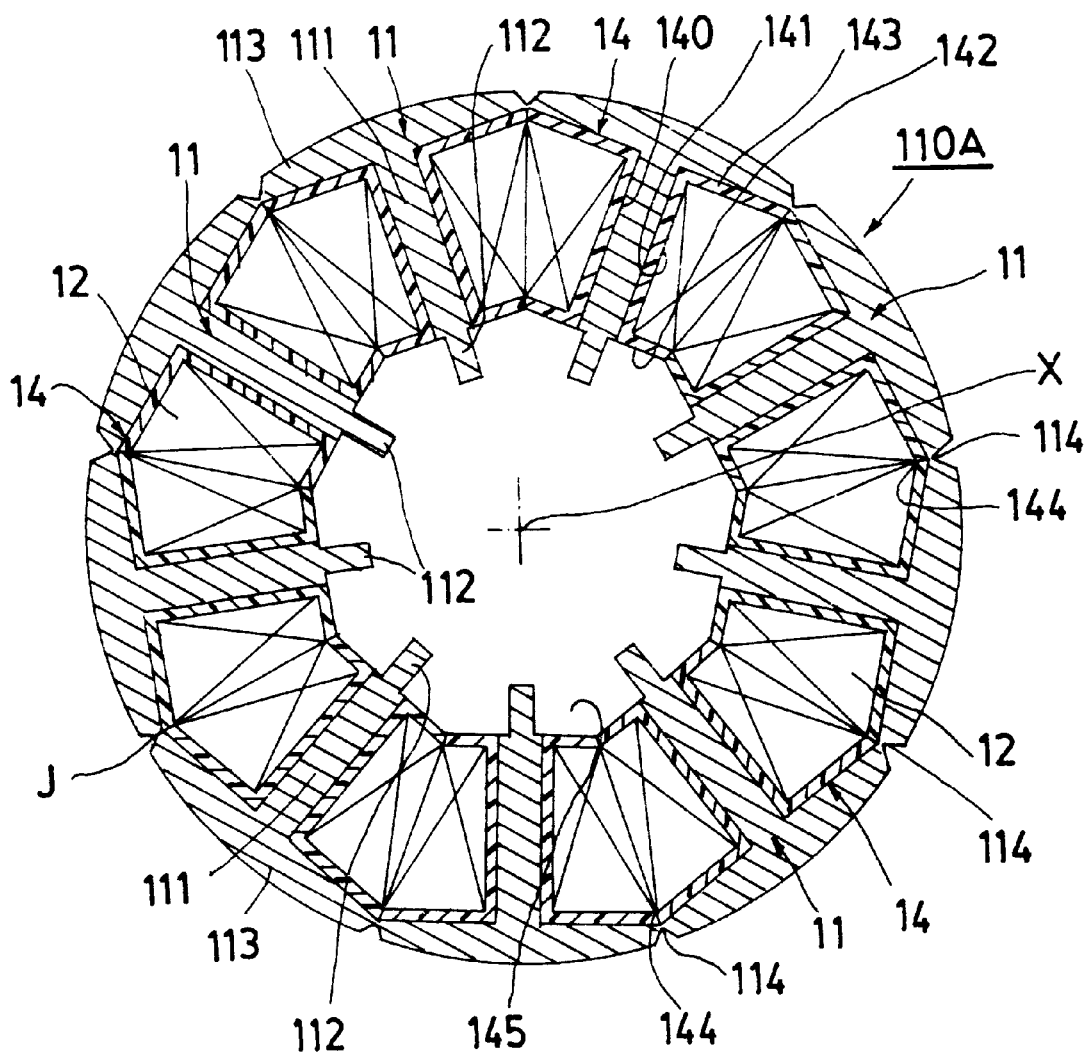


FIG. 6

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