meters to be studied, while the others are qualities which are compatible with the plasticity equations to be introduced later. The secondary wafer material should reflect changes only in those parameters under study. The above reasoning led to the selection of annealed 303 stainless steel for the primary material, and 2S aluminum, 6061 aluminum, and Armco iron for the secondary materials.

The approach to be taken here is to first describe the system of equations to be used, present the method of solution, and then show the resulting stress distributions for each of the situations under study.

A. Formulation of Governing Equations. The system of equations to be developed here are patterned from those given by Hoffman and Sachs in Reference (k). It has been determined experimentally in Reference (g), that for large plastic strains, such as occur in most metal-forming operations, the material may be considered incompressible. The condition of volume constancy may be written as

$$\epsilon_r + \epsilon_\theta + \epsilon_z = 0 \tag{1}$$

where ϵ_r, ϵ_θ, and ϵ_z are the normal strains acting in the radial, tangential, and axial directions, respectively. Since the wafer is axially symmetric, the strains are defined in terms of the displacements as

$$\epsilon_r = \frac{\partial u}{\partial r}, \quad \epsilon_\theta = \frac{u}{r}, \quad \epsilon_z = \frac{\partial \omega}{\partial z}$$