

Z. BEAUDRY.
BURNISHING TOOL.
APPLICATION FILED OCT. 13, 1906.

1,030,049.

Patented June 18, 1912.

2 SHEETS—SHEET 1.

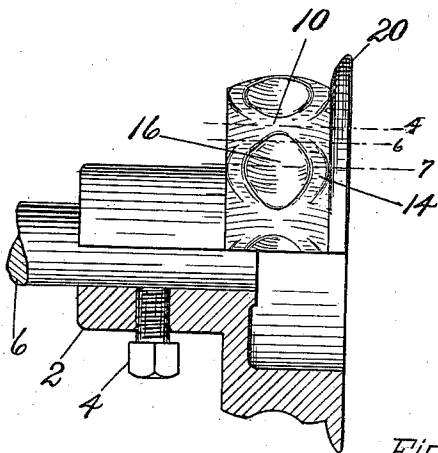


Fig. 1

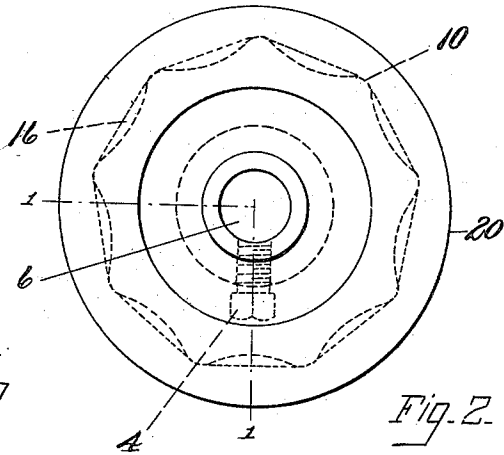


Fig. 2

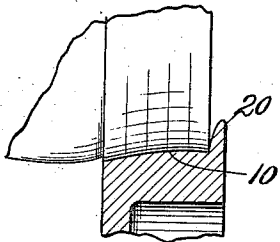


Fig. 4

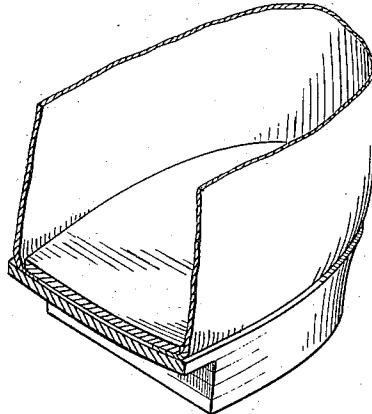


Fig. 3

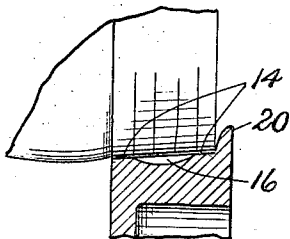


Fig. 7

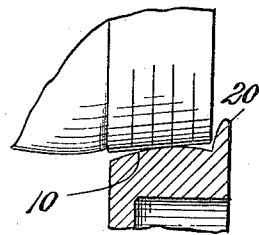


Fig. 5

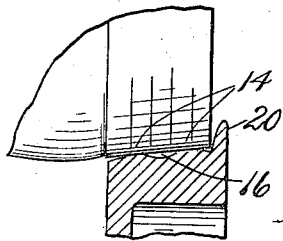


Fig. 6

WITNESSES.
Charles E. Smith
Arthur H. Russell.

INVENTOR.
Zotique Beaudry.

Z. BEAUDRY.
BURNISHING TOOL.
APPLICATION FILED OCT. 13, 1906.

1,030,049.

Patented June 18, 1912.

2 SHEETS-SHEET 2.

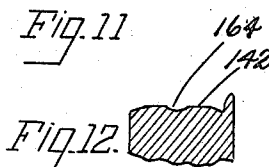
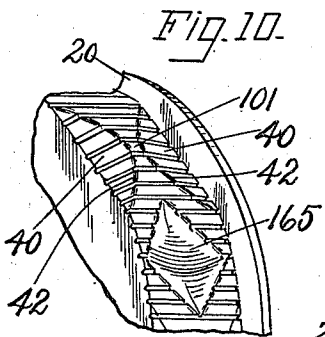
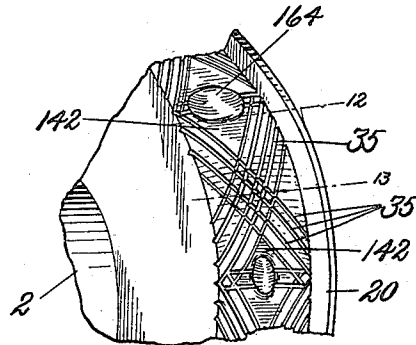
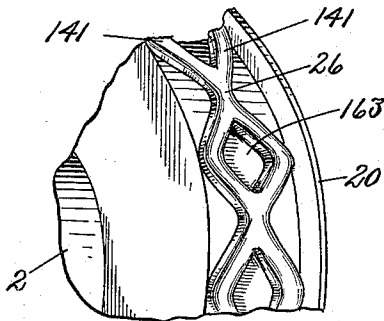
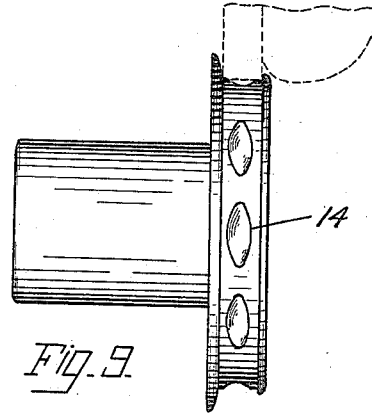
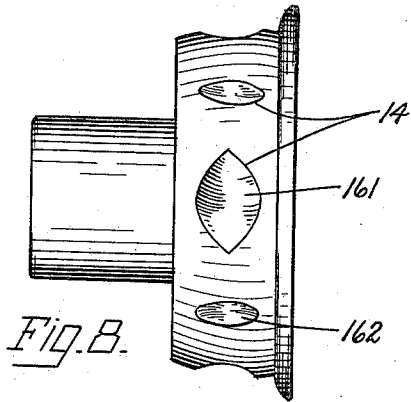
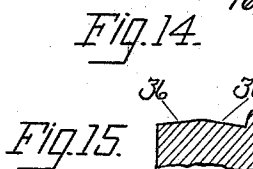
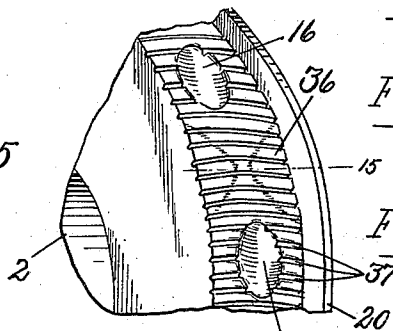


Fig. 16.
WITNESSES.
Charles E. Smith.
Arthur L. Russell.



INVENTOR.
Zotique Beaudry.

UNITED STATES PATENT OFFICE.

ZOTIQUE BEAUDRY, OF LYNN, MASSACHUSETTS, ASSIGNOR TO UNITED-XPEDITE FINISHING COMPANY, OF BERWICK, MAINE, A CORPORATION OF MAINE.

BURNISHING-TOOL.

1,030,049.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed October 13, 1906. Serial No. 338,827.

To all whom it may concern:

Be it known that I, ZOTIQUE BEAUDRY, a citizen of the United States, residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Burnishing-Tools, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to burnishing machines and particularly to the tools used in machines for burnishing the edges of heels and soles of boots and shoes.

The edges of heels and of soles vary in "edge contour," by which term as herein used is meant the configuration of the edge as it appears in a transverse section of the heel or sole. Some edges are straight or plane while others are more or less concave and still other edges are slightly convex. In some shoes also the edge of the heel is plane in one portion,—as, for example, near the breast corners,—and by reason of inaccurate trimming or scouring, and sometimes designedly, curved in another portion, as at the rear end. A tool for burnishing an edge should have a work-rubbing surface which is shaped as a substantial counterpart of the contour of the edge to be burnished and for the best results said surface should be at least as wide as said edge in order that the entire width of the edge may be treated as the tool passes over it. Two types of burnishing tools are in use for this purpose.

One type is provided with a yielding work-rubbing surface having a normal shape approximating a counterpart of the contour of the edges to be burnished, said surface being designed to yield to enable it to conform more nearly to the contour of the work as the tool passes over the work. This tool gives very satisfactory results, but it is somewhat expensive to manufacture and its work-rubbing surface has to be renewed from time to time. A second type of burnishing tool is usually made as a solid wheel or roll having a peripheral work-rubbing surface formed as a counterpart of the contour of the particular edge to be burnished by it. This tool will not burnish properly any other contour of edge than that for which it is especially shaped

and therefore a shoe manufacturer making several styles of shoes having different edges must keep on hand a large number of burnishing tools and the operator must change tools for each lot of shoes having a different edge. A further and serious objection to this old style of tool is that shoes having heels or soles which differ in edge contour in different portions cannot be satisfactorily burnished because if the burnishing tool fits one portion of the edge it fails to fit properly the portion having a different contour.

An object of this present invention is to provide a burnishing tool having a work-rubbing surface which, although it may be unyielding, will properly burnish heels or soles differing in edge contour. I have discovered that I can secure this object by providing a burnishing tool having a work-rubbing surface comprising a face which will burnish the middle portion of a heel or sole edge, whatever the contour of said edge may be, and also other faces that will act upon the heel or sole edge from its middle portion to its margins. The work-rubbing surface may include a face which is shaped to rub the middle portion of the most concave edge contour to be burnished by the tool, and a face having a properly shaped and arranged depression the edges of which constitute work-rubbing faces. The depressions will receive the less concave, straight, or convex edges, or portions of edges of any contour presented to the tool and the edges of the depressions will burnish the surface of the work as the tool advances. The depressions referred to may be merely depressions in the convex surface that do not extend below a line connecting their opposite edges, or they may be recesses that do extend below a line, or again may comprise a central portion extending below such a line and a marginal portion of substantial width that is approximately plane. For convenience the term "depressions" will hereinafter be used to refer generically to such portions of the work-rubbing surface of the tool.

Preferably the depressions in the work-rubbing surface of the tool extend across a large portion of the width of said surface, but have their edges terminating within the opposite marginal edges thereof. The de-

pressions are also preferably elliptical, diamond-shaped, or of other oblong configuration, having their edges extending obliquely from the middle of the periphery of the tool toward the opposite edges thereof. This construction provides a longitudinal series of differently-shaped faces formed to engage different contours of the surface being burnished. The convex portions will rub the middle portion of the edge, regardless of its contour, and the edges of the depressed portions rub the edge from its middle portion to its margin, so that the entire width of the heel or sole edge will be burnished whether it is straight or curved. This action will, of course, take place regardless of any variations in contour of the work at different places in the length of the edge. If the edge to be burnished is convex it is important that the depressions be deep enough to receive the rounded contour of the work while the edges of the depressed portion contact with and rub the surface of the work. It is, therefore, preferable to form the depressions as recesses, the central portions of which extend below the level of the marginal edges of the work-rubbing surface of the tool.

The depressions preferably are shaped and arranged to present edges extending obliquely across the work-rubbing surface of the tool in opposite directions. This arrangement causes said edges to lay the fibers of the leather and to work into the crevices in the edge of the heel or sole the finishing material which is usually employed in burnishing shoes. The tool may also be provided with grooves or ribs which assist in distributing the finishing material and appear to produce a smoother finished surface in the work. Preferably the depressions are separated from one another by a substantial portion of the work-rubbing surface of the tool which portion extends entirely across the width of the tool. By this arrangement I avoid sharp corners or projections on the tool which might act too harshly upon the work and a convex portion of sufficient extent is provided at the middle of the tool to burnish properly the middle portion of the heel or sole edge being treated. In addition to the depressions referred to, which may be arranged in a series extending lengthwise along the middle of the work-rubbing surface of the tool said tool may be provided with slightly flattened faces at either side of the middle and arranged lengthwise of said face to alternate with the middle depressions. The tool may, if desired, be provided with a guiding flange to assist in presenting the work in proper lateral position; and it is sometimes desirable to provide a sole-edge burnishing tool with flanges at each margin of its edge to guide the sole and burnish the corners or

upper and lower angular portions of the sole edge.

The foregoing and other features of the invention, including certain details of construction, will be explained in the following description and pointed out in the claims.

In the drawings,—Figure 1 is a side elevation, partly in section, of a heel-burnishing tool; Fig. 2 is a right-hand elevation of the tool shown in Fig. 1; Fig. 3 shows a perspective view of the heel portion of a shoe for the purpose of illustrating the edge contour of the heel; Fig. 4 is a detail sectional view on the line 4 in Fig. 1, showing a concave portion of a heel presented to the convex portion of the tool; Fig. 5 is a sectional view on said line 4 of Fig. 1, showing the action of a convex portion of the work-rubbing surface of the tool upon an approximately straight portion of the edge of the heel; Fig. 6 is a similar view on the section line 6 of Fig. 1; Fig. 7 is a similar view on the line 7 of Fig. 1. Fig. 8 is a modification, showing a burnishing tool having a series of depressions of different shape about the periphery of the tool; Fig. 9 is a side elevation of a tool embodying this invention and adapted for burnishing the edge of a sole, this tool being provided with guiding flanges at each marginal edge of its work-rubbing surface; Fig. 10 is a detail perspective view of a modified form of burnishing tool, having work-rubbing faces extending lengthwise in sinuous lines ranging from the marginal edge of the tool to its middle; Fig. 11 is a similar view of a modified construction having grooves intervening between the depressions in the work-rubbing surface of the tool and inclined in opposite directions from the edges toward the middle of said surface; Figs. 12 and 13 are, respectively, detail sectional views on the lines 12 and 13 of Fig. 11; Fig. 14 is a detail perspective view of a further modification involving this invention; Fig. 15 is a detail sectional view on line 15 of Fig. 14; Fig. 16 shows a further modification.

For the purpose of explaining this invention a rotary burnishing tool is illustrated and will be herein described. This tool comprises an attaching portion or hub 2 carrying a binding screw 4, by means of which the tool may be fastened to a shaft 6 to be actuated. The tool has its work-rubbing surface on its periphery and this surface comprises a longitudinal series of differently-shaped faces formed to engage different contours of the surfaces to be burnished,—as, for example, different edge contours of heels.

In Fig. 1 the rubbing surface of the tool is transversely convex in its general outline and the series of work-rubbing faces comprises convex faces 10 which are adapted to engage the middle portion of the most

concave edge to be burnished by the tool. Intermediate the convex faces and connecting them are depressed faces 16. These faces may have merely a less degree of convexity than the faces 10 or may be flat or plane faces viewed transversely of the tool or they may be recesses the bottom faces of which extend below a plane connecting the opposite edges of the work-rubbing surface of the tool. The faces 16 present work-rubbing members 14 extending outwardly from the middle portion of the work-rubbing surface toward its edges. The depressed faces permit a heel or a portion of an edge which is straighter than the convex face of the tool is adapted to fit to be presented in position for its surface to be acted upon by the work-rubbing faces 14, as is illustrated in Figs. 5, 6, and 7, from the middle portion of said surface to its margins.

As will be understood by reference to Figs. 4 to 7 the middle portion of the heel edge is acted upon by the middle portion of the work-rubbing surface, whatever the contour of the edge may be. From the middle portion of the edge to its margin the faces 14 will rub the work as said faces advance in the rotation of the tool. The burnishing tool is preferably provided with a guiding flange 20 at one of its marginal edges to assist the operator in presenting the edge to be burnished to the work-rubbing surface of the tool. The guiding flange also serves to prevent the angular lower edge of the heel from being broken down or deformed by pressure against the tool.

In the modified construction shown in Fig. 8 the tool is provided with a work-rubbing surface having a longitudinal series of depressions of different shape arranged alternately, the depressions being oblong and those marked 161 having their longer axes extending longitudinally of the work-rubbing surface, while the depressions marked 162 have their shorter axes extending longitudinally of the work-rubbing surface and their longer axes extending transversely thereof.

In the modification shown in Fig. 10 the tool is provided with a work-rubbing surface having burnishing faces 141 extending lengthwise thereof in sinuous or zigzag lines ranging from the marginal edges of the tool to the middle portion of the tool and merging at said middle portion. This construction forms a tool having at the middle where the faces merge a transverse convex portion and having between said convex portions work-rubbing faces which alternately diverge and converge in extending toward the marginal edge of the tool and thence back to the middle. The two faces together constitute a depressed or transverse flattened portion of the periphery of the

tool having a recess 163 to receive a convex or a straight portion of a surface being burnished.

In the modification shown in Fig. 11 the work-rubbing surface of the tool has oblong depressions of varying sizes. These depressions are also arranged in circular alignment around the periphery of the tool. As will be seen from the sectional view in Fig. 12 the portion of the tool immediately surrounding the depression 164 is transversely flattened as at 142. The convex portion of the work-rubbing face is provided in this modification with grooves 35 which extend obliquely from one marginal edge of the tool to the other. There are shown two series of these grooves crossing each other along the middle portion of the work-rubbing face.

In the modification shown in Fig. 14 the convex portion of the work-rubbing surface between the depressions 16 is flattened at its edges as at 36. This shape appears more clearly in the sectional view shown in Fig. 15. This construction enables this portion of the tool to enter a portion of the surface being burnished which is more concave than the general outline of the working surface of the tool is designed to fit. By this construction the middle of such a concave surface may be burnished by said convex portion of the tool and the portions of the work at either side of said middle portion would be acted upon by the work-rubbing faces formed at the edges of the depressions. In this modification the periphery of the tool is provided with transverse grooves 37.

In the modification shown in Fig. 16 the tool has a straight edge presenting a narrow work-rubbing surface 101 which will burnish the middle portion of an edge of any contour. The edge is beveled at 40 on opposite sides of the face 101 to permit said face to enter and engage a concave heel edge and the edges 42, at which the bevels 40 and faces 101 meet, form work-rubbing surfaces which will furnish a heel edge from its middle portion to its margins as the tool advances over the work. These edges 42 serve essentially the same purpose as the faces 14 adjoining the depressions 16 in Fig. 1. The tool shown in Fig. 16 is also preferably, although not necessarily, provided with a depression 165, the edges of which form rubbing faces. It is to be noted that the edges of the depressions form rubbing faces that extend from the middle portion of the work-rubbing surface of the tool obliquely toward its margins and faces which are oppositely inclined from the margins toward the middle of said surface. It may be observed also that these faces extend obliquely with relation to the line of movement of the tool as it is rotated.

In the modification shown in Fig. 9 a sole-

edge burnishing tool is provided with guiding flanges at each marginal edge of its work-rubbing surface.

In the use of this burnishing tool it is
 5 rotated by the shaft 6 and any heel having an edge contour approximating the general edge contour of the tool may be presented. As the tool rotates the convex portions 10 or the straight portions 101 of the work-
 10 rubbing face will engage the middle portions of the heel edge and rub an area depending upon the relative curvature of said rubbing surface and the edge contour of the heel. As the tool advances in its rotation a
 15 depressed portion of the work-rubbing face comes opposite the work and the faces 14, 141, or 142 contact with the work and rub it from said middle portion to the margins so that all portions of the edge are treated,
 20 whatever may be the contour of the surface of the work. When the tool shown in Fig. 16 is rotated the edges 42 rub the stock from its middle outwardly and then in a reverse direction in a manner similar to the action
 25 of the faces 14, 141, and 142. It will be observed that on account of the depressions in the periphery of the work-rubbing surface the extent of the burnishing surface between the opposite edges of the tool alter-
 30 nately increases and diminishes as the tool advances over the work. The depressions 16, 161, 162, 163, 164, 165 are oblong and so formed in the surface of the tool that the rubbing edges or faces 14, 141, or 142 ex-
 35 tend obliquely from the middle portion of the work-rubbing surface to its edges and from thence back to the middle portion again. This disposition of the faces 14, 141, or 142 causes them to rub the stock first
 40 outwardly toward the margins of its edge and then inwardly away from its margins and then lengthwise of the edge. This rubbing action lays the fibers of the leather and also works the finishing material into the
 45 stock. The grooves 35 and 37 also appear to assist in producing this effect. The alternate arrangement of the depressions 161, 162 in Fig. 8 also produces a rubbing of the work back and forth in different lines to
 50 the same end. This invention has the advantage that a heel can be brought into contact with the work-rubbing surface by a single movement, or by direct pressure in a way to burnish the entire width of its
 55 edge whatever the contour of that edge with reasonable limits of variation. This avoids the necessity for rocking and sliding the heel transversely of the tool as has heretofore been necessary unless the burn-
 60 ishing tool fitted accurately the contour to which the heel edge had been trimmed and scoured, and unless said edge was of uniform contour throughout its length. Less skill and labor is, therefore, required to
 65 burnish heels with this tool, less time is con-

sumed, and better results are secured than have heretofore been possible in practice.

Having explained the nature of the invention and described how it may be embodied in edge burnishing tools, I claim and
 70 desire to secure by Letters Patent of the United States:—

1. A burnishing tool having a work-rubbing surface comprising a longitudinal series of differently-shaped faces alternately
 75 arranged and formed to engage respectively different contours of surfaces being burnished.

2. A burnishing tool having a work-rubbing surface comprising a longitudinal series of differently-shaped faces formed to engage respectively, during the advance of
 80 the tool, with different portions of the width of the surface being burnished, combined with means by which the tool may be actuated.

3. A burnishing tool having a work-rubbing surface including a convex face for engaging a concave portion of the surface being
 90 burnished, and a flattened face provided with diverging rubbing members extending substantially across said acting face and arranged to engage simultaneously a less concave or straight portion of the surface being
 95 burnished.

4. A burnishing tool having a work-rubbing surface comprising a longitudinal series of differently-shaped faces formed to engage, during the advance of the tool, with
 100 different portions of a surface being burnished, said work-rubbing surface including a convex face to engage a concave portion of the work and a depressed face the edges of which form rubbing members diverging from the middle of said acting face
 105 outwardly toward the margin thereof, combined with means by which the tool may be actuated.

5. A burnishing tool having a work-rubbing surface comprising projecting convex
 110 portions to engage the middle portion of a concave surface being polished, and relatively depressed portions having rubbing faces extending from the middle of said acting face toward the marginal edges
 115 thereof to act on the surface being polished from its middle portion toward its edges.

6. A rotary tool comprising work-rubbing faces extending substantially around the tool in oblique lines back and forth between
 120 its opposite marginal edges and the middle of the acting face.

7. A burnishing tool having a work-rubbing surface provided with a series of depressions comprising oblong depressions
 125 having their longer axes extending transversely across said work-rubbing surface alternating with other depressions having their shorter axes extending transversely across said work-rubbing surface.
 130

8. A rotary burnishing tool having a work-rubbing surface provided with a longitudinal series of oblong depressions arranged with their major and minor axes alternating about the periphery of the tool.

9. A burnishing tool having a convex work-rubbing surface provided with a series of depressions located along the middle of the width of said face, and grooves between said depressions and extending transversely across the work-rubbing surface.

10. A burnishing tool having a convex work-rubbing surface provided with a series of depressions located along the middle of the width of said face, and grooves between said depressions and inclined in opposite directions from the edges of the tool toward the middle of the work-rubbing surface.

11. A burnishing tool having a transversely convex work-rubbing surface provided with a series of depressions arranged along the middle of the acting face and terminating at their sides within the opposite edges of said work-rubbing surface.

12. A rotary burnishing tool having a peripheral work-rubbing surface provided with a series of depressions, said depressions extending below a plane connecting the opposite edges of said surface and terminating at their sides within the opposite edges of the work-rubbing surface of said tool.

13. An edge burnishing tool having a convex work-rubbing surface provided with a series of depressions terminating at their sides within the opposite edges of said surface and which are arranged longitudinally around the tool and extend below the plane of the opposite edges of said convex surface, said depressions presenting at their opposite edges rubbing faces extending at an angle to the axis of rotation of the tool.

14. A rotary burnishing tool provided with a series of depressions centrally arranged in circular alinement around its periphery, said depressions terminating at their sides within the opposite edges of the work-rubbing surface of the tool.

15. A rotary burnishing tool having a work-rubbing surface provided with a series of depressions extending below the plane connecting the opposite edges of said surface and arranged longitudinally around the periphery of the tool, said depressions terminating at their sides within the opposite edges of the work-rubbing surface, and separated one from another by a substantial portion of the rubbing surface extending entirely across the tool.

16. A burnishing tool having a convex work-rubbing surface provided with a series of depressions having marginal portions of substantial width that are approximately plane faces, and recesses located within and extending below said marginal portions.

17. A burnishing tool having a trans-

versely convex work-rubbing surface provided with a series of depressions arranged along the middle of the said surface and terminating at their sides within the opposite edges of said surface, and an angular guiding flange extending around said tool at one of the edges of its work-rubbing surface.

18. A burnishing tool having a work-rubbing surface comprising a longitudinal series of differently-shaped faces formed to engage, during the advance of the tool, with different portions of a surface being burnished, said faces including transversely convex portions each having a middle rubbing surface and depressions near its edges; and intervening, centrally-depressed portions having rubbing surfaces alternately diverging from and converging toward the middle of the acting face of said work-rubbing surface.

19. A burnishing tool having a work-rubbing surface including a convex face for engaging a concave portion of the surface being burnished, and a depressed portion having a face formed to engage a less concave or a straight portion of said surface.

20. A burnishing tool having a work-rubbing surface provided with depressions terminating at their sides within the opposite edges of said work-rubbing surface and presenting at their edges rubbing faces extending obliquely with relation to the line of movement of the tool, combined with means for actuating the tool.

21. A burnishing tool having a work-rubbing surface comprising unbroken rubbing faces extending from the margins of said surfaces obliquely toward the middle thereof and other work-rubbing faces oppositely inclined from the margins toward the middle of said surface, each of said two series of oblique faces terminating at or near the middle of the periphery of the tool.

22. A rotary edge burnishing tool having a work-rubbing surface comprising a middle portion extending longitudinally about the tool for engaging the middle portion of the edge to be burnished, and inclined faces located on opposite lateral sides of said middle portion and presenting work-rubbing edges extending obliquely from the middle portion of the tool toward its margins.

23. A burnishing tool having a work-rubbing surface comprising the transversely convex rubbing faces 10 alternating with the oppositely inclined faces 14 located in a lower plane than the faces 10.

24. A burnishing tool having a work-rubbing surface comprising the transversely convex rubbing faces 10 alternating with the rubbing faces 14 which first diverge from a face 10 toward the margins of the tool edge and then converge toward the middle thereof.

25. A burnishing tool having a work-
rubbing surface comprising the transversely
convex rubbing faces 10 alternating with
depressions 16 which are bounded by the
5 diverging and converging rubbing faces 14.

26. A burnishing tool having a work-
rubbing surface on its periphery provided
with a longitudinal series of depressions
terminating at a distance from the edge of
10 the tool and having marginal work-rubbing
edges with different characteristics for vary-

ing the treatment of the work as they suc-
cessively engage it in the movement of the
tool.

In testimony whereof I have signed my 15
name to this specification in the presence of
two subscribing witnesses.

ZOTIQUE BEAUDRY.

Witnesses:

CHARLES E. GRUSH,
ARTHUR L. RUSSELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."

It is hereby certified that in Letters Patent No. 1,030,049, granted June 18, 1912, upon the application of Zotique Beaudry, of Lynn, Massachusetts, for an improvement in "Burnishing-Tools," an error appears in the printed specification requiring correction as follows: Page 5, line 55, for the compound word "wood-rubbing" read *work-rubbing*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 23rd day of July, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.