NOTICE: When government or other drawings, specifications or other data are used for any purpose other than in connection with a definitely related government procurement operation, the U. S. Government thereby incurs no responsibility, nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.
The base is assumed to consist of an arbitrary number of layers having different elastic properties, each with constant thickness. It is also assumed that no gaps are formed between the layers during deformation, the deformation is plane, the displacements are equal to zero at infinity, the state of loading is symmetrical with respect to the x axis, the stress functions and their derivatives up to the fourth order satisfy the conditions of existence of Fourier's sine and cosine transformations. Recurrence formulas are given which make it possible to solve the basic problem of the theory of elasticity for bases consisting of any number of layers, if two image functions for one of these layers can be found. The authors consider the case when the lowest layer is placed on a rigid surface and a symmetrical die acts on the top layer. The image function $\alpha(p)$ for the top layer is sought in the form

$$\alpha(p) = \frac{1}{2} \int_0^a \chi(t) J_0(pt) dt$$

(2.5)

$J_0$ denoting the cylindrical function of the first kind. The problem is reduced to a Fredholm integral equation

$$\chi(x) = \frac{R}{2(1-v^2)} \left[ y'(0+x) \int_0^\frac{T}{2} y''(x \sin \gamma) d\gamma \right] + \int_0^a \chi(t) \delta(x,t) dt$$

(2.11)
Contact problem for ...  

where \( y(x) \) is a function determining the shape of the die, and

\[
K(x,t) = x \int_0^\infty p \varphi(p) J_0(px) J_0(pt) dp 
\]

(2.12)

\[
\varphi(p) = 1 - \frac{A(p)}{A_1} 
\]

(2.8)

\[
B_1 = \alpha_1 p A(p) 
\]

(1.6)

*Abstracter's note: l not defined, probably Eq. (2.6) in which the left hand side is missing.* The image functions \( \alpha \) and \( \beta \) were defined by the authors in a previous paper (Pryklyadna mekhanika, v. 8, 1962, no. 2), \( 2a \) is the maximum width of the die. When the layer thickness tends to \( \infty \) one obtains the solution for a half-plane.