

538.9

$$D = (-1 < x < 1, y < 0)$$

$$u(x, y)$$

$$u(x, y) :$$

$$u_{xx} + u_{yy} + \omega u_y = 0, (x, y) \in D, \tag{1}$$

$$u_x \pm \omega_0 u = 0, x = \pm 1, \tag{2}$$

$$u(x, -\infty) = 0, \tag{3}$$

$$u_y(x, 0) = v(x), -1 \leq x \leq 1. \tag{4}$$

$$(1) \quad \omega = \omega_0 - \dots, \tag{4}$$

$$u(x, y) = \sum_{n=0}^{\infty} \frac{\cos \lambda_n x e^{\mu_n y}}{\mu_n \left(1 + \omega_0 \frac{\cos^2 \lambda_n}{\lambda_n^2}\right)^{-1}} \int_{-1}^1 v(\xi) \cos \lambda_n \xi d\xi, \tag{5}$$

$$\mu_n = -\frac{\omega}{2} + \sqrt{\frac{\omega^2}{4} + \lambda_n^2}, n = 1, 2, 3, \dots, \lambda_n -$$

$$\lambda = \omega_0 \operatorname{ctg} \lambda.$$

$$u(x, y)$$

W_1, W_2 и W_3 ,

$$\{ -1 \leq x \leq 1, y = 0 \},$$

$x = \pm 1$.

T^* ,

(2).

$$(5) \quad v(x) = (W_1, W_2, W_3).$$

$$I(v) = \int_{-1}^1 (u(1, y) - T^*)^2 dx. \tag{6}$$

$v(x)$

U ,

$I(v)$.

$$v_{n+1} = v_n + \varepsilon_n (v_{n-1} - v_n),$$

v_n
 ε_n

$$\min_{0 \leq \varepsilon_n \leq 1} I(v_n + \varepsilon_n (v_{n-1} - v_n)).$$

U

$$v = v_k, x_k \leq x \leq x_{k+1}, v_k = \text{const}, k = 0, 1, 2, \dots, m.$$

(5)

$$u(x, y) = \sum_{n=0}^{\infty} \frac{\cos \lambda_n x e^{\mu_n y}}{\mu_n \left(1 + \omega_0 \frac{\cos^2 \lambda_n}{\lambda_n^2}\right)} \sum_{k=0}^{\infty} v_k \frac{\sin \lambda_n x_{k+1} - \sin \lambda_n x_k}{\lambda_n},$$

$$I(v) = I(v_0, v_1, v_2, \dots, v_m).$$

$$2500 \leq v(x) \leq 5000$$

$$v(x) = \frac{1}{x_1 x_2 \dots x_n} \quad / \quad 2.$$

$$y_1, y_2, \dots, y_n$$

$$X = (x_1, x_2, \dots, x_n) \rightarrow Y(y_1, y_2, \dots, y_n).$$

$$x_1, x_2, x_3, \quad x_1 = \{\text{"температура"}\}, \quad x_2 = \{\text{"способ нагрева"}\}, \\ x_3 = \{\text{"слиток металла"}\},$$

$$T = \{\text{"минимальная"}, \text{"средняя"}, \text{"максимальная"}\},$$

$$W = \{\text{"минимальный"}, \text{"средний"}, \text{"максимальный"}\},$$

$$L = \{\text{"минимальный"}, \text{"средний"}, \text{"максимальный"}\}.$$

$$x = (x_1, x_2, x_3) \rightarrow Y \in [\alpha, \beta], \quad \alpha \text{ и } \beta$$

$$Q = \{\text{"минимальная"}, \text{"средняя"}, \text{"максимальная"}\}.$$

$$: 400\text{мм} \leq L \leq 6000\text{мм}, 2500 \text{ Вт/м}^2 \leq W \leq 5000 \text{ Вт/м}^2.$$

1. : , 2011.-111 .
2. // .
3. -2011 - . 51. 1. - . 24-38. / II. - . - 1979. - 385 .