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TRANSLATION

METHOD OF FORGING, EXTRUDING, BENDING AND OTHER DEFORMING
OPERATIONS OF SHEETED PLASTIC MATERIALS

By

L. A. Yutkin and L. I. Gol'tsova

FOREIGN TECHNOLOGY DIVISION

AIR FORCE SYSTEMS COMMAND

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METHOD OF FORGING, EXTRUDING, BENDING AND OTHER
DEFORMING OPERATIONS OF SHEETED PLASTIC MATERIALS

BY: L. A. Yutkin and L. I. Gol'tsova

English Pages: 5

SOURCE: Russian Patent Nr. 147162 (Appl Nr.
622741/25, 23 March 1959), 1962, pp 1-3

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Method of Forging, Extruding, Bending and other Deforming Operations
of Sheeted Plastic Materials.

by

L. A. Yutkin and L. I. Gol'tsova

Known are methods of forging, extruding, bending and other deforming operations of sheeted materials which make use of hydraulic or mechanical presses, in which the pressure of the fluid is produced with the aid of pumping or compressor installations.

The described method calls for the realization of the mentioned technological operations under the effect of electro-hydraulic impacts (shocks), produced in an open or closed vessel, the bottom, wall or lid of which serve as machined material, at discharges between electrodes, one of which is made in form of a ring, or between electrode and current conducting grid, or elastic sheet with passing through it current conductive contacts with possible linear displacement of electrodes, over a spiral or with delay in their movements over points of deep extrusion.

In fig.1. is shown one of the variants of the installation for realizing "downwards" forging method; in fig.2 - installation for realization of the "upwards" forging method.

The device is made in form of a die 1 with hollow 2, filled with air or situated under vacuum. As lid for the hollow of the die serves a deformed sheeted material 3.

Over the deformed material (fig.1) or under the deformed material (fig.2) is placed box 4 filled with liquid, whereby the deformed material serves either as bottom

or lid of that box.

In the arrangement, shown in fig.1, the discharge is realized between electrode 5 and the deformed material 3, and the electrode is equipped with a deflector 6.

In the arrangement, shown in fig.2, the discharge is realized between two electrodes 7 and 8 passed through the side walls of box 4. In this arrangement is used an elastic gas tapping pipe 9 and a braking crankshaft channel 10, which can be used in any device and is intended for feeding and supplementing the shortage of liquid, in order not to permit the formation of a vacuum counter-pressure, originating after shutting the cavitation hollow, caused by the discharge. The supplementation of liquid can also be realized through the check valve set on the pipe line (not shown in drawing).

To assure symmetry in the application of forces against the material when forging large size objects the method has provision for working not with one, but with several electrode pairs, symmetrically arranged or rotating relative to the center of separation axis. The simultaneity in creating electro-hydraulic impacts (shocks) on each pair of electrodes can be realized in a general manner, e.g. by ignition.

When the second electrode is made in form of a ring the discharge will run around its periphery. i.e. it will revolve. Subsequent rotary movement of the discharge can also be realized by rotating the bent away G-shaped tip of the central electrode.

Electro-hydraulic impacts (shocks) in the liquid can also be obtained by thermal explosion of current conductive elements, e.g. wire or strip, situated obligatorily near the surface of the machined material.

Object of invention

1. Method of forging, extruding, bending and execution of other operations connected with the deformation of sheeted plastic materials, distinguished by the fact, that the mentioned operations are realized under the effect of electro-hydraulic impacts (shocks) originating in an open or closed vessel, bottom, wall or lid of which is served by the machined materials.

2. Method according to point 1, distinguished by the fact that the electro-hydraulic impacts (shocks) are realized either at discharges between the electrodes and the processed material or between two electrodes, one of which is made in form of a ring, or between electrodes with current conductive grid, situated near the surface of the processed material, or by thermal explosion of current conductive elements, situated for necessity near the surface of the processed material.

3. Method according to point 1, distinguished by the fact, that for the purpose of obtaining the given deformation value on the required surface sections of the processed material, is realized linear displacement or the electrodes (electrode), or symmetrical rotation or movement of same along the spiral, or delay of electrode movement over points of deep extrusion.

4. Way of executing the method according to points 1-3, distinguished by the fact, that for the purpose of executing e.g. bending operations, the processed material is deformed through the elastic, e.g. rubber sheet covering it with many passing through it current conductive contacts.

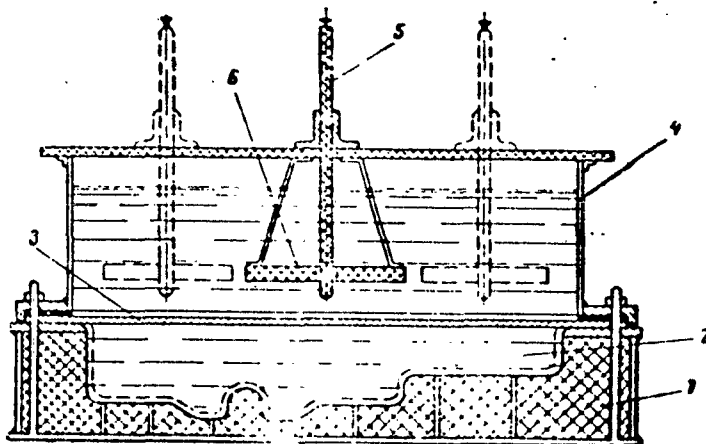


Fig.1

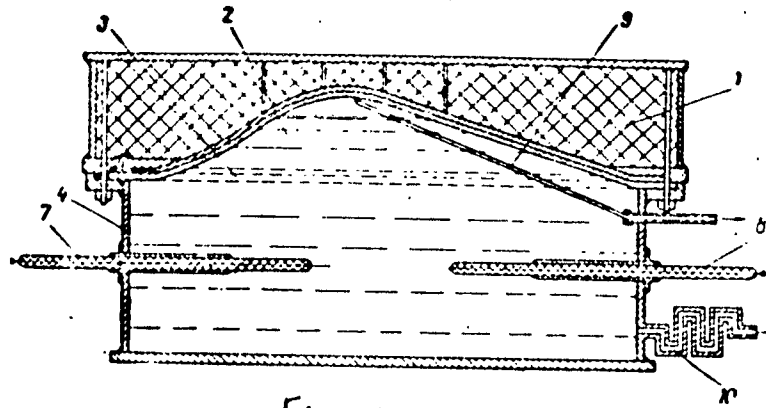


Fig. 2

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Foreign Tech. Div., Air Force Systems Command,
Wright-Patterson Air Force Base, Ohio.
METHOD OF FORGING, EXTRUDING, BENDING AND OTHER
DEFORMING OPERATIONS OF SHEETED PLASTIC
MATERIALS,

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Russian Patent Nr. 147162 (Appl. Nr. 622741/25,
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DESCRIPTORS: *Hydrostatic pressure, *Forging,
*Extrusion, Materials, Sheets, Processing,
Patents, Hydraulic presses, Deformation,
Impact shock, Shock waves, Electric discharges,
Liquids, Plastics.

Carroll

Identifiers: Electrohydraulic shocks.

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tion of other operations connected with the de-
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open or closed vessel, bottom, wall or lid of
which is served by the machined materials.
(Author)

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