

UNITED STATES PATENT OFFICE.

JULIUS HACKENBERG, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO HIMSELF,
AND CHARLES H. GRAEF, OF EDGEWATER, NEW YORK.

ORNAMENTED OBJECTS MADE OF VULCANIZED HARD RUBBER, &c.

SPECIFICATION forming part of Letters Patent No. 304,641, dated September 2, 1884.

Application filed July 23, 1884. (Specimens.)

To all whom it may concern:

Be it known that I, JULIUS HACKENBERG, of Hoboken, New Jersey, have invented an Improvement in Ornamented Objects Made of
5 Vulcanized Hard-Rubber Stock, Celluloid, Lignoid, Xylonite, Horn, Tortoise-Shell, and other Similar Materials, of which the following is a specification.

This improvement is the product resulting
10 from the process of producing designs in relief upon the surface of objects made of vulcanized hard-rubber stock, celluloid, lignoid, xylonite, horn, tortoise-shell, and other similar materials described in my application for a patent
15 therefor, serially numbered 135,165, and filed June 17, 1884. The said process is applicable to any material which, like those above mentioned, is rendered soft and readily compressible by heat, and which after being heated and
20 compressed will for a greater or less period retain its compressed form, and which upon being reheated will resume its original form.

The process consists in first heating the object which is to be ornamented sufficiently to render the material of which it is composed soft
25 and easily compressible; then indenting its surface according to a prescribed design by pressing a die or other instrumentality upon it; then, after it has become sufficiently cool,
30 grinding, scraping, or shaving more or less of the material from the surface upon which the indentations have been made; and, finally, in reheating the object, and thus causing the material in the compressed or indented parts to
35 expand and resume its original uncompressed condition, whereby the parts which were indented are made to project above the adjoining surface of the object operated upon, and to present in relief a configuration which is
40 substantially the same as the configuration in relief of the die or other instrumentality by which the indentations were made. For convenience I designate the objects ornamented in this way as "plano-carvings." Their characteristics
45 are that they are unaffected by moderate heating, and they are distinguishable by the peculiar color and effect of the ground, scraped, or shaved surface and the perfect uniformity in the appearance of the ground or

mat and the depressed parts of the pattern. 50
The raised surface of the pattern may be made to exhibit the same color and effect as the ground or mat by prolonging the grinding, scraping, or shaving operation until the entire surface of the blank is smooth, thus removing 55
a small quantity of material from the compressed parts, as well as the larger quantity from the uncompressed parts of the surface. On the other hand, the raised surface of the pattern may be made to exhibit a different 60
effect from the ground or mat, either by discontinuing the grinding, scraping, or shaving operation before any material is removed from the compressed or indented parts of the surface, or by polishing the raised surface after 65
the pattern has been brought out by the reheating operation. By the use of a suitable cutting-tool or a coarse grinding instrumentality prior to the reheating operation uniform systems of lines may be engraved or cut 70
upon the ground or mat, and upon the depressed parts of the pattern. In either case the color and effect of the ground or mat will be the same as the color and effect of the depressed parts of the pattern, however intricate 75
the pattern may be, and the ornamentation will be permanent.

I claim as my invention—

As a new article of manufacture, plano-carvings produced in the manner herein set forth 80
from vulcanized hard-rubber stock, celluloid, lignoid, xylonite, horn, tortoise-shell, or other similar material which is rendered soft and readily compressible by heat, and which after
85 being heated and compressed will for a greater or less period retain its compressed form, and which upon being reheated will resume its original form, the characteristics of such plano-carvings being the permanence of their ornamentation and the perfect uniformity in color 90
and effect of the ground, scraped, or shaved surface of the mat and the depressed parts of the pattern.

JULIUS HACKENBERG.

Witnesses:

J. B. NONES,
RICHARD BISHOP.