

Werk

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Jahr: 1973

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haben, erhalten wir die Lösung des Problems (18), (20) in der Form

$$\begin{aligned}
 u(t, x) = & \varphi_0(0) + t \varphi_1(0) + \psi_1(0) + tx \psi_1'(0) + \\
 & + [\varphi_0(x) - \varphi_0(0) - x \varphi_0'(0)] \cos \frac{ct}{a} + \frac{a}{c} [\varphi_1(x) - \varphi_1(0) - x \varphi_1'(0)] \sin \frac{ct}{a} + \\
 & + [\psi_0(t) - \psi_0(0) - t \psi_0'(0)] \cosh \frac{x}{a} + a[\psi_1(t) - \psi_1(0) - t \psi_1'(0)] \sinh \frac{x}{a} + \\
 & + \sum_{m=1}^{\infty} \left\{ \frac{1}{a^{2m}} \left[\int_{2m} \varphi_0(x) dx - \frac{x^{2m}}{(2m)!} \varphi_0(0) - \frac{x^{2m+1}}{(2m+1)!} \varphi_0'(0) \right] \sum_{n=1}^{\infty} \frac{(-1)^n}{(2n)!} \cdot \right. \\
 & \cdot \binom{n+m-1}{m} \left(\frac{ct}{a} \right)^{2n} + \frac{1}{a^{2m}} \frac{a}{c} \left[\int_{2m} \varphi_1(x) dx - \frac{x^{2m}}{(2m)!} \varphi_1(0) - \right. \\
 & \left. \left. - \frac{x^{2m+1}}{(2m+1)!} \varphi_1'(0) \right] \sum_{n=1}^{\infty} \frac{(-1)^n}{(2n+1)!} \binom{n+m-1}{m} \left(\frac{ct}{a} \right)^{2n+1} + \right. \\
 & + (-1)^m \left(\frac{c}{a} \right)^{2m} \left[\int_{2m} \psi_0(t) dt - \frac{t^{2m}}{(2m)!} \psi_0(0) - \frac{t^{2m+1}}{(2m+1)!} \psi_0'(0) \right] \cdot \\
 & \cdot \sum_{n=1}^{\infty} \frac{1}{(2n)!} \binom{n+m-1}{m} \left(\frac{x}{a} \right)^{2n} + (-1)^m \left(\frac{c}{a} \right)^{2m} a \left[\int_{2m} \psi_1(t) dt - \right. \\
 & \left. \left. - \frac{t^{2m}}{(2m)!} \psi_1(0) - \frac{t^{2m+1}}{(2m+1)!} \psi_1'(0) \right] \sum_{n=1}^{\infty} \frac{1}{(2n+1)!} \binom{n+m-1}{m} \left(\frac{x}{a} \right)^{2n+1} \right\}.
 \end{aligned}$$

Literatur

- [1] A. E. H. Love: A Treatise on the Mathematical Theory of Elasticity, Cambridge 1952.
 [2] E. Kamke: Differentialgleichungen II, Leipzig 1962.

Anschrift des Verfassers: 662 95 Brno, Janáčkovo nám. 2a (Matematický ústav ČSAV, pobočka Brno).