In [1] it was reported that certain mechanisms connected in parallel cannot be combined. Therefore, to draw a final conclusion regarding the possibility of the simultaneous action of two mechanisms of flow of porous polycrystalline bodies during hot compacting we shall examine a model of their successive connection retaining the sequence accepted in [2].

In parallel connection the same mean quadratic stress in the examined elements corresponds to different mean quadratic strains. Therefore, for a covalent polycrystal in which the main flow mechanism is creep according to Haazen, the total mean quadratic strain rate \( \ddot{\varepsilon} \) is represented by the sum of Eqs. (1) and (5) and is expressed by Eq. (22) from [1]. The mean quadratic creep rate according to Haazen, present in Eq. (22), can be written in the form

\[
\frac{1}{e_H} \frac{d\ddot{e}_H}{dt} = \frac{1}{2} Ba \tilde{\sigma}^{m+1}
\]

or after integration

\[
\ln \frac{\ddot{e}_H}{e_0} = \frac{1}{2} Ba \int_0^t \tilde{\sigma}^{m+1} dt.
\]

Thus, the mean quadratic strain \( \ddot{e}_H \) of the covalent polycrystal, forming a porous body, depends exponentially on the kinetic parameter \( Ba \), the rms stress \( \tilde{\sigma} \), and time \( t \):

\[
\ddot{e}_H = e_0 \exp \left[ \frac{1}{2} Ba \int_0^t \tilde{\sigma}^{m+1} dt \right].
\]

The integral in the right-hand part of this equation represents the product of pressure (if \( P = \text{const} \)) by the value \( 2^{(m+1)/2} D(m, \rho, t) \), determined by the integral (28) in [1]. As reported in [1], in successive bonding not only the strain rates but also strains are additive. Therefore, Eq. (22) from [1] will be written in the integral form

\[
\ddot{e} = \frac{1}{2} A \int_0^t \tilde{\sigma}^{m+1} dt + e_0 \exp \left[ \frac{1}{2} Ba \int_0^t \tilde{\sigma}^{m+1} dt \right].
\]

The first term will be transferred from the right to the left-hand part of Eq. (4):

\[
\ddot{e} - \frac{1}{2} A \int_0^t \tilde{\sigma}^{m+1} dt = e_0 \exp \left[ \frac{1}{2} Ba \int_0^t \tilde{\sigma}^{m+1} dt \right].
\]

The resultant equation is identical to Eq. (3) in which part from the total strain, relating to the operation of the Haazen mechanism, is separated. Therefore,

\[
\ln \frac{\ddot{e}_H}{e_0} = \frac{1}{2} Ba \int_0^t \tilde{\sigma}^{m+1} dt.
\]
Differentiation Eq. (6)

\[
\frac{\ddot{e}}{e} - \frac{1}{2} A \ddot{\sigma}^n = \frac{1}{2} B a \ddot{\sigma}^{n+1},
\]

we obtain the equation

\[
\frac{\ddot{e}}{e} = \frac{1}{2} \left[ A \ddot{\sigma}^n + B a \left( \frac{\ddot{e}}{e} - \frac{1}{2} A \int_0^t \ddot{\sigma}^n dt \right) \ddot{\sigma}^{n+1} \right],
\]

in which the quantity \( \varepsilon_H \), which remains unknown in Eq. (21) from [1], is fully determined

\[
\varepsilon_H = \frac{1}{2} A \int_0^t \ddot{\sigma}^n dt = \frac{n-2}{n} A \int_0^t \frac{P^\prime dt}{(\rho \chi)^{n/2}}.
\]

Equation (7) shows that the positive value of the kinetic parameter \( B a \) in consecutive connection of the examined mechanisms is ensured if the following conditions are fulfilled

\[
\frac{\ddot{e}}{e} - \frac{1}{2} A \int_0^t \ddot{\sigma}^n dt = \frac{n-2}{n} A \int_0^t \frac{P^\prime dt}{(\rho \chi)^{n/2}}.
\]

At constant temperature and pressure, from Eq. (10), we obtain

\[
\frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} > \frac{\rho_2 \chi(\rho_2)}{\rho_1 \chi(\rho_1)} \left[ \frac{\rho_2 \chi(\rho_2)}{\rho_1 \chi(\rho_1)} \right]^{n/2} > 1,
\]

\[
\ddot{e}(\rho_1) > \ddot{e}(\rho_2).
\]

Condition (13) fully coincides with the condition (11) from the report [2] for parallel connection of two flow mechanisms. We examine additional conditions resulting from the requirement from the positive value of \( A \). We shall assume that \( B a = \text{const} \), and we shall equate the expressions for \( B a \), obtained from Eq. (7), corresponding to two values of relative density \( \rho_1 \) and \( \rho_2 \):

\[
\frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} - \frac{1}{2} A \ddot{\sigma}^n(\rho_1) = \frac{\ddot{e}(\rho_2)}{\ddot{e}(\rho_2)} - \frac{1}{2} A \ddot{\sigma}^n(\rho_2)
\]

\[
\frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} - \frac{1}{2} A \ddot{\sigma}^n(\rho_1) = \frac{\ddot{e}(\rho_2)}{\ddot{e}(\rho_2)} - \frac{1}{2} A \ddot{\sigma}^n(\rho_2).
\]

denoting

\[
q_\varepsilon := \left[ \frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} \right] \left[ \frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} \right] = \left[ \frac{\rho_2 \chi(\rho_2)}{\rho_1 \chi(\rho_1)} \right] \left[ \frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} \right] = \left[ \frac{\ddot{e}(\rho_1)}{\ddot{e}(\rho_2)} \right],
\]

where \( \ddot{e}_H \) is determined by Eq. (9), we obtain