The general pattern is now clear, & we have

$$\sum \frac{\theta^n}{n!} \Omega_n = J_1 + \frac{\theta}{1!} J_3 - \frac{\theta^2}{2!} J_1 - \frac{\theta^3}{3!} J_3 + \frac{\theta^4}{4!} J_1$$

$$= J_1 \left(1 - \frac{\theta^2}{2!} + \frac{\theta^4}{4!} \cdots \right) + J_3 \left(\frac{\theta}{1!} - \frac{\theta^3}{3!} \cdots \right)$$

$$= J_1 \cos\theta + J_3 \sin\theta$$

This method is of interest because all that was ever needed was the rule $[J_1 J_2 - J_2 J_1] = J_3$ & cylic permutations thereof